Heavenly Mountain Resort

Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)



Prepared for Tahoe Regional Planning Agency



May 2, 2016 (Revised August 2016)





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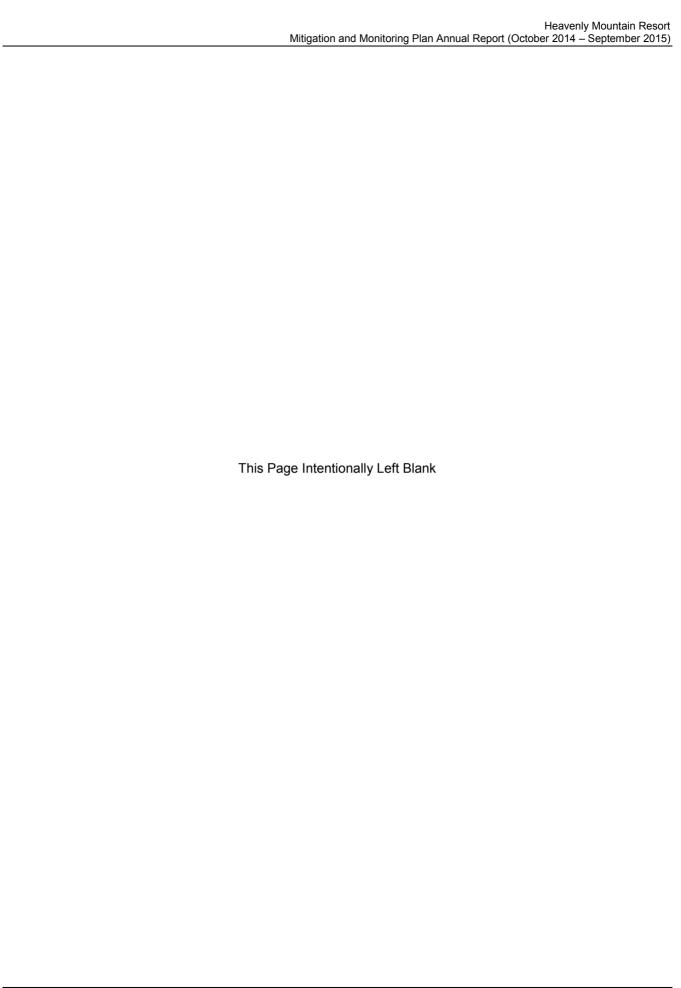
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Executive Summary

On April 25, 2007, the Tahoe Regional Planning Agency's Governing Board unanimously approved Heavenly Mountain Resort's 2006 Master Plan Amendment (MPA). "In 2013 Heavenly made application with the USDA Forest Service and TRPA to amend the MPA 07 to expand non-skiing and summer use opportunities within the resort. The 2013 proposal, titled Epic Discovery, utilizes existing infrastructure and facilities (e.g., ski lifts, lodges and roads) to provide a wide variety of new summer activities for guests.... The proposal was developed following the passage of the Federal Ski Area Recreational Opportunity Enhancement Act of 2011 which allows ski resorts operating on National Forest System lands to propose year-round non-skiing activities in order to attract a wider range of visitors to National Forests and help support employment and economic activity in local communities. The 2015 Master Plan amendment is referred to as the Heavenly Master Development Plan (MDP).¹ This annual report summarizes monitoring and evaluation activities conducted at Heavenly Mountain Resort (Heavenly) between October 2014 and September 2015 as a result of the implementation of the Mitigation and Monitoring Plan (MMP) contained in the approved Master Plan Amendment.

The Mitigation and Monitoring Plan consists of planning measures, construction measures, operations and maintenance measures, and management response to monitoring and evaluation. The content of each measure is developed to mitigate potentially adverse effects from the implementation of Heavenly's Master Development Plan. As Heavenly implements the Master Development Plan, they must meet each applicable measure and utilize monitoring and evaluation results to adapt the measures if necessary.

Monitoring and evaluation is conducted by Heavenly, the Tahoe Regional Planning Agency (TRPA), the USDA Forest Service, Lahontan Regional Water Quality Control Board, and local and county offices. Heavenly and TPRA employ the services of Cardno (formerly Cardno ENTRIX, Inc.), Resource Concepts, Inc., j.c. brennan and Associates, Sierra Ecotone Solutions (Garth Alling formerly with Hauge Brueck Associates), and Integrated Environmental Restoration Services, Inc. to conduct monitoring in their field of expertise. This annual report summarizes the monitoring results based on the data evaluation.

Heavenly has complied with all applicable measures of the MMP with the exception of partial compliance with regards to measure 7.4-3 (water quality), 7.5-6 (maintain flows in Heavenly Valley Creek), and non-compliance with measure 7.5-11 (snowmaking noise at Base areas). Heavenly is working to decrease water quality exceedances by decreasing the amount of huck salt applied on the mountain, actively looking at improving equipment and product for deicer application, studying Bijou Park Creek for potential chloride reduction, as well as treating erosion "hotspot" areas. These high priority inventoried areas are defined by one or more of the following traits: sites close to water bodies, sites that are highly erosive, and/or sites that are known sediment source contributors. Upgrades to instream flow equipment is needed in order to measure flows into and out of the California reservoir. Unless the existing snowmaking equipment is replaced with quieter models, or infrastructure barriers are built around the lodge areas, snowmaking noise exceedances at the base locations are likely to remain above the PAS boundary limits. Table 1-1 summarizes the measures contained in the MMP, their relevance to the time period of interest and whether or not Heavenly is in compliance.

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¹Heavenly Mountain Resort Master Development Plan, Page 1-1

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1 Introduction

Heavenly Mountain Resort is located on the south shore of Lake Tahoe within El Dorado and Alpine Counties of California and Douglas County of Nevada (Figure 1-1). Land ownership is shared between the United States Department of Agriculture Forest Service (Forest Service) and Heavenly. Heavenly operates on National Forest lands through a special use permit, renewed in 2002 for a period of 40 years.

A Mitigation and Monitoring Plan was first adopted during the approval of the 1996 Heavenly Master Plan. The MMP was revised based on measures that have been completed, measures that are no longer necessary, and new measures that are required to reduce potential impacts from implementation of the Master Plan Amendment. The amended Master Plan described the long-range development plans for Heavenly Mountain Resort. The latest EIR/EIS/EIS (Heavenly Mountain Resort Epic Discovery Project, February 2015) and August 2014 Master Plan Amendment, known as the Heavenly Master Development Plan (MDP), was finalized in May 2015 and contains the updated environmental mitigation conditions, monitoring and reporting requirements. A number of past measures that were no longer applicable were removed, while there were a few additional measures added to address the Epic Discovery Projects.

The MMP requires continued compliance from the Heavenly Mountain Resort with existing local, regional, state, and national regulatory programs both in and out of the Tahoe Basin (Heavenly, 2007). The MMP also contains planning, construction, operations and maintenance measures, and management responses to monitoring and evaluations. Table 1-1 summarizes the measures contained in the MMP and MDP, their relevance to the time period of interest, and whether or not Heavenly is in compliance. As discussed above, additional measures were implemented, revised and/or removed based on the latest EIR/EIS/EIS document and MDP (May 2015). Table 1-1 provides a brief summary and update of these measures.

Implementation of the MMP is conducted through the work of numerous agencies and private consultants including Heavenly, Tahoe Regional Planning Agency (TRPA), the USDA Forest Service, Cardno (formerly Cardno ENTRIX and ENTRIX, Inc.), Resource Concepts, Inc. (RCI), j.c. brennan and Associates, Sierra Ecotone Solutions, Liquid Innovations and Integrated Environmental Restoration Services, Inc. (IERS). The monitoring period of October 2014 to September 2015 was chosen for the Annual Report in order to include the 2014-2015 ski season and the 2015 summer construction season.

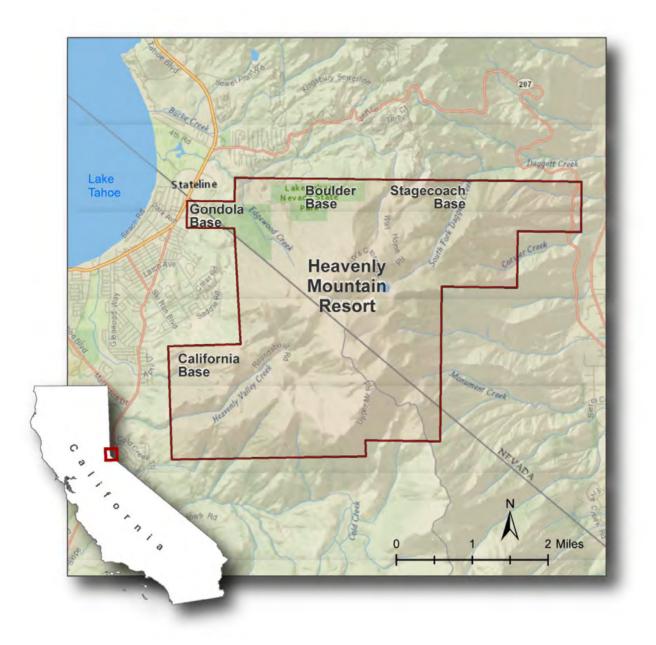


Figure 1-1 Location of Heavenly Mountain Resort

Table 1-1 Summary of Mitigation and Monitoring Plan Measures

Measure Number	Measure	2014-2015 Applicability	October 2015 Status	Discussed in Current Report	Compliance
		Planning Measures			
#	Obtain Summer Day Use PAOT Allocations	Removed, now a requirement of the TRPA Regional Plan Update.	Project Specific – Planning for future use	Removed	N/A
7.3-1	TRPA Mitigation Monitoring Activities	All Projects and Operations	Complete	Yes	Yes
7-3.2	Design and site the proposed Powderbowl Lodge to minimize visibility from off-site views	None	Not Built	No	N/A
7.3-3	Design and Site the Proposed Gondola Mid- Station Restaurant to Minimize Visibility From Off-Site Views	None	Not Built	No	N/A
#	Design and Site the Proposed Angel's Roost Communications Site to Minimize Visibility From Off-Site View	Removed – The Angle's Roost Communications Site has been implemented.	Completed	Removed	Yes
#	Reduce Visibility of the Skiways 1 and 2 Trails Through Reduction in Cleared Areas and Retention of Vegetation	Removed - Project Completed / Final TRPA inspection occurred in 2009	Completed	Removed	N/A
7.3-4	Design and Site the Proposed Sand Dunes Lodge to Minimize Visibility From Off-Site Views	None	Not Built	No	N/A

	Construction Measures				
Measure Number	Measure	2014-2015 Applicability	October 2015 Status	Discussed in Current Report	Compliance
7.4-1	Revised Implement the Construction Erosion Reduction Program	All Projects and Operations	Ongoing	Yes	Yes
7.4-2	Construct Infiltration Facilities	Annual CWE Work List	Ongoing	Yes	Yes
#	(Water-1) Control Runoff for Existing Facilities	Removed – BMPs have been completed for existing facilities. Measure 7.4-5 addresses infiltration for new facilities.	Completed	Removed	N/A
7.4-3	(Water-2) Meet Water Quality Standards	All Projects and Operations	Ongoing	Yes	Partial
7.4-4	(Water-3) Implement Adaptive Ski Run Prescriptions	California Side Ski Run Widening / Pilot Project	Ongoing	Yes	Yes
7.4-5	(Water-4) Control Runoff due to Future Construction and Long-Term Operation Facilities	All Projects and Operations	Ongoing	Yes	Yes
#	Avoid Disturbance to SEZ or Restore/Create SEZ	Removed – The SEZ restoration projects have been completed.	Completed	Removed	N/A
#	Avoid Disturbance to Wetlands or Restore/Create Wetlands	Removed – The mitigate impacts from past developments in wetlands have been completed.	Completed	Removed	N/A
7.4-6	Avoid and/or Restore Future Disturbed SEZs to Meet MP 96 Mitigation Measure 7.4-3 Requirements	No existing or new projects in 2015 triggered this measure	Project Specific	No	N/A
7.4-7	Avoid and/or Restore Future Disturbed Jurisdictional Wetlands and Waters to Meet MP 96 Mitigation Measure 7.4.4 Requirements	No new projects in 2015 triggered this measure	Project Specific	No	N/A
#	Restore Disturbed SEZs due to Construction of Phase I Projects to Meet MP 96 Mitigation Measure 7.4-7 Requirements	Removed – Combined with Measure 7.4-7.	Complete	Removed	N/A

Measure Number	Measure	2014-2015 Applicability	October 2015 Status	Discussed in Current Report	Compliance
#	Restore Jurisdictional Wetlands and Waters Disturbed Due to Construction of Phase I Projects to Meet MP 96 Mitigation Measure 7.4-8 Requirements	Removed – Combine with Measure 7.4-9	Complete	Removed	N/A
7.4-8	TRPA Land Coverage Mitigation	Updated with Epic Discovery Projects	Ongoing	Yes	Yes
7.4-9	(BIO-1) Delay Sky Meadows Challenge Course, Sky Basin Coaster and East Peak Lake Water Activities Until Sierra Nevada Yellow-legged Frog Surveys and USFWS Consultation are Complete	New Measure	Proposed	Yes	Yes
7.4-10	Reduce and Control Fugitive Dust	Summer Operations	Ongoing	Yes	Yes
7.4-11	Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows	All New Projects	Project Specific	No	N/A
7.4-12	Active Raptor and Migratory Bird Nest Site Protection Program	All Projects	Ongoing	Yes	Yes
7.4-13	Monitor and Protect Northern Goshawk	All Projects	Ongoing	Yes	Yes
7.4-14	(BIO-4) Wildlife Nursery Site Survey	New Measure. Pre-construction baseline surveys were completed prior to beginning new Epic Discovery Projects.	Proposed	Yes	Yes
7.4-15	Prohibit Skier Access on Management Prescription 9 Lands Utilize Boundary Management Plan to Manage Skier Access on Adjacent NFS Lands	Winter Operations – Revised measure to require a boundary management plan to manage skier access on Forest System Lands within Forest Plan Boundary 9.	Revised/On- going	Yes	Yes

Measure Number	Measure	2014-2015 Applicability	October 2015 Status	Discussed in Current Report	Compliance
7.4-16	Evaluate and Monitor Known Archeological Resources Within Comstock Logging Historic District	No Significant Changes	Ongoing	Yes	N/A
7.4-17	Identify and Protect Undiscovered Archaeological Resources	All Projects	Ongoing	Yes	Yes
7.4-18	Protect the Tahoe Rim Trail	None – No projects were built in the vicinity of the Tahoe Rim Trail.	Not Built	Yes	N/A
#	Secure Adequate Water Capacity Prior to Development	Removed – Requirement is enforced by local building department	Not Built	Removed	N/A
#	Secure Adequate Sewer Capacity Prior to Development	Removed – Requirement is enforced by local building department	Not Built	Removed	N/A
	Operation	ons and Maintenance Measures			
7.5-1	Revised Cumulative Watershed Maintenance and Effects Restoration Program	Summer Operations	Ongoing	Yes	Yes
7.5-2	Revised Collection/Monitoring Agreement – (Water-C1b) On-Going Environmental Monitoring Program	Revised - All Projects and Operations	Ongoing	Yes	Yes
7.5-3	(WATER-C1a) CA-1 Erosion Reduction Measures	Proposed – All Projects and Operations	Ongoing	Yes	Implementing
7.5-4	(Water-C3) NV-1 Erosion Reduction Measures	Proposed – All Projects and Operations	Ongoing	Yes	Implementing
7.5-5	Maintain Water Rights Balance	All Operations	Ongoing	Yes	Yes
7.5-6	Maintain Water Flows in Heavenly Valley Creek	All Operations	Ongoing	Yes	Partial
#	Maintain Summertime Flows in Heavenly Valley Creek	Removed – Combine with Measure 7.5-6	Removed	No	N/A
7.5-7	Maintain Water Flows in Daggett Creek	All Operations	Ongoing	Yes	Yes

Measure Number	Measure	2014-2015 Applicability	October 2015 Status	Discussed in Current Report	Compliance
7.5-8	Maintain Compliance with Water Entitlements	All Operations	Ongoing	Yes	Yes
7.5-9	Reduce Vehicle Emissions	All Operations	Ongoing	Yes	Yes
#	Snow Grooming Noise Mitigation Methods	Removed – Snow Grooming equipment has been upgraded and now complies with applicable noise standards.	Removed	No	N/A
#	Snowmobile Noise Mitigation Methods	Removed – Snowmobile equipment has been upgraded and now complies with applicable noise standards.	Removed	No	N/A
7.5-10	Snow Removal Noise Mitigation Methods	Winter Operations	Ongoing	Yes	Yes
7.5-11	Snowmaking Noise Mitigation Methods for Base Areas	Winter Operations	Ongoing	Yes	No
#	Snowmaking Noise Mitigation Methods for Upper Mountain Areas	Removed – Annual monitoring of upper mountain has shown compliance with applicable noise standards.	Removed	No	N/A
#	(Noise-1) Limit hours of Snowmaking operation and use fan gun technology for the proposed Skyline Trail Snowmaking	Removed – Skyline Trail Snowmaking Project was removed from the MDP	Removed	No	N/A
7.5-12	Rock Busting Noise Mitigation Methods	None	Not Built	No	N/A
7.5-13	Restrict Hours of Amphitheater Operations	None	Not Built	No	N/A
7.5-14	(TRANS-1) Traffic and Air Quality Mitigation Program	Proposed – Heavenly will pay into the Air Quality Mitigation Fund.	Ongoing	Yes	Implementing
#	Expanded Bus/Shuttle Access	Removed – Measure has been implemented.	Completed	Removed	N/A
#	Discourage Use of Automobiles	Removed – Measure has been implemented.	Completed	Removed	N/A

Measure Number	Measure	2014-2015 Applicability	October 2015 Status	Discussed in Current Report	Compliance
7.5-15	Implement the Coordinated Transportation System (Public Transit Services)	All Operations	Ongoing	Yes	Yes
#	Reduce Traffic on U.S. Highway 50 at Echo Summit	Removed – Levels of Service are no longer unacceptable and have been steadily improving according to TRPA traffic monitoring data.	Removed	No	N/A
7.5-16	Protect Tahoe Draba Populations within Heavenly Mountain Resort	Revised – For all operations measure 7.5-16 will require better fencing/barriers near Tahoe draba populations.	Project Specific	Yes	Implementing
#	(VEG 1-A) Tahoe Draba Long-Term Conservation Strategy	Removed – Measure has been implemented.	Completed	No	N/A
7.5-17	Minimize Loss/Degradation of Sensitive Plant Species	All Operations	Ongoing	Yes	Incomplete at this time
7.5-18	Noxious Weed Invasive Plant Management	All Projects and Operations	Ongoing	Yes	Incomplete at this time
#	(VEG 3) Late Seral/Old Growth Forest Enhancement	Removed – Measure has been implemented.	Completed	Removed	N/A
#	Restrict Vehicle Traffic within the Heavenly Ski Resort MP96 Development Area Description	Removed – Requirement has been incorporated into operations plan.	Removed	No	N/A
7.5-19	Monitor and Protect Nesting and Fledgling Bird Species	No concerts occurred	Not Built	No	N/A
7.5-20	(BIO-3) Migratory Bird and Habitat Utilization Survey	Proposed – Proposed Epic Discovery Project Locations	Ongoing	Yes	Implementing
7.5-21	(BIO-8) Wildlife Trash Management and Education Program	Proposed – All Operations	Ongoing	Yes	Implementing
#	Compliance with Design Review Guidelines Section 7 Exterior Lighting Standards and Code of Ordinances	Removed – Requirement of the TRPA Regional Plan Update	Removed	No	N/A

Measure Number	Measure	2014-2015 Applicability	October 2015 Status	Discussed in Current Report	Compliance
#	Building and Site Design	Removed – Requirement of the TRPA Regional Plan Update	Removed	No	N/A
7.5-22	Maintain Timber Thinning Practices	All Operations	Ongoing	Yes	Yes
#	Compliance with Existing Health and Safety Practices	Removed – Requirement has been incorporated into operations plan.	Removed	No	N/A
#	Avalanche Safety Practices	Removed – Requirement has been incorporated into operations plan.	Removed	No	N/A
7.5-23	Provide Employee Housing	All Operations – Revised	Ongoing	Yes	Yes - Implementing
#	Ensure Adequate Police/Sheriff/Fire Capacity	Removed – Service agreements are in place with applicable public service providers	Removed	No	N/A
Management Response to Monitoring and Evaluation					
5.8-1	Soil and Water Quality	All Projects and Operations	Ongoing	Yes	Yes
5.8-2	Traffic and Parking	All Operations	Ongoing	Yes	Yes
5.8-3	Late Seral/Old Growth Enhancement	All Operations	Completed	Yes	Yes

2 Chapter 2 – Planning Measures

Introduction

A majority of the planning measures are addressed within individual Tahoe Regional Planning Agency permits. Table 2-1 provides an update to the previous season's report (October 2013 to September 2014) project list. Projects listed as completed in the past years report are not shown. A few of the projects listed were completed but had yet to receive final inspections for revegetation and Best Management Practices (BMPs).

Table 2-1 Update on Projects Constructed Prior to the 2015 Construction Season

Project	TRPA Permit #	Status as of October 2015
Adventure Peak Zipline (including modifications to the retrieval system)	2007-0105	Construction of the zip line trolley retrieval system was completed along with the application/coverage of pine needle and mulch in areas associated with the construction. *
Tubing Lift	ERSP 2008-1018 & ERSP 2010-0859	Initially completed in December 2010. Awaiting modifications to the tubing hill to increase the slope with rock slope protection increasing tubing speed and improving the guest experience at the intended finish area. In addition, two relatively short snowmaking lines and fan guns will be constructed to extended and provide snowmaking coverage on the Big Easy ski trail. Once completed, as-built drawings will be prepared and final inspection will occur.
Tamarack Lodge	ERSP 2009-3571	Completed December 2010. BMP security released on 10/21/11. Still holding security until CFA is transferred/relocated allowing summer usage.
Bear Cave Children's Ski School Lodge (Includes tubing hill modifications)	ERSP 2011-0513	Lodge completed in October 2011. Permit still active since the tubing hill road alignment access has not yet been completed*
Wedding Arch Site Development (Permit includes all summer activity improvements)	ERSP 2012-1147	Slight project changes require a revised plan set. Changes include: realignment of the snowmaking lines, changes to the terrace at the top of the tubing hill, and an alignment change to the access road. Once the plans are submitted, a final inspection will be scheduled.

^{*}Construction is complete. Revegetation and BMPs have not received final inspection.

Table 2-2 Project Status as of October 2015

Project	TRPA Permit #	Status as of October 2014
Multi-Line (Quad) Zipline	ERSP 2012-1147 (Tied into Summer Improvements)	Quad Zipline footings and lines were installed and the facility was completed prior to the 2014/2015 ski season. Still awaiting final BMP installation. The permit will remain open until all improvements in the permit have been constructed.
Alpine Coaster	ERSP 2013-0490 (Ski Area Master Plan, Addition of Summer & Year Round Recreational Facilities)	Construction nearing completion. Winterization BMPs are staged. Grading extension granted until 10- 30-15 by Water Board and TRPA.
Climbing Rock	ERSP 2013-0490 (Ski Area Master Plan, Addition of Summer & Year Round Recreational Facilities)	100% complete. Opened on 9-4-15 to Public. BMPs in place, stable and flat site.
Complete Waterfall Lift Removal Top Station Regrading (Top of Epic Mix race Course)	ERSP 2004-0299SRD	Need to re-grade the top station area as well as complete final stabilization Work to be completed in 2016.
Mid Station Canopy Tour	ERSP 2013-0490 (Ski Area Master Plan, Addition of Summer & Year Round Recreational Facilities)	95% Complete. Road corridors are in place and cables are in the air. Trees have been cut and are lying on the ground. The site had minimal soil disturbance during construction and not much disturbance is expected. No excavation is planned except for walking paths. Walk through scheduled for 10-16-15 for sign off. Grading extension until 10-30-15.

7.3-1 TRPA Mitigation Monitoring Activities

This measure describes the Mitigation and Monitoring Agreement that Heavenly must enter into with TRPA.

Heavenly, TRPA, and Cardno ENTRIX entered a three-party on-going monitoring agreement in January 2008. This five year agreement ended in December 2012. TRPA and Heavenly began the public process requesting proposals for contracting work related to the MMP. In February 2013, Cardno (formerly Cardno ENTRIX) was selected to continue this work for an additional four-year period through June of 2017. The new contract requires that all three parties re-new this contract annually. In addition, Heavenly Mountain Resort will provide funding to TRPA for staff review related to the MMP document.

Conclusion

Heavenly complied with all applicable planning measures during the 2014-2015 monitoring period. Project specific measures such as 7.3-2 (Powderbowl Lodge), 7.3-3 (Gondola Mid-Station Restaurant) and 7.3-4 (Sand Dunes Lodge) have yet to be constructed and will be discussed in future MMP annual reports upon construction and/or completion.

3 Chapter 3 – Construction Measures

Introduction

The construction measures contained in the MMP are designed to limit the environmental impacts both during and following the construction of new projects within Heavenly Mountain Resort. Resource Concepts Inc. (RCI) assists Heavenly in developing their BMPs and conducts on-mountain monitoring of temporary construction BMPs and permanent BMPs for all of Heavenly's capital improvement projects and Cumulative Watershed Effects (CWE) projects. Integrated Environmental Restoration Services (IERS), along with Heavenly staff, assists in restoration treatment applications as well as monitor troublesome erosive areas. IERS also experiments with various slope and soil cover treatment types using this gathered information to implement and limit erosion runoff and enhancing soil characteristics.

7.4-1 Implement the Construction Erosion Reduction Program

Implement the Construction Erosion Reduction Program (CERP) would minimize the rate of soil loss related to construction activities at Heavenly. The CERP and Watershed Management Guidebook are design features that will be incorporated into construction activities through the Master Development Plan.

Heavenly contracts with RCI and IERS to ensure effective BMPs and restoration treatments are designed and implemented for each of their construction projects. During the 2015 construction season, RCI inspected both permanent and temporary constructed BMPs for implementation and effectiveness. RCI completed 34 permanent BMP inspection evaluations at 19 different locations. The 2015 inspection reports showed that 100% of the permanent BMPs were fully "implemented". The perfect implementation score is reflective of the past years "needs assessment" scores, which have been retrofitted and corrected, as well as "ensuring that plans for new construction include BMPs to address runoff and reduce erosion". Maintenance and inspection following storm events during the construction season led to permanent BMP "effective" score of 100%. Knowledge gained from years of monitoring and reporting have proven which "methods and structures" are successful on the mountain.

Eight construction sites employed temporary BMPs during the 2015 construction season. These "sites were typically monitored and evaluated biweekly for the duration of the construction season and following precipitation events." Minor field adjustments were made upon inspection; however each site received a fully "implemented" score due to "Heavenly's commitment to training new staff and continued emphasis on BMPs importance". Scheduled and completed maintenance resulted in temporary BMPs operating 100% "effective" during the construction and storm events in 2015."⁴

The 2015 BMP Effectiveness Monitoring Report (Appendix I) lists conclusions and recommendations for monitoring in 2016. A brief summary of a few of the recommendations are listed below.

 Continue to use the CERP in conjunction with the BMP recommendations found in Tables 2 through 5 (Appendix I) as a reference to select viable temporary and permeant BMPs.

² Heavenly Mountain Resort BMP Effectiveness Monitoring 2015 Annual Report and Construction Season Summary. Page 4 (Appendix I)

³ Heavenly Mountain Resort BMP Effectiveness Monitoring 2015 Annual Report and Construction Season Summary. Page 5 (Appendix I)

⁴ Heavenly Mountain Resort BMP Effectiveness Monitoring 2015 Annual Report and Construction Season Summary. Page 5 (Appendix I)

- Continue to prioritize on-site meetings to discuss "potential erosion risk, resource protection, and siting for facility and access routes". These meetings help to enforce and emphasize BMP implementation, effectiveness, and monitoring.
- For future construction projects, Heavenly (and their sub-consultants) should identify and implement the most effective permanent and temporary BMPs based on past monitoring performance (Appendix I, Tables 2 and 4)
- Continue to provide annual training to all on mountain staff, contractors, and third party vendors.
 This training emphasises the importance of BMPs, BMP implementation and effectiveness. "The BMP Breakfast includes a field component every other year. This allows staff to practice proper BMP installation."
- Continued use of an experienced field team with in depth knowledge of erosion control and BMP maintenance and installation. In addition, Heavenly's Environmental Manager's continued active role and oversight emphasizing the resource goals by providing guidance to the field crews aids in BMP effectiveness.
- The updated Waste Discharge Requirements as well as EIR/EIS/EIS Epic Discovery Project provided additional details on the future monitoring requirements. A few recommendations are as follows:
 - RCI proposes to continue monitoring on a bi-weekly schedule for "BMP Effectiveness" for both permanent and temporary BMPs following the "2004 BMP Effectiveness Monitoring protocol (developed form the USDA FS BMP Effectiveness Program).⁶
 - Stable facilities sites should be removed from monitoring after monitoring has been conducted over a period of nine years (on three year intervals) or sooner if the facility poses little risk to water quality.⁷

Moving forward the "USFS Region 5 will adhere to the new National US Forest Service BMP monitoring program. Protocols from this plan will assess BMP implementation and effectiveness for a wide variety of land management practices. Roadways, facilities and ski runs on USFS lands will be included in the sample pool to be randomly selected for annual monitoring. USFS staff will conduct and report results from this monitoring effort." This USFS monitoring effort will supplement both RCI's and IERS's on mountain monitoring effort. RCI's 2015 BMP Effectiveness Monitoring Report is contained in Appendix I. The IERS 2015 Restoration and Monitoring Annual Report is contained in Appendix II.

7.4-2 Construct Infiltration Facilities

This measure states that all new projects contributing to impervious surface shall be designed to infiltrate the 20-year, 1-hour storm.

The 2015 CWE Project and Work List noted that twelve projects within the Heavenly Valley Creek watershed (CA-1) were either completed or near completion in October 2015. This included three Master Plan projects that were tied to the Epic Discovery activities were proposed and near completion in the fall of 2015. These projects include the Alpine Coaster, the Climbing Rock, and the Mid Station Canopy Tour. The 2015 Work List includes projects tied to "hotspot" (highly erosive areas) inventory areas mapped and defined per IERS' 2014 Restoration and Monitoring Annual Report. High priority erosion "Hot spots" required by the EIR/EIS/EIS and completed within Heavenly Valley Creek watershed CA-1 in 2015 including the following projects: Sky Chute Ski Run (#'s 13, 34, 36, 37 & 38), Phase I of Hellwinkle's

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⁵ Heavenly Mountain Resort BMP Effectiveness Monitoring 2015 Annual Report and Construction Season Summary. Page 6 (Appendix I)

⁶ Heavenly Mountain Resort BMP Effectiveness Monitoring 2015 Annual Report and Construction Season Summary. Page 8 (Appendix I)

⁷ Heavenly Mountain Resort BMP Effectiveness Monitoring 2015 Annual Report and Construction Season Summary. Page 8 (Appendix I)

⁸ Environmental Monitoring Program Annual Report - Heavenly Mountain Resort Water Year 2014. Cardno, Zephyr Cove, Nevada. Page 30.

Road, the Canyon Express Lift Bottom Terminal Operator's Booth (# 32), Double Down treatment at the bottom of the ski run ((#'s 31 &33, Bottom of Sky Express Road (#35), Water bar draining roadway (#36), Hellwinkle's Road (#'s 45 & 46), and the Bottom of Ellie's Ski Run (#49). The Nevada watershed (NV-1) "hot spot" project required by the EIR/EIS/EIS addressed in 2016 was the Aries Ski Run project (#'s 1, 3-6). Crews began work on the Mott Canyon Creek road decommissioning and turnaround areas and maintenance on the top of Aries Ski Run in 2015. The top of Aries Ski Run was nearly complete in the fall of 2015 and may require additional pine needles this upcoming construction year. The Cal Dam to Maggie's Corner shoulder stabilization and the Powderbowl Express Lift Top Station to Mombo slope stabilization projects were moved from the 2014 work list to the 2015 and have since been completed. Resort-Wide efforts addressing BMP maintenance were also scheduled and completed in 2015. The BMP maintenance includes inspecting and restoring all areas damaged or affected by winter resort operations, erecting and maintaining vehicle barriers and/or fences to keep unauthorized vehicles in designated areas and inspecting and maintaining drainage structures. Road maintenance is performed throughout the resort as outlined in the annual Heavenly-Forest Service maintenance and monitoring agreement protocol. Additionally, tubing run revisions, which include constructing revised summer tubing lanes, associated grading and slope stabilization, and decommissioning and stabilization using mulch of the old access road were completed in 2015. Two projects on the 2015 summer work list were moved to the 2016 summer work list (Waterfall Lift Removal Top Station Regrading and Phase II of Hellwinkle's Road). Additional details of the 2015 completed projects can be found in RCI's 2015 BMP Effectiveness Monitoring Report (Table 1, Appendix I), while the update 2015 CWE Work List can be found in Appendix III.

7.4-3 Meet Water Quality Standards

To meet water quality standards, several items are identified in the Master Development Plan's MMP. These measures include implementing the Watershed Maintenance and Restoration Program, implementing the CERP, implementing the Environmental Monitoring Program, installation of BMPs at all facilities and parking lots, installation of a monitoring site on Daggett Creek, and prohibiting grooming on ski trails deficient of adequate snow cover.

From the period of October 2014 to September 2015, Heavenly Mountain Resort continued to implement both the CWE Restoration Program and Watershed Maintenance and Restoration Program. Each year, RCI helps Heavenly utilize adaptive management practices to prioritize maintenance and restoration projects. The completed BMP maintenance and project list for 2015 is located in RCI's 2015 BMP Effectiveness Monitoring Report (Table 1, Appendix I). Two projects on the 2015 CWE Work List were rolled over to the 2016 Work List (see measure 7.4-2 for these two projects). Detailed information concerning maintenance, monitoring, and implementation of CWE projects is located in Appendices I and II

The Environmental Monitoring Program is reported on an annual basis and has been ongoing since 1991. The 2015 water quality monitoring was conducted monthly between October 1, 2014 and September 30, 2015. Additional weekly spring runoff samples were collected for all seven of the stream monitoring sites from the end of March through mid-June.

More stringent water quality parameters took effect during the 2008-2009 water year at the California Parking Lot site (at Bijou Park Creek). Permit conditions stated that more stringent water quality standards would become effective once the BMP Retrofit Project and treatment system were in place at the California Parking Lot. Heavenly reported annual average violations at Bijou Park Creek (43BPC-4) for the following constituents: total nitrogen, total phosphorus and chloride. At the effluent sampling compliance location for the California parking lot filter vaults (43HVP-2), not to exceed limits for turbidity, total nitrogen, total phosphorus and oil and grease were recorded during the seven storm samples collected. Annual average exceedance values were reported at the Sky Meadows (43HVC-1A), Below

Patsy's Chair (43HVC-2) and Property Line (43HVC-3) sampling locations along Heavenly Valley Creek. Total phosphorus and chloride annual averages values were exceeded for the 2015 water year at these three monitoring locations. Both the total phosphorus and chloride annual average readings at the reference site located along Hidden Valley Creek (43HVDC-5) were also above the state standard limits. See the referenced Environmental Monitoring Program Annual Report (Heavenly Mountain Resort Water Year 2015) for further discussion and results from the Environmental Monitoring Program (Appendix XIII).

In an effort to reduce the amount of huck salt and subsequent chloride readings in the stream samples, Heavenly has instituted a new policy requiring a manager's approval for any application use above one 40 lbs. bag in and around the terrain parks. Huck salt is used to lower the freezing point of the snow surface helping to limit thawing of the snow and create a more stable base for taking off and landing areas around jumps. As reported in the Environmental Monitoring Program Annual Report, 2015 huck salt application decreased significantly compared to the 2013 and 2014 application values (Chapter 8, Table 8-3). The 2015 water year marked the first year salt application totals were monitored on a monthly basis at the California parking lot. Lower salt application values can also be attributed to the lack of precipitation and snow fall and the implementation of additional employee training programs.

The Lahontan Water Quality Board amended the monitoring and reporting program in May 2011. The revised permit conditions intent was to provide a better representation of mountain operations with respect to environmental impact. Many of these amended conditions were incorporated into the Waste Discharge Requirements and Monitoring Program (R6T-2015-0021) finalized on May 14, 2015. Heavenly is actively working with IERS to address treatment areas and monitoring goals, emphasizing in soil and vegetation treatment approaches and baseline and performance monitoring to measure impacts on soil, vegetation, runoff and sediment transport. The treatment goals include implementing projects that will not cause an increase in runoff or sediment transport, implement sediment source control treatments that are self-sustaining or accompanied by an ongoing maintenance plan and to develop and apply an adaptive management program for development, management and maintenance. Monitoring efforts will assess whether projects will result in increased runoff or sediment transport and identify and quantify indicators of long-term ecosystem sustainability. Specific sites and ski run test plots are ongoing at various projects and slope aspects located around the mountain. Future monitoring results will be used to measure the effectiveness of ongoing treatments, ultimately reducing sediment erosion and improving water quality samples.

RCI continues to collected data at the Daggett Creek flow monitoring station for compliance with water use permits as discussed in Chapter 4 (measure 7.5-7). If and when Ski Lift Z, or Ski Trails Z1, Z2, Z4, or Z8 are proposed for construction, a year prior to construction the Nevada Department of Environmental Quality (NDEP) and Forest Service will determine the location and if water quality monitoring along Daggett Creek is necessary. Appendix VI contains the Daggett Creek Flow Monitoring report provided by RCI.

Heavenly and the Forest Service require a 12-inch minimum compacted snow cover over all obstacles before grooming with snow cats is allowed. This policy protects soil and water resources along with preventing significant damage to snow cats.

7.4-4 Implement Adaptive Ski Run Prescriptions

This measure requires all new ski runs to be re-vegetated according to the ski trail prescriptions in the Easy Street Run Hazard Reduction Program. It also calls for the evaluation of existing ski trails to determine if the prescription would be appropriate.

Heavenly and IERS have been working together since 2006 to restore and monitor project specific construction areas using site-specific soil function improvement and revegetation prescriptions built off of an adaptive management approach. Over the years IERS, in conjunction with Heavenly, have attempted a number of treatment methods limiting erosion and runoff. Treatment modifications are made and

implemented each year based on results from previous restoration treatments and techniques. During the 2015 season, IERS focused restoration treatment efforts on two projects within the Heavenly Ski Resort property; Maggie's Trail and Sky Chute Ski Run and Water Bars. Maggie's Trail is a ski run during the winter months and a roadway with wide shoulders during the summer. The area surrounding Maggie's Trail is very steep and has highly compacted soil, limiting vegetation growth. "These factors combined make Maggie's Trail a high priority from an erosion control standpoint." High priority road shoulders were mulched with wood chips, beginning in 2014, with the low priority sections worked on in 2015. Several sections of the road shoulders are expected to receive soil loosening and seeding treatments in future years, however, the mulch application will "provide immediate sediment reductions with less initial effort".

The Sky Chute Run and Water Bars are located directly above Sky Meadows, making the lower portion of the ski run vulnerable to erosion. Additionally, Sky Chute has significant road drainage issues, "as water bars upslope concentrated runoff across the ski run". In 2015, problematic water bars were converted to infiltration swales and a Shred-Vac was used to apply a layer of pine needle mulch to approximately one acre of ski run. The measured results for runoff simulation, soil density and surface cover/vegetation composition all improved over the pre-existing conditions. Detailed information regarding Maggie's Trail and Sky Chutes water bars restoration and implementation of adaptive ski run prescription, restoration treatment techniques and success criteria explanations are contained in the Heavenly Mountain Resort Outcome-Based Watershed Management Program 2015 Restoration and Monitoring Annual Report (See Appendix II).

7.4-5 Control Runoff Due to Future Construction and Long-Term Operation Facilities

Both broad and project-specific measures are identified for Heavenly to comply with the MMP. Each new project is to have permanent and temporary BMPs as part of its design and construction. New snowmaking should be above ground, with certain exceptions. A formal BMP maintenance program shall be continued including annual mapping documenting maintenance activities.

As discussed in measure 7.4-2, four master plan projects were constructed during the 2015 construction season (see 2015 CWE Work List, Appendix III). These projects include: Alpine Coaster, Climbing Rock, Kids Zipline/Challenge Course, and the Mid Station Canopy Tour. Each of these master plan projects have infiltration BMP's incorporated within the project plans to address construction and project facility runoff (upon project completion). Additional resort-wide work focused on the maintenance of temporary and permanent BMPs on existing facilities.

Proposed projects, hotspot areas to address, as well as proposed maintenance to exiting BMPs for the 2016 construction season can be found in the 2016 Annual Watershed Maintenance Restoration Program Work List (informally called the CWE work list) found in Appendix VII. All permanent BMPs are designed and maintained to infiltrate at least the 20-year, 1-hour storm. BMP effectiveness and maintenance monitoring is performed by RCI as part of the Environmental Monitoring Program. The 2015 BMP monitoring results are included in the annual report contained in Appendix I.

No new snowmaking lines were installed in 2015 and all future snowmaking lines will be constructed above ground unless additional mitigation measures are included allowing for underground installation. IERS has mapped the location of primary sources of erosion "hot spot" locations in their annual report (Appendix II). These locations have been prioritized and are included in future years' restoration and maintenance projects.

7.4-6 Avoid and/or Restore Future Disturbed SEZs

A number of project-specific mitigation measures for avoiding disturbance to SEZs are identified in the MMP.

Due to the fact that no new facilities were constructed that required future mitigation measures to reduce SEZ disturbance, no in-basin or out-of-basin activities listed in this measure were implemented in 2015.

7.4-7 Avoid and /or Restore Future Disturbed Jurisdictional Wetlands and Waters

This measure requires that any project implemented by Heavenly will be located off jurisdictional wetlands and that Sky Meadows Deck and Boulder Operations be relocated off wetlands. If development within the wetlands cannot be avoided, Heavenly is required to obtain a Section 404 permit from the USACE and comply with all requirements set forth in the permit including coordinating with CDFW to comply with Section 1600 if removal of vegetation is needed. Additionally, any tree removal activity needed for ski lifts or trails will be conducted in a fashion that does not disturb wetlands.

No capital improvement projects were implemented in 2015 that trigger this wetland measure. This measure will be implemented if and when the Powderbowl Lodge is built and/or the Sky Meadows Deck is relocated. The Sky Meadows log deck area adjacent to Heavenly Valley Creek was restored in 2013. No additional ski trail widening occurred in 2015. If and when additional trail widening occurs, the tree removal operation will occur over existing snowpack reducing and limiting ground disturbance and impacts within the watershed and jurisdictional waters.

7.4-8 TRPA Land Coverage Mitigation

To utilize available land coverage within the Heavenly project area, TRPA must make appropriate relocation findings included in the Code of Ordinances and BMPs must be installed and maintained as outlined in the CERP.

As outlined in the Draft 06 EIR/EIS/EIS, Heavenly had 434,580 square feet of available banked and available land coverage within the Heavenly Project area. RCI provided the following table (Table 3-1) which reflects changes throughout the years to this initial land coverage value based on completed and proposed projects (updated January 18, 2016). At the present time Heavenly has 230,807 square feet of available banked land coverage in non-wetland land capability areas.

Table 3-1 Heavenly Mountain Resort Land Coverage Calculations

		Proposed	
New Coverage	Existing 1a	1a	Net Change
Tamarack Project Area Additional Activities	-		
Tamarack Lodge Deck Expansion ³	1,800	5,400	3,600
Ticketing Sales Kiosk Building		300	300
New Paths and Queuing Areas - Ticketing Sales Kiosk		290	290
Red Fir Handle Tow Lift Operator's Booth		100	100
Magic Carpet Ski School Lift		1,800	1,800
Total Coverage Tamarack Project Area Additional	1,800	7,890	6,090
Coverage Summary Table			
Maximum Allowable Coverage (per Master Plan)	1a	1b	Total
Maximum Allowable Coverage per Master Plan			2,053,854
Balance Remaining of Coverage and Banked Coverage per			, ,
Table 3.4-4 of the Final EIR/EIS/EIS ¹	434,580	4,464	439,044
Proiect Subtotals	.0 .,000	.,	.00,011
Northbowl/Olympic Express Lifts Project Balances	960	396	1,356
Gondola Hiking trails	54,501	0	54,501
Mid Station Road	50,469	0	50,469
Northbowl/Olympic Express Lifts - Plan Revision	216	0	216
World Cup/East Bowl Snowmaking - Plan Revision	283	0	283
Calif. Base Surface Lift Replacement	1,572	0	1,572
Skyline Trail Grading and Snowmaking	1,134	0	1,134
Top of the Gondola Lodge	42,387	0	42,387
Adjusted Gondola Permit Coverage	-27,519	0	-27,519
Umbrella Bar Relocation	651	0	651
Covered Surface Lift and Snowmaking	10,039	0	10,039
California Side Trail Widening	0	0	0
Adventure Peak Improvements	6,207	0	6,207
Zipline Adventure Ride	4,916	0	4,916
Verizon Angel's Roost Cell Tower and Back-up Bldg	584	0	584
Epic Race Course Electrical	0	0	0
Summer Activities	22,213	0	22,213
Tamarack Lodge Modifications	537	0	537
Adventure Peak Epic Discoveries	58,154	0	58,154
Removal of Gondola Hiking Trails	-54,501	0	-54,501
East Peak Basin Epic Discoveries	1,210	0	1,210
Sky Meadows Basin Epic Discoveries	26,816	772	27,588
Top of Gondola Temporary Hub	150		150
Summer Activities - Climbing Wall Revisions ²	0		0
Tamarack Project Area Additional Activities	6,090	0	6,090
Subtotals	207,069	1,168	208,237
Balance Remaining Upon Project Completion	227,511	3,296	230,807

^{1.} Includes 10,541 square feet of existing coverage attributed to Sky Deck

7.4-9 (BIO-1) Delay Sky Meadows Challenge Course, Sky Basin Coaster and East Peak Lake Water Activities Until Sierra Nevada Yellow-legged Frog Surveys and USFWS Consultation Are Complete

Heavenly shall delay implementation of projects in Sky Meadows or East Peak Lake until protocol surveys are completed. If Sierra Nevada yellow-legged frog (SNYLF) are found present, Heavenly will consult with agencies regarding impacts to the species and required protection measures that may or may not allow for the projects to proceed. If SNYLF are not determined to be present, Heavenly may start informal consultation with the California Department of Fish and

^{2.} Revises original coverage numbers submitted as a part of the Summer Activities Project.

^{3.} Total square footage of deck expansion is 5,400 square feet. 1,800 square feet of existing road coverage will be reallocated to the deck expansion resulting in a net increase of 3,600 square feet of new coverage.

Wildlife and USFWS regarding habitat protection measures that may allow for the projects to proceed.

Surveys for the SNYLF were completed in 2015 marking the first year of monitoring. Protocol requires one survey to be completed during a year having at least 80% snowpack. The 2015-2016 winter season has produced enough snow in order to meet the 80% snowpack requirement. Visual Encounter Surveys are also anticipated to be completed the summer of 2016. Survey information will be presented to the agencies prior to project implementation related to the Epic Discovery Projects in Sky Meadows and East Peak Lake.

7.4-10 Reduce and Control Fugitive Dust

During project construction, Heavenly employees and contractors are required to implement mitigation measures to minimize the generation and transport of fugitive dust. These measures may include the use of chemical dust suppressants and/or water on unpaved roads, grading and excavated areas, as well as cleaning onsite paved roadways daily in order to remove excess dirt and mud.

Resource Concepts Inc. (RCI) monitors the effectiveness of the Heavenly Mountain Resort dust control measures during their temporary and permanent BMP inspections. According to Heavenly's Environmental & Compliance officer, Heavenly rented a 2,000 gallon watering truck to provide dust control and suppression on steep roadway slopes and stockpiling for construction projects. The average water fills per day was 18 truckloads, with a record of 24 truckloads (Papandrea, 2016). The total mileage driven for the water truck during the summer was approximately 3,500 miles. Watering duties and dust abatement began on May 11th, 2015 and concluded on October 27th, 2015.

Table 3-2 summarizes the roadway segments that were improved, re-graded or resurfaced with road base. This information can also be found in the Forest Service Roads Report, located in Appendix I.

Table 3-2 Description of Work Completed at each Road Segment

Road Segment	Distance (miles)	Description of Work	
13N52i	0.50	Roads improved in August from Ridge Bowl uphill to past the Sky Springs	
13N40A	0.30	Maintain road to the top of First Ride chair and fixing the native road.	
1240.1	0.70	Multiple switchbacks repaired on roundabout road, rill repaired with road base near west bowl switchback, native material roadway improved and regraded in the Cut	
13N52A	0.30	Re-graded and repaired Orion's native road	
13N5	0.20	Repair the road from the top of Northbowl Chair to 100 Dollar Saddle fuel farm area with road base	
12N41	0.10	Added road base to Groove Road and reconquered WB's.	
13N52	0.20	Add road base surface and resurface native road on the Cal Dam Sky Chute	
12N41B	0.20	TOT road repairs which include adding road base and re-grading.	

A total of 2.5 miles of Heavenly Forest Service roads have been repaired, maintained and resurfaced by Heavenly staff. The Heavenly environmental and compliance manager was in close contact with the driver throughout the summer season discussing watering strategy, truckloads and problem areas.

Since 2011, the new California Storm Water Pollution Prevention Plan (SWPPP) requires all stock piles that are not in use for 14 days be covered. If in use and considered active, the pile must have BMPs located around the pile, but not covered. During the 2015 construction season, no stock piles were located in wind prone areas and alternatives to plastic sheeting were not required. Information regarding dust control, road base application and stockpiling can be found in Appendix I (RCI's 2015 BMP Monitoring Report, Appendix A, Tables 2, 4 and 5).

7.4-11 Minimize Removal/Modification of Deciduous Trees, Wetlands, and Meadows

Before any construction project Heavenly must have a qualified biologist conduct a vegetation survey and identify all deciduous trees, wetlands, and meadows located within or adjacent to the proposed construction corridor. Heavenly is then required to implement a final engineered alterative that avoids the loss or degradation of the identified riparian or wetland communities. If these communities are unable to be avoided, Heavenly must mitigate for the impacts.

Surveys for wetlands, meadows and deciduous trees occur during the planning stages of the project. Rare plant surveys identify any deciduous trees that may occur in the area and also alert the project managers of any potential wetlands. There were no individual projects located in sensitive areas containing deciduous trees, wetlands, and/or meadows in 2015.

7.4-12 (BIO-2) Active Raptor and Migratory Bird Nest Site Protection Program

This measure requires that before construction activities, a migratory bird nest site survey will be conducted to identify any active raptor nest sites within the project area. During initial construction activities, a Forest Service biological monitor is required to be onsite to evaluate if any migratory bird nests are within 100 feet of the construction corridor. If any nests are found, the biological monitor will stop construction and consult with the Forest Service and TRPA staff within 24 hours to determine the next appropriate actions.

Under the direction and oversight of the Forest Service, qualified staff from Sierra Ecotone Solutions conduct annual raptor and migratory bird nest surveys. The following areas were surveyed for nesting bird species and bat roost: Mid-Station Canopy Tour, Forest Flyer Alpine Coaster and the Kids Zipline. These areas were surveyed for the presence of bat roost sites and for nesting birds in accordance with the design features identified in the Biological Evaluation and Epic Discovery EIR/EIS/EIS. The surveys were completed on April 3rd, April 4th, April 13th, May 12th and May 13th of 2015. Additionally, Sierra Ecotone Solutions performed surveys for auditory and visual detection of the California spotted owl. These surveys are conducted and completed in potentially suitable habitat within the surrounding project areas. Protocol for surveying habitat conservation areas and spotted owls is followed as outlined by the Forest Service.

The nesting bird survey indicated there were no active nests within the project areas. However, snags containing cavities were observed and although none of the snags were currently active, they are known to be suitable nesting locations for a variety of present bird species. Sierra Ecotone Solutions recommends retaining these snags within the project area, where feasible, in order to maintain suitable nesting locations for cavity nesters. The project areas were surveyed for the presence of bat roosts in rock crevices, snags and within dense trees (clumps of whitebark pine and lodgepole). No evidence of bat roosts was observed during the completion of the surveys.

California spotted owl surveys conducted in 2015 resulted in no auditory or visual detection of the species within the survey area. Spotted owl protocol states if there has been no detection for two consecutive years, it can be assumed the results are accurate for an additional two years without performing additional surveys. The completion of the 2015 field surveys for the California spotted owls results in meeting the two-year protocol for this species. The two-year timeline starts on the last day of the last

survey, which would be August 14th, 2015; therefore, if implementation of projects would commence prior to August 14th, 2017, no further surveys for the California spotted owl would be necessary. However, if construction does not commence prior to August 14th, 2015, two-year protocol surveys must be conducted. A review of the surveyed results can be found in the 2015 Biological Survey Results Summary located in Appendix VIII.

7.4-13 Monitor and Protect Northern Goshawk

Any projects that propose to affect or are within half a mile of any suitable northern goshawk habitat are required to have pre-construction surveys completed for northern goshawks. All surveys will be in accordance with the most recent Forest Service Region 5 protocol. Additionally, Heavenly Mountain Resort is required to fund updated northern goshawk habitat maps at 5-year intervals throughout the life of the Master Plan Amendment. These maps will be used when conducting any pre-construction surveys.

Sierra Ecotone Solutions is approved by the Forest Service to conduct northern goshawk surveys. Surveys were conducted and completed in suitable habitat within and adjacent to the project area for northern goshawk based on the updated habitat map generated by the Forest Service for the environmental analysis of the Master Plan Amendment. In 2015, both dawn acoustical and broadcast survey methods were utilized and completed to protocol.

No auditory or visual detections of the northern goshawk were documented within the survey area in 2015. The completion of the 2015 field surveys for the northern goshawk meet the two-year protocol. The northern goshawk protocol does not include any discussion as to the validity of surveys for any duration of time after protocol has been met. However, since northern goshawks have been detected in previous years, Sierra Ecotone Solutions recommends the continuation of goshawks surveys to determine if goshawks are nesting within the special use permit boundary.

A northern goshawk detection was recorded by the USFS wildlife staff to the north of the Daggett and Ridge polygons in 2014. Due to this detection, a new polygon was created to cover the additional habitat that was not previously surveyed. No detections in this new polygon were observed or recorded in 2015. Additionally, the Von Schmidt Flat survey polygon was not surveyed in 2015. Due to past incidental detections from non-biologists, the Von Schmidt Flat had been included in the field surveys. However over the years, the area did not reveal any goshawk detections and the area shows relative low stability of habitat for the raptor. Therefore, the area was dropped from further surveys. Results and data sheets from the surveys conducted in 2015 are contained in the 2015 Biological Survey Results Summary located in Appendix VIII.

7.4-14 (BIO-4) Wildlife Nursery Site Survey

Heavenly shall conduct pre-construction wildlife nursery and den site surveys within 100 meters of ground disturbance activities. Findings of the survey will be reported to the USFS LTBMU which has the authority to effect the construction schedule, dates of active construction, and/or modify the facility location to provide adequate protection.

Sierra Ecotone Solutions completed pre-construction surveys for marten den sites at the following project areas: Mid-Station Canopy Tour, Forest Flyer Alpine Coaster and the Kids Zipline. These areas were surveyed for marten den locations and for the presence of wildlife species in accordance with the design features identified in the Biological Evaluation and the Epic Discovery EIR/EIS/EIS. The subject areas were surveyed on April 3rd, April 4th, April 13th, April 14th, May 12th and May 13th of 2015.

One set of marten den tracks was observed on the west side of the project area above Maggie's Canyon using snow-tracking methods. No denning activity was evident nor were there any additional observations

of marten den within the project area. A review of the surveyed results can be found in the 2015 Biological Survey Results Summary located in Appendix VIII.

7.4-15 Utilize Boundary Management Plan to Manage Skier Access on Adjacent NFS Lands.

This measure requires that Heavenly Mountain Resort prohibits skier access from the gondola mid station. Access is permitted through managed skier gates along the ski area boundary.

Heavenly provides stationed employees at the Gondola mid station to explain to skiers and riders that the mid-station is only for sightseeing and that one more stop is available where one can ski or ride. If guests with skis or snowboard equipment stop at the mid station, Heavenly employees require them to leave their equipment on a rack near the gondola where it can be monitored. In past years, during and after larger snow storm events, rider tracks can be seen from the mid station. The Heavenly Mountain Resort policy calls for employees to contact dispatch and security to apprehend the violators at the bottom of the Gondola.

The mid station also acts as a physical barrier to accessible skiable terrain. It is an elevated platform with a 10-15 foot drop to the ground. The stairs leading to an area below the mid station are roped off and marked "For Authorized Personnel Only." Heavenly does its due diligence to maintain compliance with this measure prohibiting skier access from the mid station

In years of increased precipitation and snowfall (example being the 2010-2011 ski season), skiing and prohibiting access from the Gondola mid-station becomes more problematic. The physical barrier and height is limited due to snow depth. Evidence of ski/snowboard tracks below the deck have been visible after large snow events. The 2014-2015 ski season was considered another drought year and skiing/access from the Gondola mid-station was not problematic due to the lack of snow.

The revised Boundary Management Plan, states that new signage and metal gates that will require "physical action" by a skier/rider to open them will be installed at various locations to provide back country access. The new warning signs will state the avalanche danger scale, back country checklist, and acknowledgement that one will accept full responsibility for their actions and cost associated with their rescue. The gate locations will be placed in areas in which people have traditionally accessed out-of-bounds areas. The five access points and gates will be located at the following locations: Fire Break, Raley's Gulch, Fulstone Canyon, Stateline Gate, the Breach and Broad Daylight. Detailed information on Heavenly's Boundary Management policies can be found in Appendix IX.

7.4-16 Evaluate and Monitor Known Archaeological Resources within Comstock Logging Historic District

Prior to construction activities, a qualified professional must formally evaluate the project area for the National Register of Historic Places (NRHP). The LTBMU Heritage Resources staff keeps a record of possible historic sites at Heavenly Mountain Resort.

Communication with LTBMU Heritage Resources staff revealed that evaluations of archaeological resources sites within the Comstock Logging Historic District occurred before 2007. Evaluations concluded that all sites but one (the Flume Site) were eligible for the NRHP (Maher, 2012). Monitoring of these eligible sites occurred throughout 2009 and 2010. Proposed ski runs and potential construction in the Galaxy Pod area prompted monitoring in this area in 2011 (Maher 2012). Likewise surveys, in 2011, were conducted for the trail widening project on the California side to ensure that there was no conflict with the Comstock Logging District site.

A new survey on the area adjacent of California trails for the Heavenly Mountain Resort Tamarack Project was completed during the 2015 summer months. The survey was performed due to the improvement of

winter and summer activities in the area of the Tamarack Pod of Heavenly Mountain Resort. The proposed improvements include a new activity ticketing sales kiosk, relocation of the existing Red Fir handle tow lift, addition of new Magic Carpet ski school lift, Tamarack return trail ski widening and the Blue Streak Zip line tree removal. According to the Heritage Resources Inventory Report, all improvements except for much of the Blue Streak Zip Line tree removal and Tamarack return trail ski widening were previously surveyed. An intensive pedestrian survey of the unsurveyed portions of the Area of Potential Effect (APE) was performed on October 22nd, 2015 and observed no cultural resources (Fuller, 2015). The project will have no effect on cultural resources listed on or eligible for inclusion in the National Register of Historic Places.

The LTBMU Heritage Resources staff keeps a record of possible historic sites at Heavenly Mountain Resort. If and when future projects lie within the known study area, Heavenly will plan for and avoid any known prehistoric site and additional surveys will be conducted as needed.

7.4-17 Identify and Protect Undiscovered Archaeological Resources

The LTBMU Heritage Resources staff will spot-check any proposed construction areas in consultation with the appropriate State Historic Preservation Office. If previously undiscovered resources are discovered during construction, all activity will be put on hold until the LTBMU Heritage Resources staff for either California or Nevada assess it for eligibility to the NRHP, compliance with TRPA Code Section 29, and/or (in the event of a prehistoric or ethnographic find) for Native American values.

LTBMU Heritage Resources staff has prepared a comprehensive list of historical sites within the Heavenly boundary. Surveys are done prior to choosing locations for projects. Heavenly employees and contracted construction workers receive training prior to project commencement on the protocol for an encounter with possible archaeological resources.

In 2009, to assist in project scoping and field study, a general meeting at the offices of Heavenly Mountain Resort and a site visit focusing on the Gondola's Area of Potential Effects (APE) was conducted (Lindstrom and Blom 2009). Heritage concerns were addressed by project archaeologist Susan Lindstrom and John Maher, Heritage Resource Coordinator for the USFS-LTBMU. A surface archaeological reconnaissance was conducted by Devin Gonzales Blom and Susan Lindstrom from October 26th through 29th, 2009. Additional studies were completed in 2013 reviewing the Top of the Gondola Summer Activities. It was determined that 95% of the area was already surveyed and no cultural resources were found. A screening undertaking letter was submitted finding that "little or no potential to affect historical properties". "All other projects for the Heavenly Mountain Resort 2013 Summer Activities (list) are within previously surveyed areas and do not endanger any cultural sites" (Fuller 2013).

Heavenly Mt. Resort is planning improvements in the Tamarack Pod of the resort which will require tree removal along the Blue Streak Zip Line and Easy Street. Additionally, the Redfir Lift and Magic Carpet will need to be re-located. The Area of Potential Effect (APE) for the Redfir Lift and Magic Carpet were inventoried for cultural resources in 2009. The tree removal areas were inventoried for cultural resources in 2015 and resulted in no cultural resources were located in either area (Fuller, 2016). If the scope or design of the proposed project will be altered or changed, additional review by the Heritage Resources Program will be required. Additional improvements on the Nevada portion of the Heavenly Mt. Resort are being proposed which include an aerial challenge course called the Discovery Forest Zipline Canopy Tour (which will be self-guided routes consisting of wooden columns, platforms and rope walkways/bridges), the Zipline Center and portions of the Bear Cave Challenge Course similar to the Boulder Cove Challenge Park. "This project will mostly use current standing trees for support of aerial course and ziplines, two post holes will be dug for the Zipline Center so the total disturbance will be less than one cubic meter of

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⁹ Lake Tahoe Basin Management Unit, TB-2013-01. RT2013051900013. Screened Undertaking (Class B Undertaking) Letter. 2013.

cumulative ground disturbance per acre" (Fuller, 2013). Approximately 95% of the project area has previously been surveyed and no cultural resources were found.

The Heavenly Resort proposed to add multiple summer use activities on Heavenly Mountain in accordance with the Ski Area Recreational Opportunity Enhancement Act of 2011 (SAROEA). The Epic Discovery proposal at Heavenly Mountain Resort will attract a large segment of summer and non-ski/ride visitors seeking more managed recreation opportunities. The proposed recreational activities for Adventure Peak, East Peak Basin and Sky Meadows Basin include, but are not limited to ziplining, mountain biking, hiking, construction of observatories and lookout towers and water activities such as kayaking, paddle boarding and fishing. Additionally, educational opportunities, mountain excursion tours and emergency evacuation protocol will be implemented mountain-wide. It was concluded that these undertakings fell within Stipulation 7.4 (b) of the PA (Fuller, 2015), therefore, the proposed improvements may be implemented without any further Section 106 consultation or review. Furthermore, survey of the project area is documented in multiple previous HRRs with the most current and relevant being R2005051900022 (Fuller, 2015).

For the 2014/2015 ski seasons there was not enough snow to safely over-snow monitor any of the Comstock area sites within the Galaxy Pod area. However, for the 2015/2016 season, the snow depth finally allowed for the Galaxy Pod sites to be monitored and open to the public for skiing. In general, Heavenly has now closed the Galaxy Pod sites and are only open when the snow cover is sufficient to protect the sites from any damage from skiing/snowboarding. Recreational users in previous ski seasons would cross the site without the presence of adequate snow cover, but there was no evidence of any impacts due to snow cover. Due to work load, the Galaxy Pod location was not monitored during the 2015 construction/summer/fall months.

Two road segments were discovered as extensions of a Comstock-era wood haul road which was first recorded by S&S Archaeological Consultants in 1992, as leading downward from the Mott Canyon area to the upper reaches of the South Fork of Daggett Creek (Lindstrom and Blom 2009). These new heritage resources have been recorded on State of Nevada IMACS archaeological site records in accordance with established guidelines. Updates to these forms were completed. Copies of this report and accompanying site records have been forwarded to the USFS-LTBMU for their review and processing. An additional copy has been placed on file with the Nevada State Museum, which maintains the archaeological inventory for the State of Nevada (Lindstrom and Blom 2009).

7.4-18 Protect the Tahoe Rim Trail

In order to protect the Tahoe Rim Trail (TRT) and allow for its continued used during construction of resort facilities, Heavenly Mountain Resort is required to rope off any hazardous areas within or adjacent to the TRT, prohibit construction of permanent structures which may block the use of the trail, as well as inform the public of any potential closures along the TRT.

There were no Heavenly projects implemented within the vicinity of the TRT during the 2015 construction season. The Tahoe Rim Trail Association and Tahoe Area Mountain Biking Association completed construction of the Van Sickle Connector trail as well as the Daggett Re-route Project in 2013. The Van Sickle Connector ties in the casino corridor in South Lake Tahoe (Van Sickle Park) area with the Rim Trail. The new 3.5 mile trail allows mountain biking and hiking usage in both directions providing views of Lake Tahoe. The Tahoe Rim Trail Association completed maintenance work on the Van Sickle trail in June 2015. The Daggett Re-route project was completed in 2013 re-routing the old existing trail off of the roadways of North and South Benjamin to seven new miles of trail. Heavenly Mountain Resort operations crews assisted in construction of the two trails and neither project interfered with Mountain Operations.

Conclusion

During construction, measures of the MMP are implemented during each project. Heavenly Mountain Resort maintained compliance with these measures during the planning, design, construction, and post-construction phases for each project during the 2014-2015 construction season. Annual water quality results do not meeting the state water board limits (measure 7.4-3), though Heavenly is actively limiting salt and deicer applications and monitoring/tracking salt on mountain applications. In addition, sampling data will be collected in 2016 to help address the Bijou Park Creek feasibility study which will propose future modifications to the existing filter system and/or new solutions to limit chloride levels downstream of the California Base Lodge. Two new biological monitoring measures (7.4-9 and 7.4-14) were implemented in 2015. The 2015 data collected will be used to establish baseline surveys regarding the Sierra Nevada Yellow Legged Frog and marten populations. Results for these surveys will be presented to the appropriate agencies prior to the implementation of projects related to Epic Discovery.

4 Chapter 4 – Operation and Maintenance Measures

Introduction

The operation and maintenance measures contained in the MMP govern both summer and winter activities necessary to run Heavenly Mountain Resort. While construction measures are project-specific, operation and maintenance measures encompass annual daily resort operations. These ongoing measures are usually related to either summer or winter activities.

7.5-1 Watershed Maintenance and Restoration Program

Heavenly will implement the Watershed Maintenance and Restoration Program. This program will be updated determined by ongoing monitoring. Cumulative Watershed Effects (CWE) tools were used to assess the Epic Discovery Project; however these tools are no longer sensitive enough to be useful on project-level scale. The Forest Service will monitor road maintenance which will be incorporated in developing the restoration and maintenance schedule for road segments. Future Master Plan implementation and monitoring will be reviewed as part of the Ongoing Environmental Monitoring Program (Measure 7.5-2). The Waste Discharge Requirements (WDRs) ensure that measures are implemented and maintained (Heavenly, 2015).

Each year Heavenly had prioritized CWE projects based on maintenance needs, costs, funds, proximity to water bodies and erosion potential as well as construction implementation. Moving forward, future projects will be prioritized based on the Watershed Maintenance and Restoration Program (Epic Discovery Draft EIR/EIS/EIS Appendix 3.1-D). These projects have been "organized in phases based on Priority ski trails and road segments treatment needs as well as tied to capital project implementation phasing¹⁰". During the 2015 monitoring season, RCI was responsible for BMP implementation and effectiveness monitoring. Results from the 2015 monitoring effort are located in Appendix I. Based on revisions to this measure. RCI will continue to monitoring and inspect BMPs shifting from the CWE tools and instead focus on compliance with the WDRs. Appendix III contains the updated status list of Watershed Maintenance and Restoration Program projects for the 2015 construction season. Additional BMP and maintenance projects were completed, though not listed on the 2015 CWE Work List. These projects are listed as follows: the Directional Signage Upgrades, Face Patrol Sewer Line, and the Kiddie Zipline and Challenge Course. Three of the four master plan projects listed on the 2015 CWE Work List, which include the Alpine Coaster, the Climbing Rock, and the Mid Station Canopy Tour, were completed in 2015. The fourth project, re-grading the top of the Waterfall Lift Removal Top Station, is expected to be completed in 2016. Appendix VII contains the list of proposed Watershed Maintenance and Restoration Program projects planned for 2016.

7.5-2 (WATER-C1b) On-Going Environmental Monitoring Program

This measure addresses the Lahontan Board Order No. R6T-2003-0032A2 waste discharge requirements (WDRs) and implements the monitoring and reporting program for Heavenly Mountain Resort. The Program includes monitoring the following components: Water Quality, BMP Effectiveness, Riparian Condition and Condition/Trend Monitoring. Additional roads and trails will be monitored within the special use permit boundary to comply with current Forest Service protocols (includes the Mountain Bike Park as it applies only to watershed NV-1); and in-stream fine sediment monitoring will be required for the Heavenly Valley Creek Sky Meadows

¹⁰ Heavenly Mountain Resort Master Development Plan, Page 7-20

Reach only. This effort will help to assess poor biotic health scores and document the effectiveness of mitigation measures in the area (Heavenly, 2015).

The Environmental Monitoring Program continues to be funded by Heavenly, but has been implemented by Cardno (formerly Cardno ENTRIX) and RCI since 2005. Heavenly renewed their contract with Cardno ENTRIX and RCI to complete water quality monitoring and BMP effectiveness monitoring in January 2008 for a five-year period - 2012 marked the end of the contracted work. Through the public process, TRPA and Heavenly again selected Cardno and their sub-consultant team to continue this work through 2017.

Water quality monitoring was conducted monthly between October 1, 2014 and September 30, 2015 and weekly during spring runoff at the seven sites specified the previous measure. For the 2016 water year, sampling location will abide by the new Waste Discharge Requirements (R6T-2015-0021) and Monitoring and Reporting Program (2015-0021). The two Nevada Edgewood Creek monitoring locations are outside of the Lahontan Water Control Board's jurisdiction, but will continue to be monitored. Results were reported to Lahontan and the Forest Service in the quarterly and annual/comprehensive report. The Lahontan WDR permit requires storm samples from the three California Base Parking Lot area StormFilterTM sampling locations (43HVP-2, 43HVP-1a and 43HVP-1b). Seven storm samples were collected during the 2014-2015 water year. Results from these samples are included as an appendix in the Environmental Monitoring Program 2015 Annual Report (Appendix XIII).

Pursuant the latest State Water Quality Control Board's Mitigation and Monitoring Program (MMP) amendment, BMP effectiveness reporting is now only submitted annually as an appendix to this report. Results from BMP effectiveness monitoring were discussed previously within measure 7.4-1 and can be found in Appendix I. Through an adaptive management approach, the effective soil cover program shifted from a photo monitoring program to an implementation of slope stability and cover at prioritized "hot spots" within the watershed. This approach and shift was documented in the in the Environmental Monitoring Program 2014 Annual Report.

Riparian stream condition inventory (SCI) monitoring was collected during the summer of 2015. This information was included in the Environmental Monitoring Program 2015 Annual Report (Appendix XIII). Trend analysis of the SCI data will be reviewed and discussed in Comprehensive Annual Report to be submitted in January 2017. The next round of riparian condition monitoring for the California and Nevada streams is not scheduled again until the 2019 summer season.

A portion of the stream riparian studies includes bentho macro-invertebrate (BMI) studies. Samples are collected, scored and analysed providing trends for stream health. Sampling occurs on a two year on and two-year off schedule with results collected in 2006/2007,2010/2011 and 2014/2015. The 2015 samples were collected in late June, earlier than typical data collection, due to the lack of runoff and drought conditions in the streams. The laboratory results were submitted to the State Water Board on January 18, 2016 for scoring. According the new WDRs, BMI sample collection, as required by the WDRs, is not scheduled again until 2018; however the Upper Hidden Creek reference reach will be collected in 2016 to provide a second year of data at this location. This will be the first time samples have been collected at this site over a two year period. An analysis of past BMI results up through the 2011 sampling period were provided in Appendix 3.1-B of the Heavenly Mountain Resort Epic Discovery Project (February, 2015), As discussed in the memo, "there is insufficient data at this time to determine whether biotic condition is improving significantly at any of the sites since the TMDLs were adopted". Drought conditions may or may not affect the aquatic macro-invertebrate populations. Continued monitoring on the two year on and off cycle was recommended and should continue until "at least an improved trend can be definitively documented."

New Mountain Bike Park Trails monitoring and fine sediment monitoring in Heavenly Valley Creek are new measures that will be monitored in the near future.

7.5-3 (WATER-C1a) CA-1 Erosion Reduction Measures

Prior to or concurrent to disturbance in Sky Basin, sources of erosion that will directly affect Heavenly Valley Creek and BMI scores will be mitigated as outlined in Epic Discovery Draft EIR/EIS/EIS Appendix 3.1F. This measure lists the priority of each project prior to disturbance. The status and implementation of these mitigation measures will be documented through measure 7.5-2 (Heavenly, 2015).

This new measure will be implemented during the 2016 construction season. RCI will be monitoring and documenting the listed phase hotspot locations for compliance and potential future construction in Sky Basin.

7.5-4 (WATER-C3) NV-1 Erosion Reduction Measures

Prior to or concurrent to disturbance in Mott Canyon watershed (NV-1), highest risk (greatest potential for sediment loading into the channel) sources of erosion shall be implemented as outlined in Epic Discovery Draft EIR/EIS/EIS Appendix 3.1G. This measure lists the priority of each project prior to disturbance. The status and implementation of these mitigation measures will be documented through measure 7.5-2 (Heavenly, 2015).

This new measure will be implemented during the 2016 construction season. RCI will be monitoring and documenting the listed phase hotspot locations for compliance and potential future disturbance affecting Mott Canyon.

7.5-5 Maintain Water Rights Balance

This measure specifies that Heavenly shall implement a water use/water rights monitoring program to estimate the quantity of water supplied by each source and where the water is used.

The Water Use Report for the 2014-2015 season contains detailed records on water used for snowmaking and can be found in Appendix V. "The Heavenly Mountain Resort snowmaking system consumed a total of 156.6 million gallons of water during the 2014-15 season to cover a total of 317 acres of terrain." For the 2014-2015 snowmaking season, 87.78 million gallons of water were purchased from KGID (22.97 million gallons) and STPUD (64.81 million gallons) for snowmaking operations. This was an increase of 2.91 million gallons from the 2013-2014 purchased usage. The remaining amount of water used for snowmaking was supplied from the California and East Peak Lake reservoirs. Results from the water balance report state that a net of 15.11 million gallons of out of basin water were transferred inbasin, while approximately 4.42 million gallons were transferred from California to Nevada during the 2014-2015 snowmaking season. All purchased water supplied by outside utility providers has been supplied in compliance with their approved water rights or similar permits.

The sources and use of water for the calendar year of 2015 are as discussed below. Water usage for each of the facilities below fluctuate from past year's values due to increased seasonal usage and the lack of facility usage on the Nevada side associated with the drought and lack of snow precipitation.

California Main Lodge: Water for the lodge is supplied by South Tahoe Public Utility District (STPUD). No consumption data is provided by STPUD. Annual flat fee charges for STPUD water are based on the size of the water meter.

¹¹ Barthold, Scott. Heavenly Mountain Resort Water Use Report, 2014-2015 Season. Snomatic Controls and Engineering, Inc. Page 1

Lakeview Lodge/Snow Beach Community Water System: Water for these facilities is supplied by an underground well. The estimated consumption for the 2015 calendar year is 197,300 gallons.

Sky Deck Barbeque and Bathrooms: Water for these facilities is supplied by an underground well that is not currently metered. In 2015, a pressure transducer was installed helping to limit maintenance issues and providing information allowing for the pump to run more efficiently. The estimated consumption for the 2015 calendar year is approximately 302,850 gallons. To meter this accurately, engineering design, construction and funding would be needed for a consumption meter.

Adventure Peak (Top of Gondola/Gondola Mid-Station): Water for these facilities is supplied by an underground well. The estimated consumption for the period is 1,759,000 gallons.

Boulder Lodge: Water for the lodge is supplied by Kingsbury Improvement District (KGID). Estimated consumption for the period based on water invoices from KGID is 48,580 gallons. This value is substantially lower than previously reported annual values due to the fact that the Boulder Lodge was never opened for operations due to the lack of precipitation.

Stagecoach Lodge: Water for the lodge is supplied by KGID. Estimated consumption for the period based on water invoices from KGID is 318,541 gallons. These usage values decreased slightly from last year's previously reported usage number.

East Peak Lodge: Water for this facility is supplied by an underground well. Estimated potable consumption for the 2015 period is 414,800 gallons. The usage value at East Peak Lodge increased in 2015 likely due to increased usage and skier visits.

East Peak Well: Water from the well is used to re-charge the East Peak Lake/Reservoir and subsequent snowmaking operation. For the 2015 calendar year, 102,837,255 gallons of water were used.

7.5-6 Maintain Water Flows in Heavenly Valley Creek

This measure requires a water use/water rights monitoring program specific to the California Reservoir and Heavenly Valley Creek.

Heavenly attempts to maintain and balance flows into and out of the California reservoir continuously to ensure that water rights are not exceeded. Metering equipment is in place above and below the California Reservoir; however vandalism and aged equipment have prevented continuous monitoring. New data loggers are needed to allow for continuous monitoring and provide information for a precise balance of flows into and out of the California reservoir. No date has been scheduled for modifications and new equipment installation. The revised mitigation measure requires that Heavenly manage the reservoir and dam such that, "the dam releases equal inflow to the reservoir during the summer such that instream flows are not increased" (Heavenly, 2015).

Over the past four ski seasons, Heavenly has had an increased need for snowmaking due to the lack of natural snowfall. The operation of the East Peak well was thought to have reversed the historical experience of transferring water from California to Nevada; however the past three water balance reports still show a reliance on the California reservoir water for snow making in Nevada. The 2014-2015 report states that approximately 4.4 million gallons of water from the California reservoir water were transferred to Nevada for snowmaking. "Future net transfers will be minimized by further balancing water supplies during the season and managing summer irrigation practices." 12

¹² Barthold, Scott. Heavenly Mountain Resort Water Use Report, 2014-2015 Season. Snomatic Controls and Engineering, Inc. Page 4

The revised measure also requires another source for summertime irrigation besides Heavenly Valley Creek. Moving forward (2016), other watering sources and drought resistant plants will be incorporated helping to ease the reliance on water from Heavenly Valley Creek and dam.

7.5-7 Maintain Water Flows in Daggett Creek

The MMP specifies that Heavenly shall install a flow gauge at East Peak Lake, monitor input via precipitation and output from East Peak Lake, and maintain release rates that satisfy water right permit 50525.

The water rights permit is based on snow making usage as opposed to maintaining flows in Daggett Creek. The permit states that 0.5 cfs of water can be used from November through March for snow making operations. There are a number of inputs to determine this value such as: well usage, stream flows out of the dam, and water pumped in and out of the reservoir used for snow making. Appendix V contains the 2014-2015 snowmaking report, while Appendix VI contains the 2014-2015 estimated stream flow data collected and prepared by RCI on Daggett Creek. Flow data is collected twice a year from a gauge located below East Peak Lake on the South Fork of Daggett Creek. In 2015, data was collected on May 28th, 2015 and October 7th, 2015. Additional stream discharge measurements were collected during the May 28th site visit in order to update the rating curve. Due to the non-uniform cross section location and low flows in the channel the discharge correlation is inaccurate during low flow measurements (less than 0.4 cfs). The peak discharge graphs provided by RCI show the highest flows occurred in January, followed by a general decline towards spring runoff in May. Drought conditions in the stream show the majority of readings collected below 0.2 cfs, which is not ideal for flow measurements with the existing equipment. "RCI has discussed alternative methods for estimation of natural runoff with Heavenly Mountain Resort and the Nevada Division of Water Resources. If the Division concurs that alternative methods can be used to demonstrate compliance, the gauge would be unnecessary and could be removed. If not acceptable to the Division, then the in-stream discharge measurements would be continued."13

7.5-8 Maintain Compliance with Water Entitlements

Similar to measure 7.5-5, Heavenly shall implement a water use/water rights monitoring program and comply with existing California, Nevada, and local provider water restrictions on an annual basis.

Heavenly complied with all applicable water rights during the 2014-2015 monitoring period and prepared a water use/water rights report which is contained in Appendix V. The East Peak well began operation during 2011-2012 snowmaking season. For the 2014-2015 ski season, 100.1 million gallons of water were pumped from the East Peak Well into the reservoir and 95.1 million gallons were used for the snow making operation.

7.5-9 Reduce Vehicle Emissions

Heavenly is to work with responsible agencies to implement a mitigation package that will reduce the potential increase of ambient carbon concentrations. The mitigation package includes using contributions to develop best available control technologies and using these technologies for construction, expansion and improvement of the bus system, and improved parking management. In addition, Heavenly shall consider offering skiers/riders the option of both a morning and afternoon half-day lift ticket to reduce peak parking hour traffic.

¹³ Sutherland, Jill. 2015 Water Year Daggett Flow Monitoring. Resource Concepts Inc. (RCI). April 27, 2016

To mitigate the resort's contribution to carbon emissions, Heavenly has implemented a carbon mitigation package that is largely centered on reducing vehicular traffic. Heavenly uses low emission vehicles for both transit and operations. The entire fleet of Heavenly snowmobiles has 4-stroke engines. Heavenly also uses state-of-the-art snowcats with Tier 3 California Air Resources Board (CARB) engines. The emissions from Tier 3 snowcats are the cleanest available on the market.

During the ski season, Heavenly provides free shuttle service between all base areas and lodging facilities. They discourage vehicular travel to the gondola by only offering paid parking. Employees can buy subsidized monthly bus passes and Heavenly provides free bus service on existing routes to employees from 6:00AM to 7:00PM. However the 2015 employee survey noted that 66% of all employees surveyed drive their own personal vehicle to work. Heavenly contributed to the start-up and operation of the Coordinated Transit System (CTS) and continues to contribute the 20% required local match for Capital Vehicle Replacement Grants from the Federal Transit Administration. Since 2005, all new and replacement buses on the BlueGo system have been low emission, alternative fuel vehicles.

Heavenly currently offers skiers and riders half-day afternoon lift tickets.

7.5-10 Snow Removal Noise Mitigation Methods

To reduce noise created from the snow removal process; this measure states that Heavenly should minimize night time snow removal and attempt to construct noise barriers along the perimeters of parking lots using snow.

There are no formal noise measurements conducted to determine snow removal operations' effect on the CNEL. However, no known complaints were filed with the local jurisdictions, Heavenly, TRPA, or the Forest Service. Additionally, Heavenly's snow removal plan calls for constructing snow berm barriers along the perimeter of the California Base, Boulder, and Stagecoach parking lots. Snow is typically removed early in the morning, prior to opening to the public, beginning with areas furthest from adjacent houses and pushed towards the houses to build noise barriers.

7.5-11 Snowmaking Noise Mitigation Methods for Base Areas

This measure calls for a reduction of Community Noise Equivalent Levels (CNELs) at the base areas to 1982 values or TRPA Plan Area Statement (PAS) noise standards, whichever is less, through the implementation of snowmaking technology.

The CNEL is measured annually at each base area by j.c. brennan and Associates. Results for the 2014-2015 season are contained in the Heavenly Ski Resort Master Plan Noise Monitoring Survey located in Appendix X.

"Heavenly has completed the process of converting the California Base snowmaking operations to the use of fan guns. However, portions of the lower mountain which include the ski runs named Round About and Lower Gun Barrel continue to utilize air/water nozzles." These louder air/water nozzles are portable and manoeuvrable allowing snow making operations to move them to areas of need and tend to produce more snow compared to the quitter fan gun technology. Snowmaking around the California Base is monitored by a continuous noise meter (Larson Davis Laboratories Model 820) which records sound levels during the ski season on both snowmaking and non-snowmaking days. Noise measurement were collected from November 1st through March 28th, 2015. Even on days without snowmaking the CNEL "was influenced from roadway traffic, wind and individuals recreating on the USFS property" The CNEL value

¹⁴ j.c. Brennan & associates, Inc., Master Plan Mitigation Monitoring – 2014-2015 Heavenly Ski Resort. j.c. Brennan & associates, Inc. Auburn, CA. Page 9.

¹⁵ j.c. Brennan & associates, Inc., Master Plan Mitigation Monitoring – 2014-2015 Heavenly Ski Resort. j.c. Brennan & associates, Inc. Auburn, CA. Page 15.

recorded during the 2014-2015 ski season at the Heavenly Base monitoring location exceeded the 55 dBA standards for PAS 085 and 087 (57.0 dBA). The CNEL measured on days with snowmaking increased slightly from the previous season value of 57.9 dBA to 58.7 dBA. The CNEL measurement on days without snowmaking was 52.5 dBA, below the Plan Area standards of 55 dBA.

Short-term CNEL measurements were taken at the Stagecoach and Boulder base areas during snowmaking operations on December 14th and December 18th, 2014. Three noise measurements for the snowmaking operation for the Stagecoach Base Area noise measurements were collected. Average hourly noise values at the three monitoring sites were 77 dBA at Quaking Aspen Drive, 55 dBA at Ridge Site 4, and 61 dBA at Eagle Nest Site 5. From these measurements, a 24 hour continuous snowmaking usage CNEL was calculated for each of the three sites and the values are as follows: 84 dBA (Quaking Aspen Drive), 62 dBA (Ridge Site 4), and 68 dBA (Eagles Nest Site 5). The Stagecoach noise monitoring values do not fall under TRPA jurisdiction since the "area is located outside of the TRPA area of influence." The noise measurements for the Boulder base area were as follows: 68 dBA at Boulder Base and 62 dBA at the corner of Jack Circle and Bonnie Court. The predicted values at these locations, assuming continual operation for a 24 period are 75 dBA and 69 dBA. For the 2014-2015 ski season, these measured values exceed both the Kingsbury Drainage (50 dBA) and Upper Kingsbury (55 dBA) PAS 24 hour CNEL criteria established by the TRPA Environmental Thresholds for Lake Tahoe.

The Master Development Plan states that Heavenly will replace all snowmaking equipment with fan guns or similar technology with better noise reduction. While the California base area equipment has been replaced, areas on the face and Round-About have not. This measure also lists Boulder and Stagecoach base areas as two areas were newer and quieter guns should be replaced. Heavenly anticipates replacing the air/water nozzles on the Nevada side upon completion of replacement on the entire California face.

Heavenly has actively pursued several of the mitigation measures for noise reduction at base areas listed in the Master Plan Amendment; however, the measured CNELs values measures still exceed the 080, 082, 085, 087, and 095 Plan Area CNEL Standards and the time period for replacing equipment with quieter fan gun technology has been exceeded. Therefore, this measure is listed as non-compliant.

7.5-12 Rock Busting Noise Mitigation Methods

In order to mitigate the impact to a less than significant level, Heavenly must control the number, size and location of "rock busting" blasts (to meet PAS noise standards). Heavenly will continue to implement Rock Busting Noise Mitigation from the Master Plan.

There were no rock busting activities and subsequent noise monitoring mitigation measures performed during the 2015 construction season. The revised measure states, "audible noise due to blasting is not commonly considered to be a significant source of annoyance if blasting is controlled to meet safety standards on the project site" (Heavenly 2015). Future blasting operations will adhere to this measure.

7.5-13 Restrict Hours of Amphitheater Operations

This measure restricts the hours of concert noise to the daytime and early evening hours and restricts the concerts to less than 6 hours.

The amphitheater has yet to be constructed. Heavenly has conducted a concert simulation noise study; however no concerts have occurred or been monitored through 2015. At this time this measure is not applicable.

¹⁶ .c. Brennan & associates, Inc., Master Plan Mitigation Monitoring – 2014-2015 Heavenly Ski Resort. j.c. Brennan & associates, Inc. Auburn, CA. Page 18.

7.5-14 (TRANS-1) Traffic and Air Quality Mitigation Measure

This measure requires that Heavenly contribute to the Air Quality Mitigation Fund in accordance with Chapter 65 – Traffic and Air Quality Mitigation Program of the TRPA Code of Ordinances. Fees generated will be used to support programs that reduce VMT, improve air quality, and encourage alternate modes of transit (Heavenly 2015).

This is a new measure that will be implemented/paid in 2016.

7.5-15 Implement the Coordinated Transportation System (Public Transit Services)

This measure states that Heavenly shall continue to implement their portion of the ongoing air quality and traffic mitigation measures contained in the Coordinated Transportation System (CTS) Memorandum of Understanding (MOU).

Heavenly continues to fund the CTS Mitigation Fund as well as operate the winter bus fleet and a portion of the summer fleet in accordance with this measure.

7.5-16 Protect Tahoe Draba Populations within Heavenly Mountain Resort

Seven specific measures to protect Tahoe draba populations are identified for implementation in the MMP: surveys, fencing, boardwalks, avoidance, rock removal, monitoring, and an interpretive program.

During the 2015 construction season, Heavenly Mountain Resort complied with all applicable measures regarding protection of the Tahoe draba populations. Tahoe draba surveys are required prior to projects located within potential draba habitat. During the 2014 summer season, surveys were performed in the vicinity of the Tamarack Lift. These surveys were required for planning and potential construction of the following projects: Sky Meadows Canopy Tour and Sky Meadows Coaster. Heavenly staff also installed triple rope line fences in 2015 along Skyline Trail. These fences were installed as additional protection measures and were located from the Milky Way Bowl sign to the top of Sky Express on Skyline Trail.

Every summer, Heavenly places interpretive signs about Tahoe draba along well-used driving and hiking routes to alert employees and visitors. Mandatory summer employee orientation includes a section on Tahoe draba and habitat protection. Future Master Plan projects will incorporate the new out of Basin fencing and boardwalks spanning sensitive area requirements along with the other mitigation measures to protect Draba populations.

7.5-17 Minimize Loss/Degradation of Sensitive Plant Species

To protect sensitive plants at Heavenly, projects must be surveyed prior to construction and buffers must be placed around sensitive plants species. Facilities should also be sited to avoid riparian and old growth habitats.

At this time, the LTBMU staff is unavailable to provide updates with regards to this measure. Information pertaining to field efforts and sensitive plant species will be provided in this section once it is available. A revision to this measure will be included in a reissued final version of the report.

7.5-18 Invasive Plant Management

To prevent the spread of noxious weeds, Heavenly must develop and implement a long-term integrated weed management plan, use clean vehicles and materials for construction and stage

them in weed-free areas, monitor new construction for 3 years, and implement an annual employee orientation and training program.

During initial inspections in June 2015 (20th and 28th), the LTBMU revisited five active areas. The broadleaved pepperwood invasive plant was identified at three of the five sites visited. Chemical treatment of these sites occurred in July 2015 totalling 0.54 acres treated. Sites were monitored later in the season and no new or existing invasive plants were identified (Escobedo).

7.5-19 Monitor and Protect Nesting and Fledgling Bird Species

This measure specifies allowable dates (after August 1st) for summer concerts at the Gondola top station.

No concerts occurred at the top of the Gondola during 2015. Furthermore, no concerts have been held since 2009. If and when concerts are scheduled, they will be scheduled after the mitigated August 1st date.

7.5-20 (BIO-3) Migratory Bird and Habitat Utilization Survey

Heavenly shall perform annual nesting bird surveys for the following projects: Mid-Station Canopy Tour, Sky Cycle Canopy Tour, East Peak Zipline Canopy Tour, Sky Meadows Zipline Canopy Tour and the Sky Meadows Challenge Course. These surveys shall be completed prior to the start of project operations during the breeding season and shall identify migratory birds nesting on or immediately adjacent to proposed structures and equipment associated with the projects listed above.

See Appendix VIII for the preconstruction surveys completed prior to the 2015 construction season. No active nests were observed, though there were habitat features conducive for migratory bird nests. This new measure will be further implemented in 2016 as monitoring for migratory birds and nest will occur during breading season prior to the Epic Discovery Projects operation. The U.S. Forest Service (USFS) is the lead agency and will work with Heavenly Mountain Resort to conduct point count and nesting surveys.

7.5-21 (BIO-8) Wildlife Trash Management and Education Program

Heavenly shall create and implement a trash management operation for the entire resort consisting of wildlife proof trash containers and a trash removal and management plan. The removal and management plan will include specified storage areas and practices to prevent access to refuse by wildlife species. Additionally, an educational component will be included in an effort to decrease litter and improper feeding and ramifications to wildlife. The plan shall be reviewed annually by Forest biologists.

As a condition of the approved EIR/EIS/EIS for the Epic Discovery Program, a wildlife trash management and education plan will be implemented annually, starting in 2016, and reviewed by Heavenly and the U.S. Forest Service (USFS) LTBMU. The Wildlife Trash Management and Education Program will remove refuse from deposit points, educate staff and guests on proper waste management and increase efforts to limit interactions between humans and wildlife. The plan proposes ten new animal proof receptacles to be installed in and around the Adventure Peak/Top of Gondola area. Each of these receptacles will be serviced daily. Additionally, daily refuse will continue to be removed by the food and beverage warehouse staff. Removing food and garbage waste daily is vital to the success of the program. Dumpsters are located at the California Main Lodge lower parking lot for different waste streams such as garbage and kitchen food waste recycling. These dumpsters are animal proof and are serviced by the South Tahoe Refuse. Bear Bins are expected to be deployed before summer operations and activities begin at the Adventure Peak/Top of Gondola location. These bins will be removed from the TOG area and will be

stored at an off-site location once summer operations cease in late September. The program will expand into Sky Meadows and East Peak Lake/Lodge as these regions come online. Details regarding the Wildlife Trash Management and Education Program can be found in Appendix IV.

7.5-22 Maintain Timber Thinning Practices

Heavenly must work with the Forest Service to determine areas that require timber thinning as established by the LTBMU Land and Resource Management Plan. Practices should help prevent catastrophic wildfire but be consistent with management criteria for maintenance and enhancement of wildlife values.

Each year, Heavenly and Forest Service vegetation management specialists review thinning and hazard reduction needs. When areas are identified for thinning, timber thinning practices will be consistent with the Forest Service management criteria. A few trees were removed in 2015 near the Coaster Line and Gondola Mid Station. At each location the trees were reviewed and marked prior to removal. As mentioned in section 7.4-17, improvements in the Tamarack Pod of the resort will require tree removal along the Blue Streak Zip Line and Easy Street. These trees will be reviewed and marked prior to removal and will be discussed in next year's report.

7.5-23 Provide Employee Housing

Heavenly must assist in providing employee housing as well collect and report monthly employee housing. Heavenly will continue to maintain its housing program.

Based on revisions to this measure, the percentage of occupancy (occupied beds) will be tracked monthly moving forward. The table below lists the monthly occupancy totals starting in July 2015. Next year, annual and ski year average occupancy values will be calculated. Heavenly's employee housing assistance program matches workers with available housing. The last employee housing survey occurred in January 2015, and it confirmed the majority of employees surveyed rent housing (62%). A majority of the employees rent either a house (64%) or apartment (15%). The employee housing survey is conducted annually and is contained in Appendix XII. Results from the survey indicate that an over all majority of employees are very to somewhat satisfied with their housing situation (80%) and rate the cost of their housing as very good to good regarding their rent/mortgage payments (59%).

Table 4-1 Heavenly Employee Housing Occupation

Month/Year	% Occupied	Beds Occupied (87 Total Available Beds)
July 2015	50%	43
August 2015	45%	39
September 2015	25%	22
Average Occupancy Ski Season Rate (OctSept.)	N/A	N/A
Average Annual Rate	N/A	N/A

Conclusion

Compliance with the operations and maintenance portion of the MMP is an ongoing process. Heavenly complies with the MMP through careful planning, implementation, utilization of industry experts, and educating employees on the importance of each measure. Heavenly is in compliance with nearly all of the existing Operation and Maintenance measures and they are actively addressing newer measures established in the Final EIR/EIS/EIS Epic Discovery Project and MDP. Instream monitoring equipment in Heavenly Valley Creek needs to be upgraded to effectively measure flows in and out of the California

reservoir. Snowmaking noise measurements are in non-compliance with the planned CNEL plan area statement levels at the California and Nevada Base Areas.

5 Chapter 5 – Management Response to Monitoring and Evaluation

Introduction

The Heavenly Mountain Resort response to monitoring and evaluation is as important as the monitoring and evaluation itself. This portion of the MMP is to encourage an adaptive management approach through collaboration between Heavenly and relevant interested agencies and parties.

5.8-1 Soil and Water Quality

To comply with measure 5.8-1, the results of various monitoring reports on soil and water quality are contained in this report. Heavenly's response to these reports is integral in achieving environmental improvements. Within 60 days of receiving completed monitoring reports, Heavenly, Forest Service, Lahontan, and TRPA will collaborate as necessary to develop an action plan based on monitoring results.

Heavenly has employed Cardno in a three-party contract with the TRPA to implement water quality monitoring services. During the 2015 water year (from October 2014 through September 2015) Cardno provided Quarterly Reports to Lahontan, the Forest Service, and the TRPA in fulfilment of the monitoring and reporting requirements set forth in the Lahontan Waste Discharge Requirements (WDR's). Quarterly reports were submitted on the following dates: January 30th, May 1st, and July 31st of 2015. The 2015 Annual Report, which included the fourth quarter results for the 2015 water year, was submitted on January 15, 2016. This report was revised based on agency feedback and re-submitted on March 22nd, 2016. Due to the close working relationship of Heavenly staff and field monitors, Heavenly often responds to field directives and implements corrective actions before field and work order reports are generated.

Annual averages for total phosphorus and chloride exceeded the state standard for all three of the sampling sites locations along Heavenly Valley Creek (Sky Meadows, Patsy's and Property Line). The total phosphorus and chloride exceedances are not solely due to the Heavenly Mountain Resort operations since these two parameters and annual averages were also exceeded at the reference site located along Hidden Valley Creek. Only three samples were collected at the Sky Meadows sampling location (43HVC-1A) in 2015. Findings from the EIR/EIS/EIS Epic Discovery Project facilitated the need for additional water quality sampling at this location. Sampling began in July and continued through the fourth quarter of water year 2015 (September). The annual averages for total phosphorus, total nitrogen and chloride all exceeded the state standards at the Bijou Park Creek for the 2015 water year. While total phosphorus and chloride annual average values were exceeded at the reference site along Hidden Valley Creek, values at Bijou Park Creek were well above the reference reach values.

The 2015 water year marked the fourth year the California Parking Lot Filter Vault Effluent point results were reported to the State Water Board. Not to exceed values for turbidity, total phosphorus, and total nitrogen were exceeded for storm samples collected. Turbidity samples were exceeded for all seven of the outlet samples collected. Four of the seven total phosphorus storm samples collected were exceeded, while six of the seven storm samples exceeded the total nitrogen standard. Heavenly has continued to prioritize their effort regarding maintenance and filter replacement. In 2015, 42 filters were replaced which included fourteen filters which include the Phosphosob™ media. This media has shown some improvement with removal to total phosphorus results; however the sampled results still remain higher than the water board's standard. Heavenly continues to be proactive in attempting to limit discharge exceedances; and the new WDR's require a feasibility study with regards to chloride levels within Bijou Park Creek associated with California Parking Lot runoff. The feasibility study includes additional

monitoring efforts within Bijou Park Creek and around the Parking Area to be collected during the 2016 runoff period. These additional samples will help to determine the feasible and applicable changes to the filter vaults and parking lot operations to limit future exceedances.

The 2014-2015 winter season marked another drought stricken cycle for the Tahoe basin. The lack of precipitation correlated with decreased usage of roadway deicer. Heavenly used 59,076 lbs. of deicer for the 2015 water year. This value decreased from both the 2014 and 2013 water years (124,824 lbs. in 2014 and 390,121 lbs. in 2013). Usage of deicer is highly dependent on precipitation storm cycles and cold temperatures which vary year to year. The 2011 season and application amounts reflect the last average precipitation winter season (980,960 lbs. of deicer applied in 2011). Heavenly's spreader truck is fitted with a deicer application sensor gage which accounts for both road conditions and temperature controlling the ideal amount of deicer application needed for success. The sensor also records the amount of deicer applied more accurately. Reducing the amount of deicer applied to the roadways helps limit the amount of chloride detected in the water ways. Residual chloride tends to remain in the environment and is difficult and expensive to remove. Deicer application and recovery results can be found in Table 7.1(page 53) of the Environmental Monitoring Program Annual Report (Appendix XIII).

BMP effectiveness and monitoring is performed by RCI. The State Water Board's latest Waste Discharge Requirements/Monitoring and Reporting Program (RT-2015-0021) requires all quarterly and annual BMP reporting reports to be included and submitted with this Mitigation and Monitoring Plan. The BMP Effectiveness Monitoring 2015 Annual Report is included in Appendix I. This report summarizes findings, results and trends that occurred throughout the summer/construction season. The annual report also lists recommendations for improving existing and proposed BMP implementation helping to increase the effectiveness. Feedback and comments from each of the agencies as well as lessons learned are passed along for incorporation and implementation by Heavenly's operations staff. The monitoring goal is to always be in compliance with BMP installation and maintenance, with all involved parties in agreement, limiting runoff, erosion and sediment transport. Moving forward, modified mitigation measures in the EIR/EIS/EIS and MDP will shift the reporting and monitoring effort in a new direction; however BMP effectiveness and erosion prevention will remain the focus.

In 2013, Heavenly and IERS began focusing the vegetation cover program towards erosion resistance treatment and prevention of runoff associated from construction sites. Initial efforts were focused on mapped areas in poor to critical condition. The 2015 summer and construction season marked the third season IERS and Heavenly continued to follow the outcome-based watershed management approach. This "systematic approach emphasizes the soil edaphic factors that are required to reduce erosion in the *present* and recognizes that such erosion-resistant soil conditions are a requirement for long-term reestablishment of self-sustaining vegetation communities." Beyond the hot spot treatment areas referenced in the report, IERS also discussed the post treatment successes for both Maggie's Trail and Sky Chutes Ski Run and Water Bars Restoration projects. Post construction monitoring shows improved soil characteristics and vegetation growth leading to increased coverage and improved erosion resistance. The 2015 results are discussed in the Restoration and Monitoring Annual Report found in Appendix II.

IERS recommends vital improvements in processes related to management and communication, treatment and implementation, and monitoring and assessment. Management and communication processes will focus on prioritizing annual work using erosion and water quality risk as established criteria, integrating erosion hot spot treatments into the annual work list so they are completed along with other capital and maintenance projects and creating maps to show the locations of all annual work list projects and key watershed features. Treatment and implementation processes include the following: expanding the use of mulch-only treatments and experimenting with creating mulch berms across large

¹⁷ Integrated Environment Restoration Services, Inc. Heavenly Mountain Resort Outcome-Based Watershed Management Program 2015 Restoration and Monitoring Annual Report. IERS. Tahoe City, CA. Page 8

ski runs, aging wood chips for at least one year prior to application to begin the decomposition process, the implementation of low-flow, deep-cycle irrigation where applicable, utilization of a consistent form to document site-specific restoration treatments and measuring fertilizer and seed application rates. Additionally, monitoring and assessment processes will continue to build-on and expand the Heavenly summer revegetation crew's experience. This includes increasing the inspection and photo documentation of recently treated restoration areas during rain events, as well identifying and helping to develop an integrated plan to address current road system drainage issues. Detailed recommendations from the 2015 IERS report are located in Appendix II.

Through a combined multi-agency effort and key monitoring implementations, Heavenly is presently in compliance with this ongoing mitigation measure. Agency and public responses to this annual report during the 60-day comment period will be assessed and integrated into an action plan if necessary. No comments were received for the 2014 report. The implementation of any action plan items will be discussed in the annual report the following year (2016). Removed, modified and new measures in this report were established in the EIR/EIS/EIS Epic Discovery Project and subsequent MDP. In response to this measure, an electronic copy of this report will be linked from the Heavenly website to the report posting on TRPA's website.

5.8-2 Traffic and Parking

Heavenly is to prepare a parking monitoring report at the end of each ski season that includes the following:

- Days during which overflow parking was used on Ski Run Boulevard, South Benjamin Drive, and Galaxy Bowl and any days when overflow parking was full.
- The number of parking spaces used at Galaxy Bowl each day this area was used for overflow parking.
- An explanation regarding any days during which these overflow parking areas were filled.

The monitoring reports are to be shared with the TRPA, Douglas County, El Dorado County, and the City of South Lake Tahoe and posted on the appropriate websites, not limited to the Heavenly website. Based on the results of the monitoring reports, an action plan will be devised by Heavenly and interested parties within 60 days.

The California off-site parking areas are typically used during the holiday weekends and the week between Christmas and New Year's. However, because the 2014-2015 ski season produced a low amount of precipitation/snow fall and decreased skier visits, the off-site parking area was only used once on March 1st, 2015 and occupied a total of 50 cars. Parking at the California off-site location occurred on angles along the lower Ski Run Boulevard roadway. The roadway width at this location allows for parking, paved, along both sides of the street; while still allowing ample width for two-way traffic. Additional overflow parking, available on the Nevada side of the Heavenly Ski Resort, was not utilized during the 2014-2015 ski season.

To assess Heavenly compliance with the mitigation measure to reduce vehicle traffic, data was gathered from Nevada Department of Transportation (NDOT) and the California Department of Transportation (Caltrans) on average annual daily traffic (AADT) on US Highway 50 and Kingsbury Grade. Sites along these two passes were chosen to represent major points of access to Heavenly. These sites are displayed in Figure 5-2. AADT values from 2007 through 2014 for each site are shown in Table 5-1.

Traffic numbers, for the major access points to Heavenly Mountain Resort for the 2014 year, on average were slightly higher than those values collected last year (2013). Traffic count for state station NV-

0050036, located 0.4 miles west of SR-28, increased to 13,000 compared to previous consistent traffic counts of 11,500 in 2012 and 2013. State station NV-0053150 located on Kingsbury Grade (SR-207) resulted in the only decreased traffic count of 9,500 for 2014 compared to 10,200 in 2013. The 2014 traffic number along state station NV-0050044 remained the same (21,500 for 2013 and 2014). Both of the traffic sites located on California US-50 showed an increase in traffic counts for 2014. The site located at MP 79.29 increased from 30,500 in 2013 to 31,500 in 2014 where the other California site located at MP 65.62 increased from 8,000 in 2013 to 8,100 in 2014. State stations NV-0050044 and CA-MP 79.29 continue to show the highest traffic counts compared to all the other major access routes to Heavenly.

While vehicular numbers to South Lake Tahoe fluctuate year to year, these values do not necessarily correlate with skier visits or Heavenly's influence on traffic numbers. With limited data, it is hard to draw finite conclusions or trends. Media coverage of drought cycles and snow storm events tend to correlate better with the number of skier visits. Reviewing the eight years of traffic data collected, the general trend for four of the five monitoring locations shows a decrease in traffic volume. Only one traffic monitoring location, at the intersection of Hwy 50 and SR 28 (Spooner Summit), station NV-0050036 shows an increase in traffic volumes over the eight year period.

Table 5-1 Traffic Data on US Highway 50 and State Route 207

State – Station	Location	AADT 2007	AADT 2008	AADT 2009	AADT 2010	AADT 2011	AADT 2012	AADT 2013	AADT 2014
NV - 0050036	US-50, 0.4 Miles West of SR-28 at MP 12	11,000 ¹	10,000	10,000	12,000	12,000 ¹	11,500 ¹	11,500	13,000
NV – 0053150	SR-207 (Kingsbury Grade) 0.5 Miles East of US-50	12,000	11,000	11,000	11,000 ¹	11,000 ¹	10,000 ¹	10,200	9,500 ¹
NV – 0050044	US-50, 300' East of the NV-CA State line	25,000	25,000	24,000	24,000 ¹	27,000	22,500	21,500	21,500 ¹
CA – MP 79.29	US-50 at the intersection of Ski Run Blvd. ₂	32,500	31,500	31,500	30,000	30,500	30,500	30,500	31,500
CA – MP 65.62	US-50 at the intersection of Echo Lakes Road ³	9,000	8,900	8,900	8,900	8,900	8,000	8,000	8,100
¹ Data Adjust	¹ Data Adjusted or Estimated								
² Annual Ave	² Annual Average Daily Traffic (Back AADT) Traveling West Bound								
³ Annual Ave	³ Annual Average Daily Traffic (Ahead AADT) Traveling East Bound								
NDOT Data	NDOT Data: http://www.nevadadot.com/About NDOT/NDOT Divisions/Planning/Traffic/2014 Annual Traffic Reports.aspx								
Caltrans Da	Caltrans Data - http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm								

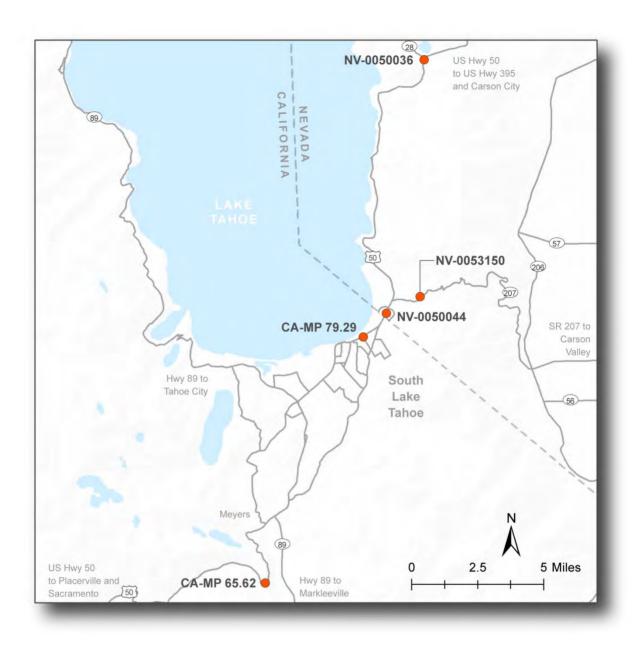


Figure 5-2 Mapping Locations of the Traffic Count Sites

5.8-3 Late Seral/Old Growth Enhancement

Monitoring is required every 5 years to track the progress of any enhanced forest or stand.

The forestry work for the restored stand was completed in 2007. In 2013, the LTBMU staff visited the restoration stand site to review the mitigation measure requirements. Results from the monitoring effort proved that the past mitigation measure objectives have been met. The EIR/EIS/EIS Epic Discovery Project and MDP removed past mitigation measure VEG-3 (7.5-25 Late Seral/Old Growth Forest Enhancement) in response to the monitoring conclusions. The LTBMU letter is included in Appendix XIV. No new additional late seral/old growth stands were removed during the 2015 construction season, nor were there additional stands that required monitoring. If and when an old growth stand is scheduled for

removal, a new stand of equal or greater acreage will be established and future monitoring of the new stand will be governed by this measure. Heavenly is in compliance with this ongoing measure.

Conclusion

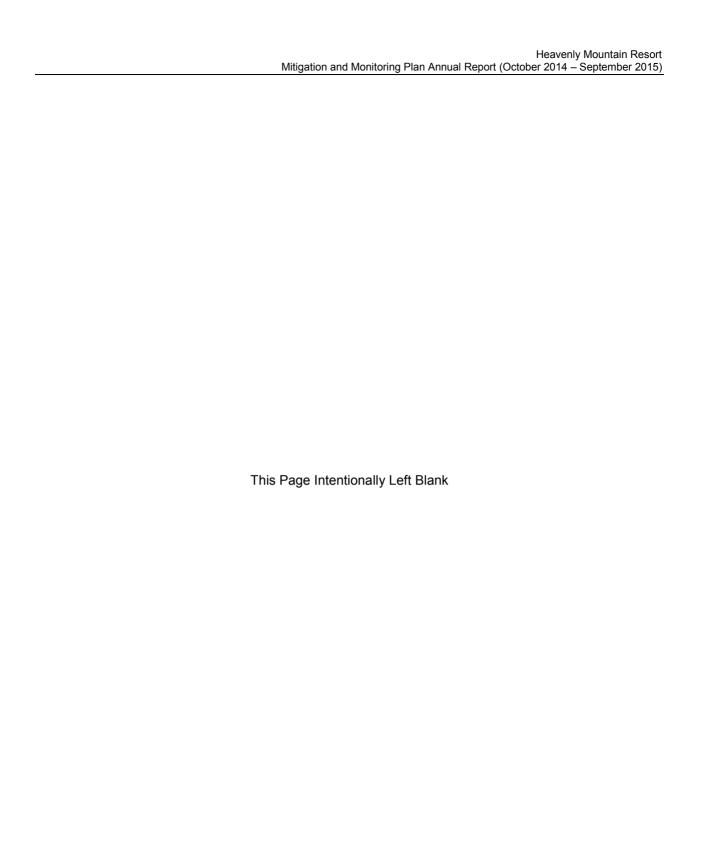
Heavenly is proactive in working closely with subject-area experts and their own trained employees to immediately respond and address on-mountain erosion issues and problem areas. Heavenly often modifies and repairs minor issues before they become potential problems and larger issues. The 2015 BMP monitoring results exemplify this methodology as results show that both permanent and temporary BMPs were 100% implemented and effective. In the case of an emergency, Heavenly actively alerts all governing parties and implements a quick remediation strategy for clean-up and/or remediation. Due to Heavenly's active on-mountain involvement and attention to each of mitigation measures listed in the Master Development Plan, these report findings have not triggered an action plan. Feedback gathered from the local agencies and interested parties generated from this report will be a used to assess any additional responses.

6 Chapter 6 – Reference List

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Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX I 2015 BMP REPORT (RCI)



Heavenly Mountain Resort

BMP Effectiveness Monitoring

2015 Annual Report & Construction Season Summary

April 27, 2016



Prepared for:

Cardno 295 Highway 50, Suite 1 P.O. Box 1533 Zephyr Cove, NV 89448

Prepared by:



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Heavenly Mountain Resort

BMP Effectiveness Monitoring

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File Doc: 2016-04-27 Final 2015 Ann BMP Rpt 07611-12 Cardno kr-js.doc April 27, 2016

INTRODUCTION

The following report summarizes the results of the BMP Effectiveness Monitoring at Heavenly Mountain Resort (Heavenly) for the 2015 construction season. It has been prepared by Resource Concepts, Inc. (RCI) to comply with the Lahontan Regional Water Quality Control Board (Lahontan) Waste Discharge Requirements (Board Order R6T-2015-0021, WDID No. 6A090033000) which requires submittal of an annual monitoring report.

Best Management Practices (BMPs) for sediment and erosion control are structural and non-structural measures used to reduce soil movement, manage surface runoff, and improve runoff water quality. BMPs at Heavenly Mountain Resort are applied to construction projects, roads, ski runs, and facilities, which include buildings, utilities, and parking lots. Structural BMPs are generally categorized as either Permanent or Temporary BMPs:

- > Temporary BMPs are short-term, used during construction and maintenance projects, and removed upon project completion.
- > Permanent BMPs are used on a long-term basis to control contaminant sources or treat runoff, and require ongoing maintenance to be effective.

Monitoring was conducted following the BMP Effectiveness component (Chapter 5) of the Revised Environmental Monitoring Program, as set forth in the 1996 Master Plan and the approved Master Plan Amendment (2007). Under this program, BMPs are monitored for both implementation and effectiveness. BMP <u>implementation</u> concerns whether plans/specifications are adequate for resource protection, and if improvements are constructed according to design. BMP <u>effectiveness</u> is determined from observed or estimated erosion and sediment transport at sites evaluated.

Key components of the program include:

- > Evaluation forms that focus on implementation and effectiveness adapted from the USDA Forest Service, Region 5, BMP Evaluation Program (Region 5 BMPEP),
- > Monitoring frequency for Permanent BMPs: post-construction, 1-year post-construction, 3-, 6-, and 9-year post-construction,
- > Monitoring frequency for Temporary BMPs for ongoing construction projects: bi-weekly during construction, and after precipitation events,
- > The revised monitoring program "Needs Assessments" conducted on the facilities constructed prior to 2000,
- > Assessment of road BMP upgrade effects using water quality risk assessment protocols, stream crossing evaluations, and modeling to estimate road erosion and sediment yield.

In February 2015, the Epic Discovery EIR/EIS/EIS was completed, which includes updates to the approved Environmental Monitoring Program. Monitoring was conducted in 2015 under the previously approved protocol with the understanding that an updated program would be implemented in 2016. An updated BMP Effectiveness Monitoring Program is discussed in the "2015 Conclusions and Recommendations for 2016" section of this report.

2015 RESPONSES TO 2014 SUMMARY REPORT

BMP Effectiveness Monitoring reports developed over the past decade have provided annual recommendations for improved planning, implementation, effectiveness and monitoring of Temporary and Permanent BMPs at Heavenly. Consistent with the adaptive management approach, Heavenly has considered these results and recommendations to develop and improve the BMP retrofit and maintenance program. A summary of the Resort's responses in 2015 to the recommendations provided in the 2014 report is provided in the following section.

Planning

Heavenly's Annual Work List is typically generated from BMP construction and maintenance items identified during the previous year's BMP Effectiveness Monitoring. The Annual Work List now also includes "Erosion Hotspots" identified in the Epic Discovery EIR/EIS/EIS. Table 1 (Appendix A) includes the BMP retrofit and maintenance projects completed in 2015 based on recommendations made in 2014, the Epic Discovery EIR/EIS/EIS, and Heavenly's ongoing inspections focusing on erosion and sediment control facilities. Projects are prioritized by potential for increasing erosion, accessibility and proximity to stream environment zones (SEZs). Also included in the BMP project recommendations for 2016, are projects planned but not completed in 2015.

The Construction Erosion Reduction Plan (CERP) remains a helpful tool for selecting appropriate BMPs for projects that lack detailed plan sets and specifications. The Epic Discovery EIR/EIS/EIS also requires that Heavenly continue to implement the CERP to meet water quality standards. As such, the CERP was referenced and evaluated in 2015 during the planning phase and throughout construction season. Additional recommendations developed from monitoring effectiveness of temporary and permanent BMPs are summarized in Appendix A. RCI inspectors consistently refer to these observations as supplemental guidance for assessing project implementation.

On-site scoping meetings conducted in the field with key staff are useful for particularly challenging sites. An on-site field meeting ensures that managers, field crews, agency staff and inspectors can voice opinions, provide insight and reach common ground to develop practical and effective solutions. An example of a successful on-site meeting was conducted at Hellwinkle's Road with representatives from Heavenly, Lahontan and RCI to discuss potential solutions to address erosion associated with the steep roadway. A phased approach with stages being completed in 2015, 2016, and 2017 was agreed upon as the most effective plan for the site. Another successful on-site meeting conducted between Heavenly and RCI resulted an effective approach to address drainage at the Adventure Peak/Gondola Top Station area, which was completed in 2015.

Permanent BMPs

Observations and recommendations made through the BMP monitoring from 2005 through 2015 were used to identify specific projects, incorporate general recommendations, and enhance the BMPs at Heavenly using the adaptive management approach. Recommendations for Permanent BMPs from past years and Heavenly's efforts to respond to these recommendations in 2015 are summarized in Tables 2 and 3 (Appendix A).

Temporary BMPs

Heavenly has continued to implement effective temporary construction BMPs identified and developed through the BMP Effectiveness Monitoring Program. The "BMP Breakfast" remains a successful training event and increases implementation scores, since well-trained staff are aware of how to properly install temporary BMPs. A summary of past recommendations for Temporary BMPs and how they were addressed in 2015 is included in Tables 4 and 5 (Appendix A).

Monitoring

The BMP Effectiveness Monitoring Program is reviewed each year to assess and improve the implementation process, following the adaptive management approach. A critical component of the monitoring program continues to be on-going coordination with Heavenly to schedule, implement, and track work related to BMP maintenance. The Annual Work List is reviewed on a regular basis throughout the construction season. Regular field meetings between the primary RCI inspector, Heavenly Environmental Manager, construction and BMP/revegetation crew (trail crew) leaders to review Annual Work List project status, potential BMP issues, actions to prepare for and respond to storm events, and additional work added by Heavenly identified during their internal inspection process.

Other monitoring tools being implemented by Heavenly include "Revegetation and Materials Trackers" which are Excel spreadsheets maintained by the Environmental Manager. Weekly forms are given to the BMP/revegetation crew (trail crew) supervisor to record information by location and date, type and quantity of BMPs installed, total staff hours, and number of loads of mulch (pine needle or wood chip). Effectiveness of the trackers will be evaluated by Heavenly and RCI in 2016 and will be modified if needed for ease of use by supervisors, relevant data for reporting requirements, and other pertinent information that may be needed. This is an example of Heavenly's proactive approach to the BMP Effectiveness Monitoring Program; the Resort is continually incorporating new ideas and modifying the program each year.

2015 MONITORING RESULTS AND DISCUSSION

The 2015 construction season began following snowmelt in late May and ended with the first snow received in early November. As explained in previous reports, while this monitoring period is logical for seasonal operation of the Resort, it does not correspond directly with the Water Year reporting timeframe indicated in the Waste Discharge Requirements, as noted below:

- > The first quarter of the 2015 Water Year (October 1 through December 31, 2014) was reported previously as part of the 2014 Construction Season Summary (RCI, April 2014).
- > No evaluations were conducted during the second quarter of the 2015 Water Year (January 1 through March 31, 2015) due to snow.
- > Evaluations began during the third quarter of the 2015 Water Year (April 1 through June 30, 2014); however, since only one day of monitoring was conducted in June, this evaluation is included with the remainder of the evaluations discussed below.
- > Evaluations conducted during the 4th quarter of the 2015 Water Year (July 1 through September 30, 2015) and the 1st quarter of the 2016 Water Year (October 1 through December 31, 2016) were combined into one report to incorporate the logical conclusion of summer maintenance and construction projects. This report is included as Appendix B.

Facility and Construction Project BMP Monitoring

The annual monitoring conducted for facility maintenance and construction projects during the 2015 construction season continued use of the HV-1 and HV-2 forms and BMP Effectiveness monitoring protocols. A total of 79 evaluations were conducted at 27 sites in 2015. Summaries of the collected data and associated evaluation forms are included in Appendix B.

Permanent BMPs

In 2015, 34 permanent BMP evaluations were performed by RCI at 19 different sites. The evaluations included post-construction monitoring at 3-year intervals and follow up visits to review BMPs after maintenance activities or after storm events.

Implementation

Results for implementation of permanent BMPs at facilities monitored in 2015 showed that BMPs were fully "implemented" at 100% of the sites scored. Permanent BMPs were implemented in accordance with project specific plans and the CERP throughout the Resort. Full implementation can be attributed to Heavenly ensuring that plans for new construction include BMPs to address runoff and reduce erosion and to Heavenly implementing BMPs on existing facilities following "Needs Assessments" conducted in past years.

Effectiveness

In 2015, 100% of the sites had "effective" permanent BMPs monitored during the construction season. Maintenance of existing structures during the construction season and following storm events continues to be a priority at Heavenly; therefore, effectiveness scores remain consistently high. After a decade of considering results from the BMP Effectiveness monitoring, Heavenly has developed an existing knowledge base for methods and structures that work best on the Mountain.

Temporary BMPs

In 2015, Temporary construction BMPs were installed by Heavenly at 8 construction sites. Sites were typically evaluated on a biweekly schedule for the duration of construction and following precipitation events. A total of 45 separate Temporary BMP evaluations were conducted at the active construction sites in 2015.

Implementation

Temporary BMPs were installed in accordance with project plans and the CERP. Minor field adjustments were made throughout the construction season; however, 100% implementation was achieved at all construction sites in 2015 (see Appendix B). Heavenly's commitment to training new staff, reminding all staff of the importance of BMPs (especially at the beginning of the construction season at the BMP Breakfast) and emphasis on BMP maintenance resulted in these high scores.

Effectiveness

Scheduled and completed maintenance resulted in temporary BMPs operating 100% "effective" during construction and during storm events in 2015 (see Appendix B). As stated previously, field adjustments and maintenance are critical to effective BMPs and resulted in subsequent high scores.

Road BMP Upgrade and Reconstruction Monitoring

The Heavenly BMP Effectiveness monitoring data for roads evaluates the effect of road reconstruction and BMP upgrade projects on the potential for sediment transport. In accordance with the existing monitoring protocols, roads monitoring is conducted on a three-year interval; roads monitoring was most recently conducted in 2014. A summary of the 2015 annual roadway maintenance mapping is included in the Environmental Monitoring Annual Report (Cardno Jan 1, 2015). During the 2015 summer construction season, 2.5 miles of roadways were repaired, maintained, and resurfaced. This maintenance mapping does not include BMP Effectiveness monitoring for roads. Future BMP Effectiveness monitoring for roads will be conducted with reference to the new USDA Forest Service National Core BMP Monitoring protocols (Technical Guide Vol. 2, FS-990b publication is expected in FY 2016). These protocols may be adapted specifically for use at Heavenly.

2015 CONCLUSIONS AND RECOMMENDATIONS FOR 2016

The following conclusions and recommendations were generated from the results of the 2015 BMP Effectiveness Monitoring at Heavenly. Recommendations are provided for planning, implementation, effectiveness, and monitoring. Recommendations aim to follow directives in the Waste Discharge Requirements from the Lahontan Regional Water Quality Control Board, USDA Forest Service monitoring protocols and the Epic Discovery EIR/EIS/EIS.

Planning

Heavenly has utilized recommendations provided as a result of the BMP Effectiveness Monitoring Program to improve planning for projects throughout the Mountain. The monitoring results should still be referred to when establishing and prioritizing BMP maintenance and retrofit projects. Recommendations for future improvements and maintenance are summarized in Table 6 and were developed from the 2015 monitoring results. This summary has typically been used to draft the Annual Work List.

The CERP also continues to serve as a tool for selecting suitable Temporary and Permanent BMPs, which is reiterated by the Epic Discovery EIR/EIS/EIS. The BMP recommendations developed in Tables 2 through 5 are be useful supplements to the CERP. Both the CERP and BMP recommendations from past years are referenced throughout the construction season.

On-site meetings should remain a priority at complex sites to discuss potential erosion risks, resource protection, and siting for facilities and access routes. Heavenly managers should continue to interface with field crews implementing projects and resource specialists conducting monitoring. Scoping level meetings and status update meetings aid in planning and implementing effective BMPs and coordinating monitoring.

Implementation

Heavenly BMPs received "100%" implemented scores for both temporary and permanent BMPs in 2015. Plans and specifications for projects at the Resort continue to include both temporary and permanent BMPs that are the most effective at Heavenly. Tables 2 and 4 in Appendix A should be used as a reference for reviewing project BMPs during the plan development process.

Heavenly's commitment to staff training resulted the 100% implementation scores for both temporary and permanent BMPs for a second year in a row. While some experienced staff return year after year, new employees also join the Heavenly team each year. In order to convey the importance of BMPs, all staff with Mountain access, contractors and third party vendors are required to attend the "BMP Breakfast." This morning training is also attended by Heavenly management and regulatory agency representatives from TRPA, the USDA Forest Service, and the Lahontan Regional Water Quality Control Board. The Heavenly Environmental Manager conducts the BMP Breakfast Training and includes critical elements to BMP implementation and effectiveness specific to Heavenly. As noted in previous reports, the BMP Breakfast includes a field component every other year. The field component allows Heavenly staff to practice the proper installation of pine needle wattles and sediment fence. In 2015 the field training was held on the World Cup Ski Run near the California Base Lodge; 113 attendees were present at the BMP Breakfast and 46 attended the field training.

In last year's report, it was recommended that an experienced field team should be employed each season. Consistent employment of the same team may be infeasible, which is the reason Heavenly's training program and oversight of the field crews is critical. Heavenly's Environmental Manager meets regularly with the BMP/revegetation crew (trail crew) to make sure resource goals are being met on a project by project basis. In 2015, another step was added to enhance BMP implementation: field crew supervisors were given the responsibility to track revegetation and materials treatments. Additionally, the Environmental Manager continues to be a significant asset by providing guidance to field crews, interfacing with inspectors and giving insight to other managers on critical processes and projects at Heavenly.

Innovative BMP and erosion control technologies continue to be tested by Heavenly. In 2015, Heavenly installed several "Durawattles" manufactured by Heavyweight Sediment Control Systems, which are durable and reusable sediment control systems that can be used in applications similar to fiber rolls/wattles. The Durawattles were installed in an area of chronic sediment movement near the California Main Lodge. Also, pilot testing of a "Shred Vac" was conducted to chip and distribute pine needle mulch onto ski runs and areas with access challenges. Effectiveness of the two technologies will be evaluated in 2016.

Effectiveness

Heavenly has been committed to incorporating environmental improvement into the planning process and by complying with regulatory requirements which have helped to improve BMP effectiveness on the Mountain. Heavenly's BMP effectiveness has also improved since the beginning of the BMP Effectiveness Monitoring Program in 2004 because they have continually implemented new techniques, which is reflected in the monitoring results. Tables 3 and 5 in Appendix A should be used as a reference for reviewing project BMPs for effectiveness.

Permanent and Temporary BMPs received 100% effective scores for 2015. During inspections, little to no erosion was observed in areas associated with active construction, no unexpected ponding was observed, hazardous materials were contained and construction area delineation fencing was generally observed by Heavenly employees and outside contractors. Permanent BMPs were inspected for maintenance needs by Heavenly throughout the Mountain. As stated previously, Heavenly's commitment to training for all employees (new and experienced) resulted in effective Temporary BMPs. Regularly scheduled maintenance inspections and coordination on action items for maintenance resulted in effective Permanent BMPs. The Environmental Manager remains a key element of the BMP Effectiveness Monitoring Program in spearheading both training and maintenance work at Heavenly.

Monitoring

The BMP Effectiveness Monitoring Program has provided useful information over the past ten years for evaluating BMPs at Heavenly, particularly with respect to permanent facility BMPs, temporary construction BMPs and road BMPs. Results have been incorporated into planning measures over the past decade; yearly modifications have helped keep the Program up to date with changing BMP technologies and regulatory requirements. As noted previously and in the 2015 Annual Report, the Epic Discovery EIR/EIS/EIS was approved in 2015 and has provided an updated approach to monitoring. The updated 2015 Waste Discharge Requirements provide additional details on the monitoring requirements. The following discussion provides recommended updates to the BMP Effectiveness Monitoring Program at Heavenly.

BMP Effectiveness Monitoring is required to meet Heavenly Valley Creek Sediment TMDL Targets (Section I.D WDR). A Rating Criteria is provided in Attachment C of the WDR, which rates BMPs using percent implemented and effective with an overall score of excellent, good, fair or poor. The 2004 BMP Effectiveness Monitoring protocol (developed from the "USDA FS BMP Effectiveness Program" and modified specifically for Heavenly) can achieve these ratings for BMPs (temporary and permanent) at facilities. In general, the existing monitoring protocol for "BMP Effectiveness" satisfies the WDR, and has the benefit of producing results comparable to previous years for use in the annual and comprehensive reporting. In 2016, RCI proposes to continue conducting the monitoring for "BMP Effectiveness" for permanent BMPs and temporary BMPs on a biweekly basis. In addition, a review may be necessary of the recently established USDA Forest Service National BMP Program (for selecting, implementing and monitoring water quality BMPs) for applicability to the monitoring requirements at Heavenly. Modifying monitoring protocols at Heavenly to match the updated agency programs is consistent with the adaptive management approach taken over the past decade.

In particular, the roads component of the 2004 BMP Effectiveness Monitoring, which was based on the protocols for the USDA Forest Service "Water Quality Risk Assessment Program (WQRAP)", could be modified to be more consistent with the protocols in the new USDA Forest Service National BMP Program. This would be part of the BMP Effectiveness Monitoring Program rather than the monitoring related to road operations and maintenance. The 2004 BMP Effectiveness Monitoring calls for roads assessment on 3 year intervals; monitoring was conducted in 2014, and so would be repeated in 2017.

In addition to the updated monitoring protocol, it is suggested that the following recommendations made previously in the 2012 Annual Report be reconsidered at this time. The 2012 monitoring report proposed that facilities could be removed from the monitoring schedule if they posed little risk to water quality. After monitoring for nine years (at three year intervals), or sooner if warranted by site stability, facilities that present little water quality risk no longer need to be monitored under the BMP Effectiveness Monitoring Program protocol. The previously used Risk Assessment Protocol (WQRAP) monitoring for roads uses a distance of 450 feet from an SEZ as a screening method to identify roads with potential to adversely affect water quality.

It is suggested the monitoring method for facilities adopt a similar screening distance for sites where BMPs have been implemented. These sites would continue to be inspected routinely by Heavenly under the seasonal maintenance requirements in the Resort's Waste Discharge Requirements. Typical maintenance items may include improving effective cover and erosion resistance by means of wood chip or pine needle mulch, cleaning and maintaining infiltration areas and cleaning of any hazardous materials spills. The following sites were identified in 2012 and are recommended again for removal from the BMP Effectiveness Monitoring Program based on distance from an SEZ or existing erosion resistance in the form of established vegetation:

- Big Easy Lower Terminal
- Big Easy Upper Terminal
- Calif. Main Lodge Lot Surface Lift
- Sky Express Upper Terminal
- Sky Patrol Building
- Tamarack Express Upper Terminal
- World Cup Lower Terminal
- Pump house Near STPUD Tank

- Boulder Magic Carpet (X)
- Boulder Magic Carpet Removed
- Boulder Magic Carpet (X1)
- Canyon Express Upper Terminal
- Patsy's Upper Terminal
- Pistol Pump House
- Skyline Trail
- Powderbowl Express Upper Terminal

Appendix A

2015 Summary Tables 1 through 6

Table 1. 2015 Completed Projects and BMP Installation or Maintenance

Location	Treatment	
California Projects		
Alpine Coaster	Constructed the Alpine Coaster as part of the 2015 Epic Discovery Activities. Drip line infiltration trenches and basin installed at loading/operator buildings.	
Canyon Express Lift Lower Terminal	Added pine needle mulch, compost and seed to areas of low cover. Area roped off for delineated parking space and ski chair staging. Installed a vegetated swale with coir material matting and pine needle check dams in existing rock lined ditch adjacent to the operator's booth.	
Climbing Rock Wall	Constructed the Climbing Rock Wall adjacent to Tamarack Lodge as part of the 2015 Epic Discovery Activities. Wood chip mulch applied around entire structure; will be refurbished annually.	
Directional Signage Upgrades	New directional signage installed at existing sign locations throughout Mountain; pine needle wattles deployed during construction and pine needle mulch applied following work.	
Double Down Ski Run	Repaired water bar and applied mulch/needles uphill of water bar. Flattened profile of the water bar and installed large pine needle berm below water bar to infiltrate run-off before reaching maintenance road.	
Ellie's Ski Run	Repaired water bar and converted to an infiltration swale. Covered lower portion of ski run with mulch.	
Face Patrol Sewer Line*	Completed maintenance on rilling over trench following one-year post construction monitoring.	
Gondola Top Station Drainage	Installed drainage infrastructure to eliminate standing water at the Gondola Top Station/Adventure Peak area.	
Hellwinkle's Road	Utilized pine needle wattles anchored with rebar and angular rock at water bar outlets. Cleaned out periodically throughout construction season. Developed phased approach to addressing erosion from steep roadway.	
Kids Zipline & Challenge Course	Constructed the zipline and challenge course at Adventure Peak as part of the 2015 Epic Discovery Activities. Wood chip mulch applied around entire structure; will be refurbished annually.	
Maggie's Corner to Cal Dam Road Segment	Erosion resistance on road shoulders was improved and stabilized with wood chip mulch. Water bar outlets were cleaned out and water bars rebuilt.	
Mid Station Canopy Tour	Constructed the Mid Station Canopy Tour as part of the 2015 Epic Discovery Activities. Wood chip application in laydown areas; trees removed. Majority of work conducted without soil disturbance.	
Mombo Trail (Blue Angel Chute) Ski Run	Improved erosion resistance and stabilized slope, recontoured water bars to increase capacity. Installed infiltration swales at top of run, seeded and mulched with pine needles.	
Sky Chute Ski Run	Application of both wood chip and pine needle filter berms.	
Sky Express Road	Improved wood chip cover adjacent to vehicle turnaround.	
Nevada Projects		
Aries Ski Run	Eliminated several rills and gullies near the top of the Aries Ski Run. Stabilized ski run with a series of mulch berms at the top of the slope. Added 2-3 inches of mulch ground cover in areas lacking effective cover. Created infiltration spreading area below the top of ski run.	
Tubing Run Revisions	Constructed revised summer tubing lanes, associated grading and slope stabilization and access road to the top of the tubing lift. Existing access road permanently decommissioned and reclaimed with mulch.	

^{*}BMP maintenance project identified during BMP Effectiveness Monitoring and Maintenance Inspection by Heavenly; therefore, was not listed in the 2014 Annual Summary Report.

Table 2. Permanent BMP Implementation – Recommendations and Responses

Observations/Recommendation	Responses/Actions in 2014
Revegetation specifications need to be updated to present standards in the Lake Tahoe Basin (2004-2005).	Revegetation specifications for construction projects including the Epic Discovery Projects were site-specific and consistent with present standards.
Design of facilities to treat or infiltrate the 20-yr 1-hour event need to be site-specific (2004-2005). Infiltration areas should be flat bottomed, filled with sufficient gravel or drain rock and bordered with rocks (4 to 8" diameter).	Maintenance and reconstruction of infiltration facilities was implemented at the following number of sites: 36 in 2006, 4 in 2007, 7 in 2008, 27 in 2009, 3 in 2010, 1 in 2011, 3 in 2012, 1 in 2013, 1 in 2014, and 3 in 2015.
Trench settlement can be prevented by compaction and mounding (2004-2005).	Backfill for trenching was compacted for the Gondola Top Station Drainage Project.
Use fiber rolls for long-term slope stabilization as well as temporary erosion control (2004-2005).	Permanent fiber rolls (pine needle wattles) were installed along the roadway to the Upper Maintenance Shop above the SEZ to provide stabilization through the construction season and during spring snowmelt and runoff. Fiber rolls were also utilized on slopes for the Hellwinkle's Road and Maggie's Corner water bar outlets.
Gravel and riprap specifications should include: sizing, gradation, angularity and geotextile installation underneath (2006).	Riprap was installed with geotextile underneath for the Tubing Lift Run Revision.
Geotextile fabric installation for slope stabilization must address anchor trenches at fabric edges, overlaps, and appropriate anchor intervals for lined channels and steep slopes (2006).	Riprap was installed with geotextile underneath at the Tubing Lift Run Revision.
New prescriptions for soil amendments and revegetation need better coordination regarding timing, accessibility, and materials availability (2007).	Logs were chipped throughout the Mountain and stockpiled for later use during the construction season. Pine needles stockpiled in strategic locations for projects.
Water bars should be elongated and installed at an angle to the direction of traffic (2009).	Road maintenance was ongoing after storms in 2015 and newly constructed water bars were angled.
Road base should be applied in areas with steep slopes, water quality concerns (proximity to SEZ/stream crossings), and high traffic areas where rutting and dust may be a problem (2009).	In 2015, road base was applied on road segments near the Powderbowl Express Upper Terminal to the Sky Express Upper Terminal and applied at select switchbacks and high traffic areas throughout the Mountain.
Excess fill could be reused on-site to build up road base in depressed areas and improve drainage. (2010)	Sediment from collection areas was placed in low areas on roads during maintenance activities.
Riprap installation on steep slopes provides better stabilization than cover with mulch (2011).	Riprap (large boulders) was placed at the Tubing Lift Run Revision project.
Incorporation of wood chip mulch provides erosion resistance and effective cover (2012).	Wood chip mulch was incorporated at Powderbowl Express Lift Upper Terminal/Mombo Trail (Blue Angel Chute).
Wattles constructed by Heavenly in-house from coir fabric and pine needles on-site provide a cost effective, easily constructible alternative to straw wattles (2013).	Pine needle wattles were deployed at active construction sites, at the Upper Shop SEZ, at water bar outlets on Hellwinkle's and Cal Dam to Maggie's Corner.
Removal of sediment from collection areas can be achieved by dry vactoring to provide extra capacity (2014).	Drop inlets were cleaned in the California Main Lodge parking lot with a vactor truck.
Testing of new available BMP technology such as the "Durawattle" and "Shred Vac" help determine innovative methods to incorporate into plans (2015).	"Durawattles" were installed at the California Main Lodge and the "Shred Vac" was used to spread pine needle mulch on a test plot on a ski run with difficult access.

Table 3. Permanent BMP Effectiveness – Recommendations and Responses

Observations/Recommendation	Responses/Actions in 2014
Soil cover was not typically achieved with straw mulch after the first construction season. (2004-2005)	Pine needle and wood chip mulch continue to be very successful for providing erosion resistance; projects with extensive mulch application include the Alpine Coaster, Mombo Trail (Blue Angel Chute), Tubing Run Revisions, Gondola Top Station Drainage, Climbing Rock Wall, Cal Dam to Maggie's Corner and ski run erosion projects.
Revegetation develops minor deficiencies after construction that requires on-going correction for several years to provide effective soil cover. (2004-2005)	Sites throughout the Mountain were revisited for mulch application. Wood chip mulch or gravel, rather than revegetation, continues to appear more effective for high traffic areas, especially road shoulders.
Fabric installed on steep slopes often slides down in small sections, even anchored securely during installation. Geotextile needs continuing maintenance if vegetation is not established. (2006)	No geotextile fabric was installed for revegetation projects in 2015.
Projects using wood chip mulch and soil amendments appear to provide longer lasting effective cover, particularly in high traffic areas. Heavenly will continue spot treatments at facility sites where barren areas occur. (2006)	Bare areas throughout the resort were refurbished with wood chip and pine needle mulch, particularly in high traffic areas. New wood chips are added throughout high traffic areas at Adventure Peak/Gondola Top Station area annually.
Sediment from outside the project area has the potential to impair the long-term effectiveness of SEZ restoration and soil stabilization projects unless follow-up work is performed. (2007)	Stabilization work was completed in 2015 on the Canyon Express Lift Lower Terminal and Operator's Booth and Ski Runs in the vicinity, which are upslope from SEZ at Sky Deck.
Wood borders for infiltration areas and trenches are often caught and pulled out by equipment in the winter, particularly in areas alongside roadways. Rock borders keyed into the soil are a more stable option to prevent movement of gravel (2009).	Wood borders have been replaced with rock borders around all infiltration areas. Rock borders were observed to hold up well from previous years; wood borders are no longer used.
Rock armored channels routing runoff from drip lines to infiltration areas are more effective than drip line trenches. Channel low points must be well defined; otherwise, new channels erode around rocks (2009).	Channels were refurbished throughout the Resort as routine maintenance, focusing on the Heavenly Valley Creek watershed following storm events.
Water bar outlet protection using energy dissipaters and enhanced infiltration is effective (2010).	Maggie's Corner to Cal Dam water bar outlets captured sediment and minimized down slope erosion after storm events and winter season; additional pine needle wattles were added in 2015 to the end of the outlet to provide additional sediment capture. Waterbar outlet protection was added to Hellwinkle's Road in 2015.
Channels lined with rock or fabric accumulate sediment over time. Sediment should be routinely removed from the channels and used for fill in low areas on roads or removed from the site (2011).	Routine sediment removal remains a priority for maintaining capacity of existing sediment capture areas, especially in the Heavenly Valley Creek watershed.
On steep slopes that require pedestrian access, rock steps are effective at providing access without contributing to erosion (2012).	Rock steps were not installed on projects in 2015.
Water bar outlets, energy dissipaters and areas to enhance infiltration of road runoff accumulate sediment and need to be cleaned periodically (2013).	Water bar outlets were cleaned along the road from Cal Dam to Maggie's Corner and Hellwinkle's by hand in 2015, a vactor truck was used in 2014.

New mulch incorporation and revegetation treatment for slope stabilization should be implemented in areas prone to erosion or with erosive soils (2014).	Pioneer Poma was 100% effective in 2015 following storm events; mulch was incorporated at the erosion resistance ski run projects (Sky, Ellie's, Double Down).
New available BMP technology such as the "Durawattle" and "Shred Vac" should be evaluated for effectiveness in erosion resistance and sediment control (2015).	"Durawattles" were installed at the California Main Lodge and the "Shred Vac" was used to spread pine needle mulch on a difficult to reach ski run in 2015; effectiveness of these technologies will be evaluated in 2016.

Table 4. Temporary BMP Implementation – Recommendations and Responses

Observations/Recommendation	Responses/Actions in 2015
·	-
BMPs should not be disassembled prematurely, because vegetation may take several seasons to be established. Specifically, plans did not specify clearly that fiber rolls were to remain after construction (2004/2005).	Construction project winterization included removal of sediment fence (presents a skier hazard, does not typically last through the winter) at the end of the season. Fiber rolls remained in place as needed (Epic Discovery projects).
Place BMPs prior to construction, thereby ensuring readiness for summer storms or winter closures (2004-2005).	BMPs were in place prior to initiation of each 2015 construction project. Small maintenance projects and stockpiles had BMPs installed per the CERP (Directional Signage Upgrades, Sky Meadows Creek Crossing).
Clean out and repair BMPs after a runoff event (2004-2005).	Repairs to and maintenance of water bars, rock lined channels and sediment basins throughout the resort.
Maintain BMPs through the life of the project, again to ensure readiness for summer storms or winter closures (2004-2005).	Temporary BMPs were in place at all active construction sites during the precipitation events and winterization measures were implemented prior to snowfall.
Temporary BMPs may concentrate runoff to a discharge point (sediment fence, fiber rolls, temporary division swales, temporary culverts, and stream diversion). Provide energy dissipation and stabilization at the point where the temporary BMPs terminate (2006).	Sediment barriers were used for Adventure Peak Epic Discovery projects and the Gondola Top Station Drainage project, mostly parallel to the slope with outlet protection in the form of a curved straw wattle or sediment fence.
If a construction project initially proposed for a single season must be extended over the winter, winterization plans should be added to the design documents (2006).	Construction was completed on projects started in 2015; no winterization plans were required. Alpine Coaster continued construction over snow with no soil disturbance.
Maintenance of sediment fence can be reduced by using proper T-Posts for support and adequate burial of fabric edges, particularly for longer-term projects. Project designs need to allow alternative fencing at sites with substantial rock or limited access (2007).	Fiber rolls were often used in lieu of sediment fence in 2015. Where sediment fence was used, edges were properly buried, reducing the need for frequent maintenance.
Dust control for soil stockpiles on the mountain can be improved. If water is unavailable from the snowmaking system, stockpiles need to be covered with plastic sheeting (2007).	Primarily, stockpiles were covered in a timely manner and were only partially uncovered when in use for construction (Alpine Coaster and Gondola Top Station Drainage). Effort was made to protect stockpiles throughout the mountain.
Location of sediment barriers (silt fence or fiber rolls) shown on project plans needs to be parallel to the slope or with energy dissipaters along the flow line and at discharge points (2008).	Sediment barriers were shown on the plans for the Adventure Peak Summer Activity projects and the Gondola Top Station Drainage. Installation was typically per plans.
Staging areas should have Temporary BMPs in place before materials stockpiled on-site (2009).	BMPs were installed prior to use at staging areas on the Mountain.
Rope fencing for road delineation is typically removed prior to the winter season. Vehicles and equipment should observe road corridors when fencing is not in place (2011).	Crews were reminded at the beginning of the construction season and throughout the construction season to observe delineated road corridors.
Communication with outside contractors regarding importance of observing BMPs (2012).	Outside contractors were diligent in respecting construction equipment boundaries. Very little impact outside rope fencing was observed.
Wattles constructed by Heavenly in-house from coir fabric and pine needles can be used in lieu of straw wattles (2013).	Wattles were deployed at staging areas to protect stockpiles, at the Upper Shop SEZ, and at water bar outlets from Maggie's Corner to Cal Dam and Hellwinkle's.
Employee training on BMPs including field installation methods should be conducted for all new employees	The BMP Breakfast continues to be held at the start of the construction season and featured a field element in 2015

and as a refresher for continuing employees (2014).	which will be repeated every other year.
Weekly reports completed by field crew supervisors can	Weekly revegetation and materials treatment tracker was
be beneficial in tracking materials used, types of BMPs	established in 2015; viability of the tracker will be evaluated
installed and manpower required to help inform	in 2016.
planning decisions (2015).	

Table 5. Temporary BMP Effectiveness – Recommendations and Responses

Observations/Recommendation	Responses/Actions in 2015
Disturbance outside construction limits (2004-2005).	Heavenly employees and outside contractors were diligent in respecting construction equipment boundaries. Very little impact outside rope fencing was observed.
Exposed soils with potential for sediment delivery to SEZ (2006).	Sediment barriers were generally installed and routinely maintained.
Dust control measures for stockpiles are more effective when snowmaking water is available to wet down soils. Plastic sheeting is less effective and is difficult to keep anchored in windy conditions, but may be the only option in some areas (2007).	No projects in 2015 were located in especially wind prone areas so alternatives to plastic sheeting were not required.
Sediment fence is effective in containing excavated stockpiled soils. If stockpiles are larger than initially anticipated, the fence must be extended (2008).	Stockpiles were generally contained with fiber rolls. In 2015, stockpiles were typically soil. Stockpiles were in continuous use so fiber rolls were adjusted accordingly.
Despite proper installation, burial of fabric edges does not always prevent wind from pulling the fabric out, and metal mesh backing does not always prevent holes and blowing fabric. Prompt inspection and repair of sediment fence is almost always needed after windy conditions (2010).	Sediment fence was used at Epic Discovery projects and was inspected and repaired following storm events on the Mountain.
Fiber rolls are most effective when keyed into the native soil and anchored securely (2011).	Fiber rolls in construction areas were keyed in and staked per the plans. Fiber rolls at the base of stockpiles were anchored with rocks or sandbags if they will be in place for a length of time.
Communication to all outside contractors and subcontractors to convey importance of observing and maintaining temporary BMPs around an active construction site (2012).	Outside contractors were diligent in respecting construction equipment boundaries. Very little impact outside rope fencing was observed.
Wattles constructed by Heavenly in-house from coir fabric and pine needles appear to be an effective alternative to typical straw wattles (2013).	Wattles were deployed at staging areas to protect stockpiles, at the Upper Shop SEZ, and at water bar outlets from the Cal Dam to Maggie's Corner and Hellwinkle's.
Pine needle wattles constructed by Heavenly in-house can be used in erosion prone areas but usually need to be replaced annually (2014).	Pine needle wattles were replaced at the Upper Shop SEZ and at water bar outlets from the Cal Dam to Maggie's Corner in 2015.
Weekly reports completed by field crew supervisors can help determine effective BMPs based on material availability, manpower required and type of BMP most often utilized (2015).	Weekly revegetation and materials treatment tracker was established in 2015; viability of the tracker will be evaluated in 2016.

Table 6. 2016 Annual Work List Projects & Related BMPs

Location	Treatment			
Priority Projects for 2015 in California				
Adventure Peak Signage	Install directional and interpretive signage throughout Adventure Peak Area as part of 2016 Epic Discovery Activities. Temporary BMPs to be installed during construction.			
Complete Waterfall Lift Removal Top Station Regrading (Top of Epic Mix Race Course)	Regrade top station area. Fill and stabilize as shown on approved project plans (2015 project).			
Discovery Forest/Black Bear Challenge Course Gear-up Deck	Construct gear-up deck and connecting trails as park of 2016 Epic Discovery Activities. Temporary BMPs to be installed during construction.			
Family Loop Trail and Animal Abilities Exhibits	Construct trail and exhibits and permanent BMPs per plans. Temporary BMPs to be installed during construction.			
Gondola Top Station Enclosure	Enclose ground floor of Gondola Top Station for storage. Install permanent BMPs in accordance with plans.			
Hellwinkle's Road	Complete Phase II: apply dust palliative and water bar adjustments per plans. Utilize pine needle wattles and angular rock. Install temporary BMPs during construction.			
Mid Station Canopy Tour Weather Shelters	Construct the Mid Station Canopy Tour Weather Shelters as part of the 2016 Epic Discovery Activities.			
Road to Canyon Express Top Station	Rehab water bars at failure points and convert into infiltration swales through soil loosening, wood chip incorporation.			
Sky Deck Revegetation	Restoration and planting of shade tolerant meadow/riparian species.			
Tamarack Express Lift to Adventure Peak Hiking Trail	Construct trail to from Tamarack Express to Adventure Peak and East Peak Lodge (out of Basin segment).			
Top of Gondola to Tamarack Lodge Trail	Repave existing walking path from Top of Gondola to Tamarack Lodge. Refurbish effective cover around walking path. Temporary BMPs to be installed during construction.			
Welcome Area at Top of Gondola	Construct Welcome Area at base of stairs at Gondola Top Station, remove existing Adventure Peak Grill seating area concrete surface. Restore paved area with wood chips.			
Priority Projects for 2015 in Ne				
Decommission Roads and Turnaround Areas	Phased over multiple years: Year 1 spread chips on existing construction access roads (completed in 2015); Year 2 till and add mulch; Year 3 complete project.			
East Peak Canopy Tour	Construct East Peak Canopy Tour as part of 2016 Epic Discovery Activities. Also construct connecting trails and weather shelters and permanent BMPs per plans.			

Appendix B

BMP Effectiveness Monitoring Report:

3rd & 4th Quarter 2015 Water Year & 1st Quarter 2016 Water Year

Heavenly Mountain Resort

BMP Effectiveness Monitoring

3rd & 4th Quarter 2015 Water Year & 1st Quarter 2016 Water Year **Summary Report**

April 27, 2016

Prepared for:

Cardno 295 Highway 50, Suite 1 P.O. Box 1533 Zephyr Cove, NV 89448

Prepared by:



Resource Concepts Inc. 340 N. Minnesota St. Carson City, NV 89703-4152

Heavenly Mountain Resort

BMP Effectiveness Monitoring

3rd & 4th Quarter 2015 Water Year & 1st Quarter 2016 Water Year **Summary Report**

April 27, 2016

Prepared for:

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RESOURCE CONCEPTS, INC.

340 North Minnesota Street Carson City, Nevada 89703-4152 Office: (775) 883-1600 Fax: (775) 883-1656 www.rci-nv.com

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Attachment A – BMP Monitoring Rule Set Attachment B – California Evaluation Sheets Attachment C – Nevada Evaluation Sheets

> File Doc: 2016-04-27 Final 2015 Ann Rpt App B-Facilities BMP Rpt 07611-12 Cardno.doc April 27, 2015

Introduction

Resource Concepts, Inc. (RCI) has been contracted by Cardno to monitor Best Management Practices (BMPs) performance at Heavenly Mountain Resort (Heavenly) since 2005. The monitoring program addresses BMP monitoring for compliance with the resort Master Plan based on requirements of the USDA Forest Service (USFS), Tahoe Regional Planning Agency (TRPA) and the Lahontan Regional Water Quality Control Board (Lahontan) Waste Discharge Requirements (Board Order No. R6T-2015-0021, WDID No. 6A090033000).

In keeping with the past decade of monitoring, the RCI Field Team used the monitoring protocols outlined in BMP Effectiveness Monitoring, Chapter 5, Heavenly Mountain Resort Environmental Monitoring Program dated December 19, 2005. In 2007, the Environmental Monitoring Program was revised and approved in conjunction with the Master Plan Amendment EIR/EIS/EIS (Appendix 3.1-D) and previous Board Order No. R6T-2003-003.

Following completion of the Epic Discovery EIR/EIS/EIS in February 2015, Waste Discharge Requirements were updated again by Board Order No. R6T-2015-0021. The revised requirements include updates to the approved Environmental Monitoring Program. Monitoring was conducted in 2015 under the previously approved protocol with the understanding that an updated program would be implemented in 2016. An updated BMP Effectiveness Monitoring Program is discussed in the "BMP Effectiveness Monitoring 2015 Annual Report & Construction Season Summary;" this report is Appendix B of the Annual Report.

The goal of the BMP Effectiveness Monitoring Program is to assess temporary BMPs at on-going construction sites, permanent BMPs after construction completion, and "BMP Needs" for continued resource protection at facilities constructed prior to 2000. BMPs are structural and non-structural measures used to reduce soil movement and resist erosion, control surface runoff, and improve runoff water quality. BMPs at Heavenly are applied to roads, ski runs, construction projects, and facilities such as buildings, utilities, and parking lots.

- Temporary BMP evaluations (Form HV-1) are generally conducted biweekly during construction.
- Permanent BMP evaluations (Form HV-2) are conducted upon construction completion, at oneyear post-construction, and at three-year intervals after construction completion.
- Both types of BMPs are evaluated following storm events.

BMPs are monitored for both implementation and effectiveness. BMP "implementation" concerns whether plans/specifications are adequate for resource protection, and if improvements are constructed according to design. BMP "effectiveness" is determined from observed or estimated erosion and sediment transport at sites evaluated. Results of all assessments are entered into an ACCESS database and digital photos are uploaded to a photodocumentation database.

The 2015 construction season at Heavenly began following snowmelt in late May and ended with the first snow received in early November. Key information provided in the report includes a summary of all monitoring completed, the BMP Monitoring Rule Set (Attachment A), datasheets for evaluations on California sites (Attachment B), and datasheets for evaluations performed on Nevada sites (Attachment C). As explained in previous reports, the monitoring period coincides with the seasonal operation of the

Resort, and does not correspond directly with the Water Year reporting timeframe indicated in the Waste Discharge Requirements, as noted below:

- > The first quarter of the 2015 Water Year (October 1 through December 31, 2014) was reported previously as part of the 2014 Construction Season Summary (RCI, April 2014).
- > No evaluations were conducted during the second quarter of the 2015 Water Year (January 1 through March 31, 2015) due to snow.
- > Evaluations began during the third quarter of the 2015 Water Year (April 1 through June 30, 2014); however, since only one day of monitoring was conducted in June, this evaluation is included with the remainder of the evaluations discussed below.
- > Evaluations conducted during the 4th quarter of the 2015 Water Year (July 1 through September 30, 2015) and the 1st quarter of the 2016 Water Year (October 1 through December 31, 2016) were combined into one report to incorporate the logical conclusion of summer maintenance and construction projects.

Assessments

Over the 2015 construction season, the RCI Field Team performed BMP evaluations at 27 different sites: 78 evaluations total; 74 within the Lake Tahoe Basin and 4 outside the Lake Tahoe Basin.

Temporary BMP monitoring (Form HV-1) was performed at the following 8 sites:

- Alpine Coaster Constructed as part of the of the 2015 Adventure Peak Epic Discovery
 Activities; top and bottom station buildings were constructed along with uphill and downhill
 coaster tracks. Minor ground disturbance as a result of track installation; bare areas covered
 with pine needle or wood chip mulch. Drip line infiltration trenches and a basin were installed at
 loading/operator buildings.
- Tubing Run Revisions Revisions to the summer tubing lanes to increase slope required grading and slope stabilization. A new access road was installed to the Tubing Lift Top Station; the old access road was decommissioned with pine needle coverage.
- Kids Zipline & Challenge Course Constructed as part of the of the 2015 Adventure Peak Epic Discovery Activities, the low challenge course and short zipline was constructed for smaller visitors in mind. Wood chip mulch applied in all exposed soil; entire challenge course disassembled and stored for winter operations.
- Gondola Top Station Drainage Drainage improvements were installed to eliminate standing water from snowmelt runoff and stormwater in the Adventure Peak area from the bottom of the Tubing Run to the Gondola Top Station. Included installation of swales, infiltration areas, and PVC piping to route drainage flows under the Gondola Top Station area to existing basins.
- Climbing Rock Wall Adjacent to Tamarack Lodge as part of the 2015 Adventure Peak Epic Discovery Activities, rock wall constructed of rebar frame and spray concrete. Flat, stable site will receive annual layer of wood chip mulch.
- Mid Station Canopy Tour Constructed as part of the of the 2015 Adventure Peak Epic Discovery Activities; multiple, elevated, interconnected ziplines and aerial bridges within the forest canopy. Some tree removal was required and anchoring to trees. Ladders and rappel equipment will provide access to/from platforms, little ground disturbance required for construction. Wood chip mulch added in laydown areas.

• The Sky Base Staging Area, East Peak Staging Area, and Boulder Parking Lot Staging Area have been used periodically for storage of logs, wood chips, pine needles, riprap, and construction equipment in the past. The Sky Base Staging Area was restored in 2014; therefore, it no longer serves as a staging area. However, the road is used as an access to lift terminals in the vicinity so the Sky Meadows Stream Crossing has been added to the temporary BMP inspection list. Wood chips were stockpiled at the East Peak Staging Area and green waste and pine needles were stored at the Boulder Parking Lot Staging Area. Since stockpiles are not soil materials, wattles were not necessary. All soil stockpiles associated with active construction were covered and protected with wattles during the 2015 construction season.

Permanent BMP monitoring (Form HV-2) included the following 19 project sites:

- 1. Angel's Roost Cell Tower
- 2. Aries Ski Run
- 3. Canyon Express Lower Terminal
- 4. Double Down Ski Run
- 5. Ellie's Ski Run
- 6. Face Patrol (277)
- 7. Galaxy Wetland
- 8. Hellwinkle's Road Segment
- 9. Lakeview Water System
- 10. Maggie's to Cal Dam Road Segment

- 11. Mombo Trail (Blue Angel Chute)
- 12. Multi-Rider Zipline
- 13. Nevada Trail Ski Run
- 14. Olympic Express Lower Terminal
- 15. Pioneer Poma
- 16. Sky Chute Ski Run
- 17. Sky Express Lower Terminal
- 18. Sky Express Road
- 19. Upper Maintenance Shop

Tables 1 and 2 provide a summary of types of monitoring and locations evaluated to date.

Table 1. Types of Evaluations Performed

Table 1. Types of Evaluations Ferrormed				
CALIFORNIA SITES		NEVADA SITES		
Lake Tahoe Basin		Lake Tahoe Basin		
Permanent BMP Evaluations	28	Permanent BMP Evaluations	2	
Temporary BMP Evaluations	30	Temporary BMP Evaluations		
Carson River Basin		Carson River Basin		
Permanent BMP Evaluations	0	Permanent BMP Evaluations	4	
Temporary BMP Evaluations	0	Temporary BMP Evaluations	0	
Total BMP Sites Evalu	ated – 27	Total Evaluations Performed – 78		

Table 2. Sites Evaluated by Location

CALIFORNIA SITES	NEVADA SITES
Lake Tahoe Basin	Lake Tahoe Basin
Angel's Roost Cell Tower	Alpine Coaster
2. Canyon Express Lower Terminal	2. Multi-Rider Zipline
3. Climbing Rock Wall	3. Olympic Express Lower Terminal
4. Directional Signage Upgrades	4. Tubing Run Revisions
5. Double Down Ski Run	

6. Ellie's Ski Run	
7. Face Patrol (277)	
8. Gondola Top Station Drainage	
9. Hellwinkle's Road Segment	
10. Kids Zipline & Challenge Course	
11. Lakeview Water System	
12. Maggie's to Cal Dam Road Segment	
13. Mid Station Canopy Tour	
14. Mombo Trail (Blue Angel Chute)	
15. Pioneer Poma	
16. Sky Chute Ski Run	
17. Sky Deck Stream Crossing	
18. Sky Express - Lower Terminal	
19. Sky Express Road	
20. Upper Maintenance Shop	
Carson River Basin	Carson River Basin
None	1. Aries Ski Run
	2. Galaxy Wetland
	3. Nevada Trail Ski Run

Implementation and Effectiveness Scoring

The database scoring is based on a regional "rule set" developed for the Region 5 BMPEP program (USDA Forest Service, 2002). It has been modified slightly to correspond with the Heavenly rating system (included in Attachment A). Scoring results for the data collected for permanent and temporary BMPs during are summarized in Tables 3 and 4. Evaluation forms for California and Nevada sites are included in Attachments B and C, respectively.

Temporary BMPs

All 44 of the temporary BMP evaluations conducted at 8 sites during the 2015 construction season resulted in "Implemented" (I) and "Effective" (E) scores during biweekly and post-storm inspections. Table 3 provides locations, dates and scores for Temporary BMP Evaluations.

Table 3. Temporary BMP Evaluation Summary

Temporary BMP Evaluations		Survey Date	Implementation	Effectiveness		
Lake Ta	Lake Tahoe Basin - California					
1.	Climbing Rock Wall	6/19/2015*	I	E		
2.	Climbing Rock Wall	7/2/2015*	I	E		
3.	Climbing Rock Wall	7/16/2015*	I	E		
4.	Climbing Rock Wall	7/31/2015	I	E		
5.	Climbing Rock Wall	8/12/2015	I	E		
6.	Climbing Rock Wall	8/24/2015	I	E		
7.	Climbing Rock Wall	9/10/2015	I	E		
1.	Directional Signage Upgrades	7/16/2015*	I	E		
2.	Directional Signage Upgrades	7/31/2015	I	E		
3.	Directional Signage Upgrades	9/10/2015	I	E		
4.	Directional Signage Upgrades	9/25/2015	I	E		

Temporary BMP Evaluations	Survey Date	Implementation	Effectiveness			
Lake Tahoe Basin - California						
Gondola Top Station Drainage	10/8/2015*	I	Е			
Gondola Top Station Drainage	10/22/2015	1	E			
1. Kids Zipline & Challenge Course	6/19/2015*	I	Е			
2. Kids Zipline & Challenge Course	7/2/2015*	1	E			
3. Kids Zipline & Challenge Course	7/16/2015*	I	E			
4. Kids Zipline & Challenge Course	7/31/2015	1	Е			
5. Kids Zipline & Challenge Course	8/12/2015	1	Е			
6. Kids Zipline & Challenge Course	8/24/2015	1	Е			
7. Kids Zipline & Challenge Course	9/10/2015	I	E			
 Mid Station Canopy Tour 	8/12/2015	I	E			
Mid Station Canopy Tour	8/24/2015	I	E			
Mid Station Canopy Tour	9/10/2015	I	E			
Mid Station Canopy Tour	9/25/2015	I	E			
Mid Station Canopy Tour	10/8/2015*	1	E			
Mid Station Canopy Tour	10/22/2015	I	E			
 Sky Meadows Stream Crossing 	7/2/2015*	1	E			
Sky Meadows Stream Crossing	7/16/2015*	1	E			
3. Sky Meadows Stream Crossing	7/31/2015	1	E			
4. Sky Meadows Stream Crossing	8/12/2015	l	Е			
Lake Tahoe Basin - Nevada						
Alpine Coaster	6/19/2015*	1	Е			
Alpine Coaster	7/2/2015*	I	E			
Alpine Coaster	7/16/2015*	I	Е			
4. Alpine Coaster	7/31/2015	I	Е			
Alpine Coaster	8/12/2015	1	E			
6. Alpine Coaster	8/24/2015	1	E			
7. Alpine Coaster	9/10/2015	1	E			
8. Alpine Coaster	9/25/2015	1	E			
9. Alpine Coaster	10/8/2015*	I	Е			
10. Alpine Coaster	10/22/2015	l	Е			
 Tubing Run Revisions 	6/19/2015*	1	Е			
2. Tubing Run Revisions	7/2/2015*	l I	Е			
Tubing Run Revisions	7/16/2015*	1	Е			
4. Tubing Run Revisions	7/31/2015	l	Е			
Carson River Basin - California						
None	None					
Carson River Basin - Nevada						
None						

^{* –} Post-storm event inspection

Permanent BMPs

During the 2015 construction season, 34 Permanent BMP evaluations were conducted at 19 sites and all scores were "Implemented" (I) and "Effective" (E). Evaluations are summarized in Table 4.

Table 4. Permanent BMP Evaluation Summary

Perman	ent BMP Evaluations	Survey Date	Survey Type	Implementation	Effectiveness
Lake Tahoe Basin - California					
1.	Angel's Roost Cell Tower	10/8/2015	3 Yr Post Construction	I	E
2.	Canyon Express Lower Terminal	8/24/2015	Follow-up	ı	E
3.	Double Down Ski Run	8/24/2015	Follow-up	1	E
4.	Ellie's Ski Run	8/24/2015	Follow-up	I	E
5.	Face Patrol (277)	7/2/2015	1 Yr Post Construction	I	E
6.	Face Patrol (277)	7/16/2015	Post Storm Survey	I	E
7.	Face Patrol (277)	7/31/2015	Follow-up	I	Е
8.	Face Patrol (277)	10/8/2015	Post Storm Survey	1	Е
9.	Hellwinkle's Road Segment	7/31/2015	Routine	I	E
10.	Hellwinkle's Road Segment	9/10/2015	Routine	I	E
11.	Hellwinkle's Road Segment	9/25/2015	Routine	1	Е
12.	Hellwinkle's Road Segment	10/8/2015	Post Storm Survey	1	E
13.	Hellwinkle's Road Segment	10/22/2015	Follow-up	I	Е
14.	Lakeview Water System	10/8/2015	6 Yr Post Construction	I	E
15.	Maggie's Road Segment	7/2/2015	Post Storm Survey	I	E
	Maggie's Road Segment	7/16/2015	Post Storm Survey	1	E
17.	Maggie's Road Segment	7/31/2015	Routine	1	E
18.	Maggie's Road Segment	8/12/2015	Follow-up	1	Е
19.	Maggie's Road Segment	8/24/2015	Routine	1	Е
20.	Maggie's Road Segment	9/10/2015	Routine	1	E
21.	Maggie's Road Segment	9/25/2015	Routine	1	Е
22.	Maggie's Road Segment	10/8/2015	Post Storm Survey	1	Е
	Mombo Trail (Blue Angel Chute)	10/22/2015	Follow-up	ı	Е
24.	Pioneer Poma	7/2/2015	Post Storm Survey	I	Е
25.	Sky Chute Ski Run	8/24/2015	Follow-up	I	E
26.	Sky Express Lower Terminal	8/24/2015	Follow-up	ı	E
27.	Sky Express Road	8/24/2015	Follow-up	l	E
28.	Upper Maintenance Shop	10/8/2015	Post Storm Survey	I	Е
Lake Ta	hoe Basin - Nevada				
1.	Multi-Rider Zipline Launch Tower	10/8/2015	Post Storm Survey & 1 Yr Post Construction	ı	E
2.	Olympic Express Lower Terminal	10/8/2015	Post Storm Survey	I	E

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Perman	ent BMP Evaluations	Survey Date	Survey Type	Implementation	Effectiveness
Carson River Basin - California					
No	ne			I	E
Carson	Carson River Basin - Nevada				
1.	Aries Ski Run	8/24/2015	Follow-up	I	E
2.	Galaxy Wetland	6/19/2015	9 Yr Post Construction	I	E
3.	Nevada Trail Ski Run	6/19/2015	Post Storm Survey	I	E
4.	Nevada Trail Ski Run	10/8/2015	Post Storm Survey	1	E



BMP Monitoring Rule Set

BMP Monitoring Rule Set – Adapted from Region 5 2002 BMPEP Rule Set

Implementation (2 questions)	Effectiveness (5 to 7 questions)
Implemented	Effective
All questions answered "meets/exceeds" and/or less than ½ of the questions are "minor departure". None are "major" or "repeated" departure. (Note: HV protocols have only two questions so both must be answered "meets/exceeds" to score Implemented.)	All questions answered "1" or "2" and less than ½ the questions are answered "2".
Minor Departure	At Risk
Greater than or equal to ½ the questions are answered "minor" departure. (Note: HV protocols have only two questions so "minor departure" means one "meets/exceeds" and one "minor departure").	Greater than or equal to ½ the questions are answered as "2" or "3". No more than one question answered as "3".
Not Implemented	Not Effective
At least one question answered "major" or "repeated" departure or both questions answered "minor departure".	Two or more questions answered as "3".

Attachment B

California Evaluation Sheets

2 = Minor departure from contract and/or minor resource concerns
4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artificents)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface of	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control syst	tem effectiveness.		
(Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a) Effectiveness of erosion control measures applied to the control	th placement, constructed swales, driplines, or othe with water quality monitoring data may be essential	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

4) Effectiveness of hazardous substance control measures. (Evaluate the effectiveness, or lack of, BMP applied to control hazardous chemical delivery to soils, groundwater or surface water bodies. Contact Hazardous Spill Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hazardous/toxic substances used for building and vehicle maintenance, and associated direct and indirect effects upon water quality. (Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones. (Aliance vidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events). Effectiveness Score:	Tiouvority Wountain Troopir	LOTO DIVIL LITE	ouveries memoring	
a) Evaluate the occurrence and mitigation of hazardous/toxic substances used for building and vehicle maintenance, and associated direct and indirect effects upon water quality. Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones. Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events). Substantial resource concern is evident, Such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	4) Effectiveness of hazardous substance con	trol measures.		
as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones. hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of haz	·		·
Effectiveness Score:	as well as construction site are adequately flagged, and equipment operations avoid infringement upon	hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill	○ NA
Additional Comments (BMP Monitoring Rule Set)	Additional Comments			
			Effectiveness Score:	E
	fencing installed.			

2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

· · · · · · · · · · · · · · · · · · ·		oils, groundwater or surface water bodies. Contact	Hazardous Spill
Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of howater quality.	azardous/toxic substances used for building and	vehicle maintenance, and associated direct and inc	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
lditional Comments		Effectiveness Score: (BMP Monitoring Rule S	E et)

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Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control system (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a simple of the control of	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
a) Effectiveness of erosion control measures app	lied to limit erosion processes and sediment deliv	very to SEZ.	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

3) Designation of construction zone and any equipment exclusion zones

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

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4) Effectiveness of hazardous substance con	trol measures.	
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact Hazardous Spill
a) Evaluate the occurrence and mitigation of haz water quality.	cardous/toxic substances used for building and	vehicle maintenance, and associated direct and indirect effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.
Additional Comments		Effectiveness Score: E (BMP Monitoring Rule Set)
Spray concrete work in progress on climbing rock housekeeping and materials management of spra		ow active areas on flat site, Delineation fencing installed. Good

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2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

3) Designation of construction zone and any equipment exclusion zones

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
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- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.
- \bigcirc NA

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		S .			
4) Effectiveness of hazardous substance control measures. (Evaluate the effectiveness, or lack of, BMP applied to control hazardous chemical delivery to soils, groundwater or surface water bodies. Contact Hazardous Spill					
pordinator if accidental spill has occurred.) Evaluate the occurrence and mitigation of ha	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and indir	ect effects unon		
ater quality.	zardous/toxic substances used for building and	verifice maintenance, and associated direct and main	ect chects upon		
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA		
		Effectiveness Score:	E		
ditional Comments		(BMP Monitoring Rule Set) "		

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2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control system (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a simple of the control of	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
a) Effectiveness of erosion control measures app	lied to limit erosion processes and sediment deliv	very to SEZ.	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
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Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of has	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact Hereby wehicle maintenance, and associated direct and indi	·
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA
Additional Comments Concrete spray work complete, finish work in proghousekeeping and materials management of spra		Effectiveness Score: (BMP Monitoring Rule Se ow active areas on flat site, Delineation fencing ins	<u></u>

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2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

2015 BMP Effect	tiveness Monitoring	California Evaluations
ficial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
erosion and slope failure potential)		
Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
stem effectiveness.		
oth placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	
plied to limit erosion processes and sediment deliv	very to SEZ.	
Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA
	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. e erosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. stem effectiveness. lack thereof, including any measure designed to did the placement, constructed swales, driplines, or ot with water quality monitoring data may be essentially included to limit erosion processes and sediment delivery to Sezifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is	less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. Perosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. Between effectiveness. Clack thereof, including any measure designed to direct site runoff or dissipate erosive energy at sys oth placement, constructed swales, driplines, or other designated infiltration areas. Maintenance of with water quality monitoring data may be essential to assess the degree of effectiveness.) Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.

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- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.
- \bigcirc NA

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4) Effectiveness of hazardous substance con (Evaluate the effectiveness, or lack of, BMP app		oils, groundwater or surface water bodies. Contact	Hazardous Spill
Coordinator if accidental spill has occurred.)	·	vehicle maintenance, and associated direct and inc	·
water quality.	erdous/toxic substances used for building and	venicie maintenance, and associated direct and in	unect enects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
		Effectiveness Score:	E
Additional Comments		(BMP Monitoring Rule S	et)
Climbing rock wall nearly complete, placement of site, delineation fencing in place still. Thick layer		emporary BMPs include straw wattle below active e structure.	areas on flat

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2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

2015 BMP Effect	tiveness Monitoring	California Evaluations
ficial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
erosion and slope failure potential)		
Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
stem effectiveness.		
oth placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	
plied to limit erosion processes and sediment deliv	very to SEZ.	
Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA
	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. e erosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. stem effectiveness. lack thereof, including any measure designed to did the placement, constructed swales, driplines, or ot with water quality monitoring data may be essentially included to limit erosion processes and sediment delivery to Sezifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is	less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. Perosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. Between effectiveness. Clack thereof, including any measure designed to direct site runoff or dissipate erosive energy at sys oth placement, constructed swales, driplines, or other designated infiltration areas. Maintenance of with water quality monitoring data may be essential to assess the degree of effectiveness.) Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
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4) Effectiveness of hazardous substance con	itrol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contac	t Hazardous Spill
a) Evaluate the occurrence and mitigation of haz water quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
		Effectiveness Score:	E
dditional Comments		(BMP Monitoring Rule S	Set)
limbing rock wall complete and open to public.	Thick layer of wood chips placed around and be	eneath entire structure.	

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Implementation Score:	I
(BMP Monitoring Rule Set)	-

1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
(Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of all to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
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) Effectiveness of hazardous substance co	ntrol measures.		
Evaluate the effectiveness, or lack of, BMP appropriate appropriate if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	Hazardous Spill
Evaluate the occurrence and mitigation of ha ater quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upor
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
		Effectiveness Score:	E
		(BMP Monitoring Rule S	

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Implementation Score: (BMP Monitoring Rule Set)

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			-
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control systems (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
also be addressed. When available, verification was a) Effectiveness of erosion control measures app		·	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

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,				
4) Effectiveness of hazardous substance control measures.				
Coordinator if accidental spill has occurred.)		oils, groundwater or surface water bodies. Contact vehicle maintenance, and associated direct and in		
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA	
		Effectiveness Score:	E	
Additional Comments (BMP Monitoring Rule Set)				
Upgrade of existing signs throughout the Mountai been completed fully covered with pine needle m		struction and soil disturbing activities. Locations weved.	here work has	

1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
(Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment delive	her designated infiltration areas. Maintenance of all to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

Coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact Hazardous Spill vehicle maintenance, and associated direct and indirect effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, Such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.
Additional Comments		Effectiveness Score: (BMP Monitoring Rule Set)
Upgrade of existing signs throughout the Mounta been completed fully covered with pine needle m		struction and soil disturbing activities. Locations where work has eved.

2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
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b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
(Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment delive	her designated infiltration areas. Maintenance of all to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

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Coordinator if accidental spill has occurred.)	blied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	·
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
Additional Comments		Effectiveness Score: (BMP Monitoring Rule S	
Upgrade of existing signs throughout the Mountal been completed fully covered with pine needle m		struction and soil disturbing activities. Locations veved.	vhere work has

2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

2015 BMP Effect	tiveness Monitoring	California Evaluations
ficial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
erosion and slope failure potential)		
Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
stem effectiveness.		
oth placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	
plied to limit erosion processes and sediment deliv	very to SEZ.	
Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA
	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. e erosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. stem effectiveness. lack thereof, including any measure designed to doth placement, constructed swales, driplines, or ot with water quality monitoring data may be essentially plied to limit erosion processes and sediment delivery to Sez erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is	less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. e erosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. Stem effectiveness. lack thereof, including any measure designed to direct site runoff or dissipate erosive energy at sys oth placement, constructed swales, driplines, or other designated infiltration areas. Maintenance of with water quality monitoring data may be essential to assess the degree of effectiveness.) Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.

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- \bigcirc NA

04/13/16

Coordinator if accidental spill has occurred.)	plied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact vehicle maintenance, and associated direct and in	·
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA
Additional Comments		Effectiveness Score:	E Set)
		es in place below active site. Trenching for PVC pi al. No evidence of erosion or ponding after ~1" ra	ipe installatin

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4 = Repeated departure from contract and/or failure to address resource concerns

Implementation Score: (BMP Monitoring Rule Set)

2 = Minor departure from contract and/or minor resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control system (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a simple of the control of	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
a) Effectiveness of erosion control measures app	lied to limit erosion processes and sediment deliv	very to SEZ.	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

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neaverily iviountain Resort	2010 DIVIP EIIE	ectiveness informating	Calliottia Eva
4) Effectiveness of hazardous substance cor	ntrol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact Hazardous	s Spill
a) Evaluate the occurrence and mitigation of hawater quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and indirect effect	ts upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	
		Effectiveness Score:	
Additional Comments		(BMP Monitoring Rule Set)	
Construction complete on infiltration areas, swale	e, piping and drop inlet at Gondola Top Station.	Disturbed areas covered with wood chip mulch.	

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2015 BMP Effect	tiveness Monitoring	California Evaluations
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Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
erosion and slope failure potential)		
Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
stem effectiveness.		
oth placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	
plied to limit erosion processes and sediment deliv	very to SEZ.	
Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA
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- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
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Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)		oils, groundwater or surface water bodies. Contact	Hazardous Spill
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	NA
ditional Comments		Effectiveness Score: (BMP Monitoring Rule S	et)

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Implementation Score: (BMP Monitoring Rule Set)

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
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2) Runoff infiltration and drainage control sys	tem effectiveness.		
(Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of all to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

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4) Effectiveness of hazardous substance control measures. (Evaluate the effectiveness, or lack of, BMP applied to control hazardous chemical delivery to soils, groundwater or surface water bodies. Contact Hazar Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hazardous/toxic substances used for building and vehicle maintenance, and associated direct and indirect each of the surface of the surf						
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).		○ NA			
Additional Comments		Effectiveness Score: (BMP Monitoring Rule Set	E			
Construction in progress, straw wattles in place ne event.	ear active construction, construction corridor de	lineated.No evidence of erosion or ponding following	~0.5" rain			

Implementation Score: (BMP Monitoring Rule Set)

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- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section

Coordinator if accidental spill has occurred.)	plied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	·
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	NA
Additional Comments		Effectiveness Score: (BMP Monitoring Rule S	Set)

2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			-
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control systems (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
also be addressed. When available, verification was a) Effectiveness of erosion control measures app		·	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

3) Designation of construction zone and any equipment exclusion zones

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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4) Effectiveness of hazardous substance cor	itrol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contac	t Hazardous Spill
a) Evaluate the occurrence and mitigation of hazwater quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
		Effectiveness Score:	E
Additional Comments		(BMP Monitoring Rule S	Set)
Construction in progress, straw wattles in place n	ear active construction, construction corridor de	lineated.	

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2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

3) Designation of construction zone and any equipment exclusion zones

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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4) Effectiveness of hazardous substance con	trol measures.		
(Evaluate the effectiveness, or lack of, BMP application of accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	t Hazardous Spill
a) Evaluate the occurrence and mitigation of haz water quality.	ardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
A.U.		Effectiveness Score: (BMP Monitoring Rule S	E
Additional Comments			
Construction in progress, straw wattles in place ne	ear active construction, construction corridor de	lineated.	

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	etem effectiveness. ack thereof, including any measure designed to diese the placement, constructed swales, driplines, or othe water quality monitoring data may be essentially being to limit erosion processes and sediment delivered.	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

3) Designation of construction zone and any equipment exclusion zones

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

	neaverily Mountain Resort	2013 DIVIP EIIE	ectiveness Monitoring	Callic	ioiiia Evaic
	4) Effectiveness of hazardous substance con	ntrol measures.			
	(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to se	oils, groundwater or surface water bodies. Contac	Hazardous Spill	
	a) Evaluate the occurrence and mitigation of ha water quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon	
	Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA	
			Effectiveness Score:	E	
F	Additional Comments		(BMP Monitoring Rule S	Set)	
(Construction nearly complete, straw wattles in pla	ace near active construction, construction corrido	or delineated. Wood chips placed on all bare soils		
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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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4) Effectiveness of hazardous substance con	trol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	t Hazardous Spill
a) Evaluate the occurrence and mitigation of haz water quality.	cardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
Additional Comments		Effectiveness Score: (BMP Monitoring Rule S	E Set)
Construction complete and open to the public. W	ood chins placed on all bare soils	,	<u> </u>
	ood on po placed on all sale conc.		

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Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
(Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth with water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of all to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
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- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section

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4) Effectiveness of hazardous substance cor (Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)		oils, groundwater or surface water bodies. Contact	t Hazardous Spill
a) Evaluate the occurrence and mitigation of hat water quality. Adjacent or inclusive wet/sensitive areas	zardous/toxic substances used for building and OMinor evidence of improper use of	vehicle maintenance, and associated direct and in Substantial resource concern is evident,	direct effects upon
as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	
Additional Comments		Effectiveness Score: (BMP Monitoring Rule S	E Set)
Additional Comments Work on tree platforms and ziplines in progress, o	construction corridor delineated, marked trees h		Set)

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Heavenly Mountain Resort	2015 BMP Effectiveness Monitoring		California Evaluations
Effectiveness 1) Source Control BMP			
a) Effectiveness of applied BMP measures (artific	cial or vegetative) designed to protect exposed or	disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface e	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control systems (Evaluate any on-site runoff control features, or lard drainage ditches, constructed berms, erosion cloth also be addressed. When available, verification with a) Effectiveness of erosion control measures applied	ck thereof, including any measure designed to di n placement, constructed swales, driplines, or oth ith water quality monitoring data may be essentia	ner designated infiltration areas. Maintenance of all to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
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4) Effectiveness of hazardous substance cor	itrol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contac	t Hazardous Spill
a) Evaluate the occurrence and mitigation of hat water quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
'		Effectiveness Score:	E
Additional Comments		(BMP Monitoring Rule S	Set)
Work on tree platforms and ziplines in progress, o	construction corridor delineated, marked trees h	ave been cut within the corridor.	

04/13/16

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Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
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2) Runoff infiltration and drainage control sys: (Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a simple of the control of	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
a) Effectiveness of erosion control measures app	lied to limit erosion processes and sediment deliv	very to SEZ.	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
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4) Effectiveness of hazardous substance cor	itrol measures.		
(Evaluate the effectiveness, or lack of, BMP approximator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	Hazardous Spill
a) Evaluate the occurrence and mitigation of hazwater quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and inc	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
A. 1881		Effectiveness Score: (BMP Monitoring Rule S	E et)
Additional Comments		(Bivii Worldoning Pale 6	
Work on tree platforms and ziplines in progress, o	construction corridor delineated, marked trees h	ave been cut within the corridor.	

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Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			-
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control systems (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
also be addressed. When available, verification was a) Effectiveness of erosion control measures app		·	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- •Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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4) Effectiveness of hazardous substance con	trol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	Hazardous Spill
a) Evaluate the occurrence and mitigation of haz water quality.	ardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
		Effectiveness Score:	E
Additional Comments		(BMP Monitoring Rule S	Set)
Work on tree platforms and ziplines in progress, c	onstruction corridor delineated, marked trees h	ave been cut within the corridor.	

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Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			-
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control systems (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
also be addressed. When available, verification was a) Effectiveness of erosion control measures app		·	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section

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4) Effectiveness of hazardous substance con (Evaluate the effectiveness, or lack of, BMP app		oils, groundwater or surface water bodies. Contac	t Hazardous Spill
Coordinator if accidental spill has occurred.)	·	•	
a) Evaluate the occurrence and mitigation of haze water quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
		Effectiveness Score:	E
Additional Comments		(BMP Monitoring Rule S	Set)
Work on tree platforms and ziplines in progress, o	construction corridor delineated, no evidence of	erosion related to construction after ~1" event.	

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2015 BMP Effect	tiveness Monitoring	California Evaluations
ficial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
erosion and slope failure potential)		
Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
stem effectiveness.		
oth placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	
plied to limit erosion processes and sediment deliv	very to SEZ.	
Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA
	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. e erosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. stem effectiveness. lack thereof, including any measure designed to did the placement, constructed swales, driplines, or ot with water quality monitoring data may be essentially included to limit erosion processes and sediment delivery to Sezifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is	less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ. Perosion and slope failure potential) Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed. Between effectiveness. Clack thereof, including any measure designed to direct site runoff or dissipate erosive energy at sys oth placement, constructed swales, driplines, or other designated infiltration areas. Maintenance of with water quality monitoring data may be essential to assess the degree of effectiveness.) Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- •Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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4) Effectiveness of hazardous substance conf	trol measures.		
(Evaluate the effectiveness, or lack of, BMP appl Coordinator if accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact Ha	zardous Spill
a) Evaluate the occurrence and mitigation of haz water quality.	ardous/toxic substances used for building and	vehicle maintenance, and associated direct and indire	ect effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.) NA
Additional Comments		Effectiveness Score: (BMP Monitoring Rule Set)	E
Additional Comments Work completed on tree platforms and ziplines, wo	ood chips placed on disturbed soil around laydo	(BMP Monitoring Rule Set)	je

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			-
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control systems (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
also be addressed. When available, verification was a) Effectiveness of erosion control measures app		·	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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coordinator if accidental spill has occurred.) Description:	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact F	·
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA
ditional Comments		Effectiveness Score: (BMP Monitoring Rule Se	E t)

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Implementation Score: (BMP Monitoring Rule Set)

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			-
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control systems (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
also be addressed. When available, verification was a) Effectiveness of erosion control measures app		·	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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4) Effectiveness of hazardous substance con	itrol measures.		
Coordinator if accidental spill has occurred.)		oils, groundwater or surface water bodies. Contact vehicle maintenance, and associated direct and inc	
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
Additional Comments		Effectiveness Score: (BMP Monitoring Rule S	E et)
Weighted pine needle and straw wattles in place	at stream crossing, in place and sufficient prote	ction	

1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control system (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a simple of the control of	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
a) Effectiveness of erosion control measures app	lied to limit erosion processes and sediment deliv	very to SEZ.	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

		3	
4) Effectiveness of hazardous substance co	ntrol measures.		
Coordinator if accidental spill has occurred.)	ŕ	oils, groundwater or surface water bodies. Contact Hazardous S	•
 a) Evaluate the occurrence and mitigation of na water quality. 	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and indirect effects	upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	
dditional Comments		Effectiveness Score: E (BMP Monitoring Rule Set)	

2 = Minor departure from contract and/or minor resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	California Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control system (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a simple of the control of	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl	her designated infiltration areas. Maintenance of	tem outlets, including these features should
a) Effectiveness of erosion control measures app	lied to limit erosion processes and sediment deliv	very to SEZ.	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- a) Sensitve areas and construction zone are adequately "flagged" and designated as "Equipment Boundary Zones"
- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

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4) Effectiveness of hazardous substance con	ntrol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	soils, groundwater or surface water bodies. Contact Hazardous Spill	
Evaluate the occurrence and mitigation of hawater quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and indirect effects upon	_
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	
		Effectiveness Score: E (BMP Monitoring Rule Set)	_

UTM Zone 11 Easting 247727 Northing 4313595 Form HV2: Permanent BMPs for B and Structure Developments	uildings	Selection Code S03	540
Building/Structure Name Aries Ski Run	Towr	nship 12N Range 18E Section	on 1
Date of Project Start Date of Project End	6th Field HUC	Watershed CA-1 State C	A
Reviewer(s)		I COMPANIA	
K. Roaldson Survey Date 8/24/2015 Date BMP Imp	elementation Complete	Last BMP Maintenance	
Structure Type: Other Survey Type Follow-up	Depth/Duration:	Other (Describe) Ski Run	
Plan Title: Erosion Hotspot Inventory Epic Discovery Job No.:	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource p	protection.	
Soil stabilization, prevention of sediment transport, improve erosion resistance.			
Implementation			
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from sta 3=Major departure from sta	Hr standards and/or no resource concerns andards and/or minor resource concerns andards and/or major resource concerns a standards/failure to address concerns	
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to mai	intain resource protection during a 20-year	1
Are BMP measures constructed according to contract design specifications?			1
2// No 2/11 model of contracted decorating to contract design operations.			
Additional Comments:			
Implementation of treatment identified in Erosion Hotspot Inventory.			
<u>Effectiveness</u>		Implementation Score:	I
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	hin the omment.	(BMP Monitoring Rule S	Set)
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive area	S.	
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)			

a) Soil Protection measures, artificial or vegetatif	tve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures ap loth or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
2) Runoff infiltration and drainage control sys	stem effectiveness.		
	oth placement, constructed swales, driplines, or o	direct site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes ial to assess the degree of effectiveness.)	
a) Functioning condition (potential for sediment a armor areas or infiltration trenches, as well as ar		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding onsite, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Eliectivelless of flazardous substance co			
Coordinator if accidental spill has occurred.)	,	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	,		·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	O Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 247727 Northing 4313595 Form HV2: Permanent BMPs for B and Structure Developments	uildings	Selection Code S03	470
Building/Structure Name Ellie's Ski Run	Townsl	hip 12N Range 18E Section	n 1
Date of Project Start Date of Project End	6th Field HUC Wa	atershed CA-1 State C	A
Reviewer(s) Curvey Pote 9/24/2045 Deta BMD Imm	plementation Complete	Last BMP Maintenance	
K. Roaldson Survey Date 8/24/2015 Date BMP Imp	nementation Complete	Last BIMP Maintenance	
Structure Type: Other Survey Type Follow-up	Depth/Duration:	Other (Describe) Ski Run	
Plan Title: Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures de	esigned to achieve resource pro	otection.	
Soil stabilization, prevention of sediment transport, improve erosion resistance.			
<u>Implementation</u>			
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from stand 3=Major departure from stand	standards and/or no resource concerns dards and/or minor resource concerns dards and/or major resource concerns standards/failure to address concerns	
1) Were source control, drainage and infiltration systems, and hazardous material cor 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maint	ain resource protection during a 20-year	1
Are BMP measures constructed according to contract design specifications?			1
Additional Comments:			
Implementation of treatment identified in Erosion Hotspot Inventory.			
<u>Effectiveness</u>		Implementation Score:	I
Note: Effective and adequate maintenance of BMP measures should be included wi effectiveness evaluation. When topic is not applicable, please make informational of	thin the omment.	(BMP Monitoring Rule S	et)
1) Source area erosion control. Protection and stabilization of structure site, p	articularly any erosive areas.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)			

a) Soil Protection measures, artificial or vegetatif	tve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures ap loth or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
2) Runoff infiltration and drainage control sys	stem effectiveness.		
	oth placement, constructed swales, driplines, or o	direct site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes ial to assess the degree of effectiveness.)	
a) Functioning condition (potential for sediment a armor areas or infiltration trenches, as well as ar		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
, (Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spil
Coordinator if accidental spill has occurred.)	applied to control hazardous chemical delivery to	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact	d indirect effects up
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	mazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 245882 Northing 4312774 Form HV2: Permanent BMPs for Branch and Structure Developments	uildings Selection Code S03
Building/Structure Name Angel's Roost Cell Tower Date of Project Start 9/12/2012 Date of Project End	Township 12N Range 18E Section 1 6th Field HUC Watershed CA-6 State CA
Reviewer(s)	
	Dementation Complete 10/15/2013 Last BMP Maintenance 10/15/2013
Structure Type: Other Survey Type 1st Year Post Construction	Depth/Duration: Other (Describe) Monopine Cell Tower
Plan Title: Mobilitie Telecommunications Infrastructure Angel's Roost	Plan Date: 06/24/2011 Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource protection.
Erosion and sediment transport prevention, revegetation establishment	
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
Straw wattles remain in place, pine needle mulch for erosion resistance.	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational countries.	
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		eduled; and adequate erosion protection measures ap oth or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Sp
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	NA

UTM Zone 11 Easting 247158 Northing 4312234 Form HV2: Permanent BMPs for Bu and Structure Developments	uildings Selection Code S03
Building/Structure Name Canyon Express - Lower Terminal	Township 12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End 10/15/2006 Reviewer(s) K. Roaldson Survey Date 8/24/2015 Date BMP Impl	6th Field HUC Watershed CA-1 State CA lementation Complete Last BMP Maintenance
Structure Type: Lift-Base Survey Type Follow-up	Depth/Duration: Other (Describe) Completed BMP Proj.
Plan Title: Infiltration BMP Maintenance, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS Specific concerns associated with construction project and describe BMP measures des	Plan Date: Plan Revision Date: signed to achieve resource protection.
Roof downspout outfall infiltration, soil erosion. Reference construction plans job #00-6 removal erosion control.	
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material control-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	,
Area requiring additional cover identified during BMP monitoring, area given revegetati treatment identified in Erosion Hotspot Inventory.	on treatment with wood chip mulch, compost and seed. Implementation of
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational co	,
1) Source area erosion control. Protection and stabilization of structure site, par	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in s separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		eduled; and adequate erosion protection measures ap oth or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
3) Effectiveness of hazardous substance co	ontrol measures.		
,			
(Evaluate the effectiveness, or lack of, BMP a	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Conf	act Hazardous Spill
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	, ,		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	, ,	soils, groundwater or surface water bodies. Conf	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I	, ,		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of bwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	NA

UTM Zone 11 Easting 247158 Northing 4312234 Form HV2: Permanent BMPs for Branch and Structure Developments	ıildings	Selection Code S03	505
Building/Structure Name Double Down Ski Run	Township	12N Range 18E Section	1
Date of Project Start 8/7/2006 Date of Project End 10/15/2006	6th Field HUC Water	rshed CA-1 State CA	
Reviewer(s) K. Roaldson Survey Date 8/24/2015 Date BMP Imp	lementation Complete	Last BMP Maintenance	
Structure Type: Other Survey Type Follow-up	Depth/Duration:	Other (Describe) Ski Run	
Plan Title: Infiltration BMP Maintenance, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource protec	ction.	
Soil stabilization, prevention of sediment transport, improve erosion resistance.			
Implementation			
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from standard 3=Major departure from standard	andards and/or no resource concerns ds and/or minor resource concerns ds and/or major resource concerns ndards/failure to address concerns	
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain	resource protection during a 20-year	1
Are BMP measures constructed according to contract design specifications?			1
Additional Comments:	ion tractment with wood ship mul	ob compact and acad	
Area requiring additional cover identified during BMP monitoring, area given revegetat	on treatment with wood chip muit	on, compost and seed.	
<u>Effectiveness</u>		Implementation Score:	Ī
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational co		(BMP Monitoring Rule Set)	
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)			

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system o ther designated infiltration areas. Maintenance of these ial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
 Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site. 	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Effectiveness of hazardous substance co			
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	pplied to control hazardous chemical delivery to		·
(Evaluate the effectiveness, or lack of, BMP and Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of has water quality. • Hazardous substance control measures	Oplied to control hazardous chemical delivery to azardous/toxic substances used for building and open the control of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 245909 Northing 4312841 Form HV2: Permanent BMPs for Beand Structure Developments	ıilding s	election Code S03	499
Building/Structure Name Face Patrol (227)	Township 12	2N Range 18E Section	1
Date of Project Start 8/7/2006 Date of Project End	6th Field HUC Watershe	ed CA-1 State CA	
Reviewer(s)	amantation Complete	Lost DMD Maintenance	
K. Roaldson Survey Date 8/24/2015 Date BMP Imp	ementation Complete	Last BMP Maintenance	
Structure Type: Building Survey Type 1st Year Post Construction	Depth/Duration:	Other (Describe)	
Plan Title: Face Patrol Building Retrofit Job No.:	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource protection		
Attainment of effective ground cover, splash and scour erosion protection: roofline infil		1.	
<u>Implementation</u>			
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standa 2=Minor departure from standards a 3=Major departure from standards a 4=Repeated departure from standards	and/or minor resource concerns and/or major resource concerns	
,	Tropositos soperiuro mom otamas		
1) Were source control, drainage and infiltration systems, and hazardous material conta- 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain res	ource protection during a 20-year	1
Are BMP measures constructed according to contract design specifications?			1
2) Are Divir Theasures constructed according to contract design specifications:			
Additional Comments:			
<u>Effectiveness</u>		Implementation Score:	
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational co		(BMP Monitoring Rule Se	t)
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)			

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of these all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
3) Effectiveness of hazardous substance co	ntrol measures.		
	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	tact Hazardous Spill
Coordinator if accidental spill has occurred.)	,		·
Coordinator if accidental spill has occurred.)	,	soils, groundwater or surface water bodies. Cont	·
Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	,		·
Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	d indirect effects upo
Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	O NA Score:

UTM Zone 11 Easting 245909 Northing 4312841 Form HV2: Permanent BMPs for But and Structure Developments	ıildings	Selection Code S03
Building/Structure Name Face Patrol (227)	Township	12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End Reviewer(s)	6th Field HUC Water	rshed CA-1 State CA
	ementation Complete	Last BMP Maintenance
Structure Type: Building Survey Type Post Storm Survey	Depth/Duration: ~1.0"	Other (Describe)
Plan Title: Face Patrol Building Retrofit Job No.:	Plan Date:	Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de Attainment of effective ground cover, splash and scour erosion protection: roofline infill		
<u>Implementation</u>		
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from standard 3=Major departure from standard	ndards and/or no resource concerns ds and/or minor resource concerns ds and/or major resource concerns ndards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain	resource protection during a 20-year 1
2) Are BMP measures constructed according to contract design specifications?		1
Additional Comments:		,
<u>Effectiveness</u>		Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational countries.		(BMP Monitoring Rule Set)
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.	
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)		

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		eduled; and adequate erosion protection measures ap oth or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

04/13/16

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
, (Evaluate the effectiveness, or lack of, BMP a	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	act Hazardous Spi
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality.	,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 245909 Northing 4312841 Form HV2: Permanent BMPs for But and Structure Developments	uildings	Selection Code S03	557
Building/Structure Name Face Patrol (227)	Township	12N Range 18E Section 1	
Date of Project Start 8/7/2006 Date of Project End Reviewer(s) K. Roaldson Survey Date 7/31/2015 Date BMP Imple	6th Field HUC Water	rshed CA-1 State CA Last BMP Maintenance	
N. Rodiusoff Survey Date 175 1720 15	ementation complete	Last Bivir Waliteriance	
Structure Type: Building Survey Type Follow-up	Depth/Duration:	Other (Describe)	
Plan Title: Face Patrol Building Retrofit Job No.:	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures de		<u>-</u>	
Attainment of effective ground cover, splash and scour erosion protection: roofline infilt	ration trenches, wood chip mulch		
Implementation			
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from standard 3=Major departure from standard	andards and/or no resource concerns ds and/or minor resource concerns ds and/or major resource concerns ndards/failure to address concerns	
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain	resource protection during a 20-year	1
Are BMP measures constructed according to contract design specifications?			1
Additional Comments:		,	
<u>Effectiveness</u>		Implementation Score:	
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational countries of the control of the contro		(BMP Monitoring Rule Set)	
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)			

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		eduled; and adequate erosion protection measures ap oth or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
(Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 245909 Northing 4312841 Building/Structure Name Face Patrol (227)	uildings Selection Code S03 Township 12N Range 18E Section 1	6
Date of Project Start 8/7/2006 Date of Project End Reviewer(s) K. Roaldson Survey Date 7/16/2015 Date BMP Impl Structure Type: Building Survey Type Post Storm Survey	6th Field HUC Watershed CA-1 State CA Depth/Duration: ~1.0" Other (Describe)	
Plan Title: Face Patrol Building Retrofit Job No.: Specific concerns associated with construction project and describe BMP measures destaction Attainment of effective ground cover, splash and scour erosion protection: roofline infilt	·	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns	
Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards? 2) Are BMP measures constructed according to contract design specifications?	trol systems designed to maintain resource protection during a 20-year	ī 1
Additional Comments:		
Effectiveness Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational co		
 Source area erosion control. Protection and stabilization of structure site, pa (Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately) 	or deposition on- or off-site, specifically areas naturally devoid of vegetation (e.g.	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system o ther designated infiltration areas. Maintenance of these ial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
 Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site. 	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding onsite, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
<i>,</i> (Evaluate the effectiveness, or lack of, BMP a	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 247287 Northing 4312392 Form HV2: Permanent BMPs for Bu and Structure Developments	uildings Selection Code S03
Building/Structure Name Hellwinkle's Road Segment	Township 12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End	6th Field HUC Watershed CA-1 State CA
Reviewer(s) K. Roaldson Survey Date 10/8/2015 Date BMP Impl	lementation Complete 9/30/2006 Last BMP Maintenance 9/30/2006
Ourvey Bate 10/0/2013 Bate Birli IIIIpi	Cincination Complete 3/30/2000 Least Bill Walnerhance 3/30/2000
Structure Type: Other Survey Type Post Storm Survey	Depth/Duration: Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Plan Date: Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures des	
Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	n of sediment transport, improve erosion resistance, water bar outlet protection.
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material control. 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?	1
ALIE IO	,
Additional Comments:	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational co	
1) Source area erosion control. Protection and stabilization of structure site, par	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apported or other) applied while vegetation becomes establish	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system or ther designated infiltration areas. Maintenance of these al to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Conta	act Hazardous Spil
Coordinator if accidental spill has occurred.)	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	·
coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill	indirect effects upo
coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects upo

UTM Zone 11 Easting 247287 Northing 4312392 Form HV2: Permanent BMPs for and Structure Developments	Buildings	Selection Code S03	545
Building/Structure Name Hellwinkle's Road Segment		Township 12N Range 18E S	ection 1
	mplementation Complete	HUC Watershed CA-1 State 9/30/2006 Last BMP Maintenance	9/30/2006
Structure Type: Other Survey Type Follow-up	Depth/Duration:	Other (Describe) Road	
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS Job No.:	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures of Water bar connection to SEZ, road shoulder effective cover, soil stabilization, preven		· · · · · · · · · · · · · · · · · · ·	t protection.
<u>Implementation</u>			
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from 3=Major departure from	yr 1-Hr standards and/or no resource concer m standards and/or minor resource concerns m standards and/or major resource concerns e from standards/failure to address concerns	S .
1) Were source control, drainage and infiltration systems, and hazardous material control storm Event, to achieve Forest Service and State water quality standards?	ontrol systems designed to	o maintain resource protection during a 20-ye	ear 1
2) Are BMP measures constructed according to contract design specifications?			1
Additional Comments:			
<u>Effectiveness</u>		Implementation Sco	ore: I
Note: Effective and adequate maintenance of BMP measures should be included veffectiveness evaluation. When topic is not applicable, please make informational		(BMP Monitoring Ru	ule Set)
1) Source area erosion control. Protection and stabilization of structure site,	particularly any erosive	areas.	
(Note the evidence of erosion processes such as rills, gullies, sediment scour and pumice slopes, or deteriorated granitic areas) or areas identified for revegetation is separately)			

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of these all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
, Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Sp
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	d indirect effects up
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	O Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	Indirect effects up

UTM Zone 11 Easting 247287 Northing 4312392 Form HV2: Permanent BMPs for B and Structure Developments	uildings Selection Code S03
Building/Structure Name Hellwinkle's Road Segment Date of Project Start 8/7/2006 Date of Project End	Township 12N Range 18E Section 1 6th Field HUC Watershed CA-1 State CA
Reviewer(s)	
K. Roaldson Survey Date 7/31/2015 Date BMP Imp	plementation Complete 9/30/2006 Last BMP Maintenance 9/30/2006
Structure Type: Other Survey Type Routine	Depth/Duration: Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Plan Date: Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system o ther designated infiltration areas. Maintenance of these ial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
 Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site. 	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
2) Effectiveness of herordous authorises a	ontrol measures.		
o) Enectiveness of nazardous substance co			
 (Evaluate the effectiveness, or lack of, BMP a 		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	applied to control hazardous chemical delivery to		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of lack of the contract of the contra	applied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	·
Coordinator if accidental spill has occurred.)	applied to control hazardous chemical delivery to		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of water quality. • Hazardous substance control measures	mazardous/toxic substances used for building an Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	O NA

UTM Zone 11 Easting 247287 Northing 4312392 Form HV2: Permanent BMPs for B and Structure Developments	Suildings Selection Code S03
Building/Structure Name Hellwinkle's Road Segment Date of Project Start 8/7/2006 Date of Project End	Township 12N Range 18E Section 1 6th Field HUC Watershed CA-1 State CA
Reviewer(s)	
	plementation Complete 9/30/2006 Last BMP Maintenance 9/30/2006
Structure Type: Other Survey Type Routine	Depth/Duration: Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Job No.: Specific concerns associated with construction project and describe BMP measures de	Plan Date: Plan Revision Date:
Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system o ther designated infiltration areas. Maintenance of these ial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
 Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site. 	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
N = 61 1 1 1 1 1	ontrol measures		
B) Effectiveness of hazardous substance co	micusures.		
(Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Conf	tact Hazardous Spil
Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to	. •	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Conf	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to	. •	d indirect effects up
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I water quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building an Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	nd indirect effects up

UTM Zone 11 Easting 247287 Northing 4312392 Form HV2: Permanent BMPs for Branch and Structure Developments	uildings	Selection Code	S03	547
Building/Structure Name Hellwinkle's Road Segment Date of Project Start 8/7/2006 Date of Project End		Natershed CA-1	ge 18E Section State CA	1
Reviewer(s)			,	
	ementation Complete	9/30/2006 Last BMF	P Maintenance	9/30/2006
Structure Type: Other Survey Type Routine	Depth/Duration:	Other (Describe)	Road	
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Job No.: Discovery EIR/EIS/EIS	Plan Date:		vision Date:	
Specific concerns associated with construction project and describe BMP measures de Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention			water bar outlet prote	ection.
Implementation				
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1- 2=Minor departure from sta 3=Major departure from sta 4=Repeated departure from	andards and/or minor res andards and/or major res	ource concerns ource concerns	
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to ma	ntain resource protection	during a 20-year	1
2) Are BMP measures constructed according to contract design specifications?				1
Additional Comments:				
<u>Effectiveness</u>		Imple	ementation Score:	I
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational countries.		(BMI	Monitoring Rule Se	t)
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive area	S.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)				

a) Soil Protection measures, artificial or vegetatif	tve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures ap loth or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
2) Runoff infiltration and drainage control sys	stem effectiveness.		
	oth placement, constructed swales, driplines, or o	direct site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes ial to assess the degree of effectiveness.)	
a) Functioning condition (potential for sediment a armor areas or infiltration trenches, as well as ar		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
of Enectiveness of nazardous substance co			
Coordinator if accidental spill has occurred.)	,	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	,		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	O Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects up

UTM Zone 10 Easting 245942 Form HV2: Permanent BMPs for Board Structure Developments	uildings Selection Code S02
Northing 4312894 Building/Structure Name Lakeview Water System	Township 12N Range 18E Section 1
Date of Project Start 8/25/2008 Date of Project End 9/15/2011	6th Field HUC Watershed CA-6 State CA
Reviewer(s) K. Roaldson Survey Date 10/8/2015 Date BMP Imp	lementation Complete 8/1/2011 Last BMP Maintenance 8/1/2011
Structure Type: Other Survey Type 3rd Year Post Construction	Depth/Duration: Other (Describe) Water System
Plan Title: Lakeview Water System Job No.: 08607.1 Specific concerns associated with construction project and describe BMP measures de	Plan Date: 7/25/2008 Plan Revision Date: 7/31/2008
Effective cover over trench and on decommissioned road, revegetation.	signed to achieve resource protection.
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	,
Additional comments.	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational co	
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the sial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
) Enectiveness of nazardous substance co			
Coordinator if accidental spill has occurred.)	,	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	,		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects up

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for B and Structure Developments	Selection Code S03
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End 9/1/2006 Reviewer(s) K. Roaldson, K. Flannagan, E. Har Survey Date 7/2/2015 Date BMP Imp Structure Type: Other Survey Type Post Storm Survey	6th Field HUC Watershed CA-1 State CA Diementation Complete 9/1/2006 Last BMP Maintenance 10/1/2010 Depth/Duration: ~1.0" Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Job No.: Specific concerns associated with construction project and describe BMP measures de Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	Plan Date: Plan Revision Date: esigned to achieve resource protection.
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
Water bar outlets built up with riprap additional protection provided with wattles	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	` ' '
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		eduled; and adequate erosion protection measures ap oth or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Enectiveness of nazardous substance co			
Coordinator if accidental spill has occurred.)	,	soils, groundwater or surface water bodies. Conta	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	,		·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects upo

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for B and Structure Developments	Suildings Selection Code S03
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End 9/1/2006 Reviewer(s) K. Roaldson, K. Flannagan, E. Har Survey Date 7/2/2015 Date BMP Imp	6th Field HUC Watershed CA-1 State CA Diementation Complete 9/1/2006 Last BMP Maintenance 10/1/2010 Depth/Duration: ~1.0" Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Job No.: Specific concerns associated with construction project and describe BMP measures de Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	Plan Date: Plan Revision Date: esigned to achieve resource protection.
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
Water bar outlets built up with riprap additional protection provided with wattles	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	` ' '
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establish	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding onsite, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	NA

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for Bu and Structure Developments	uildings Selection Code S03
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 18E Section 1
	6th Field HUC Watershed CA-1 State CA lementation Complete 9/1/2006 Last BMP Maintenance 10/1/2010
Structure Type: Other Survey Type Routine	Depth/Duration: Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS Discovery EIR/EIS/EIS	Plan Date: Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures des Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	,
Water bar outlets built up with riprap additional protection provided with wattles	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational co	
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the sial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to azardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for Bu and Structure Developments	uildings Selection Code S03
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End 9/1/2006 Reviewer(s) K. Roaldson, K. Flannagan, E. Har Survey Date 7/2/2015 Date BMP Impl Structure Type: Other Survey Type Post Storm Survey	6th Field HUC Watershed CA-1 State CA ementation Complete 9/1/2006 Last BMP Maintenance 10/1/2010 Depth/Duration: ~1.0" Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Job No.: Specific concerns associated with construction project and describe BMP measures des Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	Plan Date: Plan Revision Date: signed to achieve resource protection.
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	,
Water bar outlets built up with riprap additional protection provided with wattles	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational co	` ' '
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establish	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
of Enectiveness of nazardous substance co			
Coordinator if accidental spill has occurred.)	,	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	,		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	O Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects up

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for Bu and Structure Developments	uildings Selection Code S03
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 18E Section 1
	6th Field HUC Watershed CA-1 State CA ementation Complete 9/1/2006 Last BMP Maintenance 10/1/2010
Structure Type: Other Survey Type Follow-up Plan Title: CERP applies, Erosion Hotspot Inventory Epic Job No.: Specific concerns associated with construction project and describe BMP measures des Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material control. 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
Water bar outlets built up with riprap additional protection provided with wattles	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational co	
1) Source area erosion control. Protection and stabilization of structure site, par	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in s separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		eduled; and adequate erosion protection measures a oth or other) applied while vegetation becomes estab	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling pond	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
(Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Sp
Coordinator if accidental spill has occurred.)	nazardous/toxic substances used for building an Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of water quality. • Hazardous substance control measures	nazardous/toxic substances used for building an Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects up

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for But and Structure Developments	uildings Selection Code S03	553
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 188	E Section 1
Date of Project Start 8/7/2006 Date of Project End 9/1/2006	6th Field HUC Watershed CA-1	State CA
Reviewer(s) K. Roaldson, K. Flannagan, E. Har Survey Date 7/2/2015 Date BMP Imp	ementation Complete 9/1/2006 Last BMP Maint	tenance 10/1/2010
N. Hailiagail, E. Hai	3/1/2000 Last Bivii Waint	10/1/2010
Structure Type: Other Survey Type Routine	Depth/Duration: Other (Describe)	
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Plan Date: Plan Revision I	Date:
Specific concerns associated with construction project and describe BMP measures de		
Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	n of sediment transport, improve erosion resistance, water b	par outlet protection.
<u>Implementation</u>		
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource 2=Minor departure from standards and/or minor resource 0 3=Major departure from standards and/or major resource 0 4=Repeated departure from standards/failure to address or	concerns concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during	g a 20-year 1
Are BMP measures constructed according to contract design specifications?		1
Additional Comments:		
Water bar outlets built up with riprap additional protection provided with wattles		
Effectiveness	Implementa	tion Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational content of the property of		toring Rule Set)
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.	
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)		

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the sial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
N = 6	ontrol measures		
3) Effectiveness of hazardous substance co	mi oi mododi ooi		
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Conf	tact Hazardous Spil
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Conf	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I	pplied to control hazardous chemical delivery to	. •	d indirect effects up
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I water quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building an Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	d indirect effects up

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for Branch and Structure Developments	uildings Selection Code S03
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 18E Section 1
	6th Field HUC Watershed CA-1 State CA Dementation Complete 9/1/2006 Last BMP Maintenance 10/1/2010
Structure Type: Other Survey Type Routine Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Depth/Duration: Other (Describe) Road Plan Date: Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	,
Water bar outlets built up with riprap additional protection provided with wattles	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational co	` '
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		eduled; and adequate erosion protection measures a oth or other) applied while vegetation becomes estab	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling pond	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	

No evidence of unexpected ponding onsite, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality.	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 246846 Northing 4312787 Form HV2: Permanent BMPs for B and Structure Developments	uildings Selection Code S03
Building/Structure Name Maggie's Corner to Cal Dam	Township 12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End 9/1/2006 Reviewer(s) K. Roaldson, K. Flannagan, E. Har Survey Date 7/2/2015 Date BMP Imp Structure Type: Other Survey Type Post Storm Survey	6th Field HUC Watershed CA-1 State CA Ilementation Complete 9/1/2006 Last BMP Maintenance 10/1/2010 Depth/Duration: ~1.0" Other (Describe) Road
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Job No.: Specific concerns associated with construction project and describe BMP measures de Water bar connection to SEZ, road shoulder effective cover, soil stabilization, prevention	
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material control. 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	,
Water bar outlets built up with riprap additional protection provided with wattles	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	` '
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		eduled; and adequate erosion protection measures a oth or other) applied while vegetation becomes estab	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling pond	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
of Enectiveness of nazardous substance co			
Coordinator if accidental spill has occurred.)	,	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	,		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	O Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects up

UTM Zone 11 Easting 246817 Form HV2: Permanent BMPs for B and Structure Developments	uildings Selection Code S03
Northing 4312030	
Building/Structure Name Mombo Ski Run/Blue Angel Chutes	Township 12N Range 18E Section 1
Date of Project Start 10/1/2010 Date of Project End 10/15/2010	6th Field HUC Watershed CA-1 State CA
Reviewer(s)	
K. Roaldson Survey Date 10/22/2015 Date BMP Imp	Dementation Complete 10/15/2010 Last BMP Maintenance 10/15/2010
Structure Type: Other Survey Type Follow-up	Depth/Duration: Other (Describe) Ski Run
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Plan Date: Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource protection.
Soils very fine and sandy. Water bars needed to prevent gullies down slope. Road wat	erbar diverts drainage away from slope.
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
Water bar, effective cover, slope stabilization	
Effectiveness	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

a) Soil Protection measures, artificial or vegetatif	tve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures ap loth or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
2) Runoff infiltration and drainage control sys	stem effectiveness.		
	oth placement, constructed swales, driplines, or o	direct site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of thes ial to assess the degree of effectiveness.)	
a) Functioning condition (potential for sediment a armor areas or infiltration trenches, as well as ar		tration zones, such as detention basins, settling ponds	, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
) Effectiveness of hazardous substance co			
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	pplied to control hazardous chemical delivery to		·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	O Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 246148 Northing 4313086 Form HV2: Permanent and Structure Develop		Selection Code	-	466
Building/Structure Name Pioneer Poma		Township 12N Ra	inge 18E Section	1
Date of Project Start Date of Project End Reviewer(s)		Id HUC Watershed CA-1	State CA	
K. Roaldson, K. Flannagan, E. Har Survey Date 7/2/2015	Date BMP Implementation Comple	te 7/31/2002 Last BN	MP Maintenance	
Structure Type: Lift Survey Type Post Storm S	Depth/Duration	: ~1.0" Other (Describ	e)	
Plan Title: Pioneer Poma Lift Replacement Job No.	.: 00-607-03 Plan Date	: 12-14-2001 Plan F	Revision Date:	
Specific concerns associated with construction project and describe BM	IP measures designed to achieve re	source protection.		
Soil stabilization and sediment transport to SEZ, revegetation.				
<u>Implementation</u>				
For Permanent or Temporary-Seasonal Structures:	2=Minor departure 3=Major departure	20-yr 1-Hr standards and/or no from standards and/or minor re from standards and/or major reture from standards/failure to a	esource concerns esource concerns	
1) Were source control, drainage and infiltration systems, and hazardo 1-hour Storm Event, to achieve Forest Service and State water quality		d to maintain resource protecti	on during a 20-year	1
2) Are BMP measures constructed according to contract design specif	ications?			1
Additional Comments:				
<u>Effectiveness</u>		Im	plementation Score:	
Note: Effective and adequate maintenance of BMP measures should effectiveness evaluation. When topic is not applicable, please make		(Bi	MP Monitoring Rule Set)	
1) Source area erosion control. Protection and stabilization of st	ructure site, particularly any eros	ive areas.		
(Note the evidence of erosion processes such as rills, gullies, sedim pumice slopes, or deteriorated granitic areas) or areas identified for separately)				

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the sial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building an Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I water quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building an Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	NA

UTM Zone 11 Easting 247245 Northing 4312403 Form HV2: Permanent BMPs for B and Structure Developments	uildings	Selection Code S03
Building/Structure Name Sky Chute Ski Run	Township	12N Range 18E Section 1
Date of Project Start 8/7/2006 Date of Project End Reviewer(s) K. Roaldson Survey Date 8/24/2015 Date BMP Imp	6th Field HUC Waters	Shed CA-1 State CA Last BMP Maintenance
Structure Type: Other Survey Type Follow-up	Depth/Duration:	Other (Describe) Ski Run
Plan Title: Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS	Plan Date:	Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de Infiltration trench beneath dripline, gravel beneath pervious deck.	esigned to achieve resource protect	tion.
Implementation		
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from standard	ndards and/or no resource concerns Is and/or minor resource concerns Is and/or major resource concerns Idards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cor 1-hour Storm Event, to achieve Forest Service and State water quality standards?	itrol systems designed to maintain r	resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?		1
Additional Comments:		,
Infiltration areas in place and functioning.		
<u>Effectiveness</u>		Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wi effectiveness evaluation. When topic is not applicable, please make informational content of the content of		(BMP Monitoring Rule Set)
1) Source area erosion control. Protection and stabilization of structure site, p	articularly any erosive areas.	
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/opumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)		

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system o ther designated infiltration areas. Maintenance of these ial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
 Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site. 	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding onsite, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	NA

UTM Zone 11 Easting 247202 Northing 4312286 Form HV2: Permanent BMPs for Beau and Structure Developments	uildings	Selection Code S03	451
Building/Structure Name Sky Express - Lower Terminal	Township	12N Range 18E Section 1	
Date of Project Start 8/7/2006 Date of Project End Reviewer(s) K. Roaldson Survey Date 8/24/2015 Date BMP Imp	6th Field HUC Water	CA-1 State CA Last BMP Maintenance	
Structure Type: Lift-Base Survey Type Follow-up	Depth/Duration:	Other (Describe)	
Plan Title: Infiltration BMP Maintenance Job No.:	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures de Infiltration trenches for impervious surfaces (roof drip lines), prevent soil erosion, ero	· · · · · · · · · · · · · · · · · · ·	ction.	
<u>Implementation</u>			
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from standard 3=Major departure from standard	andards and/or no resource concerns ds and/or minor resource concerns ds and/or major resource concerns ndards/failure to address concerns	
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain	resource protection during a 20-year	1
Are BMP measures constructed according to contract design specifications?			1
Additional Comments:			
Effectiveness		Implementation Score:	
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational co		(BMP Monitoring Rule Set)	
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)			ed

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the sial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
3) Effectiveness of hazardous substance co	ontrol measures.		
,			
(Evaluate the effectiveness, or lack of, BMP a	applied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Conf	tact Hazardous Spill
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	,,	soils, groundwater or surface water bodies. Conf	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of	,,		·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of water quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects upo

UTM Zone 11 Easting 247277 Northing 4312421 Form HV2: Permanent BMPs for Branch and Structure Developments	uildings Selection Code S03
Building/Structure Name Sky Express Road Date of Project Start 8/7/2006 Date of Project End	Township 12N Range 18E Section 1 6th Field HUC Watershed CA-1 State CA
Reviewer(s)	
K. Roaldson Survey Date 8/24/2015 Date BMP Imp	lementation Complete 9/30/2006 Last BMP Maintenance 9/30/2006
Structure Type: Other Survey Type Follow-up	Depth/Duration: Other (Describe) Road
Plan Title: No plan set, CERP applies and Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS Job No.:	Plan Date: Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource protection.
Revegetation, infiltration areas, erosion resistance on bare areas.	
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?	1
2) Are Divir measures constructed according to contract design specifications:	
Additional Comments:	
Revegetation/stabilization area.	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational co	
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		eduled; and adequate erosion protection measures a oth or other) applied while vegetation becomes estab	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling pond	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
, (Evaluate the effectiveness, or lack of, BMP a	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone 11 Easting 246118 Northing 4312927 Form HV2: Permanent BMPs for But and Structure Developments	uildings Selection Code S03
Building/Structure Name Upper Maintenance Shop	Township 12N Range 18E Section 1
Date of Project Start 8/22/2006 Date of Project End 10/15/2010 Reviewer(s)	6th Field HUC Watershed CA-1 State CA
K. Roaldson Survey Date 10/8/2015 Date BMP Impl	ementation Complete Last BMP Maintenance
Structure Type: SEZ Restoration Survey Type Post Storm Survey	Depth/Duration: ~1.0" Other (Describe)
Plan Title: Upper Shops Water Quality and Stream Environment Zone Improvements Job No.: 00-607-41	Plan Date: 4/25/06 Plan Revision Date: 8/31/06
Specific concerns associated with construction project and describe BMP measures des	
BMPs to protect adjacent SEZ - drainage diversion, concrete wall, SEZ drop pool desig	n, revegetation
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?	1
Additional Comments	
Additional Comments: SEZ protective measures in place, revegetation robust	
SEZ protective measures in place, revegetation robust	
Effectiveness	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational co	nin the (BMP Monitoring Rule Set) mment.
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/or pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.) NA
		neduled; and adequate erosion protection measures aport or other) applied while vegetation becomes establi	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.) NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	○ NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system ther designated infiltration areas. Maintenance of the sial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds	s, driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
	untual magazinas		
) Effectiveness of hazardous substance co	ontroi measures.		
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Conf	tact Hazardous Spil
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Conf	·
 (Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I 	pplied to control hazardous chemical delivery to		d indirect effects up
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of I water quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	O NA

Attachment C

Nevada Evaluation Sheets

H	Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	, Nevada Evaluations
Effective	<u>eness</u>			
1) Sourc	ce Control BMP			
a) Effec	tiveness of applied BMP measures (artif	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
no e or ii	I protection measures are effective and erosion is evident, or expected, on-site mmediately off-site. OR no soil turbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut aı	nd fill slope protection (including surface	erosion and slope failure potential)		
er m er de pr se tra	emporary BMP measures (such as rosion control or geotextile blankets, bulch or pine straw application, incompassing filter fences, berms or esigned swales) applied to slope rotection is adequate to prevent or everely limit erosion initiation and ansport processes. OR project does of require the construction and liaintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runo	ff infiltration and drainage control sys	stem effectiveness.		
drainage also be a	e ditches, constructed berms, erosion clo addressed. When available, verification v	ack thereof, including any measure designed to di oth placement, constructed swales, driplines, or oth with water quality monitoring data may be essential olied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	
ev Ex ar ac se	o evidence of erosion on-site, and no vidence of associated off-site erosion. xisting, or newly constructed, runoff and drainage control measures are dequate to eliminate erosion and ediment transport processes induced y a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.
- \bigcirc NA

Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of ha	blied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA
Additional Comments	buildings to specially provided as	Effectiveness Score: (BMP Monitoring Rule S	
snow making system for dust control. Post storm		be delineation, straw & pine needle wattles, hose of expected ponding following event.	connected to

1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring (Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	tem effectiveness.		
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth vith water quality monitoring data may be essential blied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

4) Effectiveness of hazardous substance con	ntrol measures.	·			
(Evaluate the effectiveness, or lack of, BMP applied to control hazardous chemical delivery to soils, groundwater or surface water bodies. Contact Hazardous Spill Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hazardous/toxic substances used for building and vehicle maintenance, and associated direct and indirect effects upon					
water quality.	zaruous/toxic substances used for building and	venicle maintenance, and associated unect and in	unect enects upon		
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA		
Additional Comments		Effectiveness Score: (BMP Monitoring Rule S	Set)		
Construction in progress on loading and operator	buildings and track installation, concrete truck of	on-site using washout, stockpiles covered with play	stic sheeting		

Construction in progress on loading and operator buildings and track installation, concrete truck on-site using washout, stockpiles covered with plastic sheeting and wattles, other temporary BMPs in place include rope delineation, straw & pine needle wattles, hose connected to snow making system for dust control. Post storm event inspection, minor evidence of erosion, no unexpected ponding following ~0.5" rain event.

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4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	, Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control syst (Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a) Effectiveness of erosion control measures app	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth vith water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

sensitive zones or off-site

adequately flagged, and equipment

operations avoid infringement upon

designated zones.

observed soil or vegetation impacts off-

site or any activity induced impact within

SEZ. If mitigation is required, please make recommendations in comment

section

ricaverily incantain resent	ZOTO DIVIL ETIC	ouveriess mornioning	
4) Effectiveness of hazardous substance con	trol measures.		
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact Hazardous Sp	pill
a) Evaluate the occurrence and mitigation of haz water quality.	ardous/toxic substances used for building and	vehicle maintenance, and associated direct and indirect effects u	noqu
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	
		Effectiveness Score:	
Additional Comments		(BMP Monitoring Rule Set)	
		red with plastic sheeting and wattles, other temporary BMPs in ence of erosion or unexpected ponding following event of ~1".	

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1 = Meets / Exceeds contract requirements and/or no resource concerns

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4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	, Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control syst (Evaluate any on-site runoff control features, or la drainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a) Effectiveness of erosion control measures app	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth vith water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- •Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

ricaverny incurriant recent	Zo To Bivii Zilio	our one continuing			
4) Effectiveness of hazardous substance con	trol measures.				
(Evaluate the effectiveness, or lack of, BMP applied to control hazardous chemical delivery to soils, groundwater or surface water bodies. Contact Hazardous Spill Coordinator if accidental spill has occurred.)					
a) Evaluate the occurrence and mitigation of haz water quality.	zardous/toxic substances used for building and	vehicle maintenance, and associated direct and indirect effects upon			
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 			
		Effectiveness Score:			
Additional Comments		(BMP Monitoring Rule Set)			
Construction in progress on loading and operator place include rope delineation, straw & pine need		red with plastic sheeting and wattles, other temporary BMPs in le restroom staked and away from equipment.			

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2 = Minor departure from contract and/or minor resource concerns

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4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion cloralso be addressed. When available, verification v	tem effectiveness. ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

	out chess wormening	
ntrol measures.		
olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contac	: Hazardous Spill
zardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator. 	○ NA
	Effectiveness Score:	E
	(BMP Monitoring Rule S	Set)
buildings and track installation, temporary BMF	s in place include rope delineation, straw & pine n	eedle wattles.
	Diled to control hazardous chemical delivery to second to control hazardous chemical delivery to second to control hazardous chemical or improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Dilied to control hazardous chemical delivery to soils, groundwater or surface water bodies. Contact zardous/toxic substances used for building and vehicle maintenance, and associated direct and in Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	tem effectiveness. ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

4) Effectiveness of hazardous substance con (Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)		oils, groundwater or surface water bodies. Contact	Hazardous Spill
a) Evaluate the occurrence and mitigation of hazwater quality. Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	NA
dditional Comments		Effectiveness Score: (BMP Monitoring Rule S	et)

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3 = Major departure from contract and/or major resource concerns

04/13/2016

4 = Repeated departure from contract and/or failure to address resource concerns

Implementation Score: (BMP Monitoring Rule Set)

1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

Heavenly Mountain Resort	2015 BMP Effec	tiveness Monitoring (Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed o	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	tem effectiveness. ack thereof, including any measure designed to d th placement, constructed swales, driplines, or ot with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive area as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

		ective liess Monitoring	
Effectiveness of hazardous substance convaluate the effectiveness, or lack of, BMP appropriator if accidental spill has occurred.)		oils, groundwater or surface water bodies. Contact	: Hazardous Spill
Evaluate the occurrence and mitigation of hater quality.	azardous/toxic substances used for building and	vehicle maintenance, and associated direct and in	direct effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA
		Effectiveness Score:	E
ditional Comments		(BMP Monitoring Rule S	Set)

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	, Nevada Evaluations
Effectiveness			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion cloralso be addressed. When available, verification w	tem effectiveness. ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.
- \bigcirc NA

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Effectiveness of hazardous substance constrained in the effectiveness, or lack of, BMP appropriate appropriate in accidental spill has occurred.)		oils, groundwater or surface water bodies. Contact	t Hazardous Spill
Evaluate the occurrence and mitigation of haze vater quality. Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	direct effects upo
lditional Comments		Effectiveness Score: (BMP Monitoring Rule S	E Set)

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	, Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	tem effectiveness. ack thereof, including any measure designed to di th placement, constructed swales, driplines, or otl with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

4) Effectiveness of hazardous substance co		
The cuveness of mazardous substance co	ntrol measures.	
Coordinator if accidental spill has occurred.)	•	oils, groundwater or surface water bodies. Contact Hazardous Spill vehicle maintenance, and associated direct and indirect effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	 Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.
dditional Comments		Effectiveness Score: (BMP Monitoring Rule Set)

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artiful terms of applied BMP measures)	ficial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control sys	stem effectiveness.		
drainage ditches, constructed berms, erosion cloalso be addressed. When available, verification	lack thereof, including any measure designed to di oth placement, constructed swales, driplines, or oth with water quality monitoring data may be essential plied to limit erosion processes and sediment deliv	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section

04/13/2016

neasures. c control hazardous chemical delivery to so	hila graundwater er aurface water hedies. Centecter	
	ons, groundwater of surface water bodies. Contact	Hazardous Spill
•	, <u>, , , , , , , , , , , , , , , , , , </u>	·
us/toxic substances used for building and v	vehicle maintenance, and associated direct and inc	direct effects upon
Minor evidence of improper use of azardous substances, such as shemical or mineral stains; however, evidence of SEZ contamination is not abserved and ground water contamination is limited (consider approximate volume, microtopography, icinity to SEZ, permeability of soil, lepth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA
	Effectiveness Score:	E
/ ia id	Alinor evidence of improper use of azardous substances, such as hemical or mineral stains; however, vidence of SEZ contamination is not bserved and ground water ontamination is limited (consider pproximate volume, microtopography, icinity to SEZ, permeability of soil, epth of stain and recent weather	azardous substances, such as hemical or mineral stains; however, vidence of SEZ contamination is not bserved and ground water ontamination is limited (consider pproximate volume, microtopography, icinity to SEZ, permeability of soil, epth of stain and recent weather vents).

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1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effect	tiveness Monitoring	, Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artification)	cial or vegetative) designed to protect exposed or	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depostional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
2) Runoff infiltration and drainage control system (Evaluate any on-site runoff control features, or ladrainage ditches, constructed berms, erosion clot also be addressed. When available, verification was a) Effectiveness of erosion control measures approximately.	ack thereof, including any measure designed to di th placement, constructed swales, driplines, or oth vith water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- with limited adverse impacts upon sensitive zones or off-site
- zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section

rioavorily incurriant record	Zo To Bivii Zillo	curences memoring		
4) Effectiveness of hazardous substance con	trol measures.			
(Evaluate the effectiveness, or lack of, BMP applied to control hazardous chemical delivery to soils, groundwater or surface water bodies. Contact Hazardous Spill Coordinator if accidental spill has occurred.)				
a) Evaluate the occurrence and mitigation of haz water quality.	ardous/toxic substances used for building and	vehicle maintenance, and associated direct and indire	ct effects upon	
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	• Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.) NA	
		Effectiveness Score:	E	
Additional Comments		(BMP Monitoring Rule Set)		
		and soil on top. Stockpiled soil protected with wattles, Stockpiled boulders for stabilization. No evidence of		

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2 = Minor departure from contract and/or minor resource concerns	4 = Repeated departure from contract and/or failure to address resource concerns
	Implementation Score:
	(BMP Monitoring Rule Set)

1 = Meets / Exceeds contract requirements and/or no resource concerns

3 = Major departure from contract and/or major resource concerns

Heavenly Mountain Resort	2015 BMP Effec	tiveness Monitoring (Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed o	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	tem effectiveness. ack thereof, including any measure designed to d th placement, constructed swales, driplines, or ot with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts off-site or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section
- \bigcirc NA

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4) Effectiveness of hazardous substance con	trol measures.	
(Evaluate the effectiveness, or lack of, BMP app Coordinator if accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact Hazardous Spill
a) Evaluate the occurrence and mitigation of haz water quality.	cardous/toxic substances used for building and	vehicle maintenance, and associated direct and indirect effects upon
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.
		Effectiveness Score:
Additional Comments		(BMP Monitoring Rule Set)
		work and road base application on new access road. Wood ing ~0.5" rain event. New access road grading in progress.

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Heavenly Mountain Resort	2015 BMP Effec	tiveness Monitoring (Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed o	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	tem effectiveness. ack thereof, including any measure designed to d th placement, constructed swales, driplines, or ot with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section

ricaverily indufficin Neson	2010 81111 2110	ctiveness Montoning	
coordinator if accidental spill has occurred.)	olied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	·
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	○ NA
dditional Comments		Effectiveness Score: (BMP Monitoring Rule S	et)

1 = Meets / Exceeds contract requirements and/or no resource concerns

2 = Minor departure from contract and/or minor resource concerns

3 = Major departure from contract and/or major resource concerns

4 = Repeated departure from contract and/or failure to address resource concerns

Heavenly Mountain Resort	2015 BMP Effec	tiveness Monitoring (Nevada Evaluations
<u>Effectiveness</u>			
1) Source Control BMP			
a) Effectiveness of applied BMP measures (artifi	icial or vegetative) designed to protect exposed o	r disturbed soil surfaces including soil storage pile	es and compacted areas.
Soil protection measures are effective and no erosion is evident, or expected, on-site or immediately off-site. OR no soil disturbance is associated with project.	Exposed and/or disturbed soil areas have less than full cover, OR minor erosion, such as infrequent rills or small depositional fans, are evident near erodable soil areas; however, no evidence is observed of sediment delivery to SEZ.	Substantial areas of exposed erodable soil are not protected and evidence of erosion processes, such as rills or sediment deposition are readily observed. OR any evidence of sediment runoff to SEZ.	○ NA
b) Cut and fill slope protection (including surface	erosion and slope failure potential)		
Temporary BMP measures (such as erosion control or geotextile blankets, mulch or pine straw application, encompassing filter fences, berms or designed swales) applied to slope protection is adequate to prevent or severely limit erosion initiation and transport processes. OR project does not require the construction and maintenance of cut and fill slopes.	Minor erosion and sediment deposition is noted from storms <20-year 1-hour event; however, sediment transport to any SEZ, on- or off-site, is not observed.	Temporary BMP measures are inadequate to protect erosion from cut and fill slopes from storms <20 year-1 hour event; or any observation of sediment transport and/or deposition within SEZ.	○ NA
drainage ditches, constructed berms, erosion clo also be addressed. When available, verification v	tem effectiveness. ack thereof, including any measure designed to d th placement, constructed swales, driplines, or ot with water quality monitoring data may be essentia	her designated infiltration areas. Maintenance of al to assess the degree of effectiveness.)	tem outlets, including these features should
No evidence of erosion on-site, and no evidence of associated off-site erosion. Existing, or newly constructed, runoff and drainage control measures are adequate to eliminate erosion and sediment transport processes induced by a 20-year 1-hour storm event.	Observed evidence of minor on-site erosion and sediment transport. Specifically, only minor erosion and/or deposition observed adjacent to any runoff control measures, such as infrequent rill formation near ditch-lines, or at erosion control measures; however, sediment delivery to SEZ is not observed or anticipated.	Observed evidence of major or substantial project induced erosion, either on- or off-site, such as frequent rills (>3) or any gully exhibiting direct sediment delivery to ditch-line, or erosion control measures overwhelmed (e.g. substantial erosion around or overtop of straw bales/sediment fence/erosion cloth/etc.). OR any evidence of sediment delivery to SEZ.	○ NA

- Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.
- Minor breach of designated boundaries, with limited adverse impacts upon sensitive zones or off-site.
- Major breach of designated boundary zones by equipment operation, and observed soil or vegetation impacts offsite or any activity induced impact within SEZ. If mitigation is required, please make recommendations in comment section.

 \bigcirc NA

ricaverny ivioantam resort	ZOTO DIVIT ETIC	ouveriess monitoring	
Coordinator if accidental spill has occurred.)	lied to control hazardous chemical delivery to s	oils, groundwater or surface water bodies. Contact	
Adjacent or inclusive wet/sensitive areas as well as construction site are adequately flagged, and equipment operations avoid infringement upon designated zones.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and ground water contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather events).	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator.	NA
Additional Comments		Effectiveness Score: (BMP Monitoring Rule S	Set)
Grading work complete and two tubing lanes oper decommissioned and stabilized.	n to the public. Wood chips placed around enti	e tubing area and on public access path. Old acce	ess road to be

UTM Zone 11 Easting 247727 Northing 4313595 Form HV2: Permanent BMPs for Branch and Structure Developments	uildings	Selection Code S03	540
Building/Structure Name	Township 6th Field HUC Waters	12N Range 18E Section	1
Reviewer(s)	Oth Field Floo Waters	JOA-1 State JOA	
	ementation Complete	Last BMP Maintenance	
Structure Type: Other Survey Type Follow-up	Depth/Duration:	Other (Describe) Ski Run	
Plan Title: Erosion Hotspot Inventory Epic Discovery Job No.:	Plan Date:	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource protect	ion.	
Soil stabilization, prevention of sediment transport, improve erosion resistance.			
Implementation			
For Permanent or Temporary-Seasonal Structures:	2=Minor departure from standard	ndards and/or no resource concerns s and/or minor resource concerns s and/or major resource concerns dards/failure to address concerns	
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain r	resource protection during a 20-year	1
2) Are BMP measures constructed according to contract design specifications?			1
Additional Comments:			
Implementation of treatment identified in Erosion Hotspot Inventory.			
<u>Effectiveness</u>		Implementation Score:	I
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational co		(BMP Monitoring Rule Se	t)
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)			

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent depostion is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surface	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system o ther designated infiltration areas. Maintenance of these ial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
 Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site. 	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	NA

UTM Zone 11 Easting 249800 Northing 4314757 Form HV2: Permanent BMPs for B and Structure Developments	uildings Selection Code S03
Building/Structure Name Galaxy Wetland	Township 13N Range 19E Section 31
Date of Project Start Date of Project End 10/30/2007	6th Field HUC Watershed NV-2+5 State NV
Reviewer(s)	Januaristica Complete
K. Roaldson, K. Flannagan, E. Har Survey Date 6/19/2015 Date BMP Imp	Last BMP Maintenance
Structure Type: Other Survey Type 9th Year Post Construction	Depth/Duration: Other (Describe)
Plan Title: Galaxy Wetland Restoration Job No.:	Plan Date: Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de Inlet and Outlet Stability, sediment contribution to stream flow, maintenance of wetland	
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	trol systems designed to maintain resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
Additional comments.	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	
1) Source area erosion control. Protection and stabilization of structure site, pa	articularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures appl loth or other) applied while vegetation becomes establish	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.	NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
Irainage ditches, constructed berms, erosion clo		direct site runoff or dissipate erosive energy at system ou ther designated infiltration areas. Maintenance of these ial to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		Itration zones, such as detention basins, settling ponds, o	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
Coordinator if accidental spill has occurred.)	oplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Conta	·
Hazardous substance control measures provide effective mitigation.	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	○ NA
	events).		
	events).	Effectiveness S	Score: E
Additional Comments	events).	Effectiveness S	

UTM Zone 11 Easting 249410 Northing 4315724 Form HV2: Permanent BMPs for and Structure Developments	Buildings	Selection (Code S06	515
Building/Structure Name Nevada Trail Ski Run		Township 13N	Range 19E Section	30
Date of Project Start Date of Project End	6th Field F	HUC Watershed NV-4	State NV	
Reviewer(s) K. Roaldson, K. Flannagan, E. Har Survey Date 6/19/2015 Date BMP II	mplementation Complete	La	ast BMP Maintenance	
Structure Type: Other Survey Type Post Storm Survey	Depth/Duration: ~	1.0" Other (De	Ski Run	
Plan Title: CERP applies, Erosion Hotspot Inventory Epic Discovery EIR/EIS/EIS Job No.:	Plan Date:	F	Plan Revision Date:	
Specific concerns associated with construction project and describe BMP measures	designed to achieve resou	urce protection.		
Erosion resistance along roadway				
Implementation				
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20- 2=Minor departure from 3=Major departure from 4=Repeated departure	m standards and/or mi m standards and/or ma	ajor resource concerns	
1) Were source control, drainage and infiltration systems, and hazardous material c 1-hour Storm Event, to achieve Forest Service and State water quality standards?	ontrol systems designed to	o maintain resource pro	otection during a 20-year	1
Are BMP measures constructed according to contract design specifications?				1
Additional Comments:				
Effective cover				
Effectiveness			Implementation Score:	I
Note: Effective and adequate maintenance of BMP measures should be included effectiveness evaluation. When topic is not applicable, please make informational			(BMP Monitoring Rule Set)
1) Source area erosion control. Protection and stabilization of structure site,	, particularly any erosive	areas.		
(Note the evidence of erosion processes such as rills, gullies, sediment scour and pumice slopes, or deteriorated granitic areas) or areas identified for revegetation separately)	d/or deposition on- or off-s in structure plan, see struc	ite, specifically areas noture sketch. Construc	naturally devoid of vegetation ted cut and fill slopes are add	(e.g. dressed

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of these all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding onsite, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
(Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Cont	act Hazardous Spi
Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality Monitoring Crew Leader.	·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	I indirect effects up

UTM Zone	Form HV2: Permanent BMPs for B and Structure Developments	uildings	Selection Code S06	544
Building/Structure Name Nevada	rail Ski Run	Township	P 13N Range 19E Section	n 30
Date of Project Start Reviewer(s) K. Roaldson, K. Flannagan, E. Har	Date of Project End Survey Date 10/8/2015 Date BMP Imp	6th Field HUC Wate	ershed NV-4 State NV Last BMP Maintenance	
Structure Type: Other	Survey Type Post Storm Survey	Depth/Duration: ~1.0"	Other (Describe) Ski Run	
Plan Title: CERP applies, Erosion Hot Discovery EIR/EIS/EIS	spot Inventory Epic Job No.:	Plan Date:	Plan Revision Date:	
Specific concerns associated with const	ruction project and describe BMP measures de	signed to achieve resource prote	ection.	
Erosion resistance along roadway				
Implementation				
<u>Implementation</u>		1=Meets/Exceeds 20-vr 1-Hr st	tandards and/or no resource concerns	
		2=Minor departure from standa	ards and/or minor resource concerns	
For Permanent or Temporary-Season	al Structures:		rds and/or major resource concerns andards/failure to address concerns	
	nfiltration systems, and hazardous material con Service and State water quality standards?	trol systems designed to maintain	n resource protection during a 20-year	1
2) Are BMP measures constructed acco	ording to contract design specifications?			1
Additional Comments:				-
Effective cover				
<u>Effectiveness</u>			Implementation Score:	I
	nance of BMP measures should be included with is not applicable, please make informational co		(BMP Monitoring Rule Se	et)
1) Source area erosion control. Pro	tection and stabilization of structure site, pa	articularly any erosive areas.		
	sses such as rills, gullies, sediment scour and/c ic areas) or areas identified for revegetation in			

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of these all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
		soils, groundwater or surface water bodies. Cont	act Hazardous Spil
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact	·
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however,	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If	indirect effects upo
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects up

UTM Zone 11 Easting 248867 Northing 4315031 Form HV2: Permanent BMPs for B and Structure Developments	uildings Selection Code S03
Building/Structure Name Olympic Express Lower Terminal	Township 13N Range 19E Section 31
Date of Project Start 7/23/2007 Date of Project End	6th Field HUC Watershed NV-3 State NV
Reviewer(s)	Lost DMD Maintanana
K. Roaldson Survey Date 10/8/2015 Date BMP Imp	lementation Complete Last BMP Maintenance
Structure Type: Lift-Base Survey Type Post Storm Survey	Depth/Duration: ~1.0" Other (Describe)
Plan Title: 2007 Implementation - Northbowl/Olympic Job No.: 00-607.32 Express Lift Replacement Project	Plan Date: 06/27/2007 Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de	signed to achieve resource protection.
Erosion and sediment transport prevention, revegetation establishment	
Implementation	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material con 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
2) Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	,
Permanent infiltration BMPs are implemented per the plans	
<u>Effectiveness</u>	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included wit effectiveness evaluation. When topic is not applicable, please make informational contents.	
1) Source area erosion control. Protection and stabilization of structure site, pa	rrticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
c) Cut and fill slope protection (including surfac	e erosion and slope failure potential).		
BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of these all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
3) Effectiveness of hazardous substance co			
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.)		soils, groundwater or surface water bodies. Cont d vehicle maintenance, and associated direct and	·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality.	azardous/toxic substances used for building and	d vehicle maintenance, and associated direct and	indirect effects upo
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	indirect effects upo

UTM Zone 11 Easting 247813 Form HV2: Permanent BMPs for Board Structure Developments	uildings Selection Code S03
Northing 4313806 Zip Line (Multi Rider) - Launch Tower Date of Project Start 6/17/2013 Date of Project End 9/10/2014	Township 12N Range 18E Section 1 6th Field HUC Watershed CA-1 State NV
Reviewer(s)	0/40/0040 Last DMD Maintainean 2/40/0040
K. Roaldson Survey Date 10/8/2015 Date BMP Imp	lementation Complete 9/10/2013 Last BMP Maintenance 9/10/2013
Structure Type: Other Survey Type 1st Year Post Construction	Depth/Duration: Other (Describe) Zip Line Terminal
Plan Title: Heavenly Summer Activities Job No.: 12-602.4	Plan Date: 11/9/12 Plan Revision Date:
Specific concerns associated with construction project and describe BMP measures de Effective cover/erosion resistance	signed to achieve resource protection.
<u>Implementation</u>	
For Permanent or Temporary-Seasonal Structures:	1=Meets/Exceeds 20-yr 1-Hr standards and/or no resource concerns 2=Minor departure from standards and/or minor resource concerns 3=Major departure from standards and/or major resource concerns 4=Repeated departure from standards/failure to address concerns
1) Were source control, drainage and infiltration systems, and hazardous material cont 1-hour Storm Event, to achieve Forest Service and State water quality standards?	rol systems designed to maintain resource protection during a 20-year
Are BMP measures constructed according to contract design specifications?	1
Additional Comments:	
Effectiveness	Implementation Score:
Note: Effective and adequate maintenance of BMP measures should be included with effectiveness evaluation. When topic is not applicable, please make informational countries.	
1) Source area erosion control. Protection and stabilization of structure site, pa	rticularly any erosive areas.
(Note the evidence of erosion processes such as rills, gullies, sediment scour and/o pumice slopes, or deteriorated granitic areas) or areas identified for revegetation in separately)	

) Soil Protection measures, artificial or vegetatit	ve, designed to eliminate erosion by runoff and r	ain-drop impact	
Nearly 70% coverage of any erodible surfaces, and no evidence of erosion.	Structure site exhibits less than full cover of soil; however, only minor erosion is evident and subsequent deposition is limited to on-site areas excluding deposition within any on-site SEZ.	Areas of exposed soil are observed, and erosion is evident and extensive (for example sediment is transported off-site or directly to SEZ.	NA
		neduled; and adequate erosion protection measures apport or other) applied while vegetation becomes establis	
Revegetation establishment proceeding as expectednew and existing vegetative cover in combination with temporary BMP measures are effective at eliminating/ mitigating erosion processes from those areas.	Revegetation efforts are not proceeding as expected. Minor additional efforts are required for successful revegetation establishment, or minor maintenance/retrofit of temporary BMP measures applied (for erosion control during revegetation efforts) is needed.	Temporary BMP measures provide inadequate erosion control, and/or specified revegetation efforts are deemed unsuccessful, as major modifications are needed to achieve vegetative ground cover goals and success. OR major onsite erosion, or any evidence of sediment delivery to SEZ.	NA
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BMP measures (including seeding/planting, with mulch of pine straw, designed swales, retention walls or use of erosion control blankets) applied to cut or fill slopes are adequate to prevent erosion. Craks or slumping is not evident.	BMP measures applied (see the previous checkbox) exhibit minor erosion and/or deposition is noted at base of cut or fill slope, near retention walls or around erosion control blankets or mulch. However, erosion is limited to on-site areas excluding any transport to SEZ. Or retaining wall integrity is showing signs of concern, such as bulging or wavy appearance.	BMP measures are inadequate to protect erosion on cut and fill slopes from storms <20 year1 hour event; or any evidence of sediment transport and/or deposition within SEZ is observed. Or cracks are present and appear to be threatening integrity of fill and/or retaining wall. Or the occurrence of any fillslope failure has occurred.) NA
) Runoff infiltration and drainage control sys	tem effectiveness.		
rainage ditches, constructed berms, erosion clo		lirect site runoff or dissipate erosive energy at system of ther designated infiltration areas. Maintenance of these all to assess the degree of effectiveness.)	
) Functioning condition (potential for sediment a rmor areas or infiltration trenches, as well as an		tration zones, such as detention basins, settling ponds,	driplines, grave
Natural or newly constructed drainage control and infiltration systems are adequate to eliminate erosion and sediment transport processes. No evidence of erosion or sediment movement on-site.	Observed evidence of minor on-site erosion and sediment transport, but limited to on-site deposition, and no evidence of transport to any SEZ.	Observed evidence of substantial on-site erosion such as frequent rill formation or any observation of gully features observed, or any evidence of sediment transport to SEZ. OR where major maintenance or adaptive erosion control strategies are required for resource protection. OR where water quality data indicates exceedance of state standards.	○ NA

No evidence of unexpected ponding on- site, or constructed detention ponds and outlets are stable (naturally stable, stablized with planted vegetation, or other type of armor) and exhibit no signs of erosion or downstream resource concerns.	Some evidence of on-site ponding, but does not appear to threaten integrity of fillslopes or foundations. Or minor erosion and/or downslope resource concerns, are evident at constructed basin outlet, such as sediment plumes or small rill formation. However, sediment is not transported to SEZ and is not anticipated from events <20-year 1-hour storm.	On-site ponding observed that is threatening fillslope or foundation integrity. And/or outlet of ponded area, or constructed basins, exhibit major erosion including substantial scour, rill or gully formation. Or the evidence of any sediment transport to SEZ.	○ NA
B) Effectiveness of hazardous substance co	introi measures.		
Evaluate the effectiveness, or lack of, BMP a		soils, groundwater or surface water bodies. Conf	tact Hazardous Spil
(Evaluate the effectiveness, or lack of, BMP a Coordinator if accidental spill has occurred.)	pplied to control hazardous chemical delivery to	soils, groundwater or surface water bodies. Cont	·
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of h	pplied to control hazardous chemical delivery to		d indirect effects up
(Evaluate the effectiveness, or lack of, BMP at Coordinator if accidental spill has occurred.) a) Evaluate the occurrence and mitigation of hwater quality. • Hazardous substance control measures	pplied to control hazardous chemical delivery to nazardous/toxic substances used for building and Minor evidence of improper use of hazardous substances, such as chemical or mineral stains; however, evidence of SEZ contamination is not observed and, ground water and soil contamination is limited (consider approximate volume, microtopography, vicinity to SEZ, permeability of soil, depth of stain and recent weather	Substantial resource concern is evident, such as direct/indirect evidence of SEZ or groundwater contamination. If immediate action is warranted, contact Management and Hazardous Spill Coordinator and Water Quality	d indirect effects up

Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX II

2015 RESTORATION & MONITORING ANNUAL REPORT (IERS)





HEAVENLY MOUNTAIN RESORT OUTCOME-BASED WATERSHED MANAGEMENT PROGRAM

2015 RESTORATION AND MONITORING ANNUAL REPORT



Prepared by

Kevin Drake, CPESC
Integrated Environmental Restoration Services, Inc.

Prepared for

Frank Papandrea and Andrew Strain

Heavenly Mountain Resort

April 2016

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INTRODUCTION

This report describes the results of an outcome-based watershed management approach that guided restoration and monitoring efforts on a growing list of mountain improvement projects at Heavenly Mountain Resort since 2007. These projects were approved as part of Heavenly Mountain Resort's 2007 Master Plan Amendment. Integrated Environmental Restoration Services (IERS) principal Michael Hogan began working with Heavenly in 2006 to facilitate an agreement between Heavenly, the USDA Forest Service - Lake Tahoe Basin Management Unit (LTBMU), and the League to Save Lake Tahoe that established common ground between all parties. This agreement laid out a framework for setting clear goals, defining "success" in quantitative terms, developing low-maintenance and effective treatment strategies, and directly measuring the results of project implementation. This framework follows the principles of outcome-based management (described below).

In 2014, this outcome-based watershed management approach was formally incorporated into the Mitigation and Monitoring Program for the Heavenly Epic Discovery EIS and additional erosion hot spot assessment was completed in the upper portion of the CA-1 watershed (Sky Basin) and the NV-1 watershed (Mott Canyon). 2015 was focused on treating high priority hot spots identified in both the CA-1 ad NV-1 watersheds.

PROJECT OVERVIEW

IERS has been working with Heavenly since 2006 to set goals and objectives, define success criteria, develop soil and vegetation treatment approaches, conduct pre-treatment (baseline) and post-treatment (performance) monitoring to measure whether each project had a net impact on soil, vegetation, or runoff and sediment transport, and to document implementation activities. This report describes the process and results of using this outcome-based adaptive management approach to plan, implement, monitor and continually improve specific projects and overall watershed management approaches at Heavenly. This approach has been supported by the League to Save Lake Tahoe, the USDA Forest Service - Lake Tahoe Basin Management Unit, the Tahoe Regional Planning Agency, and the Lahontan Regional Water Quality Control Board and is an integral component of Heavenly's Master Plan Amendment EIR.

Projects implemented under this program to date include lift replacement, lodge construction, spoils placement and stabilization, zip line construction, road construction and removal, ski run clearing and glading, and waterline and snowmaking line installation. For each project, goals and success criteria have been defined, performance monitoring has been conducted using direct erosion measurements (rainfall or runoff simulation) and a suite of soil and vegetation measurements, and follow-up actions have been developed where needed in order to achieve project success criteria. Despite much discussion about adaptive management in the Lake Tahoe Basin, this program is one of the only known multi-year examples of adaptive management actually being applied to improve the sediment source control effectiveness of on-the-ground restoration projects in the Lake Tahoe Basin.

This information being developed in this program is of great value in this region and beyond, as little monitoring of restoration treatment effectiveness has been conducted in high elevation (above 8000 ft) settings with poorly developed soils, particularly those derived from decomposed granite. The Heavenly restoration and monitoring program is demonstrating and continually refining a new model for land management, one that rethinks and tests assumptions about project outcomes. This program is also helping to develop new restoration treatment techniques, expand understanding of treatment effectiveness, define and refine appropriate success criteria, and sharing this information to support similar efforts within and beyond the Tahoe Basin.

OVERALL SITE DESCRIPTION

Heavenly Mountain Resort (Heavenly) is a ski resort located on the east slope of the central Sierra Nevada Mountains in the Carson Range on the southeast side of the Lake Tahoe Basin. Heavenly spans Nevada and California and has approximately 650 acres of ski runs, 30 ski lifts, 35 structures, and approximately 30 miles of roads within the resort boundary.

Soils are derived from granitic parent material and deposits of decomposed granite rock including quartz, monzonite, and granodiorite. Heavenly is predominantly located within a mixed conifer forest, with some of the upper reaches of the resort within a Western White Pine Series vegetation type (Sawyer and Keeler-Wolf, 1995). Elevations range from 6,225 ft above mean sea level (AMSL) in the Heavenly Village to 10,400 ft AMSL at the top of the Sky Express.

The environment varies from densely forested at the lower elevations to open and exposed slopes at the higher elevations. The overstory is dominated by red fir (*Abies magnifica*), whitebark pine (*Pinus albicaulis*), Western white pine (*Pinus monticola*), lodgepole pine (*Pinus contorta*), and mountain hemlock (*Tsuga mertensiana*). Native plants dominate the understory in undisturbed areas and include pinemat manzanita (*Arctostaphylos nevadensis*) and huckleberry oak (*Quercus vacciniifolia*). Native grasses and forbs are also present. At the higher elevations, plant cover is sparser and large areas of bare soil exist. Ski runs and other disturbed and revegetation treatment areas tend to be dominated by non-native fescue (*Festuca trachyphylla*).

OVERALL PROGRAM GOALS

TREATMENT GOALS

- To implement projects that result in no net increase in runoff or sediment transport
- To implement sediment source control treatments that are either self-sustaining (as measured by resilience indices, discussed below) OR are accompanied by a plan for ongoing maintenance and management to maintain erosion resistance
- To develop and demonstrate an applied adaptive management program for development, management and maintenance activities in upper watersheds

MONITORING GOALS

- To quantitatively assess whether projects result in no net increase in runoff or sediment transport
- To identify and quantify indices of long-term ecosystem sustainability to the greatest extent possible
- To use monitoring data to determine the cost-effectiveness of restoration techniques
- To use monitoring data to improve effectiveness of future treatments

OUTCOME-BASED WATERSHED MANAGEMENT APPROACH

The Heavenly Valley Master Plan Amendment EIR of 2007 included an innovative approach to project implementation known as adaptive management, or more recently described as "outcome-based management" (Drake and Hogan 2012). For many years in the Lake Tahoe Basin, projects have been designed to comply with regulations. In that attempt to comply is embedded the assumption that compliance measures actually attain the goals that they are designed to attain. However, a majority of the BMPs currently approved for specific projects have not been tested or measured for performance in the type of situation or conditions to which they are being applied. In fact, most permanent BMPs are based on model predictions, such as the Universal Soil Loss Equation. Thus we have made little progress toward either understanding or improving performance on many of the standard and accepted BMPs. Heavenly has departed from this approach and while the outcome-based management system being employed assures regulatory compliance, this approach is being used to assess the actual performance of both standard and newly developed BMPs in order to assure a higher level of environmental performance and cost-effectiveness.

The concept of adaptive management has been applied for centuries under a number of different names. Physical engineers have used this approach since the first structure or bridge was constructed to continually learn from 'failures' and successes to improve designs. In the realm of applied science, including restoration and erosion control, adaptive management has not, until recently, been widely embraced. This effort at Heavenly Mountain Resort is one of the first projects truly managed for outcomes (rather than simply compliance) in the Lake Tahoe Basin.

Outcome-based management is a stepwise process that enables effective watershed management by embracing the fact that we do not fully understand the range of complex variables within a watershed. The process acknowledges that we do not completely understand the system that we are working with, and that we must proceed with projects using existing information while simultaneously gathering the knowledge that we lack. This structured decision making process is designed to increase knowledge and understanding while taking concrete steps toward quantifiable sediment source control. It is an extremely powerful tool to help protect and improve water quality and guide watershed management programs. Outcome-based management allows flexibility, while supporting accountability and innovation. There are five steps in the outcome-based management process being used at Heavenly:

- **1.** AIMING: articulating goals and objectives, defining success criteria, and identifying known and unknown information.
- 2. GAINING UNDERSTANDING: gathering on-the-ground information the site/project and watershed and assessing strategies for a site-specific implementation plan.

 Monitoring results from past projects are used as the basis for developing treatment strategies for new projects that are most likely to achieve project objectives and success criteria. Often this step includes small-scale development plots to test different treatment approaches.
 IMPROVING
 AIMING
- **3.** DOING: the part of the process where the plan is understood, implemented, and documented to support monitoring and continual improvement.
- **4.** ACHIEVING: directly assessing project performance/effectiveness relative to goals and success criteria and reporting this information annually.
- 5. IMPROVING: embracing unexpected project outcomes, sharing project successes and failures with others, making adjustments to projects that did not achieve their intended outcome(s), and integrating lessons learned into future projects.



Figure 1. Outcome-based Management Model (from Drake and Hogan 2012).

Many technical tools and examples of what has been achieved through this adaptive watershed management process at Heavenly (and many other sites in the Tahoe region) have been integrated into the *Watershed Management Guidebook* (Drake and Hogan 2012), a new resource for outcome-based watershed management prepared by Integrated Environmental Restoration Services for the California State Water Resources Control Board.

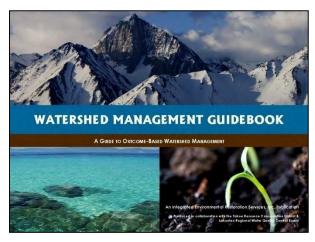


Figure 2. Watershed Management Guidebook (Drake and Hogan 2012).

SHIFTING FROM PLANT COVER TO EROSION RESISTANCE

For many decades, the success of erosion control projects has been defined largely in terms of plant cover or other form-based measures of vegetation response. At the core of Heavenly's Cumulative Watershed Effects (CWE) implementation program is the goal of establishing "effective soil cover." The term "effective soil cover" has its roots in the Universal Soil Loss Equation (USLE), an erosion model developed in and for agricultural settings, not high elevation forested settings like Heavenly. A core assumption in the USLE model is that control of erosion is dependent on the presence of vegetative cover. A growing body of research from Heavenly projects and throughout the Tahoe Basin has shown that effective erosion control is, instead, more dependent on a range of other readily-measurable variables including total cover (mulch, rock, vegetation, etc), soil density, infiltration, and slope and surface roughness than it is on vegetative cover alone (IERS/Grismer and Hogan, 2002-2009). Moreover, short-term plant establishment has been shown to be an insufficient (and sometimes misleading) predictor of long-term restoration success (Herrick et al. 2006) and erosion resistance (Grismer et al. 2008). Heavenly has gone to great lengths and made large financial investments in labor and infrastructure to repeatedly fertilize, seed and irrigate disturbed soil areas in an effort to establish vegetation. However, by using applied adaptive management, testing new treatment approaches, and directly measuring erosion reductions, Heavenly has demonstrated a range of cost-effective treatment and monitoring approaches over the past few years.

In this outcome-based watershed management program at Heavenly, a seemingly modest plant cover success criteria of 10% has been maintained for the past several years. Most treatment efforts at Heavenly over the past 3-4 years have met the success criteria for direct erosion measurements (e.g. sediment yield, infiltration rate) and indices of key soil edaphic¹ factors responsible for controlling erosion (e.g. organic matter, soil density). However, unmet vegetation success criteria in the first year or two after treatment have triggered actions such as reseeding and irrigation in an effort to accelerate vegetation establishment on several projects. In most cases these actions have not led to achievement of vegetation success criteria and in some isolated areas, temporary irrigation has actually *increased* erosion. One year following treatment, the overall *functional* goal of "no increase in runoff or sediment yield" had been met but in pursuit of the commonly accepted *form*-based indicator of erosion control success – vegetation cover – additional resources were expended with no further reduction in erosion risk.

In the arid, high-alpine conditions at Heavenly, soil development and vegetation establishment is a very slow process, even in undisturbed "native" areas. Rather, the ecosystem's natural strategy for resisting erosion and sustaining itself is to capture energy in the form of carbon through breakdown and assimilation of surface organic matter. The soil-based treatment approach at Heavenly has been aiming to re-establish the same soil edaphic factors found in undisturbed areas in areas where those factors have been disrupted (e.g. compaction, topsoil removal, etc.). When soil edaphic factors are optimized, not only is the overall goal of erosion resistance achieved but conditions are created that will eventually support native vegetation. At some sites, nearby seeds transported by wind or animals or root-propagating plants may have a competitive advantage over hand-applied commercial seed. The key variable is time, and we have limited understanding of how these sites will change over time. The outcome-based management process being used at Heavenly is based on this premise that while we cannot

¹ Of, or relating to, the physical, chemical and biological conditions of the soil. Edaphic characteristics include such factors as water content, aeration, and the availability of nutrients.

effectively predict change, we can take steps to learn from each project and simultaneously assure that the goal of erosion resistance is achieved and maintained over time.

We are now using a systematic approach that emphasizes the soil edaphic factors that are required to reduce erosion in the *present* and recognizes that such erosion-resistant soil conditions are a requirement for long-term re-establishment of self-sustaining vegetation communities. This approach is quite different than the way most erosion control efforts are planned, implemented and assessed, and is essentially an important shift from a vegetation-oriented "landscaping" approach to a function-driven "ecosystem" approach.

WATERSHED MANAGEMENT OBJECTIVES

TREATMENT OBJECTIVES

- To prioritize treatment types and locations based on water flow, connectivity and cost-effectiveness
- To maximize hydrologic function (surface flow patterns, infiltration)
- To stabilize soils (surface protection, minimize runoff)
- To re-establish native vegetation where appropriate²
- To minimize irrigation and fertilizer use to greatest extent possible

MONITORING OBJECTIVES

- To quantitatively assess erosion reductions and indices of long-term erosion resistance
- To use monitoring data to determine the cost-effectiveness of different restoration treatments
- To use monitoring data to improve effectiveness of future restoration treatments

WATERSHED ASSESSMENT AND RESTORATION PROCESS

PRIORITIZE TREATMENTS

Rather than assessing vegetation cover at fixed sites around the mountain, Heavenly is using the erosion-focused rapid assessment (EfRA) process described in the *Watershed Management Guidebook* (Drake et al. 2012). This methodology focuses on identifying the primary sources of erosion ("hot spots") through a simple GIS flow accumulation mapping exercise followed by on-the-ground assessment and prioritizing treatments within a watershed context. That is, areas with high erosion potential (or actual observed erosion) and high hydrologic connectivity to surface waters are generally ranked as higher priorities and hot spots with lower erosion potential and/or connectivity to surface water are ranked as lower priorities. This approach is based on developing an understanding of water flow patterns in the watershed and addressing the root cause(s) of erosion issues (often a failed water bar or other concentrated drainage features) rather than using modeling and extrapolation to make statements about the theorized "condition" of the entire watershed. Ultimately, this approach is about actually

² Vegetation re-establishment goals will be determined on a project-specific basis. For instance, vegetation is typically more integral for creating erosion-resistant site conditions in an SEZ or on very steep slopes, whereas vegetation may be a lower priority on a high-elevation project near the top of the mountain. Vegetation establishment trajectories will also be different for sites with access to irrigation versus sites without access to irrigation.

fixing erosion problems. This effort of identifying and prioritizing hot spots began in the CA-1 watershed (Heavenly Valley Creek) in 2013 and will be expanded to other Heavenly watersheds in the coming years.

TREAT PRIORITY AREAS

Once erosion "hot spots" are identified and prioritized, treatments are developed based on the understanding of site conditions gained through Tier 2 or 3 assessment (see Table 1 below), treatment goals and operational requirements. Different treatment levels – ranging from mulch-only to "full restoration" – have been tested and demonstrated at Heavenly over the past decade. Heavenly's intention is to continue testing different erosion control and restoration treatments at different sites in order to demonstrate increasingly cost-efficient and ecologically effective outcomes in watershed management.

MEASURE OUTCOMES

Heavenly has already been using monitoring techniques that directly measure erosion reductions and indices of a site's erosion resistance. These measurement methods are typically used before implementation of erosion control treatments and repeated one year after treatments to assess the effectiveness of a project at reducing erosion and rebuilding erosion resistance at a particular site.

Below is a brief description of the primary assessment approaches being used to measure erosion resistance and treatment effectiveness at Heavenly restoration sites. These methods can be used individually or in combination as assessment "tiers", as described in 1, below. The exact monitoring approach will be adjusted where appropriate to best suit site conditions, assessment and management needs, and treatment goals for specific projects and/or watersheds. Monitoring will be more intensive on some projects and less intensive on others, depending on the site's erosion risk and confidence in the repeatability of results from past projects with similar treatments.

- Visual Erosion Assessment: visually identify physical signs of erosion from direct or indirect field evidence in order to trace them to their source, characterize their nature and cause(s), and use this information to develop appropriate treatments.
- Cone Penetrometer: depth to refusal at a given pressure (typically 350 PSI) is relatively rapid and easy to measure and provides an important index of soil density/compaction.
- Cover Characterization: assess percent total cover, mulch cover, and plant cover using photo grid method
 and/or ocular estimates. These methods are far more rapid than transect-based approaches and since
 vegetation cover alone has been shown to have little to no correlation with sediment yield reductions at
 Heavenly, it is not necessary to be overly precise with plant cover measurements. Dominant vegetation
 species will be noted, as well as presence of any noxious weeds.
- Soil Assessment: field assessment of soil color, structure/texture, and other edaphic factors that provide insights into longer-term erosion resistance and the site's ability to eventually support an appropriate vegetation community. May also include collecting soil samples before treatment (to determine soil deficiencies) and then again 2-3 years post-treatment³ for lab analysis of key indicators of soil "capital" such as organic matter and total nitrogen.

³ Analysis of soil post-treatment soil samples is best done 2-3 years following treatment, since decomposition of high-carbon soil amendments (e.g. wood chips), which are commonly used at Heavenly, takes at least several years in Taboe's arid climate.

- Runoff Simulation: less time required than rainfall simulation and provides useful information about
 erosion processes and a site's erosion resistance, particularly with the coarse granitic soils at Heavenly
 (simulates snowmelt rather than rainfall). Runoff simulation is typically conducted on plots 1 meter wide
 and 2-4 meters in length, which enables assessment of runoff and erosion processes that are likely to be
 more representative of larger areas. Erosion measurements include: surface runoff velocity (ft/min), time
 and distance to rilling, rill characterization (#, soil loss), as well as site description elements such as slope
 angle, cover composition and litter depth.
- Rainfall Simulation: provides direct measurement of soil infiltration rate (in/hr), sediment yield
 (lbs/acre/inch), time to runoff, and other key erosion-related factors. Rainfall simulation is conducted on 1
 square meter plots (smaller than runoff simulation plots) and resulting data is readily comparable to other
 sites and the large database of rainfall simulation data collected on past Heavenly projects and other
 projects throughout the Tahoe Basin.

Table 1. Heavenly Erosion Assessment Tiers

Tools	Tier 1 - Visual	Tier 2 – Soil/Site Condition	Tier 3 - Performance
Visual Erosion Assessment	х	x	х
Cone Penetrometer		X	х
Cover Characterization (mulch and veg cover, litter depth, veg composition)		x	х
Soil Assessment		X Visually assess texture, color, root penetration, soil development, etc.	X Same as Tier 2 + collect samples for analysis (organic matter, N)
Runoff/Rainfall Simulation			Х
Purpose	Identify erosion problems and trace them to their source(s).	Characterize the nature/cause of erosion areas and develop appropriate treatments. This level of assessment will be applied to most sites before/after treatment and can be efficient at larger scales.	Directly assess erosion processes and post-treatment erosion reductions. This level of assessment will be applied at a smaller number of selected sites where new types of treatments and/or site conditions are being assessed.
Level of Effort	Low	Low to moderate	Moderate to intensive
Spatial Scale	Small catchment to whole watershed	Plot scale up to project treatment area (< 1 acre)	Plot scale up to project treatment area (< 1 acre)

EROSION-FOCUSED RAPID ASSESSMENT

Heavenly is using the erosion-focused rapid assessment (EfRA) process described in the *Watershed Management Guidebook* (Drake et al. 2012). This methodology focuses on identifying the primary sources of erosion ("hot spots") through a simple GIS flow accumulation mapping exercise followed by on-the-ground assessment and prioritizing erosion "hot spots" for treatment within a watershed context. That is, areas with high erosion potential (or actual observed erosion) and high hydrologic connectivity to surface waters are generally ranked as higher priorities and hot spots with lower erosion potential and/or connectivity to surface water are ranked as lower priorities. This approach is based on developing an understanding of water flow patterns in the watershed and addressing the root cause(s) of erosion issues (often a failed water bar or other concentrated drainage features) rather than using modeling and extrapolation to make statements about the theorized "condition" of the entire watershed. Ultimately, this approach is about actually fixing erosion problems. This effort of identifying and prioritizing hot spots began in the CA-1 watershed (Heavenly Valley Creek) in 2013 and was expanded to the NV-1 (Mott Canyon) watershed in 2014. The erosion hot spots identified and their treatment status are summarized in this report.

EROSION HOT SPOT RANKING CRITERIA

- Erosion Risk (high/medium/low H/M/L): combination of soil and site factors that directly influence erosion potential such as soil density/compaction, slope angle (steepness), total surface cover, and presence of flow concentration features (e.g. gully, water bar).
- Active Erosion (Y/N): visual evidence of erosion observed.
- Active Deposition (Y/N): visual evidence of sediment deposition observed.
- Proximity to Stream/SEZ (H/M/L): distance from hot spot to stream or SEZ (as the crow flies). Categories are: H = >500ft, M = 100-500ft, L = <100ft
- Connectivity to Stream/SEZ (H/M/L): likelihood of runoff and sediment from hot spot being transported to
 a stream or SEZ. Assessing connectivity requires basic understanding of hydrologic processes and a keen
 eye in the field, yet can be somewhat subjective. In general, high connectivity is characterized by a welldefined drainage path with minimal potential for storage or infiltration (e.g. a relatively steep gully/ditch).
 Low connectivity is generally characterized as having broad topographic definition and little to no
 evidence of recent concentrated flow.
- Watershed Priority (H/M/L): overall treatment priority for improving watershed conditions, based on above criteria.

CA-1: EROSION HOT SPOT SUMMARY MATRIX

Table 2. Heavenly Erosion Hot Spot Summary Matrix (CA-1 watershed)

Hot Spot #	Erosion Risk	Active Erosion	Active Deposition	Proximity to Stream/SEZ	Connectivity to Stream/SEZ	Watershed Priority	Problem Description	Treatment Recommended/ Implemented
1	Н	Υ	Υ	L	L	M	Gully formed on slope from road drainage above	Rock armor gully; PN wattles to capture sediment
2	Н	Υ	Υ	Н	Н	Н	Powderbowl lower slope (directly above creek)	Full Hogan treatment completed in 2012
3	Н	Υ	Υ	Н	Н	Н	ski run with dense soil, little cover and drains direct to creek	remove lower 1-2 WBs; mulch and/or chip 'n' rip
4	Н	Υ	Υ	Н	Н	Н	small gully connecting road runoff to creek	chip 'n' rip road shoulder (to spread and infiltration runoff) + add PN wattle as sediment forebay
5	Н	Υ	Υ	Н	Н	Н	water bar creates quasi- basin off Maggies, which overtops to down drain direct to creek when full	slight reshaping and Full Hogan treatment to maximize infiltration
6	Н	Υ	Υ	L	L	M	Giant sediment plume and incising WBs downslope of road, all caused by concentrated road runoff	2015: Infiltration area added for road runoff; entire slope mulched; sediment plume removed at bottom of slope
7	М	Υ	Υ	L	L	M	Road drainage to breached WB formed gully down fir- covered ski run.	maintain drainage to WB on ski run; rake out gully; apply thick mulch to lower ski run above road
8	Н	Υ	Υ	Н	M	M	Gully down 277 sidehill below mid-slope WB	remove WB and gully and treat with full Hogan
9	н	Υ	Υ	Н	н	н	large plume of deposited sediment and eroding slope above (just downslope of 277 sidehill)	stabilize bare soil areas with Full Hogan and/or chip 'n' rip; mulch filter berm or PN wattle could be temp fix

Hot				Proximity	Connectivity			Treatment
Spot	Erosion	Active	Active	to	to	Watershed	Problem	Recommended/
#	Risk	Erosion	Deposition	Stream/SEZ	Stream/SEZ	Priority	Description	Implemented
10	н	Υ	Υ	н	н	н	Road drainage/erosion issues into SEZ above snow beach	PN wattles already installed as temp protection; stabilize compacted/bare source areas along roads upslope (e.g. chip 'n' rip); heavy chip 'n' rip below road to create spreading/infiltration area
11	Н	Υ	Υ	М	М	L	gully on slope created from concentrated road drainage	re-orient road drainage or rock-armor gully
12	М	Y	Y	М	М	M	Combo of ski run erosion and road drainage near Patsy's chair. Head cutting along rock swale near summer road. Roadside swale buried in sediment. Several bare areas and gullies on ski run.	Consider surfacing road to reduce erosion. Stabilize bare/eroding areas on ski run. Maintain portions of rock armored swales and till in chips under swales to increase infiltration.
13	Н	Y	Y	М	Н	L	water bar draining to reservoir.	Infiltration swale constructed and wattles installed 2015
14	Н	Y	Υ	М	М	L	water bar draining to reservoir.	Infiltration swale constructed and wattles installed 2015
15	Н	Υ	Υ	Н	М	L	water bar draining to reservoir.	Infiltration swale constructed and wattles installed 2015
16	Н	Υ	Υ	Н	Н	L	water bar draining to reservoir.	Infiltration swale constructed and wattles installed 2015
17	Н	Υ	Υ	Н	Н	Н	1st WB below res on Maggie's, drains direct to crk.	Wood chips applied along shoulders; PN wattles installed and maintained throughout season
18	Н	Υ	Υ	Н	Н	Н	2nd WB below res on Maggie's, drains direct to crk.	Wood chips applied along shoulders; PN wattles installed and maintained throughout season
19	Н	Υ	Υ	М	М	M	WB along Maggie's, first below intersecting rd (drops of steep slope)	Wood chips applied along shoulders; PN wattles installed and maintained throughout season
20	Н	Υ	Υ	М	М	M	WB along Maggie's	Wood chips applied along shoulders; PN wattles installed and maintained throughout season

Hot				Proximity	Connectivity			Treatment
Spot	Erosion	Active	Active	to	to	Watershed	Problem	Recommended/
#	Risk	Erosion	Deposition	Stream/SEZ	Stream/SEZ	Priority	Description	Implemented
21	Н	Υ	Υ	M	Н	Н	WB along Maggie's, obvious flow accum above road	Wood chips applied along shoulders; PN wattles installed and maintained throughout season
22	Н	Υ	Υ	M	М	M	WB along Maggie's, starting to flatten out (geogrid on slope)	Wood chips applied along shoulders; PN wattles installed and maintained throughout season
23	М	Υ	Υ	Н	н	н	Lower Pioneer Poma - several WBs concentrate surface runoff into swale down middle of ski run, which routes sediment to SEZ	Full Hogan and chip 'n' rip treatments completed October 2013
24	Н	Υ	Υ	н	н	н	water bar drains direct to creek	PN wattles installed and maintained above Creek
25	Т	Υ	Υ	н	н	M	ditch between road and eroding cut slope; major deposition; req's frequent maintenance	stabilize cut slope (install a few small test treatments); use pine needle check dams to trap sediment and determine slope areas producing most sediment
30		N	Υ	Н	Н	M	bare and poorly vegetated area under Sky Deck (~3000sf)	restoration and planting shade- tolerant meadow/riparian species
31	М	Υ	Υ	Н	Н	н	erosion from bare ski run area above road (and on road) directly to meadow below	Mulch application completed on road shoulders above meadow
32	М	Υ	Υ	Н	Н	Н	rock-lined swale around Canyon base filled with sediment; sediment plume into meadow	Sediment removed and pine needle check dams added to drainage

Hot				Proximity	Connectivity			Treatment
Spot	Erosion	Active	Active	to	to	Watershed	Problem	Recommended/
#	Risk	Erosion	Deposition	Stream/SEZ	Stream/SEZ	Priority	Description	Implemented
33	Н	Υ	Υ	н	M	н	steep ski run (lower double down) with low surface cover and sparse trees; water bar near bottom of run filled with sediment and overtopped	2015: Pine needle filter berms installed across slope; water bar tilled and converted to infiltration swale
34	Н	Y	Y	Н	Н	Н	steep ski run (lower ridge run/sky chute) with little surface cover and widespread erosion; several v-shaped water bars direct water to a culvert system that leads to meadow and several water bars have overtopped (causing erosion below)	2015: water bar to swale conversation; nearly 1 acre of mulching and mulch berms completed on ski run
35	М	N	N	н	н	н	bare, compacted vehicle turnaround and access to Sky lift base, which is ~20ft from creek channel	Thick wood chip mulch added to turnaround in 2014
36	Н	Υ	Υ	M	Н	н	water bar draining road is causing erosion under large ski run sign, compromising power box, and contributing runoff and sediment to ski run below (lower ridge run - hot spot 34)	Infiltration swale created and pine needle wattle installed in 2015
37	Н	Υ	Υ	L	Н	н	road drainage collects at V- shaped water bar with culvert direct to meadow; erosion along water bar (head cutting); water bar overtopped at culvert inlet, causing erosion downslope	Infiltration swale created and pine needle wattle installed in 2015

Hot Spot	Erosion	Active	Active	Proximity to	Connectivity to	Watershed	Problem	Treatment Recommended/
#	Risk	Erosion	Deposition	Stream/SEZ	Stream/SEZ	Priority	Description	Implemented
38	н	Υ	Y	L	Н	Н	road drainage directed along water bar on ski run; erosion along water bar and downslope where water bar overtopped	Infiltration swale created and pine needle wattle installed in 2015
39	н	Υ	Y	L	н	L	large ephemeral drainage; lots of woody debris in flow line and moderate mulch cover in surrounding areas	no action recommended
40	н	Y	Y	L	M	L	many water bars on high roller ski run above and below summer road; many have failures where they have overtopped, causing erosion downslope	rehab water bars at failure points and convert into infiltration swales through soil loosening, wood chip incorporation (~10,000-15,000sf)
41	н	Υ	Υ	L	н	M	ski run (upper ridge run) with ~6 eroding water bars that direct runoff into large drainage that eventually outlets at the Canyon lift base and connects to Sky Meadow; many water bars have failures.	rehab water bars at failure points and convert into infiltration swales through soil loosening, wood chip incorporation (~10,000-15,000sf)
42	М	N	N	Н	Н	M	south fork of SEZ channel above Sky Meadow culvert with mostly bare soil and moderately steep slopes on both sides of channel; old decomposed jute and plastic netting observed from previous USFS erosion control efforts; generally no visible erosion from banks; channel is somewhat straight and incised but no significant head cuts or bank erosion observed	definitely potential for restoration/stabilization of banks (loosening/seeding/mulch - no fabric); approx ~5000sf of bare soil along channel

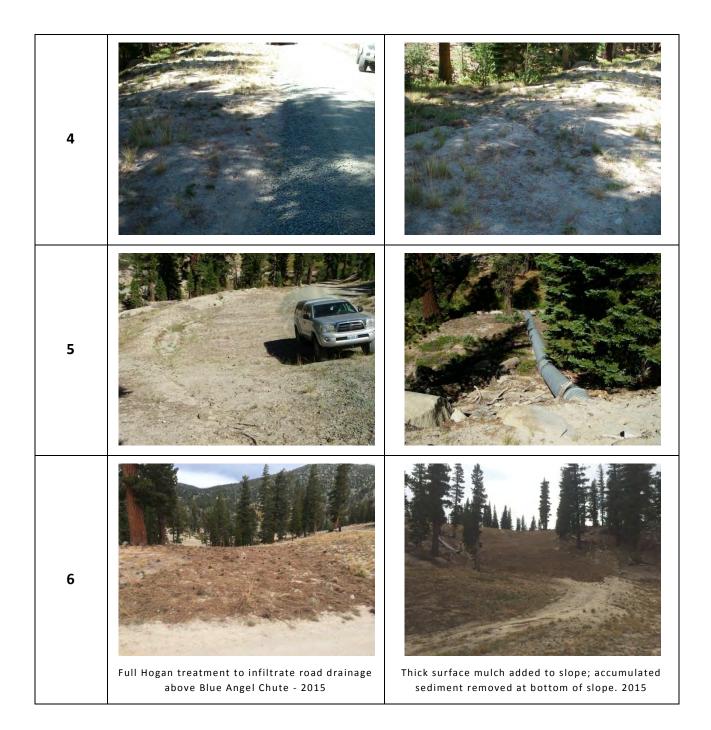
Hot				Proximity	Connectivity			Treatment
Spot	Erosion	Active	Active	to	to	Watershed	Problem	Recommended/
#	Risk	Erosion	Deposition	Stream/SEZ	Stream/SEZ	Priority	Description	Implemented
43	М	Y	Y	Н	Н	M	bank erosion and sediment plume in south fork of SEZ channel above Sky Meadows culvert	bank stabilization/restoration treatment (loosening/seeding/mulch - no fabric); ~300sf
44	М	Υ	Υ	Н	Н	M	sediment plume in south fork of SEZ channel above Sky Meadows culvert; sediment appears to have come from short section of rock-lined swale upslope of creek; no obvious bank erosion	decommission rock-lined swale, which appears to unnecessarily collect dispersed runoff from rocky slope above it (~1000sf)
45	Н	Υ	Υ	Н	Н	Н	very steep section of road (Hellwinkle's) is delivering sediment downslope into a fingered section of the north fork of the SEZ channel above Sky Meadows culvert; rills and gullies formed on hillslide below road and above channel	stabilize rills/gullies on hillside, and address road runoff. Road options: 1) surface and/or pave road; 2) decommission road and use only for emergency access; 3) improve infiltration capacity and conduct very frequent maintenance at sediment basins along road (~1000-5000sf)
46	Н	Υ	Υ	Н	Н	Н	very steep section of road (Hellwinkle's) is delivering sediment downslope into a fingered section of the north fork of the SEZ channel above Sky Meadows culvert; minor rilling on hillslide below road and above channel	options: 1) surface and/or pave road; 2) decommission road and use only for emergency access; 3) improve infiltration capacity and conduct very frequent maintenance at sediment basins along road (~1000-5000sf)
47	M	Υ	Υ	L	Н	L	large ephemeral drainage at crossing with lower Cal trail; relatively stable and well vegetated with small meadow below road crossing; evidence of flow during recent rain events but no obvious sediment transport	no action recommended

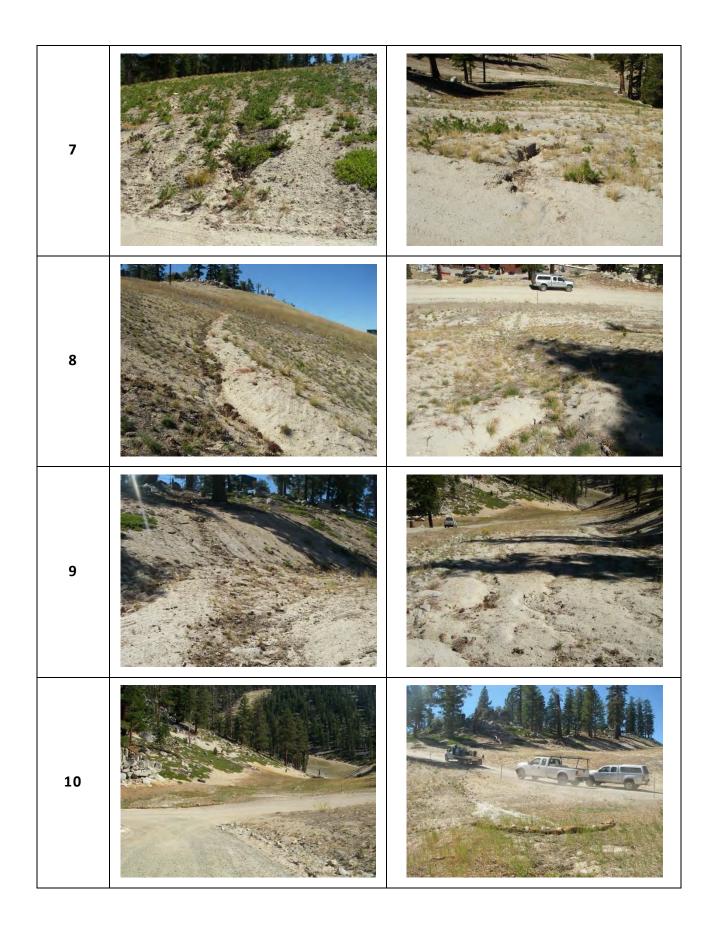
Hot Spot	Erosion	Active	Active	Proximity to	Connectivity to	Watershed	Problem	Treatment Recommended/
#	Risk	Erosion	Deposition	Stream/SEZ	Stream/SEZ	Priority	Description	Implemented
48	M	Y	Y	L	М	L	well-established gully formed at downslope end of lower Cal trail; collects water from large drainage area; moderate amount of erosion and deposition observed from recent rain storm	full restoration treatment along gully (maintain general swale-like shape) to slow and infiltrate surface runoff during spring snowment and rain storms; installation of mulch filter berms would provide short-term benefits (~1500sf)
49	Н	Y	Y	Н	М	Н	steep ski run (lower Liz's) with compacted soil, moderate veg cover, and visible rilling; water bar near bottom of run filled with sediment and overtopped in several locations	2015: Water bar converted to infiltration swale and mulch berms installed on ski run upslope

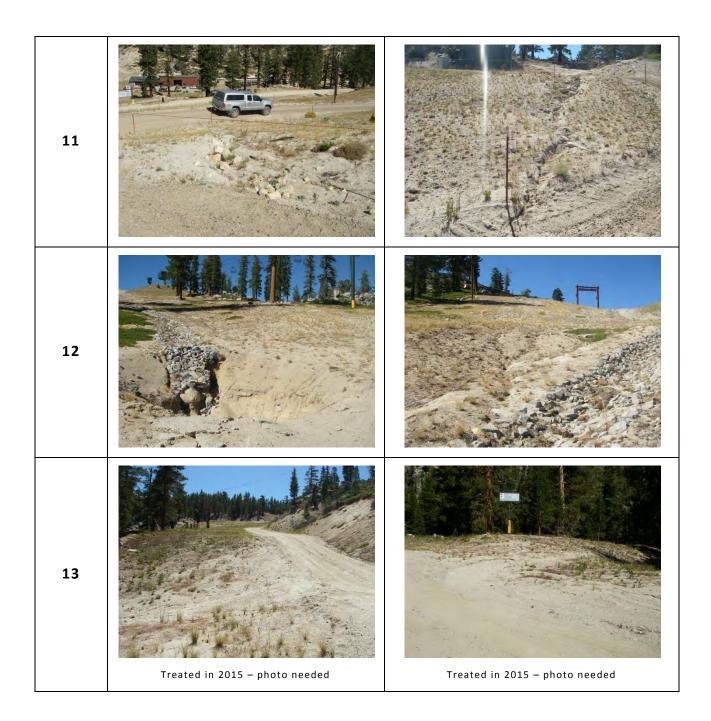
CA-1: EROSION HOT SPOT PHOTOS

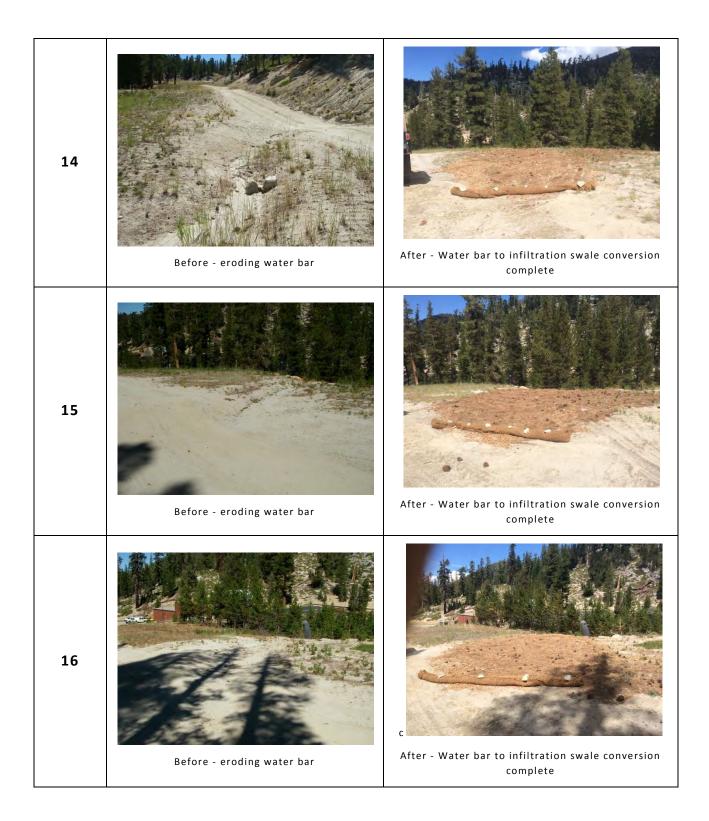
Table 3. Heavenly Erosion Hot Spot Photo Summary (CA-1)

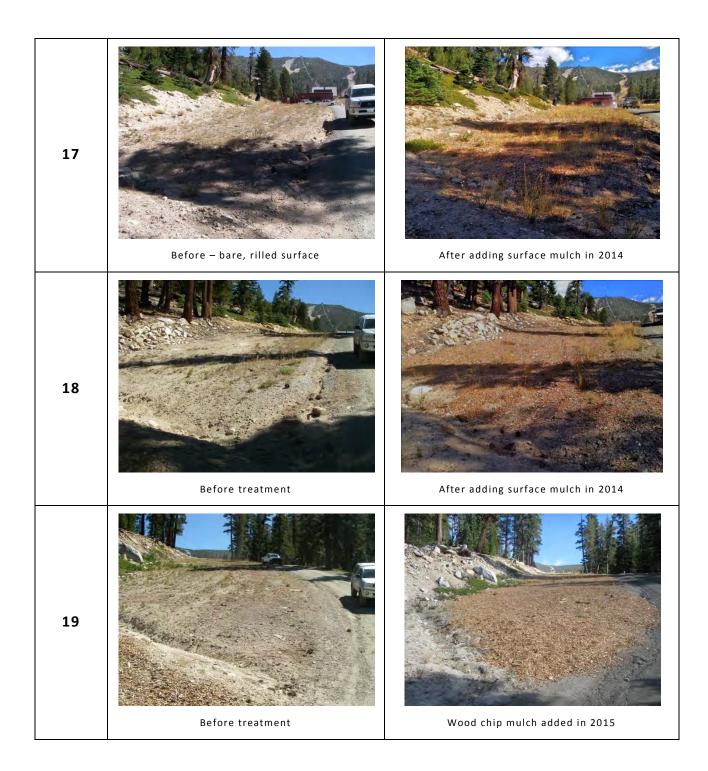
Hot Spot #	Photo 1	Photo 2
1		
2	Water bar and erosion	1 year after full restoration treatment
3		

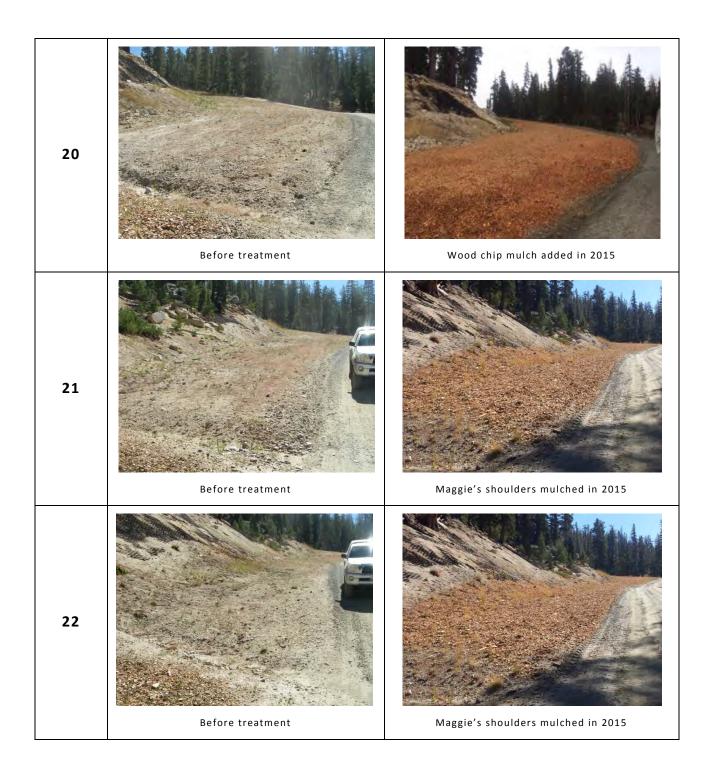


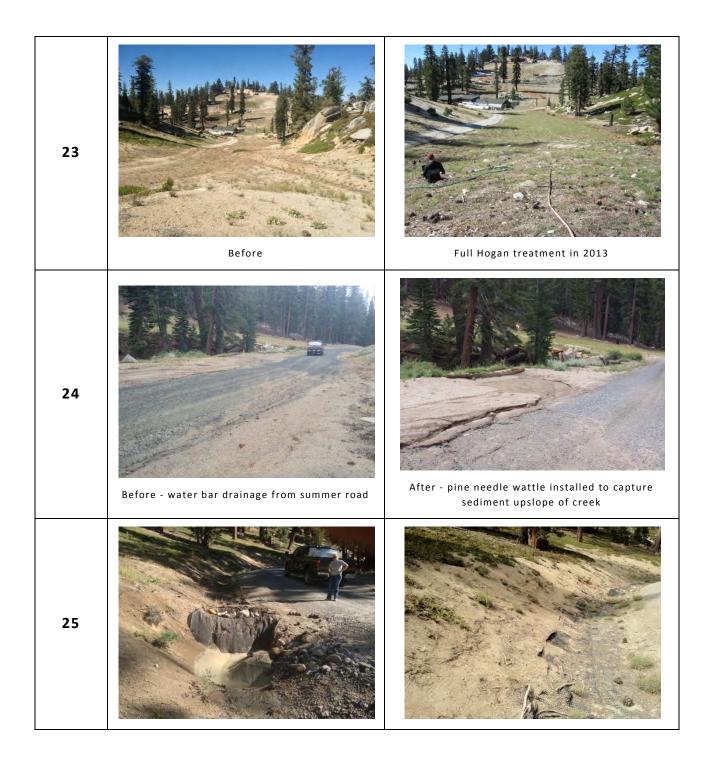


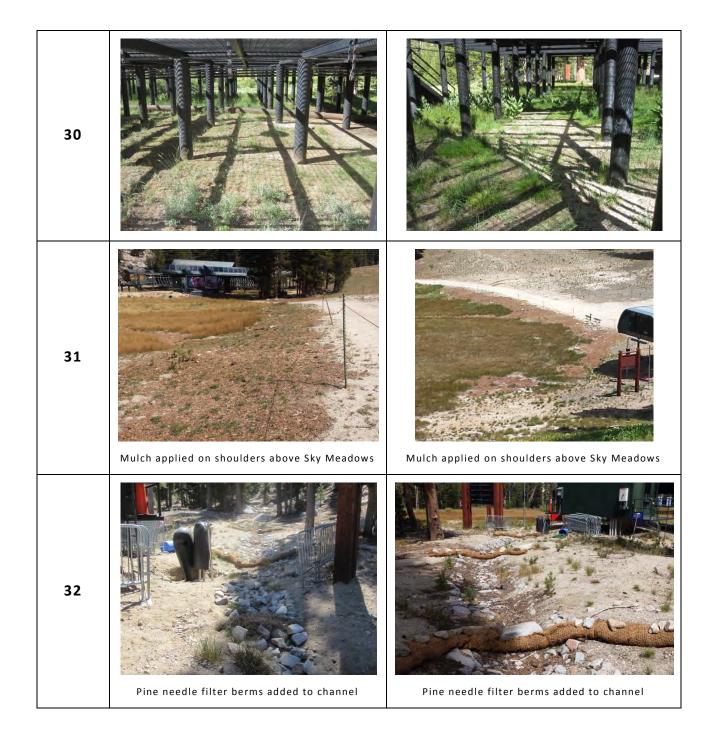


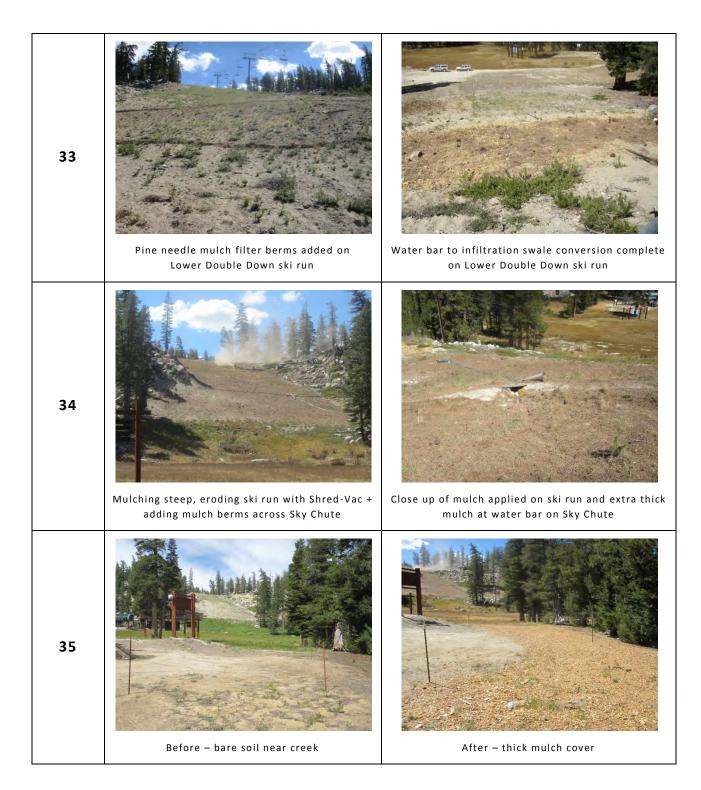


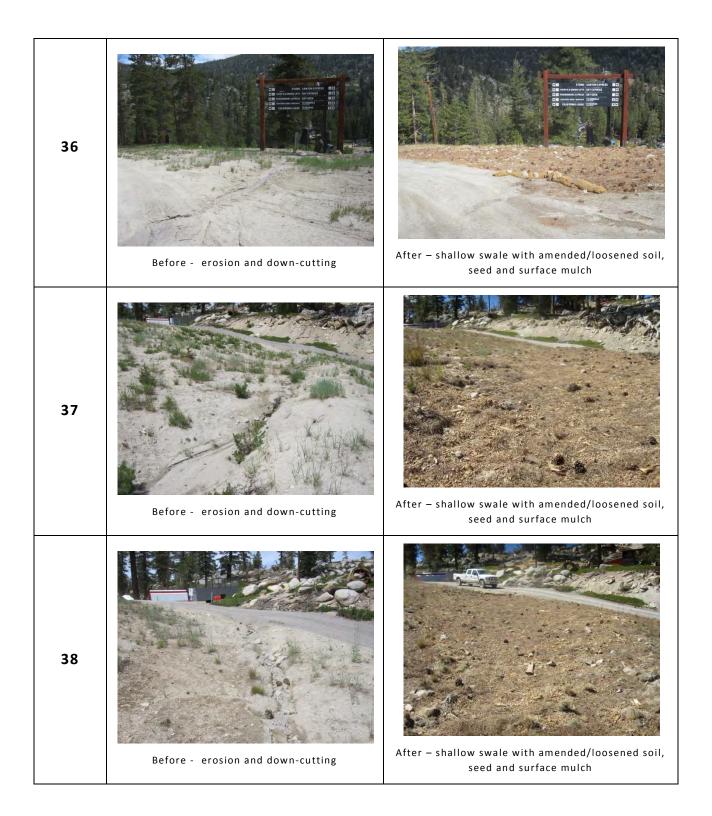


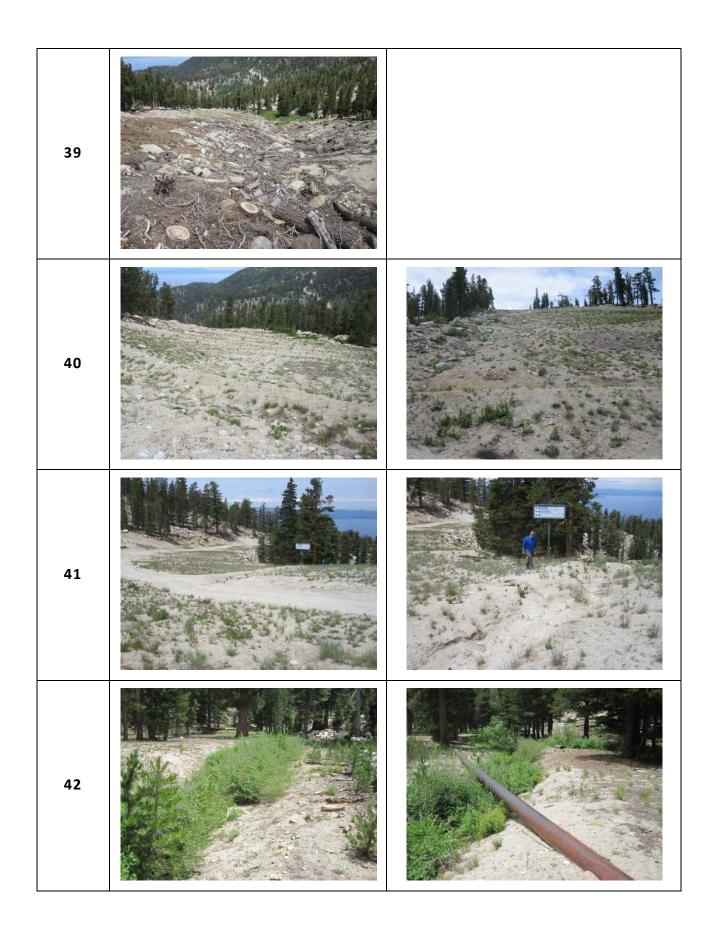


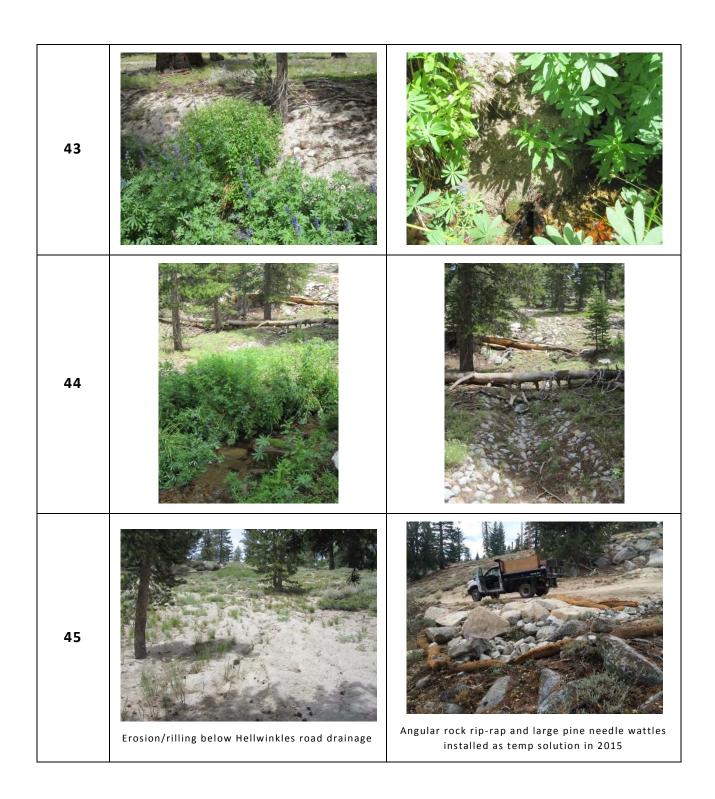


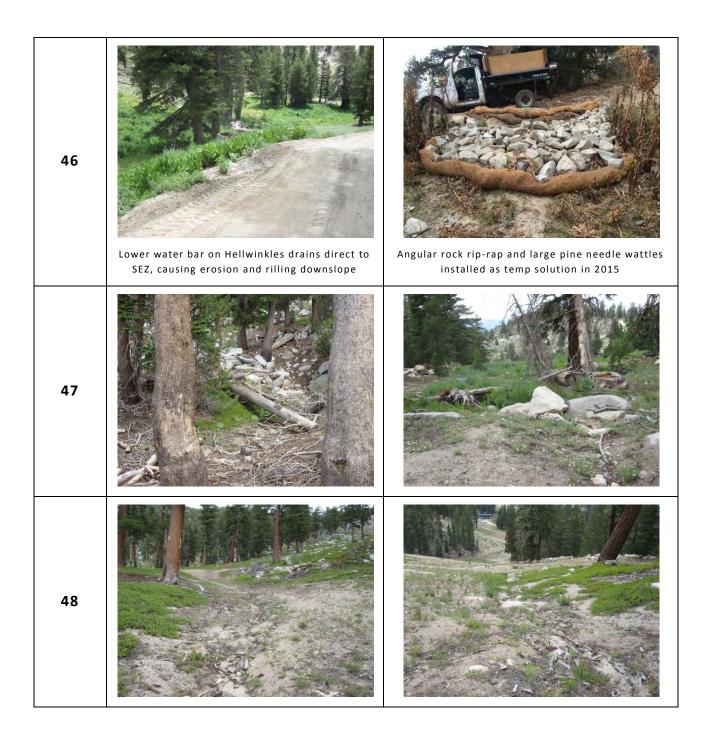














Eroding water bar across Lower Liz's ski run



Water bar converted to infiltration swale in 2015



49



Gully formed in spring 2015.



Infiltration area added upslope to address source of runoff; Full Hogan treatment on slope. PROBLEM IDENTIFIED AND TREATED IN SAME SEASON!

CA-1: EROSION HOT SPOT MAPS

See next page.

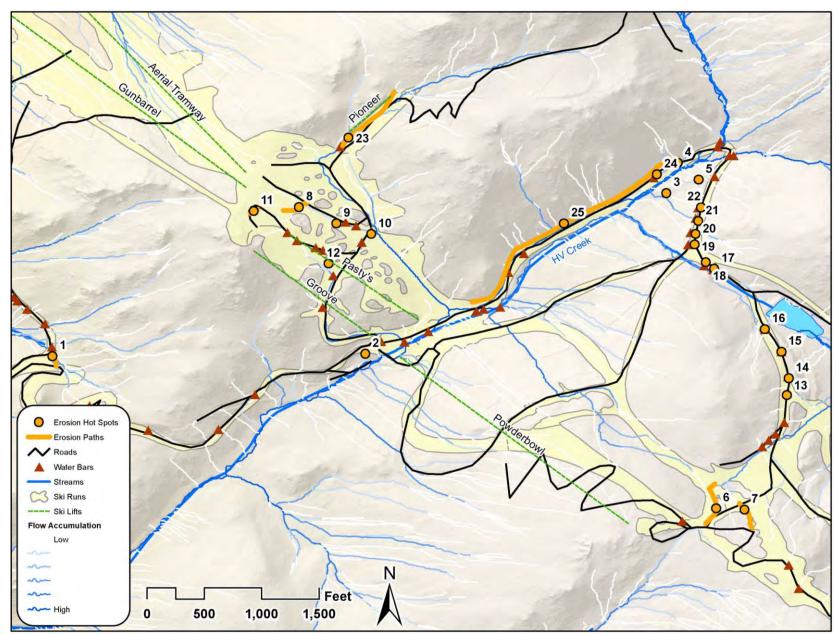


Figure 3. EfRA Summary Map showing hot spots in lower Heavenly Creek watershed (CA-1).

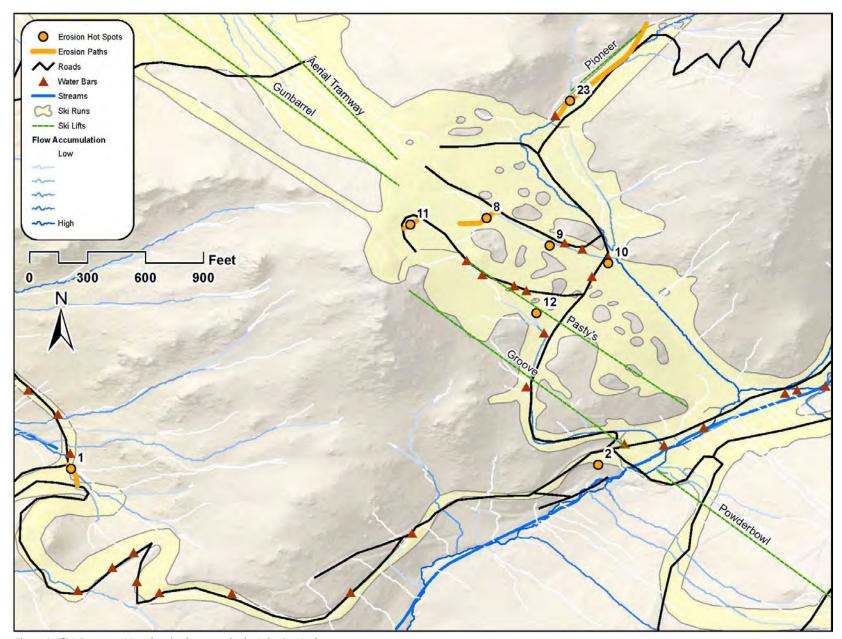


Figure 4. EfRA Summary Map showing hot spots in the Lakeview Lodge area.

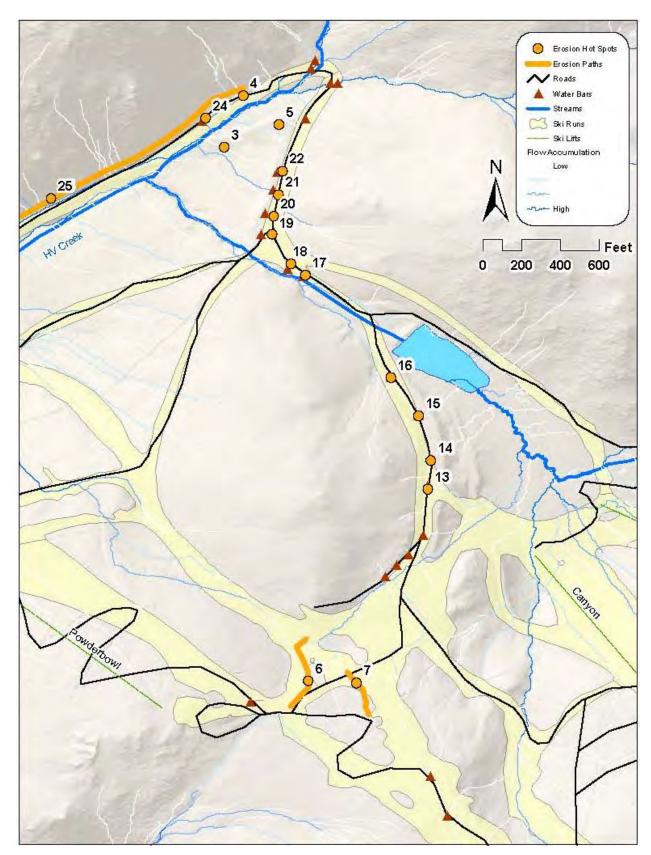


Figure 5. EfRA Summary Map showing hot spots in the Maggie's Run area.

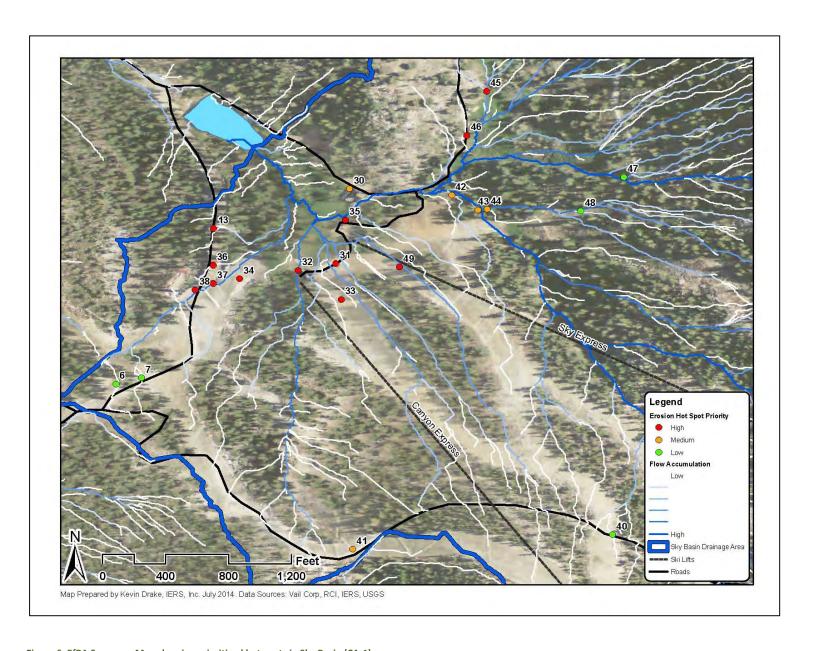


Figure 6. EfRA Summary Map showing prioritized hot spots in Sky Basin (CA-1).

NV-1: EROSION HOT SPOT SUMMARY MATRIX

Table 4. Erosion Hot Spot Summary Matrix (NV-1 Watershed)

Hot Spot #	Feature Type	Hot Spot- Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Overall Priority	Problem Description, Notes	Mitigation Recommendations
1	water bar	Y	L	Υ	Υ	L	М	н	trail crosses old low-gradient water bar	remove/decommission water bar using soil restoration treatment
	water									rebuild water bars and create infiltration capacity on the upslope side through soil restoration treatment; rake out rills downslope; construct mulch berms or infiltration strips on ski run to
2	bar	N	Н	Υ	Υ	L	М	M	water bar overtopped (WB #4 on Orion's); heavy rilling below	prevent further erosion by slowing/disbursing flow
3	rill/gully	Y	М	Y	Y	L	М	Н	rilling through depositional area below steep rocky slope where proposed beginner trail crosses	restoration treatment to stabilize rilling area below rocks
4	rill/gully	Y	Н	Υ	Υ	L	M	н	several rills and a big gully down Aries ski run; both beg and adv trails are proposed to cross erosion paths on ski run	address source of runoff (see HS#5); stabilize ski run with full restoration treatment and/or series of infiltration strips or mulch berms
5	ski run/ road	Y	M	Υ	Y	L	M	н	compacted ski run/old road below Comet lift top terminal sheds water onto Aries ski run, contributing to ski run erosion issues (linked to HS #4)	create infiltration/spreading area at top of Aries ski run (before ski run steepens)
6	rill/gully	Υ	М	Υ	Υ	L	М	Н	~4 distinct large rills on ski run at proposed trail crossing	soil restoration treatment to stabilize rilling area below rocks
7	water bar	Υ	Н	Υ	Υ	L	M	Н	proposed trail crossing at water bar with erosion, which collects runoff from at least 150ft of dirt road	design stable drainage crossing for trail
8	propose d trail	Y	L	N	N	L	Н	Н	proposed trail switchback very near dipper drainage; lots of bare soil but no visible erosion	shift trail alignment so it doesn't drain to dipper drainage
9	water	Υ	М	Υ	Υ	L	М	Н	proposed trail switchback at end of water bar (major depositional area)	shift trail alignment away from water bar depositional area

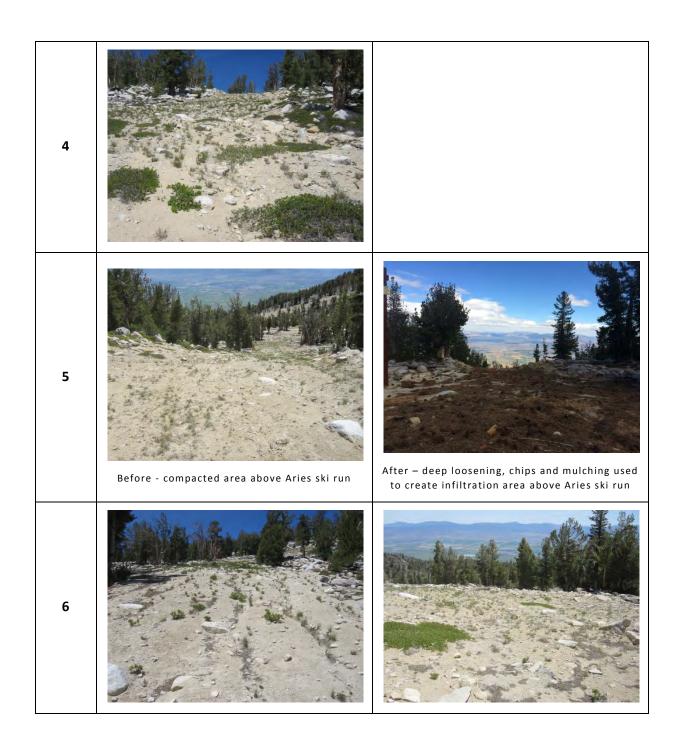
Hot Spot #	Feature Type bar	Hot Spot- Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Overall Priority	Problem Description, Notes	Mitigation Recommendations
10	propose d trail	Υ	M	Y	Y	L	Н	н	proposed trail switchback very near dipper drainage with a few rills just upslope of proposed trail and connecting to dipper drainage	shift trail alignment away from dipper drainage and existing rills
11	water bar	Υ	M	Υ	Y	L	L	н	proposed trail switchback near water bar outlet with visible rilling	shift trail alignment away from water bar drainage area
12	road	N	L	N	N	L	М	L	old road - mitigation opportunity	decommission old road
13	propose d trail	Υ	L	N	N	L	Н	н	proposed trail switchback close to dipper drainage and in area with heavy Manzanita understory	shift trail alignment away from dipper drainage and out of heavily- vegetated area
14	water bar	N	Н	Y	Y	L	Н	M	several blown out water bars on Big Dipper ski run; mitigation opportunity - not in proposed trail alignment	rebuild water bars and create infiltration capacity on the upslope sides through soil restoration treatment; rake out rills downslope; construct mulch berms or infiltration strips on ski run to prevent further erosion by slowing/disbursing flow
15	depositi onal area	N	Н	Y	Y	L	M	M	depositional area at lower end of dipper drainage	address erosion through source control upslope
16	drainage	Υ	M	Y	Y	L	M	н	proposed trail alignment crosses defined drainage	shift proposed trail alignment (location of switchback) to avoid crossing drainage
17	road	N	М	Υ	Υ	L	М	L	old road to avalanche gun - mitigation opportunity	Road to avi gun decommissioned in 2015
18	road	N	L	N	N	L	L	L	short loop/turnaround road - mitigation opportunity	Turnaround decommissioned in 2015
19	road- drainage crossing	N	Н	Y	Y	M	M	M	lower end of dipper drainage crosses summer road; know to carry moderate flow during spring runoff	Pine needle mulch berms installed across channels that drain to road; still need to create infiltration/spreading area below

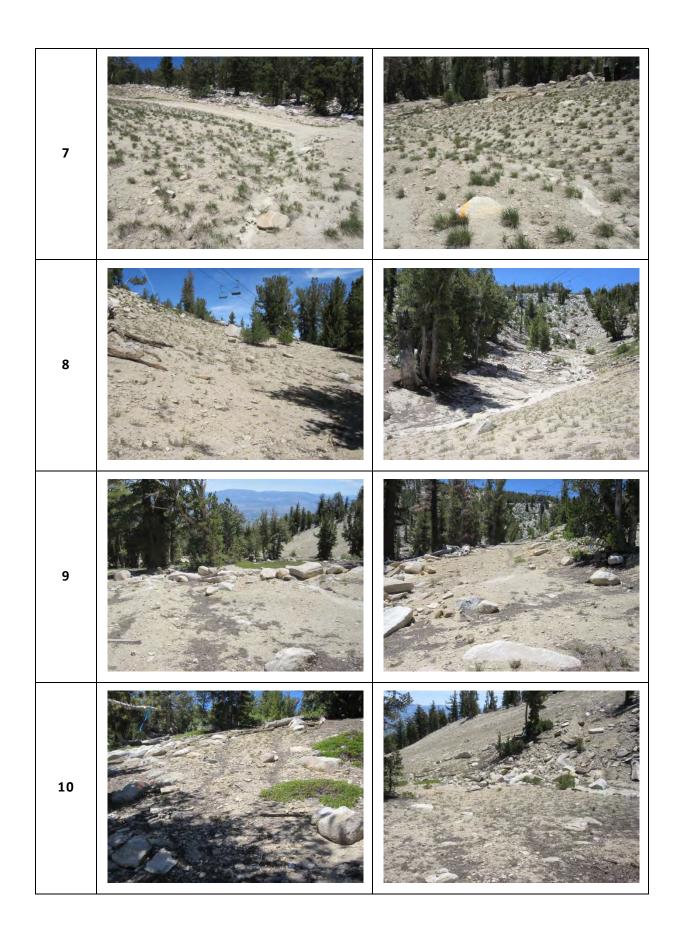
Hot Spot #	Feature Type	Hot Spot- Proposed Trail Interaction	Erosion Risk	Active Erosion	Active Depos.	Prox to stream or SEZ	Connect. to stream or SEZ	Overall Priority	Problem Description, Notes	Mitigation Recommendations
										road
20	drainage	Y	L	Υ	Υ	M	L	н	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
21	drainage	Y	M	Y	Y	M	L	н	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
22	drainage	Υ	L	Υ	Υ	M	L	н	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
23	drainage	Y	Н	Y	Y	M	L	н	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing
24	drainage	Y	M	Y	Y	M	L	н	proposed trail alignment crosses defined drainage (created by concentrated runoff from water bars on Orion's ski run upslope)	realign trail to avoid drainage or design stable drainage crossing

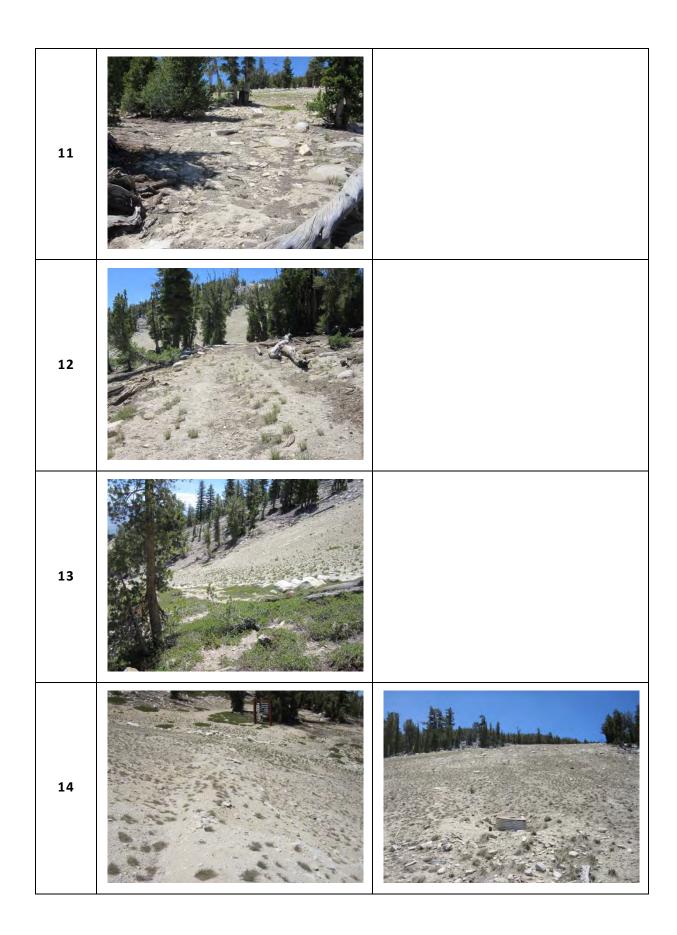
NV-1: EROSION HOT SPOT PHOTOS

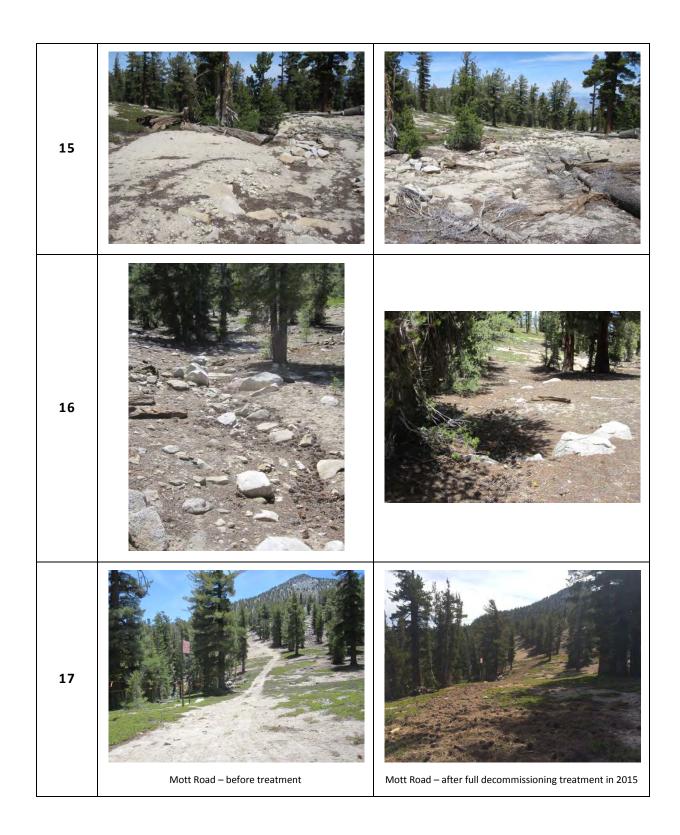
Table 5. Erosion Hot Spot Photo Summary (NV-1 Watershed)

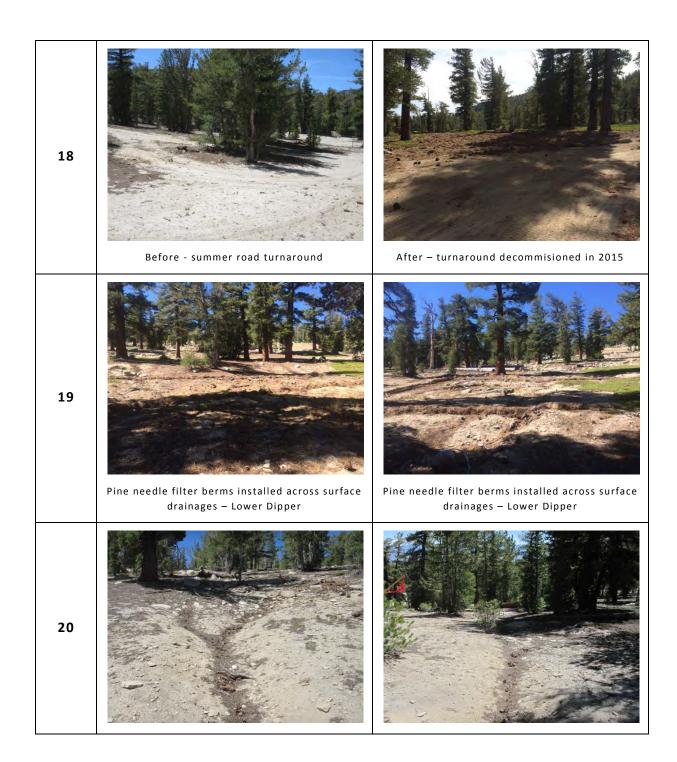
Hot Spot #	Photo 1	Photo 2
1		
2		
3		

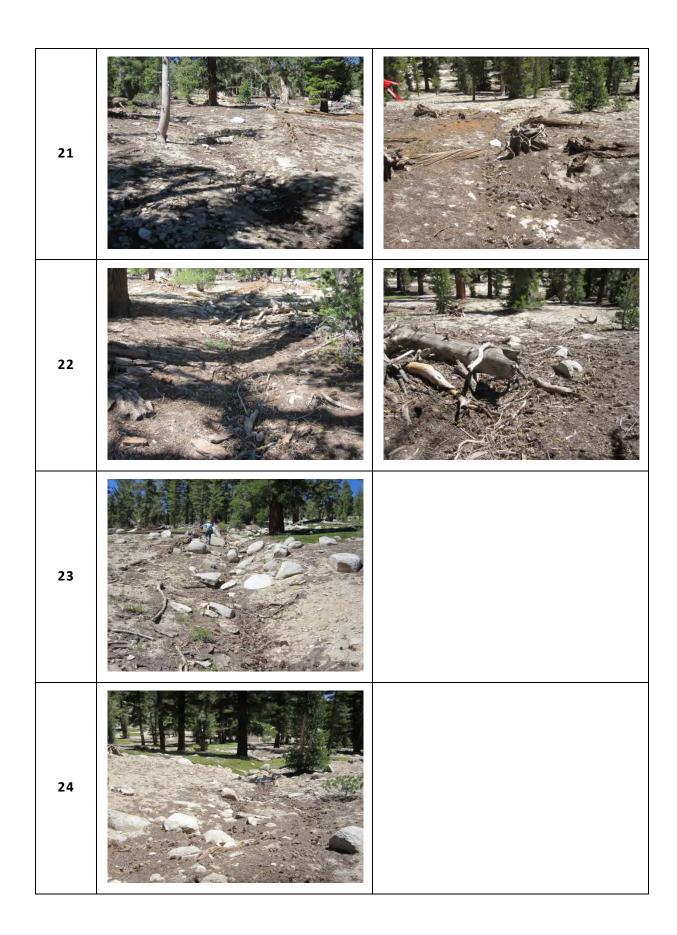












NV-1: EROSION HOT SPOT MAPS
See next page.

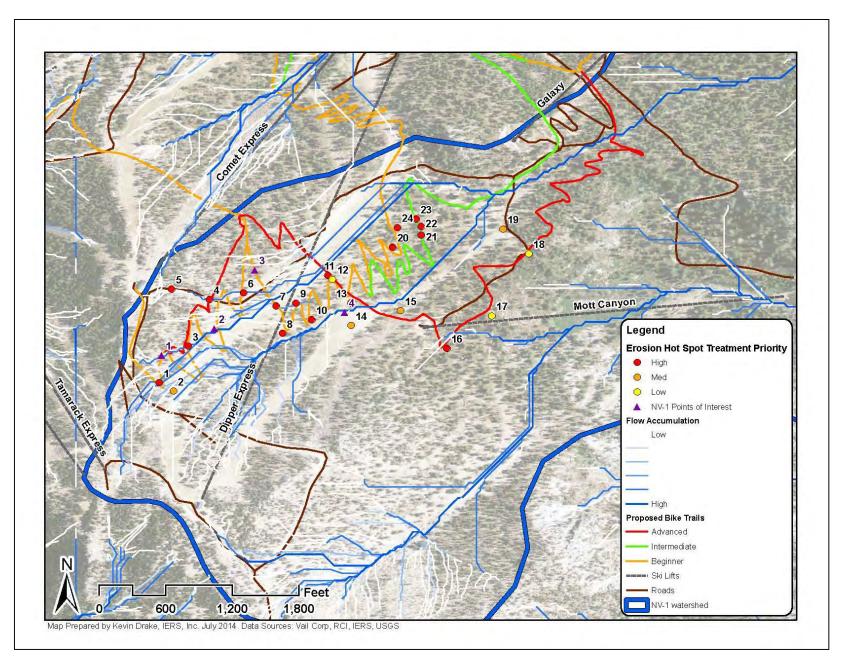


Figure 7. EfRA Summary Map showing hot spots in NV-1 watershed, zoomed in to focus on hot spot locations.

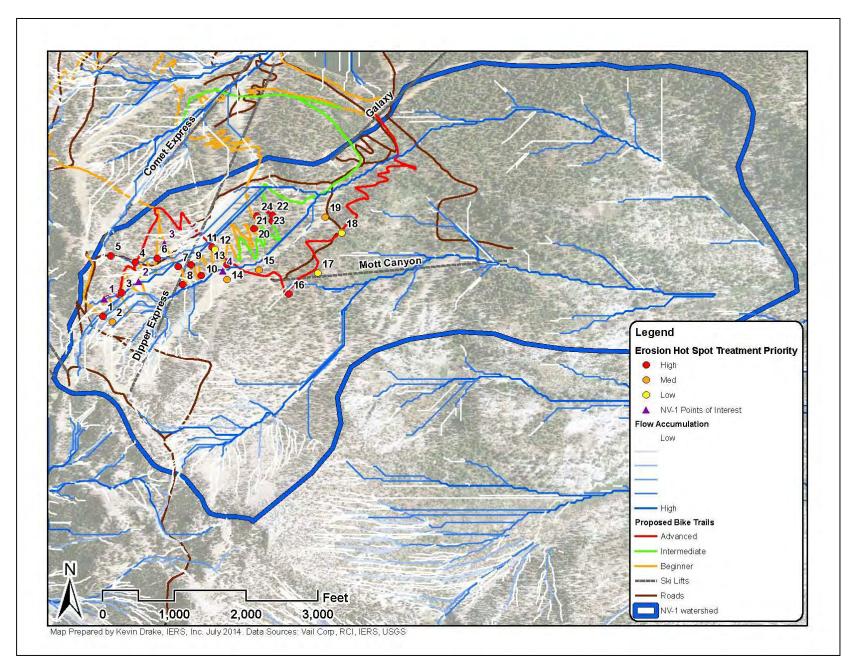


Figure 8. EfRA Summary Map showing hot spots in Mott Canyon (NV-1), zoomed out to show entire NV-1 watershed.

MAGGIE'S TRAIL (CA-1 HOT SPOTS 17-22)

OVERVIEW

Maggie's Trail is a ski run in the winter and a road with wide shoulders in the summer months. It is located immediately downslope of the mid-mountain reservoir near the base of the Canyon Lift. The shoulder areas alongside the summer road are very compacted and despite many years of efforts to revegetate and stabilize the slopes using primarily seeding and irrigation, the soil is still very compacted and vegetation cover is relatively sparse. Rills are abundant throughout this area and are a likely a result of high soil compaction and low surface cover. This area is very steep and has tightly spaced water bars, some of which drain directly to Heavenly Valley Creek. All of these factors combined make Maggie's Trail a high priority from an erosion control standpoint and a good opportunity to test several types of treatments along a long, linear road shoulder/ski run.

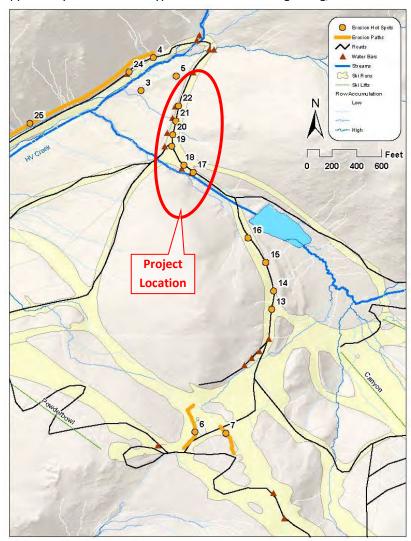


Figure 9. Maggie's Trail project location map.

RESTORATION TREATMENTS

The road shoulders along Maggie's are referred to as "plots", which are delineated by the water bars at the base of each plot (Hot Spots 17-22). The upper three plots drain directly to Heavenly Valley Creek, and were deemed the highest treatment priorities. Plot 1 was mulched with wood chips in 2014. Plots 2 and 3 were mulched with wood chips in 2015. Some of these plots are intended to receive full treatment (soil loosening, seeding, etc) in future years, but applying several inches of mulch is expected to provide immediate sediment reductions with less initial effort. The photos below show Plot 2 before and after mulch application.





Figure 10. Photo of Maggie's Plot 2 before treatment.

Figure 11. Photo of Maggie's Plot 2 after applying wood chips in 2015.

PERFORMANCE MONITORING

In 2013, IERS conducted a baseline assessment of existing conditions at Maggie's Trail. The baseline assessment included photo documenting the site, runoff simulation, penetrometer depth to refusal (DTR) readings, soil moisture readings, ocular estimate of mulch and vegetation cover/composition, visual erosion assessment and documentation of general site characteristics.

Runoff Simulation

Runoff simulation can be used in many different ways to directly assess the erosion resistance of a site. At this site, water was delivered to the slope at a flow rate of 2 gallons per minute and the surface runoff rate (feet per minute) was recorded. Distance of surface flow is measured in feet at 1 minute intervals for up to 10 minutes or until surface runoff has traveled 10 feet – whichever happens first. As illustrated in the graph below, surface runoff reached the end of the plot (10 ft) within 2 minutes before treatment and between 6 and 10 minutes after applying surface mulch. While runoff simulation produced very little rilling in 2013, rills from natural rain and snowmelt were visible throughout the plots. With 3-4 inches of wood chips applied to the surface, runoff still occurred but at a much slower rate than before treatment and with far less erosive force.

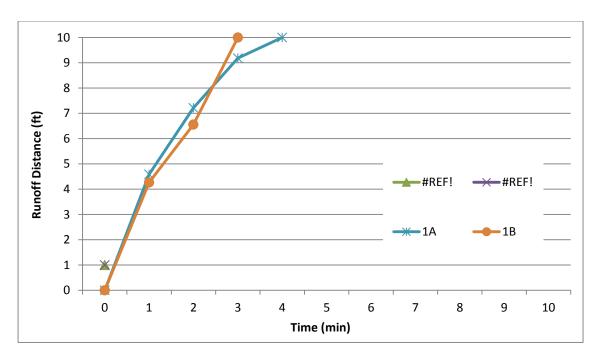


Figure 12. Runoff simulation results before and after mulch application at Maggie's Trail.





Figure 13. Runoff simulation before treatment with surface runoff and wide wetting front.

Figure 14. Runoff simulation after mulch application. Runoff is dispersed and slowed by the wood chips.

The table below shows the average runoff velocity (runoff distance divided by time), time to rilling, and other characteristics of each plot. Runoff velocity is a new metric that is intended to provide an indication of a given slope's propensity to generate and transmit surface runoff. As this number decreases, it suggests that the slope is becoming more erosion resistant. Average runoff velocity at Maggie's Trail decreased by 72% and max runoff velocity decreased by 70% after application of 3-4 inches of wood chips. Soil loosening treatments are likely to lead to even further reductions in runoff velocity, but these results underscore the value of mulch application when more time-intensive treatments are not a feasible option.

Table 6. Comparing runoff velocity and other runoff simulation parameters at Maggie's Trail.

	2A-	2B-	2A-	2B-
	untreated	untreated	mulched	mulched
Velocity-AVG (ft/min)	5.0	5.0	1.0	1.8
Velocity-MAX (ft/min)	6.6	6.8	1.5	2.5
Slope (%)	10.8	12.9	11.3	11.1
Time to Rilling (min)	1	none	none	None
Simulator Flow Rate (GPM)	2	2	2	2

Soil Density

The cone penetrometer is used to measure a soil's resistance to force, which can be used as a surrogate for soil density and infiltration potential. Penetrometer depth to refusal (DTR) at 350 pounds per square inch (PSI) was measured at this site. DTR ranged from 2.0 to 2.5 inches before mulching and 3.0 to 3.2 inches after mulching. While mulch application does not directly reduce soil density, fungal activity generated by high-carbon materials like wood chips has been observed to lead to gradual increased in DTR at other Tahoe Basin sites. The decrease in soil density measured at this site is likely within the margin of error of the cone penetrometer or the higher soil moisture levels, but is a positive sign nonetheless.

Table 7. Penetrometer depth to refusal (DTR) and soil moisture measurements at Maggie's Trail.

	2A- untreated	2B- untreated	2A- mulched	2B- mulched
Soil Moisture (%)	3.25	3	4	5
Penetrometer DTR (in)	2.0	2.5	3.0	3.2

Surface Cover and Vegetation Composition

Mulch cover increased dramatically from 10-20% before treatment to 100% after treatment. While plant cover was reduced due to thick mulch applications, vegetation will return as the mulch decomposes, or if the area is seeded following future soil loosening treatments. Vegetation cover has been shown to have no correlation to erosion reductions at multiple study sites at Heavenly.

Table 8. Ocular estimates of surface cover at Maggie's Trail.

	2A-	2B-	2A-	2B-
	untreated	untreated	mulched	mulched
Litter Depth (in)	0.3	0.3	4.3	3.5
Plant Cover (%)	5	15	5	5
Mulch Cover (%)	10	20	100	100
Total Cover (%)	10	20	100	100

SKY CHUTE SKI RUN AND WATER BARS (CA-1 HOT SPOTS 34 & 36-38)

OVERVIEW

Sky Chute is a large ski run directly above Sky Meadow. The lower portion of this ski run has been a source of erosion to Sky Meadow for many years, but it is very difficult to access for vehicles and equipment and is a very large area (roughly 1 acre), making meaningful erosion reduction treatments difficult. Some of the drainage and erosion issues on Sky Chute stem from road drainage, as water bars upslope concentrated runoff across the ski run. Over many years, the water bars have been filled in by sediment and overtopped in numerous places, creating widespread rills and gullies.

RESTORATION TREATMENTS

In 2015, a mulch blower called a Shred-Vac was used to apply a layer of pine needle mulch to almost 1 acre of ski run. In addition, several large mulch berms were created across the slope to further slow down and disburse surface runoff.







Figure 16. Heavenly staff applying mulch to the Sky Chute ski run using the Shred-Vac.

Upslope of the ski run, several problematic water bars underwent a conversion to infiltration swales. The water bars had wood chips incorporated into the soil, deep soil loosening, reshaping to reduce flow concentration, and seeding/mulching. The goal was to transform the water bars – which were originally designed to concentrate runoff – into sponges able to infiltration the majority of runoff from the summer road.





Figure 17. Heavily eroded water bar (HS #36) before treatment.

Figure 18. Water bar to infiltration swale conversation complete!

PERFORMANCE MONITORING

Runoff Simulation

Runoff simulation was conducted within a week of completing the water bar-to-swale conversation treatments and was compared to pre-treatment (standard water bar) conditions. The results are summarized in the graph and table below. The infiltration swale treatments dramatically reduced runoff rate and total distance. The untreated water bar conveyed surface runoff 13 feet in 3 minutes. Once the water bar was converted to a swale using deep tilling, recontouring and mulching, a 10minute simulation could not produce surface runoff past 2 feet. The immediate hydrologic improvements of this treatment are obvious. Returning to this site in the spring time during snowmelt will help us better understand how these roadside infiltration swales function during periods of higher soil moisture.

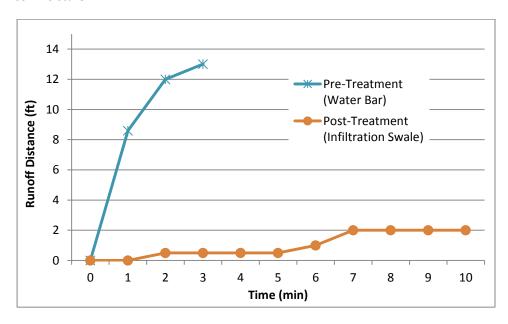


Figure 19. Runoff simulation results before and after treatment (water bar-to-infiltration swale conversation).

Table 9. Comparing runoff velocity and other runoff simulation parameters pre- and post-treatment at Sky Chute water bars.

	Pre-Treatment	Post-Treatment	% Change
Velocity-AVG (ft/min)	4.3	0.2	-95%
Velocity-MAX (ft/min)	8.6	1.0	-88%
Slope (%)	3.8	6.7	
Time to Rilling (min)	1	n/a	-100%
Simulator Flow Rate (GPM)	4	4	

Soil Density and Surface Cover

Depth to refusal – as measured with a cone penetrometer – increased by 320% after deep tilling was completed. This is a key factor that helps explain the surface runoff reductions measured with the runoff simulator. Litter depth, mulch cover and total cover all increased substantially as well. Plant cover was completely eliminated due to deep tilling, but the swales were seeded with Heavenly's high elevation native grass seed mix, so native vegetation is expected to begin re-establishment this coming spring.

Table 10. Comparing penetrometer depth to refusal and cover conditions pre- and post-treatment at Sky Chute water bars.

	Pre-Treatment	Post-Treatment	% Change
Penetrometer DTR (in)	4.0	12.8	+320%
Litter Depth (in)	0.3	2.3	+930%
Plant Cover (%)	30	0	-100%
Mulch Cover (%)	5	100	+2000%
Total Cover (%)	35	100	+290%

CONCLUSIONS

2015 was a big year for Heavenly's watershed management and restoration program. Not only were many high and medium priority hot spots treated, but several erosion issues caused by isolated storm events fully addressed in the same year they occurred (e.g. Patsy's gully), rather than being added to the next season's work list. Heavenly demonstrated several new out-of-the-box treatment approaches: water bar-to-swale conversation, mulch filter berms, and using the Shred-Vac to apply mulch to very large and/or steep ski run areas that would have otherwise been difficult or impossible to treat. There is a great deal to be learned by revisiting these innovative treatment sites as soon as they are accessible in the spring to assess their effectiveness.

RECOMMENDATIONS

MANAGEMENT AND COMMUNICATION PROCESS

- Create set of maps showing locations of all projects on annual work list and key watershed features such
 as streams, SEZs, roads and lifts. These maps can support clear communication between management and
 field staff and provide a simple format for both field-documenting erosion hot spots and
 reporting/communicating watershed management efforts and completed projects.
- Continue to prioritize annual work list using erosion and water quality risk (among others) as prioritization criteria. This will help Heavenly show that limited resources are achieving maximum water quality benefit.
- Continue to integrate erosion hot spot treatments into the annual work list so that they are scheduled along with other capital and maintenance projects.

TREATMENT IMPLEMENTATION PROCESS

- Expand use of mulch-only treatments (like those completed at Maggie's Trail), especially where it can be a first step toward full restoration treatment in a future season.
- Continue to experiment with creating mulch berms across large ski runs, especially those where equipment access is a big challenge.
- Start aging wood chips for at least one year prior to application whenever possible in order to begin the decomposition process.
- Where irrigation is deemed necessary, use low-flow, deep-cycle irrigation methods in order to minimize water use, eliminate irrigation-caused erosion and establish deeper-rooting plants.
- Utilize a consistent form to document restoration treatments (such as the one provided by IERS).
 Documentation of site-specific treatments is critical to understanding and improving treatment cost-effectiveness.
- Measure fertilizer and seed application rates expand use and understanding of simple but standardized
 measurement protocols to ensure accurate and consistent application rates for seed and fertilizer (such as
 5-gallon buckets marked with volumes that correspond to seed or fertilizer weight). Native seed is very
 expensive and measuring application rates will lead to cost savings by not over-seeding.

MONITORING AND ASSESSMENT PROCESS

- Continue to build and expand monitoring/assessment capacity in Heavenly summer reveg crew so that they can play a more active role in tracking the trajectory of treated sites.
- Inspect and photo document recently treated restoration areas during rain events (in addition to road BMPs) so that any minor drainage or erosion issues can be addressed before escalating to larger erosion problems.

flows from roads ar			

Identify, assess and develop integrated plan to resolve road system drainage issues (such as converting more water bars to infiltration swales). Nearly all erosion issues observed on ski runs are related to

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APPENDIX III 2015 CWE WORK LIST



HEAVENLY MOUNTAIN RESORT 2015 ANNUAL SUMMER WORK LIST 10/15/2015 Completion Status

From the EIS:

Phase 1: CA-1 High Priority Erosion Hotspots are # 13, 31-38, 45-46, & 49

Phase 1: NV-1 High Priority Erosion Hotspots are # 1, & 3-6

: Hot Spots to be included in future summer work lists, as required by the EIS

Project #	Source*	Location	Treatment	Status Update as of: 10/15/2015
	led: CA-1	Heavenly Valley Creek		
1	В	Cal Dam to Maggie's Corner	Complete stabilization and erosion resistance on road shoulders. Apply wood chips to road shoulders	WC's applied, project completed
2	В	Powderbowl Express Lift Top Station/Mombo Trail (Blue Angel Chute)	Improve erosion resistance and stabilize slope. Apply treatment used on fill slope below lower Powderbowl. Recontour the waterbars at the lower end of Blue Angel Chute, which will improve the capacity for excess sedimentation. Field fit best strategy.	Sediment from lower water bar mechanically removed in June. There is increased capacity now at bottom of run. Infiltration swales at top installed, and "Full Hogan" implemented. PN coverage will be completed by 10-16-15
3	RM	Tubing Run Revisions	Construct revised summer tubing lanes, associated grading and slope stabilization and access road to the top of the tubing lift.	Tubing lanes completed and associated grading and slope stabilization. Decommissioning of old road with pine needle coverage completed.
4	В	Top of Gondola Surface Drainage	Install surface drainage to eliminate standing water at the Top of Gondola/Adventure Peak area.	Construction completed. WC coverage on the disturbed areas applied.
5	P	Alpine Coaster	Construct the Alpine Coaster as part of the 2015 Adventure Peak Epic Discovery Activities.	Construction nearing completion. Winterization BMPs are staged. Grading extension granted until 10-30-15 with LRWQCB, and TRPA
6	P	Climbing Rock	Construct the Climbing Rock Wall adjacent to Tamarack Lodge as part of the 2015 Adventure Peak Epic Discovery Activities.	100% complete. Opened on 9-4-15 to Public. BMPs in place, stable and flat site.
7	P	Complete Waterfall Lift Removal Top Station Regrading (Top of Epic Mix race Course)	Regrade top station area. Fill and stabilize as shown on approved project plans.	Will complete in 2016
8	EH-CA	Sky Chute Ski Run	Treat Hotspot inventory #'s 13, 36, 37, & 38. Restoration includes application of mulch (chips &/or pine needles). Apply small amounts of	Infiltration swales, sky chute shred vac applied full coverage on ski run. PC and PN Materials have been staged at 7 water bars above and

			fertilizer and seed if field fitting deems necessary.	below the wooden sign. Cal Dam to TP Bone Yard. Sky Chute Restorations completed on 9- 13-15
9	EH-CA	Hellwinkle's Road	Treat Hotspot inventory #'s 45 & 46. Field fit problem locations by stabilizing existing rills and gullies. Utilize large diameter pine needle wattles and angular rock. In-slope road in key areas, toward the bottom of the road under last water bar, and add a new settling/infiltration area near the right hand side bottom of the road.	Large PN Wattles placed at 3 main WB's on 9-17-15. Field Fit best strategy with Water Board and RCI on 9-15-15. In sloping road was not recommended by Water Board and RCI. Phase I complete. Phase II Plan to be developed before start of 2016 construction season. Phase II to be implemented in 2016.
10	EH-CA	Canyon Express Lift Bottom Terminal Operator's Booth	Treat Hotspot Inventory #32. Install a vegetated swale with coir material matting (coconut fiber) and pine needle check dams in existing rock lined ditch adjacent to the operator's booth. Clean out rock-lined ditch, either by hand or using equipment uphill of the newly installed vegetated swale. Allow run-off from above to infiltrate and settle before making it to the Sky Meadows.	Rock Lined Ditch has been cleaned out and PN Check dams installed. PN check damns need to be build up bigger. 3 Large PN Wattles installed uphill of Hydrant. PN coverage applied to loose DG in meadow. Completed 9-11-15
11	EH-CA	Double Down - bottom of ski run water bar	Treat Hotspot inventory #'s 31 & 33. Water bar has a visible failure point and barren areas. Repair the failure and apply mulch/needles uphill of water bar. Flatten profile of the water bar slightly and install large pine needle berm below water bar to better infiltrate run-off and snow melt before it reaches the maintenance road.	3 large dump trucks loads of PN delivered to below the DD WB on 8-7-15 1 small dump truck load of PC in place just below WB WB was maintained and cleaned out by Trails Crew in late July. 3 PN Berms uphill of bottom WB in Place, and Project is 100% complete.
12	EH-CA	Bottom of Sky Express Road	Treat Hotspot inventory #35. Improve wood chip cover adjacent to vehicle turnaround.	100% Completed 7-20-15
13	EH-CA	Bottom of Ellie's Ski Run	Treat Hotspot Inventory # 49. Repair water bar and convert to an infiltration swale. Cover lower portion of ski run with mulch. Amount of mulch will depend on access and treatment options.	2 large dump truck loads of PN delivered to Lower Liz's below the last WB. WB was maintained during last week of July. Completed 9-13-15
		Bijou Creek		
12	P	Mid Station Canopy Tour	Construct the Mid Station Canopy Tour as part of the 2015 Adventure Peak Epic Discovery	95% complete. Road Corridors are in place, and cables are in the air. Trees have been cut and are

			Activities.	lying on the ground. Site had minimal soil disturbance, and not much disturbance is expected. No excavation work is planned, other than the walking paths. Once completed the Lay down area will likely need a light coating of WC.
				Walk through with Brownie and FS walkthrough on 10-16-15 for sign off. Grading extension until 10-30-15
Watersl	hed: CA-7	Unnamed Creek - Gond	<u>ola</u>	
		NONE		
Watersl	hed: NV-1	Mott Canyon Creek		
	EH-NV	Decommission roads	Treat Hotspot inventory # 12, 17, 18. Phased over	12 PN Loads are being delivered to East Peak
13		and turnaround areas	multiple years: Year 1 spread chips on existing	Lake/Perimeter run area during week of 8-10-15.
			construction access roads; Year 2 till and add	This will get us a stockpile of chips/Needles for
			mulch; Year 3 complete project.	the Upper NV-1 Erosion Hotspots for 2016.
Watersl	ned: NV-3	Edgewood Creek		
		NONE		
Watersl	hed: NV-2	+ 5 Daggett Creek		
14	EH-NV	Top of Aries Ski Run	Treat Hotspot inventory #'s 4 & 5. Eliminate several rills and gullies near the top of the Aries ski	Water Bar has been maintained and cleaned out as of 8-6-15. The hand work was done well.
			run. Stabilize ski run with a series of infiltration strips such as mulch berms at the top of the slope.	Materials like PC and PN should be delivered to area for the full restoration project.
			Add 2-3 inches of mulch ground cover in key areas	projection
			that lack effective cover, or are prone to rilling.	Project is completed as of 9-18-15
			Create infiltration spreading area below the top of	Some additional PN coverage might be needed in
			Aries ski run, before the run steepens. 1 year	2016, will check in June 2016
			Project	
Resort '		T		
15	M	Resort-Wide	Inspect and restore all areas damaged or affected by	Top of Patsy's Lift area has a large rill from July
			winter resort operations, including hydrants & pipe	storms. It is over 3 feet deep in some areas.
			failures, and areas affected by snowcat operations;	Skiers right of the 277 sewer line restoration, due
			document areas treated.	to the concentrated road run off on the access
				road to 277. Plan should be to rip chips in and
				create a spongy area for the road run-off,
				Eliminate/cover up the DI that is no longer

16	M	Resort-Wide	Erect and maintain vehicles barriers and/or fences	functioning. IT locates done, Snowmaking in area, Barrett recommends only 12" of chips ripped for this project. Electrical Locates completed from LE Project completed in early October. Completed
10	141	Resolt Wide	to prevent unauthorized vehicle access off of designated summer roads and facility parking areas.	Completed
17	M	Resort-Wide	Inspect and maintain all drainage structures.	On Going with Trails crew, Heavenly Enviro. and RCI
18	M	Base Areas	Maintain all BMPs and drainage structures. Erect and maintain vehicle barriers and/or fences to prevent unauthorized vehicle access from base areas.	On Going
19	M	Resort-Wide	Road Maintenance Projects based on the annual Heavenly-Forest Service roads maintenance & monitoring agreement.	On Going, Grader at Upper Shop on 8-11-15 .6 miles on Sky Road during August 2015 13N52.9 .7 Miles of Road Base applied and Maintenance occurred on Roundabout Road 12N40.1 during July 2015, Including 3 switchbacks, and roadway, WB's.
*Source	e Codes			
Dourt	M	BMP Maintenance Need	ed	Varu
	В		from BMP Effectiveness Monitoring	Key:
	P	Master Plan Implementar		PC: Pine Chips PN: Pine Needles
	RM	Resort Maintenance Proj		WB: Water Bars
	MMP		& Mitigation Plan Requirement	TP: Terrain Park
	EH-CA	Erosion Hotspot Inventor		II. ICHam Lark
	EH-NV	Erosion Hotspot Inventor	ry Nevada	

APPENDIX IV

USFS WILDLIFE TRASH MANAGEMENT AND EDUCATION PROGRAM





USFS Wildlife Trash Management and Education Program:

As a condition of the approved EIS for the Epic Discovery Program a wildlife trash management and education plan will be implemented annually and reviewed by Heavenly and the US Forest Service LTBMU. The Heavenly Mountain Resort Master Development Plan (2015) includes a number of Operations and Maintenance Measures as part of the Mitigation and Monitoring Plan. 7.5-21 BIO

8: Wildlife Trash Management and Education Program.

A number of the activities at Heavenly Mountain Resort are located at the Top of The Gondola region and are known as Adventure Peak. As part of the Epic Discovery Project implementation the resort shall create and implement a trash management and education program. The goal of this program is for timely removal of refuse from deposit points, education of our guests and staff about proper waste management, and to keep any interactions between humans and wildlife to a minimum.

Deposit points where animal proof receptacles will be implemented at following locations:

- 1. Bottom of the Gondola steps/Interpretive Welcome Center(1)
- 2. Base of Tamarack Express lift (1)
- 3. Top of the Blue Streak Zip Line/ Top of Tamarack Chair (1 small single unit, on hand)
- 4. The Bottom Big Easy Chair area, gear on area near cowboy fence (1)
- 5. The Bottom of the Coaster (1)
- 6. The Base of the Rock Climbing Wall (1)
- 7. The Base of the Tubing Lift viewing area (1)
- 8. NW side of Tamarack Lodge (1)
- 9. Viewing area of the Bear Cave Challenge Course (1)
- 10. Kiddy Zip area (1)
- 11. Mid-Station Observation Deck of the Gondola (Existing)

Wildlife Proof receptacles in and around Adventure Peak will be serviced each day of operations. All garbage from the remote receptacles will be consolidated to the Tamarack Lodge loading dock by the Adventure Peak grounds crew, where all refuse is kept inside of the loading dock facility. Daily refuse removal by the F&B Warehouse staff will continue. This is necessary for the success of this program. All garbage, kitchen food waste recycling, and recycling are taken to the California Main Lodge lower parking lot where dedicated dumpsters for the different waste streams are located. There are dumpsters labeled for blue bag recycling, food waste recycling, straight garbage, and construction and demolition materials. All dumpsters at this location are animal proof with lids, doors, and the food waste can is locked.

These dumpsters are serviced by South Tahoe Refuse and are monitored by Heavenly management staff closely for frequency of service. Since 2013 all of these CA Base dumpsters were made animal proof and the wildlife we have seen on property at CA Base has been significantly reduced. Wildlife interactions at the Lower CA Base area parking lot do not appear to be a problem at this time.

Bear Bins will always be deployed before summer Adventure Peak operations and activities begin. These bins will be removed from the TOG area so as to not interfere with winter operations. They will be stored at an off-site location once summer operations cease in late September. These bins might be stored at the Heavenly storage property (Known as KGID, near the top of Kingsbury Grade), or uphill of the summer road near the Big Easy water tank.

Future Expansion into Sky Meadows and East Peak Lake/Lodge to be developed as those regions come online.

APPENDIX V 2015 WATER USE BALANCE REPORT



Heavenly Mountain Resort

Water Use Report, 2014-15 Season



Heavenly Mountain Resort is furnishing this report on water usage during the 2014-15 season as per the terms of the existing master plan agreement.

Snowmaking Water Usage

The Heavenly Mountain Resort snowmaking system consumed a total of 156.6 million gallons of water during the 2014-15 season to cover a total of 317 acres of terrain. The distribution of water sources and water consumption is described below:

Total Snowmaking Water UseCalifornia	68.09	million gallons	
Total Snowmaking Water UseNevada	88.51	million gallons	
Net Total Snowmaking Water Use	156.60	million gallons	
Water Supplied in California	72.50	million gallons	
Water Used in California	68.09	million gallons	
Net Surplus (flow out of California)	4.42	million gallons	
Water Supplied in Nevada	84.10	million gallons	
Water Used in Nevada	88.51	million gallons	
Net Deficit (Flow into Nevada)	-4.42	million gallons	
Water Supplied In Basin	72.50	million gallons	
Water Used in Basin	87.61	million gallons	
Difference (flow out of Basin)	-15.11	million gallons	
Water Supplied Out of Basin	84.10	million gallons	
Water Used Out of Basin	68.99	million gallons	
Difference (flow into Basin)	15.11	million gallons	
Water PurchasedSTPUD	64.81	million gallons	
Water PurchasedKGID	22.97	million gallons	
TOTAL WATER PURCHASED	87.78	million gallons	

Table 1 provides a breakdown of water usage between California and Nevada, along with the net transfer of water between the States.

Table 1	2014-2015 W	ater Usage Sum	maryInter State	e Transfers	
Dumning Region	MG used	In Cal	ifornia	In Ne	vada
Pumping Region	wig useu	% of acre-ft	Water (MG)	% of acre-ft	Water (MG)
Cal Base	31.1	100%	31.1	0%	0.0
Cal Dam	30.4	100%	30.4	0.0%	0.0
E. Peak	95.1	7%	6.6	93%	88.5
Total	156.6		68.1		88.5
Water Supply- (Purchased +	Recharge)		72.5		84.1
InterState Water Transfer			-4.4		4.4

Table 2a provides a breakdown of water usage between in-basin and out of basin regions, along with the net inter-basin transfer of water.

Table 2a2014-2015 Water Usage SummaryInter Basin					
Pumping Region	MG used	In B	asin	Out of Basin	
Pumping Region	wig useu	% of acre-ft	Water (MG)	% of acre-ft	Water (MG)
Cal Base	31.1	100%	31.1	0%	0.0
Cal Dam	30.4	100.0%	30.4	0.0%	0.0
E. PeakCA	6.6	0%	0.0	100%	6.6
Total California	68.1		61.5		6.6
E. PeakNV	88.5	29.5%	26.1	70.5%	62.4
Total Nevada	88.5		26.1		62.4
TOTAL SNOWMAKING	156.6		87.6		69.0
Water Supply			72.5		84.1
Inter Basin Water Transfer			15.1		-15.1

Table 2b further breaks down the Nevada water use within 4 water right quadrants as listed below:

Tab	ole 2b2014-20)15 Water Usage	SummaryInter	r Basin	
	l l		asin	Out of Basin	
Pumping Region	MG used	% of acre-ft	Water (MG)	% of acre-ft	Water (MG)
Cal Base	31.1	100%	31.1	0%	0.0
Cal Dam	30.4	100%	30.4	0%	0.0
E. PeakCA	6.6	0%	0.0	100%	6.6
Total California	68.1		61.5		6.6
Quandrant A	0.0	12.0%	10.6		
Quadrant B				58%	51.3
Quadrant C				13%	11.1
Quandrant D		18%	15.5		
Total Nevada	88.5		26.1		62.4
TOTAL SNOWMAKING	156.6		87.6		69.0
Water Supply			72.5		84.1
Inter Basin Water Transfer			15.1		-15.1

- A Within Tahoe Basin and south of the southern boundary of section 25, 26, 27 T. 13 N. R 18 E. and section 30 T. 13. N., R. 19 E.
- B Outside of Tahoe Basin and south of the southern boundary of section 25, 26, 27 T. 13 N. R 18 E. and section 30 T. 13. N., R. 19 E.
- C Outside of Tahoe Basin and North of the southern boundary of section 25, 26, 27 T. 13 N. R 18 E. and section 30 T. 13. N., R. 19 E.
- D Within Tahoe Basin and North of the southern boundary of section 25, 26, 27 T. 13 N. R 18 E. and section 30 T. 13. N., R. 19 E.

The following attachments provide documentation and calculations procedures used in determining these values:

Attachment 1....Map of Existing Meter Locations

Attachment 2....Schematic of Water Transfers

Attachment 3....California Snowmaking Trails

Attachment 4....Nevada Snowmaking Trails and Water Right Quadrants

Calculation Procedures

Water allocation calculations for Heavenly Mountain Resort are complicated by the fact that snowmaking occurs in both Nevada and California, as well as inside and outside the TRPA boundary. While the snowmaking piping distribution system for the entire resort is interlinked, there are 3 basic sub-regions:

- Cal Base This region consists of the acreage on the California side falling below Cal Dam.
 This entire region falls within the State of California and within the Tahoe Basin.
- 2. Cal Dam This region consists of acreage on the California side that is above Cal Dam. This entire region falls within the State of California and within the Tahoe Basin.
- 3. East Peak This region consists of acreage above and below East Peak Lake. The region is predominantly in Nevada, though some trails serviced at the top fall inside California. A majority of this terrain is out of the Tahoe Basin, but 25% lies inside the Basin.

Attachment 2 provides a schematic of pumping operations, meter readings, and the calculation procedure for interstate water transfers. These calculations consist of performing a water balance between the STPUD and KGID supplies, water entering and exiting reservoirs, and a flowmeter installed on the existing transfer line between the Cal Dam and East Peak systems.

The methodology used this analysis to track inter-basin water usage involves calculating the total water usage within the 3 major sub-regions (Lower Cal, Cal Dam, and East Peak) and then allocating water proportionally based on snowmaking terrain within that region that falls inside and outside the Tahoe basin. Since different trails require different design depths of snow, the allocation is based on the trail acreage x design depth for each trail, as detailed in Attachments 3 and 4. The same methodology is

used to allocate East Peak water between California and Nevada. No changes have been made in the metering locations, configuration, or calculation procedure from the previous year.

The trail data provided in Attachment 4 indicates that 7% of the East Peak design acre-ft of snow coverage occurs in California. Therefore, 7% of the total 95.1 MG used for snowmaking in the East Peak sub-region is calculated to fall in California (6.6 MG) while 93% is calculated to fall in Nevada (88.5 MG)¹. Of this 88.5 MG of East Peak water that is used in Nevada, 29.5% of the design acre-ft of snow production occurs within the Tahoe Basin. Therefore 29.5% of the 88.5 million gallons of water used in this sub-region are calculated to be used within the Basin (26.1 MG) while 70.5% are calculated to be used outside the basin (62.4 MG)².

Revised Operating Procedures

The calculations indicate that a net of 15.1 million gallons of water was transferred into the basin during the 2014-2015 snowmaking season, while 4.4 MG was transferred from California to Nevada. Future net transfers will be minimized by further balancing water supplies during the season and managing summer irrigation practices.

Respectfully Submitted,

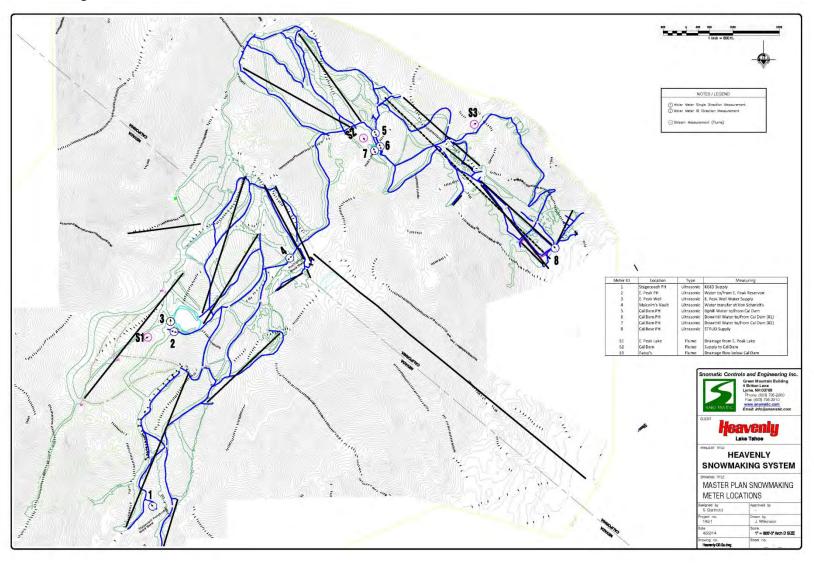
Scott Barthold, PE

Somatic Controls and Engineering, Inc.

¹ Refer to Table 1 for calculation

² Refer to Table 2a/b for calculation

Attachment 1...Existing meter locations



Attachment 2---Schematic

Heavenly Mountain Resort Snowmaking Water Usage Attachment 2 2014-2015 Water Transfers Nevada Snowmaking Water Upper Nev Water Pumped by E Peak pumps 100.1 MG Snowmaking 2 Water Sent to Cal Dam via Von Schm 5.0 MG 3 KGID Water used directly for SM 0.0 MG assume CD recharge Upper Cal 4 Total Nevada Snowmaking Water 95.1 MG Snowmaking 5 STPUD Water transerred to Nevada 16.0 MG 16.0 MG KGID and Inflow water used in NV Upper Cal Snowmaking Cal Dam Discharge 46.4 MG Water Fed to NV through Von S 16.0 MG Water Fed to CA through Von 5.0 MG Water from NV to recharge Cal 5.0 MG 0.00 MG calculated 16 Net Upper Cal Water Use 30.4 MG Precip. and E Peak Lake (6) 114.8 MG From E. Peak Well 7.7 MG calculated 61.1 MG From E. Peak Well to balance 39.0 East Pk E. Peak Domestic (7) MG--Meter Outflow Outflow (Flume A) 0 (iSno value) Lower Nevada Snowmaking Water Low er Nev KGID Purchase Water Entering E Peak 39.0 MG Lower Cal Snowmaking Flows Water entering E Peak through VS 16.0 MG **KGID Water** Total STPUD Water Purchased 10 Water to E. Peak from Stagecoach 23.0 MG used directly on L. Nev Water Pumped into Cal Dam 39.8 MG KGID water used directly for snowmaki 0.0 MG Gravity Water From Cal Dam 6.0 MG L. Cal Snowmaking Water 31.1 MG Lower Cal Snowmaking 0.0 MG--Meter Lower Cal 64.8 Totalizer data Water Purchased -- STPD 64.8 MG

From E. Peak Meter

- Based on Cal Dam meter reading (entering pond)
- Calculated by Equation 11
- Water Pumped by E. Peak water sent to CA + KGID water used directly for snowmaking = Nevada SM water
- Water entering E. Peak -(Water Pumped via KGID KGID water used directly on L. Nevada)
- Total Nevada water transfer to Cal Dam = KGID and Inflow water used in NV
- 7 Provided by Purchase Records from KGID
- 8 Based on E. Peak Meter Reading
- 9 From Equation 5
- 10 Total Water into E. Peak (from meter) water transferred to E. Peak from Von Shmidt = water transferred from Stage coach
- 11 Water purchased from KGID water transferred from KGID to E. Peak = KGID water used directly for snowmaking

- **Calculation Notes** Read from Cal Dam uphill meter
 - 13 From Equation 5
 - Cal Dam Uphill meter reading (reverse flow)
 - Cal Dam Uphill meter reading (reverse flow)
 - (Water Pumped from Cal Dam water transferred to NV) + (Water pumped from E Peak into CA water entering Cal Dam)
 - 17 From Purchase records
 - From Cal Dam downhill meter
 - From Cal Dam Downhill Meter 19
 - Water Pumped from L Cal Water delivered to Cal Dam + gravity water running back down to lower Cal

6

ATTACHMENT 3---CALIFORNIA SNOWMAKING ACREAGE

	TTACHMENT 3CALIFORNIA SNO			
2007 Master Plan Amendme	nt Trail Name	2007 Master Plan Amendment	Acroano	Acre
Trail #	int Hall Name	Snowmaking Action (1)		ft. (3)
California In Basin 'p	od' trails	• • • • • • • • • • • • • • • • • • • •		
B1	EAST BOWL -THE FACE	EXISTING	16.3	81.3
B2	GUNBARREL	EXISTING	8.2	40.8
D1 E1	WORLD CUP PATSY'S	EXISTING EXISTING	6.0 7.9	16.1 21.4
G1	MAGGIES	EXISTING	8.4	22.7
G2	CAT TRACK	EXISTING	1.0	2.7
G5	MOMBO MEADOWS	EXISTING	4.1	11.1
G6	MOMBO	EXISTING	1.0	2.6
G7	LOWER MOMBO	EXISTING	2.5	6.7
H9	CANYON - SKY CANYON JACKPOT (RUSUTSU)	EXISTING	6.1	16.5 11.6
H10 H11	HIGH ROLLER (STEAMBOAT)	EXISTING EXISTING	4.3 3.3	8.9
11	LI7'S	EXISTING	9.6	25.9
13	UPPER ELLIE'S / ELLIE'S	EXISTING	12.4	49.6
K1	PERFECT RIDE (WEST BOWL)	EXISTING	8.7	23.4
*L1	LOWER SKI SCHOOL	EXISTING	2.3	6.2
M1	CHILDRENS SKI CENTER	EXISTING	0.9	2.4
N1	PIONEER PLATTER PULL	EXISTING	2.4	6.5
01 *GG1	LEARN TO SKI CENTER	EXISTING EXISTING	1.4 7.4	3.7 20.0
**GG2	(UPR.) CALIFORNIA TRAIL SAM'S DREAM	EXISTING - UNBUILT	4.3	17.1
*GG3	TAMARACK RETURN	EXISTING	0.7	2.0
*GG6	CASCADE	EXISTING	8.0	32.1
*HH1	EASY STREET (1/2)	EXISTING	3.4	9.2
HH2	EASY STREET II (1/2)	RETAIN	2.1	5.6
B3	PISTOL WEST BOWL	REMOVE	0.0	0.0
B4 E2	GROOVE WEST BOWL	REMOVE EXISTING	0.0 3.8	0.0 10.2
63	SWING TRAIL	NO ACTION	0.0	0.0
G4	WATERFALL	RETAIN	3.5	17.4
G8	POWDERBOWL	RETAIN	3.5	14.1
G9	NEW - POWDERBOWL 2 (Gladed)	NEW	1.9	5.1
H1	WOODS TRAIL	NO ACTION	0.0	0.0
H2	BETTY'S SWING	NO ACTION	0.0	0.0
H3 H4	RIDGE BOWL	NO ACTION	0.0	0.0
п 4 Н5	RIDGE CHUTE HIGH ROLLER (BETTY'S RUN)	NO ACTION RETAIN	0.0 12.7	0.0 63.4
H6	DOUBLE DOWN (BETTY'S BOWL)	RETAIN	0.0	0.0
H7	LOWER BETTY'S	RETAIN	0.0	0.0
H8	BETTY'S CUTOFF	NO ACTION	0.0	0.0
H12	NEW - BETTY'S CUTOFF	NO ACTION	0.0	0.0
H13	NEW - BETTY'S ESCAPE	NO ACTION	0.0	0.0
12 14	ELLIE'S SWING - EXTENSION	RETAIN NO ACTION	3.4 0.0	9.2
14 15	NEW - SKIWAYS 1 (GLADED) NEW - SKIWAYS 2 (GLADED)	NO ACTION	0.0	0.0
GG5	49ER	RETAIN	1.6	6.3
California In-Basinnon				
1 2	ROUND-A-BOUT	EXISTING	15.6	42.1
3	RIDGE RUN LOWER RIDGE RUN	EXISTING EXISTING	1.7 15.9	4.5 42.9
5	CALIFORNIA TRAIL	EXISTING	5.5	14.9
5A	NEW- CAL. TRAIL ALTERNATIVE	NEW	1.7	4.5
10	VON SCHMIDT'S (1/4)	RETAIN	1.2	3.3
**11	VON SCHMIDT'S - MEADOW	RETAIN	4.1	11.1
1 4	ROUND-A-BOUT - REALIGNMENT SKYLINE TRAIL	NEW RETAIN	1.6 2.8	4.2 7.6
12	NEW - MAGGIES CANYON (GLADED)		0.0	0.0
n Basin TotalMaster P		NO ACTION	212.8	706.7
n Basin TotalCal Base			57.9	212.4
n Basin TotalCal Dam	Existing		91.2	262.3
n Basin TotalE. Peak E	Existing		0.0	0.0
California Out of D:	and trails			
California Out of Basin 'p V4	Dod" trails BIG DIPPER (1/5)	EXISTING	3.7	10.0
V4 V8	ORION'S (1/2)	EXISTING	8.4	22.6
*V10	METEOR (1/2) - (GLADED)	EXISTING - UNBUILT	2.9	7.8
**V11	METEOR II (1/3) - (GLADED)	REMOVE	0.0	0.0
V7	DIPPER BOWL (1/2)	NO ACTION	0.0	0.0
GG4	SAND DUNES	RETAIN	3.0	8.0
V1 V3	MILKY WAY BOWL (2/3)	NO ACTION	0.0 1.2	0.0 3.2
V3 Dut of Basin TotalMast	DIPPER KNOB er Plan	RETAIN	17.9	48.4
Dut of Basin TotalWasi Dut of Basin TotalCal B			0.0	0.0
Out of Basin TotalCal D			0.0	0.0
Out of Basin TotalE. Pe			12.1	32.6
California TotalMas			230.8	755.1
California TotalExis	sting		161.1	507.3
Cambina Total-Exis				
oamoma rotarExis			57.9	212.4
	ng		01.0	
Cal Base Total Existi	•		91.2	262.3
Cal Base Total Existi Cal DamTotal Existin E Peak Total Existing	g		91.2 12.1	32.6
Cal Base Total Existin Cal DamTotal Existin E Peak Total Existing Cal Base Existing9	g I 6 In Basin		91.2 12.1 100%	32.6 100%
Cal Base Total Existin Cal DamTotal Existin E Peak Total Existing Cal Base Existing9 Cal Dam Existing%	g I 6 In Basin		91.2 12.1	32.6

ATTACHMENT 4---NEVADA SNOWMAKING ACREAGE

2007 Master Plan Amended Facilities - Snowmaking at Buildout

2007		2007										
Master Plan Amendment Trail #	Trail Name	Master Plan Amendment Snowmaking Action (1)	Acreage (acres)	Acre ft. (3)	Α	Acreage b B	y Quandra C	nt D	A	Acre-ft by B	Quadrant C	D
evada In Basin 'pod' trails Q1	BOULDER (EDGEWOOD) BOWL	EXISTING	17.2	68.9				17.2				68.9
S1	OLYMPIC DOWNHILL (3/5)	EXISTING	15.5	41.8	15.5			17.2	41.8			00.5
X1	BOULDER SKI SCHOOL	EXISTING	2.8	7.6				2.8				7.6
*HH1	EASY STREET (1/2)	EXISTING	3.4	9.2	3.4				9.2			
\$2	BOULDER CHUTE (075)	RETAIN	2.7	11.0								
S3	NORTH BOWL	RETAIN	7.8	38.9								
\$4	UPPER NORTH BOWL	RETAIN	4.2	21.0								
S8	NEW - NORTH BOWL 2	NEW	5.1	13.8								
S9	NEW - NORTH BOWL 3 (Gladed)	NEW	8.1	22.0								
S10 HH2	NEW - NORTH BOWL 4 (Gladed)	NEW NO ACTION	7.8 2.1	21.2 5.6								
nn2	EASY STREET II (1/2) (wasn't on snowmaking plan)	NO ACTION	2.1	5.0								
vada In Basin non 'pod' tr	ansport trails											
9	STEVE'S	EXISTING	0.5	1.4	0.5				1.4			
10 / In Basin TotalMaster P	VON SCHMIDT'S (1/4)	RETAIN	1.2 78.5	3.3 265.5								
V In Basin Existing Total(all E. Peak)		39.4	128.8								
evada Out of Basin 'pod' tr												
R2	(UPPER) STAGECOACH	EXISTING	4.2	16.6			4.2			40.4	16.6	
S1 S5	OLYMPIC DOWNHILL (2/5) CROSSOVER	EXISTING EXISTING	10.3 6.7	27.9 18.1		3.8 6.7	6.5			10.4 18.1	17.5	
V4	BIG DIPPER (4/5)	EXISTING	14.8	40.0		14.8				40.0		
V6	ORION'S BELT	EXISTING	1.1	2.9		1.1				2.9		
V8	ORION'S (1/2)	EXISTING	8.4	22.6		8.4				22.6		
V9	LOWER ORION'S	EXISTING	2.9	7.8		2.9			1	7.8		
*V10	METEOR (1/2) - (GLADED)	EXISTING - UNBUILT	2.9	7.8					1			
W3 W4	LITTLE DIPPER COMET	EXISTING EXISTING	10.4 14.2	52.2 38.3		10.4 14.2				52.2 38.3		
						14.2				30.3		
Z1	NEW - WELLS FARGO 1	NEW	5.4	14.5								
72 72	NEW - WELLS FARGO 2	RETAIN NEW	8.3 11.4	22.4 30.7								
Z3 Z4	NEW - WELLS FARGO 3 NEW - WELLS FARGO 4	RETAIN	12.8	34.6								
Z5	NEW - WELLS FARGO 5	NEW	2.8	7.5								
Z7	NEW - WELLS FARGO 7	NEW	6.9	18.7								
R1	STAGECOACH	EXISTING	12.4	49.6		10.8	1.6			43.2	6.3	
R3	NEW - STAGECOACH 2	NO ACTION	7.1	35.6								
R4	NEW - STAGECOACH 3	NO ACTION	0.0	0.0								
R5	DONDEDOCA (DOMANZA DOM)	DETAIN	4.0	15.0								
S6 S7	PONDEROSA (BONANZA BOWL) EAST PEAK	RETAIN RETAIN	4.0 3.9	15.9 15.8					1			
57 U1	PERIMETER	RETAIN	13.5	36.4								
U2	GALAXY	RETAIN	10.1	27.3					1			
U3	NEW - GALAXY 1	NEW	8.7	23.4								
U4	NEW - GALAXY 2	NEW	2.7	7.3								
V5	LOWER BIG DIPPER	RETAIN	3.7	9.9								
V12	NEW - ORION'S II	NEW	3.4	9.3								
W1	ARIES	RETAIN	1.3	3.4								
W2 *HH3	JACK'S SILVER SPUR	NEW NO ACTION	3.0 0.5	8.0 1.4								
rino	SILVEN SFUN	NO ACTION	0.5	1.4								
cada Out of Basin Non 'pe												
7	LOWER WAY HOME	EXISTING	5.2	14.1		4.0	5.2			40.0	14.1	
8	PEPI'S	EXISTING	4.0	10.8		4.0				10.8		
10 14	VON SCHMIDT'S (1/2) NEW - GALAXY ACCESS	EXISTING NEW	2.4 6.4	6.5 17.3		2.4				6.5		
15	NEW - GALAKT AGGESS NEW - SCORPION	NEW	6.3	17.1								
6	NEW - NEVADA TRAIL (WAY HOME)	NEW	5.9	16.0								
16	NEW - FARGO TO GALAXY	NEW	1.1	2.9								
-Out of Basin Total MP			229.1	690.8	-							
Out of Basin Existing Tot	al (all E. Peak)		97.0	307.5			y Quandra				Quadrant	
			Acreage total b % of To	y Quandrant Ital Acreage		79.5 58.3%	17.5 12.8%	20.0 14.7%	52.4 12.0%	252.8 58.0%	54.6 12.5%	76.5 17.5%
evada TotalMaster P	an		307.6	956.3	-		TOTAL	136.4			TOTAL	436.3
evada TotalExisting			136.4	436.3								
In BasinExisting			29%	30%								
Out of Basin			71%	70%								
rand Total2007 Mast	er Plan		538.4	1,711.4								
	1981		550.7	.,								
		Cal Base Total	57.9	212.4								
		% in CA	100%	100%								
		0/ 1 - 0	100%	100%								
		% In Basin										
			04.0	200 0								
		Cal DamTotal	91.2	262.3								
			91.2 100% 100%	100%								
		Cal DamTotal % in CA % in Basin	100% 100%	100% 100%								
		Cal DamTotal % in CA % in Basin E. Peak Total	100% 100% 148.5	100% 100% 468.9								
		Cal DamTotal % in CA % in Basin E. Peak Total % in CA	100% 100% 148.5 8%	100% 100% 468.9 7%								
		Cal DamTotal % in CA % in Basin E. Peak Total % in CA E. Peak in CA	100% 100% 148.5 8% 12.1	100% 100% 468.9 7% 32.6								
		Cal DamTotal % in CA % in Basin E. Peak Total % in CA	100% 100% 148.5 8% 12.1	100% 100% 468.9 7%								

APPENDIX VI DAGGETT CREEK MEMORANDUM





April 27, 2016

Mr. Andrew Strain HEAVENLY MOUNTAIN RESORT P.O. Box 2180 Stateline, Nevada 89449

Re: 2015 Water Year Daggett Creek Flow Monitoring

Dear Mr. Strain:

Resource Concepts, Inc. (RCI) periodically downloads data from the gauge located below East Peak Lake on the South Fork of Daggett Creek. The gauge was installed in 2004 and consists of a pressure transducer mounted in a perforated pipe at a confined natural section of the creek. Data is collected continuously at 15-minute intervals. RCI personnel accessed the gauge twice during the Water Year 2015 (WY2015), on May 28, 2015 and October 7, 2015, to perform maintenance on the data logger and download stored data. Figure 1 graphs the pressure data collected.

During the May 28, 2015 site visit, RCI staff collected stream discharge measurements in order to update the rating curve developed in past years. The rating curve is used to estimate discharge from the pressure data by developing a relationship between the pressure transducer readings and stream discharge. Figure 2 graphs the estimated discharge in cubic feet per second (cfs).

The stream gauge below East Peak Lake has been used to support compliance monitoring for Heavenly's water rights since 2004. The graphs help demonstrate that downstream flows in Daggett Creek are maintained and downstream water rights are not impacted. While the pressure transducer gauge provides a relative indication of water depth in Daggett Creek below East Peak Lake, the correlation to discharge is not very accurate, specifically for low flows in the range of 0 to 0.4 cfs. This is mostly due to the low flow depth and irregular cross section of the natural stream channel. In addition, the pressure transducer equipment has been difficult to maintain, due to both access restrictions and because the equipment is no longer manufactured.

Keeping these limitations in mind, Figure 2 reflects the average flow just below East Peak Lake. In January 2015, the Western Regional Climate Center¹ reported that "extreme drought continues into the 4th winter in California, and western Nevada…and a warm and dry January exacerbated drought conditions in these regions and depleted snowpack in the Cascades and Sierra." The graph indicates little winter storm activity impacting the stream gauge with the highest flow in May 2015, which corresponds to nearly two feet of late season snow that fell during the month along with typical spring snowmelt and runoff. In addition to storms and runoff, East Peak Lake was drawn down for repairs on the outlet valve, which is shown by the spike in flow in May. Daily pressure fluctuations during late

Western Regional Climate Center: http://www.wrcc.dri.edu/articles/

Mr. Andrew Strain April 27, 2016 Page 2

July/early August are not related to any specific activity at the resort to our knowledge and may be related to the transducer equipment.

Since the data logger has been in place for over a decade, RCI recommends installing a new data logger in Water Year 2016. The manufacturer of the current data logger (In-Situ, Inc.) advised upgrading the data logger to the "Rugged Troll 100." The cost for the data logger, associated communication cable and installation can be covered under the current Daggett Creek Monitoring Budget for Water Year 2015.

RCI has previously discussed alternate methods for estimation of natural runoff and releases with Heavenly Mountain Resort and the Nevada Division of Water Resources. If the Division concurs that alternative methods can be used to demonstrate compliance, the gauge would be unnecessary and could be removed. If not acceptable to the Division, then the in-stream discharge measurements would be continued.

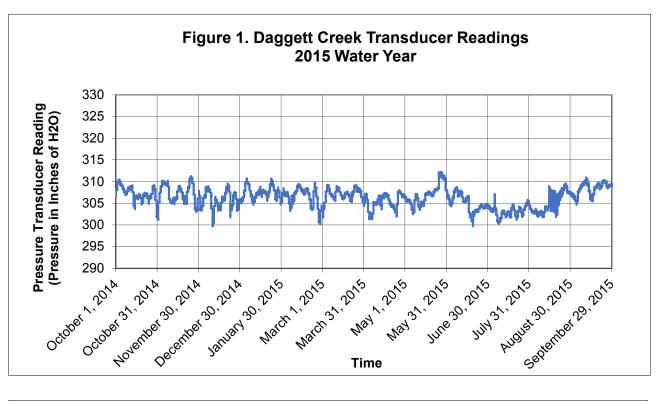
Please feel free to contact me with any comments or questions.

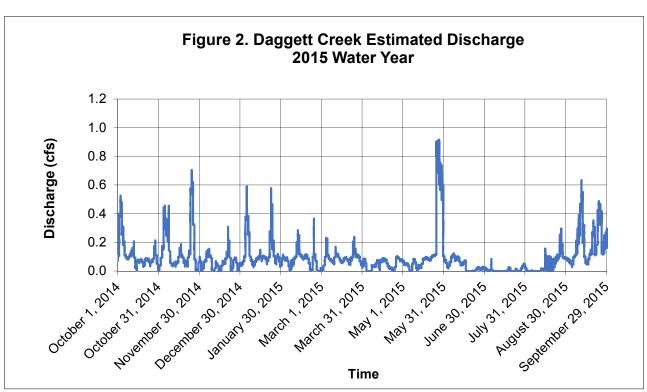
Sincerely,

Jill Sutherland, P.E. Project Manager

JLS:td

Attachments





APPENDIX VII

2016 WATERSHED MAINTENANCE RESTORATION PROGRAM (WMRP) WORK LIST



HEAVENLY MOUNTAIN RESORT 2016 ANNUAL SUMMER WORK LIST 4/25/16 Final

Phase 1: CA-1 High Priority Hotspots #45, 46

Phase 2: CA-1 Medium Priority Erosion Hotspots #30, 41-46, 48

Phase 2: NV-1 High Priority Erosion Hotspot #6

Phase 2: NV-1 Medium Priority Erosion Hotspots # 2, 14

Note: Erosion Hotspots are included in summer work lists, as required by the Epic Discovery EIR/EIS/EIS

Project #	Source*	Location	Treatment			
Watershed: CA-1 Heavenly Valley Creek						
1	Р	Family Loop Trail and Animal Abilities Exhibits	Construct trail and exhibits and permanent BMPs per plans.			
2	Р	Gondola Top Station Enclosure	Enclose bottom of Gondola Top Station for storage. Install permanent BMPs per plans.			
3	Р	Gondola Top Station to Tamarack Lodge Trail	Repave existing walking path from Gondola Top Station to Tamarack Lodge. Refurbish effective cover around walking path.			
4	EH-CA	Gully at Lower Cal Trail	Treat Low Priority Hotspot # 48. Well-established gully at lower Cal Trail. Restoration treatment along gully to slow and infiltrate surface runoff. Install pine needle filter berms cross slope for uphill protection and stabilization.			
5	EH-CA	Heavenly Valley Creek Stream Bank Stabilization and Restoration on South Fork	Treat Medium Hotspots #42, 43. Multiple sites need addressed above the culverts in Sky Meadows. ~5,000 sf of bare soil along steep banks to be hand loosened, mulched, and seeded. No fabric to be used on this restoration per IERS.			
6	EH-CA	Hellwinkle's Road	Treat Hotspot #'s 45 & 46. Choose option from Hellwinkle's Road Segment Alternatives, potentially dust palliative and water bar adjustments per plans.			
7	EH-CA	Rock Lined Ditch Decommission above Sky Meadows Culverts	Treat Medium Hotspot #44. Decommission rock-lined swale, which appears to unnecessarily collect dispersed run-off from steep rocky slopes above.			
8	EH-CA	Sky Deck Restoration Under Deck	Treat Hotspot #30. Restoration includes application of shade tolerant meadow/riparian species. Cover with a thin layer of pine needles to protect the seeds.			
9	Р	Tamarack Express Lift to Adventure Peak Hiking Trail	Construct trail from Tamarack Express to Adventure Peak and East Peak Lodge (out of Basin segment).			
10	Р	Tubing Run Revisions	Construction complete on revised tubing lanes. Complete seeding and soil loosening on decommissioned road.			

11	EH-CA	Upper Ridge Bowl	Treat Medium Erosion Hotspot #41. Rehab approximately 5 water bars at failure points, convert to infiltration swales by soil loosening and wood chip incorporation.		
12	Р	Waterfall Lift Removal Top Station Regrading (Top of Epic Mix Race Course)	Regrade top station area. Fill and stabilize as shown on approved project plans.		
13	Р	Welcome Area at Gondola Top Station	Construct Welcome Area at base of stairs at Gondola Top Station, remove existing Adventure Peak Grill seating area and restore paved area with wood chips.		
Waters	hed: CA-6 B	ijou Creek			
		NONE			
Waters	hed: CA-7 U	nnamed Creek - Gondola			
14	Р	Mid Station Canopy Tour Weather Shelter	Construct Mid Station Canopy Tour Weather Shelter and permanent BMPs.		
Waters	hed: NV-1 N	Nott Canyon Creek			
15	EH-NV	Big Dipper Lower Ski Run Water Bar	Treat Medium Hotspot #14. Rebuild water bars on Big Dipper Ski Run and create infiltration capacity upslope of the water bars through soil restoration treatment. Construct mulch berms/infiltration strips to prevent erosion and disperse flow.		
16	EH-NV	Orion's Middle Ski Run	Pine needle coverage to reduce chronic erosion and vegetation loss at Orion's Middle Ski Run. Located to the lookers left of the Dipper Express Lift line near towers 7-11.		
Waters	hed: NV-3 E	dgewood Creek			
		NONE			
Waters	hed: NV-2+	5 Daggett Creek			
17	Р	East Peak Canopy Tour	Construct East Peak Canopy Tour along with connecting trails, weather shelter and permanent BMPs per plans.		
Resort	<u>Wide</u>				
18	M	Resort-Wide	Inspect & restore all areas damaged or affected by winter resort operations, including hydrants & pipe failures, & areas affected by snowcat operations; document treatment.		
19	М	Resort-Wide	Erect and maintain vehicles barriers and/or fences to prevent unauthorized vehicle access off of designated summer roads and facility parking areas.		
20	М	Resort-Wide	Inspect and maintain all drainage structures.		
21	М	Base Areas	Maintain all BMPs and drainage structures. Erect and maintain vehicle barriers and/or fences to prevent unauthorized vehicle access from base areas.		
22	М	Resort-Wide	Road Maintenance Projects based on the annual Heavenly-Forest Service roads maintenance & monitoring agreement.		

*Source Cod	*Source Codes					
	M	BMP Maintenance				
	Р	Master Plan Implementation Project/Epic Discovery Project				
	RM	Resort Maintenance Project				
	EH-CA	Erosion Hotspot Inventory California Project				
	EH-NV	Erosion Hotspot Inventory Nevada Project				

Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX VIII 2015 BIOLOGICAL SURVEY RESULTS





25 November 2014

Mr. Andrew Strain Heavenly Mountain Resort P.O. Box 2180 Stateline, NV 89449

SUBJECT: HEAVENLY MOUNTAIN RESORT 2015 BIOLOGICAL SURVEY RESULTS SUMMARY

Dear Mr. Strain,

In order to comply with US Forest Service LTBMU requirements and to allow for preparation of environmental documentation for future construction and implementation of projects, Sierra Ecotone Solutions LLC has performed wildlife and plant surveys in suitable habitat within the Special Use Permit Boundary in 2015. Surveys for both northern goshawk and California spotted owl were completed to protocol. Additional surveys were performed for nesting bird species in the areas surrounding 2015 capital projects. Tahoe draba (*Draba asterophera asterophera*) surveys were performed for 2015 capital projects. A summary of each species surveys is provided below:

Tahoe Draba

Surveys for Tahoe draba were performed in the vicinity of the top terminal at Sky chair that was proposed for panting, the proposed lookout tower location and the Mott Canyon Avalauncher. All data collected was recorded by GPS and taken to LTBMU staff for use in future environmental documents.

California Spotted Owl

Methods:

Surveys were conducted and completed in potentially suitable habitat within and surrounding the project area. Surveys were conducted according to the United States Forest Service "Protocol for Surveying for Spotted Owls in Proposed Management Activity Areas and Habitat Conservation Areas" (March 12, 1991, Revised February 1993). The survey points used since the 2007 field season were utilized again in 2015 to provide continuity of data collected. Data sheets for 2015 surveys are attached to this letter.

Results:

No auditory or visual detections of California spotted owls were documented within the survey area during 2015.

Northern Goshawk

Methods:

Surveys were conducted and completed in suitable habitat within and adjacent to the project area for northern goshawk based on the updated habitat map generated by the US Forest Service for the environmental analysis of the Master Plan Amendment. In 2015, both dawn acoustical and broadcast survey methods were utilized and were completed to protocol. All surveys were conducted according

to "Survey Methodology for Northern Goshawks in the Pacific Southwest Region, U.S. Forest Service" (14 May 2002). Data sheets for 2015 dawn acoustical and broadcast surveys are submitted with this letter.

Results: No auditory or visual detections of northern goshawk were documented within the survey area in 2015.

The completion of the 2015 field surveys for northern goshawk and California spotted owl results in meeting the two-year protocol for these species. Based on Appendix A of the California spotted owl survey protocol, since no detections were documented, and the two year protocol was met, "the negative results may be considered accurate for two additional years without conducting additional surveys." The two-year timeline starts on the last day of the last survey, which would be 14 August 2015. Therefore, if implementation of projects would commence prior to 14 August 2017, no further surveys for California spotted owl would be necessary. However, if construction does not commence prior to this date, two-year protocol surveys must be conducted. The northern goshawk protocol does not include any discussion as to validity of surveys for any duration of time after protocol has been met. However, since northern goshawks have been detected in previous years, it is recommended surveys for northern goshawks are continued to determine if goshawks are nesting within the special use permit boundary.

A northern goshawk detection was recorded by USFS wildlife staff (plucking post) to the north of the Daggett and Ridge polygons in 2014. Due to this detection, a new polygon was created to cover the additional habitat that was previously not surveyed. Additionally, the Von Schmidt Flat survey polygon was not surveyed in 2015. The Von Schmidt Flat polygon remained in the survey area due to past incidental detections from non-biologists, and due to the fact the area did not reveal any detections over the years, and the relative low suitability of the habitat, the are was dropped from further surveys. The new polygon labeled Lower Daggett is now shown on the attached northern goshawk polygon map. No detections in this new polygon were observed or recorded.

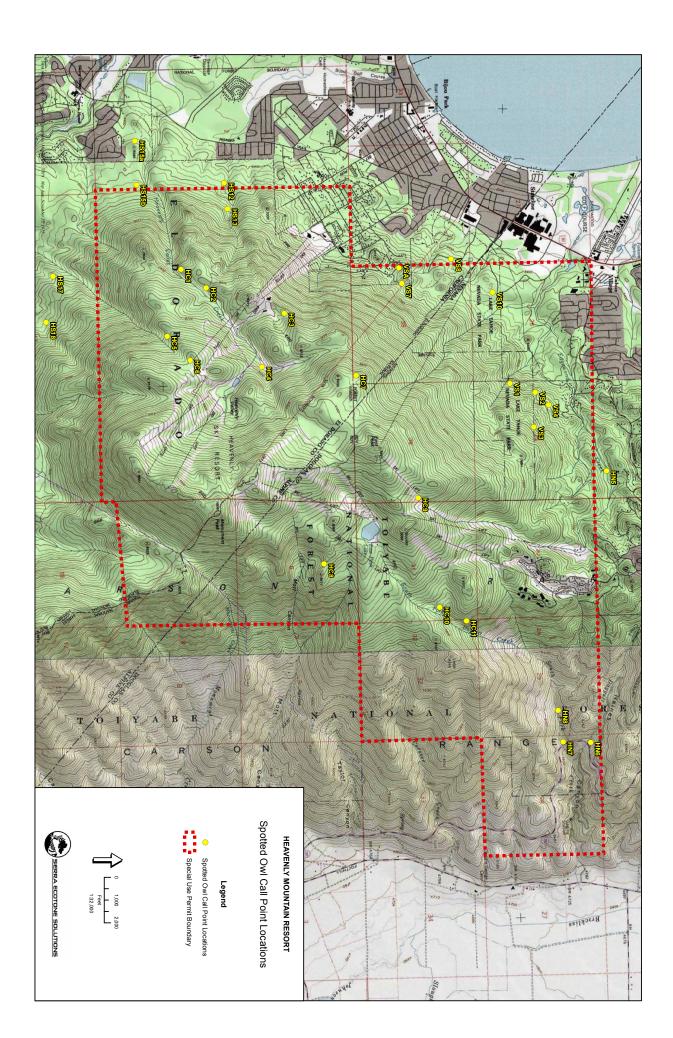
If you should have any questions regarding the surveys performed for the 2015 season, please do not hesitate to contact me at (530) 416-2440.

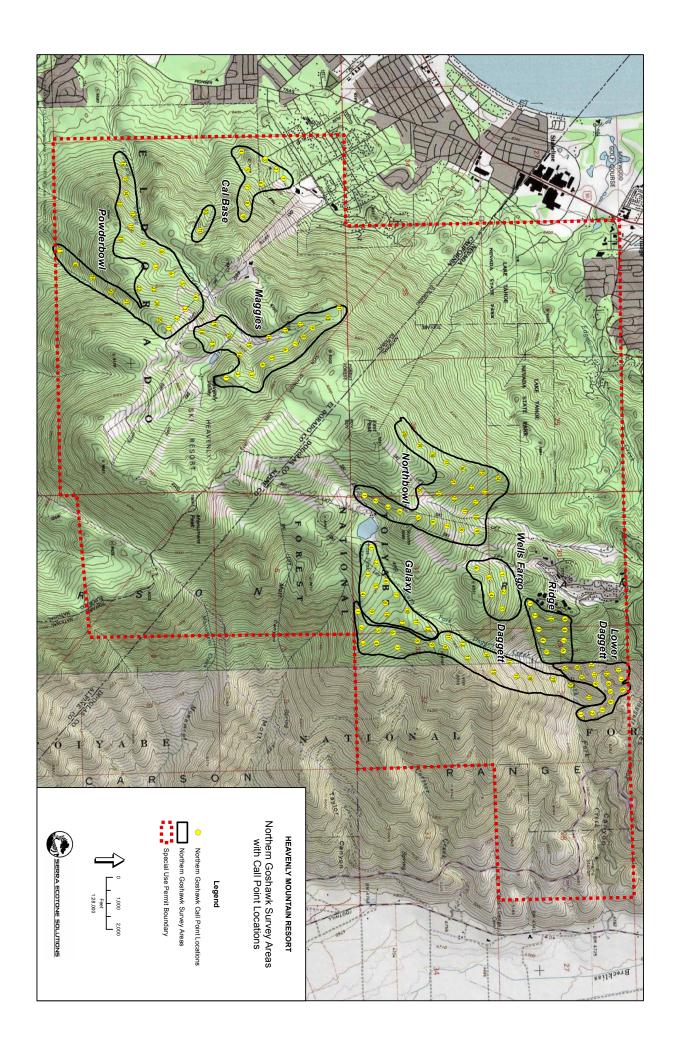
Regards,

Garth Alling Principal Biologist

Enclosures

CC: Shay Zanetti , USFS LTBMU Chris Donley, Cardno





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1	1-3	wind dir. shown by smoke dir,
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in constant motion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

^{*}do not survey in wind conditions >4 Beaufort

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1	1-3	wind dir. shown by smoke dir.
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in constant motion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

^{*}do not survey in wind conditions >4 Beaufort

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6	25-31	large tree branches move

^{*}do not survey in wind conditions >4 Beaufort

California Spotted Owl Visit Form-USFS-Lake Tahoe Basin Management Unit

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^{*}do not survey in wind conditions >4 Beaufort

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^{*}do not survey in wind conditions >4 Beaufort

California Spotted Owl Visit Form-USFS-Lake Tahoe Basin Management Unit

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^{*}do not survey in wind conditions >4 Beaufort

California Spotted Owl Visit Form-USFS-Lake Tahoe Basin Management Unit

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^{*}do not survey in wind conditions >4 Beaufort

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DRI	VUT TO	to be	TV	9-1-4cm	Like Di	Super 8	CAEC	SMA	479~N #1
		F 193			711 00	7 +			301 -
									speed: start end
NRIS	E: 071	1	START	SURVEY:_(0620	END SURV	EY: 02	345	
tection	ns: (include	time and dur	ation of vo	ocalizations,	type of vocalizat	tion, direction	n and dista	nce of v	ocal or visual detection
M co	ordinates)			UO	705 PC	NISC			
me	Duration	Call Type	Visual?	Direction	Distance (m)	Comments	s (include l	JTM co	ordinates)
			1			60	1850	5 Pa	NSE
			/		1 1				
-		-							
-									
						-			
-									
-									

Vocalization descriptions: Alarm Cull- a harsh kak-kak-kak repeated many times, Wail Call- a loud, plaintive, drawn out call.

#	Speed	Indicator of wind speed					
0	0	smoke rises vertically.					
1	1-3	wind dir. shown by smoke dir.					
2 4.7		wind on face; leaves rustle					
3	8-12	leaves, twigs in constant motion					
4	13-18	dust and leaves move					
5	19-24	small trees sway					
6 25-31		large tree branches move					

Route na Descript	ime: 146/	AVIJM 4	Cowson and I	how accesse	sit #:d:	•
40	7 100	GU TH	toot	141/001-	DECOME!	TO COWER DAGGETT
1200	TROW	10 C	ALC !	POWT	#9	
eather.	: % cloud co	over: 20%	precip:		np: start 3 °F	end 40 °F Beaufort wind speed: start ond
UNRIS	E: 07-0	15	START	SIIDVEV.	3/15	END SURVEY: 0825
etection	ns: (include	time and dur	ation of vo	ocalizations,	type of vocalizat	tion, direction and distance of vocal or visual detection
1 IVI CO	ordinates)		-/	W)	RISPO	NSO
ime	Duration	Call Type		-	Distance (m)	Comments (include UTM coordinates)
				-		(Milas S 222 SOO(GIRAGS)
	/===					
				-		
-			-			
				-		0
-						
			10.00			
			12 1.27			

Additional species detected:

Beaufort #	Wind Speed	Indicator of wind speed					
0	0	smoke rises vertically.					
1	1-3	wind dir. shown by smoke dir.					
2 4-7		wind on face; leaves rustle					
3	8-12	leaves, twigs in constant motion					
4	13-18	dust and leaves move					
5	19-24	small trees sway					
6	25-31	large tree branches move					

Vocalization descriptions: <u>Alarm Call</u>- a harsh kak-kak-kak repeated many times.

<u>Wail Call</u>- a loud, plaintive, drawn out call.

Observe	- GA	LLING	A CCT:	. CE	C	and the state of t
Addition	nal Observe	rs and affiliat	ion: (each	surveyor mu	ıst complete sepa	Date: 18 MAR 15 urate data form)
	-		_		_	
			-	_	· -	
		by station loca			sit #:	
SKW	FROM	STAGE	tone.	to to	AT THURST	C TRT THOSE TREADERS
						0 = 10 @ KNOPS
Weather	: % cloud co	over: 10	_ precip:	1 ter	np: stan 79 °F	end 40 °F Beaufort wind speed: start 3 end
SUNRIS	E: M	08	START	SHEVEV.	06/100	END SURVEY: 07.17
Detectio UTM co	ns: (include ordinates)	time and dur	ation of vo	ocalizations,	type of vocalizat	ion, direction and distance of vocal or visual detection,
	Ordinates)			10	DONE	CTT ONS
Time	Duration	Call Type	Visual?			Comments (include UTM coordinates)
	1127					
	7					
-			- 11			
4						
	-	-				

Additional species detected:

Beaufort Wind # Speed		Indicator of wind speed					
0	0	smoke rises vertically.					
1 1-3		wind dir, shown by smoke dir.					
		wind on face; leaves rustle					
3	8-12	leaves, twigs in constant motion					
4	13-18	dust and leaves move					
5	19-24	small trees sway					
6	25-31	large tree branches move					

Vocalization descriptions: <u>Alarm Call</u>- a harsh kak-kak repeated many times.

<u>Wail Call</u>- a loud, plaintive, drawn out call.

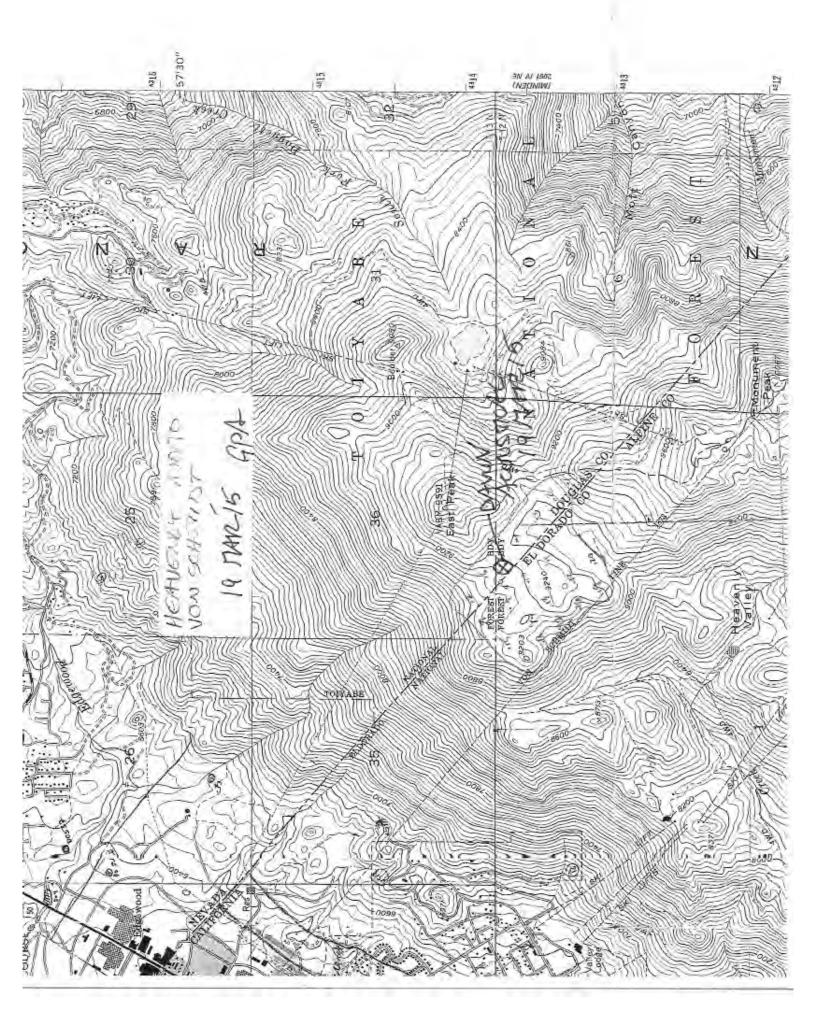
Observe	r. G.A	LIME	Affiliati	ion: <	BE	Date: 19 MAR 15
Addition	nal Observe	rs and affiliat	ion: (each	surveyor mu	ist complete sepa	parate data form)
Route na	ame: 146	AVINC ey station loca	Yth	SANA i	sit #:	_
SICIA	PROT	1 50/46	CECTIVE	The CO	415 4	OT & HIKET TO VONSCHOTET
5GF	TAP	150%	6000	TIMAL		
Weather	: % cloud co	over:	precip:	(// ter	np: stan 29 °F	end 34/°F Beaufort wind speed: start 3 end 2
						END SURVEY: 0 823
Detection	ns: (include ordinates)	time and dur	ation of vo	ocalizations,	type of vocaliza	tion, direction and distance of vocal or visual detection,
	ordinates)			100	D076	CTIONS
Time	Duration	Call Type	Visual?			Comments (include UTM coordinates)
		-				
			-14			
			1	14		
-		1		H		

Additional species detected:

Beaufort #	Wind Speed	Indicator of wind speed					
0	0	smoke rises vertically.					
1	1-3	wind dir. shown by smoke dir.					
2	4-7	wind on face; leaves rustle					
3	8-12	leaves, twigs in constant motion					
4	13-18	dust and leaves move					
5	19-24	small trees sway					
6	25-31	large tree branches move					

Vocalization descriptions: <u>Alarm Call</u>- a harsh kak-kak-kak repeated many times.

<u>Wail Call</u>- a loud, plaintive, drawn out call.



California Spotted Owl Visit Form-USFS-Lake Tahoe Basin Management Unit 16015114 COUNTY ...

Route Name/Territory:	19677 0 6706 4	200114	LIB	Visit#	Outing# -	Date:
Observers (and affiliation):	G. ALLING	(2022)	1			

Type of Survey (spot calling SC, follow-up FO, additional visit AD): Sunset/Sunrise: 1936 10679 Quad: SCT

Weather: % cloud cover: 10 9 precip: very: start 10 °F end 51 °F Beaufort wind speed: start 2 end 2

Summary of Survey Results and Comments:

NO RUSPONST

CS #	Start/Finish	V, A or B-sex (M,F,U)	Dir.	Dis.(m)	U1 Northing	Ms Easting	G P S	Comments (include legals and elevation for detections)
1%	1936-1946							NT
17	1958-2008							
	2031-2041							
15a	2054-2104							-:
13	2136-2146							
12	2157-2207							1
Vist-	12287248							9110 @ 340° = 300 m
VSA	SKIIZ							
183	2320-2330			1				11/2
vslo	2352-8002							1
				tuna Tunual				

Travel to Area Survey of Area Travel from Area

Beg.Time	 	
End Time	 	
Total		
Mil. Beg		
Mil. End		
Totals		

Beaufort #	Wind Speed	Indicator of wind speed
0	0	smoke rises vertically.
1	1-3	wind dir. shown by smoke dir.
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in constant motion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

^{*}do not survey in wind conditions >4 Beaufort

Observe	E AL	LING	Affiliati	on: 505		Date: 10 MAR IE
Addition	nal Observer	rs and affiliat	ion: (each	surveyor mu	st complete sepa	Date: CD MAN 15 urate data form)
Route na	ame: 1087	TH 13000	stion, and I	Vis	it #:	
70 Weather	: % cloud co	7/17/20 over: 7:3	precip:	Ø ten	np: start 78_°F	end 37°F Beaufort wind speed: start 3 end 2
Detectio			ation of vo	ocalizations,		tion, direction and distance of vocal or visual detection
Time	Duration	Call Type	Visual?	Direction	Distance (m)	Comments (include UTM coordinates)
			-			

Additional species detected:

Beaufort #	Wind Speed	Indicator of wind speed				
0	0	smoke rises vertically				
1	1-3	wind dir. shown by smoke dir.				
2	4-7	wind on face; leaves rustle				
3	8-12	leaves, twigs in constant motion				
4	13-18	dust and leaves move				
5	19-24	small trees sway				
6	25-31	large tree branches move				

Vocalization descriptions: <u>Alarm Call</u>- a harsh kak-kak repeated many times.

<u>Wail Call</u>- a loud, plaintive, drawn out call.

Visit #:	Outin	ıg#: Qu	ad: 50	T	ALCING T_	R sac(s)		_ Date:	DOM.
					т				
Weather: %	cloud cov	er: start (end (nracin us	CA	0	N Sec(S)	-		-4 -
		or star of cital					6/°F Beaufort		
SURVEY	INFORI	MATION:	Start Time	0511	End Time 091	56. Cal	ll point and route in	formation or	back.
RESULTS	:				O DETTO				· onen
Detection Number	Time	Detection	Bearing	Distance		E 10 UTMs	9		
Number	_	Type		(m)	Easting	Northin	g Latitude	Longitude	GPS
		-							915
									-
			1						-
					-				
	14 7 4					-			
						_			
	-								
Detection Number	Commen	ts							
		SURV	US1075	Litters	PARIX	1 -	DENT PUR		
				00000	FAGILGO.	4 151	DAY BOOK	Chil	
			NO	176517	THAT				
			7.	- Dest	- 102/05				
		5075	TAP TO	1350	1000	1 1 2			
		200	Tell In	2.10	4500	MES	7 STA 66	CATION	J
ection Type	: A= aları	n call; W= wai	l call; J= juv	renile beg; V=	visual only: N=	nect. DP= alor	cking post; F= feath		
p: Attach m	ap and der	note all call poin	ts (use O) an	d detections (us	e Δ)	nest, 11- pige	cking post; F= teath	er; R= roost	
	7	ravel To Site	Survey	12000	P				
Start Tim	-	To one	Survey	Travel	From Site	Beau-	Wind	of wind speed	21
Stop Tim				-		fort #	CONT. 10 -0 20 1200	The second second	111
						1	0 Smoke rises v	rertically In by smoke dir.	
Total Tim		100				A	Invited diff. Show	m ov smoke dir	

Total Time	Total Mileage

Begin Mileage End Mileage Total Mileage

Beau- fort #	Wind Speed	Indicator of wind speed
0	O	Smoke rises vertically
1	1-3	wind dir. shown by smake dir.
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in constant motion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

/isit #:	Outin	g#: \ Ou	ad S	LT	ACCING				Date:	3.01.
		Qu	iu		TF	sec(s)				
Veather: %	cloud cov	er: start O end	precip: start	C end	Z temp:	start F oF en	166°F	Beaufort w	ind speed; sta	n≤ er
	NFOR	MATION:	Start Time	0505	End Time_/ 10 4					
Detection	Time	Detection	Bearing	Distance	ZONI	E 10 UTMs		H.		
Number		Type		(m)	Easting	Northin	9	Latitude	Longitude	CDC
								Satitude	Longitude	GPS
	1	-								
					-					
					+	+		-		
						7	-			
							_			
Detection	Commer	its					_			
lumber	-		_							
	Vov	THBOW	15	75	110					
	7	111112000		2)	300	DOTGICT			-	
									_	
							_		_	-
										_
-										_
ection Type	: A= alar	m call; W= wai	l call; J= juv	enile beg; V=	visual only; N=1	nest; PP= plu	cking p	Ost: F= feath	er P≡ roost	
ection Type o: Attach m	: A= alar ap and de	m call; W= wai	l call; J= juv ts (use O) and	renile beg; V=	visual only; N= τ se Δ)	nest; PP= plu	cking po	ost; F= featho	er; R= roost	
ection Type a: Attach m		m call; W= wai	(000 0) 410	a detections (a	se a)		cking po	ost; F= feathe	er; R= roost	
ection Type :: Attach m	1		l call; J= juv ts (use O) and Survey	a detections (a	visual only; N= r se Δ)	Boau-	Wind	-277 / Sa. 257 / Sa. 257	18 18 18 18 18 18 18 18 18 18 18 18 18 1	
	ie 1		(000 0) 410	a detections (a	se a)			-277 / Sa. 257 / Sa. 257	of wind speed	10 m
Start Tin	ie e		(000 0) 410	a detections (a	se a)	Beau- fort #	Wind Speed	Indicator of Smoke rises v	of wind speed ertically n by smoke dir	12.

Total Time	Total Mileage

End Mileage

Total Mileage

fort #	Wind Speed	Indicator of wind speed
0	0	Smoke rises vertically
1	1-3	wind dir. shown by smoke dir.
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in constant motion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

					. ALCI				Date:	00 /
V 1511 #:	Outin				r					
		Qua	ad:		т	R sec(s)			
Weather: %	cloud cov	er: start end	nrecin: start	0	temp:	150	17.	75.50		~
			_ preorp. start	end	temp:	startQ3_F en	id 7 Col	Beaufort w	ind speed: sta	m ^S e
URVEY	INFORM	MATION:	Start Time	1139	End Time 151	7 C	Il noint	and route in	Sec. 11	
ESULTS				the second second second			n point	and route in	ormation on	back.
Detection	Time	Detection	Bearing		JI-TUCT,					
Number		Type	bearing	Distance (m)		E 10 UTMs			70.77.4	
		-		()	Easting	Northin	ng	Latitude	Longitude	GPS
					-					
-			-				_			
										10
				P 100						
		1				_		+		
					1	_	_			
					-	_				
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	_									
etection	Commen	ts								
umber										
						_				-
			110	DOM	YTANY					
			110	1900	per rox					
			_							
										_
							_			
ection Type	: A= aları	m call; W= wai	l call; J= juv	enile beg; V=	visual only; N=	nest; PP= plt	ucking n	ost: F= feathe	r R= roost	
. Attach in	ap and des	note all call poin	ts (use O) an	d detections (u	se Δ)				7, 14-100SL	
	1	ravel To Site	Survey	Trave	I From Site					
Start Tin				Trave	errom site	Beau- fort #	Wind Speed	Indicator	of wind speed	590
Other C Till						TOP 22	 300eed 	THE RESERVE THE PROPERTY OF THE PARTY OF THE	**************************************	Septime 1
100000000000000000000000000000000000000	e					-		A TOR BUT WEEK TO	产工程的	11
Stop Tim						0	0 1-3	Smoke rises v	产工程的	

8-12

13-18

19-24

4

5

leaves, twigs in constant metion

dust and leaves move

large tree branches move

small trees sway

Begin Mileage

End Mileage

Total Mileage

Total Mileage

Total Time

Site: (H)	217191	1 1-21	Surve	yors: 7	ALC WG	7		Date:	WI
/isit #:	Outin	og #:Qu	ad: 567	1711	10014	Rsec(s)			
		Qu	ad:		T	R sec(s)			
Weather: %	cloud cov	er: start o end	orecip: start	9 and	(Z) *******	2/7 or	177°F Beaufort w		7
UDVEVI	MEODI			-/	temp.	start / C r end	177 F Beaufort w	ind speed: sta	_n_
OKVEYI	NFOR	MATION:	Start Time	0527	End Time 13	2-/ Ca	ll point and route in	formation on	bac
ESULTS:			NO	DOLLEGE	TIONS				
Detection Number	Time	Detection Type	Bearing	Distance	ZON	E 10 UTMs			
, amber		Туре		(m)	Easting	Northin	g Latitude	Longitude	GP
			-	-					
	-	1		-					1
		-	-		-		- 14 17		
				-	-				1-
			-	-	+				
				-	+				
				-					
					-				
	Commen	its							
Number	_								
				100	WIT 6179	74472			
			- /	00 1	701601	10/03			
					-				
-									
ection Type: D: Attach ma	A= alar	m call; W= wa note all call poir	il call; J= ju	venile beg; V=	visual only; N=	nest; PP= plu	cking post; F= feath	er; R= roost	_
			(use O) all	ia detections (u	se Δ)				
	1 -	Fravel To Site	-						
1		preserved for first.	Carinal	700					
Start Tim		raver to Site	Survey	Trave	el From Site	Beau-	Wind		1.3
Start Tim	e	rraver to Site	Survey	Trave	of From Site	Beau- fort #	Wind Indicator 0 Smoke rises v	of wind speed	

1
-
-

fort #	Speed	Indicator of wind speed
. 0	0	Smoke rises vertically
1	1-3	wind dir. shown by smoke dir.
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in conctant metion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

Total Time		Total Mileage	
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Visit #:	Outin	g#:Qu	ad: 54	7	ALCIN	R sec(s)	31		
		Qu	ad:		Т	R sec(s)			
Veather: %	cloud cov	er: start 2 end 9	precip: start	2 end	D temp	stan 44 °F and	10°F Beaufort v	Europa An	7 -
		MATION:							
			Start Time	11.3	End Time 101	Call	point and route in	formation on	back.
ESULTS Detection	Time	Detection	Bearing	Distance		CCTTO	MZ		
Number	- 53.64	Туре	bearing	(m)	Easting	E 10 UTMs Northing	Latitude		
				100		Northing	Labtude	Longitude	GPS
				1					_
								-	-
					1				
								-	
			100						
						_			
etection	Commen	its						_	_
-									
				1103	11:	- 11 P			
				NO	120201	CITON	1		
							-		
ection Type	: A= alar	m call; W= wai	l call; J= jus	renile beg; V=	visual only; N=	nest; PP= pluc	king post; F= feath	er: R= roost	
. receci iii	ap and de	note all call poin	its (use O) an	d detections (us	se Δ)			-11 14 10031	
0		ravel To Site	Survey	Trave	From Site	Beau-	Wind	William Control	esci.
Start Tin							Speed Indicator	of wind speed	
Stop Tim						0	0 Smoke rises		_
Total Tim	ie					1	1-3 wind dir shov	n by smoke dir	5

Ind Mileage	
Total Mileage	

Begin Mileage

fort #	Speed	Indicator of wind speed
0	0	Smoke rises vertically
1	1-3	wind dir shown by smoke dir.
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in constant motion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

Total Time	Total Mileage
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ISH #.	Outin	g#: Oua	id: 5	CT	ACCU 	2 2006	1		Date:	-
										_
		1 -		10.7	TF	sec(s)				_
eather: %	cloud cov	er: start end	precip: stan	end end	y temp:	start 6 °F end	76°F	Beaufort w	ind speed: star	3
RVEY	INFORM	MATION:	Start Time	0517	End Time	Z Cal	l point	and route inf	ormation on	hack
SULTS					DE TOICT					
etection	Time	Detection	Bearing	Distance		E 10 UTMs				_
umber		Type		(m)	Easting	Northin	g .	Latitude	Longitude	GP
								Journage	Longitude	Gr
							-			-
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		111			1		_			-
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						-				
						-				
				-						
									-	
tection	Commen	its								
mber	2 \$ 110.004									
						100	_			_
				110	DUTTEC	170 N				_
				V - X	1				_	_
						_	_			_
tion Type	e: A= alar	m call; W≔ wai	call: .I= im	venile heg: V=	E visual on hu. N-					
tion Type Attach n	e: A= alar nap and de	m call; W= wai note all call poin	l call; J= ju ts (use O) an	venile beg; V=	visual only; N= se Δ)	nest; PP= plu	cking po	ost; F= feath	er; R= roost	
tion Type Attach n	e: A= alar nap and de	m call; W= wai	I call; J= juv ts (use O) an	venile beg; V= d detections (u	visual only; N= se Δ)	nest; PP= plu	cking po	ost; F= feath	er; R= roost	
tion Type Attach n		Total out poin	is (use o) an	d detections (t	se a)	nest; PP= plu	cking po	ost; F= feathe	er; R= roost	
	1	m call; W= wai note all call poin Fravel To Site	l call; J= ju ts (use O) an Survey	d detections (t	visual only; N= se Δ)	Веаи-	Wind		A Section 1	
Start Tin	ne 1	Total out poin	is (use o) an	d detections (t	se a)	Beau- fort #	Wind Speed	Indicator	of wind speed	
tion Type Attach n Start Tin	ne 1	Total out poin	is (use o) an	d detections (t	se a)	Beau- fort # 0	Wind Speed	Indicator	of wind speed ertically	17.
Start Tin	ne le	Total out poin	is (use o) an	d detections (t	se a)	Beau- fort #	Wind Speed	Indicator	of wind speed ertically in by smoke dir	17.1

End Mileage

Total Mileage

Total Time

Total Mileage

13-18

19-24

25-31

leaves, twigs in constant motion

dust and leaves move

large tree branches move

small trees sway

Site: (A)	CAL	13/150	Survey	ors: 6.	ALCU	40			Date: J	12/5
Visit #:	_ Outin	g #:Qu	ad:	SLT	TI	Rsec(s)	7		
		Qua	ad:		TI	Rsec(s)			
Weather: %	cloud cov	er: starr end	Oprecip: start	Z end	temp:	start 4/oF on	1700	Danife + v		マ
		MATION:								
			Start Time	1500	End Time /5 3	Ca Ca	ll point a	ind route inf	ormation on	back
RESULTS Detection	Time	Detection	Bearing	Distance		7/00	5			
Number		Туре	bearing	(m)	Easting	E 10 UTMs Northin	a	Latituda	Danier I	one
						.vortann	8	Latitude	Longitude	GPS
										1-
		-								56
Detection	Commen	ts								
Number										
	_									
				-/-	/	1				
				17	/	1-				
				1						_
				1			_			
										_
-	· A= alar	m call; W= wai	l call: J= inv	renile hear V=	visual only: N-	none DD I				
ection Type	- Le mini	and the same of the same of	its (use O) an	d detections (us	se Δ)	iest; PP= plu	icking po	st; F= feathe	er; R= roost	
ection Type p: Attach m	ap and de	note all call poin	is (use or) an	The state of the s						
ection Type p: Attach m	ap and de	note all call poin	ns (use O) an							
ection Type p: Attach m		ravel To Site	Survey		From Site	la rever	with the sale	ranty Service and other the		
ection Type p: Attach m	7				From Site	Beau- fort #	Wind Speed	Indicator	of wind speed	

	The same	Survey	Travel From Site
Start Time			
Stop Time			-
Total Time			
Begin Mileage			
End Mileage			
Total Mileage			

fort #	Speed	Indicator of wind speed
. 0	0	Smoke rises vertically
1	1-3	wind dir. shown by smoke dir
2	4-7	wind on face; leaves rustle
3	8-12	leaves, twigs in constant metion
4	13-18	dust and leaves move
5	19-24	small trees sway
6	25-31	large tree branches move

Total Time		Total Mileage	
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15 May 2015

Mr. Andrew Strain Heavenly Mountain Resort PO Box 2180 Stateline, NV 89449 -via e-mail-

SUBJECT: 2015 EPIC DISCOVERY PROJECT PRECONSTRUCTION BIOLOGICAL SURVEYS RESULTS

Mr. Strain:

This memorandum is to inform you of the completion of preconstruction surveys for nesting bird species, marten den sites and bat roost surveys. The following project areas were surveyed for the presence of the above wildlife species/types: Mid-Station Canopy Tour, Forest Flyer Alpine Coaster and the Kids Zipline. These areas were surveyed for marten den locations, the presence of bat roost sites and for nesting birds in accordance with the design features identified in the Biological Evaluation and the Epic Discovery EIR/EIS/EIS. The subject area was surveyed on 3 April, 4 April, 13 April, 12 and 13 May 2015.

Bat Roost Survey: The project areas were surveyed for the presence of bat roosts in rock crevices, snags and within dense trees (clumps of whitebark pine and lodgepole). No evidence of bat roosts was observed during the surveys.

Marten Den Site Survey: The project area was surveyed for the presence of marten den sites during the above dates. A trace amount of snow fell on 2 April that allowed for the area to be surveyed using snow-tracking methods. One set of tracks was observed crossing the project area on the west side of the project area above Maggie's Canyon with no evidence of denning activity. No other evidence of marten was observed in the project area.

Nesting Bird Survey: The project area was surveyed for nesting birds on all of the above dates. No active nests were observed. It should be noted a few snags exist within the project area that contain cavities (none of which were active) that are suitable nesting locations for a variety of bird species present. Efforts should be made to retain these snags within the project area where feasible in order to maintain suitable nesting locations for cavity nesters.

Species observed: Avian species: mountain chickadee (*Poecile gambeli*), dark-eyed junco (*Junco hyemalis*), common raven (*Corvas corax*), Stellar's Jay (*Cyanocitta stelleri*), northern flicker (*Colaptes auratus*), white- headed woodpecker (*Picoides albolarvatus*), Williamson's sapsucker (*Sphyrapicus thyroideus*), red-breasted nuthatch (*Sitta canadensis*), pygmy nuthatch (*Sitta pygmaea*), mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), Canada goose (*Branta canadensis*), yellow-rumped warbler (*Setophaga coronata*), brewers blackbird (*Euphagus cyanocephalus*), red tailed hawk (*Buteo jamaicensis*), pine siskin (*Carduelis pinus*), Cassin's finch (*Haemorhous cassinii*). Mammals: Raccoon (*Procyon lotor*), Douglas squirrel (Tamiasciurus douglasii), least chipmunk (*Tamias minimus*).

Regards,

Garth Alling

Principal Biologist

Attachment: survey area shape file (electronic)

CC: Rena Escobedo, LTBMU

Holly Eddinger, LTBMU Matt Dickinson, LTBMU

Jonathan Cook-Fisher, LTBMU

James Grant, Heavenly Mountain Resort

Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX IX 2015 BOUNDARY MANAGEMENT PLAN



BOUNDARY MANAGEMENT

A. In perimeter areas, where it is likely for the skiing public to ski out of the patrolled area, Heavenly may utilize a gated boundary system consisting of the following elements:

- 1. Gates located in areas that people have traditionally gone through in order to reach an area out-of-bounds.
- 2. Appropriate signage will be placed at the gates, informing users this is true backcountry access. Heavenly will place signs indicating that terrain is not patrolled or maintained beyond this point. Avalanche danger exists. You are responsible for your own safety and survival. Searches may or may not be conducted due to hazardous conditions. Skiers who enter the Backcountry areas will do so knowingly and will accept full responsibility for property loss, injury and/or death. Gate postings will also include the Back Country Checklist, the North American Public Avalanche Danger Scale, USDAFS Access Point Notice and other signage. They may also be cited by local authorities and charged for the cost of their rescue.
- 3. Gated entries will be a well identified vertical structures through which a skier must pass. A steel gate will hang horizontally from one post and be held against the other by a self-closing mechanism.

For someone to enter the area they must pull the gate in front of them as they pass through, the gate will automatically close behind them. The bar will be height adjustable to allow it to remain at waist-height for a normal adult. The intent in doing this is to require a physical action beyond merely going through the posts to enter the area.

4. Due to the fact that this experience would be the same as any other backcountry experience, Heavenly will rarely "close" access into the terrain. these gates would be closed when Heavenly staff is actively performing avalanche control with explosives in the adjacent permit area.

There are other rare instances where a back country gate may be closed by the operating ski resort in order to halt access to the terrain by none authorized individuals.

- 5. "Closed Ski Area Boundary, Exit Through Gates Only" signage will be placed along perimeter ropes. These signs are placed at appropriate intervals so that individuals have the opportunity to read the warning from inside the area perimeter ropes. The signage will indicate that some routes may access private property.
- 6. Heavenly will provide and maintain counters at each of the gates for the entire ski season. Gate use will be monitored and reported to Forest Service
- 7. Heavenly will assist county search and rescue efforts when possible. Back Country Access gates will be monitored throughout the winter season to ensure signage is in place, the gates are functioning properly, and that they are at the appropriate height. The gates are installed at the following locations:
- 1. Fire Break: This gate is located to the north of the top of Olympic Chair. It accesses north/northwest terrain locally termed "The Palisades" continuing down towards lower 207 Kingsbury grade (lake side).

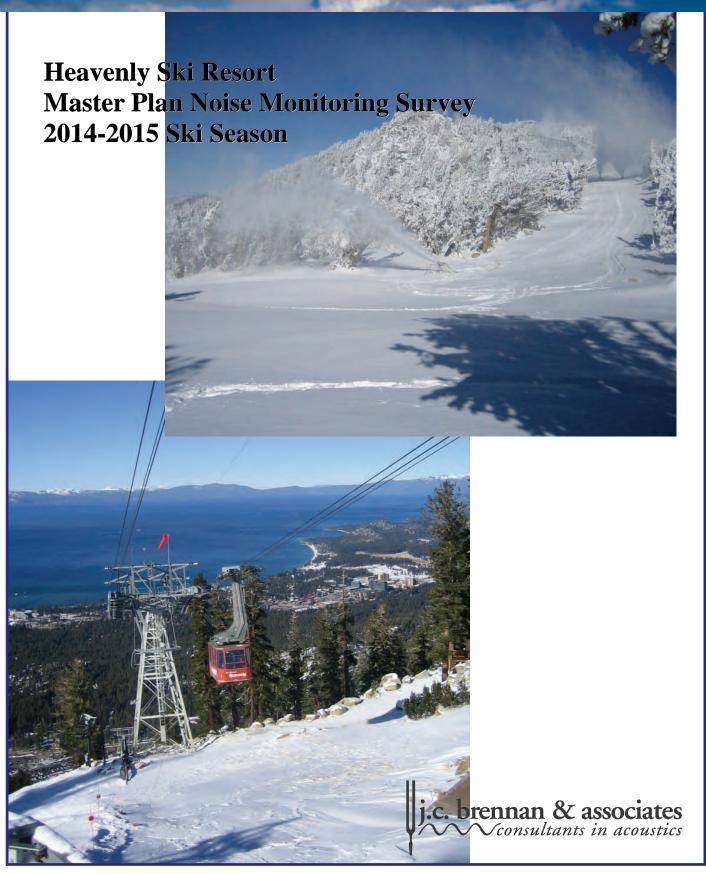
- 2. Raley's Gulch: This gate is located off the California Trail at the perimeter rope of Maggie's Canyon. It accesses north/northwest terrain that continues down the front side of the mountain towards Lake Tahoe.
- 3. Fulstone Canyon: This gate is located above the existing Gate "A" of Killebrew Canyon. It accesses east/northeast terrain to the southeast of Killebrew Canyon and continues down to the Foothill side of 207 Kingsbury grade.
- 4. Stateline Gate: This gate is located at the top of Red Fir Handle tow lift above and behind Tamarack Lodge. This gate accesses north/northwest terrain that continues down the front side of the mountain and areas under the gondola.
- 5. The Beach: This gate is located off of the upper area of the Skyline Trail. It accesses east facing terrain that continues down to Monument Pass and the lower Fullstone terrain.
- 6. Broad Daylight: This gate is located at the end of "The Cut" on upper Roundabout trail. It accesses north/northwest terrain that continues down to the "Powerline Trail", Pioneer Trail, and upper Ski Run areas.

Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX X 2015 ANNUAL NOISE MONITORING REPORT









P.O. Box 6748 • Auburn, California 95604 1287 High Street • Auburn, California 95603 p.530.823.0960 • f.530.823.0961 • www.jcbrennanassoc.com

December 10, 2015

Mr. Chris Donley Senior Project Engineer Cardno, Inc. 701 University Avenue, Suite 200 Sacramento, CA 95825

Subject: Submittal of the Heavenly Ski Area Mitigation Monitoring Report for Noise - 2014/2015 Ski Season

Dear Mr. Donley:

The acoustical consulting firm of j.c. brennan & associates, Inc. is pleased to submit the results of the 2014/2015 Heavenly Ski Area Mitigation Monitoring Noise Report. The results of the report are very similar to previous years. Snowmaking noise levels at the California and Nevada base areas continue to show slight reductions in overall noise levels. Continued implementation of newer technology quiet snowmaking equipment on the mountain is expected to continue this trend.

We have made some recommendations with regards to the snowmobile mitigation monitoring and rock busting mitigation monitoring requirements. It is our recommendation that these two monitoring requirements are removed. We have provided discussions on the reasoning for these recommendations within the report.

Please feel free to call if you have questions.

Respectfully submitted,

j.c. brennan & associates, Inc.

Jim Brennan President

I INTRODUCTION

j.c. brennan & associates, Inc. is providing a final report for the Heavenly Master Plan Noise Mitigation Monitoring Plan, and analysis of noise measurement data collected during the 2014/2015 snowmaking operations at Heavenly Ski Resort. The noise measurements and analysis of data are required as a condition of approval for the Heavenly Master Plan EIS/EIR. This is the nineteenth annual analysis of snowmaking operations noise levels.

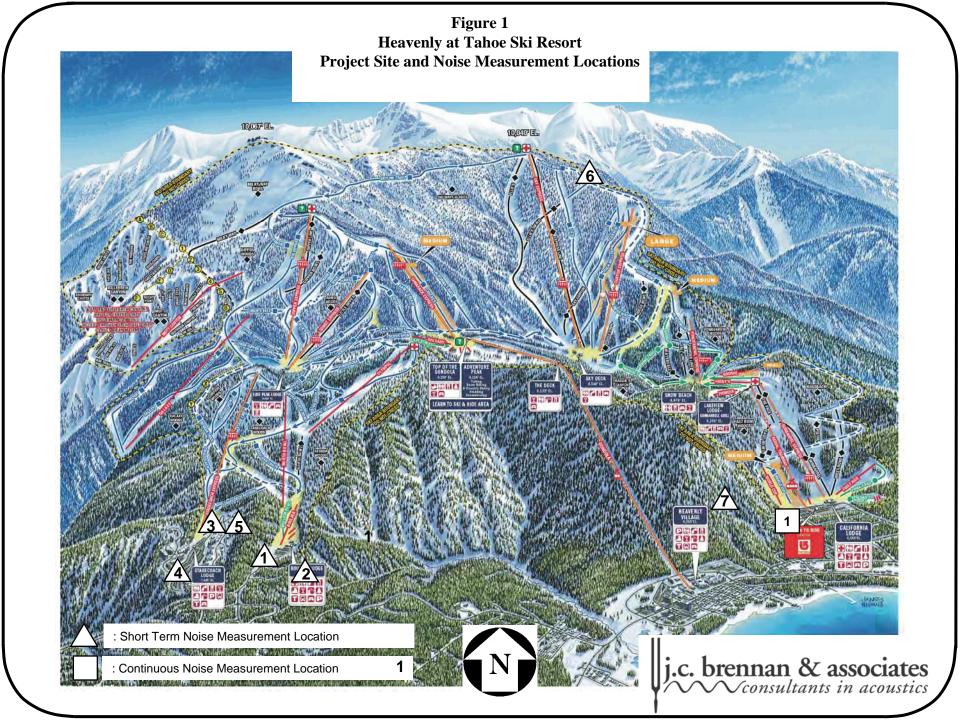
j.c. brennan & associates, Inc. staff have been involved in conducting the annual snowmaking operations noise analyses since the 1996/1997 ski seasons. The previous ten noise analyses for the 2004/2005 through the 2013/2014 ski seasons were prepared by j.c. brennan & associates, Inc.

The conditions of approval for the Heavenly Master Plan EIS/EIR include instituting a comprehensive noise monitoring program, the replacement of older and louder air/ water nozzles with quiet model snowmaking equipment, sound control devices for snowmaking equipment, and participation with the snowmaking industry in the research and development of quiet snowmaking equipment and sound control devices for snowmaking equipment. The current technology considers quiet snowmaking equipment to include both fan guns and more efficient air/water nozzles (sometimes referred to as "stick guns"). Based upon noise measurement data collected for the various types of snowmaking equipment, fan guns are generally 10 or more dBA quieter than older model air/water nozzles. In recent years, significant reductions in noise have been realized from newer designs of some air/water nozzles. Generally, lower air pressure during the mixing process at the nozzle results in lower noise emissions. In addition, fan guns which receive air pressure from a central compressor located within a building and are not equipped with individual air compressors also result in reduced noise emissions.

Since the 1996/1997 ski season, Heavenly Ski Resort has committed to the installation of a permanent noise monitoring site at the base of the ski area near the California lodge, and to establishing the existing snowmaking noise levels at the Boulder Base and Stagecoach Base. Refer to Figure 1 for locations of noise monitoring sites.

According to the previous snowmaking noise reports, during the 1996/1997 ski season some quiet snowmaking equipment was installed and used at the California Base facilities. However, the use of quiet equipment was limited. During the 1997/1998 ski season, additional quiet snowmaking equipment was introduced into the fleet of snowmaking operations. During the 1998/1999 snowmaking operations, no additional quiet snowmaking equipment was implemented. Based upon review of the log of snowmaking activities provided by Heavenly, fan guns have been used in both the lower and upper locations of the California Base since the 1999/2000 ski season. Beginning with the 2008/2009 ski season, fan guns have been used extensively on the lower portion of the California Base area. Based upon the snowmaking logs, there has been limited use of air/water nozzles on the lower portion of the California side as an effort to reduce overall snowmaking noise levels.

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II PURPOSE AND NEED

The purpose and need for the Annual Noise Monitoring Report, is to address the attainment of performance standards contained within the Heavenly Master Plan and to address progress toward attainment of the TRPA noise level criteria.

TRPA Criteria

The Tahoe Regional Planning Agency (TRPA) has adopted Environmental Thresholds for the Lake Tahoe Region. The noise standards, or Thresholds as they are commonly referred to, are numerical Community Noise Equivalent Level (CNEL)¹ values for various land use categories and transportation corridors.

As a form of zoning, the TRPA has divided the Lake Tahoe Region into more than 175 separate Plan Areas. Boundaries for each of the Plan Areas have been established based upon similar land uses and the unique character of each geographic area. For each Plan Area, a Statement is made as to how that particular area should be regulated to achieve regional environmental and land use objectives. As a part of each Statement an outdoor CNEL standard is established based upon the Thresholds. Table 1 shows the existing CNEL standards for the Heavenly Plan Areas and adjacent Plan Areas.

	Table 1 Plan Area Statement (PAS) CNEL Criteria							
PAS	Description	CNEL Criterion						
087	Heavenly Valley California	55 dBA						
085	Lakeview Heights (Location of California Base noise monitoring location)	55 dBA						
094	Glenwood	50 dBA						
095	Trout/Cold Creek	50 dBA						
086	Heavenly Valley Nevada	55 dBA						
082	Upper Kingsbury	55 dBA						
080	Kingsbury Drainage	50 dBA						
088	Tahoe Village	55 dBA						

j.c. brennan & associates, Inc.

¹ For an explanation of these terms, see Appendix A: "Acoustical Terminology"

III COMPLIANCE REPORTING

III.1 Snow Grooming Noise

III.1a Master Plan Mitigation Methods

The Master Plan mitigation methods for snow grooming operations are to maintain an 85 foot setback from Plan Area boundaries that are adjacent to Heavenly. Operations of snow grooming equipment would not exceed Plan Area noise standards with a minimum of 85 feet of separation.

III.1.b Master Plan Milestone/Product

Snow grooming machines are not operated within 85 feet of PAS boundaries. Portions of the fleet are replaced continually with newer technology equipment

III.1c Responsible Party

Heavenly is responsible for educating snow groomers to maintain the 85 foot setback.

III.1d PAS Criteria

PAS 080 – 50 dB CNEL PAS 082, 085, 086, 087, 088 – 55 dB CNEL PAS 095, PAS 121 – 45 dB CNEL

III.1.e Results of Reporting and Determination of Compliance

In previous years this measure was included in the Cardno compliance report.

III.2 Snowmobile Noise

III.2.a Master Plan Mitigation Methods

Replace all snowmobiles with 4-stroke technology. This would ensure that snowmobiles would comply with the 82 dBA single event noise level standard. Currently, Heavenly only uses 4-stroke engine snowmobiles.

III.2.b Master Plan Milestone/Product

Snowmobile equipment is maintained and operated within 85 feet of PAS boundaries. Portions of the fleet are replaced with newer technology equipment on an annual basis.

III.2.c Responsible Party

Heavenly is responsible for replacing the fleet of snowmobiles with 4-stroke technology machines.

III.2.d Criteria

The TRPA single event noise level standard for snowmobiles is 82 dBA Lmax, at a distance of 50 feet.

III.2.e Results of Reporting and Determination of Compliance

Heavenly staff reported in 2008 that all snowmobiles in the fleet are 4-stroke engine technology. Noise measurement data collected for the snowmobiles indicate that they comply with the noise level criterion of 82 dBA Lmax. Therefore, this is in compliance with the TRPA thresholds.

Since the Heavenly snowmobile fleet has been converted to 4-stroke technology and the technology continues to focus attention on quiet operations, the Heavenly snowmobile fleet is expected to continue to become quieter over time. It is acknowledged within this report that this mitigation measure has attained compliance and can be removed from the master plan mitigation measures.

III.3 Snow Removal Noise

III.3.a Master Plan Mitigation Methods

Mitigation methods for snow removal noise impacts are to minimize nighttime snow removal operations, and by constructing noise barriers along the perimeters of the parking lots. At the California Base area, the upper parking lot should be cleared first, and clearing of the lower parking lot should be conducted during the daytime and evening hours.

III.3.b Master Plan Milestone/Product

Snow removal equipment is operated consistent with the measures listed above.

III.3.c Responsible Party

Heavenly is responsible for operating snow removal equipment consistent with the measures listed above.

III.3.d Criteria

PAS 080 – 50 dB CNEL PAS 082, 085, 086, 087, 088 – 55 dB CNEL

Results of Reporting and Determination of Compliance

To be provided in Cardno compliance report.

III.4 Snowmaking California Base Area Noise

III.4.a Master Plan Mitigation Methods

- 1. Use of fans in place of air/water nozzles or air/water guns which are low noise;
- 2. Re-direction of nozzles and fans to minimize noise exposures at PAS boundaries;
- 3. Reduction in the numbers of nozzles and/or fans;
- 4. Use of setbacks to reduce noise exposures at PAS boundaries;
- 5. Use of noise reduction housings for air/water nozzles:
- 6. Use of barriers at low-mounted air/water nozzles;
- 7. Reduction in snowmaking activities at nighttime;
- Sponsor research into reducing noise produced by snowmaking. This may include support
 of industry-wide research activities, specific studies concerning nozzle design sponsored
 directly by Heavenly, and the study of alternatives in placement of guns and fans at
 Heavenly.

III.4.b Master Plan Milestone/Product

Heavenly has installed the long-term noise monitoring station at the California Base area. The annual noise monitoring occurs from approximately November 1st, and generally through March 31st, depending on the snowmaking activities. Heavenly has completely replaced the air-water snowmaking nozzles at the base of California with fan guns. Heavenly has not implemented items 4 through 6 listed above. However, Heavenly staff has closely monitored the snowpack produced through winter storms and snowmaking operations to determine the appropriate time for discontinuing snowmaking operations and reduce nighttime snowmaking noise levels. In addition, Heavenly continues to invest in conducting noise measurements of varying types of snowmaking equipment to determine the feasibility of introducing more quiet technology snowmaking equipment.

III.4.c Responsible Party

Heavenly is responsible for implementing the mitigation measures.

III.4.d PAS Criteria

PAS 080 – 50 dB CNEL PAS 082, 085, 086, 087, 088 – 55 dB CNEL PAS 095, PAS 121 – 45 dB CNEL

III.4.e Results of Reporting and Determination of Compliance

1996/1997 - 2014/2015 Snowmaking Noise Levels Summary:

Previous reports provide details on the analysis of past and present snowmaking seasons. Results of all noise monitoring surveys are provided in Tables 2 and 3.

2014/2015 Snowmaking Noise Levels Summary:

The ski season during the 2014/2015 spanned a total of approximately 151 days. Continuous snowmaking noise level measurements were conducted between November 1, 2014 and March 28, 2015 at the permanent noise monitoring site, located on the USFS property located directly east of Heavenly Ski Area, and across Keller Road (PAS 085). The monitoring site is located on the southeast corner of the intersection of Keller Road and Saddle Road, with a direct line of sight to the California Base snowmaking operations. As mentioned in previous reports, the location of the noise monitor was at the northeast corner of Keller Road and Saddle Road, and adjacent to the Tahoe Seasons Resort. That monitoring location was reaching the limitations of its usefulness. Traffic noise from the intersection of Keller Road and Saddle Road was influencing the overall measured noise levels. The current location has sufficient setback to reduce the amount of noise associated with the traffic as it affected the overall measured noise levels and the noise levels associated with the snowmaking operations.

The equipment used for the noise level measurements was a Larson Davis Laboratories (LDL) Model 820 precision integrating sound level meter which was calibrated with an LDL Model CAL 200 acoustical calibrator. The sound level meter is powered by a solar panel with a deep cell battery back-up. The sound level meter was downloaded once per month, and was checked for calibration.

During the 2014/2015 ski season the Heavenly snowmaking staff continued the log of snowmaking operations, also noting the use and location of snowmaking equipment, during the hours of operation when snowmaking activity occurred. Upon review of the snowmaking activities log provided by Heavenly snowmaking personnel, the measured CNEL values during snowmaking activities was determined at the noise monitoring location. Noise associated with snowmaking activities was a function of the number and location of snowmaking nozzles and/or fans guns in operation. Table 2 summarizes the previous eighteen years of snowmaking levels at the Tahoe Seasons Resort (PAS 085), as well as the 2014/2015 season.

Table 2 Summary of Measured Noise Levels at the Heavenly Base Area (Average Measured CNEL Values) Noise Monitoring Site GPS Coordinates (38° 56' 17.43" N - 119° 56' 18.43" W)

					,	
Year	CNEL on Days Year with Snowmaking		CNEL During Measurement Period	Total # of Monitoring Days	Total # of Snowmaking Days	
1996/1997	74.1 dBA	61.7 dBA	71.6 dBA			
1997/1998	73.5 dBA	61.8 dBA	70.2 dBA			
1998/1999	73.0 dBA	62.0 dBA	69.5 dBA			
1999/2000	74.3 dBA	62.0 dBA	73.0 dBA	141	101	
*2000/2001	74.1 dBA	60.0 dBA	72.2 dBA	140	89	
*2001/2002	73.9 dBA	60.3 dBA	72.1 dBA	145	93	
*2002/2003	72.0 dBA	63.1 dBA	68.3 dBA	150	61	
*2003/2004	67.4 dBA	62.3 dBA	65.7 dBA	104	56	
*2004/2005	65.3 dBA	61.5 dBA	63.1 dBA	149	51	
*2005/2006	61.0 dBA	60.9 dBA	61.4 dBA	151	41	
*2006/2007	63.7 dBA	58.1 dBA	62.6 dBA	149	75	
*2007/2008	62.4 dBA	58.2 dBA	61.6 dBA	140	62	
*2008/2009	62.4 dBA	59.7 dBA	61.2 dBA	119	75	
**2009/2010	**2009/2010 59.8 dBA		58.1 dBA	150	72	
**2010/2011	57.9 dBA	55.6 dBA	56.5 dBA	150	52	
**2011/2012	59.3 dBA	55.5 dBA	58.1 dBA	148	86	
**2012/2013	60.1 dBA	55.9 dBA	58.6 dBA	143	77	
**2013/2014	57.9 dBA	55.2 dBA	56.7 dBA	136	62	
**2014/2015	58.7 dBA	52.5 dBA	57.0 dBA	148	86	

^{*}The 2000/2001 - 2008/2009 measurement site was moved to the ground level of the Tahoe Seasons Resort. Previously this site was located at the roof-top of the Tahoe Seasons Resort.

The average measured CNEL value at the monitoring site for the 2014/2015 season was 58.7 dBA when snowmaking operations occurred. This is consistent with the lowest measured CNEL values since the reporting began. There continues to be significant progress in reducing snowmaking noise since the introduction of the Fan Technology and improved noise reduction associated with air/water guns. In addition, the measured CNEL values on days without snowmaking operations was 52.2 dBA, and was in compliance with the 085 and 087 Plan Area CNEL standards. It was still

^{**} Noise measurement site moved to USFS property @ northeast corner of Keller and Saddle.

Year 2003-2004 Heavenly began Fan Gun Technology

noted that when snowmaking did not occur there was influence from roadway traffic, wind and individuals recreating on the USFS property where the sound level meter is located. Figures 2 through 6 graphically show the results of the noise monitoring, as they compare to the TRPA CNEL criterion of 55 dBA for PAS 085 and 087.

Snowmaking can occur over a significant portion of the California side of the mountain. In addition, the array of snowmaking at the California Base can include air/water nozzle and fan-gun type snowmaking equipment. The fan-guns have been found to produce noise levels which are a minimum of 10 dBA less than the traditional air-water nozzle guns. Table 3 summarizes the last twelve years of CNEL values for varying types of snowmaking operations.

Table 3 Summary of Measured Noise Levels at the Heavenly Base Area Based upon Varying Arrays of Snowmaking Operations at the California Base										
Year	Days with Lower Snowmaking Only	Days with Upper Snowmaking Only	Days with Lower Air/Water Nozzles Only	Days with Upper Air/Water Nozzles Only	Days with Lower Fan-Guns Only					
	Logarithmic CNEL									
2001-2002	74.7 dBA	63.7 dBA	72.2 dBA	63.7 dBA	A NA ²					
2002-2003	73.0 dBA	63.0 dBA	NA ³	62.8 dBA	NA ²					
2003-2004	61.7 dBA	60.9 dBA	NA ³	60.3 dBA	61.1 dBA					
2004-2005	64.1 dBA 60.3 dE		66.1 dBA	NA ¹	NA ²					
2005-2006	63.4 dBA	dBA 57.6 dBA		NA ¹	63.4 dBA					
2006-2007	65.4 dBA 60.2 dBA		NA ³	59.3 dBA	65.2 dBA					
2007-2008	60.6 dBA	61.2 dBA	NA ³	62.0 dBA	60.1 dBA					
2008-2009	64.3 dBA 58.1 dBA		NA ³	63.3 dBA	63.4 dBA					
2009-2010	57.9 dBA	55.7 dBA	NA ³	58.4 dBA	57.9 dBA					
2010-2011	2010-2011 58.8 dBA		NA ³	51.9 dBA	58.8 dBA					
2011-2012	59.8 dBA	56.1 dBA	NA ³	53.4 dBA	58.5 dBA					
2012-2013	60.2 dBA 55.5 dBA		NA ³	55.5 dBA	60.3 dBA					
2013-2014	62.7 dBA	56.5 dBA	NA ³	55.3 dBA	62.7 dBA					
2014-2015	62.1 dBA	54.2 dBA	NA ³	51.8 dBA	62.1 dBA					

¹NA - No snowmaking occurred with strictly Upper Air-Water Nozzles operating.

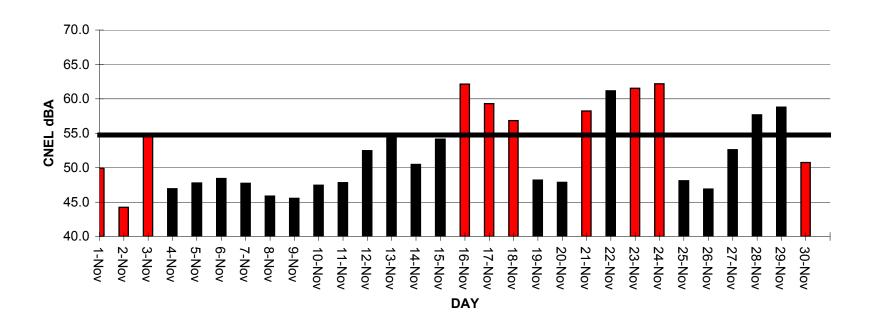
²NA - No snowmaking occurred with strictly Fan Guns operating.

³NA - No snowmaking occurred with strictly Lower Air-Water Nozzles Only

Figure 2
2015-101
Heavenly California Base Area Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL November, 2014

NOVEMBER 2014



NO SNOWMAKING ON CALIFORNIA SIDE

SNOWMAKING ON CALIFORNIA SIDE

CNEL Criterion 55 dBA

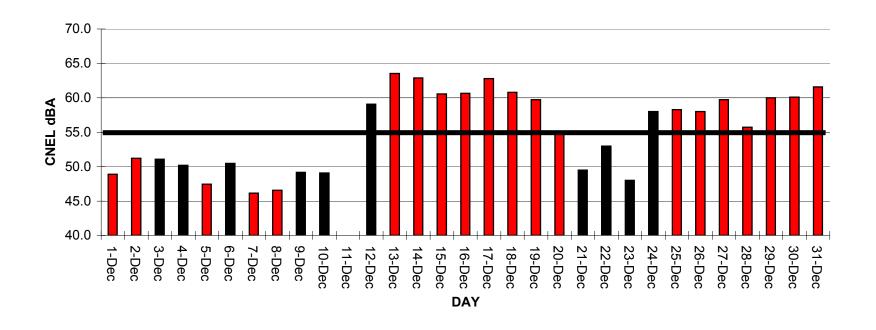
j.c. brennan & associates

Consultants in acoustics

Figure 3
2015-101
California Base Area Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL December, 2014

DECEMBER 2014



NO SNOWMAKING ON CALIFORNIA SIDE

SNOWMAKING ON CALIFORNIA SIDE

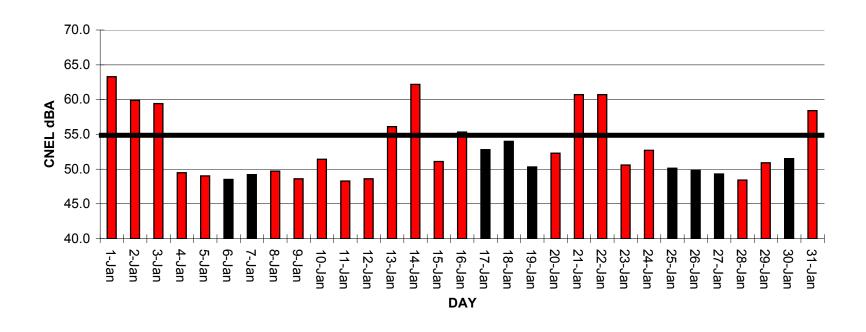
CNEL Criterion 55 dBA



Figure 4
2015-101
California Base Area Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL January, 2015

JANUARY 2015



NO SNOWMAKING ON CALIFORNIA SIDE

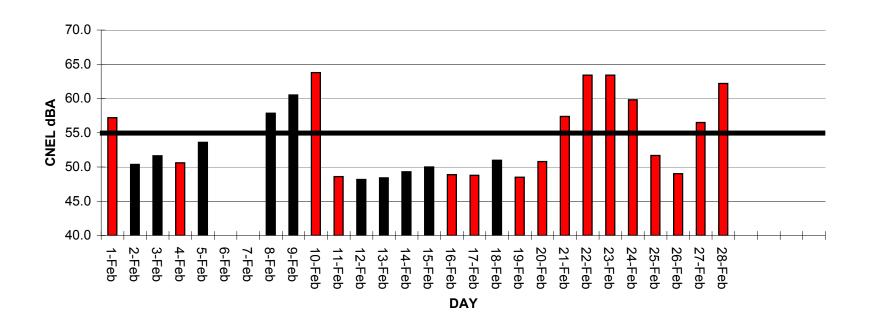
SNOWMAKING ON CALIFORNIA SIDE

CNEL Criterion 55 dBA

Figure 5
2015-101
California Base Area Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL February, 2015

FEBRUARY 2015



NO SNOWMAKING ON CALIFORNIA SIDE

SNOWMAKING ON CALIFORNIA SIDE

CNEL Criterion 55 dBA

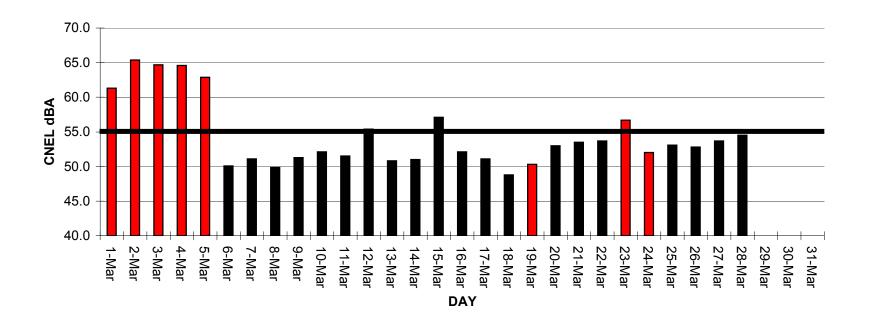
j.c. brennan & associates

Consultants in acoustics

Figure 6 2015-101 California Base Area Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL March, 2015

MARCH 2015



NO SNOWMAKING ON CALIFORNIA SIDE

SNOWMAKING ON CALIFORNIA SIDE

CNEL Criterion 55 dBA

The CNEL levels show a small decrease in noise levels at the California base. This could be the result of an increase in use of fan guns compared to the previous year.

Fan Gun Noise Levels

Heavenly has completed the process of converting the California Base snowmaking operations to the use of fan-guns. However, portions of the lower mountain which include the ski runs named Round About and Lower Gun Barrel continue to utilize air/water nozzles. The types of fan guns which Heavenly is currently using include SMI Super Polecat. The air/water nozzle snowmaking guns are currently newer technology and produce lower noise levels than the older technology air/water nozzle snowmaking guns.

As Heavenly continues to introduce lower noise emission technology snowmaking equipment to the lower California snowmaking fleet, it is expected that a minimum noise level reduction of 3 dBA to 5 dBA can be achieved for all snowmaking operations. During the 2014/2015 ski season, Heavenly reported consistent use of fan guns for snowmaking at the lower portion of the California side. As the lower mountain converts to fan guns, it is expected that a reduction in snowmaking noise levels can be realized at the base areas.

The determining factors on overall noise from the snowmaking system include the types of snowmaking equipment, the number of air/water nozzles or fans operating at any time, and the total hours of operations. If fan gun technology is not capable of producing the amount of snow that the air/water nozzles produce, then snowmaking operations may require an increase in the number of fan guns operating at any one time and/or an increase in hours of operation.

III.5 Snowmaking at Boulder Base Area Noise

III.5.a Master Plan Mitigation Methods

- 1. Use of fans in place of air/water nozzles or using air/water nozzles which are low noise;
- 2. Re-direction of nozzles and fans to minimize noise exposures at PAS boundaries;
- 3. Reduction in the numbers of nozzles and/or fans:
- 4. Use of setbacks to reduce noise exposures at PAS boundaries;
- 5. Use of noise reduction housings for air/water nozzles;
- 6. Use of barriers at low-mounted air/water nozzles;
- 7. Reduction in snowmaking activities at nighttime:
- 8. Sponsor research into reducing noise produced by snowmaking. This may include support of industry-wide research activities, specific studies concerning nozzle design sponsored directly by Heavenly, and the study of alternatives in placement of guns and fans at Heavenly.
- 9. At the Stagecoach and Boulder Bases, Heavenly will strive to replace all air/water nozzles with fans.

III.5.b Master Plan Milestone/Product

During the 2014/2015 ski season, j.c. brennan & associates, Inc. has conducted short-term noise monitoring at the Boulder Base area. The noise monitoring occurs for short periods of time since the snowmaking only occurs for between 2 and 4 days per year. Heavenly anticipates replacing the air/water nozzles after complete replacement of nozzles with fan guns on the entire California face. Heavenly is investing in low noise technology fan gun and air/water nozzles and anticipates this is the next area for replacement of noisy air/water nozzles. Heavenly has not implemented any of the other mitigation measures listed above.

III.5.c Responsible Party

Heavenly is responsible for implementing the mitigation measures.

III.5.d PAS Criteria

PAS 080 – 50 dB CNEL PAS 082, 085, 086, 087, 088 – 55 dB CNEL PAS 095, PAS 121 – 45 dB CNEL

III.5.e Results of Reporting and Determination of Compliance

Short-term noise level measurements of snowmaking operations were conducted during the 2014/2015 ski season at the Boulder Base on December 18, 2014. Measured noise levels at this location were approximately 68 dBA Leq during snowmaking operations. Measurements were also conducted at the corner of Jack Circle and Bonnie Court. The measured noise levels were approximately 62 dBA Leq. The results of the ambient noise measurements for the 2014/2015 ski season and previous ski seasons are shown in Table 4. The predicted CNEL value at the Boulder Base is 75 dBA. The predicted CNEL value at the Jacks Circle location is 69 dBA.

The CNEL calculations assume snowmaking operations occur continually for a 24-hour period.

Table 4 Ambient Noise Level Measurements for the Boulder Base Area								
		Measured Sound Level, Leq						
Year	Date	Boulder Base	Corner of Jack Cir. & Bonnie Ct Site 2					
		Site 1	Measured	Measured for Master Plan				
1999-2000	December 14, 1999	70 dBA	63 dBA					
2000-2001	December 14, 2000	73 dBA	65 dBA					
2001-2002	NA ¹	NA ¹	NA					
2002-2003	February 4, 2003	71 dBA	53 dBA					
2003-2004	December 8, 2003	60 dBA	NA ¹					
2004-2005	December 3, 2004	66 dBA	58 dBA					
2005-2006	December 13, 2005	71 dBA	64 dBA					
2006-2007	December 28, 2006	68 dBA	63 dBA	65 dBA				
2007-2008	December 31, 2007	67 dBA	65 dBA	00 dbA				
2008-2009	December 24, 2008	67 dBA	65 dBA					
2009-2010	December 15, 2009	68 dBA	62 dBA					
2010-2011	December 15, 2010	67 dBA	64 dBA					
2011-2012	December 22, 2011	68 dBA	65 dBA					
2012-2013	December 17, 2012	67 dBA	63 dBA					
2013-2014	January 15, 2014	69 dBA	64 dBA					
2014-2015	December 18, 2014	68 dBA	62 dBA					

¹Snowmaking operations did not occur at this location during this season. Boulder Base GPS Coordinates (38° 58.3' 3.98" N - 119° 53' 25.81"W)

Jack Circle/Bonnie Ct. GPS Coordinates (38° 58' 5.14" N - 119° 53' 34.76" W)

Currently, the snowmaking operations are out of compliance with the TRPA criteria.

III.6 Snowmaking at Stagecoach Base Area Noise

III.6.a Master Plan Mitigation Methods

- 1. Use of fans in place of air/water nozzles or air/water guns which are low noise;
- 2. Re-direction of nozzles and fans to minimize noise exposures at PAS boundaries;
- 3. Reduction in the numbers of nozzles and/or fans;
- 4. Use of setbacks to reduce noise exposures at PAS boundaries;
- 5. Use of noise reduction housings for air/water nozzles;
- 6. Use of barriers at low-mounted air/water nozzles;
- 7. Reduction in snowmaking activities at nighttime;
- 8. Sponsor research into reducing noise produced by snowmaking. This may include support of industry-wide research activities, specific studies concerning nozzle design sponsored directly by Heavenly, and the study of alternatives in placement of guns and fans at

Heavenly.

9. At the Stagecoach and Boulder Bases, Heavenly will strive to replace all air/water nozzles with fans.

III.6.b Master Plan Milestone/Product

During the 2014/2015 ski season, Heavenly has conducted short-term noise monitoring at the Stagecoach Base area. The noise monitoring occurs for short periods of time since the snowmaking only occurs for between 2 and 4 days per year. Heavenly anticipates replacing the air/water nozzles after complete replacement of nozzles with fan guns on the entire California face. Heavenly has not implemented any of the mitigation measures listed above.

III.6.c Responsible Party

Heavenly is responsible for implementing the mitigation measures.

III.6.d PAS Criteria

This area is located outside of the TRPA area of influence.

III.6.e Results of Reporting and Determination of Compliance

Short-term noise level measurements of snowmaking operations were conducted during the 2014/2015 ski season at three locations of the Stagecoach Base, on December 14, 2014. The noise levels during snowmaking operations were 77 dBA Leq at 460 Quaking Aspen, 61 dBA Leq at the entrance to the Eagles Nest, and 55 dBA Leq at the entrance to the Ridge. The average hourly noise levels at the Quaking Aspen location conducted for the development of the Master Plan were between 82 dBA and 92 dBA Leq in 1996. The results of the ambient noise measurements for the 2014/2015 ski season and previous ski seasons are shown in Table 5.

Table 5 Ambient Noise Level Measurements Stage Coach Base Area										
		Measured Sound Level, L _{eq}								
Year	Date	460 Quaking Sit	g Aspen Rd. e 3	Entrance to The Ridge	Eagles Nest					
		Measured	Measured for Master Plan	Site 4	Site 5					
1999-2000	December 4, 1999	87 dBA		62 dBA	78 dBA					
2000-2001	December 11, 2000	86 dBA		56 dBA	72 dBA					
2001-2002	November 30, 2001	57 dBA		55 dBA	59 dBA					
2002-2003	February 2, 2003	83 dBA			70 dBA					
2003-2004	December 8, 2003	87 dBA		58 dBA	74 dBA					
2004-2005	November 30, 2004	81 dBA		58 dBA	68 dBA					
2005-2006	December 5, 2005	81 dBA		63 dBA	73 dBA					
2006-2007	December 18, 2006	88 dBA	82-92 dBA	62 dBA	72 dBA					
2007-2008	December 20, 2007	82 dBA		60 dBA	68 dBA					
2008-2009	December 17, 2008	78 dBA		55 dBA	65 dBA					
2001-2002 2002-2003 2003-2004 2004-2005 2005-2006 2006-2007 2007-2008	November 30, 2001 February 2, 2003 December 8, 2003 November 30, 2004 December 5, 2005 December 18, 2006 December 20, 2007	57 dBA 83 dBA 87 dBA 81 dBA 81 dBA 88 dBA 82 dBA	82-92 dBA	55 dBA 58 dBA 58 dBA 63 dBA 62 dBA 60 dBA	59 dBA 70 dBA 74 dBA 68 dBA 73 dBA 72 dBA 68 dBA					

78 dBA

78 dBA

75 dBA

78 dBA

77 dBA

77 dBA

Quaking Aspen GPS Coordinates (38° 57' 37.52" - 119° 53' 16.57" W)
Entrance to Ridge GPS Coordinates (38° 57' 46.68" N - 119° 56' 3.68" W)
Eagles Nest GPS Coordinates (38° 57' 35.04" N - 119° 53' 23.63" W)

Using the data collected on December 14, 2014 shown in Table 5, a 24 hour CNEL was calculated for each of the three locations at the Stage Coach Base Area. With continuous snowmaking operations for 24 hours, The calculated CNEL at Eagle Nest is 68 dBA CNEL. The 24 hour operations at 460 Quaking Aspen resulted in a CNEL of 84 dBA. The 24 hour operations at the entrance to The Ridge resulted in a 62 dBA CNEL.

III.7 Snowmaking Upper Mountain Noise

December 8, 2009

November 29, 2010

December 9, 2011

December 14, 2012

December 9, 2013

December 14, 2014

III.7.a Master Plan Mitigation Methods

In order to reduce overall snowmaking noise levels, Heavenly shall use fan guns or other similar noise reduction measures for all new snowmaking areas. In addition, where new snowmaking is placed adjacent to existing ski trails with snowmaking, Heavenly shall convert the existing air/water snowmaking nozzles with fan guns or use other similar noise reduction measures to maintain or reduce existing noise levels in that area.

2009-2010

2010-2011

2011-2012

2012-2013

2013-2014

2014-2015

56 dBA

58 dBA

57 dBA

57 dBA

56 dBA

55 dBA

62 dBA

65 dBA

62 dBA

60 dBA

60 dBA

61 dBA

III.7.b Master Plan Milestone/Product

Snowmaking noise from the upper mountain areas is monitored and evaluated from the California Base Area permanent noise monitor, and through Remote Plan Area monitoring. The analysis to date indicates that upper mountain snowmaking does not exceed the ambient noise when snowmaking is not occurring. New snowmaking installations are fan guns.

III.7.c Responsible Party

Heavenly is the responsible party.

III.7.d PAS Criteria

PAS 080 – 50 dB CNEL PAS 082, 085, 086, 087, 088 – 55 dB CNEL PAS 095, PAS 121 – 45 dB CNEL

III.7.e Results of Reporting and Determination of Compliance

See the reporting for the California Base Area. The following provides results of the Remote Plan Area Noise Measurements

j.c. brennan & associates, Inc., conducted noise level measurements of snowmaking operations at one remote Plan Area location on February 10, 2015. The noise measurement location, which is known as the area identified as "Party Rock" (Noise Measurement Site 7) is located within Plan Area 080. During this year, noise measurements were not conducted at the upper mountain remote area in Plan Area 095, which is generally located adjacent to the ski area boundary, and southeast of Liz's and Canyon Runs (Noise Measurement Site 6). The noise level measurements at Party Rock (Site 7) were conducted to determine if snowmaking operations at the lower mountain and base areas (which included 22 fan guns) would exceed the applicable standards.

The results of the noise measurements and field observations were that the snowmaking operations were audible and was approximately 38 dBA Leq.

GPS coordinates for the Remote Plan Area measurements sites are as follows:

Party Rock (38° 56' 27.63" N - 119° 56' 1.35" W); Liz's / Canyon Run (38° 54' 47.5" N - 119° 54' 43" W).

Noise levels do not exceed the Plan Area 080 criteria.

III.8 Rock Busting Noise

III.8.a Master Plan Mitigation Methods

Rock busting generally occurs through the use of explosives and blasting. Control the number, size and location of Rock Busting blasts.

III.8.b Master Plan Milestone/Product

None

III.8.c Responsible Party

Heavenly is the responsible party.

III.8.d PAS Criteria

PAS 080 – 50 dB CNEL PAS 082, 085, 086, 087, 088 – 55 dB CNEL PAS 095, PAS 121 – 45 dB CNEL

III.8.e Results of Reporting and Determination of Compliance

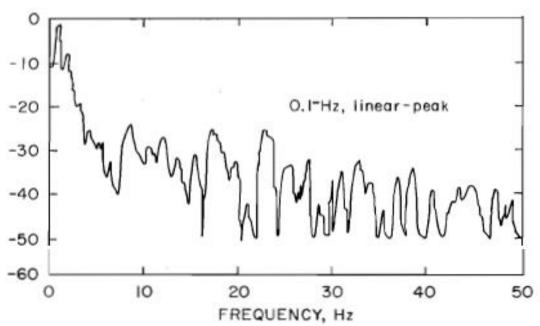
Heavenly has not contacted j.c. brennan & associates, Inc. to conduct noise measurements of blasting or rock busting. It is assumed that this activity has not occurred.

The process associated with rock busting includes setting explosive charges. The process includes drilling holes in the rock to set the charges. In general, blasting is controlled using micro delays between charges and by limiting charge size to minimize dispersal of the rock fragments, and to ensure the safety of the workers. Blasting is also controlled to prevent damage to nearby structures.

Airborne overpressures produced by blasting are typically measured in terms of the overall peak sound pressure level, without applying the A-weighting filter. The dominant frequencies of sound pressures associated with blasting lie in the very low frequency ranges of 2 Hz to 25 Hz, and the acoustical energy is concentrated below about 5 Hz. The figure below depicts a typical blast acoustical spectrum, which shows that the acoustical energy is concentrated well below 5 Hz.

Typical Blast Acoustical Spectrum

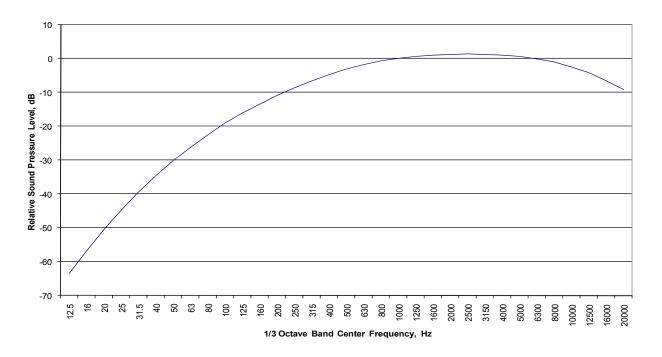
Relative Amplitude, dB



Source: "Airblast Instrumentation and Measurement Techniques for Surface Mine Blasting" U.S. Dept. of the Interior Report of Investigations 8508.

Audible sound, in contrast, is usually assumed to begin at 20 Hz, ranging up to 20,000 Hz. People hear best at frequencies in the range of 1,000 Hz to 4,000 Hz, and people hear poorly at the low frequencies associated with blast overpressures. As a result, the A-weighting curve is usually applied to other environmental noise measurements. The A-weighting curve is shown by Figure 7 below.

Figure 7
A-Weighting Filter Response



The A-weighting adjustment factor for sound at 25 Hz (the upper limit of the dominant blast frequencies) is -44.7 dB. There are no published A-weighting correction factors below 12.5 Hz (where the A-weighting correction factor is -63.4 dB). These factors indicate that very high blast overpressures would be required to generate sound pressure levels that would be audible in an outdoor environment.

The audible sound associated with blasting is the result of escaping gases and falling (slumping) rock. Subjectively, audible blasting sound has been described as similar to the closing of a car trunk, or to rolling thunder. While these terms are subjective rather than quantitative, the described sounds are relatively benign. Audible noise due to blasting is not commonly considered to be a significant source of annoyance if blasting is controlled to meet safety standards on the project site.

Since rock busting is such an infrequent event, and is not considered to be a significant noise source, it is recommended that this mitigation monitoring measure is removed.

III.9 Amphitheater Operations Noise

III.9.a Master Plan Mitigation Methods

Restrict hours of concert noise to the daytime and early evening hours. This is consistent with the hours of operations assumed for the amphitheater noise study. In addition, concerts should not extend more than 6 hours in duration.

III.9.b Master Plan Milestone/Product

Heavenly has conducted a concert simulation and amphitheater noise study.

III.9.c Responsible Party

Heavenly is the responsible party

III.9.d PAS Criteria.

PAS 080 – 50 dB CNEL PAS 082, 085, 086, 087, 088 – 55 dB CNEL PAS 095, PAS 121 – 45 dB CNEL

III.9.e Results of Reporting and Determination of Compliance

No concerts were monitored.

Appendix A

Acoustical Terminology

Acoustics The science of sound.

Ambient Noise The distinctive acoustical characteristics of a given space consisting of all noise sources audible at

that location. In many cases, the term ambient is used to describe an existing or pre-project condition

such as the setting in an environmental noise study.

Attenuation The reduction of an acoustic signal.

A-Weighting A frequency-response adjustment of a sound level meter that conditions the output signal to

approximate human response.

Decibel or dB Fundamental unit of sound, A Bell is defined as the logarithm of the ratio of the sound pressure

squared over the reference pressure squared. A Decibel is one-tenth of a Bell.

CNEL Community Noise Equivalent Level. Defined as the 24-hour average noise level with noise occurring

during evening hours (7 - 10 p.m.) weighted by a factor of three (+5 dB for TRPA calculations) and

nighttime hours weighted by a factor of 10 (or +10 dB) prior to averaging.

Frequency The measure of the rapidity of alterations of a periodic signal, expressed in cycles per second or

hertz.

Ldn Day/Night Average Sound Level. Similar to CNEL but with no evening weighting.

Leq Equivalent or energy-averaged sound level.

Lmax The highest root-mean-square (RMS) sound level measured over a given period of time.

L(n) The sound level exceeded a described percentile over a measurement period. For instance, an hourly

L50 is the sound level exceeded 50% of the time during the one hour period.

Loudness A subjective term for the sensation of the magnitude of sound.

Noise Unwanted sound.

Peak Noise The level corresponding to the highest (not RMS) sound pressure measured over a given period of

time. This term is often confused with the "Maximum" level, which is the highest RMS level.

RT₆₀ The time it takes reverberant sound to decay by 60 dB once the source has been removed.

Sabin The unit of sound absorption. One square foot of material absorbing 100% of incident sound has an

absorption of 1 sabin.

Threshold

dB for persons with perfect hearing.

Threshold

of Pain Approximately 120 dB above the threshold of hearing.

Impulsive Sound of short duration, usually less than one second, with an abrupt onset and rapid decay.

Simple Tone Any sound which can be judged as audible as a single pitch or set of single pitches.



Appendix B

2015-101

Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL

November, 2014

			California				Nevada					
Day	CNEL dB	Snow	Up	per	Lov	Lower Upper		Lower		Base	York	
			A	F	Α	F	Α	F	Α	F	F	
1-Nov	49.9	Υ	27	6								
2-Nov	44.2	Υ	30	5			18	7				
3-Nov	54.8	Υ		5			48	14				
4-Nov	47.0	Υ					19	9				
5-Nov	47.8	N										
6-Nov	48.4	N										
7-Nov	47.7	N										
8-Nov	45.9	N										
9-Nov	45.5	N										
10-Nov	47.5	N										
11-Nov	47.8	N										
12-Nov	52.5	Υ					29	16				
13-Nov	54.3	Υ					48	16				
14-Nov	50.5	Υ					40	17				
15-Nov	54.2	Υ					39	18				
16-Nov	62.1	Υ	5	1			40	15				
17-Nov	59.3	Υ	7	1			42	15				
18-Nov	56.8	Υ	5	1			40	13				
19-Nov	48.2	Υ					35	16				
20-Nov	47.9	Υ					15	4				
21-Nov	58.2	Υ	1	1		4	36	14				
22-Nov	61.2	Υ					20	8				
23-Nov	61.6	Υ	1	1		9	50	13				
24-Nov	62.2	Υ	1	1		7	52	16				
25-Nov	48.1	Υ					40	10				
26-Nov	46.9	N										
27-Nov	52.6	N										
28-Nov	57.7	N										
29-Nov	58.8	Υ					30					
30-Nov	50.7	Υ		3			40	10				

* A- Air Nozzles

F- Fan Guns

No Snowmaking Log Available

Snowmaking

Meter Downtime/Incomplete Data



CNEL Average

of No Snowmaking Days

of Snowmaking Days Total Days of Monitoring 50.8

57.1

55.9

10 20

30

No Snowmaking

Snowmaking

Total

2015-101

Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL

December, 2014

				Calif	ornia	1			N	levad	la		
Day	CNEL dB	Snow	Up	per	Lo	wer	Up	per	Lo	wer	Base	York	
			Α	F	Α	F	Α	F	Α	F	F		CNEL Average
1-Dec	48.9	Υ	3	3			38	8					No Snowmaking
2-Dec	51.2	Υ		3			38	9					Snowmaking
3-Dec	51.1	N											Total
4-Dec	50.2	N											
5-Dec	47.5	Υ	4	2			42	9					
6-Dec	50.5	N											# of No Snowmaking Days
7-Dec	46.1	Υ		3			38	10					# of Snowmaking Days
8-Dec	46.6	Υ	4	3			29	10					Total Days of Monitoring
9-Dec	49.1	N											·
10-Dec	49.1	N											
11-Dec	1.0	N											
12-Dec	59.1	N											
13-Dec	63.5	Υ				13							
14-Dec	62.9	Υ				19	45	9	10				
15-Dec	60.6	Υ				19	29	10	10				
16-Dec	60.7	Υ				3	39	3					
17-Dec	62.8	Υ	8	5		4	38	7	10				
18-Dec	60.8	Υ	20	5		4	20	10	9	1			
19-Dec	59.7	Υ	12	6		4	31	7	10				
20-Dec	55.0	Υ	37	4			5	4					
21-Dec	49.5	Ν											
22-Dec	53.0	N											
23-Dec	48.0	Ν											
24-Dec	58.0	Ν											
25-Dec	58.3	Υ	28	6		10		4	24				
26-Dec	58.0	Υ	32	6	6		12	2	12				
27-Dec	59.7	Υ	42	3		7	15	2	1				
28-Dec	55.7	Υ	33				18	3					
29-Dec	60.0	Υ	36			7	20	3		1			
30-Dec	60.1	Υ	24	1				1					
31-Dec	61.6	Υ	15			6							

* A- Air Nozzles

F- Fan Guns

No Snowmaking Log Available

Snowmaking

Meter Downtime/Incomplete Data



53.2 59.4 58.0

> 11 20 31

2015-101

Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL January, 2015

			Cal	iforn	ia				N	levad	la		
		Snow	Up	per	Lov	wer	Up	per	Lo	wer	Base	York	•
Day	CNEL dB		Α	F	Α	F	Α	F	Α	F	F		CNEL Average
1-Jan	63.3	Υ		16		6	10	10					No Snowmaking
2-Jan	59.9	Υ		29		5	9	10					Snowmaking
3-Jan	59.4	Υ	26	1		4	9						Total
4-Jan	49.5	Υ	26	1			6	4					
5-Jan	49.0	Υ	36										
6-Jan	48.5	N											# of No Snowmaking Days
7-Jan	49.2	N											# of Snowmaking Days
8-Jan	49.7	Υ	12										Total Days of Monitoring
9-Jan	48.6	Υ	31										
10-Jan	51.4	Υ	19										
11-Jan	48.3	Υ	29	1									
12-Jan	48.6	Υ	22	2			2	1					
13-Jan	56.1	Υ	36	2			6	11					
14-Jan	62.2	Υ	20	2		10	25	12					
15-Jan	51.1	Υ	2	21			14	9					
16-Jan	55.3	Υ	15	1			14	9					
17-Jan	52.8	N											
18-Jan	54.0	N											
19-Jan	50.3	N											
20-Jan	52.3	Υ	25	2			9	3					
21-Jan	60.7	Υ	29	2		11	17	13					
22-Jan	60.7	Υ	30	1			19	15					
23-Jan	50.6	Υ	27	1			16	15					
24-Jan	52.7	Υ	60				9	8					
25-Jan	50.1	N											
26-Jan	49.8	N											
27-Jan	49.3	N											
28-Jan	48.4	Υ	24	2			7	3					
29-Jan	50.9	Υ	24	2			26	3					
30-Jan	51.5	N											
31-Jan	58.4	Υ	30	2		7	6	11					

* A- Air Nozzles

F- Fan Guns

No Snowmaking Log Available

Snowmaking
Meter Downtime/Incomplete Data



51.0

56.9 55.9

9

22 31

2015-101

Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL

February, 2015

r cordary,			Calif	ornia					N	levac	la	
		Snow	Up	per	Lo	wer	Up	per	Lo	wer	Base	York
Day	CNEL dB		Α	F	Α	F	Α	F	Α	F	F	
1-Feb	57.2	Υ	22	2		4	11	14				
2-Feb	50.4	N										
3-Feb	51.6	N										
4-Feb	50.6	Υ	15				2	1				
5-Feb	53.6	N										
6-Feb	1.0	N										
7-Feb	1.0	N										
8-Feb	57.9	N										
9-Feb	60.5	N										
10-Feb	63.8	Υ	27	2		22		11	9			
11-Feb	48.6	Υ	41	2								
12-Feb	48.2	N										
13-Feb	48.4	N										
14-Feb	49.3	N										
15-Feb	50.0	N										
16-Feb	48.9	Υ	26	2								
17-Feb	48.8	Υ	24	2								
18-Feb	51.0	Ν										
19-Feb	48.5	Υ	26	2								
20-Feb	50.8	Υ	25	1								
21-Feb	57.4	Υ	33	2			3	4				
22-Feb	63.4	Υ	35	3		12	3	7	7	1		
23-Feb	63.4	Υ	38	3		12	8	10	8	1		
24-Feb	59.8	Υ	31	2		13	5	11	8	1		
25-Feb	51.7	Υ	22	1		5	3	1	15			
26-Feb	49.0	Υ	33	2			12	1				
27-Feb	56.5	Υ	18	2			7	1				
28-Feb	62.2	Υ	22	2	11		8	4		1		

* A- Air Nozzles

F- Fan Guns

No Snowmaking Log Available Snowmaking

Meter Downtime/Incomplete Data



CNEL Average

58.6

57.1

12

16 28

No Snowmaking Snowmaking

of No Snowmaking Days

of Snowmaking Days
Total Days of Monitoring

Total

2015-101

Heavenly Snowmaking Monitoring

Annual Snowmaking Report Summary of CNEL March, 2015

			Cali	iforni	а				N	levad	la		
		Snow	Up	per	Lov	ver	Up	per	Lo	wer	Base	York	
Day	CNEL dB		Α	F	Α	F	Α	F	Α	F	F		
1-Mar	61.3	Υ	28	2		5		2	9				
2-Mar	65.4	Υ	1	31		11		7	8	1			
3-Mar	64.7	Υ	25	1		11	8	2					
4-Mar	64.6	Υ	32	1		12	6	9					
5-Mar	62.9	Υ	23	2		11	6	10					
6-Mar	50.1	Ζ											
7-Mar	51.1	Ν]
8-Mar	49.9	N											
9-Mar	51.3	Ζ											
10-Mar	52.1	Ζ											
11-Mar	51.5	Ζ											
12-Mar	55.4	Ν											
13-Mar	50.8	N											
14-Mar	51.0	N											
15-Mar	57.1	Ζ											
16-Mar	52.1	Ν											
17-Mar	51.1	N											1
18-Mar	48.8	N											
19-Mar	50.3	Υ	17	1									
20-Mar	53.0	N											
21-Mar	53.5	N											1
22-Mar	53.7	N											
23-Mar	56.7	Υ		20			9	2					
24-Mar	52.0	Υ	23	1			10	1					
25-Mar	53.1	N											1
26-Mar	52.8	N											1
27-Mar	53.7	N											1
28-Mar	54.5	N											1
29-Mar													1
30-Mar													1
31-Mar													1

* A- Air Nozzles

F- Fan Guns

No Snowmaking Log Available

Snowmaking

Meter Downtime/Incomplete Data



CNEL Average

No Snowmaking Snowmaking

of No Snowmaking Days

of Snowmaking Days

Total Days of Monitoring

Total

52.8

62.2

57.9

20

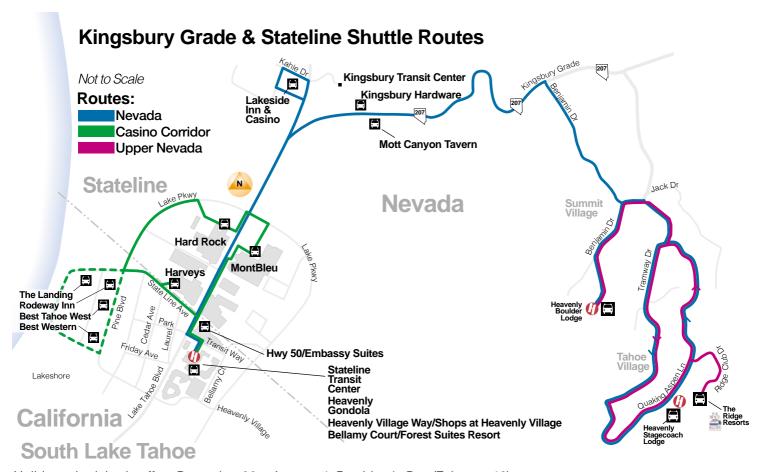
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Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX XI 2014-2015 SKI SHUTTLE & ROUTE SCHEDULE





Holiday schedules in effect December 20 – January 4; President's Day (February 16)

NEVADA: WEEKEND/HOLIDAY 8AM TO 6PM								
Heavenly Gondola	Lakeside Inn & Casino	Mott Canyon Tavern	Heavenly Boulder Lodge	Heavenly Stagecoach Lodge	Kingsbury Hardware	Lakeside Inn & Casino	Heavenly Gondola	
:00	:05	:07	:20	:35	:48	:50	:55	
:20	:25	:27	:40	:55	:08	:10	:15	
:40	:45	:47	:00	:15	:18	:30	:35	

NEVADA: WEEKDAY 8AM TO 6PM											
Heavenly Gondola	Lakeside Inn & Casino	Mott Canyon Tavern	Heavenly Boulder Lodge	Heavenly Stagecoach Lodge	Kingsbury Hardware	Lakeside Inn & Casino	Heavenly Gondola				
:00	:05	:07	:20	:35	:48	:50	:55				
:30	:35	:37	:50	:05	:18	:20	:25				

CASINO CORRIDOR 8AM TO 6PM							
Heavenly Gondola	Montbleu	Hard Rock	Rodeway Inn	Best Tahoe West Inn	Best Western & The Landing	Harvey's	Heavenly Gondola
:00	:08	:10	on request	on request	on request	:15	:18
:20	:28	:30	on request	on request	on request	:35	:38
:40	:48	:50	on request	on request	on request	:55	:58

UPPER NEVADA: HOLIDAY/WEEKEND 8:15-11:15AM & 2:15-5:45PM								
Heavenly Boulder Lodge	Heavenly Stagecoach Lodge	The Ridge Resorts Clubhouse*	Heavenly Stagecoach Lodge	Heavenly Boulder Lodge				
:15	:25	:30	:35	:45				
:30	:40	:45	:50	:00				
:45	:55	:00	:05	:15				
:00	:10	:15	:20	:30				

UPPER NEVADA: WEEKEND 11:15AM-2:15PM UPPER NEVADA: WEEKDAY 8AM TO 6PM										
Heavenly Boulder Lodge	der Heavenly Stagecoach The Ridge Resorts Heavenly Stagecoach Heavenly Boulder Lodge Lodge Lodge									
:00 :10 :15 :20 :30										
:30 :40 :45 :50 :00										

*Service to The Ridge Resorts begins at 8:15 a.m. Last Ridge Drop off at 5:45 p.m.





(530) 541-7149 ext. 0 tahoetransportation.org

(775) 586-7000 skiheavenly.com



LAKE TAHOE BLVD ROUTE 8:12 AM TO 6 PM										
Heavenly Gondola	Tahoe Beach & Ski	Lakeland Village	Lakeshore Lodge & Spa	Beach Retreat & Lodge	Inn By The Lake	Safeway	Knight's Inn	Lake Tahoe Vacation Resort	Quality Inn	Heavenly Gondola
:00	:05	:06	:08	:10	:12	:14	:16	:20	:23	:25
:30	:35	:36	:38	:40	:42	:44	:46	:50	:53	:55

NOTE: Service begins at 8:12AM at Inn By The Lake

CALIFORNIA ROUTE								
Heavenly Gondola	Pioneer Tr 7-Eleven	Ski Run Blvd/Pioneer Trail	Heavenly CA Lodge	Ski Run/Inn at Heavenly		Pioneer Tr Glen Road	Pioneer Tr 7-Eleven	Heavenly Gondola
:00	:04	:08	:15	:19	:21	:23	:24	:27
:10	:14	:18	:25	:29	:31	:33	:34	:37
:20	:24	:28	:35	:39	:41	:43	:44	:47
:30	:34	:38	:45	:49	:51	:53	:54	:57
:40	:44	:48	:55	:59	:01	:03	:04	:07
:50	:54	:58	:05	:09	:11	:13	:14	:17





FOR WINTER SKI SHUTTLE QUESTIONS CONTACT:

JTTLE FOR MOUNTAIN RESORT ACT: INFORMATION CONTACT:

(530) 541-7149 ext. 0 tahoetransportation.org

(775) 586-7000 skiheavenly.com

Information updated as ski or weather conditions change.



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APPENDIX XII 2014-2015 HEAVENLY EMPLOYEE SURVEY RESULTS



2014-2015 Annual Housing and Transportation Survey January 2rd-January 12th, 2015



- Please help us this year and participate in this very short survey.
- This survey is a requirement of the Heavenly Mountain Resort Master Plan, and is one of many reporting requirements for us to operate a fantastic ski resort in a sensitive alpine environment.
- The purpose of this survey is to find out how you get to work, where you live, do you find your housing to be affordable, and whether or not you are satisfied with your current housing situation. It is 13 questions, and does not take very long to complete, approx 1-3 minutes.
- It is also available in Spanish.

If you have questions or comments please contact Frank Papandrea the Environmental Manager at Extention-2315.

What is your current employment classification?

Seasonal 46.00%

Year-Round 54.00%

Which of the following categories best describes your current residence?

House 64.00%

Duplex 7.00%

Triplex/Fourplex 2.00%

Townhouse/Condominium 6.00%

Apartment 15.00%

Mobile Home 1.00%

Employee Housing 3.00%

Other 2.00%

Do you own or rent your current residence?

Own 38.00%

Rent 62.00%

Where do you live?

South Lake Tahoe 59.00%

Meyers/ Tahoe Paradise 8.00%

Stateline/ Kingsbury Grade area 14.00%

Zephyr Cove area 4.00%

Minden/ Gardnerville 9.00%

Carson City 2.00%

Other 4.00%

How many people including yourself live in your household?

1	12.00%
1 1	45.00%
2	
3	16.00%
3	
4	20.00%
4	
5	5.00%
5	
6 or more	2.00%

How many bedrooms are in your current residence?

0 (Studio-type layout)	5.00%
1	9.00%
2	27.00%
3	42.00%
4	16.00%
5	1.00%
6 or more	0.00%

RENTERS: How much do YOU currently pay for rent?

less than \$299	5.00%
\$300 - \$499	20.00%
\$500 - \$699	10.00%
\$700 - \$899	9.00%
\$900 - \$1099	9.00%
more than \$1100	9.00%
Not Applicable	38.00%

OWNERS: How much is YOUR current mortgage payment on your residence?

less than \$399 3.00%

\$400 - \$599 2.00%

\$600 - \$799 1.00%

\$800 - \$999 3.00%

\$1000 - \$1199 7.00%

more than \$1200 20.00%

Not Applicable 64.00%

How satisfied are you with your existing housing situation?

Very Satisfied 52.00%

Somewhat Satisfied 28.00%

Neutral 13.00%

Somewhat Unsatisfied 6.00%

Very Unsatisfied 3.00%

How would you rate the availability of housing in your community?

Very Good 13.00%

Good 39.00%

Neutral 33.00%

Poor 12.00%

Very Poor 4.00%

How do you rate your cost of housing?

Very Good 24.00%

Good 35.00%

Neutral 30.00%

Poor 8.00%

Very Poor 4.00%

Do you have a Car?

Yes 79.00%

No 21.00%

How do you normally get to work?

Drive 66.00%

Get a Ride with Someone in a Car or Truck 6.00%

Ride the Bus 21.00%

Walk/ Bike 16.00%

Other 0.00%

Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX XIII

ENVIRONMENTAL MONITORING ANNUAL REPORT HEAVENLY MOUNTAIN RESORT WATER YEAR 2015



Environmental Monitoring Program Annual Report

Heavenly Mountain Resort Water Year 2015

Project Number E314001900

Prepared on behalf of Heavenly Mountain Resort

January 15, 2016 (Revised March 2016)





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Acronyms

BMI Benthic Macro Invertebrate BMPs Best Management Practices

BMPEP Best Management Practices Effectiveness Program

CERP Construction Erosion Reduction Program

CNPS California Native Plant Society

CRWQCB California Regional Water Quality Control Board

CWE Cumulative Watershed Effects

cm Centimeter

ESC Effective Soil Cover

EIR/EIS Environmental Impact Report / Environmental Impact Statement

EIR/EIS/EIS Environmental Impact Report / Environmental Impact Statement / Environmental Impact

Statement

GIS Arc-Geo Information Systems
IBI Index of Biological Integrity

Lahontan Lahontan Regional Water Quality Control Board (of the state of California)

LTBMU Lake Tahoe Basin Management Unit (USDA Forest Service)

M or m Meter mm Millimeter Mg/L milligrams/liter

MRP Monitoring and Reporting Program

NDEP Nevada Department of Environmental Protection

NTU Nephelometric Turbidity Units RCI Resources Concepts Inc.

RIVPACS River Invertebrate Prediction and Classification System

SCI Stream Control Inventory
SOP Standard Operating Procedure
STE Standard Taxonomic Effort

SWAMP Surface Water Ambient Monitoring Program

TBD To Be Determined
TKN Total Kjeldahl Nitrogen
TMDL Total Maximum Daily Load

TRPA Tahoe Regional Planning Agency
TSS Total Suspended Sediment

USDA United States Department of Agriculture

USFS United States Forest Service
USGS United States Geological Survey
VRAP Vegetation Rapid Assessment Protocol

WMPR Watershed Maintenance and Restoration Program

1 Introduction

This annual report is submitted in partial fulfilment of monitoring and reporting requirements set forth in the Lahontan Regional Water Quality Control Board and Monitoring and Reporting Program Order No. R6T-2015-0021. This report summarizes monitoring and evaluation activities conducted at Heavenly Mountain Resort (Heavenly) during the 2015 water year as a result of the implementation of the Water Quality and Best Management Practices Monitoring Program. This program is a component of the Heavenly Mountain Resort Master Plan (Heavenly 1996), the Heavenly Mountain Resort Master Plan Amendments (Heavenly 2007 and 2015).

Heavenly Mountain Resort is located on the south shore of Lake Tahoe within El Dorado and Alpine Counties of California and Douglas County of Nevada (Figure 1.1). Land ownership is shared between the U.S.D.A. Forest Service (USDA Forest Service) and Heavenly. Heavenly operates on National Forest lands through a special use permit, renewed in 2002 for a period of 40 years.

The Water Quality and Best Management Practices Monitoring Program were initiated at Heavenly in 1995 in conjunction with the completion of the Heavenly Mountain Resort Master Plan (Heavenly 1996). The need for such a monitoring program was established during preparation of a Cumulative Watershed Effects (CWE) Analysis required by Tahoe Regional Planning Agency (TRPA) guidelines for ski area expansion. Implementation of the monitoring program was a condition of the Master Plan approval by the USDA Forest Service and TRPA. The 2007 amendment to the Heavenly Mountain Resort Master Plan, approved by TRPA on April 25, 2007, was in effect and implemented by Heavenly in collaboration with Lahontan Regional Water Quality Control Board (Lahontan), the USDA Forest Service, and TRPA. Modifications resulting from the Master Plan Amendment include incorporating all monitoring into a single report that was submitted May 15, 2009 to the TRPA, USDA Forest Service, and Lahontan. This monitoring report is on an ongoing schedule due annually.

A joint Environmental Impact Report/Environmental Impact Statement/Environmental Statement (EIR/EIS/EIS) was approved in the spring of 2015. The EIR/EIS/EIS followed the past format and where appropriate the previous Master Plan was updated and refined.

The requirements of the Annual Water Quality and Best Management Practices Monitoring Reports remain the same following approval of the Master Plan Amendment. As the CEQA lead agency, the Water Board is the responsible party for ensuring all mitigation measures are in accordance with the program. "The Water Board recognizes that another agency (USFS or TRPA) has responsibilities for ensuring implementation" for monitoring mitigation measures outside of the Water Boards authority. Similar to past reports, the BMP monitoring report will be submitted with the TRPA Annual Mitigation and Monitoring report due on May 1st of the following year.

The Master Plan represents a comprehensive twenty-year development plan for Heavenly Mountain Resort. Master Plan and Master Plan Amendment implementation objectives of Heavenly, TRPA, and the USDA Forest Service regarding protection of the environment include (Heavenly 1996):

Making optimal use of the natural attributes of the site without creating a significant impact on the environment (Heavenly);

- > Restoring the health of sub-watersheds and other natural resource values disturbed by past activities (Heavenly);
- > Protecting the environmental quality of the area (USDA Forest Service);

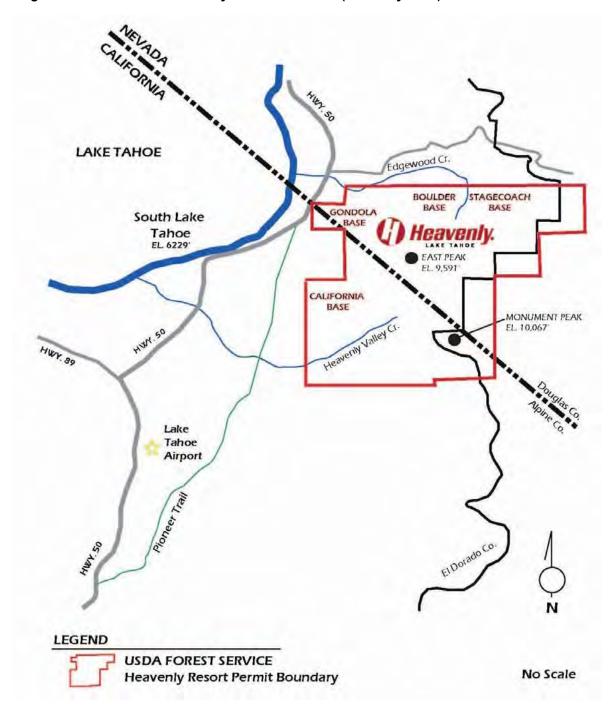
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¹ California Regional Water Quality Control Board-Lahontan Region. Board Order No. R6T-2015-0021. WDID No. 6A090033000.Waste Discharge Requirements for Heavenly Mountain Resort. 2015 (pages 16-17).

- > Providing a quality ski experience within the resort with ski runs and other disturbed areas stabilized to reduce the potential for soil erosion (USDA Forest Service);
- > Improving the visual quality of the area (USDA Forest Service); and
- > Providing for long-term preservation and restoration of Stream Environment Zones (TRPA).

Implementation of the Collection/Monitoring Agreement between Heavenly and the USDA Forest Service (Monitoring Program) will provide data sufficient to determine compliance with agency water quality standards and validate the efficiency of management practices in protecting against adverse cumulative watershed effects.

Figure 1-1 Location of Heavenly Mountain Resort (Heavenly 2007)



1.2 Environmental Monitoring

The overall objective of the Environmental Monitoring Program is to evaluate and monitor water quality and overall ecological health of Heavenly creeks and watersheds while satisfying California, Nevada, and TRPA regulatory water quality requirements. The Environmental Monitoring Program is made up of five major components (Heavenly 1996):

- > Water quality monitoring to comply with regulatory monitoring requirements;
- > Soil cover monitoring to gain understanding of how to prevent soil loss and protect water quality;
- > Monitoring to determine BMP effectiveness under the various conditions at the ski area;
- > Riparian condition monitoring to determine riparian area response to Heavenly Mountain Resort activities; and,
- > Overall watershed condition and trend monitoring.

The overall objectives of the Environmental Monitoring Program have not changed; however amendments and modifications regarding the objectives have with acceptance of the EIR/EIS/EIS (2015).

1.3 Monitoring Plan

The Environmental Monitoring Program Plan was Chapter 7 of the Draft Master Plan Amendment (updated in 2007). The Monitoring Program was designed to satisfy the requirements of Lahontan Board Order No. 6-91-36. The Monitoring Plan addresses the five components stated above. Key plan requirements are summarized and revised as follows.

1.3.1 Water Quality Monitoring

The waste discharge requirements, monitoring, and reporting program were updated by Lahontan Board Order Number R6T-2003-0032 in 2003. The monitoring and reporting program was amended in 2011 under Board Order Number 2003-0032A1 and again in November 2013 under Board Order Number 2003-0032A2. In conjunction with the EIR/EIS/EIS Master Development Plan to protect water quality, the Water Board rescinded Board Order Number R6T-2003-0032 with the passage of new Board Order Number R6T-2015-0021 (May 14, 2015).

The new Monitoring Program includes water quality monitoring at five California stream stations as well as three California Base Parking Area StormFilter™ locations. Monitoring and sampling is to occur at all California stream sites monthly as safety and stream flows permit. During the spring snowmelt period, sampling is to occur bi-weekly (every two weeks). Five runoff sampling events at each of the three California Base Parking Area StormFilter™ locations shall be collected to reflect rainfall and snow runoff to assess performance of the StormFitlers™.²

Results and discussion are to be reported to Heavenly, TRPA, and Lahontan in this annual report.

Constituents are identified in the Monitoring Program for sampling at each of the stations. The following primary list of constituents is monitored at each of the receiving water sampling stations:

- > Discharge (Flow)
- > Turbidity
- > Suspended Sediment
- > Total Nitrogen (Total Kjeldahl Nitrogen+Nitrate+Nitrite)
- > Total Phosphorus

²California Regional Water Quality Control Board-Lahontan Region. 2015. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort. 2015 (pages 1-2).

> Chloride

Influent and effluent sampling locations for the StormFilter[™] at the California Base Parking Area shall monitor the following list of constituents:

- > Oil and Grease with silica gel treatment
- > Total Nitrogen (Total Kjeldahl Nitrogen+Nitrate+Nitrite)
- > Total Phosphorus
- > Turbidity
- > Chloride

1.3.2 Effective Soil Cover Monitoring

The Monitoring Program includes soil cover monitoring to determine requirements and effectiveness of various soil covers under different slopes and conditions. Monitoring examines the effectiveness of past and current projects. Soil cover monitoring conducted from 1995 to 2003 was based on the use of random transects at elevations above 7,000 ft. The results were reported in the 2003 Comprehensive Report. Collection of the data was too time-intensive, making it difficult to obtain data for the entire resort and the 2003 Comprehensive Report recommended that the measurements be discontinued. The report also recommended development of new protocol. A new general methodology was developed in 2005 by Cardno ENTRIX (formerly ENTRIX, Inc.) and approved by the USDA Forest Service.

In the 2007 Annual Report and later in the 2008 Effective Soil Cover Workplan, a new protocol was presented that combined the California Native Plant Society's (CNPS) Vegetation Rapid Assessment Protocol (VRAP) and the establishment of permanent photo points. After discussions with the USDA Forest Service, it was determined that the CNPS VRAP method should support an aerial survey, rather than being the only data collected. Heavenly and the USDA Forest Service agreed to share the cost of an over-flight. An infrared aerial flyover of Heavenly Mountain Resort was conducted by 3DiWest in conjunction with the USDA Forest Service in July of 2009. The flight produced a 1:8,000 resolution infrared aerial photo of the entire mountain and was used along with Geographic Information Systems (GIS) and field verification (i.e. ground-truthing) to produce an accurate picture of the soil cover at Heavenly. The VRAP method was augmented in 2009 with the establishment of permanent photo points to better track variability over time. Photo points established in 2009 established a baseline reference, though not all of the sites were accessible. Four years of photo monitoring showed little to no progress and it was determined that Integrated Environmental Restoration Services, Inc. (IERS) would lead a change to the existing program. Soil cover monitoring has shifted from ski slope vegetation and ground cover to hot spot prioritization monitoring and assessments leading to on the ground implementation. This programmatic shift is further discussed in Chapter 3 and is referred to as the Watershed Maintenance and Restoration Program (WMRP) in the Water Boards latest Monitoring and Reporting Program.

1.3.3 BMP Effectiveness Monitoring

The Monitoring Program includes BMP monitoring to determine the effectiveness of the BMPs in preventing soil erosion and protecting water quality under various conditions. Based on recommendations contained in the 2003 Comprehensive Report, the USDA Forest Service designed and implemented a new BMP monitoring strategy modelled after Region 5's Best Management Practices Effectiveness Program (BMPEP) protocols (USDA Forest Service 2002). The BMP monitoring program is currently being implemented by Resource Concepts Inc. (RCI). The 2015 Construction Erosion Reduction Program (CERP) data will be presented in the TRPA Annual Mitigation and Monitoring Report submitted in May 2016.

1.3.4 Riparian Condition Monitoring

The Monitoring Program includes stream condition inventory monitoring, as well as macro-invertebrate monitoring to assess the following objectives:

- > Determine which, and by how much, various creek health parameters fluctuate between monitoring periods
- > Evaluate the impacts Heavenly management practices have on the health of the stream riparian systems

In 2003, the USDA Forest Service made a number of recommendations to improve channel condition monitoring. These recommendations are reflected in the Riparian Conditions Monitoring Plan developed by ENTRIX in 2005. The revised plan was implemented in 2006, 2009 and most recently in 2011. Channel condition monitoring occurred annually along the Edgewood Creek reaches through 2011. Results from the annual survey showed little to no change, and the annual survey of these reaches was discontinued. Instead, the Edgewood stream condition inventory monitoring concurs with the California site reaches. The schedule for all reaches now occurs once every four years. The 2015 water year marked the first time many of the reaches had been surveyed since 2011.

Macro-invertebrate monitoring occurred in 2006, 2007, 2010, 2011, 2014 and 2015. Laboratory results for the 2015 samples have yet to be returned. Once returned, the results will be submitted in accordance with the Surface Water Ambient Monitoring Program (SWAMP) template to the Lahontan Water Control Board for scoring. The next round of macro-invertebrate monitoring is not required until the summer of 2018 in accordance with the approved schedule in the new Monitoring and Reporting Program.

1.3.5 <u>Condition and Trend Monitoring</u>

Condition and trend evaluations will be conducted on each of the data elements of the monitoring program both individually and cumulatively to gauge overall watershed condition, trends, and to determine if ski area management activities are improving or degrading water quality and ecological health. These evaluations are conducted in 5-year intervals and discussed in the Comprehensive Reports. The past comprehensive report covered six water years (2006-2011), in order to align the monitoring program with the reporting and monitoring sequencing. The six year comprehensive report was submitted in January 2012 and a revised copy was submitted in October 2013. An amendment to this report was submitted in August 2014 finalizing this report. The next comprehensive report is due in January 2017 covering the five year period from 2012-2016.

2 Water Quality

2.1 Station Description

Heavenly Mountain Resort (Heavenly) measures water quality parameters along four creeks to determine the effects of ski area development on background conditions (Table 2.3). Water samples were collected at seven stations for the 2015 water year, which include the additional station located on Heavenly Valley Creek at Sky Meadows, just above the snowmaking pond. Stations and sampling rationale are given in Table 2.1 and include the filter vault sampling locations. The approximate location of each station is shown in Figure 2.1.

Table 2-1 Heavenly Valley Mountain Resort Monitoring Program Water Quality Stations

	, ,	, ,
Station ID	Station Name	Rationale
43HVC-1A	Heavenly Valley Creek at Sky Meadows, Above Snowmaking Pond	Characterized water quality in Heavenly Valley Creek drainage from the developed ski area
43HVC-2	Heavenly Valley Creek Below Patsy's and Groove Chair Lifts	Characterized water quality in Heavenly Valley Creek drainage from the developed ski area
43HVC-3	Heavenly Valley Creek located at the Forest Service Property Line	Characterized water quality in Heavenly Valley Creek leaving National Forest Lands below Heavenly Mountain Resort
43BPC-4	Bijou Park Creek located below the Heavenly California Base Parking Lot	Characterized water quality in Bijou Park Creek below the California Main Lodge and parking area
43HDVC-5	Hidden Valley Creek Baseline Station	Characterized water quality in creek draining a similar, mostly undeveloped watershed
43HVE-1	Edgewood Creek Above Boulder Parking Lot	Characterized water quality in Edgewood Creek above Boulder parking lot and below the ski runs
43HVE-2	Edgewood Creek Below Boulder Parking Lot	Characterized water quality in Edgewood Creek below Boulder parking lot
43HVP-1A	North Manhole Influent Pipe Into the Filter System	Characterized water quality inflow from the lower parking lot into the filter system
43HVP-1B	South Manhole Influent Pipe into the Filter System	Characterized water quality inflow from the upper parking lot into the filter system
43HVP-2	West Manhole Effluent Pipe Out Of The Filter System	Characterized water quality exiting the filter system

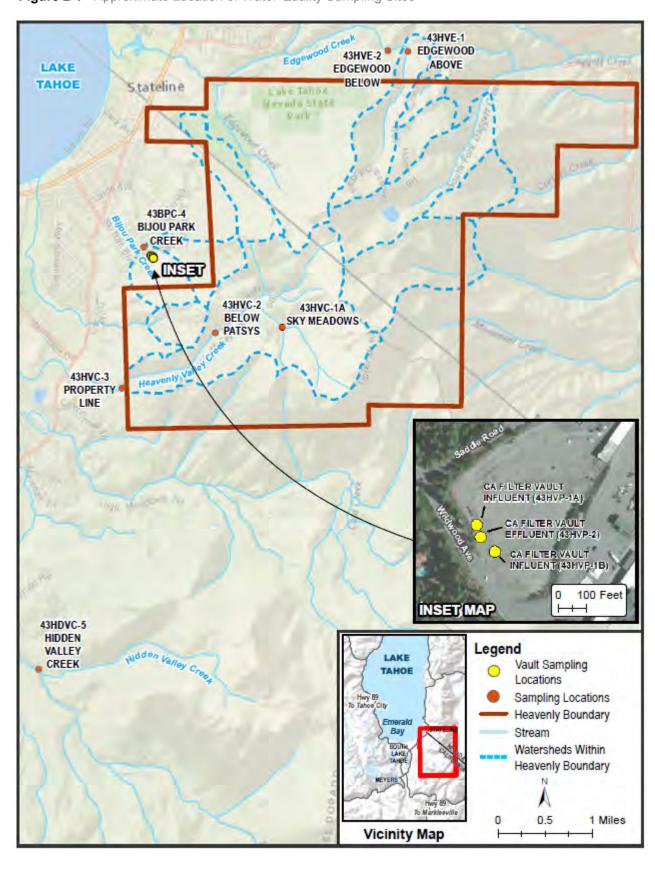


Figure 2-1 Approximate Location of Water Quality Sampling Sites

2.2 Precipitation Summary

Precipitation for the 2015 water year is shown in Figure 2.2. Data was taken from the National Resource Conservation Service, National Water and Climate Center website (http://www.wcc.nrcs.usda.gov). This graph represents accumulated precipitation and snow water content measured at SNOTEL Station 19L24S ("Heavenly Valley"), operated by the USDA Natural Resource Conservation Service. This station is located in the upper watershed of Heavenly Valley Creek near the current Sky Meadows monitoring station (43HVC-1A) at latitude 38° 56' N, longitude 119° 54' W, and elevation 8,850 feet.

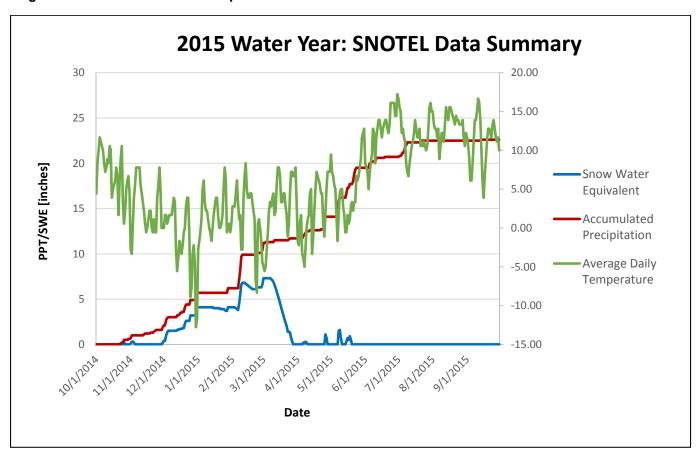


Figure 2-2 SNOTEL Weather Graph for the Water Year 2015

2.3 Sampling Frequency and Analysis

A total of 99 stream samples were collected during the 2015 water year. Twenty-one samples were collected at Bijou Park Creek (43BPC-4) and Hidden Valley Creek (43HDVC-5). The extremely low to no flows in Heavenly Valley Creek at Property Line location (43HVC-3) and Below Patsy's Chair (43HVC-2) resulted in only ten and nineteen total samples collected at each site, respectively. Water samples on Heavenly Valley Creek at Sky Meadows (43HVC-1A) were only collected during the fourth quarter of the 2015 water year, generating a total of three samples for this site. The new Lahontan Water Board Permit required the re-introduction of this site.

Twenty-one samples are comprised of monthly samples and an additional nine weekly samples collected during the spring runoff period. Only four samples were collected at the Upper Edgewood (43HVE-1) site, while a total of twenty-one samples were collected at Lower Edgewood (43HVE-2) due to seasonal low to no flows in the creek. The number of samples collected along the two Edgewood Creek sites varies because of low flows conditions and resort activities that prevent sampling. Seven storm samples were collected for each influent and effluent sample at the California Base Parking Area filter vault locations (43HVP-1A, 43HVP-1B, and 43HVP-2). Table 2-2 provides a summary of sampling and analysis for the 2015 water year.

Analyses for specific conductivity, turbidity, suspended sediment, nitrate/nitrite, total Kjeldahl nitrogen, total nitrogen, total phosphorus, soluble reactive phosphorus, and dissolved phosphorus were performed by High Sierra water Lab located near Truckee, California. Analyses for chloride were performed by Western Environmental Testing Laboratory (WET Lab) in Reno, Nevada. Additionally, WET Lab performed all constituent testing for the influent and effluent filter vault samples. Analytical results by station are provided in Appendix A and Appendix B.

Table 2-2 Summary of Sampling Analysis Conducted for the Water Year of 2015

Station ID	Station Name	# of Samples	Constituents Tested
43HVC-1A	Heavenly Creek at Sky Meadows	3	Full Suite
43HVC-2	Heavenly Creek Below Patsy's	19	Full Suite
43HVC-3	Heavenly Creek at Property Line	10	Full Suite
43BPC-4	Bijou Park Creek Below the California Parking Lot	21	Full Suite
43HDVC-5	Hidden Valley Creek	21	Full Suite
43HVE-1	Edgewood Creek Above Boulder Parking Lot	4	Full Suite, Specific Conductivity, SRP, & DP
43HVE-2	Edgewood Creek Below Boulder Parking Lot	21	Full Suite, Specific Conductivity, SRP, & DO
43HVP-1A	North Manhole Influent Pipe Into the Filter System	7	Full Suite, and Oil & Grease ²
43HVP-1B	South Manhole Influent Pipe into the Filter System	7	Full Suite, and Oil & Grease ²
43HVP-2	West Manhole Effluent Pipe Out Of The Filter System	7	Full Suite, and Oil & Grease ²

¹Full suite = Discharge, turbidity, suspended sediment, nitrate/nitrite, total Kjeldahl nitrogen, total phosphorus, and chloride.

2.4 Results and Discussion

2.4.1 <u>Discharge</u>

Stream flow was measured using a Marsh-McBimey meter at all of the stream sites except at Heavenly Creek Below Patsy's (43HVC-2) where flow was calculated from stage values in a Parshall Flume. Heavenly Creek monitoring locations at Below Patsy's (43HVC-2) and Property Line (43HVC-3) as well as the monitoring location at Hidden Valley Creek (43HDVC-5) exhibited peak discharge values near the end of May into early June. The values displayed for the Sky Meadows (43HVC-1A) monitoring location along Heavenly Creek reflect only the fourth quarter of the water year. The 2016 water year hydrology and monitoring effort at Sky Meadows (43HVC-1A) should align with the other two sampling sites along Heavenly Valley Creek. Limited samples (four) at the above Edgewood Creek monitoring location (43HVE-1) do not help estimate the peak discharge at this site. However, the Lower Edgewood Creek (43HVC-2) sampling site exhibited peak discharge values near the end of May. Peak discharge values for the Bijou Park Creek (43BPC-4) monitoring location where determined to occur towards the end of May. Each of the stream monitoring sites stream flow appeared to peak at different times throughout the spring runoff; however they all seem to peak near the end of May early June window. Limited snow pack, warmer temperatures, the lack of snowpack at lower elevations and smaller contributing watersheds are likely to be the cause for the earlier runoff spikes along Edgewood Creek and Bijou Park Creek. It should be noted that man-made snow at the resort affects the Heavenly Valley Creek watershed,

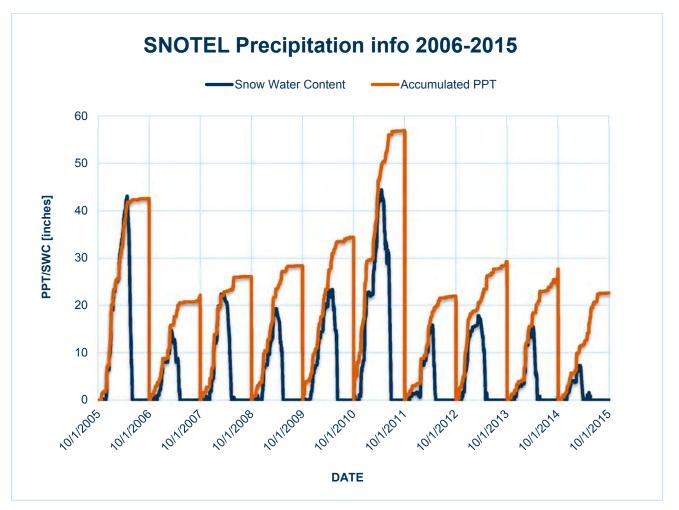
²Suspended sediment analysis was not performed on these samples.

though stream runoff values peaked approximately a week later at the Hidden Valley Creek reference reach monitoring location.

The 2015 water year marked the fourth consecutive year of below average precipitation. Discharge peak values are well below the 2010 and 2011 peak values due to lack of precipitation (snow pack) over the past four winter seasons (water years).

Precipitation total values and snow water equivalent peak measurements for the 2015 water year were lower than those calculated for the 2014 water year. The precipitation total values show a reasonable decrease from the 2014 water year, however the snow water equivalent peak measurement displays a significant drop for the 2015 water year. Figure 2-3 represents the past ten water years of SNOTEL precipitation data. Figures 2-4, 2-5, 2-6 and 2-7 represent the hydrographs at each of the seven sampling stations and associated creeks.

Figure 2-3 SNOTEL Precipitation Graph for Water Years 2006-2015



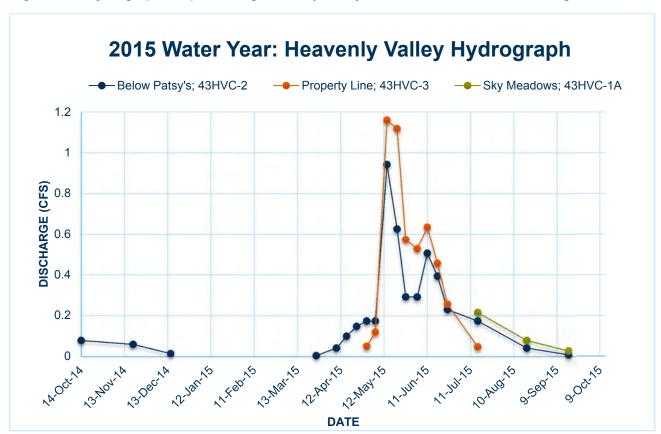
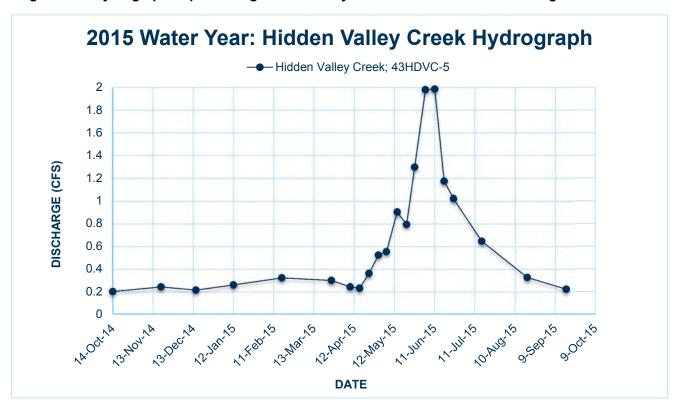


Figure 2-4 Hydrographs Representing Heavenly Valley Creek for the Water Year Ending in 2015





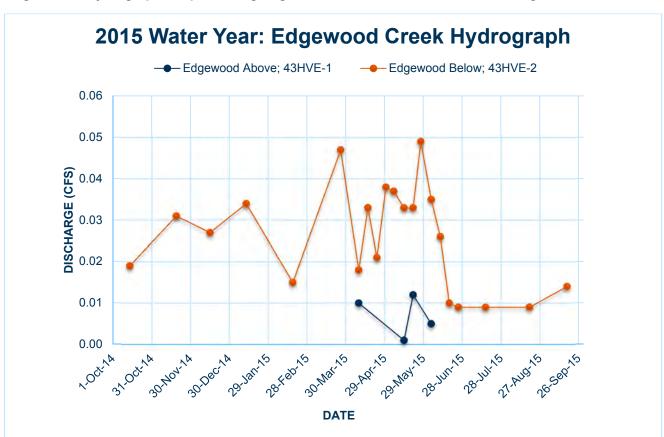
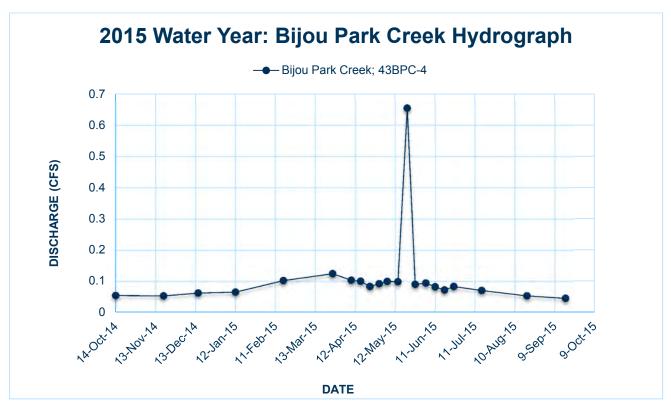


Figure 2-6 Hydrographs Representing Edgewood Creek for the Water Year Ending in 2015





Early water year and winter month monitoring were infrequent due to low and/or no flows within the creeks. Upper Edgewood Creek monitoring data was not collected due to the lack of stream flow. In the past resort activities, which begin in December and continued to March, typically prevent sampling but without snow and manmade snowmaking the Boulder area and Lodge did not open in 2014/15.

2.5 Annual Load Estimates

Table 2-3 presents the annual load values calculated from flow-weighted concentration data for total nitrogen, total phosphorus and suspended sediment at Heavenly Valley Creek at Property Line sampling location and at the Hidden Valley Creek baseline station from 2013 through the 2015 water year. Annual load values are calculated by weighing the number of days between sample collections and multiplying the weighted average times the discharge measurements collected in the field. This calculated value represents the weighted flow. Laboratory values for total nitrogen, total phosphorus and suspended sediment are multiplied and summed. The final unit conversion is applied and the annual loading values are reported in Table 2-3 and Table 2-4. The method used to calculate annual loading values is based on constituent concentrations, discharge and days between samples as discussed above. The methodology has been used in previously submitted annual reports and verified by Lahontan staff in the spring of 2010.

The Total Maximum Daily Load (TMDL) for sediment at Heavenly Creek is a five-year rolling average. The calculated 5-year rolling average from 2011 through the 2015 water year is shown in Table 2-4 and equates to a total of 24.4 tons/year along Heavenly Valley Creek. This is approximately 14 tons/year less than that calculated in the 2014 water year. It should be noted that only 10 stream flow values were collected in the 2015 water year due to the fact that on a number of sampling occasions the stream was near dry or dry preventing flow measurements. The Lahontan permit TMDL standard along Heavenly Valley Creek for suspended sediment is 58 tons/year. For comparison, the suspended sediment rolling average for Hidden Valley Creek was also calculated to be 14.2 tons/year. The decrease in constituent loading (total nitrogen, total phosphorus and suspended sediment) correlates to the decrease in precipitation and stream flows both of which were extremely low for the 2015 water year.

Table 2-3 Annual Load Values at Heavenly Valley Creek (Property Line 43HVC-3) and Hidden Valley Creek (43HDVC-5).

Year	Discharge (m³/yr)	Total Nitrogen (kg/yr)	Total Phosphorus (kg/yr)	Suspended Sediment (tons/yr)
		Property Line (43HV	/C-3)	
2013	382,367	37	5	1.0
2014	149,688	19	3	0.24
2015	92,131	8	2	0.16
		Hidden Valley Creek (43	HDVC-5)	
2013	873,425	102	21	3.5
2014	594,447	93	15	1.5
2015	412,713	48	10	1.4

Table 2-4 Five Year Suspended Sediment Rolling Average for Heavenly Valley Creek (Property Line 43HVC-3) and Hidden Valley Creek (43HDVC-5) Stations.

Water Year	Property Line (HV-C3) Suspended Sediment (Tons/Year)	Hidden Valley Creek (HV-H5) Suspended Sediment (Tons/Year)
2009	0.5	1.9
2010 ¹	70.5	18.6
2011	118.6	60.9
2012	1.7	3.4
2013	1.0	3.5
2014	0.24	1.5
2015	0.16	1.4
5 Year Rolling Average	24.4	14.2

¹ The 2010 water year discharge values were revisited and changed the annual load calculations.

2.6 Heavenly Valley and Hidden Valley Creeks

2.6.1 Summary Statistics for Water Quality Constituents: Water Year 2015

Statistical summaries for both Heavenly Valley and Hidden Valley Creek for water year 2015 are shown in Tables 2-5 through 2-8. The raw data and constituent data are provided in Appendix A. At Sky Meadows (43HVC-1A) the total phosphorus and chloride annual average values exceeded the state standard for the three month record collected. Constituent data collected at the Sky Meadows site (43HVC-1A) on July 16th showed the highest annual values for turbidity, total nitrogen, total phosphorus and chloride representative of the first sample collected at this site along Heavenly Valley Creek. Additionally, total phosphorus and chloride annual average values were also exceeded at Heavenly Valley Creek samples sites Below Patsy's Chair (43HVC-2) and Property Line (43HVC-3). Annual average standards along Heavenly Valley Creek for total phosphorus and chloride were exceeded at the reference reach along Hidden Valley Creek (43HDVC-5). The twenty-one samples collected reflect monthly sampling in addition to nine weeks of runoff sampling.

All four sampling sites (43HVC-1A, 43HVC-2, 43HVC-3 and 43HDVC-5) had total suspended sediment (TSS) values below the 90th percentile state standard value of 60 mg/L. The two highest daily peak TSS readings were recorded at Below Patsy's Chair (17.2 mg/L at 43HVC-2) on Heavenly Valley Creek and at the Hidden Valley Creek sampling site (13.0 mg/L at 43HDVC-5). Both of these TSS peaks are well below the annual state standard for the water year 2015. These values compare similarly with low water/precipitation years. Decreased precipitation and stream flow somewhat correlate with decreased TSS measurements. As stream flows increase, suspended sediment along the stream banks is mobilized and transported. Additionally, higher flows tend to alter the stream channel and mobilize sediment that had otherwise been trapped behind woody debris and fallen trees. As flows steadily decrease during extended periods of drought; sediment and debris are trapped above the water line and during peak storm events these materials become mobilized causing a rise in suspended sediment readings.

The California Lahontan state annual standard for total nitrogen (0.19 mg/L) is the sum of the total nitrate, total nitrite and total Kjeldahl nitrogen. The annual total nitrogen average at Sky Meadows (43-HVC-1A) is 0.133 mg/L, 0.157 mg/L at the Below Pasty's site (43HVC-2) and 0.102 mg/L at Property Line (43HVC-3) demonstrating that the annual state average was not exceeded on Heavenly Valley Creek. The Hidden Valley Creek reference site (43HDVC-5) annual average for total nitrogen is 0.115 mg/L below the annual state standard. These results suggest that resort operations have a less than significant impact on total nitrogen concentrations during low precipitation years.

Annual averages for total phosphorus were required to be below the 0.015 mg/L Lahontan state standard for Heavenly Valley Creek and Hidden Valley Creek. All four sampling locations were above the state standard (43HVC-1A, 43HVC-2, 43HVC-3 and 43HDVC-5). Average values for the four stations were as follows: Sky

Meadows (43HVC-1A) 0.018 mg/L, Below Patsy's Chair (43HVC-2) 0.022 mg/L, Property Line (43HVC-3) 0.022 mg/L and Hidden Valley Creek (43HDVC-5) 0.025 mg/L. The reference reach had the highest annual average value for total phosphorus, among the four sites listed above, suggesting that during low precipitation years resort activities along Heavenly Valley Creek have a less than significant impact on total phosphorus levels.

Annual average chloride values along Heavenly Valley Creek at Sky Meadows (43HVC-1A), Below Patsy's Chair (43HVC-2) and Property Line (43HVC-3) locations were exceeded for the 2015 water year. All three daily samples collected at Sky Meadows site (43HVC-1A) exceeded the annual average of 0.15 mg/L. Likewise all nineteen daily samples collected at Below Patsy's Chair (43HVC-2) and nine of the ten daily samples collected at Property Line (43HVC-3) exceeded the annual average for chloride. One daily sample did not exceed the annual average for unknown reasons and was determined to be non-detectable (June 25th). Nineteen of the twenty-one collected samples at Hidden Valley Creek (43HDVC-5) also exceeded the annual average for chloride. Chloride readings at all of these sites, with the exception of Sky Meadows (43HVC-1A), have been problematic and exceeding the state standard over the past decade. Sky Meadows has not been sampled regularly since 2006. While chloride readings were above the state standard at Hidden Valley Creek (43HDVC-5), they are relatively lower than values collected along Heavenly Valley Creek (43HVC-1A, 43HVC-2 and 43HVC-3). The exact cause for these increased chloride readings are not known. Application of salt on the terrain parks within the Heavenly Valley watershed may be one plausible cause; however, this doesn't explain the higher readings of the annual average at the undisturbed watershed reference site along Hidden Valley Creek (43HDVC-5).

Following the implementation of the Amended Monitoring and Reporting Program in May 2011, monitoring constituent test requirements for specific conductivity, soluble reactive phosphorus (SRP) and total iron were removed from the daily sampling regime along the Heavenly Valley Creek sites (43HVC-1A, 43HVC-2 and 43HVC-3) as well as the Hidden Valley Creek site (43HDVC-5).

Table 2-5 Heavenly Valley Creek Sky Meadows 2015 Water Year Statistical Summary

	Exceedances	xceedances of the California Lake Tahoe Receiving Water Limits – Sky Meadows (43HVC-1A)									
	Q (cfs)	Turbidity (NTU)	Total Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)					
CA State Standard	-	-	60	0.19	0.015	0.15					
# Samples	3	3	3	3	3	3					
Min	0.028	0.62	1.60	0.105	0.018	0.78					
Max	0.215	1.62	2.80	0.161	0.019	0.86					
Annual Average	0.107	1.083	2.13	0.133	0.018	0.81					
90th Percentile	-	-	-	-	-	-					

¹The 90th Percentile values could not be calculated due to the limited number of samples collected (three).

Table 2-6 Heavenly Valley Creek Below Patsy's Chair 2015 Water Year Statistical Summary

Exceedances of the California Lake Tahoe Receiving Water Limits – Below Patsy's Chair (43HVC-2)									
	Q (cfs)	Turbidity (NTU)	Total Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)			
CA State Standard		-	60	0.19	0.015	0.15			
# Samples	19	19	19	19	19	19			
Min	0.005	0.36	1.00	0.050	0.012	0.880			
Max	0.942	11.8	17.2	0.312	0.065	4.20			
Annual Average	0.226	1.94	3.46	0.157	0.022	1.62			
90th Percentile	-	-	6.40	-	-	-			

Table 2-7 Heavenly Valley Creek Property Line 2015 Water Year Statistical Summary

	Exceedance	Exceedances of the California Lake Tahoe Receiving Water Limits – Property Line (43HVC-3)										
	Q (cfs)	Turbidity (NTU)	Total Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)						
CA State Standard	-	-	60	0.19	0.015	0.15						
# Samples	10	10	10	10	10	10						
Min	0.048	0.28	0.80	0.052	0.013	0.96						
Max	1.161	1.65	6.00	0.212	0.034	2.00						
Annual Average	0.495	0.70	1.92	0.102	0.022	1.25						
90th Percentile	-	-	5.60	-	-	-						

Table 2-8 Hidden Valley Creek (Lower Hidden) 2015 Water Year Statistical Summary

Exceed	lances of the	e Lake Tahoe R	Receiving Water Limits f	or Trout Creek - Hidd	en Valley Creek (43HDV	C-5)
	Q (cfs)	Turbidity (NTU)	Total Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)
CA State Standard		20	60	0.19	0.015	0.15
# Samples	21	21	21	21	21	21
Min	0.204	0.28	0.80	0.055	0.018	0.15
Max	1.986	4.25	13.00	0.225	0.048	0.38
Annual Average	0.659	1.20	3.11	0.115	0.025	0.24
90th Percentile	-	-	5.80	-	-	-

2.7 Bijou Park Creek and California Park Lot Effluent

2.7.1 Summary Statistics for Water Quality Constituents: Water Year 2015

Raw data for both the Bijou Park Creek (Below California Parking 43BPC-4) and Effluent of the California Base Parking Lot (43HVP-2) can be found in Appendix A and B. Table 2-9 summarizes the Lahontan State Standards that have been in place in the past. Current state standards at the Bijou Park Creek sampling site (43BPC-4) fall under the Lake Tahoe Receiving Water Limits for: total dissolved solids (TDS), total nitrogen, total phosphorus and chloride. The effluent sampling location from the parking lot filter system (43HVP-2) is governed by the maximum not to exceed concentrations for discharge to surface water. These standards took effect in May 2011, when the Amended Monitoring and Reporting Program was finalized. Table 2-10 shows the water quality analysis of the Bijou Park Creek sampling site for the water year 2015.

Table 2-9 Summary of the Sampling Analysis Limits for the 2015 Water Year

Constituents	Units	Maximum Concentration for Discharge to Land Treatment ¹	Maximum Concentration for Discharge to Surface Water ²	Lake Tahoe Receiving Water Limits ³
Total Dissolved Solids	mg/L	-	-	60
Total Nitrogen	mg/L	5.0	0.5	0.15
Total Phosphorus	mg/L	1.0	0.1	0.008
Chloride	mg/L	-	-	3.0

¹The effluent limits for discharge to land were effective for discharge from the California Base area on December 31, 2004.

Table 2-10 Bijou Park Creek 2015 Water Year Statistical Summary

Exceedances	Exceedances of the California Lake Tahoe Receiving Water Limits for Bijou Park Creek - Below the California Parking Lot (43BPC-4)										
	Q (cfs)	Turbidity (NTU)	Total Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)					
CA State Standard		-	60	0.15	0.008	3.0					
# Samples	21	21	21	21	21	21					
Min	0.046	6.47	2.4	0.365	0.048	22					
Max	0.655	66.3	70.1	0.984	0.237	58					
Annual Average	0.109	12.43	7.92	0.541	0.070	45.9					

The annual average for total suspended sediment of 7.92 mg/L was well below the state standard of 60 mg/L at Bijou Park Creek (43BPC-4). The maximum daily reading for total suspended sediment was 70.1 mg/L recorded on May 21st, 2015. With the exception of the maximum daily reading, all other twenty daily samples collected during the 2015 water year were well below the state standard limit. As stated above with other creeks, suspended sediment values typically correlate with precipitation and increased flow values transporting sediment.

The annual average for total nitrogen at Bijou Park Creek (43BPC-4) of 0.541 mg/L, was above the state standard of 0.15 mg/L. All twenty-one of the daily samples collected were above the state standard. Since the state standard for total nitrogen was lowered from 0.50 mg/L to 0.15 mg/L, compliance within the state

²The effluent limits not to exceed for discharge to surface waters were effective for discharge from the California Base area beginning November 30, 2008.

³The amended monitoring and reporting program, effective May 30, 2011, for the 2012 Water Year and beyond required monitoring of the outfall of the filter vault system. Bijou Creek effluent limits to discharge moved to Lake Tahoe receiving water limits and the outfall to the filter vaults effluent limits fall under the maximum concentration for discharge to surface waters.

standard has not been met nor have the sampling results been close to meeting the standard. The past three water year's total nitrogen values (all low precipitation / drought years) are relatively similar annual average values (2012 – 0.61 mg/L, 2013 – 0.74 mg/L and 2014 – 0.54 mg/L). Table 2-11 shows the past eight years of total annual average nitrogen data for Bijou Park Creek (43BPC-4). The general trend regarding the average is in a downward direction; however, this trend may also be associated with the decreased flow values measured in the creek over the past four water years. The annual average flow values shown do not reflect the annual precipitation totals. For example, the 2010 water year was wetter than the 2015 water year yet the annual average flow values are fairly close. This further cements the notion that calculated weighted average flow values shown in Tables 2-3 and 2-4 for the annual load estimates (Section 2.5) are more valid than the straight average calculation exclusive of flow.

Table 2-11 Total Nitrogen Annual Average Values versus Flow at Bijou Park Creek (43BPC-4)

Water Year	Annual Average Total Nitrogen Values – (mg/L)	Annual Average Flows – (cfs)
2007	1.47	0.26
2008	1.88	0.33
2009	0.88	0.20
2010	0.73	0.15
2011	0.66	0.46
2012	0.61	0.22
2013	0.74	0.22
2014	0.54	0.14
2015	0.54	0.11

The annual average for total phosphorus at Bijou Park Creek (43BPC-4) for the water year 2015 was 0.070 mg/L. This annual average is well above the state receiving water standard of 0.008 mg/L. The lower receiving water standard is more than eight times less than the recorded annual average. Total phosphorus annual averages were also exceeded along Heavenly Valley Creek (43HVC-1A, 43HVC-2 and 43HVC-3) as well as the reference reach along Hidden Valley Creek (43HDVC-5) for the water year 2015. The water year 2015 shows an increase in the total phosphorus annual average value (0.070 mg/L) compared to that calculated for the water year 2014 (0.063 mg/L) but still remains less than the annual average value for the 2013 water year (0.105 mg/L). Total phosphorus and total nitrogen constituent readings can vary with vegetation uptake, decay and removal along with changes in the hydrologic cycle (fluctuations in precipitation and flows).

All twenty-one daily samples collected, exceeded the annual state average for chloride at Bijou Park Creek (43BPC-4) during the water year of 2015. The 2015 annual average for chloride was 45.9 mg/L, well above the state standard of 3.0 mg/L. While not as high as the Bijou Park Creek readings, the annual average for chloride was exceeded at the reference reach at Hidden Valley Creek (43HDVC-5, 0.24 mg/L). The difference is that the exceedance value at Bijou Park Creek is more than fifteen times higher than that of the limit, whereas the reference reach (43HDVC-5) along Hidden Valley Creek is nearly double the state annual average limit. Chloride readings have been problematic for the past decade, as Heavenly and the City of South Lake Tahoe salt and cinder the roadway during storm events and times where the temperature is below freezing and icing can be a public safety concern. Residual chloride is known to accumulate in the environment and removal mechanisms/processes are not readily available or affordable.

With the signing of the Amended Monitoring and Reporting Program in May 2011, monitoring and constituent test requirements for specific conductivity, soluble reactive phosphorus (SRP) total iron, total lead, dissolved ammonia and total petroleum hydrocarbons (TPH) were removed from the daily sampling regime at the Bijou Park Creek site below the California Parking Lot (43BPC-4).

The signed Amended Monitoring and Reporting Program also enforced the submittal of the California Parking Lot filter vault effluent results. The filter vault system collects storm and snow melt runoff from both the upper and lower parking lots. Table 2-12 provides a summary of the results for the water year 2015. Seven storm samples were collected during the 2015 water year. The amended monitoring program requires ten samples over the course of the water year; however, the lack of storms and timing of storm event prevented additional sample collections. See Appendix B, for the storm filter sampling results (43HVP-1A, 43HVP-1B and 43HVP-2).

At the effluent sampling location (outlet 43HVP-2), five out of the seven samples collected for turbidity exceeded the not-to-exceed limit of 20 NTUs. Six out of seven samples collected exceeded the not-to-exceed limit for total nitrogen (0.50 mg/L); while four of the seven samples collected exceeded the total phosphorus not-to-exceed state limit (0.10 mg/L). Only one oil and grease sample exceeded the state not-to-exceed limit (2.0 mg/L) for the water year ending in 2015. These storm readings all reflect the first flush effect collecting and transporting constituents into and through the filter system.

Since installation, maintenance of the filter system has been problematic and limited (2008). Autumn 2011, marked the first time that the sacrificial filters (14 total) were replaced. Since 2011, the sacrificial filters have been replaced annually due to sediment loading. In September 2012, the sacrificial filters as well as the filters in the Wildwood vaults were replaced. A different phosphorus absorbent media was used in all fourteen sacrificial filters that were replaced in September 2013. The media was changed from Zeolite, Perlite and Granular Activated Carbon media (ZPGTM) to a PhosphoSorbTM absorbent media in hopes to reduce total phosphorus exceedances. In addition, 176 filters were replaced in the main chambers. These additional filters were not installed with the newer media due to the additional associated cost. In June 2014, an additional 221 cartridges were replaced. Fourteen of the 221, included the PhosphoSorbTM media and replaced in the sacrificial filters. The remaining 207 did not include the newer media and replaced both the upstream and downstream parallel large vaults and filter bays. The filter installation in June completed the first full cycle of filter replacement since initial installation. The 2015 filter replacement cycle occurred on October 15th and 16th and included 42 filters. Fourteen PhosphoSorbTM media filters were replaced at the sacrificial vaults, while 28 cartridges were replaced at the Wildwood vaults.

Comparing the water quality results with the annual PhosphoSorbTM media and filter replacement show slight improvements with regards to the minimum tested constituent values; however total phosphorus and total nitrogen levels are still above the exceedance limits. Continued annual maintenance and filter replacement appear to show some water quality improvement as exceedance and maximum constituent values (spikes) have not risen significantly over time. Chloride and turbidity results from both the 2014 and 2015 water year remain high.

Table 2-12 California Base Storm Filter Effluent 2015 Water Year Statistical Summary

Exceedances of the California Maximum Concentration for Discharge to Surface Waters Limits for the Storm Filter Effluent Site (43HVP-2)										
	Turbidity (NTU)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)	Oil & Grease (mg/L					
CA State Standard	20	0.5	0.10	-	2.0					
# Samples	7	7	7	7	7					
Min	24	0.47	0.03	4	ND					
Max	220	4.4	0.30	57	3.9					
% of the time in Exceedance	71%	86%	57%	-	14%					

2.8 Edgewood Creek

Edgewood Creek is located in Nevada, outside of Lahontan's jurisdiction, and included in this report for compliance with the Master Plan Amendment that are within TRPA's basin jurisdiction. The two Edgewood

Creek locations are sampled for compliance with the Nevada Department of Environmental Protection (NDEP) standards. Data are summarized in Tables 2-13 and 2-14, and the raw data tables are referenced in Appendix A.

Out of the four daily samples collected at the Upper Edgewood Creek sampling site (43HVE-1), no exceedances occurred for turbidity, suspended sediment, total nitrogen and total phosphorus.

Two daily values for turbidity exceeded the NDEP state standard for the Lower Edgewood Creek sampling site below the Boulder Parking Lot (43HVE-2). Exceedances at Lower Edgewood Creek site (43HVE-2) occurred on June 25th and August 19th, 2015. The daily turbidity readings were 10.9 NTUs and 11.6 NTUs, respectively. The exact cause of the turbidity spikes are not known. Exceedances for suspended sediment, total nitrogen and total phosphorus were not recorded for this site.

Table 2-13 Edgewood Creek Above the Boulder Parking Lot 2015 Water Year Statistical Summary

Excee	Exceedances of the State (NDEP) Standards for the Edgewood Creek Site – Above the Boulder Parking Lot (43HVE-1)										
	Q (cfs)	Specific Conductivity (mmhos)	Turbidity (NTU)	Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	SRP (mg/L)	DOP (mg/L)			
NDEP Standards ¹	-	-	10.0	25	0.6 ²	0.10	-	-			
# Samples	4	4	4	4	4	4	4	4			
Min	0.001	40.40	0.77	2.40	0.057	0.028	0.009	0.019			
Max	0.012	72.40	1.82	7.60	0.277	0.059	0.012	0.024			
Annual Average	0.007	57.15	1.28	5.30	0.176	0.042	0.010	0.021			

¹NDEP Standards are from the Nevada Administrative Code (NAC) Chapter 445A.1915. All listed numbers are standards for single values no greater than a given parameter unless otherwise noted

Table 2-14 Edgewood Creek Below the Boulder Parking Lot 2015 Water Year Statistical Summary

Excee	Exceedances of the State (NDEP) Standards for the Edgewood Creek Site – Below the Boulder Parking Lot (43HVE-2)											
	Q (cfs)	Specific Conductivity (mmhos)	Turbidity (NTU)	Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	SRP (mg/L)	DOP (mg/L)				
NDEP Standards ¹	-	-	10.0	25	0.6 ²	0.10	-	-				
# Samples	21	21	21	21	21	21	21	21				
Min	0.009	134.7	0.57	1.20	0.099	0.016	0.002	0.012				
Max	0.049	153.6	11.6	18.0	0.472	0.068	0.010	0.030				
Annual Average	0.026	142.76	2.48	3.75	0.208	0.025	0.005	0.017				

¹NDEP Standards are from the Nevada Administrative Code (NAC) Chapter 445A.1915. All listed numbers are standards for single values no greater than a given parameter unless otherwise noted

2.9 Conclusions and Recommendations

The 2015 water year marks the four consecutive below average precipitation water year. The 2015 water year compares similarly to the 2007 and 2012 water year in terms of precipitation totals but is significantly lower in term of water content (amount of water held within the snow pack) dating back to the 2005 water year. Figure

²Annual Average

²Annual Average

2-3 presents a great comparison for the amount of water content and precipitation totals since 2005. Annual noncompliance values are typically less in low water years than in higher precipitation and increased stream flow seasons. Constituent values in noncompliance are not solely due to mountain operations associated with the resort activities as values at the base line reference station also exceeded annual averages. The following sections include a summary of the monitoring program and the 2015 finding for each creek and applicable recommendations.

2.9.1 <u>Heavenly Valley Creek</u>

Annual average values for both total phosphorus and chloride were exceeded at all three sampling locations along Heavenly Valley Creek (43HVC-1A, 43HVC-2 and 43HVC-3). These two annual average constituent values were also exceeded for the 2011, 2012, 2013 and 2014 water years along Heavenly Valley Creek at the Below Patsy's Chair (43HVC-2) and Property Line (43HVC-3) sampling sites. Total phosphorus and chloride annual average constituent values were exceeded at the reference site along Hidden Creek (43HDVC-5) over the past four water years as well. Resort operations and development within the watershed are not solely responsible for these higher readings along Heavenly Valley Creek as evidenced by the increased readings at the reference site.

Suspended sediment Total Maximum Daily Load (TMDL) weighted annual average values have been calculated since 2001 and the five year rolling average has been below the limit since 2005. Low precipitation and runoff levels have been linked to these lower suspended sediment totals. Additional resources (BMPs), increased employee awareness and on mountain improvements can also be linked to this value being in compliance. While total suspended sediment values are in compliance for Heavenly Valley Creek, other metrics such as bentho macroinvertebrate (BMI) and stream condition inventory results (Chapter 5) will need to show improvement before possible discussion and potential (TMDL) de-listing of the Heavenly Valley Creek were to occur.

2.9.2 Bijou Park Creek / California Parking Lot Effluent

Since the state standards along Bijou Park Creek were lowered to the Lake Tahoe receiving water limits, the annual state standard values collected at the monitoring location have not been met for total nitrogen, total phosphorus and chloride. The amended monitoring and reporting program in 2011 lowered the standards by nearly a factor of ten for these three constituents. As discussed above, total phosphorus and chloride levels were also exceeded at the reference reach along Hidden Valley Creek (43HDVC-5); however, the Bijou Park Creek (43BPC-4) exceedances were well above the state standards.

Chloride readings continue to be problematic at these two sites as well as the other California stream monitoring locations. In the past, Heavenly Mountain Ski Resort (Heavenly) has purchased different deicer mixtures for roadway application. However, the existing spreading equipment and vehicle were not equipped to handle this denser material and Heavenly ended up applying more deicer to the roadways resulting in a "dirty" look as the applied material fell out in clumps. Heavenly reverted back to the older mixture for the 2014/2015 winters season; however new equipment and vehicular improvements have allowed Heavenly to switch to a Washoe Sand deicer mixture with a five-to-one cinder to salt ratio for the 2015/2016 winter season. As a benefit to their guests, Heavenly continues to apply deicer to the roadways leading to the California parking lot providing guests a safer means during icy travel conditions. Further discussion on this issue can be found in Chapter 7.

The 2015 water year marks the fourth year that effluent results from the California Parking Lot filter vault system were reported to the State Water Board. All seven storm samples collected had constituent results that exceeded the not-to-exceed state standard. Turbidity, total phosphorus, total nitrogen and oil and grease values each were exceeded once or more for the seven samples collected. Chloride levels were exceeded for each sample collected with the annual average chloride readings calculated at 23.6 mg/L (almost half of the annual average limit at Bijou Park Creek located downstream 45.9 mg/L). The filter outlet annual average for chloride is lower than the Bijou Park Creek annual average; however there is a larger cumulative watershed and inputs at Bijou Park Creek. There is not a state standard exceedance limit for chloride at the filter vault

outlet monitoring location (43HVP-2). The Water Board language states that the metric for exceedance is 10% above background levels; however there is not an upstream sampling location to determine this value.

As mentioned in last year's annual report, the 221 filters replaced in 2014 marked the first time that all of the original filters had been replaced since initial installation in 2008. Continuing with filter maintenance and replacement schedule an additional 42 filters were replaced in 2015. Pacific Stormwater Solution's vault inspection report is included in Appendix D. The implementation and filter replacement schedule has prioritized the need for Heavenly to spend maintenance dollars on the system. The schedule prioritized filter replacement ensuring that over a four year period Heavenly will replace every filter within the system while helping to spread out the filter replacement costs over time. The sacrificial filters replaced in 2015 included the newer Phosphosorb™ media. The media and filter data show a small improvement with regards to total phosphorus exceedances; though at this time there is not a filter media that exists specifically targeting the reduction of chloride levels. The 2015 water year marks the second year of data collected using the new media. Water quality results with the use of this new media have limited the total phosphorus exceedance spikes; however, they are still exceedances. The peak exceedance values at the outlet monitoring location (43HVP-2) were similar to those reported in 2014 with the exception being chloride. Chloride storm samples were well below the 2014 values and are likely attributed to less deicer used on the parking lot associated with the lack of storms, snow fall and cold temperatures.

Heavenly continues to be proactive in attempting to limit discharge exceedances by replacing cartridges, maintaining the system, updating sampling equipment and trying new media. The new Lahontan permit required that Heavenly submit a feasibility plan in the fall of 2015 to address deicer use, chloride spikes and Bijou Park Creek (43BPC-4). Additional monitoring, and potential vault improvements will be collected and reviewed in 2016. Results from these additional studies required by the feasibility study will be incorporated into the comprehensive report next year as well as implemented to help limit future constituent exceedance discharges.

2.9.3 Edgewood Creek

Only four samples were collected at the Edgewood Creek site above the Boulder parking lot (43HVE-1); while twenty-one samples were collected downstream the lower Edgewood Creek site (43HVE-2). The discrepancy between the total samples collected results from the lack of water/flows at the Upper Edgewood Creek sampling site. Typically resort activities (snow making and grooming) limit winter sampling; however the lack of snow and no additional snow making prevented Heavenly from opening Boulder Lodge area for the 2014/2015 ski season. The lack of samples at the upper site (43HVE-1) do not complete the runoff hydrograph for the 2015 water year. Additional samples were collected at the lower site (43HVE-2), located at a lower elevation in the water shed, completing the 2015 runoff hydrograph. No documented daily exceedances occurred at the Upper Edgewood Creek sampling site (43HVE-1) for the limited samples collected. NDEP daily standards at the Lower Edgewood Creek sampling site (43HVE-2) were exceeded for turbidity in late June and August. Since the restoration project in 2007 along Edgewood Creek, there have only been three water year's in which the daily not to exceed NDPE stream effluents limits were not met. Exceedances were collected over the past two water years (2014 and 2015) forming an unfavourable trend.

Watershed Maintenance and Restoration Program (WMRP)

Beginning in 2013, Integrated Environmental Services (IERS) began an adaptive management approach and paradigm shift away from past monitoring methodology and protocol. The revised approach and history is documented in Chapter 3 of the *Heavenly Mountain Environmental Monitoring Program (2012)*, as well as IERS's paradigm shift memorandum included in Appendix E. Shifting away from what was once titled the "Effective Soil Cover Program", the Monitoring and Reporting program now outlines reporting and tracking of mitigation and restoration projects. In addition, annually or once within a three year cycle the Heavenly Valley Creek and Bijou Park Creek watersheds will be assessed for erosion problem areas. This report will also note the potential solution and schedule for implementing corrective actions. The 2016 water year will mark the first results from this program. Past monitoring results from the 2015 monitoring period will be included in the Mitigation and Monitoring Program Annual Report due on May 1st 2016.

4 Best Management Practices (BMP) Implementation and Monitoring

The new Monitoring and Reporting Program (MRP) 2015-0021 includes a requirement for USFS Roads Monitoring.³ On March 26th, 2015 Heavenly Mountain Resort and the LTBMU entered a roads maintenance and reporting agreement to cooperate on maintaining the existing on mountain roadway network. This agreement also set forth the standards for road maintenance, new roadway construction, annual meetings, and reporting of road maintenance activity. Heavenly submitted the road network maintenance performed in 2015 to the Forest Service in September 2015 in accordance with the above mentioned agreement. The road improvements and map are included in Appendix G. This agreement does not specify a protocol for assessing, identifying, and documenting road condition and maintenance needs on an annual basis, however several monitoring efforts outlined in the MRP and Heavenly Resort Monitoring Plan adequately address this need.

BMP effectiveness monitoring is also required in the permit to help address Heavenly Valley Creek Sediment TMDL targets.⁴ RCI conducted this monitoring, utilizing a protocol modelled after the Forest Service's Region 5 BMP Evaluation Program (BMPEP) in 2015. Results for both temporary and permanent BMPs for the 2015 construction season will be included in the Mitigation and Monitoring Program Annual Report due on May 1st, 2016.

The USFS Region 5 is phasing out its Regional BMPEP program, in favor of a new National US Forest Service BMP monitoring program. The National BMP Monitoring program technical guide is still in draft form, but the protocols have been actively utilized by the agency across the nation for the past two years. A final version of the National BMP monitoring technical guide is expected before the end of 2016. The National BMP Monitoring protocols programmatically assess BMP implementation and effectiveness for a wide variety of land management practices. Roads, facilities, and ski runs on USFS lands at Heavenly Resort will be included in the sample pool for this randomly selected annual monitoring beginning in 2016, and USFS staff will conduct and report out results from this monitoring effort.

Because the targets for National BMP monitoring on each Forest are relatively small (approximately 6 evaluations per Forest per year) and are randomly selected, Heavenly will also continue to implement annual resort wide identification of erosion problems and BMP effectiveness, on resort roads, ski runs, and facilities. Heavenly and its consultant(s) will consider a more streamlined process in 2016 for documenting and reporting this information, and may discontinue use of the current forms that were based on the USFS Regional BMPEP protocol.

Furthermore, IERS performed rapid assessment erosion hot spot monitoring⁵, within the CA-1 watershed prioritizing potential erosion risk areas from roads, ski runs and facilities within the watershed that are hydrologically connected to a water body. Identified erosion risk areas were incorporated into the Annual Work list for repair and BMP implementation. The 2015 "hot spot' monitoring report will also be submitted this spring as an appendix in the Mitigation and Monitoring Report. Results from this report will be incorporated into the 2016 summer Annual Work list. Rapid assessment erosion hot spot monitoring will be conducted on additional California watersheds in future years.

³ California Regional Water Quality Control Board-Lahontan Region. 2015. Monitoring and Reporting Program for Heavenly Mountain Resort. Board Order No. R6T-2015-0021. WDID No. 6A090033000. 2015. Page 9. Section D.

⁴ California Regional Water Quality Control Board-Lahontan Region. 2015. Waste Discharge Requirements for Heavenly Mountain Resort. Board Order No. R6T-2015-0021. WDID No. 6A090033000. 2015. Page 24. Table 3.

⁵ Drake Kevin, *Heavenly Mountain Resort Outcome-Based Watershed Management Program, 2014 Restoration and Monitoring Annual Report.* Integrated Environmental Restoration Solutions, Inc. April, 2015.

5 Riparian Condition Summary

5.1 Introduction and Monitoring Objectives

Riparian areas function as transition zones between uplands and stream channels, linking terrestrial and aquatic ecosystem processes. Their position in the landscape often affords immediate and measurable effects from changes on either side. It is this sensitivity that makes riparian areas ideal for interpreting management effects on the ecosystem over both short and long temporal scales.

Past riparian condition monitoring at Heavenly Mountain Resort (Resort) included a modified version of the Pfankuch Stream Inventory, Channel Stability Evaluation (Pfankuch 1975), and the Rosgen Stream Classification (Rosgen 1992, 1996).

This chapter discusses the stream channel monitoring activities conducted in 2015 in accordance with the Work Plan for Riparian Condition Monitoring (Work Plan) (ENTRIX 2005), incorporating the Stream Condition Inventory (SCI) procedures (Roby et al. 2005, Version 5), and reflecting recommendations from the most recent comprehensive report (2006-2011)⁶.

The objective of this long-term monitoring is to assess the effectiveness of erosion control measures and restoration activities on stream health. Monitoring is conducted to characterize stream and riparian conditions along selected stream reaches within the Heavenly Mountain Resort area as well as along reference reaches unaffected by Resort activity. The evaluation and comparison of monitoring data is used to assess changes in stream and riparian conditions and, if changes are encountered, determine whether they are associated with operations at the Resort.

5.1.1 Monitoring Schedule

In accordance with the EIR/EIS/EIS and subsequent Total Maximum Daily Load (TMDL) from the Monitoring and Reporting Program, Heavenly is required to monitor and survey stream conditioning inventory (SCI) at least once every four years corresponding with the second year of the benthic macroinvertebrate (BMI) sampling on Heavenly Valley and Hidden Valley Creeks. The 2015 season marked the second year of BMI collection followed by SCI surveys. Edgewood and Daggett Creeks were also included in this investigation to align with the California stream surveys. The next round of required BMI sampling will occur in 2018, while the next SCI surveys will occur in 2019. The monitoring schedule is documented in the Lahontan Water Board's Monitoring and Reporting Program No. 2015-002 (WDID NO. 6A090033000).

5.2 Monitoring Methods

As outlined in the Work Plan for Riparian Condition Monitoring (ENTRIX 2005), the monitoring activities collect geomorphology and riparian data in accordance with the United States Department of Agriculture Forest Service (USFS) Stream Condition Inventory (SCI) Technical Guide: Pacific Northwest Region, Version 5.0 (USFS Technical Document) (2005). The SCI method was developed to collect intensive and repeatable data from stream reaches to monitor conditions over time.

The SCI methodology also includes BMI sampling, which was conducted in 2006, 2007, 2010, 2011, 2014 and 2015 on Heavenly Valley and Hidden Valley Creeks in support of bioassessment monitoring required by the 2003 Heavenly Valley Creek Total Maximum Daily Load (TMDL) Bioassessment Monitoring Plan and amended in the Lahontan monitoring and reporting program permit (2011). Bioassessment data scored and reviewed in the EIR/EIS/EIS show inconclusive to poor health in Heavenly Valley Creek. Further discussion of BMI monitoring and results are presented in Chapter 5, section 5.4.2.8.

⁶ Cardno ENTRIX 2012 Environmental Monitoring Program Comprehensive Report Heavenly Mountain Resort. Water Years 2006-2011 (Revised August 2014). Cardno ENTRIX, Zephyr Cove, Nevada.

⁷ California Regional Water Quality Control Board-Lahontan Region. 2015. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort. 2015 (pages 3-4).

5.3 Monitoring Locations

The project-related monitoring locations consist of three project reaches along Heavenly Valley Creek (HVC-1, HVC-2, and HVC-3), two project reaches on Edgewood Creek (EC-1 and EC-2), two project reaches on Daggett Creek (DC-1 and DC-2), and one project reach on Mott Creek (MC-1). The background or reference monitoring sites consist of two reference reaches on Hidden Valley Creek (HDVC-1 and HDVC-2). The locations are shown in Figures 5.1 and 5.2.

The project reaches on Heavenly Valley Creek are located within California and were established by the USFS in 2001. HVC-1 (Sky Meadows) is situated in the vicinity of Sky Meadows between the snowmaking pond and the 90-degree bend in the creek immediately downstream of the Sky Express Chair. HVC-2 (Below Patsy's) extends downstream of the culverts near Patsy's Chair to immediately upstream of the steep boulder field situated beyond the ski area boundary. HVC-3 (Property Line) extends downstream from the USFS boundary to immediately upstream of Powerline Trail.

The project reaches on Edgewood Creek, Daggett Creek, and Mott Creek are located in Nevada and were established by Cardno ENTRIX (formerly ENTRIX, Inc.) and the USFS in 2006. EC-1 (Upper Edgewood) on Edgewood Creek is located upstream of the stream restoration project completed in 2006 along the proposed alignment for the new North Bowl Express Lift and is used to monitor the stream restoration project in that area. EC-2 (Lower Edgewood) extends downstream from the Boulder Lodge parking lot past the Edgewood Below water quality site and is used to monitor the stream restoration project completed in 2007. Along Daggett Creek, DC-1 (Upper Daggett) is located downstream of the dam outlet culvert and DC-2 (Lower Daggett) is located downstream of DC-1 under the Galaxy chairlift. The monitoring location MC-1 on Mott Creek is located downstream of the Tahoe Rim Trail creek crossing. Based on feedback from the LTBMU (USFS) following recent evaluations for the Heavenly Epic Discovery Project, no additional surveys are recommended at the Mott Creek location. This boulder-dominated channel is inherently stable and resistant to change and is unlikely to be affected by ongoing and proposed management activities in the contributing watershed⁸.

The two reference reaches are located on Hidden Valley Creek in California and were established by the USFS in 2001. These two reference reaches are used for comparison with the project reaches on Heavenly Valley Creek. HDVC-1 (Upper Hidden Valley Creek) is located in the upper watershed, above the Resort area, and is used as a reference site for project reach HVC-1. HDVC-2 (Lower Hidden Valley Creek) extends approximately 270 meters (m) upstream from the Trout Creek confluence and is used as a reference site for project reach HVC-3.

The field observation dates during 2015 are listed in Table 5.1 for the benefit of analysis that may require consideration of weather and streamflow conditions.

Table 5-1 Riparian Condition Monitoring in 2015

Creek	Reach	Observation Date(s)
Heavenly Valley Creek	Sky Meadows	6/22/2015
Heavenly Valley Creek	Below Patsy's	6/17/2015
Heavenly Valley Creek	Property Line	6/29/2015
Hidden Valley Creek	Upper Hidden Valley	6/23/2015
Hidden Valley Creek	Lower Hidden Valley	6/16/2015
Edgewood Creek	Upper Edgewood	7/14/2015
Edgewood Creek	Lower Edgewood	7/15/2015
Daggett Creek	Upper Daggett	7/31/2015
Daggett Creek	Lower Daggett	6/02/2015
Mott Creek	Mott Creek	N/A

⁸ S. Norman (LTBMU) – Personal Communication May 28th, 2015.

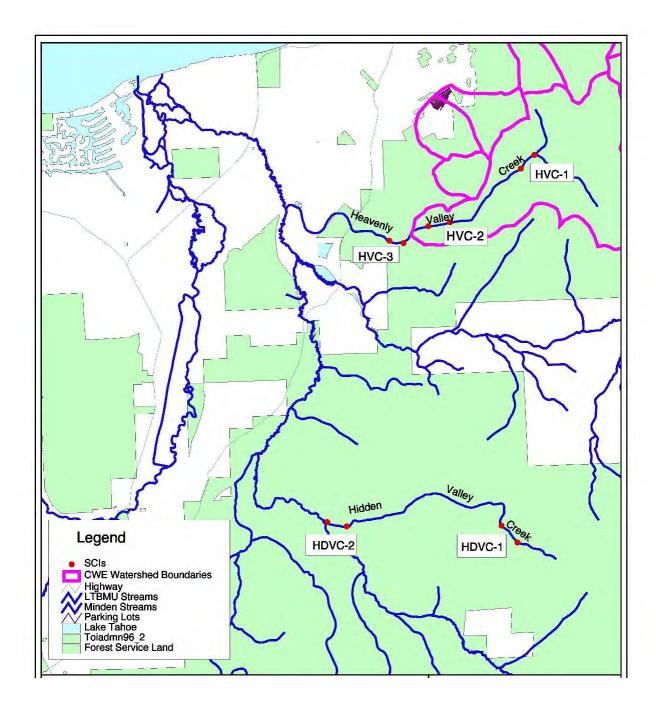


Figure 5-1 SCI monitoring sites in California established in 2001 (USFS 2001)

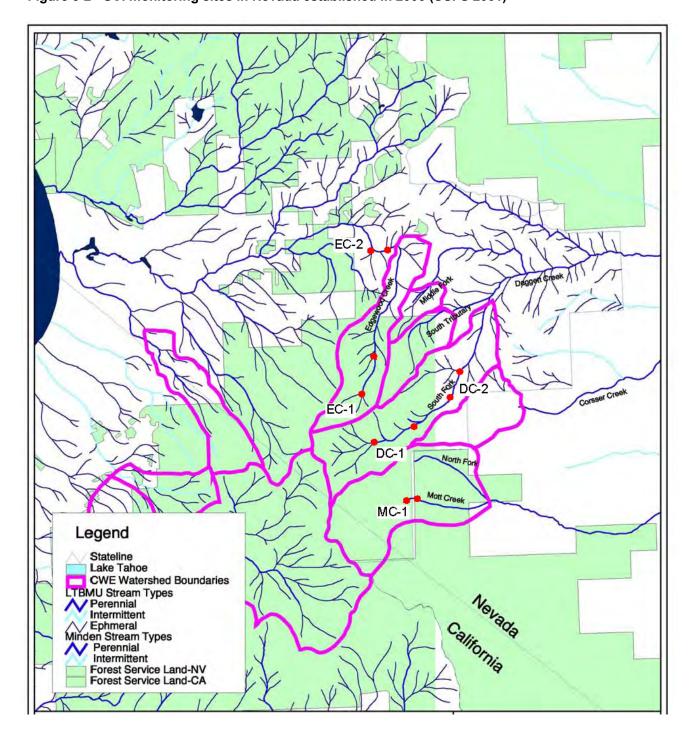


Figure 5-2 SCI monitoring sites in Nevada established in 2006 (USFS 2001)

5.4 Monitoring Results

5.4.1 Goal: Stable Functional Channel

5.4.1.1 Channel Type

5.4.1.1.1 California Project Reaches

The Sky Meadows site (HVC-1) is the upper-most monitoring reach on Heavenly Valley Creek and was established by the USFS in 1996. This stretch of creek is a perennial reach that falls under the "C" type channel under the Rosgen classification system. A "C" type channel is a low gradient, meandering, riffle/pool, alluvial channel with broad, well-defined floodplains (Rosgen 1996). This channel type has not changed since 2006.

The Below Patsy's site (HVC-2) is the second monitoring reach located on Heavenly Valley Creek and was established by the USFS in 1996. This reach exhibits the characteristics of a Rosgen "B" type channel. A "B" type channel is a moderately entrenched, moderate gradient, riffle dominated channel with infrequently spaced pools, stable banks and a stable profile (Rosgen 1996). The channel type has not changed since 2006.

The Property Line site (HVC-3) downstream of Heavenly Ski Resort's boundaries was established in 2001 to show temporal changes in channel morphology resulting from cumulative impacts. This reach exhibits Rosgen "A" channel characteristics. An "A" type channel is a steep, entrenched, cascading, stream that has high energy to transport sediment (Rosgen 1996). In 2006, the classification was changed from a "B" type to an "A" type channel. Although there some attributes fit both types (such as its stable banks and moderate entrenchment), the classification was changed back to an "A" type channel due to the steepness of the reach.

5.4.1.1.2 California Reference Reaches

The Upper Hidden Valley site (HDVC-1) is located in the headwaters area of Hidden Valley Creek. Established in 1996, HDVC-1 is a reference reach undisturbed by ski resort activities, and is comparable to the Sky Meadows site on Heavenly Valley Creek. The Upper Hidden reach exhibits the characteristics of a Rosgen "C" type channel. A "C" type channel is low gradient, meandering, point bar, riffle/pool alluvial channel with broad, well-defined floodplains (Rosgen 1996). The channel type has not changed since 2006.

The Lower Hidden Valley site (HDVC-2) was established in 2001 as a reference site to HVC-3 (Property Line). While both reaches have similar gradient, canopy cover, adjacent streamside vegetation types, elevation, and bankfull widths; Heavenly Valley and Hidden Valley creeks have dissimilar flow regimes. The discharge in Heavenly Valley Creek is influenced by the Sky Meadows dam, while Hidden Valley Creek flows are not regulated. This reach exhibits Rosgen "A" type channel characteristics. An "A" type channel is generally described as a steep, entrenched, cascading, stream that has high energy to transport sediment (Rosgen, 1996). In 2006, the classification was changed from a "B" type channel to an "A" type channel. Although some attributes fit both types (such as stable banks and moderate entrenchment), the classification was changed to an "A" type channel due to the steepness of the reach.

5.4.1.1.3 Nevada Project Reaches

The Edgewood Creek watershed has been the location of multiple restoration projects. The restoration project in the portion of Edgewood Creek including the Upper Edgewood riparian monitoring site (EC-1) is referred to as the North Bowl Restoration Stream Environment Project. Phase 1 (the downstream two-thirds of the project) of the North Bowl Restoration Stream Environment Project was completed in 2006. Other activities in 2006 included gabion structures added as gully improvements upstream of the North Bowl Restoration Stream Environment Project and best management practices installed on the road that descends from Boulder Parking Lot along Edgewood Creek. Phase 2 of the North Bowl Restoration Stream Environment Project was completed in the summer of 2007. Phase 2 involved the installation of more gabion structures, strategic placement of large woody debris, and vegetation establishment. For a more thorough description, please reference the Final Edgewood Watershed Assessment and Enhancement Plan: Upper Edgewood Creek (Swanson 2006).

The stream at the Upper Edgewood site (EC-1) is a high gradient stream so only a longitudinal bed profile and cross-section analysis were conducted in the past. The three permanent cross-sections extend across the entire valley floor width and were selected in 2006 to avoid construction disturbance from restoration in 2007. The EC-1 reach exhibits characteristics of a Rosgen "Aa+" type channel. It is very steep (>10 percent), somewhat entrenched, and confined. The channel resembles a gully and has a step/pool morphology resulting from the large number of downed trees in the channel (Rosgen 1996).

Edgewood Creek, directly upstream of the Lower Edgewood Creek monitoring site (EC-2), underwent restoration in 2007. These restoration activities included repair of a head-cut and channel incision by constructing plunge pools and riparian planting. Only the upstream cross-section of the EC-2 riparian monitoring site was modified. A vault treatment system was previously installed at the Boulder parking lot in 2005. The untreated areas of Lower Edgewood exhibits characteristics of a Rosgen "G" type channel. A "G" channel type typically has very high bank erosion rates and a high sediment supply. Channel degradation and side slope rejuvenation processes are also typical (Rosgen 1996).

The Upper Daggett Creek site (DC-1) exhibits characteristics of a Rosgen "Aa+" type channel. An "Aa+" type channel is a very steep, deeply entrenched stream with the capacity of debris transport (Rosgen 1996). This reach is steep (>10 percent), well entrenched, and is highly confined. Typical characteristics include a step/pool morphology with chutes and waterfalls (Rosgen 1996). The channel type has not changed since 2006.

The Lower Daggett site (DC-2) exhibits characteristics of a Rosgen "A" type channel. It is similar to an "Aa+" type channel in terms of several channel characteristics, yet has lower channel slope (Rosgen 1996). The channel type has not changed since 2006.

The Mott Creek site (MC-1) exhibits characteristics of a Rosgen "Aa+" type channel. It is very steep (>10 percent), well entrenched, and is highly confined. Typical characteristics include step/pool morphology with chutes and waterfalls (Rosgen 1996). The channel type has not changed since 2006. Mott Creek was not sampled in 2015, based on recommendations from the LTBMU to focus monitoring on more sensitive reaches. Large boulders within and along the creek channel are very stable preventing morphology changes within this reach.

5.4.1.2 Bankfull Channel Geometry

Bankfull stage is identified in the field in order to determine the associated channel characteristics such as bankfull width, bankfull depth, bankfull width-to-depth ratio, and as input to the entrenchment ratio. The bankfull stage is not readily apparent at some of the steep channel sites that lack a well-defined floodplain surface. In such cases, best professional judgment was used to identify other bankfull indicators such as: break in bank slope, vegetation, changes in sizes of bank materials, water stains or lichen lines on substrate, and scour lines or undercut banks. To improve the consistency of field decisions regarding bankfull indicators, and to provide better records, the specific indicator types and 'quality' ratings were noted for all field observations within each reach. A wide range of indicators and certainty were noted by the observers (Table 5.2), as represented by a few photographs from the field (Figure 5.3).

Table 5-2 Bankfull Indicator Types and Quality* in 2015

Creek	Reach			Type of Ban	kfull Indicator		
		Deposits	Slope Break	Inundation Feature	Exposed Roots / Undercuts	Vegetation Rooting	Lichen/Moss types and change
HVC	Sky Meadows	-	Strong	Moderate Weak	-	Strong Moderate Weak	Strong
HVC	Below Patsy's	-	Strong Weak	-	-	Strong Moderate Weak	-
HVC	Property Line	-	Strong Moderate	-	Strong	Strong Moderate Weak	Strong Moderate
HDVC	Upper Hidden Valley	Strong	Strong Moderate	-	-	Moderate Weak	Moderate Weak
HDVC	Lower Hidden Valley	-	Strong Moderate	Moderate Weak	Strong Moderate	Moderate Weak	Strong
EC	Upper Edgewood	-	Strong Moderate Weak	-	Moderate	Strong Moderate	-
EC	Lower Edgewood	-	Strong Moderate	-	Strong Moderate	Strong Moderate	Strong Moderate
DC	Upper Daggett		Strong Moderate		Moderate	Strong Moderate	Strong Moderate
DC	Lower Daggett	Moderate Weak	Strong Moderate	Moderate		Strong Moderate	

^{*} Each indicator noted by the observers was also assigned one of three quality/certainty ratings: "Strong" "Moderate" or "Weak"

Figure 5-3 Examples of 2015 Bankfull Indicator Types and Quality



Strong Slope Break (Sky Meadows)



Moderate Exposed Roots/Undercut (Upper Edgewood)



Strong/Moderate Lichen/Moss Types (Property Line)



Moderate/Weak Deposits (Lower Daggett)

Bankfull width is the width of the active channel at the bankfull stage elevation. The bankfull widths for each of the monumented cross-sections in the monitoring reaches are reported in Table 5.3.

Bankfull Width Table 5-3

Year		Bankfull Width (m)													
						Н	eavenly V	alley Cree	k						
	Н	VC-1 (Sky	Meadow	s)		Н	VC-2 (Bel	ow Patsy's	s)		ŀ	HVC-3 (F	ropert	y Line	e)
XS	1	2	3	mean	1		2	3	mea	an	1	2		3	mean
@ STA**	34	131	426	-	30	30 537		1300	-		154	892	1	200	
2015	2.4	1.3	2.6	2.1	1.	7	2.1	1.9	1.9	9	2.3	4.3	:	2.5	3.0
						H	lidden Va	lley Creek	*						
		HDV	C-1 (Upper	Hidden Cr	eek)*				H	HDVC	C-2 (Lower	Hidder	Creek	()	
XS	1	1 2 3 mean 1 2 3 mean													
@ STA**	15		478	624			-	247			604	80	00		
2015	2.0		1.8	2.1			2.0	4.5			2.4	3.	5		3.5
							Edgewo	od Creek							
		E	C-1 (Upper	- Edgewoo	d)					EC	C-2 (Lower	Edgew	ood)		
XS	1		2	3		r	mean	1			2	3	}		mean
@ STA**	50		241	540			-	20			105	32	25		-
2015	11.6		10.4	10.2			10.7	4.4			0.6	2.	1		2.4
							Dagget	t Creek							
		DC-	1 (Upper [Daggett Cre	eek)					DC-2	2 (Lower D	Daggett	Creek)		
XS	1		2	3	3 mean 1 2 3 mea							mean			
@ STA**	33		203	622			-	43			140	37	6		-
2015	2.7		2.1	2.1			2.3	1.1			2.4	2.			2.0

^{*}Cross section ID numbers and station profile location vary in prior year field notes. Use caution comparing year-to-year. **Station values are expressed in field measurement units (feet).

The width-to-depth ratio is the ratio of bankfull channel width to the mean bankfull channel depth. This is a common metric used to characterize stream morphology and aquatic habitat. The width-to-depth ratio based on survey data for each of the monumented cross-sections is reported in Table 5.4.

Table 5-4 Bankfull Width/Depth Ratio

Year		Bankfull Width/Mean Depth Ratio												
						Hea	venly V	alley C	reek					
	HV	C-1 (Sk	y Meadov	vs)		HVC	C-2 (Belo	ow Pats	sy's)		Н	VC-3 (Pr	operty	Line)
XS	1	2	3	mean	1		2	3	m	nean	1	2	3	mean
2015	7.1	10.1	18.9	12.0	6.2	2	5.4	7.5		6.4	9.6	28.9	7.3	15.3
						Hic	dden Va	lley Cr	eek					
	ŀ	HDVC-1 (Upper Hidden Creek)* HDVC-2 (Lower Hidden Creek)*												
XS	1		2	3	m	ean	1		2		3		4	mean
2015	5.9	ç	9.2	15.0	1	0.0	16	.6	7.0		20.3	١	J/A	14.6
						Е	dgewoo	od Cree	ek					
Year		Е	EC-1 (Upp	er Edgewoo	od)					E	C-2 (Lowe	r Edgewo	od)	
XS	1		2	3		me	ean		1		2	3		mean
2015	27.0		12.5	9.0		10	6.2	2	25.8		1.1	9.4		12.1
							Dagget	t Creek	(
Year	DC-1 (Upper Daggett Creek) DC-2 (Lower Daggett Creek)													
XS	1		2	3		me	an		1		2	3		mean
2015	4.7		12.7	9.7		9.			4.5		33.0	16.4		21.3

^{*}Cross section ID numbers and station profile location vary in prior year field notes. Use caution comparing year-to-year.

Entrenchment ratio is calculated as the ratio of floodprone width (measured in the field at twice the maximum bankfull depth) to bankfull width. The objective of this measurement is to quantify the degree of lateral channel confinement within the valley floor. The entrenchment ratio calculated for the monumented cross-sections along each survey reach is reported in Table 5.5.

Table 5-5 Entrenchment Ratio

Year				Floodpr	one Wi	idth/Bankfull	Width (Ent	trenchme	nt Ratio)					
						Heavenly V	alley Cree	k						
	H	VC-1 (Sky Meadows	s)		HVC-2 (Beld	ow Patsy's	s)	ŀ	HVC-3 (Pro	perty I	_ine)		
XS	1	2	3	mean	1	2	3	mean	1	2	3	mean		
2015	12.5	2.3	8.9	7.9	4.4 3.3 4.4 5.4 2					2.5	2.0	2.3		
						Hidden Va	lley Creek							
		HDVC-1 (Upper Hidden Creek)* HDVC-2 (Lower Hidden Creek)												
XS	1		2	3		mean	1		2	3		mean		
2015	4.8		9.3	4.9		6.3	1.6		2.1	2.1		1.9		
						Edgewoo	od Creek							
			EC-1 (Upper	Edgewood	d)			Е	C-2 (Lower	Edgewoo	d)			
XS	1		2	3		mean	1		2	3		mean		
2015	3.3		4.9	4.6		4.3	2.4		16.8	3.5		7.6		
						Dagget	t Creek							
			DC-1 (Upper D	aggett Cre	eek)			DC	-2 (Lower [Daggett Cr	eek)			
	1		2	3	3 mean 1 2 3 mean						mean			
2015	11.8		4.6	5.1		7.2	10.9		4.0	3.9		6.3		

^{*}Cross section ID numbers and station profile location vary in prior year field notes. Use caution comparing year-to-year.

5.4.1.3 Cross section geometry

The permanent monitoring cross-sections at each monitoring reach provide survey data to evaluate possible changes in channel geometry. Three monumented cross-sections were established within each of the 10 monitoring reaches. The cross-sections were located in fast water habitats and were oriented perpendicular to flow. At each cross-section, headpins were established along the left and right streambanks (viewed in the downstream direction) and a measuring tape was run horizontally across the channel from the left bank monument to the right bank monument. Elevations were surveyed using an auto-level along the ground surface, including the left and right edge of water surfaces, breaks in slope, apparent location of bankfull stage, and at notable changes in vegetation or substrate. Photographs of each cross-section were taken. Graphs and representative photographs (see Appendix H) of the cross sections provide visual indicators of channel shape and dimension. The calculated channel cross section areas are used to quantitatively compare channel dimensions (see Table 5.6).

Table 5-6 Bankfull Channel Cross Sectional Area

Year				Bankfull	Char	nnel Cross Sec	ctional Are	a (squar	e meters)					
						Heavenly V	alley Cree	k						
	H\	/C-1 (Sk	y Meadows	s)		HVC-2 (Belo	ow Patsy's	s)	ŀ	HVC-3 (Pro	perty	Line)		
XS	1	2	3	mean	1	2	3	mean	1	2	3	mean		
2015	0.8	0.2	0.4		0.5	5 0.8	0.5		0.5	0.7	0.9)		
						Hidden Va	Iley Creek							
		HDVC-1 (Upper Hidden Creek)* HDVC-2 (Lower Hidden Creek)												
XS	1		2	3		mean	1		2	3		mean		
2015	0.7		0.4	0.3			1.2		0.9	0.6				
						Edgewoo	od Creek							
		E	C-1 (Upper	Edgewood	d)			I	EC-2 (Lower	Edgewoo	d)			
XS	1		2	3		mean	1		2	3		mean		
2015	5.0		8.6	11.5			0.8		0.4	0.5				
						Dagget	t Creek							
		DC	C-1 (Upper D	aggett Cre	eek)	•		D	C-2 (Lower [Daggett Cre	eek)			
	1		2	3		mean	1		2	3		mean		
2015	1.6		0.2	0.4			0.1		0.2	0.4				

^{*}Cross section ID numbers and station profile location vary in prior year field notes. Use caution comparing year-to-year.

5.4.1.4 Channel Gradient

The channel gradient surveys measure the water surface slope, if flow is present, and streambed slope at each of the three surveyed cross sections, extending upstream and downstream, and over a minimum of 100 feet of channel length. The average slopes are provided in Table 5.7, as calculated two ways: a simple overall slope using the two furthest upstream and downstream survey points; and, an average from a linear best-fit line using all of the surveyed profile points (listed in parentheses).

Table 5-7 Channel and Water Surface* Slopes

2015					Chann	el Bed	d and	d Water Su	urface Slo	pes, In I	Percent**				
							Н	leavenly V	alley Cree	k					
	Н	IVC-1	(Sky	Meadows	s)		Н	IVC-2 (Belo	ow Patsy's	s)	ŀ	HVC-3 (Pro	perty	Line))
XS	1	2	2	3	mean	1		2	3	mear	1	2	3	}	mean
Bed	1.3 (1.6)	1. (1.		0.5 (0.5)			3.0 3.0 (3.4) (2.5)		4.0 (4.2)		3.0 (3.1)	1.5 (0.8)	12 (9.		
Water*	1.2 (1.4)	1. (1.		0.3 (0.4)			(3.4) (2.4) (4.2) (3.			3.0 (3.0)	2.0 (1.2)	12 (9.			
								Hidden Va	Iley Creek						
		H	HDVC	-1 (Upper	Hidden Cr	eek)*				НЕ	VC-2 (Lowe	r Hidden C	Creek)		
XS	1	1 2 3 mean 1 2 3 mea											mean		
Bed	1.0 (1.4)			1.0 (0.9)	0.6 (0.5)				5.0 8.7 6.6 (3.7) (8.4) (5.8)						
Water*	1.1 (1.3)			1.0 (0.9)	0.6 (0.5)				4.4 (3.6)		8.0 (8.5)	9.6 (5.9)			
								Edgewoo	od Creek						
			EC	:-1 (Upper	Edgewoo	d)					EC-2 (Lower	r Edgewoo	od)		
XS	1			2	3		ı	mean	1		2	3			mean
Bed	19.3 (19.7))		12.5 (12.0)	16.0 (17.5)				7.2 (6.7)		8.6 (7.8)	10.0 (7.6)			
Water*	n/a			n/a	n/a				9.8 (6.4)		8.0 (7.7)	9.6 (7.3)			
								Dagget	t Creek						
			DC-1	(Upper D	aggett Cre	eek)				D	C-2 (Lower [Daggett Cr	eek)		
	1			2	3		mean		1		2	3			mean
Bed	7.3 (8.2)			14.4 14.0)	13.0 (13.3)		6.6 (6.8)		3.3 (3.3)	7.3 (7.6)					
Water*	8.0 (8.0)			14.0 (13.7)	13.0 (13.2)				7.0 (6.7)		3.0 (3.3)	7.0 (7.6)			

^{*} Water surface slope surveyed only if water present at the time of survey.

5.4.1.5 Streambank Stability

Streambank stability is a measure of the vulnerability of streambanks to erosion. Streambank stability was measured along the entire length of a monitoring reach, at 25 equally spaced intervals. These measurements were taken along the left and right banks of each reach. Observations on streambank stability were recorded using a 1, 2, 3 ranking system as follows: 1 = stable, 2 = vulnerable and 3 = unstable. Stable streambanks were identified as having 75% or more cover of living plants and/or other stability components that are not easily eroded (such as binding roots, rocks and logs). Stable banks show no indicator of instability (e.g., erosion). Vulnerable banks have 75% or more cover, but have one or more instability indicators. Unstable banks have less than 75% cover and have instability indicators. Unstable streambanks are often bare, or nearly bare, composed of particle sizes too small or un-cohesive to resist erosion at high flows.

^{**} Values in parenthesis () are from linear best-fit lines (see Appendix for graphs).

The bank stability ratings (combined left and right bank observations) (Table 5.8) indicate that bank stability ranges from 21% stability at EC-1 (Upper Edgewood Creek) to 99% stability at DC-2 (Lower Daggett Creek).

Table 5-8 Percent of Stable Banks

	Heavenly Valley Creek									
Year	HVC-1 (Sky Meadows)	HV (Below)		HVC-3 (Property Line)						
2015	71%	65	%	29%						
		Hidden Va	Valley Creek							
Year	HDVC-1 (Upper Hidden (Creek)	HDVC	-2 (Lower Hidden Creek)						
2015	47%		63%							
		Edgewoo	ood Creek							
Year	EC-1 (Upper Edgewood (Creek)	EC-2 (Lower Edgewood Creek)						
2015	21%			39%						
		Dagget	t Creek							
Year	DC-1 (Upper Daggett C	reek)	DC-2 (Lower Daggett Creek)							
2015	69%		99%							

5.4.2 Goal: Quality Aquatic Habitat

5.4.2.1 Habitat Types

Habitat types were classified along entire monitoring reaches to describe the spatial distribution of fast and slow water habitat units. Fast water (riffles and runs) and slow water (pools) are important core attributes because they are the base stratification of physical habitats that support aquatic life. The habitat types were measured and described by an aquatic ecologist based on stationing established along each survey reach. All of the monitoring reaches are dominated by fast water habitats, with slow water (pool) habitats occupying a relatively low percent of the channel length (Table 5.9).

Table 5-9 Pool (Slow Water) Habitat (% of length)

	Heavenly Valley Creek									
Year	HVC-1 (Sky Meadows)	HV (Below)		HVC-3 (Property Line)						
2015	8	7	7	19						
		Hidden Va	Valley Creek							
Year	HDVC-1 (Upper Hidden (Creek)	HDVC	-2 (Lower Hidden Creek)						
2015	5		12							
		Edgewoo	ood Creek							
Year	EC-1 (Upper Edgewood (Creek)	EC-2 (Lower Edgewood Creek)						
2015	12			11						
		Dagget	t Creek							
Year	DC-1 (Upper Daggett Ci	reek)	DC-2 (Lower Daggett Creek)							
2015	11		13							

5.4.2.2 Pools

The objectives of pool measurements include quantifying the number of pools in each survey reach, determining the range of residual pool depth⁹ within the survey segment, and documenting whether wood is a factor in pool formation (Table 5.10). Residual pool depth was measured to characterize pools because it corrects for possible variability in pool depths that result from differences in the stage at the time of observation. Residual pool depth was determined by identifying the point of zero flow (PZF) elevation on the controlling riffle downstream and then measuring the depth from the bottom of the pool up to the PZF elevation. Pools were identified on the on basis of three key criteria: 1. Flow (slow or no velocity during summer low flows), 2. Morphology (hydraulic control at the pool tail, usually a concave longitudinal profile, and, 3. Dimension (length is greater than the wetted width, depth is greater than non-pools, and the maximum depth is more than twice the pool tail depth). To be considered a pool, it must occupy most of stream width and include the thalweg. Backwater and side water pools were not measured. At each pool the depth at the deepest point was measured along with the pool tail crest depth.

Table 5-10 Pool Numbers, Length (m) and Residual Pool Depth (cm)

Table 5-10	Pool Numbers, Len	gili (ili) aliu Kesiuuai F	ooi beptii (ciii)	
Year	Number of Pools (n)	Number of Pools per 100 ft of channel (n)	Mean Pool Length (m)	Mean Pool Residual depth (cm)
		HV (Sky Me		
2015	3	0.9	3.3	16.7
			C-2 Patsy's)	
2015	10	0.8	3.0	31.2
		HV (Proper	C-3 ty Line)	
2015	24	2.1	2.3	41
		HDVC-1 (Upper	Hidden Creek)	
2015	4	1.2	1.5	19.8
		HDVC-2 (Lower	Hidden Creek)	
2015	15	1.8	2.5	20.8
		EC-1 (Upper Ed	lgewood Creek)	
2015	8	1.5	3.0	32.2
		EC-2 (Lower Ed	lgewood Creek)	
2015	8	2.5	1.6	18.5
		DC-1 (Upper D	Daggett Creek)	
2015	12	1.9	2.0	21.2
		DC-2 (Lower E	Daggett Creek)	
2015	3	1.9	2.4	21.3

5.4.2.3 Particle Size Distribution

Particle size distribution measurements on the streambed surface were conducted at riffle locations along each reach. At each riffle location, measurements were collected from the streambed at randomly spaced transects.

⁹ Residual pool depth is the depth of the pool when adjacent riffle bed is dry.

Ten particles were selected along each transect using the blind touch method and were measured using a gravelometer. The median particle size (D_{50}) and associated dominant pebble class of the 100 particles sampled was determined (Table 5-11). Refer to Appendix H for bed particle distribution graphs at each cross section.

Table 5-11 Median (D50) Particle Diameter Class (mm)

Year				Me	dian I	Parti <u>c</u>	le Size	by Sam	ple and	Typical F	article Size	Class	by Read	ch				
								Hea	venly \	/alley Cre	ek							
		(S	HVC- ky Mea					(1	HVC Below F					HVC- (Property				
XS	1	2	3	4	Тур	ical	1	2	3	4	Typical	1	2	3	4	Typical		
@ STA*	38	100	112	290			185	535	860	1090		152	365	716	1170			
2015	18.5	7.1	24.7	17.5	Gra	arse avel -32)	18.5	27.8	29.7	24.8	Coarse Gravel (16-32)	8.2	27.8	38.1	32.0	Coarse Gravel (16-23)		
								Hi	dden Va	alley Cree	k							
			HDVC-	1 (Uppe	r Hido	den C	reek)				HD\	/C-2 (L	ower Hi	dden Cre	ek)			
XS	1		2	3			4 Typical 1 2 3 4								ТурісаІ			
@ STA*	33		203	366	ć	5	515			80	250	4	87	640				
2015	12.5		10.7	11.	9	12.5		Medi Gra (8-1	vel	36.4	25.4	4	2.5	30.1		rse Gravel (23-32)		
								E	Edgewo	ood Creek								
			EC-1 (l	Jpper E	dgew	ood C	reek)				EC-	2 (Low	er Edge	wood Cre	ek)			
XS	1		2	3			4	Турі	cal	1	2		3	4		ТурісаІ		
@ STA*	24		100	230)	4	170			20	116	2	42	264				
2015	9.3		2.0	13.	8	3	3.2	Fine/ Grad	vel	2.9	4.3	3	3.9	3.9	Fii	ne Gravel (4-8)		
									Dagge	tt Creek								
			DC-1	(Upper	Dagge	ett Cr	eek)				DC	:-2 (Lo\	ver Dag	gett Cree	k)			
XS	1		2	3			4	Турі	cal	1	2		3	4		Typical		
@ STA*	25		205	23	1	2	90			50	153	2	35	370				
2015	20.8		4.4	3.7	,	2.8 Fine Gravel 7.7 8.1 7.6 6.4				Fine	e Gravel (4- 8)							

^{*}Station values are expressed in field measurement units (feet).

5.4.2.4 LWD/Total Wood

Large woody debris (LWD) variables characterize the abundance of woody debris within each reach. The monitoring involved inventorying and counting all LWD that was that was longer than one-half the bankfull width and located within a portion of the bankfull width of the channel. The counts of individual pieces (Table 5.13) and LWD aggregates comprised of at least 4 pieces each (Table 5.14), are presented, along with the number per unit stream length (100 feet). In 2015, the only root wads were four observed on Upper Edgewood Creek, all other LWD was in the form of trunks (logs) lacking intact root wads.

Table 5-12 Large Wood Pieces

Year	Number o	f LWM pied	ces	Number of L	WM piece	es/100 fee	t of channel
			Heavenly V	alley Creek			
	HVC-1 (Sky Meadows)		C-2 Patsy's)		HV((Proper	
2015	29	6.1	144	11.1	34	12	28.5
			Hidden Va	Illey Creek			
	HDVC-1 (Upp	er Hidden	Creek)	HDVC	-2 (Lower	Hidden C	Creek)
2015	96		13.7	207			24.4
			Edgewo	od Creek			
	EC-1 (Upper	Edgewood	Creek)	EC-2 (Lower Ed	gewood (Creek)
2015	170		28.3	153			43.7
			Dagget	t Creek			
	DC-1 (Uppe	Daggett C	reek)	DC-2	(Lower D	aggett Cr	reek)
2015	76		11.7			14.5	

Table 5-13 Large Wood Aggregates

Year	Number of LWM Aggregates (>4 pieces)			Number of Aggregates /100 feet of channel			
	Heavenly Valley Creek						
	HVC-1 (Sky Meadows)		HVC-2 (Below Patsy's)		HVC-3 (Property Line)		
2015	8	1.7	140	10.8	37	70	30.8
	Hidden Valley Creek						
	HDVC-1 (Upper Hidden Creek)			HDVC-2 (Lower Hidden Creek)			
2015	5		0.7	215		25.3	
	Edgewood Creek						
	EC-1 (Upper I	EC-1 (Upper Edgewood Creek)			EC-2 (Lower Edgewood Creek)		
2015	20		3.3	16			4.6
	Daggett Creek						
	DC-1 (Upper Daggett Creek)			DC-2 (Lower Daggett Creek)			
2015	45		6.9	0			0

5.4.2.5 Stream Shading

Stream shading measures the average canopy cover in each monitoring reach. Stream shading was measured at the same 50 equally spaced transects used to assess streambank stability. At each of the 50 transects, stream shading was measured using a Solar Pathfinder. The Solar Pathfinder was oriented to the south at approximately 0.3 meters (m) above the water surface. Looking at the reflection of the sky in the Solar Pathfinder dome along the August sun path, the field crew was able to add up the shaded sections to yield the percent shade for each of the 50 transects. Table 5.15 lists the average percent stream shading for each reach.

Table 5-14 Stream Shading

Year	Mean Percent of Channel Shading (%)					
	Heavenly Valley Creek					
	HVC-1 (Sky Meadows)	HV (Below I		HVC-3 (Property Line)		
2015	24	80		92		
	Hidden Valley Creek					
	HDVC-1 (Upper Hidden Creek)		HDVC-2 (Lower Hidden Creek)			
2015	41		92			
		Edgewood Creek				
	EC-1 (Upper Edgewood)		EC-2 (Lower Edgewood)			
2015	27		94			
	Daggett Creek					
	DC-1 (Upper Daggett Creek)		DC-2 (Lower Daggett Creek)			
2015	80		33			

5.4.2.6 Streambank Angle

Streambank angle measures the dominant angle of the streambank between the bottom of the bank and the bankfull stage. This measure falls under the SCI Standard protocol for low gradient channels (gradient less than 2%) and can influence factors such as shading, vegetation potential and bank stability. Upper Edgewood Creek, Daggett Creek, and Mott Creek channel gradients are all too steep for the protocol, therefore this metric is only applicable for Heavenly Valley Creek at Sky Meadows (HVC-1) and Upper Hidden Creek (HDVC-1). Measurements were collected at the same 50 transects used to assess streambank stability and stream shading. At each transect, each bank was measured for an angle using a clinometer. (Table 5.16).

Table 5-15 Streambank Angle

Year	Mean Streambank Angle (degrees)
	Heavenly Valley Creek*
	HVC-1 (Sky Meadows)
2015	125
	Hidden Valley Creek*
	HDVC-1 (Upper Hidden Creek)
2015	125

5.4.2.7 Streamshore Water Depth

Streamshore water depth is an important indicator of channel morphology and is closely related to other indicators of channel conditions such as bank angle and undercut bank. Streamshore water depth was measured at each of the 50 equally spaced transects along the entire channel reach, on each bank. At each transect and each bank, the water depth was measured at the water's edge. If the bank angle was equal to or less than 90 degrees, the water depth was measured using a measuring tape. If the bank angle was greater than 90 degrees the bank shore depth was recorded as zero. These measurements fall under the SCI Standard protocol and are only made for streams with gradients less than 2 %. Therefore, this metric is only applicable for Heavenly Valley Creek at Sky Meadows (HVC-1) and Upper Hidden Creek (HDVC-1) (Table 5.17).

Table 5-16 Mean Shore Depth (cm)

Year	Heavenly Valley Creek*		
	HVC-1 (Sky Meadows)		
2015	3.8		
	Hidden Valley Creek		
	HDVC-1 (Upper Hidden Creek)		
2015	2.3		

5.4.2.8 Aquatic Fauna

Due to a lack of consistent methods and varied observers from year to year, the aquatic fauna observations are not considered useful or reliable.

5.4.2.9 Bentho-Macro Invertebrate Surveys

BMI stream reach surveys were collected in 2014 and again in 2015. Samples were collected prior to the July 1st collection window due to the lack of winter precipitation and low flows in the creek. The earlier sample date was approved by the Water Board. Laboratory results from the surveys are submitted and scored by the Lahontan Water Board. As discussed in the EIR/EIS/EIS, results are inconclusive. However the Sky Meadow reach along Heavenly Valley Creek suggests an impaired trend occurring. Future surveys of this reach including particle size and stream embeddedness results hope to clarify the invertebrate and stream health trending analysis. Results from the 2015 survey are expected within next month (January) and will be submitted to the Water Board for scoring. The 2014 BMI results have been scored and an internal memorandum with the results continues to suggest that Heavenly Valley Creek is impaired. The memorandums conclusion requests additional bioassessment surveys providing a longer reference period of time and scores for gauging stream health. Additional discussion and trend analysis will be discussed in the comprehensive report next year (January 2017).

5.5 Discussion

Stream condition surveys to evaluate the impacts of Heavenly management practices on riparian system health were completed for Heavenly Valley Creek, Hidden Valley Creek, Edgewood Creek and Daggett Creek. Condition and trend evaluations will be conducted on each of the data elements of the monitoring program both individually and cumulatively to gauge overall watershed condition, trends, and to determine if ski area management activities are improving or degrading water quality and ecological health. These evaluations are completed in 5-year intervals and will be presented in the 2016 Comprehensive Report due January, 2017.

6 Annual Work List

The Annual Work List for the 2016 construction season will be included in the Mitigation and Monitoring Program Annual Report due on May 1st, 2016. The list will include significant maintenance and restoration projects to be completed during the summer construction window in 2016. Included projects will be prioritized based on the annual erosion hot spot assessment as part of the Watershed Maintenance and Restoration Program (WMRP) as well as capital improvement projects, stability, known areas of concern and conductivity to surface water.

7 Deicer and Abrasives Application and Recovery

Application of deicer and abrasives began on November 29th, 2014 during the first quarter of the water year 2015. Application was limited to November and December in the first quarter and there was no application in the month of January due to the lack of precipitation and cold temperatures. Limited application occurred in February March and April with conclusion of application on April 10th. Upon the resort closure, 30,960 lbs of abrasives were collected in and around the California parking lots. Daily and monthly deicer logs, for the fourth quarter, can be found in Appendix D. Table 7-1 provides a year to date balance of deicer application and recovery.

For the water year 2015, approximately 57% of the material applied to the roadways was recovered by Heavenly and their subcontracted vendor for sweeping (vactor truck). The percentage of recovery is not entirely inclusive, since the City of South Lake Tahoe additionally sweeps the roadways leading up to Heavenly Mountain Resort. The City sweeper collects debris, cinders, and sand that Heavenly applies to roadways leading to the resort (Ski Run Blvd., Needle Peak Road, Wildwood Avenue and Saddle Road). In theory, the city's sweeper collection values should be added to the recovery number increasing the percentage of recovery. However, the city also applies deicer to the roadways adjacent the resort and at this time application and recovery is not tracked and accounted for.

Table 7-1 Summary of Deicer Application and Recovery

	• • • • • • • • • • • • • • • • • • • •	
Month/Year	Total Amount of Deicer and Abrasives Applied (lbs.)	Total Amount of Deicer and Abrasives Recovered (lbs.)
October 2014	0	0
November 2014	4,443	0
December 2014	37,666	0
January 2015	0	2,940
February 2015	10,604	0
March 2015	2,323	0
April 2015	4,040	30,960
May 2015	0	0
June 2015	0	0
July 2015	0	0
August 2015	0	0
September 2015	0	0
Totals	59,076 lbs.	33,900 lbs.

Deicer laboratory analysis was performed in the first quarter of 2015 water year (December 2014) and can be found in the Second Quarter Report (May 1st, 2015). New regulations set forth in the Monitoring and Reporting Program (2015-0021) prompted Heavenly to switch from a volcanic cinder/deicer mixture to a 5:1 Washoe Sand deicer mixture for the 2015/2016 winter season. This material was analysed by the laboratory and will be included in the First Quarter Report (February 1st, 2016). Improvements and upgrades to the application fleet of vehicles (dump truck and spreader truck) have allowed Heavenly to switch from the use of cinders to a Washoe Sand deicer mixture that is more favourable with the Water Board. Monitoring results from the 2015/2016 winter months hope to show improved water quality results with regards to chloride levels around the California Base Lodge water quality sites (Vault Outlet 43HVP-2, and Bijou Park Creek 43BPC-4).

8 Snow Condition and Snowmaking Enhancement Monitoring

Pursuant to Environmental Monitoring Program Comprehensive Report for Heavenly Mountain Resort Water Years 2006-2011, submitted on January 17, 2012 and modified in October 2013, Table 8-1 was created in order to summarize the annual water year's total application of huck salt applied at the four recorded sites on the mountain. No additional huck salt was applied during the fourth quarter of the 2015 water year.

Table 8-1 The Location and the Application Amount of Huck Salt (Obtained from the Monthly Monitoring Logs, Water Year 2015)

Month/Year	Top of the Gondola (lbs.)	World Cup Race Course (lbs.)	Terrain Park (lbs.)	Adventure Peak – Tubing Area (lbs.)
October 2014	0	0	0	0
November 2014	0	0	0	0
December 2014	3	0	0	0
January 2015	10	0	18	0
February 2015	3	0	230	0
March 2015	0	50	170	0
April 2015	0	0	0	0
May 2015	0	0	0	0
June 2015	0	0	0	0
July 2015	0	0	0	0
August 2015	0	0	0	0
September 2015	0	0	0	0
Totals	16 lbs.	50 lbs.	418 lbs.	0 lbs.

In addition, snow and ice melt is applied to the upper parking lot walkways providing safer guest access to the main lodge from the parking areas. The 2015 water year marks the first year these application values have been tracked and reported. Moving forward, this additional "deicer" application location and amounts will be recorded and tracked in future reports. Application at the Upper California Main Lodge area is done using a hand spreader or similar. Table 8-2 summarizes the 2015 water year salt application at the Lodge. The last date of application occurred on April 6th, 2015. There was no application of ice melt for either the third or fourth quarter and the total ice melt used for water year 2015 was 544.25 lbs. The fourth quarter monthly applications logs are included in Appendix D.

Table 8-2 Upper California Main Lodge Parking Area Snow and Ice Melt Application Totals (Obtained from the Monthly Monitoring Logs, Water Year 2015)

Month/Year	Snow and Ice Melt (Ibs.)
October 2014	-
November 2014	50
December 2014	230
January 2015	98
February 2015	100
March 2015	50
April 2015	16.25
May 2015	0
June 2015	0
July 2015	0
August 2015	0
September 2015	0
Totals	544.25 lbs.

Table 8-3 summarizes the past five water year salt application totals for each of the five locations. As noted above the 2015 water year marks the first year that the Upper California Parking Lot site was monitored. Salt application usage has decreased over the past two ski seasons. This can be contributed to two things: one, the lack to precipitation and snow fall has decreased deicer usage; and two, additional employee training and application approval is required limiting usage. Additional application records over a longer period of time through varying precipitation years will help to verify the application relationship with water year precipitation (snow fall) totals.

Table 8-3 Annual Huck Salt Application Records (2011-2015).

Water Year	Top of the Gondola	World Cup Race Course	Terrain Park	Adventure Peak – Tubing Area	CA Parking Lot Application ²	Total Salt Usage
2011 Water Year	250 lbs.	900 lbs.	3,360 lbs.	3,400 lbs.	-	7,910 lbs.
2012 Water Year	300 lbs.	800 lbs.	1,962 lbs.	100 lbs.	-	3,162 lbs.
2013 Water Year	450 lbs.	1,680 lbs.	4,160 lbs.	400 lbs.	-	6,690 lbs.
2014 Water Year	80 lbs.	60 lbs.	2,840 lbs.	0 lbs.	-	2,980 lbs.
2015 Water Year ¹	16 lbs.	50 lbs.	418 lbs.	0 lbs.	544 lbs.	1,028 lbs.

¹ The 2015 Water Year marked the first year that deicer/salt application near and around the CA lodge was tracked on a monthly basis. Application is needed to provide safer walkability during the ski season (slip/fall). Application has occurred in the past water years; however the amounts were not recorded.

9 On Mountain Monitoring

Additional on mountain monitoring documentation can be found in Appendices D-G. Appendix D includes the facilities monitoring checklist for the months of July, August and September. Previous monthly facility monitoring checklists (October through June) can be found in past quarterly reports for the water year 2015. Additionally, Appendix D contains the filter vaults maintenance inspection report. Appendix E includes the documentation of the quarterly Erosion Control and Facilities Maintenance Monitoring. The table and associated photos represent the fourth quarter of the 2015 water year (July through September). Past quarterly monitoring logs have been submitted with the quarterly reports. As required by the Monitoring and Reporting Program, Appendix F includes the compliance cover letter, sign in sheet and slide presentation associated with the Facilities Watershed Awareness Training (BMP Breakfast) held annually. The training this year was held on May 28, 2015.

10 References

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Heavenly Mountain Resort Water Year 2015

APPENDIX A RAW WATER QUALITY CONSTITUENTS WATER YEAR 2015



Table A-1:		Heavenly Mour station is locat		_	-	-	_	station 43HVC-1	A, Heavenly \	/alley Creek at S	ky Meadows. This
Date	Time	Discharge (cfs) ⁴	Turbidity (ntu)	Suspended Sediment ² (mg/L)	Total Nitrite/Nitrate (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)	Average Temperature (Deg C)	Precipitation (in)
Lahontan Standards ¹		N/A	N/A	60	N/A	N/A	0.190	0.015	0.15	N/A	N/A
First Quarter WY 2014-2015	•	•		•	•			•			•
Samples not collected at this site of	during the First	Quarter									
Second Quarter WY 2014-2015											
Samples not collected at this site of	during the Seco	nd Quarter									
Third Quarter WY 2014-2015				5							
Samples not collected at this site of	during the Third	Quarter									
Fourth Quarter WY 2014-2015											
7/16/15	14:15	0.215	1.62	1.6	0.067	0.094	0.161	0.019	0.86	13.9	0
8/19/2015 ⁴	14:15	0.079	1.01	2.8	0.035	0.099	0.134	0.018	0.78	14.4	0
9/17/15	13:55	0.028	0.62	2.0	0.015	0.090	0.105	0.018	0.80	6.7	0
	Minimum	0.028	0.620	1.60	0.015	0.090	0.105	0.018	0.78	6.7	<u> </u>
Annual Summary	Maximum	0.215	1.620	2.80	0.067	0.099	0.161	0.019	0.86	14.4	-
	Average	0.107	1.083	2.13	0.039	0.094	0.133	0.018	0.81	11.7	-
90	th Percentile ³	-	-	#NUM!	-	-	_	-	-	-	-

Standards are annual averages for the receiving waters of Trout Creek.

Other 4th quarter discharge recordings are values obtained using the Marsh McBirney flow meter due to the fact that the flume outfall is submerged.

² Standards are for receiving waters of Trout Creek, 90th Percentile.

³ There are not enough numbers in the range to interpolate a value for the 90th percentile.

⁴ 8/19/15 discharge value estimated from flume reading.

Table A-2:		_		_	_	-	_	station 43HVC-2, elevation of 8,00	-	illey Creek below	Patsy's Chair.
Date	Time	Discharge (cfs) ³	Turbidity (ntu)	Suspended Sediment ² (mg/L)	Total Nitrite/Nitrate (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)	Average Temperature (Deg C)	Precipitation (in)
Lahontan Standards ¹		N/A	N/A	60	N/A	N/A	0.190	0.015	0.15	N/A	N/A
First Quarter WY 2014-2015				•				•			
10/14/14	13:20	0.079	0.55	2.00	0.007	0.048	0.055	0.017	1.2	10.0	0
11/19/14	13:10	0.060	0.8	1.0	0.015	0.035	0.050	0.013	1.3	2.2	0.1
12/15/14	12:45	0.015	0.36	1.6	0.01	0.051	0.061	0.014	1.5	-1.7	0.1
Second Quarter WY 2014-2015											
1/12/15	No Sample co	ollected, due to ex	xtremely low flo	ows and ice in th	e stream.					-0.6	0
2/17/15	No Sample co	ollected, due to ex	xtremely low flo	ows and ice in th	e stream.					4.4	0
3/26/15	13:20	0.005	0.60	4.0	0.015	0.073	0.088	0.026	3.2	7.2	0
Third Quarter WY 2014-2015											
4/9/15	13:00	0.042	2.51	2.0	0.252	0.054	0.306	0.020	4.2	0.0	0.2
4/16/15	13:25	0.100	1.40	2.0	0.10	0.123	0.223	0.016	2.7	2.2	0
4/23/15	13:05	0.148	0.73	1.2	0.04	0.106	0.146	0.013	2.4	4.4	0
4/30/15	12:20	0.174	0.84	1.6	0.018	0.107	0.125	0.014	2.0	7.2	0
5/6/15	13:30	0.174	0.75	2.0	0.01	0.059	0.069	0.012	1.8	1.7	0
5/14/15	11:15	0.942	11.8	17.2	0.007	0.305	0.312	0.065	1.1	-0.6	0
5/21/15	11:15	0.626	3.15	6.4	0.025	0.207	0.232	0.025	0.88	2.2	0.3
5/27/15	12:55	0.292	1.46	2.0	0.019	0.149	0.168	0.017	0.99	7.8	0
6/4/15	13:35	0.292	2.33	5.2	0.028	0.168	0.196	0.024	0.95	5.0	0
6/11/15	13:00	0.505	3.08	4.4	0.034	0.148	0.182	0.023	0.95	11.7	0.4
6/18/15	13:45	0.393	1.48	2.4	0.034	0.096	0.130	0.025	0.99	13.3	0
6/25/15	14:15	0.230	1.49	2.8	0.034	0.100	0.134	0.023	1.0	16.1	0
Fourth Quarter WY 2014-2015											
7/16/15	13:30	0.174	1.06	1.6	0.039	0.097	0.136	0.019	1.1	13.9	0
8/19/15	13:30	0.042	1.16	4.4	0.073	0.190	0.263	0.027	1.2	14.4	0
9/17/15	13:25	0.009	1.21	2.00	0.053	0.063	0.116	0.018	1.4	6.7	0
					0.55=		0.5==	0.5.15		. =	_
	Minimum	0.005	0.360	1.00	0.007	0.035	0.050	0.012	0.88	-1.7	-
-	Maximum	0.942	11.800	17.20	0.252	0.305	0.312	0.065	4.20	16.1	-
	Average	0.226	1.935	3.46	0.043	0.115	0.157	0.022	1.62	6.1	-
90	Oth Percentile	-	-	6.40	-	-	-	-	-	-	-

¹ Standards are annual averages for the receiving waters of Trout Creek.

² Standards are for receiving waters of Trout Creek, 90th Percentile.

³Sampling of the Creek during 01/13/14 was frozen, gage reading might be skewed by ice.

Table A-3:		_		_	_	-	_	station 43HVC-3,	-	_	Property Line. This
Date	Time	Discharge (cfs)	Turbidity (ntu)	Suspended Sediment ² (mg/L)	Total Nitrite/Nitrate (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)	Average Temperature (Deg C)	Precipitation (in)
Lahontan Standards ¹		N/A	N/A	60	N/A	N/A	0.190	0.015	0.15	N/A	N/A
First Quarter WY 2014-2015	-				_						
10/14/14	No Sample co	llected, due to e	xtremely low fl	OWS.						10.0	0
11/19/14	No Sample co	llected, due to e	xtremely low fl	OWS.						2.2	0.1
12/15/14	No Sample co	llected, due to e	xtremely low fl	OWS.						-1.7	0.1
Second Quarter WY 2014-2015											
1/12/15	No Sample co	llected, due to e	xtremely low to	o no flows.						-0.6	0
2/17/15	No Sample co	llected, due to e	xtremely low to	o no flows.						4.4	0
3/26/15	No Sample co	llected, due to e	xtremely low to	o no flows.						7.2	0
Third Quarter WY 2014-2015											
4/9/15	No Sample collected, due to extremely low to no flows.									0.0	0.2
4/16/15	No Sample co	Sample collected, due to extremely low to no flows.								2.2	0
4/23/15	No Sample co	llected, due to e	xtremely low to	o no flows.						4.4	0
4/30/15	11:00	0.051	1.11	1.6	0.005	0.207	0.212	0.034	2.0	7.2	0
5/6/15	11:40	0.120	1.65	6.0	0.003	0.161	0.164	0.028	1.9	1.7	0
5/14/15	13:15	1.161	0.69	1.6	0.003	0.071	0.074	0.020	1.3	-0.6	0
5/21/15	11:20	1.119	0.89	2.0	0.004	0.099	0.103	0.017	0.96	2.2	0.3
5/27/15	11:50	0.573	0.34	0.8	0.002	0.070	0.072	0.013	1.0	7.8	0
6/4/15	11:45	0.527	0.28	1.6	0.002	0.086	0.088	0.018	1.0	5.0	0
6/11/15	11:50	0.635	0.31	1.2	0.002	0.091	0.093	0.021	0.96	11.7	0.4
6/18/15	12:10	0.456	0.75	8.0	0.003	0.049	0.052	0.025	1.0	13.3	0
6/25/15	12:15	0.256	0.43	1.6	0.002	0.062	0.064	0.022	ND	16.1	0
Fourth Quarter WY 2014-2015											
7/16/15	11:45	0.048	0.52	2.0	0.003	0.095	0.098	0.020	1.1	13.9	0
8/19/15	No Sample co	llected, due to e	xtremely low to	o no flows.						14.4	0
9/17/15	No Sample co	llected, due to e	xtremely low to	o no flows.						6.7	0
			-								
	Minimum	0.048	0.28	0.80	0.002	0.049	0.052	0.013	0.96	-1.7	-
Annual Summary	Maximum	1.161	1.65	6.00	0.005	0.207	0.212	0.034	2.00	16.1	-
	Average	0.495	0.70	1.92	0.003	0.099	0.102	0.022	1.25	6.1	-
9	0th Percentile	-	-	5.60	-	-	-	-	-	-	-

¹ Standards are annual averages for the receiving waters of Trout Creek.
² Standards are for receiving waters of Trout Creek, 90th Percentile.

Bijou Park Creek - Below California Parking Lot (43BPC-4)

Table A-4:		_		_		_		station 43BPC-4, I	-		ia Parking Lot. This
Date	Time	Discharge (cfs) ²	Turbidity (ntu)	Suspended Sediment ¹ (mg/L)	Total Nitrite/ Nitrate (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride ¹ (mg/L)	Average Temperature (Deg C)	Precipitation (in)
Lahontan Standards ¹		N/A	N/A	60	N/A	N/A	0.15	0.008	3.0	N/A	N/A
First Quarter WY 2014-2015				•	•			•		•	
10/14/14	12:50	0.055	17.5	8.5	0.229	0.136	0.365	0.088	46	10.0	0
11/19/14	12:30	0.054	8.6	6.0	0.253	0.128	0.381	0.058	43	2.2	0.1
12/15/14	12:00	0.063	10.2	5.0	0.210	0.173	0.383	0.058	44	-1.7	0.1
Second Quarter WY 2014-2015											
1/12/15	12:00	0.066	6.98	2.4	0.192	0.226	0.418	0.048	51	-0.6	0
2/17/15	12:00	0.103	7.86	4.0	0.219	0.226	0.445	0.052	51	4.4	0
3/26/15	12:00	0.125	8.17	4.8	0.223	0.217	0.440	0.081	42	7.2	0
Third Quarter WY 2014-2015											
4/9/15	12:15	0.104	9.15	4.4	0.270	0.205	0.475	0.062	57	0.0	0.2
4/16/15	12:30	0.101	9.42	4.4	0.337	0.355	0.692	0.056	46	2.2	0
4/23/15	12:10	0.084	10.5	4.0	0.328	0.367	0.695	0.060	51	4.4	0
4/30/15	12:00	0.093	8.59	4.0	0.319	0.272	0.591	0.053	56	7.2	0
5/6/15	12:40	0.100	11.4	4.8	0.340	0.275	0.615	0.061	58	1.7	0
5/14/15	11:45	0.099	8.43	3.2	0.352	0.227	0.579	0.049	48	-0.6	0
5/21/15	12:45	0.655	66.3	70.1	0.258	0.726	0.984	0.237	22	2.2	0.3
5/27/15	13:25	0.091	6.47	3.6	0.366	0.242	0.608	0.048	47	7.8	0
6/4/15	12:50	0.095	10.7	5.2	0.314	0.282	0.596	0.063	46	5.0	0
6/11/15	12:30	0.083	7.59	7.6	0.307	0.252	0.559	0.070	47	11.7	0.4
6/18/15	12:55	0.073	9.84	3.2	0.328	0.237	0.565	0.063	44	13.3	0
6/25/15	13:35	0.084	7.44	4.0	0.264	0.264	0.528	0.065	44	16.1	0
Fourth Quarter WY 2014-2015											
7/16/15	12:30	0.071	17.4	8.0	0.240	0.284	0.524	0.091	44	13.9	0
8/19/15	12:40	0.054	10.3	4.8	0.241	0.252	0.493	0.056	40	14.4	0
9/17/15	12:35	0.046	8.26	4.4	0.233	0.197	0.430	0.058	37	6.7	0
	Min	0.046	6.47	2.40	0.192	0.128	0.365	0.048	22.0	-1.7	-
Annual Summary	Max	0.655	66.30	70.10	0.366	0.726	0.984	0.237	58.0	16.1	-
	Average	0.109	12.43	7.92	0.277	0.264	0.541	0.070	45.9	6.1	-

ND=Non-detect

¹Standards are for receiving water objectives from the Lahontan Basin Plan expressed as an annual average.

²Sampling of the Creek on 01/13/14 the flow measurement may be skewed due to a missing piece of the equipment.

Table A-5:		Heavenly Mour station is locat		•	•	•			, Hidden Vall	ey Creek baselin	e station. This
Date	Time	Discharge (cfs)	Turbidity (ntu)	Suspended Sediment (mg/L)	Total Nitrite/Nitrate (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)	Average Temperature (Deg C)	Precipitation (in)
Lahontan Standards ¹		N/A	N/A	60	N/A	N/A	0.19	0.015	0.15	N/A	N/A
First Quarter WY 2014-2015		•		•	•			•	•		•
10/14/14	10:50	0.204	4.25	13.0	0.004	0.221	0.225	0.048	0.38	10.0	0
11/19/14	11:10	0.245	0.95	1.0	0.007	0.048	0.055	0.021	0.27	2.2	0.1
12/15/14	10:30	0.217	1.94	5.0	0.009	0.100	0.109	0.028	0.30	-1.7	0.1
Second Quarter WY 2014-2015	•	-	-	<u>-</u>	-	•		•	•	-	•
1/12/15	10:30	0.263	0.49	0.8	0.014	0.056	0.070	0.019	0.27	-0.6	0
2/17/15	10:30	0.325	0.76	2.4	0.013	0.121	0.134	0.023	0.25	4.4	0
3/26/15	10:30	0.302	0.28	0.80	0.008	0.092	0.100	0.018	0.26	7.2	0
Third Quarter WY 2014-2015											
4/9/15	10:30	0.245	0.57	2.4	0.010	0.067	0.077	0.020	0.31	0.0	0.2
4/16/15	10:45	0.234	0.65	1.6	0.009	0.127	0.136	0.022	0.38	2.2	0
4/23/15	10:30	0.364	2.23	2.8	0.007	0.157	0.164	0.023	0.30	4.4	0
4/30/15	10:30	0.526	0.54	2.0	0.007	0.104	0.111	0.021	0.32	7.2	0
5/6/15	10:35	0.555	1.45	2.8	0.006	0.070	0.076	0.019	0.29	1.7	0
5/14/15	14:30	0.906	0.44	2.8	0.005	0.070	0.075	0.020	0.20	-0.6	0
5/21/15	10:30	0.795	0.40	2.8	0.005	0.130	0.135	0.020	0.19	2.2	0.3
5/27/15	10:45	1.298	1.05	2.8	0.004	0.124	0.128	0.022	0.19	7.8	0
6/4/15	10:45	1.980	1.49	4.8	0.004	0.143	0.147	0.027	0.16	5.0	0
6/11/15	10:40	1.986	2.86	6.0	0.006	0.165	0.171	0.035	0.17	11.7	0.4
6/18/15	11:00	1.174	0.74	2.0	0.006	0.093	0.099	0.029	0.15	13.3	0
6/25/15	11:10	1.022	0.49	2.0	0.006	0.088	0.094	0.028	0.15	16.1	0
Fourth Quarter WY 2014-2015											
7/16/15	10:40	0.648	0.85	1.6	0.010	0.092	0.102	0.022	0.16	13.9	0
8/19/15	10:50	0.328	0.70	3.2	0.023	0.094	0.117	0.025	0.20	14.4	0
9/17/15	11:00	0.225	2.07	2.8	0.014	0.080	0.094	0.026	0.22	6.7	0
	Minimum	0.204	0.28	0.80	0.004	0.048	0.055	0.018	0.15	-1.7	-
Annual Summary	Maximum	1.986	4.25	13.00	0.023	0.221	0.225	0.048	0.38	16.1	-
	Average	0.659	1.20	3.11	0.008	0.107	0.115	0.025	0.24	6.1	-
90	th Percentile		-	5.80	-	-	-	-	-	-	-

ND=Non-detect

¹ Standards are annual averages for the receiving waters of Trout Creek. For Suspended Sediment, standards are for streams tributary to Lake Tahoe. Suspended Sediment concentrations shall not exceed a 90th percentile value of 60 mg/L.

Tabl	e A-6:		ntain Resort water e learn-to-ski cente		_		from station	43HVE-1, Ed	lgewood Creek al	bove Boulder I	Parking Lot. Thi	s station is locat	ed in Edgewood
Date	Time	Discharge (cfs)	Specific Conductivity (mmhos)	Turbidity (ntu)	Suspended Sediment (mg/L)	Total Nitrite/Nitrate (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Soluble Reactive P (mg/L)	Dissolved P (mg/L)	Average Temperature (Deg C)	Precipitation (in)
NDEP Stand	dards ¹	N/A	N/A	10	25.00	N/A	N/A	0.6 ²	0.1	N/A	N/A	N/A	N/A
First Quarte	r WY 2014-20	15			=				3	-	-		=
10/14/14	No measurer	nent due to com	pletely dry stream									10.0	0
11/19/14	No measurer	nent due to com	pletely dry stream									2.2	0.1
12/15/14	No measurer	nent due to com	pletely dry stream/re	esort activities (snow making an	d grooming)						-1.7	0.1
Second Qua	arter WY 2014	-2015							=	-			-
1/12/15	No measurer	nent due to com	pletely dry stream/re	esort activities (snow making an	d grooming)						-0.6	0
2/17/15	No measurer	nent due to com	pletely dry stream/re	esort activities (snow making an	d grooming)						4.4	0
			pletely dry stream/re	esort activities (snow making an	d grooming)						7.2	0
Third Quarte	er WY 2014-2	015											
4/9/15	13:50	0.010	51.9	1.82	7.6	0.003	0.054	0.057	0.059	0.012	0.024	0.0	0.2
			extremely low to no									2.2	0
			extremely low to no									4.4	0
4/30/15	•		extremely low to no									7.2	0
	•		extremely low to no									1.7	0
5/14/15	10:00	0.001	40.4	0.92	6.4	0.003	0.274	0.277	0.044	0.009	0.019	-0.6	0
5/21/15	13:50	0.012	63.9	1.59	4.8	0.002	0.186	0.188	0.038	0.009	0.019	2.2	0.3
5/27/15	•		extremely low to no									7.8	0
6/4/15	14:40	0.005	72.4	0.77	2.4	0.002	0.181	0.183	0.028	0.009	0.022	5.0	0
6/11/15			extremely low to no									11.7	0.4
	•		extremely low to no									13.3	0
			extremely low to no	flows.								16.1	0
	rter WY 2014-			-		•			T	•			_
			extremely low to no									13.9	0
			extremely low to no									14.4	0
9/17/15	No Sample c	ollected, due to	extremely low to no	tlows.								6.7	0
	I see		40.40	0.77	0.40	0.000	0.054	0.057	0.000	0.000		4 70	1
Annual	Minimum	0.001	40.40	0.77	2.40	0.002	0.054	0.057	0.028	0.009	0.019	-1.70	-
Summary	Maximum	0.012	72.40	1.82	7.60	0.003	0.274	0.277	0.059	0.012	0.024	16.10	-
	Average	0.007	57.15	1.28	5.30	0.003	0.174	0.176	0.042	0.010	0.021	6.07	-

¹NDEP Standards are from the Nevada Administrative Code (NAC) Chapter 445A.1915. All listed numbers are standards for single values no greater than a given parameter unless otherwise noted.

²Annual Average

Tabl	le A-7:	Heavenly Mountain the parking lot, und				•	n station 43H	IVE-2, Edgewo	ood Creek below	Boulder Park	ing Lot This s	tation is located	1/4 mile below
Date	Time	Discharge (cfs) ³	Specific Conductivity (mmhos)	Turbidity (ntu)	Suspended Sediment (mg/L)	Total Nitrite/Nitrate (mg/L)	Total Kjeldahl N (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Soluble Reactive P (mg/L)	Dissolved P (mg/L)	Average Temperature (Deg C)	Precipitation (in)
NDEP Standa	ards ¹	N/A	N/A	10.0	25.0	N/A	N/A	0.6 ²	0.1	N/A	N/A	N/A	N/A
First Quarter	WY 2014-201	5											
10/14/14	14:10	0.019	153.6	1.25	2.0	0.004	0.095	0.099	0.025	0.002	0.018	10.0	0
11/19/14	14:30	0.031	153.5	1.5	4.0	0.041	0.136	0.177	0.026	0.003	0.017	2.2	0.1
12/15/14	14:10	0.027	144.3	1.55	2.8	0.062	0.139	0.201	0.019	0.004	0.015	-1.7	0.1
Second Quar	rter WY 2014-2	2015											
1/12/15	15:00	0.034	136.1	0.98	1.20	0.07	0.088	0.158	0.017	0.003	0.015	-0.6	0
2/17/15	14:20	0.015	138.0	2.60	2.0	0.066	0.136	0.202	0.018	0.005	0.014	4.4	0
3/26/15	14:20	0.047	145.0	0.82	1.20	0.066	0.104	0.17	0.016	0.004	0.012	7.2	0
Third Quarte	r WY 2014-201	5		•	•	•			•				•
4/9/15	14:00	0.018	144.4	1.42	2.0	0.07	0.12	0.190	0.022	0.004	0.016	0.0	0.2
4/16/15	14:30	0.033	145.2	1.77	2.4	0.072	0.176	0.248	0.018	0.004	0.012	2.2	0
4/23/15	14:00	0.021	144.8	1.16	2.0	0.051	0.166	0.217	0.018	0.004	0.013	4.4	0
4/30/15	12:20	0.038	145.0	1.18	3.2	0.064	0.136	0.20	0.029	0.005	0.014	7.2	0
5/6/15	10:35	0.037	145.0	0.98	1.6	0.054	0.102	0.156	0.017	0.005	0.013	1.7	0
5/14/15	10:30	0.033	143.7	1.24	1.2	0.062	0.113	0.175	0.018	0.004	0.015	-0.6	0
5/21/15	14:10	0.033	139.8	1.71	2.0	0.061	0.128	0.189	0.017	0.004	0.013	2.2	0.3
5/27/15	14:45	0.049	140.8	2.96	2.0	0.054	0.164	0.218	0.025	0.010	0.018	7.8	0
6/4/15	14:55	0.035	143.6	2.33	2.8	0.061	0.153	0.214	0.020	0.005	0.015	5.0	0
6/11/15	13:55	0.026	145.3	1.96	2.8	0.061	0.141	0.202	0.034	0.005	0.030	11.7	0.4
6/18/15	15:00	0.010	142.7	2.30	4.0	0.058	0.149	0.207	0.033	0.006	0.028	13.3	0
6/25/15	15:15	0.009	139.4	10.9	18.0	0.064	0.408	0.472	0.068	0.006	0.028	16.1	0
Fourth Quart	ter WY 2014-20)15											
7/16/15	15:15	0.009	138.2	1.20	1.6	0.059	0.093	0.152	0.021	0.006	0.018	13.9	0
8/19/15	15:05	0.009	134.9	11.6	17.2	0.031	0.383	0.414	0.051	0.006	0.017	14.4	0
9/17/15	15:35	0.014	134.7	0.57	2.8	0.023	0.081	0.104	0.018	0.005	0.016	6.7	0
		_		_		-	<u> </u>						_
	Minimum	0.009	134.70	0.57	1.200	0.004	0.081	0.099	0.016	0.002	0.012	-1.7	-
Annual	Maximum	0.049	153.60	11.60	18.000	0.072	0.408	0.472	0.068	0.010	0.030	16.1	-
Summary	Average	0.026	142.76	2.48	3.752	0.055	0.153	0.208	0.025	0.005	0.017	6.1	-

¹NDEP Standards are from the Nevada Administrative Code (NAC) Chapter 445A.1915. All listed numbers are standards for single values no greater than a given parameter unless otherwise noted.

²Annual Average



Specializing in Soil, Hazardous Waste and Water Analysis

7/20/2015

Cardno Entrix, Inc.

OrderID:

1507466

PO Box 1533

Zephyr Cove, NV 89448 Attn: Chris Donley

Dear: Chris Donley

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 7/17/2015. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith QA Manager

Las Vegas, Nevada 89102 tel (702) 475-8899 fax (702) 622-2868 EPA LAB ID: NV00932

Western Environmental Testing Laboratory Report Comments

Cardno Entrix, Inc. - 1507466

Specific Report Comments

None

Report Legend

В	Blank contamination; Analyte detected above the method reporting limit in an associated blank.
D	Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	Sample analyzed beyond the accepted holding time.
J	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
M	The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	Not calculated due to matrix interference or very high sample concentration.
QD	The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS

surrogate recovery was within acceptance limits.

SC -- Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered.

-- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit.

General Lab Comments

U

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:

A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Western Environmental Testing Laboratory Analytical Report

Cardno Entrix, Inc. **Date Printed:** 7/20/2015 PO Box 1533 OrderID: 1507466

Zephyr Cove, NV 89448 **Attn:** Chris Donley

Chloride

Chloride

Chloride

Phone: (775) 588-9069 (775) 588-9219 Fax:

Customer Sample ID: 20150716 43 HDVC-5 Hidden Collect Date/Time: 7/16/2015 10:40

WETLAB Sample ID: 1507466-001 **Receive Date:** 7/17/2015 08:20

Analyte Method Results Units DF RL Analyzed LabID **Anions by Ion Chromatography**

mg/L

mg/L

mg/L

Customer Sample ID: 20150716 43 HVC-3 Property Collect Date/Time: 7/16/2015 11:45

EPA 300.0

EPA 300.0

EPA 300.0

WETLAB Sample ID: 1507466-002 Receive Date: 7/17/2015 08:20

0.16

Analyte Method Results Units DF RL Analyzed LabID Anions by Ion Chromatography

Customer Sample ID: 20150716 43 BPC-4 Bijou Collect Date/Time: 7/16/2015 12:30

1.1

WETLAB Sample ID: 1507466-003 Receive Date: 7/17/2015 08:20

Analyte Method Results Units DF RL Analyzed LabID Anions by Ion Chromatography

44 **Customer Sample ID:** 20150716 43 HVC-2 Patsy's Collect Date/Time: 7/16/2015 13:30

WETLAB Sample ID: 1507466-004 Receive Date: 7/17/2015 08:20

Analyte Method Results Units DF RL Analyzed LabID

Chloride EPA 300.0 1.1 mg/L0.10 7/17/2015 NV00925

Customer Sample ID: 20150716 43 HVC-1A Sky Meadow Collect Date/Time: 7/16/2015 14:15

WETLAB Sample ID: 1507466-005 Receive Date: 7/17/2015 08:20

Method Results Units DF RL LabID Analyte Analyzed Anions by Ion Chromatography Chloride EPA 300.0 0.86 0.10 7/17/2015 NV00925 mg/L 1

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Page 3 of 4

Anions by Ion Chromatography

0.10

0.10

0.10

7/17/2015

7/17/2015

7/17/2015

NV00925

NV00925

NV00925

Western Environmental Testing Laboratory QC Report

QCBatchID QCType	Parameter	Method	l	Result	Units						
QC15070749 Blank 1	Chloride	EPA 30	0.0	ND	mg/L						
QCBatchID QCType	Parameter	Method	l	Result	Actual	% Rec	covery	Units	5		
QC15070749 LCS 1	Chloride	EPA 30	0.0	10.4	10.0	104		mg/	L		
QCBatchID QCType	Parameter	Method	Spike Sample	Sample Result	MS Result	MSD Result	Spike Value	Units	MS % Rec.	MSD % Rec.	RPD
QC15070749 MS 1	Chloride	EPA 300.0	1507466-001	0.164	5.83	5.93	5.00	mg/L	113	115	2%

	WETLAB WESTERN ENVIRONMENTAL TESTING LABORATORY Specializing in Soil, Hazardous Waste and Wa
	475 E. Greg Street #119 Sparks, Nevada 89431 www.WETLaboratory
	tel (775) 355-0202 fax (775) 355-0817 1084
	tel (775) 777-9933 fax (775) 777-9933
	3230 Polaris Ave., Suite 4 Las Vegas, Nevada 89102 tel (702) 475-8899 fax (702) 776-6152
Client (CARDNO
	295 HWY 50 Suite 1
	e & Zip Zephyr Cove NV 89443

	WETLAB Order ID. 1507466
ter Analysis.	Sparks Control #
com	Elko Control #
	LV Control #
	Report 7/31/15

City, State & Zip Zephyr Cove NV 89443 48 Hour (100%) 24 Hour (100%) Samples Collected From Which State? Report Results Via
Address 295 HWY 50 Suite City. State & Zip Zephyr Cove NV 89443 City. State & Zip Zephyr Cove NV 89443 Contact Chris Donley Phone 775 588 9069 Collector's Name PO. Number Email Chris. Conley@Cardno.com Billing Address (if different than Client Address) City. State & Zip Company Address City. State & Zip Company Address City. State & Zip Contact Phone Fax Samples Collected From Which State? Possible Vision Report Results Via No. Report Regulatory Agency? Standard OC Results Via Analyses Requested Analyses Requested Analyses Requested Analyses Requested Analyses Requested Fax Fax Fax Fax Fax Fax Fax Fa
City. State & Zip Zephyr Cove NV 89443 48 Hour (100%) 24 Hour (100%) Samples Collected From Which State? Report Results Via
Contact Chris Donley Phone 775 588 9069 Collector's Name PWS/Project Name PWS/Project Name PWS/Project Number Email Chris. Conley @ Cardno. Com Billing Address (if different than Client Address) Company Address City, State&Zip Contact Phone Fax Email SAMPLE ID/LOCATION DATE TIME Email SAMPLE ID/LOCATION DATE TIME
Phone 775 588 9069 Collector's Name PWS/Project Name PWS/Project Number Email Chris. Con ley @ cardno. com Billing Address (if different than Client Address) Company Address City, State & Zip Contact Phone Fax Email SAMPLE ID/LOCATION DATE TIME Email SAMPLE ID/LOCATION SAMPLE ID/LOCATION A DATE TIME Email SAMPLE ID/LOCATION A DATE TIME T
Pax
Report to Regulatory Agency? Standard QC Required? Yes No. Yes No.
P.O. Number PWS/Project Number PWS/Project Num
Billing Address (if different than Client Address)
Billing Address (if different than Client Address)
Company
City, State & Zip
Contact
Phone
SAMPLE ID/LOCATION DATE TIME # \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$ \$
SAMPLE ID/LOCATION DATE TIME & R S SPI. No. 20150716 43 HDVC-5 HIDDEN 7/16 10:40 5W 1 X 1 20150716 43 HVC-3 Property 7/16 11:45 5W 1 X 2 20150716 43 BPC-4 Bija 7/16 12:30 SW 1 X 3 20150716 43 HVC-2 PATSY'S 7/16 1:30 SW 1 X 4
20150716 43 HDVC-5 HIDDEN 7/16 10:405W1X 1 20150716 43 HVC-3 Property 7/16 11:455W1X 2 20150716 43 BPC-4 Bijo 7/16 12:305W1X 3 20150716 43 HVC-2 PATSY's 7/16 1:305W1X
20150716 43 HVC-3 Property 7/16 11:45 SW 1 X 2 20150716 43 BPC-4 Bijo 7/16 12:30 SW 1 X 3 20150716 43 HVC-2 PATSY's 7/16 1:30 SW 1 X 4
20150716 43 BPC-4 Bija 7/16 12:30 SW 1 X 3 20150716 43 HVC-2 PATSY's 7/16 1:30 SW 1 X 4
20150716 43 HVC-Z PATSY'S 7/16 1:30 SW) X
20150716 43 HVC-Z PATSY'S 7/16 1:30 SW) X
1507 1
Instructions/Comments/Special Requirements:
Sample Matrix/ Type Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:
SAMPLE RECEIPT
Temp Custody Seal # of Containers DATE TIME Samples Relinquished By Samples Received By
8.8°C Y N (None) 5 7/17/15 0820 X JULY / MUNA Seull
°C Y N None
°C Y N None
∘ _C Y N None

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636).

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted.

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.



Specializing in Soil, Hazardous Waste and Water Analysis

8/25/2015

Cardno

OrderID:

1508509

PO Box 1533

Zephyr Cove, NV 89448 Chris Donley Attn:

Dear: Chris Donley

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 8/20/2015. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith QA Manager

3230 Polaris Ave. Suite 4 Las Vegas, Nevada 89102 tel (702) 475-8899 fax (702) 622-2868 EPA LAB ID: NV00932

Western Environmental Testing Laboratory Report Comments

Cardno - 1508509

Specific Report Comments

Report Legend

В	 Blank contamination; Analyte detected above the method reporting limit in an associated blank.
D	 Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	 Sample analyzed beyond the accepted holding time.
J	 The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
M	 The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	 There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	 Not calculated due to matrix interference or very high sample concentration.
QD	 The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	 The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

surrogate recovery was within acceptance limits. SC -- Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered. U

-- Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS

-- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit.

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:

A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Western Environmental Testing Laboratory Analytical Report

Cardno **Date Printed:** 8/25/2015 PO Box 1533 OrderID: 1508509

Zephyr Cove, NV 89448 **Attn:** Chris Donley

Phone: (775) 588-9069 Fax: (775) 588-9219

Customer Sample ID: 20150819 43HDVC-5 Collect Date/Time: 8/19/2015 10:50

WETLAB Sample ID: 1508509-001 Receive Date: 8/20/2015 08:09

Method Units Analyte Results DF RL Analyzed LabID

Anions by Ion Chromatography

Chloride EPA 300.0 0.20 0.10 8/20/2015 NV00925 mg/L

20150819 43-BPC-4 Collect Date/Time: 8/19/2015 12:40 **Customer Sample ID:**

WETLAB Sample ID: 1508509-002 Receive Date: 8/20/2015 08:09

Analyte Method Results Units DF RL Analyzed LabID

Anions by Ion Chromatography

EPA 300.0 Chloride 40 NV00925 mg/L 0.10 8/20/2015

Customer Sample ID: 20150819 43HVC-2 Collect Date/Time: 8/19/2015 13:30

WETLAB Sample ID: 1508509-003 Receive Date: 8/20/2015 08:09

Analyte Method Results Units DF RLAnalyzed LabID Anions by Ion Chromatography

mg/L

0.10

8/20/2015

NV00925

Chloride

1.2 **Customer Sample ID:** 20150819 43HVC-1A Collect Date/Time: 8/19/2015 14:15

EPA 300.0

WETLAB Sample ID: 1508509-004 Receive Date: 8/20/2015 08:09

Analyte Method Results Units DF RL Analyzed LabID

Anions by Ion Chromatography

Chloride EPA 300.0 0.78 0.10 8/20/2015 NV00925 mg/L 1

LAS VEGAS

Western Environmental Testing Laboratory QC Report

QCBatchID QC	Туре	Parameter	Method	l	Result	Units	Units					
QC15080911 BI	lank 1	Chloride	EPA 30	0.0	ND	mg/L						
QCBatchID QC	Туре	Parameter	Method	l	Result	Actual	% Rec	covery	Units	5		
QC15080911 L0	CS 1	Chloride	EPA 30	0.0	10.2	10.0	102		mg/l	L		
QCBatchID QC	Type Pa	arameter	Method	Spike Sample	Sample Result	MS Result	MSD Result	Spike Value	Units	MS % Rec.	MSD % Rec.	RPD
QC15080911 M	1S 1 C	hloride	EPA 300.0	1508519-002	2 0.244	1.54	1.55	1.25	mg/L	104	104	1%

							_					_	
A WETLAR							WETLA	B Order	ID.	308	50°	1	
WESTERN ENVIRONMENTAL							Sparks Control #						
TESTING LABORATORY Specializing in Soil, Hazardous Waste and Water Analy						ysis.	Sis. Elko Control #						
475 E. Greg Street #119 I Sparks, Nevada 89431 I www.WETLaboratory.com tel (775) 355-0202 I fax (775) 355-0817							LV Control #						
1084 Lamoille Highway I Elko, Nevada 89801 tel (775) 777-9933 I fax (775) 777-9933							Report Due Date 09-03-15						
3230 Polaris Ave., Suite 4 Las V tel (702) 475-8899 fax (7		02					Page _	1 01	1		, ,		
Client (ARDNO							Turn	around Tim	e Require	ements			
	Suite	#1				5 Day*	St (25%)	andard	- 4	50%)			
City, State & Zip Zephyr Co			149				* (100%)		A Hour'	200%)		=	
contact Chris Donley							ples Collected Which State	From			sults Via		
Phone 775-588-9269	Collector's Name						VCA_		(PDI		EDD		
Fax	PWS/Project Nar	ne					npliance Moni	toring? No	Other_				
P.O. Number	PWS/Project Nur					Report	to Regulatory	Agency?	Star Yes		Required*	?	
	carduc			s	NO.	l le		alyses F	1725		140		
Billing Address (if different			-	A	OF				III		TT	\neg	
Company				M	C		$I \mid I \mid I$				11		
Address				P	N	11						/1	
City, State & Zip				E	T		11						
Contact					A	1.8							
PhoneF				T	N N	13		1 1		1 1	1	11	
Email				Y	E	0		1 1		1 1			
SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE	E	R	8						Spl.	
20150819 43 HDVC -S	8/19	10:50	*	**	S	X			11			No.	
20150819 43BPC -4	8/19	12:40	1	SW		\nearrow							
20150819 43 HVC-2	8/19	1:30	1	SW	1							- 1	
20150819 43 HVC - 1A	8/19	2'15	1	SW	1				+	+	+		
21300/1 13111C 1/1	0/17	612	-	700		1	+++		+	+	-		
				1						-			
				+									
				-		-			100		1	-	
									150	0.0	, -		
									150	9	4 1	_	
Instructions/Comments/Special Requirements:									VV				
Sample Matrix Key** DW = Drinking Water WW = V	Vastewater SW = Surface	ce Water MW	= Monitorin	g Well S	SD = So	olid/Sludge	SO = Soil H	N = Hazard	ous Waste	OTHER	t:		
*SAMPLE PRESERVATIVES: 1=Unpres	served 2=H2SO4	3=NaOH	4=HC	5=H	NO3	6=Na2	S2O3 7=2	ZnOAc+l	NaOH	8=HC	I/VOA V	'ial	
Temp Custody Seal # of Containers E	DATE TIME	San	nples R	elinq	uishe	ed By		Sampl	es Re	ceived	Ву		
10.1°C Y N (None) 4 8/20/15 8:09am 200				A			1	100	5	2			
°C Y N None								-					
°C Y N None													
°C Y N None													
WETLAB'S Standard Terms and Con-	ditions apply un	less writt	en agr	eeme	nts s	pecify	otherwise	. Paym	ent ter	ms ar	e Net 3	0.	

Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636). initial

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, included the correspondence of action or legal theory pled or asserted.

unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. ______ initial WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. 30 Please contact your Project Manager for details. ______ initial

1509514



Specializing in Soil, Hazardous Waste and Water Analysis

OrderID:

9/29/2015

Cardno

PO Box 1533

Zephyr Cove, NV 89448 Chris Donley Attn:

Dear: Chris Donley

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 9/18/2015. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith QA Manager

Western Environmental Testing Laboratory Report Comments

Cardno - 1509514

Specific Report Comments

None

Report Legend

В	 Blank contamination; Analyte detected above the method reporting limit in an associated blank.
D	 Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	 Sample analyzed beyond the EPA recommended holding time.
J	 The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
M	 The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	 There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	 Not calculated due to matrix interference or very high sample concentration.
QD	 The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	 The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	 Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS

- surrogate recovery was within acceptance limits.

 SC -- Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered.
- U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit.

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:

A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

Western Environmental Testing Laboratory Analytical Report

Cardno **Date Printed:** 9/29/2015 PO Box 1533 OrderID: 1509514

Zephyr Cove, NV 89448 **Attn:** Chris Donley

Analyte

Phone: (775) 588-9069 Fax: (775) 588-9219

Method

Customer Sample ID: 20150917 43HDVC-5 Hidden Collect Date/Time: 9/17/2015 11:00

WETLAB Sample ID: 1509514-001 Receive Date: 9/18/2015 08:09

Results

Anions by Ion Chromatography

Chloride EPA 300.0 0.22 0.10 9/22/2015 NV00925 mg/L

Units

DF

RL

Analyzed

LabID

Collect Date/Time: 9/17/2015 12:35 **Customer Sample ID:** 20150917 43BPC-4 Bijou

WETLAB Sample ID: 1509514-002 Receive Date: 9/18/2015 08:09

Analyte Method Results Units DF RL Analyzed LabID

Anions by Ion Chromatography

Chloride 37 EPA 300.0 mg/L 0.10 9/22/2015 NV00925

Customer Sample ID: 20150917 43HVC-2 Patsy's Collect Date/Time: 9/17/2015 13:25

WETLAB Sample ID: 1509514-003 Receive Date: 9/18/2015 08:09

Analyte Method Results Units DF RLAnalyzed LabID

Anions by Ion Chromatography

Chloride EPA 300.0 1.4 mg/L 0.10 9/22/2015 NV00925

Customer Sample ID: 20150917 43HVC-1A Sky Meadows Collect Date/Time: 9/17/2015 13:55

WETLAB Sample ID: 1509514-004 Receive Date: 9/18/2015 08:09

Analyte Method Results Units DF RL Analyzed LabID Anions by Ion Chromatography Chloride EPA 300.0 0.80 0.10 9/22/2015 NV00925 mg/L 1

Elko, Nevada 89801

tel (775) 777-9933 fax (775) 777-9933

LAS VEGAS

Western Environmental Testing Laboratory QC Report

QCBatchID	QCType	Parameter	Metho	d	Result	Units						
QC15090833	Blank 1	Chloride	EPA 30	0.00	ND	mg/L						
QCBatchID	QCType	Parameter	Metho	d	Result	Actual	% Re	covery	Unit	s		
QC15090833	LCS 1	Chloride	EPA 30	0.00	10.0	10.0	100		mg/	L		
QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result	MS Result	MSD Result	Spike Value	Units	MS % Rec.	MSD % Rec.	RPD
QC15090833	MS 1	Chloride	EPA 300.0	1509514-004	4 0.803	2.15	2.15	1.25	mg/L	108	108	<1%

							_				
WETLAB WESTERN ENVIRONMENTAL							70.00	B Order I			518
TESTING LABORATORY Special 475 E. Greg Street #119 Spar	lizing in Soil, Hazar					ysis.					
tel (775) 355-0202 I fax (775) 355-0817	1 00000.002	Laburau	ury.cu	ui.			rol #			
1084 Lamoille Highway I Elko, tel (775) 777-9933 I fax (Report Due Dat	e \ (7-0	2-1	5
3230 Polaris Ave., Suite 4 Las V tel (702) 475-8899 fax (/egas, Nevada 8910)2					Page _	of	1		
Client CARDMO							Turna	round Time	Require	ments	
Address 295 AWY 50	Suite #	1				5 Day' (2	Sta 25%)	andard7		00%)	
City, State & Zip Zephyr Cov		894	148			1 2 2 2 2 2 2	(100%)		4 Hour* (2	(%00%)	
Contact Chris Dunley						Samp	oles Collected Which State	From	_	port Resul	ts Via
Phone (775) 588-1019	Collector's Name					N/	/ CA_ Other			1	
Fax	PWS/Project Nam					Com	pliance Monit	oring?	Other	EDD	i
P.O. Number					-	Report t	to Regulatory	Agency?	Stan	dard QC Re	
Email Chris donley (PWS/Project Num			s	NO.	Yes		lyses R	eques		No
Billing Address (if different			n	A	OF	10		1	1 1		11
		-		M	CO		'				
CompanyAddress				P	N	11				1 1	11
City, State & Zip				E	Т		1 1	1 1		1 1	1 1
Contact					A	121					1 1
PhoneF				T	N	15	1 1	1 1			
Email	.,,			P	E	0					
SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	E **	R S	5					Spl.
20150917 43HDVC-5 H		11:00	1	SW		X					1
20150917 43BPC-4 BIC	DU 9/17	12:35	1	SW	1	X					2
20150917 43 HVC-2 PA	¥154/5 9/17	1:25	1	SW	1	X					3
20150917 43 HVC-1A SK	y Meed of 9/17	1:55	1	SW	1	X					4
										- 1	
Instructions/Comments/Special Requirements:							111111			15,00	* 1
										100	1,
Sample Matrix Key** DW = Drinking Water WW = V								2	e de la constante		+
*SAMPLE PRESERVATIVES: 1=Unpres	served 2=H2SO4	3=NaOH	4=HCI	5=HI	VO3	6=Na2S	S2O3 7=Z	nOAc+N	IaOH 8	3=HCI/V	OA Vial
	DATE TIME	Sam	ples R	elinqu	uishe	d By		Sample	es Rec	eived B	у
5.7°C Y N (None) 4 9/	18/15 8:09ar	10	M'	-	1		10	3/	2	76	2
°C Y N None						3					
°C Y N None											
°C Y N None											
WETLAB'S Standard Terms and Cond	ditions apply un	ess writt	en agre	emer	nts si	necify o	therwise	Payme	nt terr	ne ara l	Vet 30

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. WETLAB will dispose of samples 90 days from sample receipt. Client may request a longer sample storage time for an additional fee. Please contact your Project Manager for details. initial

301.2E

Client Name: Entrix - Heavenly Report Date: August 5, 2015

ANALYSIS F	REPORT											
Client:	Cardno Ent	rix - Heavenly	y Water	Quality Sam	oling		Lab:	High Sier	ra Water	Lab		
	701 Univers	ity Ave. Suite	e 200					Collin St	asenburg	jh		
	Sacramento	, CA 95825						PO Box 8	43			
	(916) 923-10	97						Tahoe Ci	ty, CA 96 ²	145		
								Phone 53	0 584 243	88		
	E-mail: chri	s.donley@ca	rdno.co	m				Fax 530 5	84 2439			
								E-mail: c	ollin@hig	hsierrawa	aterlab.com	1
Report Date: 8/5	5/15 (file na	me: HV0	80515	.xls)								
Site	ID	Date	Time	NO3/NO2-N	SRP-P	DP-P	TP-P	TKN	TSS	Cond	Turbidity	
				(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(mg/L)	(µs/cm)	(ntu)	
Patsy's	HV-C2	7/16/2015	13:30	39			19	97	1.6		1.06	
Bijou Park Creek	HV-C4	7/16/2015	12:30	240			91	284	8.0		17.4	
Property Line	HV-C3	7/16/2015	11:45	3			20	95	2.0		0.52	
Hidden	HV-H5	7/16/2015	10:40	10			22	92	1.6		0.85	
Sky Meadow	HV-C1	7/16/2015	14:15	67			19	94	1.6		1.62	
Edgewood Below	HV-E2	7/16/2015	15:15	59	6	18	21	93	1.6	138.2	1.20	

Client Name: Entrix - Heavenly Report Date: September 8, 2015

ANALYSIS F	REPORT											
Client:	Cardno Entr	ix - Heavenly	/ Water	Quality Samp	oling		Lab:	High Sier	ra Water	Lab		
	701 Universi	ity Ave. Suite	200					Collin St	rasenburg	gh		
	Sacramento	, CA 95825						PO Box 8	343			
	(916) 923-10	97						Tahoe Ci	ty, CA 96	145		
								Phone 53	30 584 243	38		
	E-mail: chris	.donley@ca	rdno.co	m				Fax 530 5	584 2439			
								E-mail: c	ollin@hig	hsierrawa	aterlab.com	
Report Date: 9/8	8/15 (file na	me: HV09	90815	.xls)								
Site	ID	Date	Time	NO3/NO2-N	SRP-P	DP-P	TP-P	TKN	TSS	Cond	Turbidity	
				(ppb)	(ppb)	(ppb)	(ppb)	(ppb)	(mg/L)	(µs/cm)	(ntu)	
Patsy's	HV-C2	8/19/2015	13:30	73			27	190	4.4		1.16	
Bijou Park Creek	HV-C4	8/19/2015	12:40	241			56	252	4.8		10.3	
Hidden	HV-H5	8/19/2015	10:50	23			25	94	3.2		0.70	
Sky Meadow	HV-C1	8/19/2015	14:15	35			18	99	2.8		1.01	
Edgewood Below	HV-E2	8/19/2015	15:05	31	6	17	51	383	17.2	134.9	11.6	

Client Name: Entrix - Heavenly Report Date: September 30, 2015

Page 1 of 1

file name: HV093015.xls

ANAI VOIC DEDODT

	REPURI											
Client:	Cardno Enti	ix - Heavenly	Water	Quality Samp	oling		Lab:	High Sier	ra Water	Lab		
	701 Univers	ity Ave. Suite	200					Collin Str	asenburg	jh		
	Sacramento	, CA 95825						PO Box 8	43			
	(916) 923-10	97						Tahoe Ci	ty, CA 961	145		
								Phone 53	0 584 243	8		
	E-mail: chris	s.donley@ca	rdno.co	m				Fax 530 5	84 2439			
								E-mail: co	ollin@hig	hsierrawa	aterlab.com	
Report Date: 9/	/30/15 (file n	ame: HV	09301	5.xls)								
Site	ID	Date	Time	NO3/NO2-N	SRP-P	DP-P	TP-P	TKN	TSS	Cond	Turbidity	
Site	ID	Date	Time	NO3/NO2-N (ppb)	SRP-P (ppb)	DP-P (ppb)	TP-P (ppb)	TKN (ppb)	TSS (mg/L)	Cond (µs/cm)	Turbidity (ntu)	
	ID HV-C2	Date 9/17/2015	Time 13:25		_						,	
Patsy's				(ppb)	_		(ppb)	(ppb)	(mg/L)		(ntu)	
Patsy's Bijou Park Creek	HV-C2	9/17/2015	13:25	(ppb) 53	_		(ppb) 18	(ppb) 63	(mg/L) 2.0		(ntu) 1.21	
Site Patsy's Bijou Park Creek Hidden Sky Meadow	HV-C2 HV-C4	9/17/2015 9/17/2015	13:25 12:35	(ppb) 53 233	_		(ppb) 18 58	(ppb) 63 197	(mg/L) 2.0 4.4		(ntu) 1.21 8.26	

Heavenly Mountain Resort Water Year 2015

APPENDIX B
RAW WATER QUALITY CONSTITUENTS CA FILTER VAULTS WATER YEAR 2015



Table B-1	_		t water year 2015 wa ne CA parking lot.	ter quality monito	oring data from influ	uent station 43HVF	P-1a (North), Califor	nia Parking Lot Fili	ter Vault influer	nt point one. This
Date	Notes	Time	Turbidity (NTU)	Total Phosphorus (mg/L)	Nitrate Nitrogen (mg/L)	Nitrite Nitrogen (mg/L) ³	Total Kjeldahl Nitrogen (mg/L)	Total Nitrogen Calc. (mg/L)	Chloride (mg/L)	Oil & Grease (mg/L)
Lahontan Stan	dards		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
First Quarter V	VY 2014-20)15								
11/22/2014	1	11:11	46	0.19	0.066	0.026	0.68	0.77	18	ND
12/2/2014	2	19:51	39	0.15	0.060	ND	0.39	0.45	19	ND
Second Quarte	er WY 2014	I-2015								
2/8/2015	3	16:42	-	0.095	0.12	0.031	0.6	0.71	56	2.2
Third Quarter \	NY 2014-2	015			-			-		
5/7/2015		12:58	24	0.084	0.22	0.019	0.54	0.78	43	ND
5/15/2015	4	8:10	5.6	0.041	0.45	ND	0.24	0.69	61	ND
6/29/2015		No Sample collec	ted due to automated	equipment mishap).					
ourth Quarter	WY 2014	2015						_		
7/8/2015	5	14:25	64	0.086	0.19	ND	0.42	0.60	5.0	ND

¹ Reported Turbidity, Nitrate and Nitrite as Nitrogen constituent values were analyzed beyond the accepted holding time. Samples collected on a Saturday.

²Reported oil and grease value is estimated; The value failed to meet QC criteria for either precision or accuracy.

³ Turbidity was mistakenly left off of the chain of custody and it was determined that the sample was past the hold time upon discovery.

⁴ The North auto-sampler did not collect the storm surge on 5/14/15. The sample collected reflects the morning after tram sump water (groundwater).

⁵ The results for the laboratory control sample (LCS) for Oil and Grease were outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

Table B-2			t water year 2015 wa hin the CA parking lo		oring data from infl	uent station 43HVF	P-1b (South), Califo	ornia Parking Lot F	Filter Vault influent	point two.
Date	Notes	Time	Turbidity (NTU)	Total Phosphorus (mg/L)	Nitrate Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Nitrogen Calc. (mg/L)	Chloride (mg/L)	Oil & Grease (mg/L)
Lahontan Stan	dards		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
First Quarter V	/Y 2014-20	15								
11/22/2014	1,2	13:18	30	0.096	0.080	0.026	0.38	0.49	18	ND
12/3/2014	2	17:30	34	0.14	0.078	0.017	0.39	0.48	20	ND
Second Quarte	r WY 2014	l-2015								
2/8/2015		No Sample collec	ted due to automated	equipment mishap).					
Third Quarter \	NY 2014-2	015								
5/7/2015		12:48	27	0.072	0.11	0.020	0.65	0.78	27	ND
5/14/2015		22:22	19	0.046	0.14	ND	0.56	0.70	11	ND
6/29/2015	3	18:03	260	0.70	ND	0.021	9.7	9.7	11	ND
Fourth Quarter	WY 2014-	2015								
7/8/2015	4	14:22	24	0.096	0.18	ND	0.48	24	2.4	ND

¹ Reported Turbidity, Nitrate and Nitrite as Nitrogen consitutent values were analyzed beyond the accepted holding time. Samples collected on a Saturday.

² Samples collected reflect grab samples collected during the storm event. The automated composite samples were not triggered during the event.

³ The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of total Kjeldahl Nitrogen (TKN) were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

⁴ The results for the laboratory control sample (LCS) for Oil and Grease were outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.

Table B-3	Heavenly Mountain Resort water year 2015 water quality monitoring data from effluent station 43HVP-2, California Parking Lot Filter Vault effluent point. This station is located within the CA parking lot.											
Date	Notes	Time	Turbidity (NTU)	Total Phosphorus (mg/L)	Nitrate Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Nitrogen Calc. (mg/L)	Chloride (mg/L)	Oil & Grease (mg/L)		
Lahontan Standard	ds ¹		20.0	0.10	N/A	N/A	N/A	0.5	N/A	2.0		
First Quarter WY 2	014-2015											
11/22/2014	2,3,4	11:15	42	0.20	0.055	0.026	0.56	0.64	20	ND		
12/2/2014	-	19:49	46	0.072	0.066	0.018	0.38	0.47	20	ND		
Second Quarter W	Y 2014-2015	5										
02/08/15	4,5	17:34	-	0.13	0.050	0.013	0.67	0.74	57	3.9		
Third Quarter WY	2014-2015						-					
5/7/2015	6,7	12:58	-	0.070	-	-	0.74	0.74	-	ND		
5/14/2015	8	23:23	26	0.030	0.21	ND	0.57	0.78	24	ND		
6/29/2015	6	18:13	220	0.30	ND	ND	4.4	4.4	17	ND		
Fourth Quarter WY	2014-2015											
7/8/2015	6,9	14:27	24	0.15	0.17	ND	0.70	0.88	4	ND		
		Min	24	0.03	0.05	0.01	0.38	0.47	4	ND		
Annual Sum	mary	Max	220	0.3	0.21	0.026	4.4	4.4	57	3.9		
		# of Samples	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0		
# of Nonco	mpliance Sa	amples	5.0	4.0	-	-	-	6.0	-	1.0		
% of Nonco	mpliance S	amples	71%	57%	_	-	-	86%	-	14%		

¹ Standards are maximum concentration for discharge to surface waters not to exceed, effective November 30, 2008.

² Reported Turbidity, Nitrate and Nitrite as Nitrogen consitutent values were analyzed beyond the accepted holding time. Samples collected on a Saturday.

³ Reported oil and grease and Total Kjeldahl Nitorgen values are estimated; The sample matrix interfered with the analysis.

⁴ Spike recovery not calculated for Chloride, Sample concentration >4X the spike amount; therefore, the spike could not be adequetly recovered.

⁵ Turbidity was mistakenly left off of the chain of custody and it was determined that the sample was past the hold time upon discovery.

⁶ The matrix spike/matrix spike duplicate values for oil and grease parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.

⁷ During transporation, the effluent bottle lid popped off. The carrier misplaced the bottle within the cooler and the bottle arrived to the laboratory empty. Nitrate, nitrite, turbidity and chloride were not analyized due to the lack of unpreserved water samples.

⁸ The North inlet sample was collected the next morning and reflects the sump/groundwater. Not indicative of the storm surge.

⁹ The results for the laboratory control sample (LCS) for Oil and Grease were outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.



Specializing in Soil, Hazardous Waste and Water Analysis

7/28/2015

Cardno Entrix, Inc.

OrderID:

1507289

PO Box 1533

Zephyr Cove, NV 89448

Attn: Chris Donley

Dear: Chris Donley

This is to transmit the attached analytical report. The analytical data and information contained therein was generated using specified or selected methods contained in references, such as Standard Methods for the Examination of Water and Wastewater, online edition, Methods for Determination of Organic Compounds in Drinking Water, EPA-600/4-79-020, and Test Methods for Evaluation of Solid Waste, Physical/Chemical Methods (SW846) Third Edition.

The samples were received by WETLAB-Western Environmental Testing Laboratory in good condition on 7/9/2015. Additional comments are located on page 2 of this report.

If you should have any questions or comments regarding this report, please do not hesitate to call.

Sincerely,

Andy Smith

QA Manager

Western Environmental Testing Laboratory Report Comments

Cardno Entrix, Inc. - 1507289

Specific Report Comments

None

Report Legend

В	 Blank contamination; Analyte detected above the method reporting limit in an associated blank.
D	 Due to the sample matrix dilution was required in order to properly detect and report the analyte. The reporting limit has been adjusted accordingly.
HT	 Sample analyzed beyond the accepted holding time.
J	 The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
M	 The matrix spike/matrix spike duplicate (MS/MSD) values for the analysis of this parameter were outside acceptance criteria due to probable matrix interference. The reported result should be considered an estimate.
N	 There was insufficient sample available to perform a spike and/or duplicate on this analytical batch.
NC	 Not calculated due to matrix interference or very high sample concentration.
QD	 The sample duplicate or matrix spike duplicate analysis demonstrated sample imprecision. The reported result should be considered an estimate.
QL	 The result for the laboratory control sample (LCS) was outside WETLAB acceptance criteria and reanalysis was not possible. The reported data should be considered an estimate.
S	 Surrogate recovery was outside of laboratory acceptance limits due to matrix interference. The associated blank and LCS surrogate recovery was within acceptance limits.

- SC -- Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered.
- U -- The analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit.

General Lab Comments

Per method recommendation (section 4.4), Samples analyzed by methods EPA 300.0 and EPA 300.1 have been filtered prior to analysis.

The following is an interpretation of the results from EPA method 9223B:

A result of zero (0) indicates absence for both coliform and Escherichia coli meaning the water meets the microbiological requirements of the U.S. EPA Safe Drinking Water Act (SDWA). A result of one (1) for either test indicates presence and the water does not meet the SDWA requirements. Waters with positive tests should be disinfected by a certified water treatment operator and retested.

3230 Polaris Ave. Suite 4 Las Vegas, Nevada 89102 tel (702) 475-8899 fax (702) 622-2868 EPA LAB ID: NV00932

Western Environmental Testing Laboratory Analytical Report

 Cardno Entrix, Inc.
 Date Printed:
 7/28/2015

 PO Box 1533
 OrderID:
 1507289

Zephyr Cove, NV 89448
Attn: Chris Donley

Phone: (775) 588-9069 **Fax:** (775) 588-9219

Customer Sample ID: HV-P1A (North) Collect Date/Time: 7/8/2015 14:25

WETLAB Sample ID: 1507289-001 **Receive Date:** 7/9/2015 16:20

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Total Phosphorous as P	SM 4500-P E	0.086	mg/L	1	0.010	7/21/2015	NV00925
Total Suspended Solids (TSS)	SM 2540D	72	mg/L	1	1	7/15/2015	NV00925
Total Nitrogen	Calc.	0.60	mg/L	1	0.22	7/23/2015	NV00925
Turbidity (Nephelometric)	EPA 180.1	64	NTU	5	0.50	7/10/2015	NV00925
Oil & Grease (SGT-HEM)	EPA 1664	ND QL	mg/L	1	2.0	7/20/2015	NV00925
Anions by Ion Chromatography							
Chloride	EPA 300.0	5.0	mg/L	1	0.10	7/9/2015	NV00925
Nitrate Nitrogen	EPA 300.0	0.19	mg/L	1	0.010	7/9/2015	NV00925
Nitrite Nitrogen	EPA 300.0	ND	mg/L	1	0.010	7/9/2015	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	0.42	mg/L	1	0.20	7/23/2015	NV00925

 Customer Sample ID:
 HV-P1B (South)
 Collect Date/Time:
 7/8/2015
 14:22

 WETLAB Sample ID:
 1507289-002
 Receive Date:
 7/9/2015
 16:20

Analyte Method Results Units DF RL LabID Analyzed **General Chemistry** 0.096 0.010 Total Phosphorous as P SM 4500-P E 1 7/21/2015 NV00925 mg/L SM 2540D 7/15/2015 NV00925 Total Suspended Solids (TSS) 68 mg/L 1 Total Nitrogen 0.65 1 0.22 NV00925 Calc. mg/L 7/23/2015 Turbidity (Nephelometric) EPA 180.1 24 NTU 5 0.50 7/10/2015 NV00925 1 Oil & Grease (SGT-HEM) EPA 1664 ND QL mg/L 2.0 7/20/2015 NV00925 Anions by Ion Chromatography Chloride EPA 300.0 2.4 0.10 7/9/2015 NV00925 mg/L 1 Nitrate Nitrogen 0.18 0.010EPA 300.0 mg/L 1 7/9/2015 NV00925 Nitrite Nitrogen EPA 300.0 ND mg/L 0.010 7/9/2015 NV00925 **Flow Injection Analyses** Total Kjeldahl Nitrogen EPA 351.2 0.48 0.20 NV00925 mg/L 7/23/2015

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Elko, Nevada 89801

tel (775) 777-9933 fax (775) 777-9933

EPA LAB ID: NV00926

Cardno Entrix, Inc. - 1507289

Customer Sample ID: HV-P2 (Out)

WETLAB Sample ID: 1507289-003 **Collect Date/Time:** 7/8/2015 14:27

Receive Date: 7/9/2015 16:20

Analyte	Method	Results	Units	DF	RL	Analyzed	LabID
General Chemistry							
Total Phosphorous as P	SM 4500-P E	0.15	mg/L	1	0.010	7/21/2015	NV00925
Total Suspended Solids (TSS)	SM 2540D	64	mg/L	1	1	7/15/2015	NV00925
Total Nitrogen	Calc.	0.88	mg/L	1	0.22	7/24/2015	NV00925
Turbidity (Nephelometric)	EPA 180.1	24	NTU	5	0.50	7/10/2015	NV00925
Oil & Grease (SGT-HEM)	EPA 1664	ND M,QL	mg/L	1	2.0	7/20/2015	NV00925
Anions by Ion Chromatography							
Chloride	EPA 300.0	4.0	mg/L	1	0.10	7/9/2015	NV00925
Nitrate Nitrogen	EPA 300.0	0.17	mg/L	1	0.010	7/9/2015	NV00925
Nitrite Nitrogen	EPA 300.0	ND	mg/L	1	0.010	7/9/2015	NV00925
Flow Injection Analyses							
Total Kjeldahl Nitrogen	EPA 351.2	0.70	mg/L	1	0.20	7/24/2015	NV00925

Western Environmental Testing Laboratory QC Report

QCBatchID	QCType	Parameter		Method		Result	τ	nits						
QC15070412	Blank 1	Chloride		EPA 300	0.0	ND	n	ng/L						
		Nitrate Nitrogen		EPA 300	0.0	ND	n	ng/L						
		Nitrite Nitrogen		EPA 300	0.0	ND	n	ng/L						
QC15070526	Blank 1	Turbidity (Nephelometric	:)	EPA 180	0.1	ND	N	TU						
QC15070741	Blank 1	Total Suspended Solids (TSS)	SM 254	0D	ND	n	ng/L						
QC15070800	Blank 1	Oil & Grease (SGT-HEM	(I)	EPA 16	64	ND	n	ng/L						
QC15070811	Blank 1	Total Phosphorous as P		SM 450	0-P E	ND	n	ng/L						
QC15070938	Blank 1	Total Kjeldahl Nitrogen		EPA 35	1.2	ND	n	ng/L						
QC15071052	Blank 1	Total Kjeldahl Nitrogen		EPA 35	1.2	ND	n	ng/L						
QCBatchID	QCType	Parameter		Method		Result	A	ctual	% Rec	covery	Unit	s		
QC15070412	LCS 1	Chloride		EPA 300	0.0	10.7	1	0.0	107		mg/	L		
		Nitrate Nitrogen		EPA 300	0.0	0.523	0	.500	105		mg/	L		
		Nitrite Nitrogen		EPA 300	0.0	0.513	0	.500	103		mg/	L		
QC15070526	LCS 1	Turbidity (Nephelometric	:)	EPA 180	0.1	4.74	5	.00	95		NT	IJ		
QC15070741	LCS 1	Total Suspended Solids (TSS)	SM 254	0D	195	2	00	98		mg/	L		
QC15070741	LCS 2	Total Suspended Solids (TSS)	SM 254	0D	196	2	00	98		mg/	L		
QC15070800	LCS 1	Oil & Grease (SGT-HEM	(I)	EPA 16	64	6.00	1	0.0	60		mg/	L		
QC15070811	LCS 1	Total Phosphorous as P		SM 450	0-P E	0.240	0	.250	96		mg/	L		
QC15070938	LCS 1	Total Kjeldahl Nitrogen		EPA 35	1.2	0.932	1	.00	93		mg/	L		
QC15071052	LCS 1	Total Kjeldahl Nitrogen		EPA 35	1.2	0.928	1	.00	93		mg/	L		
QCBatchID	QCType	Parameter		Method		Duplicate Sample		Sample Result	Dupli Resul		Uni	ts	RPI)
QC15070526	Duplica	e Turbidity (Nephelometric	c)	EPA 180	0.1	1507285-001		1.46	1.26		NT	IJ	15 %	6
QC15070526	Duplica	e Turbidity (Nephelometric	e)	EPA 180	0.1	1507282-001]	ND	ND	QD	NT	IJ	32 %	6
QC15070741	Duplica	te Total Suspended Solids (TSS)	SM 254	0D	1507280-001		101	102		mg/	L	1 %	
QC15070741	Duplica	te Total Suspended Solids (TSS)	SM 254	0D	1507298-005		40.0	40.0		mg/	L	<1%)
QCBatchID	QCType	Parameter	Meth	od	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS % Rec.	MSD % Rec.	RPD
QC15070412	MS 1	Chloride	EPA 3	300.0	1507199-002	7.73		9.04	9.06	1.25	mg/L	105	106	<1%
		Nitrate Nitrogen	EPA 3	300.0	1507199-002	ND		0.544	0.553	0.500	mg/L	108	110	2%
		Nitrite Nitrogen	EPA 3	300.0	1507199-002	ND		0.123	0.127	0.125	mg/L	98	102	3%
QC15070412	MS 2	Chloride	EPA 3	300.0	1507289-003	4.00		5.42	5.44	1.25	mg/L	114	115	<1%
		Nitrate Nitrogen	EPA 3	300.0	1507289-003	0.172		0.705	0.713	0.500		106	108	1%
		Nitrite Nitrogen	EPA 3		1507289-003			0.123	0.124	0.125	mg/L	99	100	1%
QC15070800	MS 1	Oil & Grease (SGT-HEM)	EPA 1		1507289-003		M,	4.40	NA	10.0	mg/L	NC	NA	NA
QC15070811	MS 1	Total Phosphorous as P			1507287-001			0.263	0.265	0.250	mg/L	NC	NC	NC
QC15070811	MS 2	Total Phosphorous as P			1507362-002			0.389	0.385	0.250	mg/L	98	96	1%
QC15070938		Total Kjeldahl Nitrogen	EPA 3		1507283-001			1.29	1.39	1.00	mg/L	91	101	7%
QC15070938		Total Kjeldahl Nitrogen	EPA 3		1507284-001		M	1.26	1.10	1.00	mg/L	NC	NC	NC
QC15071052		Total Kjeldahl Nitrogen	EPA 3		1507295-001			1.24	1.01	1.00	mg/L	NC	NC	NC
		1-10-5011			200.200				1.01	1.00				

DF=Dilution Factor, RL=Reporting Limit, ND=Not Detected or <RL

Total Kjeldahl Nitrogen

Page 5 of 5

NC

NC

NC

MS 2

QC15071052

Elko, Nevada 89801

tel (775) 777-9933 fax (775) 777-9933 EPA LAB ID: NV00926

1507295-003 ND

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LAS VEGAS

1.00

mg/L

WETLAB WESTERN ENVIRONMENTAL TESTING LABORATORY 475 E. Greg Street #119 Spar tel (775) 355-0202 fax (1084 Lamoille Highway Elko, tel (775) 777-9933 fax (3230 Polaris Ave., Suite 4 Las V tel (702) 475-8899 fax (775) 355-0817 , Nevada 89801 775) 777-9933 Vegas, Nevada 8910	I www.WE			nalysis.	Elko Control #_ LV Control #_ Report Due Date	+	289
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Client/Collector attests to the validity and authenticity of this (these) sample(s) and, is (are) aware that tampering with or intentionally mislabeling the sample(s) location, date or time of collection may be considered fraud and subject to legal action (NAC445.0636)

To the maximum extent permitted by law, the Client agrees to limit the liability of WETLAB for the Client's damages to the total compensation received, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted.

Heavenly Mountain Resort Water Year 2015

APPENDIX C EFFECTIVE SOIL COVER PARADIGM SHIFT MEMO



MEMORANDUM

FROM: Kevin Drake, Integrated Environmental Restoration Services, Inc.

Frank Papandrea, Heavenly Mountain Resort

TO: Bud Amorfini, Lahontan Regional Water Quality Control Board

Sue Norman, USFS - Lake Tahoe Basin Management Unit

David Landry, Tahoe Regional Planning Agency

RE: Proposed changes to Heavenly Mountain Resort's Effective Soil Cover Evaluation Program

CC: Andrew Strain, Heavenly Mountain Resort

Chris Donley, Cardno ENTRIX

Problem Statement

For many decades, the success of erosion control projects has been defined largely in terms of plant cover or other form-based measures of vegetation response. At the core of Heavenly's Cumulative Watershed Effects (CWE) implementation program is the goal of establishing "effective soil cover." The term "effective soil cover" has its roots in the Universal Soil Loss Equation (USLE), an erosion model developed in and for agricultural settings, not high elevation forested settings like Heavenly. A core assumption in the USLE model is that control of erosion is dependent on the presence of vegetative cover. A growing body of research from Heavenly projects and throughout the Tahoe Basin has shown that effective erosion control is, instead, more dependent on a range of other readily-measurable variables including total cover (mulch, rock, vegetation, etc), soil density, infiltration, and slope and surface roughness than it is on vegetative cover alone (IERS/Grismer and Hogan, 2002-2009). Moreover, short-term plant establishment has been shown to be an insufficient (and sometimes misleading) predictor of long-term restoration success (Herrick et al. 2006) and erosion resistance (Grismer et al. 2008). Heavenly has gone to great lengths and made large financial investments in labor and infrastructure to repeatedly fertilize, seed and irrigate disturbed soil areas in an effort to establish vegetation. However, by using applied adaptive management, testing new treatment approaches, and directly measuring erosion reductions, Heavenly has demonstrated a range of cost-effective treatment and monitoring approaches over the past few years and hopes to formalize agency support for these approaches through circulation of this memo.

Current Assessment Methods and Objectives

Current methods for evaluating effective soil cover (ESC) include GIS analysis of aerial images to develop a bare soil to vegetation ratio, followed by field verification of vegetation cover and other site characteristics at 10 sites around the mountain. The ratio and field verifications are then used to extrapolate the effective soil cover in other areas at Heavenly (refer to 2008 Effective Soil Cover Workplan for further details), which is compared from year to year to assess changes in ESC and, by extension, changes in watershed erosion rates. This is largely a compliance-oriented exercise intended to understand changes in extrapolated or assumed erosion rates, but it does not directly lead to fixing specific erosion problems. These assessment efforts have been done in good faith but do not answer the fundamental question: are we actually reducing erosion?

The primary objectives of the current Effective Soil Cover Evaluation Program (from the 2011 Comprehensive Monitoring Report) are to:

- Determine if changes in cover result in changes in runoff and sediment volume from ski runs and other project infrastructure.
 - **Current State of Knowledge:** research at Heavenly and throughout the Tahoe area has consistently shown that erosion reductions are closely related to <u>total</u> cover (including mulch, rocks, etc), and other primary variables, specifically infiltration, but not necessarily vegetative cover alone.
- 2. Evaluate utilization of soil amendments/treatments to increase infiltration capacity for those areas resistant to revegetation efforts, or where revegetation is ineffective.

Current State of Knowledge: research at Heavenly and throughout the Tahoe area has shown that high-carbon soil amendments (such as wood chips), when combined with soil loosening, can increase infiltration rates and support immediate and long-term reductions in runoff and erosion rates.

Proposed Assessment Methods and Objectives

Prioritize Treatments

Rather than assessing vegetation cover at 10 sites around the mountain, Heavenly proposes to use the erosion-focused rapid assessment (EfRA) process described in the *Watershed Management Guidebook* (Drake et al. 2012). This methodology focuses on identifying the primary sources of erosion ("hot spots") through a simple GIS exercise followed by on-the-ground assessment and prioritizing treatments within a watershed context. That is, areas with high erosion potential (or actual observed erosion) and high hydrologic connectivity to surface waters are generally ranked as higher priorities and hot spots with lower erosion potential and/or connectivity to surface water are ranked as lower priorities. We also intend to integrate the USFS' road risk analysis ratings for Heavenly roads into the treatment prioritization framework. This approach is based on developing an understanding of water flow patterns in the watershed and addressing the root cause(s) of erosion issues (often a failed water bar or other concentrated drainage features) rather than using modeling and extrapolation to make statements about the theorized "condition" of the entire watershed. Ultimately, this approach is about actually fixing erosion problems. We propose to begin this effort of identifying and prioritizing hot spots in the CA-1 watershed (Heavenly Valley Creek) in 2013 and expand to other Heavenly watersheds in the coming years.

Measure Outcomes

Heavenly has already been using monitoring techniques that directly measure erosion reductions and indices of a site's erosion resistance. These measurement methods are typically used before implementation of erosion control treatments and repeated one year after treatments to assess the effectiveness of a project at reducing erosion and rebuilding erosion resistance at a particular site.

Below is a brief description of the primary assessment approaches we propose using to measure erosion resistance and treatment effectiveness at Heavenly restoration sites. These methods can be used individually or in combination as assessment "tiers", as described in Table 1, below. The exact monitoring approach will be adjusted where appropriate to best suit site conditions, assessment and management needs, and treatment goals for specific projects and/or watersheds. Monitoring will be more intensive on some projects and less intensive on others, depending on the site's erosion risk and confidence in results from past projects with similar treatments.

Visual Erosion Assessment: the process of visually identifying physical signs of erosion from direct or indirect field
evidence in order to trace them to their source, characterize their nature and cause(s), and use this information to
develop appropriate treatments.

- Cone Penetrometer: relatively fast and easy to measure and provides important index of soil density/compaction.
- Cover Characterization: assess percent total cover, mulch cover, and plant cover using photo grid method and/or
 ocular estimates. These methods are far more rapid than transect-based approaches and since vegetation cover
 alone has been shown to have little to no correlation with sediment yield reductions at Heavenly, it is not
 necessary to be overly precise with plant cover measurements. Dominant vegetation species will be noted, as well
 as presence of any noxious weeds.
- Soil Assessment: field assessment of soil color, structure/texture, and other edaphic factors that provide insights into longer-term erosion resistance and the site's ability to eventually support an appropriate vegetation community. May also include collecting soil samples before treatment (to determine soil deficiencies) and then again 2-3 years post-treatment¹ for lab analysis of key indicators of soil "capital" such as organic matter and nitrogen.
- Runoff Simulation: less time required than rainfall simulation and provides useful information about erosion processes and a site's erosion resistance, particularly with the coarse granitic soils at Heavenly (simulates snowmelt rather than rainfall). Runoff simulation is typically conducted on plots 1 meter wide and 2-4 meters in length, which enables assessment of runoff and erosion processes that are likely to be more representative of larger areas. Erosion measurements include: surface runoff rate (ft/min), time and distance to rilling, rill characterization (#, soil loss), as well as site description elements such as slope angle, cover composition and surface roughness.
- Rainfall Simulation: provides direct measurement of soil infiltration rate (in/hr), sediment yield (lbs/acre/inch), time to runoff, and other key erosion-related factors. Rainfall simulation is conducted on 1 square meter plots (smaller than runoff simulation plots) and resulting data is readily comparable to other sites and the large database of rainfall simulation data collected on past Heavenly projects and other projects throughout the Tahoe Basin.

3

Analysis of soil post-treatment soil samples is best done 2-3 years following treatment, since decomposition of high-carbon soil amendments (e.g. wood chips), which are commonly used at Heavenly, takes at least several years in Tahoe's arid climate.

Table 1. Heavenly Erosion Assessment Tiers

Tools	Tier 1 - Visual	Tier 2 - Soil/Site Condition	Tier 3 - Performance
Visual Erosion Assessment	X	X	x
Cone Penetrometer		X	x
Cover Characterization (mulch cover, veg cover, veg composition)		×	×
Soil Assessment		X Visually assess texture, color, root penetration, soil development, etc.	X Same as Tier 2 + collect samples for analysis (organic matter, N)
Runoff/Rainfall Simulation			X
Purpose	Identify erosion problems and trace them to their source(s).	Characterize the nature/cause of erosion areas and develop appropriate treatments. This level of assessment will be applied to most sites before/after treatment and can	Directly assess erosion processes and post-treatment erosion reductions. This level of assessment will be applied at a smaller number of selected sites where new types of treatments and/or site
Level of Effect	Value	be efficient at larger scales.	conditions are being assessed.
Level of Effort	Low	Low to moderate	Moderate to intensive
Spatial Scale	Small catchment to whole watershed	Plot scale up to project treatment area (< 1 acre)	Plot scale up to project treatment area (< 1 acre)

Proposed Treatment Objectives

- To prioritize treatment types and locations based on water flow, connectivity and cost-effectiveness
- To maximize hydrologic function (surface flow patterns, infiltration)
- To stabilize soils (surface protection, minimize runoff)
- To re-establish native vegetation where appropriate²
- To minimize irrigation and fertilizer use to greatest extent possible

Proposed Monitoring Objectives

- To quantitatively assess erosion reductions and indices of long-term erosion resistance
- To use monitoring data to determine the cost-effectiveness of different restoration treatments
- To use monitoring data to improve effectiveness of future restoration treatments

² Vegetation re-establishment goals will be determined on a project-specific basis. For instance, vegetation is typically more integral for creating erosion-resistant site conditions in an SEZ or on very steep slopes, whereas vegetation may be a lower priority on a high-elevation project near the top of the mountain. Vegetation establishment trajectories will also be different for sites with access to irrigation versus sites without access to irrigation.

Regulatory Alignment

The proposed monitoring methods described here are consistent with existing Monitoring and Reporting Program requirements and are already described in Appendix 3-1(d) of Heavenly's Master Plan Amendment FEIS (Mitigation of Soil Disturbance Effectiveness Monitoring). We believe that the monitoring methods described above do not require any amendments to existing regulatory documents at this time and get closer to the intent of these regulations than current monitoring program elements.

Reporting

Annual outputs from Heavenly's proposed erosion-focused assessment approach will include:

- A prioritized annual work list with erosion- and water quality-focused prioritization criteria (with corresponding map)
- A map showing erosion hot spots and completed projects (with accompanying photographs)
- A summary of project-specific erosion reductions and effectiveness monitoring results

These deliverables will be included in the Mitigation and Monitoring Program Annual Report each spring.

The Heavenly team welcomes your feedback and looks forward to working with you to protect and improve water quality at Heavenly Mountain Resort.

David L. Landry

Senior Planner-Tahoe Regional Planning Agency, Planning Department

dlandry@trpa.org

775-589-5214

Signature

Date_

The proposed change to the effective soil cover evaluation program is consistent with the current amended monitoring and reporting program (MRP No. 2003-0032-A2) and is acceptable to the Water Board.

Bud Amorfini

California Regional Water Quality Control Board-Lahontan Region

Engineering Geologist

2501 Lake Tahoe Blvd. South Lake Tahoe, CA 96150

bamorfini@waterboards.ca.gov

530-542-5463

Signature

Date 12/30/2013

References

Arst, R., and M. Hogan. 2008. Monitoring and Assessment of Erosion Control and Treatments in and around the Lake Tahoe Basin. Prepared by IERS for Caltrans.

Claassen, V.P., and M.P. Hogan. 2002. Soil Nutrients Associated with Revegetation of Disturbed Sites in the Lake Tahoe Basin. *Restoration Ecology* 10, 2: 195-203.

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Drake, K. 2013. Heavenly Mountain Resort Restoration and Monitoring 2012 Summary Report. Prepared by IERS for Heavenly Mountain Resort.

Grismer, M.E., and M.P. Hogan. 2005. Evaluation of Revegetation/Mulch Erosion Control Using Simulated Rainfall in the Lake Tahoe Basin: 3. Treatment Assessment. *Land Degradation & Dev.* 16: 489-501.

Grismer, M.E., C. Schnurrenberger, R. Arst and M.P. Hogan. 2008. Integrated Monitoring and Assessment of Soil Restoration Treatments in the Lake Tahoe Basin. Environ. Monitoring & Assessment .150: 365-383.

Herrick, J.E., G. E. Schuman and A. Rango. 2006. Monitoring ecological processes for restoration projects. J. Nature Conservation 14:161-171.

Heavenly Mountain Resort Water Year 2015

APPENDIX D FACILITIES MONITORING & APPLICATION CHECKLIST





November 12, 2015

Mr. Bud Amorfini Environmental Scientist Lahontan Regional Water Quality Control Board 2501 Lake Tahoe Boulevard South Lake Tahoe, CA 96150

Re: Heavenly Mountain Resort 2015 Fourth Quarter Snow Conditioning and Snowmaking Enhancement Monitoring

Dear Mr. Amorfini:

Pursuant to the Amended Monitoring and Reporting Program No. 2015-0021, Heavenly is required to submit monthly snow conditioning and snow enhancement monitoring logs. Instead of providing a number of zero reported usage forms for salt application on the mountain during the fourth quarter, this letter and the table below summarize the usage over the past three months (July, August and September) at the following sites: Top of the Gondola, World Cup Race Courses, Terrain Park, and Adventure Peak. April typically ends the ski season resort activities and salt was not used during the summer months. Chapter 8 of the Environmental Monitoring Program Annual Report provides a water year to date summary of the amount of huck salt applied for the 2014/2015 Water Year.

Table 1-1 The Location and the Application Amount of Huck Salt (Fourth Quarter)

Month/Year	Top of the Gondola (lbs.)	World Cup Race Course (lbs.)	Terrain Park (lbs.)	Adventure Peak – Tubing Area (lbs.)
July 2015	0	0	0	0
August 2015	0	0	0	0
September 2015	0	0	0	0
Totals	0 lbs.	0 lbs.	0 lbs.	0 lbs.

Should you require additional information or have questions regarding this report and its contents, please contact Frank Papandrea at 775-586-2315.

Sincerely

Frank Papandrea

Heavenly Environmental Manager



HEAVENLY SKI RESORT

DEICERS and ABARSIVES APPLICATION and RECOVERY

Monthly Summary Report

(MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)

Quantity of ice control agents and abrasives used on Heavenly property and on CSLT streets. When the Dischargers apply deicers and/or abrasives on parking lots, base facilities, private roads, or City of South Lake Tahoe roads to the California Base area, the Dischargers shall keep a daily log and report a monthly summary of the following to Brandy Thompson for Quarterly reporting to LRWQCB:

Month and Year: July 2015 Reporter: Ryan Sm	nith
Location Name: Heavenly California Base and C Total Monthly Application: 0 lbs Total Monthly Recovery: 0 lbs Location of Disposal Facilities: Carson Landfill (•
Ryan Smith Employee Signature	Supervisor Signature

HEAVENLY SKI RESORT DEICERS and ABRASIVES <u>APPLICATION</u> (MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)

DAILY LOG

MONTH/YEAF	C: <u>July 2015</u>				
LOCATION NA	AME: California Main Lodge				
roadways, Heav	•	e following daily use for we	ontrol agents on parking lots and ekly submittal to supervisors and to LRWQCB:		
	ower Lot oad (Wildwood above Saddle) ildwood – Needle Peak Run er an Way	Material Codes C – Cinders NaCl - Salt S - Sand Other – Describe	::		
Date/Time	Quantity (lbs)	Location Code	Type of Material		
	- -				
Total Monthly APPLICATION Heavenly (lbs?) cinders 0 salt 0 sand other					
Total Monthly	APPLICATION Heavenly (1	bs?) cinders 0 salt 0 sand	l other		
•	APPLICATION Heavenly (I APPLICATION in CSLT (Il				
Total Monthly	APPLICATION in CSLT (II		other		
Total Monthly Submit Weekly	APPLICATION in CSLT (ltv to Supervisor. Time	os?) cinders 0 salt 0 sand_	other		

CHECKLIST FOR OPERATION AND MAINTENANCE INSPECTION RECORD

Date of Inspection:	08/08/15
Name of Inpector:	Ryan Smith

Name of Area: California Base Lodge Parking Lot

System/Structure Inspected: Wildwood Culvert
--

	Comments			
Structure ID				Required
or Location	Observations	Acceptable	Unacceptable	maintenance
	Clear &			
Wildwood	Opening			
Culvert	Swept	X		None
	'			

HEAVENLY SKI RESORT CALIFORNIA PARKING LOT, LODGE and ROADS MONITORING CHECKLIST ONITORING AND REPORTING PROGRAM NO.R6T-2003-0032

	(MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)					
Date: _	July 2015	Inspector:		Ryan	<u>Smith</u>	
at least	te the following inspection a once monthly and after s al to Brandy Thompson for	ignificant storm event	s. Turr	n in Ch		
	Were any of the following o	bbserved?	Yes	No	Comments	
a. <u>Drop I</u>	nlets (CA Parking Lot and	d Roads)			Describe Problems, Locations and Corrective Actions	
1) Clog	ged by debris, ice, or sedin	nent?		Х		
2) Rund	off movement into the infiltr	ation gallery?	Х		Trickle	
3) Dam	aged by vehicles or snow p	plow?		Х		
b. <u>Draina</u>	ge Collection System (CA	A Parking Lot, Roads)			Describe Problems, Locations and Corrective Actions	
1) Clog	ged by debris, ice, or sedin	nent?	Х	.,	Near the base of the ramp drain is slow.	
	ement of water through piperintenances impeded?	es, channels,		Х	Near the base of the ramp. Cruz construction is scheduled to rebuild drain to correct problem.	
3) Drair	nage collection system dan	naged?		X		
•	equate energy dissipation?			^	Describe Problem and	
Roads	,	_			Corrective Actions	
vaults, o	nent accumulated in each or galleries? If yes, estimate	e depth and volume.		Х	Sediment trap at wildwood gate cleaned out 7/7/15	
Traps cleaning	s and Vaults recently cleand.	ed? List date of last	Х		7/7/15	
3) Prese	ence of sheen, foam, trash	or scum?		Х		
	<u>n Control</u> (CA Parking Lo nance Shops)	t, Lodges, and			Please Note Locations and Corrective Actions	
1) Vege	etation appears unhealthy?			Х		
2) Gully	or rill erosion on slopes?			X		
3) Sedi	ment buildup at toes of slop	pes?		X		

Χ

4) Vegetation damaged by vehicles or heavy foot traffic?

C.	Culvert Outlet (west of Wildwood Avenue)		
,	Inadequate energy dissipation?	X	Water running clear
:	2) Trash or debris needs to be removed from drainage way?	х	Clean
e.	<u>Upstream Drainage Diversion</u> (Located on Perfect Ride Run)		
	1) Structures not in place?	X	
:	2) Structures not operational?	X	
f.	Spilled Chemicals, Paints, Fuels, Sealants, Oils, Greases, Antifreeze, etc? (All locations)	X	
g.	Sediment/Sand Buildup in CA Parking Lot?	X	Swept 5/1
h.	Grease Interceptor Not Operating Properly? (CA Base Lodge)	X	
-			
-	Documentation of resulting actions and dates problem Sediment trap at Wildwood cleaned on 7/7/15	ns corrected:	<u>.</u>
-			-
_			

-2-

N/A: Not applicable

INSPECTION PURPOSE AND GOALS:

The purpose of the inspection is to identify actual or potential erosion and surface runoff on the project site and to identify BMP maintenance needs so that corrective measures may be immediately undertaken.

Any erosion, surface runoff problems, wastewater disposal problems, or other adverse conditions, which are found on the subject property, shall be clearly described and the corrective measures proposed by the Dischargers (Heavenly) shall be included in the quarterly monitoring report. In the event that no such problems are found on the property, a statement certifying this condition must be included for each monthly inspection.

PLEASE ADD ADDITIONAL INFORMATION IF NECESSARY AND ATTACH PHOTO DOCUMENTATION

Contact Brandy Travers at 775-586-2314 or btravers@vailresorts.com with any questions/concerns.

-		
HEAVENLY SKI RESORT SNOW CONDITIONING and SNOW ENHANCEMENT Water Year 2014	(MONITORING AND REPORTING PROGRAM NO2003- 0032A2)	If snow-conditioning or snowmaking enhancement chemicals or other additives are used on ski slopes (including tubing runs, halfpipes, jumps, other terrain parks, and ski race areas), a daily log of the following information shall be kept and reported to supervisors on a weekly basis and to the USDA Forest Service on a monthly basis for input into Quarterly reporting to LRWQCB:
LOCATION: Heavenly Ski Resort	California Main Lodge	
Department : Base Operations Reporter: Ryan Smith		
Type of Materials Applied <u>"Sno</u> Plow Ice melt"		
Approximate Acreage: 1 <u>ACRE</u>)		
Date	Pounds used	ACRES
July	0.00	
Total	0.00	0.00
Employee sign off, Ryan Smith		

HEAVENLY SKI RESORT

DEICERS and ABARSIVES APPLICATION and RECOVERY

Monthly Summary Report

(MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)

Quantity of ice control agents and abrasives used on Heavenly property and on CSLT streets. When the Dischargers apply deicers and/or abrasives on parking lots, base facilities, private roads, or City of South Lake Tahoe roads to the California Base area, the Dischargers shall keep a daily log and report a monthly summary of the following to Brandy Thompson for Quarterly reporting to LRWQCB:

the following to Drundy Thompson for Quarterly reporting to Driving 2021.	
Month and Year: August 2015 Reporter: Ryan Smith	
Location Name: Heavenly California Base and City of South Lake Tahoe Roads Total Monthly Application: 0 lbs Total Monthly Recovery: 0 lbs Location of Disposal Facilities: Carson Landfill (by Tahoe Refuse)	
Ryan Smith Employee Signature Supervisor Signature	

HEAVENLY SKI RESORT DEICERS and ABRASIVES <u>APPLICATION</u> (MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)

DAILY LOG

MONTH/YEAR	R: <u>August 2015</u>			
LOCATION NA	AME: California Main Lodge			
roadways, Heav		e following daily use for we	control agents on parking lots and ekly submittal to supervisors and to LRWQCB:	
	ower Lot oad (Wildwood above Saddle) ildwood – Needle Peak Run er an Way	Material Codes C – Cinders NaCl - Salt S - Sand Other – Describe	::	
Date/Time	Quantity (lbs)	Location Code	Type of Material	
	- - -			
Total Monthly	APPLICATION Heavenly (1	bs?) cinders 0 salt 0 sand	l other	
Total Monthly	APPLICATION in CSLT (lb	os?) cinders 0 salt 0 sand_	other	
Submit Weekly	y to Supervisor. Time	period covered <u>8/1/15</u>	to 8/31/15	
	ith 09/09/2015			
Employee Signature/DATE Supervisor Signature/DATE				

CHECKLIST FOR OPERATION AND MAINTENANCE INSPECTION RECORD

Date of Inspection:	09/09/15
Name of Inpector:	Ryan Smith
System/Structure Inspected:	Wildwood Culvert

Name of Area: California Base Lodge Parking Lot

	Comments			
Structure ID	and			Required
or Location	Observations	Acceptable	Unacceptable	maintenance
	Clear &			
Wildwood	Opening			
Culvert	Swept	Χ		None

Structure ID				Required
or Location	Observations	Acceptable	Unacceptable	maintenance
	Clear &			
Wildwood	Opening			
Culvert	Swept	Χ		None
	·			

HEAVENLY SKI RESORT CALIFORNIA PARKING LOT, LODGE and ROADS MONITORING CHECKLIST ONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)

(MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)					
Date:	August 2015	Inspector:		Ryan	Smith_
at least on		gnificant storm event	s . Turr	in Ch	lge, and associated roads , ecklists to Supervisor for CB.
We	re any of the following ob	served?	Yes	No	Comments
a. <u>Drop Inlet</u>	ts (CA Parking Lot and	Roads)			Describe Problems, Locations and Corrective Actions
1) Clogged	I by debris, ice, or sedime	ent?		Х	
2) Runoff n	movement into the infiltra	tion gallery?		Х	
3) Damage	ed by vehicles or snow pl	ow?		Х	
,	Collection System (CA				Describe Problems, Locations and Corrective Actions
1) Clogged	I by debris, ice, or sedime	ent?	X	V	Near the base of the ramp drain is slow.
	ent of water through pipes nances impeded?	s, channels,		X	Near the base of the ramp. Cruz construction is scheduled to rebuild drain to correct problem.
3) Drainage	e collection system dama	aged?		X	
	ate energy dissipation?			Х	
c. <u>Sediment</u> Roads)	Traps and Vaults (CA F	arking Lot and			Describe Problem and Corrective Actions
1) Sedimen	nt accumulated in each challeries? If yes, estimate			Х	Sediment trap at wildwood gate cleaned out 7/7/15
Traps an cleaning.	nd Vaults recently cleaned	d? List date of last		Х	Scheduled for this month.
3) Presence	e of sheen, foam, trash o	r scum?		X	
	control (CA Parking Lot, nce Shops)	Lodges, and			Please Note Locations and Corrective Actions
1) Vegetati	ion appears unhealthy?			Х	
2) Gully or	rill erosion on slopes?			Х	
3) Sedimer	nt buildup at toes of slope	es?		Х	

Χ

4) Vegetation damaged by vehicles or heavy foot traffic?

c. Culvert Outlet (west of Wildwood Avenue)	
1) Inadequate energy dissipation?	X
2) Trash or debris needs to be removed from drainage way?	x
e. <u>Upstream Drainage Diversion</u> (Located on Perfect Ride Run)	
1) Structures not in place?	X
2) Structures not operational?	X
f. Spilled Chemicals, Paints, Fuels, Sealants, Oils, Greases, Antifreeze, etc? (All locations)	X
g. Sediment/Sand Buildup in CA Parking Lot?	X
h. Grease Interceptor Not Operating Properly? (CA Base Lodge)	X
Documentation of resulting actions and dates problem	ns corrected:

-2-

N/A: Not applicable

INSPECTION PURPOSE AND GOALS:

The purpose of the inspection is to identify actual or potential erosion and surface runoff on the project site and to identify BMP maintenance needs so that corrective measures may be immediately undertaken.

Any erosion, surface runoff problems, wastewater disposal problems, or other adverse conditions, which are found on the subject property, shall be clearly described and the corrective measures proposed by the Dischargers (Heavenly) shall be included in the quarterly monitoring report. In the event that no such problems are found on the property, a statement certifying this condition must be included for each monthly inspection.

PLEASE ADD ADDITIONAL INFORMATION IF NECESSARY AND ATTACH PHOTO DOCUMENTATION

Contact Brandy Travers at 775-586-2314 or btravers@vailresorts.com with any questions/concerns.

HEAVENLY SKI RESORT SNOW CONDITIONING and SNOW ENHANCEMENT Water Year 2015	(MONITORING AND REPORTING PROGRAM NO2003- 0032A2)	If snow-conditioning or snowmaking enhancement chemicals or other additives are used on ski slopes (including tubing runs, halfpipes, jumps, other terrain parks, and ski race areas), a daily log of the following information shall be kept and reported to supervisors on a weekly basis and to the USDA Forest Service on a monthly basis for input into Quarterly reporting to LRWQCB:
LOCATION: <u>Heavenly Ski Resort</u>	California Main Lodge	
Department: Base Operations Reporter: Ryan Smith Type of Materials Applied "Sno Plow Ice melt" Approximate Acreage: 1 ACRE)		
Date	Pounds used	ACRES
August	0.00	
Total	0.00	0.00

Employee sign off, Ryan Smith

HEAVENLY SKI RESORT

DEICERS and ABARSIVES APPLICATION and RECOVERY

Monthly Summary Report

(MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)

Quantity of ice control agents and abrasives used on Heavenly property and on CSLT streets. When the Dischargers apply deicers and/or abrasives on parking lots, base facilities, private roads, or City of South Lake Tahoe roads to the California Base area, the Dischargers shall keep a daily log and report a monthly summary of the following to Brandy Thompson for Quarterly reporting to LRWQCB:

g a significant part of the si	
Month and Year: September 2015 Reporter: Ryan Smith	h
Location Name: Heavenly California Base and City of So Total Monthly Application: 0 lbs Total Monthly Recovery: 0 lbs Location of Disposal Facilities: Carson Landfill (by Tahoe	
Ryan Smith	Sumania an Sian atum
Employee Signature	Supervisor Signature

HEAVENLY SKI RESORT DEICERS and ABRASIVES <u>APPLICATION</u> (MONITORING AND REPORTING PROGRAM NO.R6T-2003-0032)

DAILY LOG

MONTH/YEAR	R: September 2015		
LOCATION NA	AME: California Main Lodge		
roadways, Heav		e following daily use for we	ontrol agents on parking lots and ekly submittal to supervisors and to LRWQCB:
	ower Lot oad (Wildwood above Saddle) ildwood – Needle Peak Run er an Way	Material Codes C – Cinders NaCl - Salt S - Sand Other – Describe	:
Date/Time	Quantity (lbs)	Location Code	Type of Material
	- - -		
Total Monthly	APPLICATION Heavenly (I	bs?) cinders 0 salt 0 sand	l other
Total Monthly	APPLICATION in CSLT (II	os?) cinders 0 salt 0 sand_	other
Submit Weekly	y to Supervisor. Time	period covered9/1/15	to 6/30/15
	ith 10/09/2015		
Employee Sign	ature/DATE	Supervisor Si	gnature/DATE

CHECKLIST FOR OPERATION AND MAINTENANCE INSPECTION RECORD

Date of Inspection:	10/07/15
Name of Inpector:	Ryan Smith
System/Structure Inspected:	Wildwood Culvert

Name of Area: California Base Lodge Parking Lot

	Comments			
Structure ID	and			Required
or Location	Observations	Acceptable	Unacceptable	maintenance
	Clear &			
Wildwood	Opening			
Culvert	Swept	Х		None

HEAVENLY SKI RESORT CALIFORNIA PARKING LOT, LODGE and ROADS MONITORING CHECKLIST DNITORING AND REPORTING PROGRAM NO.R6T-2003-0032

	(MONITORING AND REF	PORTING PROGE	RAM	IO.R6	T-2003-0032)
Date:	September 2015	Inspector:	:		Ryan Smith
at least on	he following inspection at the C ce monthly and after significate Brandy Thompson for input in	ant storm events	. Turn	in Che	ecklists to Supervisor for
We	re any of the following observe	d?	Yes	No	Comments
a Dran Inla	to (CA Parking Lat and Paad	٥)			Describe Problems, Locations and Corrective Actions
a. <u>Drop Inle</u>	ts (CA Parking Lot and Roads	>)		Х	Clean Harbors completing
1) Clogged	by debris, ice, or sediment?			^	vacuuming all Vaults on 9/28
, 55	movement into the infiltration ga	allery?		Х	<u> </u>
,	S	ĺ		Χ	
3) Damage	ed by vehicles or snow plow?				
b. <u>Drainage</u>	Collection System (CA Parki	ng Lot, Roads)			Describe Problems, Locations and Corrective Actions
				Х	Swept 9/13
 Clogged 	by debris, ice, or sediment?				•
	ent of water through pipes, char nances impeded?	nnels,		Х	10/8 completion of imporved French Drain and DI
and appunte	nances impeded:	-		Χ	
3) Drainag	e collection system damaged?				
4) Inadegu	ate energy dissipation?			Χ	
c. <u>Sediment</u> Roads)	Traps and Vaults (CA Parkin	g Lot and			Describe Problem and Corrective Actions
	nt accumulated in each chambe alleries? If yes , estimate depth			Х	Sediment trap at wildwood gate cleaned out 7/7/15
_	nd Vaults recently cleaned? List			Х	9/28/2015
•	e of sheen, foam, trash or scun	1?		Х	
	c <u>ontrol</u> (CA Parking Lot, Lodg nce Shops)	es, and			Please Note Locations and Corrective Actions
1) Vegetat	ion appears unhealthy?			Х	
2) Culls an	rill arasian an alanaa?			V	
2) Gully or	rill erosion on slopes?	-		X	

Χ

4) Vegetation damaged by vehicles or heavy foot traffic?

3) Sediment buildup at toes of slopes?

c. Culvert Outlet (west of Wildwood Avenue)		
Inadequate energy dissipation?	X	
Trash or debris needs to be removed from drainage way?	Х	Cleared 10/7/2015
e. <u>Upstream Drainage Diversion (</u> Located on Perfect Ride Run)		
Structures not in place?	X	
2) Structures not operational?	X	
f. Spilled Chemicals, Paints, Fuels, Sealants, Oils, Greases, Antifreeze, etc? (All locations)	X	
g. Sediment/Sand Buildup in CA Parking Lot?	Х	
h. <u>Grease Interceptor Not Operating Properly?</u> (CA Base Lodge)	X	
Documentation of resulting actions and dates problem	ns corrected	:

-2-

N/A: Not applicable

INSPECTION PURPOSE AND GOALS:

The purpose of the inspection is to identify actual or potential erosion and surface runoff on the project site and to identify BMP maintenance needs so that corrective measures may be immediately undertaken.

Any erosion, surface runoff problems, wastewater disposal problems, or other adverse conditions, which are found on the subject property, shall be clearly described and the corrective measures proposed by the Dischargers (Heavenly) shall be included in the quarterly monitoring report. In the event that no such problems are found on the property, a statement certifying this condition must be included for each monthly inspection.

PLEASE ADD ADDITIONAL INFORMATION IF NECESSARY AND ATTACH PHOTO DOCUMENTATION

Contact Brandy Travers at 775-586-2314 or btravers@vailresorts.com with any questions/concerns.

-		
HEAVENLY SKI RESORT SNOW CONDITIONING and SNOW ENHANCEMENT Water Year 2015	(MONITORING AND REPORTING PROGRAM NO2003- 0032A2)	If snow-conditioning or snowmaking enhancement chemicals or other additives are used on ski slopes (including tubing runs, half-pipes, jumps, other terrain parks, and ski race areas), a daily log of the following information shall be kept and reported to supervisors on a weekly basis and to the USDA Forest Service on a monthly basis for input into Quarterly reporting to LRWQCB:
LOCATION: <u>Heavenly Ski Resort</u>	California Main Lodge	
Department: Base Operations Reporter: Ryan Smith Type of Materials Applied "Sno Plow Ice melt" Approximate Acreage: 1 ACRE)		
Date	Pounds used	ACRES
September	0.00	
'		
Total	0.00	0.00

Employee sign off, Ryan Smith

Pacific Stormwater Solutions,LLC

P.O. Box 12246 Santa Rosa, Ca. 95406

Phone: 707.544.5012 - www.pacstorm.com

Stormwater Inspection Report 2015



Project Name:	Heavenly Ski Resort	Weather Conditions:	Clea	
Project Address:	1504 Wildwood Ave, South Lake Tahoe	Number of BMPs Inspected:	Four (4)	
Inspection Date:	6/4/2015	Number of Pages:	Fou	

REPORT INDEX

This report contains information regarding the results of inspection of BMP(s) for the above referenced project.

The following information is provided for each BMP inspected:

BMP Type
Product Name (if applicable)
Inspection Date
Date of Last Inspection (or install date if not previously inspected)
BMP& Site Description
BMP Condition
Pollutant Load Description

Additional Observations/Comments
BMP Photos (as appropriate)
Recommended Actions

Based on the results of the inspection it is recommended that:
No further action is required at this time. Next inspection should be performed prior to:
Cleaning of system(s) recommended. Review page two & Three.

Pacific Stormwater Inspection Report

Page 2

INSPECTION	RESULTS		
GPS Coordinates:	See sheet 3 & 4	Model & Size:	
Unit location:	Parking lot/Wildwood		
Vault		StormFilter	
Manhole]	StormGate	
Catchbasin]	HDS	
Date installed / Last Service:	Nov-12	Media	ZPG
Sediment Depth - Cart bay:	See sheet 3 & 4	Cart #	See photos
Sediment Depth - Forebay:	See sheet 3 & 4	Other	
Water Depth:	See Sheet 3 & 4	Site Contact	Tom Fortune
Excessive Oil:	No		
Internal Condition of unit:	Internal components appe	ear in good condition	
	INSPEC	TION SUMMARY	
Systems appear to be workin time.	ig properly. Maintenance r	ecommended on three of t	he four systems on this report at this
This certifies the information accepted industry procedures		accurate and was detailed	using
Inspector's Name: Gor	don Clem	Company: Pacific Storm	nwater BMP Solutions,LLC
Signature: Morson	Elem	Date:	7/28/2015
Title/Qualifications: CPS	SWQ		

Inspection Report

Pacific Stormwater

Project Name: Heavenly Ski Resort Page 3

ATTACHMENT:

System Number: #3 & #9

(list site designation if available)







Unit #3 - 7 Phosphorous Cart MH

6" Sediment/21" water

Maintenance recommended due to high water level







Unit #9 - 7 Phosphorous Cart MH

4" Sediment/Impacted media

Maintenance recommended- see note below

Notes: Unit #3# maintenance recommended due styrofoam cup blocking influent pipe. Unclogged pipe and water drained very slow through filter. Unit #9 Maintenance is recommended due to high scumline above top of filters.

Project Name: Heavenly Ski Resort Page 4

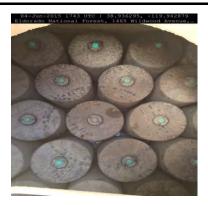
ATTACHMENT:

System Number: Wildwood Ave unit & Unit #4

(list site designation if available)







Wildwood Ave Unit - 42 ZPG Cart vault

Maintenance recommended





12" Sediment/Carts spent



#4 unit - 114 ZPG cartridge vault

Maintenance not recommended

less than .5" sediment. Media loose and unimpacted.

Notes: Wildwood Ave unit requires maintenance due to very high scum line and excessive sediment. Unit #4 maintenance is not recommended due to -.5" of sediment and thin scum line partially up filters. Suspect minimal sediment due to cup blocking unit #3

Heavenly Mountain Resort Water Year 2015

APPENDIX E EROSION CONTROL & FACILITIES MAINTENANCE MONITORING



Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
A.	7-19 & 7-22-15	Frank P.	Powderbowl vegetation treatment area and Pioneer Poma restorations sites form 2012 and 2013 look really good. Sprinklers in place on Pioneer Poma, and 277 Sewer Line restoration areas, but are not being used. No irrigation was used at these 2 sites in 2015. Large double rill observed at 277 Sewer line restoration site in July 2015 between 277 road and TOT road, Infiltration/vegated swale and wood chips restoration (Full Hogan) put in place, and rills were fully repaired in late September 2015. Work Completed on October 2 nd , 2015	Full Hogan Restoration at the Top of Patsy's Chair. 23 pounds of seed, and 53 pounds of Biolsol incorporated into soil. 10+ Cu Yards of Pine Chips, and 3+ Cu Yards of Pine Needles used at this site.	Project completed, and stable even after significant rain events in Early-Mid October.
В.	N/A	Frank P.	All 12", 24", and 36" culverts inspected were clear and free of any obstructions on 6/26/15 when annually inspected.	None	

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
C.	9-14-15	Frank P.	Designated roadways are being used by employee vehicles and 3 rd party vendors. Rope corridors will remain in place until early October 2015	N/A	
D.	9-14-15	Frank P.	Rope closures are in place, on most of the roadway corridors, delineating the roads. Irrigation equipment is also in place at a number of key areas. Irrigation equipment is not being used at Lower Cat track, or Maggie's corner in 2015, TOG (Tamarack Lodge) grasses are being irrigated less often than in past summer.	N/A	
E.	9-30-15	Frank P.	Energy dissipaters on culverts in good shape	N/A	
F.	9-30-15	Frank P.	Sediment Basins have adequate capacity in most areas.	N/A	

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
Н.	9-30-15	Frank P.	Rip Rap at various locations on the mountain in great shape. No failures to speak of. New Rip Rap installed below 3 main Water Bars on Hellwinkles on 10-1-15	New Rip Rap installed, High Priority Hotspot in CA-1	
1.	9-14-15	Frank P.	Lower water Bars on Double Down and Liz's completed on 9/10-9/13/2015 for the maintenance and restoration projects as part of the EIS high priority hot spots projects in Sky Basin.	Full restoration in these two Water Bars complete. Now we have vegetated swales in place instead of an erosive water bar that convey water.	
J.	9-30-15	Frank P	All Infrastructure lines on the mountain performing properly. No failures reported or observed at this time	N/A	

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
K.	9-30-15	Frank P.	No unprotected stockpiles of soils or materials observed on the mountain this summer. Wattles in place at the base of stockpiles of gravel and dirt. Most stockpiles have been utilized by September 30 th , 2015	N/A	
L.	9-14-15	Frank P.	Infiltration trenches functioning properly	N/A	
M.	9-30-15	Frank P.	Gullies and rills on slopes and roadways not an issue at this time. After any major rain events our maintenance Crew's addressed and reported problems right away, especially on the maintenance roads.	N/A	

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
N	9-30-15	Frank P.	CML Storm vaults filter replacements are scheduled with Pacific Stormwater BMP Solutions for mid Sept 2015. Clean Harbors is Scheduled to conduct DI maintenance and sediment removal in the CML parking lot drains in early Sept. 2015 as well. Clean harbors does maintenance in advance of the CML Vaults Cartridge replacements	Scheduled 3 rd party vendors to complete the routine maintenance at the storm vaults and Drop Inlets at the California Parking Lot. It is now completed September 2015	

- A. Re-vegetated Areas
- B. Erosion at Culverts and Drainage Crossing (all culverts > 36" should be inspected annually at a minimum)
- C. Designated Roadways
- D. Closures and use controls on closed roadways
- E. Energy Dissipaters on culverts
- F. Sediment basins/irrigation ponds
- G. Rock-Lined Channels
- H. Mechanical stabilization measures (i.e. Riprap and gabions)
- I. Degraded Water Bars
- J. Erosion from Water Supply, sewer, snowmaking, irrigation pipes and holding tanks
- K. Unprotected soil piles
- L. Infiltration trenches
- M. Gully/Rill erosion on slopes
- N. Other erosion control and storm water runoff facilities

Water Year 2015 4th Quarter (July, Aug., Sept.)

Powder bowl Treatment area, 6-26-15: No Irrigation applied or needed in 2015



View of Pioneer-Poma Treatment from the Tram Road, Upper Vehicles Shop in foreground, 6-26-15:



Page 1 of 8

Pioneer-Poma Restoration area 6-27-14, Vegetation is visible and growing:



Pioneer-Poma Restoration area 7-29-15, Vegetation is flourishing. June/July rains are helping to reduce any need for irrigation in 2015. Vegetation is well established now over 18 months after project started.



Double Down Lower Run before Treatment 7-29-15:



Double Down Lower after Full Restoration Treatment. 2 full run width Pine Needle Filter Berms above Infitration/Vegetated Swale.



Double Down Lower Infiltration Swale Completed September 2^{nd} . 2015



Clean Harbors DI Cleaning California Parking Lot, Late September 2015:



Finished Wood Chip Mulch on Maggies Shoulders Sept. 30th, 2015:





Page 5 of 8

Hellwinkles Fall 2015 Restoration work:



Sky Meadows Restorations of High Priority Hotspots:



Lower Liz's Full Hogan restoration with Shred Vac from IERS. We rented this unit for 2 week in 2015:



Heavenly Mountain Resort Hellwinkle's Road Segment Photos



Riprap armoring below waterbar outlet





Pine needle wattle and riprap below waterbar outlet



Second layer of wattle protection below riprap outlet



Pine needle wattles, added riprap below waterbar outlet



Additional pine needle wattle added below riprap

Heavenly Mountain Resort Water Year 2015

APPENDIX F FACILITIES & WATERSHED AWARENESS LETTER





June 8, 2015

Mr. Bud Amorfini Environmental Scientist State of California Regional Water Control Board Lahontan Region 2501 Lake Tahoe Blvd South Lake Tahoe, CA 96150

Dear Mr. Amorfini:

HEAVENLY SKI RESORT UPDATED WASTE DISCHARGE REQUIREMENTS BOARD ORDER NO. R6T-2003, WDID NO. 6A090033000-VERIFICATION OF FACILITIES AND WATERSHED AWARENESS TRAINING

This letter verifies the 2015 Facilities and Watershed Awareness training that was held at Heavenly Mountain Resort on May 28, 2015. A copy of the agenda and attendance list is attached.

Thank you for attending the meeting and speaking on behalf of your organization. Please contact me at 775.586.2313 if you have any further questions or comments.

Sincerely,

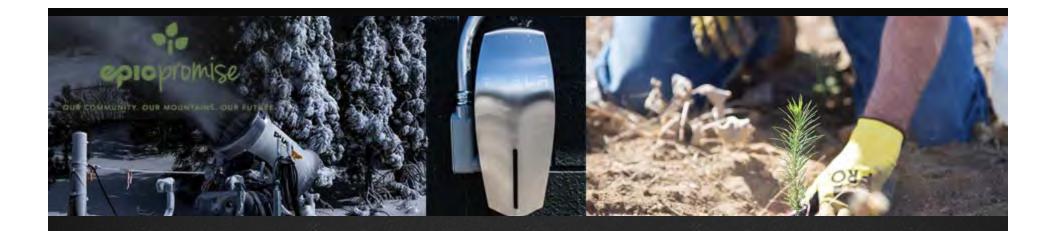
Andrew Strain

Vice President of Planning and Governmental Affairs

/bt

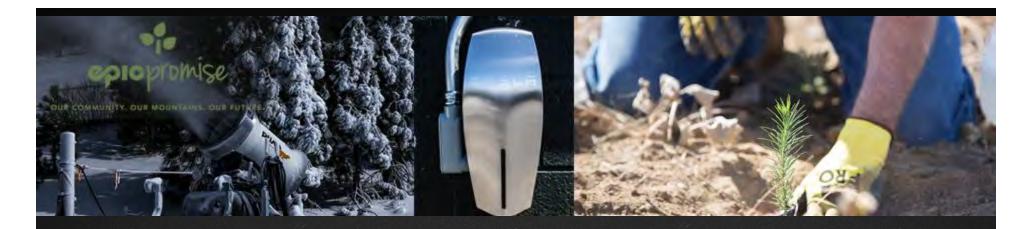
Enclosures

cc: Jonathan Cook-Fisher, USDA Forest Service Lake Tahoe Basin Management Unit



2015 Facilities & Watershed Awareness Training

May 28, 2015



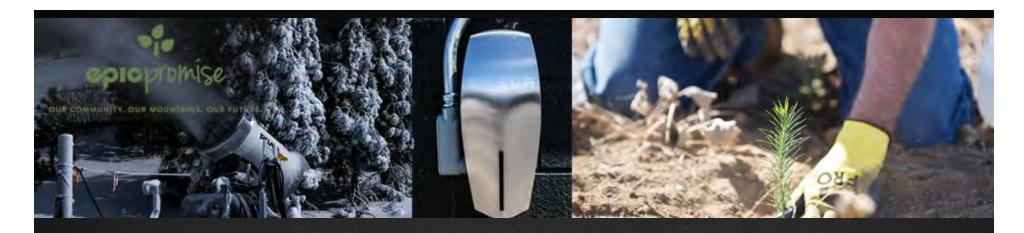
Purpose/Agenda

- Review Heavenly's Watershed Protection Commitment
 & Your Role
- Review the Summer Rules of the Road
- Meet Our Agency Partners
- Provide Contractor Awareness
- Review Wildland Fire Awareness & Response Procedures



Our Commitment

- USDA Forest Service: Our partner in outdoor recreation & resource management
- Tahoe Regional Planning Agency: The Master Plan, Mitigation & Monitoring, Project Permit Conditions
- State of California Regional Water Quality Control Board, Lahontan Region: Waste Discharge Requirements (WDRs)
- Ourselves: Do Right and Do Good



Agency Partners

- TRPA-Sarah Jones (BMP's) and David Landry (Sr. Planner)
- Lahontan-Bud Amorfini (Engineering Geologist)
- Consultant- Kristen Roaldson (BMP's 3rd Party Inspector, w/ RCI)
- LTBMU Forest Service



Major Erosion Control & BMP Project Locations

- CA Road Shoulders below Cal Dam
- Stabilize and improve erosion resistance on road shoulders treatments-rip and chip, seed, fertilize. Fix water bars,
 - New pine needle wattles at end of water bars have been effective
 - Sky Meadows Erosion Hotspots
 - ·Sky chute, Double Down lower, Behind Lower Canyon Lift House 20 Projects
 - Adventure Peak/Summer Activities
 - Coaster, Climbing Wall, Tubing Lift Modifications, and roadway work, Mid
 Station Canopy Tours
 - Big Dipper and Orions Ski trails treatments
 - Maintain effectiveness of ski run BMP's, including water bars and revegetation/cover.



Pioneer/Poma prior to treatment

Pioneer/Poma after treatment







Recent Restorations

Nearing completion of this nearly 34 acre site 2013



Finished Project Grasses growing in summer 2014





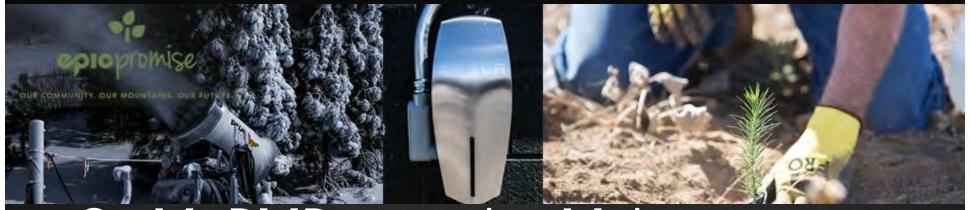
Powderbowl Restoration Site-

In 2012 prior to treatment



In late 2014 after treatment

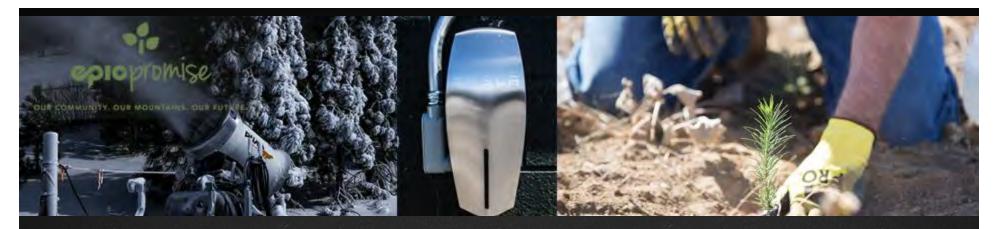




On Mt BMP's ongoing Maintenance Infiltration basin 2012 Infiltration basin 2013

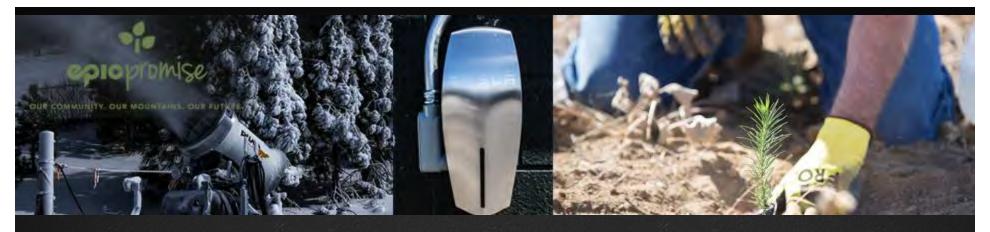






More BMP Project Locations

- TOG Drainage
- Top Of Aries Ski Run-Chips and Needle cover below top of Comet Lift
- Hellwinkles Bottom section-Inslope road from last water bar down, to a new drop basin
- Facility Specific BMP Maintenance- Canyon Express Lift Operators Booth, Sky Meadows BMP's, ropes, and delineation near the restroom

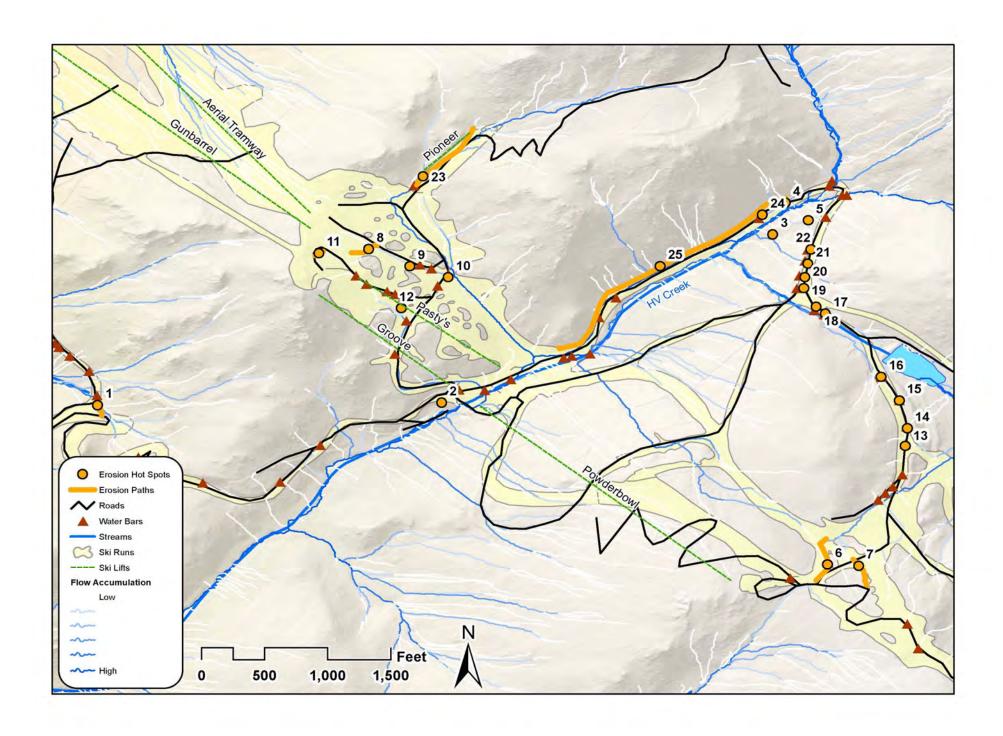


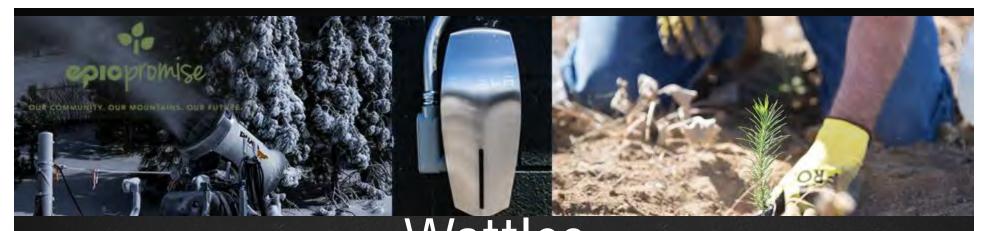
Maggies Pits Vacuumed out in October 2014



After picture highlights the improvement in sediment capacity



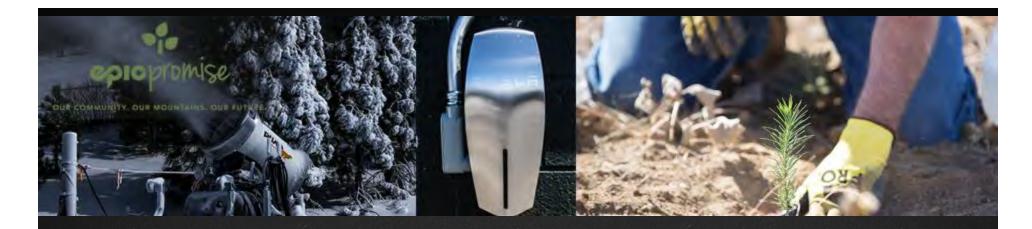




Wattles
Straw wattle with silt fence Pine Needle Wattle



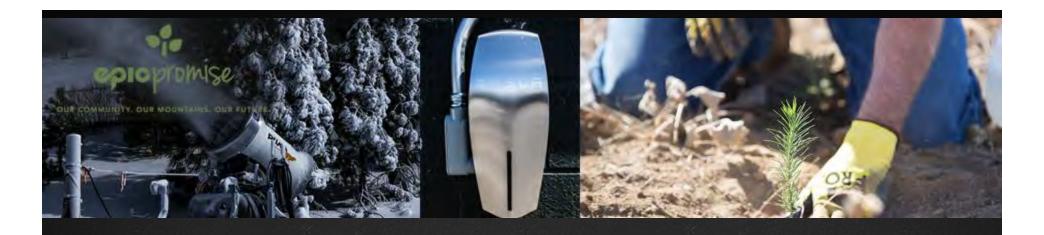




Implemented and effective?



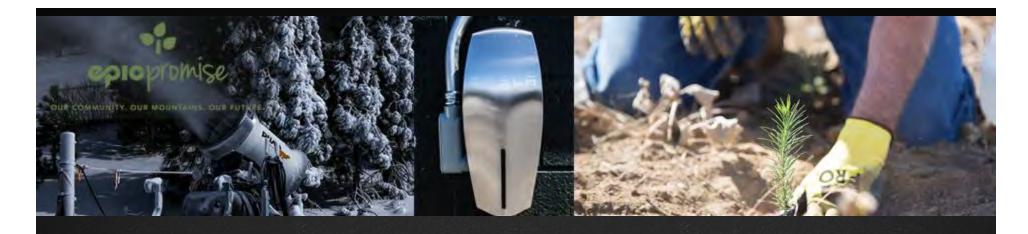




Implemented and effective?







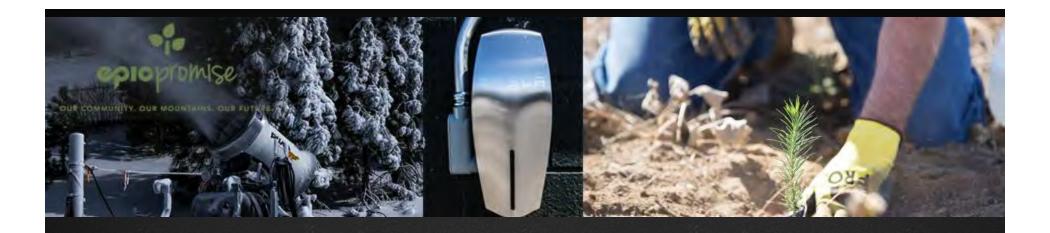
CML Storm Filters

Over 200 filters replaced in 2014

Full cartridge replacement of all 456 filter since installation in 2008, completed in 2014







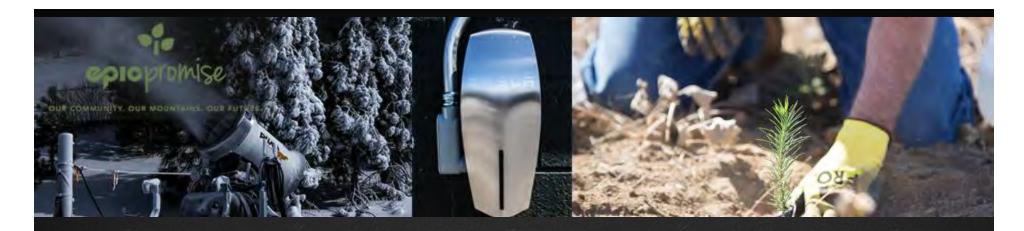
CML Storm Filters continued

Dozens of cubic yards of spend filter media and sediment removed in 2014

Sacrificial filters before being replaced with 14 new phosphorus filter media, which is showing positive improvements in WQ







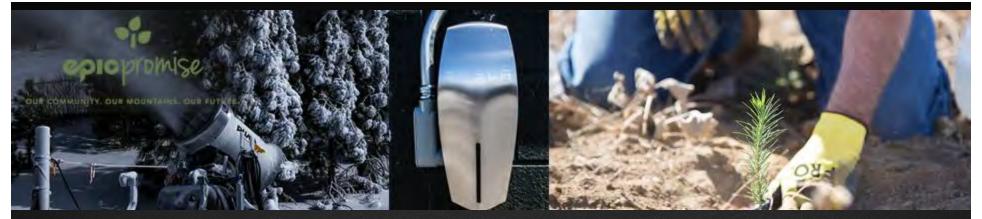
Tahoe Draba

Interpretive Signage at Top of Tamarack Express



Photo of a plant from Heavenly





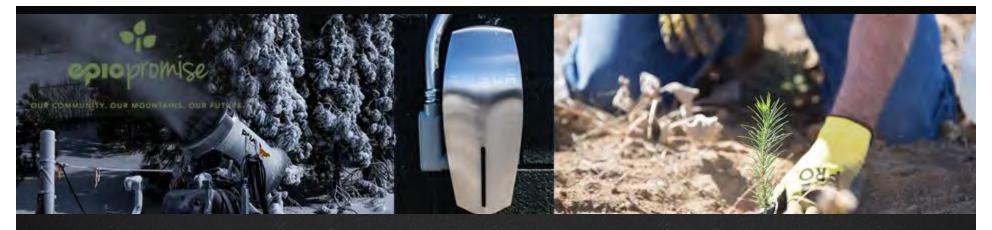
Protect Tahoe Draba Populations

Full grown plants



Draba like to grow in disturbed areas, under drip lines of rocks





Invasive Weeds are known to exist on top of Heavenly Mountain. Siting and treatments by the FS have occurred the last few summers. Top of Tamarack Lift

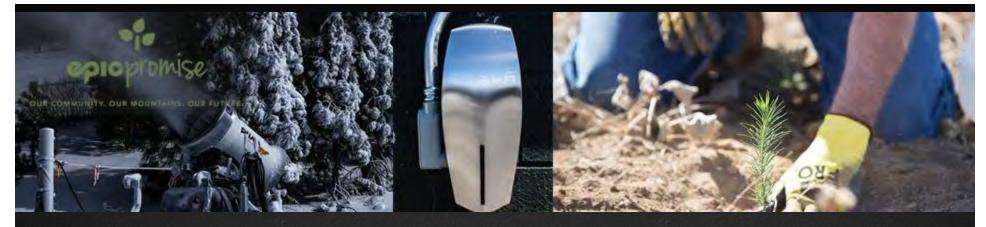
<u>Tall Whitetop Identification</u>: Tall whitetop (also called perennial pepperweed) has many stems. It reproduces from rhizomes (root-like under-ground stems) and from seed. In Truckee, this species is common in many of the round-abouts, as well as, low, wet areas.



Tall Whitetop showing root connection



Tall Whitetop in flower



Bull Thistle

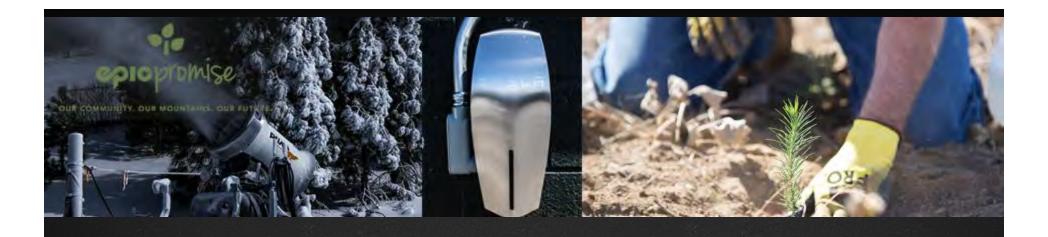


Bull Thistle flower

Canada Thistle



Canada Thistle flowers are smaller than most other thistle flowers



Pine Needle Wattle Initiative

Manufacturing by trails crew began in 2013!



On mountain use for erosion control, in 2014 over 600 Ft built





Pine Needle Wattles

Pine Needle Wattles installed near Heavenly Valley Creek Fall 2013

Pine needle wattles a success in 2014, after large precipitation events







Important takeaways for you to ponder, with regard to BMP's:

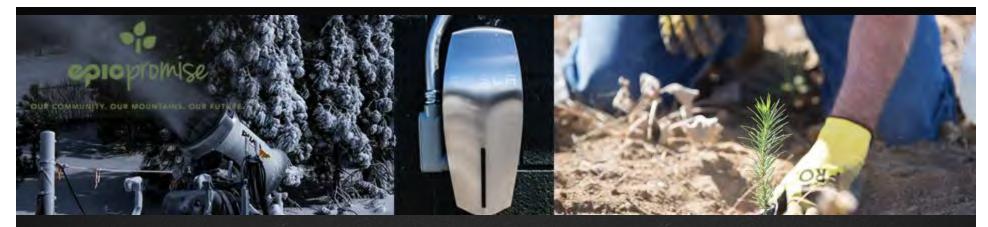
- Is it working? (rather than "are we in trouble?")
- Source control we're trying to stop the "bleeding" at the source rather than chasing it downstream.
- Water flow its all connected
- Prioritization address the highest risk spot first (e/g/ nearest to creek, most erosive, Problem spots, etc)



Keep Your Eyes Open During & Immediately After Rain and Thunderstorms (Listen to Level 1-4 from Dispatch on Radio)
These Are the "Events" That Can Cause Environmental Damage If You See Damage Occurring Call Dispatch on the Radio Immediately

This includes the Base Areas, particularly Cal Base





Summer Rules of the Road

- Drive on the Designated Roads only
- Park only within Roped Designated Parking Areas
- If you feel that you can't do your job because of this, tell your supervisor FIRST before driving into any closed areas
- If you see someone not complying, tell them about it IT IS UP TO US
- Just because you drive an ATV/Rhino does not mean you can drive onto a ski slope or on a decommissioned road or any trails
- When accessing the mountain all vehicles MUST be in 4WD to prevent erosion on the roads, and stay at or below 10 mph. Be especially aware of Fugitive Dust

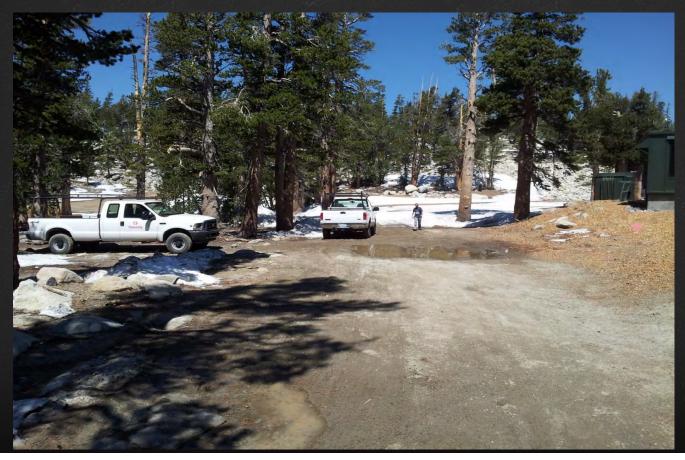


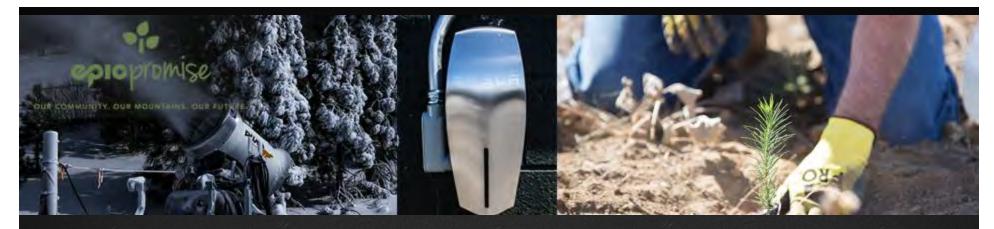
More Summer Rules of the Road

- Stay out of erosion control projects & stream zone restoration sites
- Report anything that looks like an obvious erosion or sediment problem to your supervisor.
- All outside contractors and vendors must have a Mountain Access Permit issued by the Dispatch Dept.
- Prior to accessing the mountain roads anyone from outside of the Tahoe Basin will need to spray the bottom of their vehicle to prevent the spread of noxious weeds
- If you don't see a mountain access permit, stop them & ask to see their permit. Even if you see Utility trucks Like SW Gas or Liberty, ask to see their permit. If no Permit Send them down to Dispatch.



Summer Rules of the Road





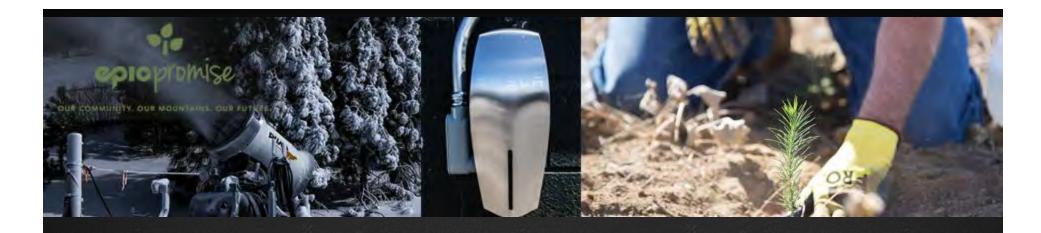
New Water Quality Program

- Best Practice initiative that is company wide
- Using Northstar as a Model
- CA Resorts do a great job of managing storm water and implementing BMP's
- CO is using us as a template to initiate their new program
- New Rain Shut Down Process



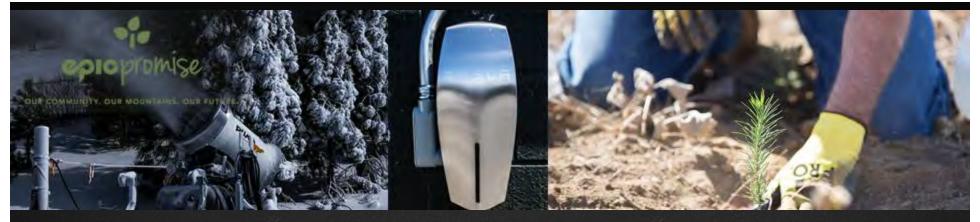
New Rain Shut Down Process

- Weather Forecast and Construction Activity Guidelines
- The weather forecast should be checked daily on the NOAA forecast:
- www.noaa.gov (South Lake Tahoe, CA)
- Days with 10% 49% Chance of Rain or a Chance of Thunderstorms – Tier 1, Be prepared to Shut-Down active construction sites w/in 1 Hour
- Days with 50% or More Chance of Rain Tier 2, Be prepared to Shut-Down Site immediately.



Construction Rain Shut Down Process

- Know the Weather Forecast
- Listen closely to the radio
- Grading Operations and Exposed Soils—Pay attention to
- Stockpile BMP's supplies-KGID, Boulder, & Deicer Storage Area
- Vehicle Access-open and closed roads
- BMP Inspections Pre & Post Storm—Take Pictures!



Heavenly Earthwork Notification Form



Earthwork Project Notification

Project Name

Date

Project Manager Project Location

Approximate Area of Disturbance (sq. ft.)

Project Start and Estimated Completion Date

Regulatory Plans & Permit Needs: LISES TRPA

Regulatory Plans & Permit Needs: USFS, TRP

Lahotan, 404/401

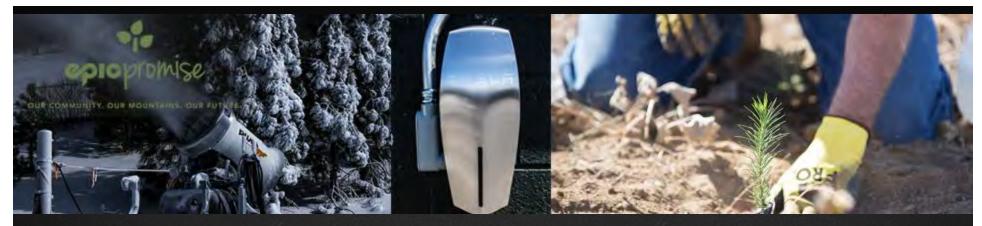
Utilities Located (Yes / No) Sensitive Resources On Site (i.e., Wetlands)

Attached Site Plan (Yes / No)

Any projects that disturb the ground in any form and utilize equipment for the process are required to submit this form to Environmental for review prior to construction.

Re-Vegetation Plan

Note



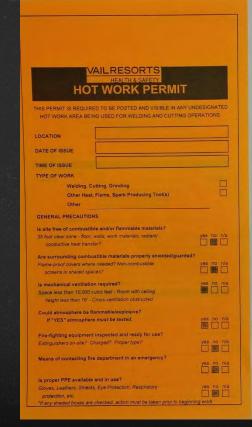
Heavenly Hot Work Permit

Required for any hot work outside of a designated weld shop.

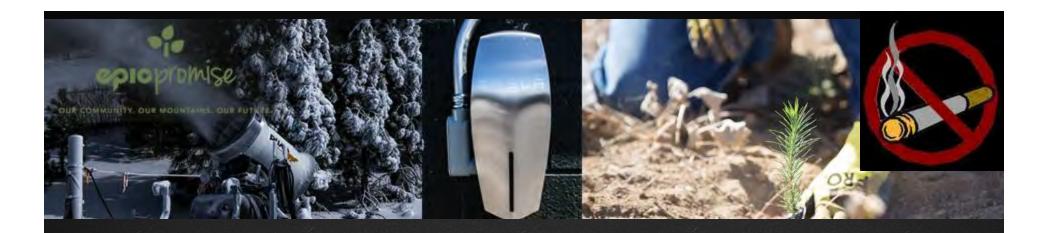
Know the PAL code for the day.

Issued by James Grant, Barrett Burghard, Curtis Kezich.

Must be posted on site.

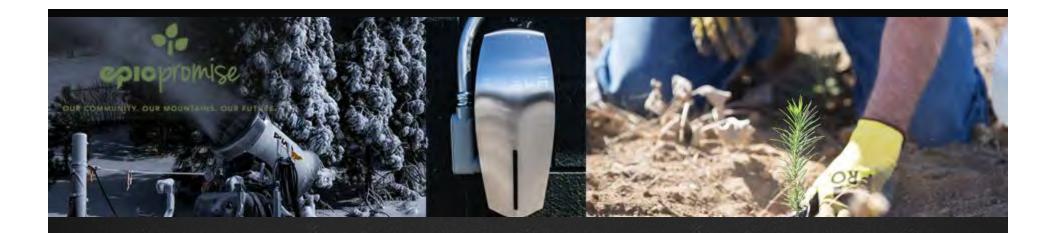


FIRE WATCH			
A TRAINED FI	RE WATCH MUST BE EMPLOY WITHIN 35' OF COMBUSTIBLE	E MATERIAL.	INS OCCUR
FIRE WAT	TCH REQUIREMENTS:		
Currer	uppression equipment on site nt (annual) training with suppress nt (annual) training in emergency in on site for 1/2 hour after opera	procedures	
10.00		ř	es no n/a
is a trained fire	watch in position?	-	
	ONFINED SPACE ? s", this is a Permit-Required C Hot Work Permit must be dis		try
	Confined Space Entry		
Precautio	ons for Hot Work in Permit-Req	uired Confined Sp	paces
Mandatory For	rced-Air Ventilation		
Historical Mon	r-Quality Monitoring itoring Data can be provided we been collected during similar	Hot Work activities,	OR
Gas Cylinders	outside of Space & secured		
Cylinders OFF	& hoses CLEARED during bre	aks	
	perations has been exam precautions have bee	n taken.	
Signature:			
Date:	Time:		



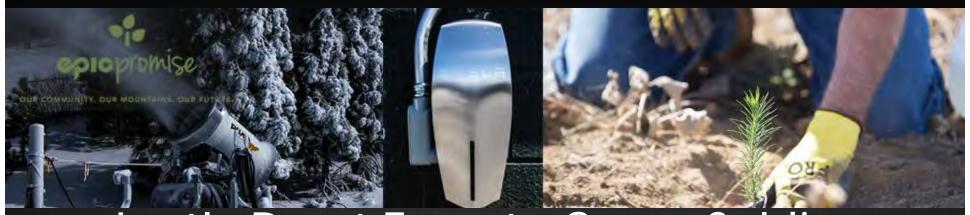
Absolutely NO SMOKING

- Due to EXTREME wild fire danger, and the ongoing Drought smoking is prohibited anywhere on the mountain at any time.
- This includes NO Smoking at any time in any company or 3rd Party vehicles.



Wildland Fire Awareness



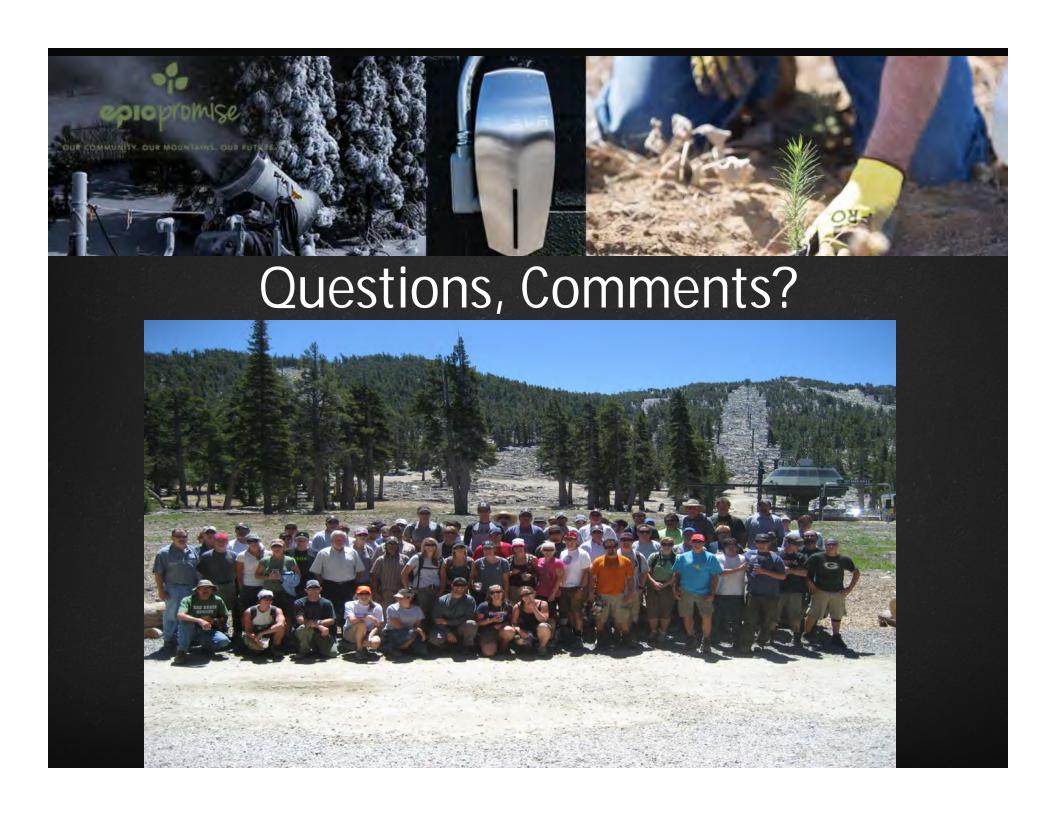


Lastly Don't Forget - Green Soldier Recognition in June and July











LEGAL FIRST NAME - PLEASE PRINT CLEARLY	LAST NAME - PLEASE PRINT CLEARLY	Employee ID	Contact- Cell or E-mail
ANDY	Noore	216827	and E Valorets
Kory	Alartin	209382	Kmartin 30 vailresorts
BRAD	LEIGH	130272	RANG.
CHUS	EGLOG	175121	CIC .
Roger	Tavaver	130274	The
ENTAR	LIZAOLA	142438	Til
Eric	Williams	194938	Silvi
Doey	Wichtman	217802	Beyle-
Brian	Cally how	131284	3
Chris	Hansen	148370	CA
Stan,	Griffin	160188	A Attor
DERYL	Poite	713256	A
Oliver	Lacey	219112	Pho
William	Brown	235234	BB
Brym	Speele	181239	n
Marc	Bugg	128604	n
Sean	Maloney	185794	501
Brian	Belser	211898	Ru
Star	Pais		12/2
James	Clancy	139283	()in la
Tyler	Lehnan	166415	Tyll
Charley	Haugher	128609	
Ryan	Sm ith	197095	20
Shenja	Lanz	130267	Ship
WAGARE	GROVER.	128648	Halle



LEGAL FIRST NAME - PLEASE PRINT CLEARLY	LAST NAME - PLEASE PRINT CLEARLY	Employee ID	Contact- Cell or E-mail
Lupe	Barricates	126889	
JACOB	Blazek	224147	
David	Hage	200421	draguavalresur.
Che .	Wighina	154102	4
Rapt	Boy man	128674	
Kyle	Henderson	154995	
JUMI	HERBST	149482	
SACK	ALLEN	206778	
MARK	LUNDBERG	128572	
DEAN	SCATEZ	153959	delater @Vailreyer
Andrew	Cabiness	217167	
Frank	Dowte	203832	1
Zec	-bogense n	154373	
/s/L	Nesson	161763	I Total
Christian	Brocherson	704061	
Ryan Albertson	Albertson	161603	
William	Ackermann .	128613	
Phil	DEMUS	128897	
Dave	Zebo	158935	DZchopua, Ireso
VIN /	VALORE	135375	
JIMI	SESVOLA	211831	
SCOTT	ADAMS	136545	
Randall	Cooper	177670	Reoper 1 @ vail
Phil .	Domaniz	175 256	
JoH Tron	Earls	131753	

Brandy

Thomson

73727



	LEGAL FIRST NAME - PLEASE PRINT CLEARLY	LAST NAME - PLEASE PRINT CLEARLY	Employee ID	Contact- Cell or E-mail
1	STEVE	MEBRIDE	128573	6958
2	McLean.	Pettia rew	203004	6262
3	Bud	Amorfini	201790	lestouteur.
4	Tames	Wilson		
5	90 hn	Fontan eti		
6	Jacob	Giusto	19843C	
7	Steve	Steele	142433	55/ee/da) 12 crosops
8	Jon	Hart	215101	har Hovailre rolts, con
9	Jesse	Plater	212568	4449
10	Hest	Reid	125026	6941
11	Michelle	Peter Lin	142376	X2400
12	Peter	Spelman	198983	×6219
13	MICHELLE	BASTIN	182938	X4430
14	Max	Hummel	148726	× 2323
5	Curtis	Kezich	128566	6271
6	JOFF	ASHLET	185130	4430
7	Steve	Kremer	129876	6940
8	Kale	Peery	Cruz Construc	
9	SIEVE	BREACE	CRUZ COUST.	
20	XFF	LOCICIPIO	155320	X4437
21	Potrick	Gicadina	145074	
22	Alyson CRAKE	Borausi.	150235	×4447
23	CRAKE	BOVAUSL: AUTRINIOCR	128596	
24	TOLI .	Hyrus	195 096	
25	GNEC	perstrys	142370	2323

Kelli J09 Trais

Gothler

128914 6941 trav8. gother@granl.wg



LEGAL FIRST NAME - PLEASE PRINT CLEARLY	LAST NAME - PLEASE PRINT CLEARLY	Employee ID	Contact- Cell or E-mail
Glen	Reed	195512	
Chris	Williams	194981	
Demiza	Garcia	128683	
ETEIC	BATES	130290	24. 71.
Miles	Becherer	229928	Mnbecherevegmall (a
Arnando	Mendose	129060	mandenender @ hetra! 1.
Barret	Burghard	128574	Il blughede Valasais
Julia	Regularen	80	requarthovail.
Lies	Kenney	216260	Thenney @ vailresu
Balbana	Tenney	234426	310.998-6694
Knistin	Roaldson.	NA	Enistina rei-nk.com
Forly	Harmon	NA	emily arci-nv.com
Rylesh:	Pannagan	NA "	xylon@rci-riv-com
Fun	Clark 0	175145	illako Vall Rosorts.can
MEKENNA	DINNELL	230353	-loTARYDY DGHAIL. COM
Gany	Rawlings	128581	
Janes	Browen	130289	j brower evalue ests: com
Sakana	Lay	233692	SRAYI PO Vail resorts, com
Chassin	ALBREWS	181262	Czaszim Damailin
KICH	M'ADON	130250	
Brandon	Swartz	178167	bawarte Quailresocts, com
Dune	Pa	182330	dpa us Dailiosoxts, co
Zane	8 Mo+2	207198	Zane@yahog.can
Emmett.	Richmand	172253	ERichmand@vailres
Andr	hard	128395	
Day.	Schompor	179885	Miller
CRIC	MEZA	147609	
Alec	G1/suod	166 409	1



	LEGAL FIRST NAME -	LAST NAME - PLEASE PRINT CLEARLY	Employee ID	Contact- Cell or E-mail
1	TOM FORTUNE		180197	tfortune@vailresuits.
2	Sostrua	Davis	226495	Socialaris1010 Sfwll200104/20 530-308-8164
3	Will		148700	Sfwillzooleyn
4	TIM	RAMOS COOLBAUGH	SIERRA VALION	530-308-8164
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6/08/15-BMP's Hands On Training 7:15am

	LEGAL FIRST NAME - PLEASE PRINT CLEARLY	LAST NAME - PLEASE PRINT CLEARLY	Employee ID
1	GRAEME	GrovER	128648
2	Bryan	Steele	181239
3	Mai	Dinnell	230353
4	Him	Griffin J.	160 188
5	Tol	Joigensen	15713
6	1.	mil-	20/290
7	Aut	Exton	212026
8	Emmet	Richmond	172253
9	Kezich	Curtis	128566
10	Ky/c.	Henderson	154998
11	JACOB	Blatek	224147
12	23410L	Cloudelin	145034
13	Bill	Ackermann	128613
14	Barnt	Burshard	128574
15	Prans	ALTRINGER	128596
16	Sean	Maloney	185794
17	6/en	Kus	195512
18	Bring	Callahan	131284
19	BrowniE		235234
20	Barch	FRRY	119344
21	Don	Abicht	128681
22	Shenga	Lanz	130269
23	Mars	Williams	194981
24	James	Wilson	20/290
25	Dave	2060	128632



6/08/15-BMP's Hands On Training 7:15am

	LEGAL FIRST NAME - PLEASE PRINT CLEARLY	LAST NAME - PLEASE PRINT CLEARLY	Employee ID
1	Jall .	HUFLES	195096
2	CRAIL	ALTRINGER	128596
3	MEZA	ERIC	147609
4	Philip @	Dongera	175256
5	Alec	Grisvold	166409
6	Zane	Motz	207198
7	Jott	Earls	131753
8	Andri	Villace	128595
9	904n	40000	193625
10	Joe	CARMICHARL	128914
11	JOSH	WESSON	161763
12	Christian	Brockerson	704061
13	Jon	Hast	215/01
14	Chris	Youan	221345
15	JACOB	Blazek	224147
16	Rick	Powers	128904
17	RUSSECL	HODGSON	141939
18	Sean	Leslies	155506
19	RYCN	Smrth	197095
20	Dan	Schembri	179885
21	Volan	VAURS	135375
22			
23			
24			
25			

Heavenly Mountain Resort Water Year 2015

APPENDIX G 2015 ANNUAL ROADWAY MAINTENACE MAPPING





January 15, 2016

Garrett Villanueva Acting Regional Trail Program Manager LTBMU Forest Service Pacific Southwest Regional Office

Re: Heavenly Mountain Resort - Road Maintenance Summer Through August 31st, 2015

13N52i-- .5 Miles of <u>Roads Improved</u> in August (From Ridge Bowl Run uphill to past the Sky Spring)
13N40A--.3 Miles of <u>Roads Maintained</u> after summer storms June/July (Road to the top of First Ride chair, WB Maintenance and fixing the native road.)

1240.1--.7 Miles, Roundabout <u>Road Maintained</u> and repaired in July and August (multiple switchbacks repaired on roundabout road, rills repaired with road base near west bowl switchback, native material roadway improved and regraded in the Cut)

13N52A--Orion's--.3 Miles, native Road Maintained native road re-graded and repaired.

13N5--Pepi's--.2 Miles, <u>Road Maintained</u> repair with road base (from the top of Northbowl Chair to 100 Dollar Saddle fuel farm area)

12N41--Groove Road--.1 mile, Road Maintained road base added to road and reconquered WB's.

13N52--Cal Dam to Sky Chute, --.2 miles, <u>Road Maintained</u> Mix of new road base surface added to existing road base, and resurfacing of native roadway. Repairs to WB's were completed.

12N41B--TOT Road repairs, --.2 miles, Road Maintained road base and WB's repaired and re-graded in June.

	-		ML1	ML2	ML3	ML4	ML5
Roads Improved	P OTEON .	7	0	.5	0	0	0
Roads Maintained			0	2	0	0	0
Roads Decommissioned			0	0	0	0	0
×							·

I have a total of 2.5 miles of Heavenly FS roads that I have estimated to have been repaired, maintained, and resurfaced in house. This occurred between May and August 2015.

Should you require additional information or have questions regarding this report and its contents, please contact myself or Chris Donley of Cardno. at 916-386-3845.

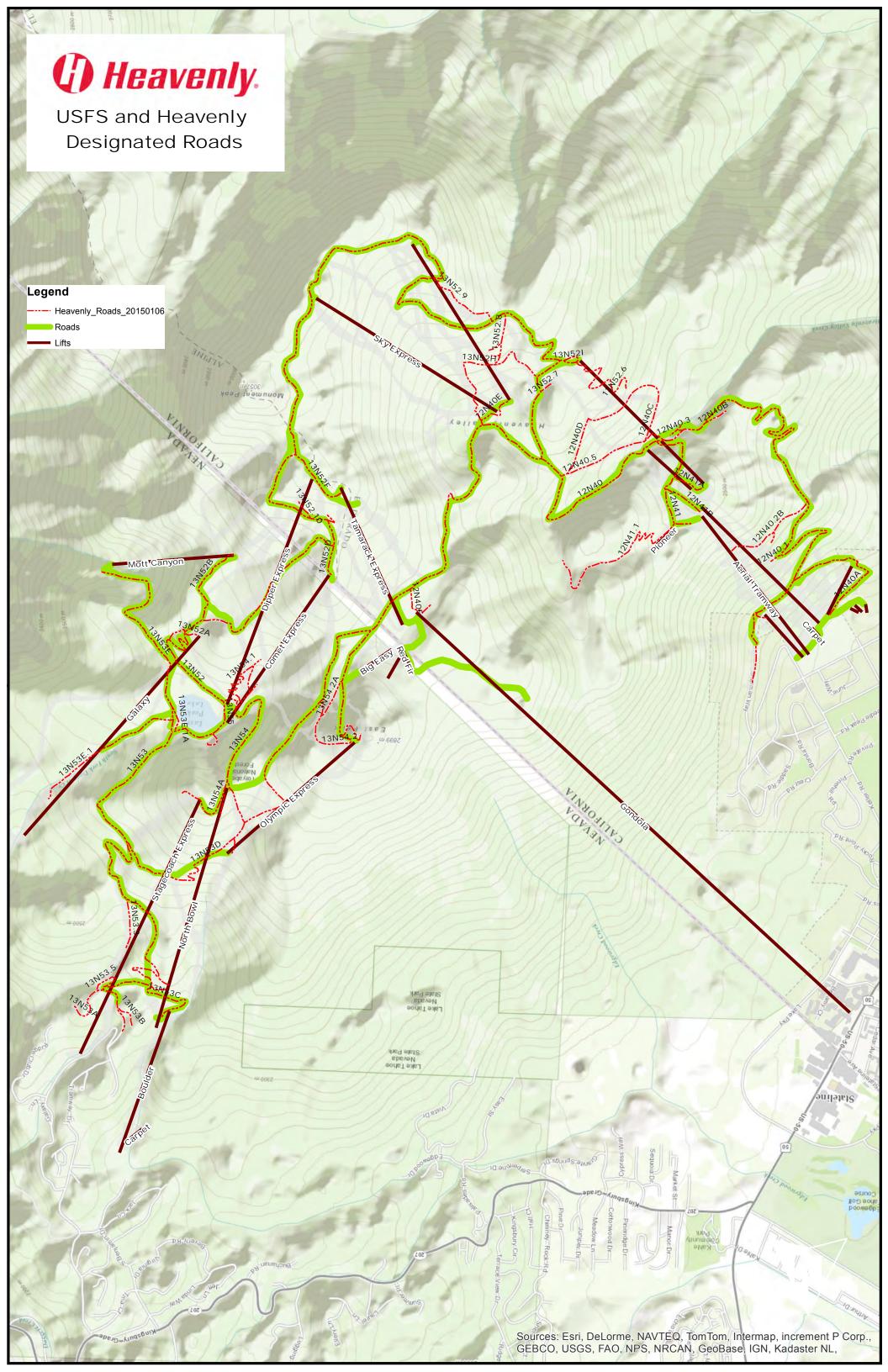
Sincerely.

Frank Papandrea

Heavenly Environmental Manager

P.O. Box 2180 Stateline, NV 89449 775/586-7000 www.skiheavenly.com

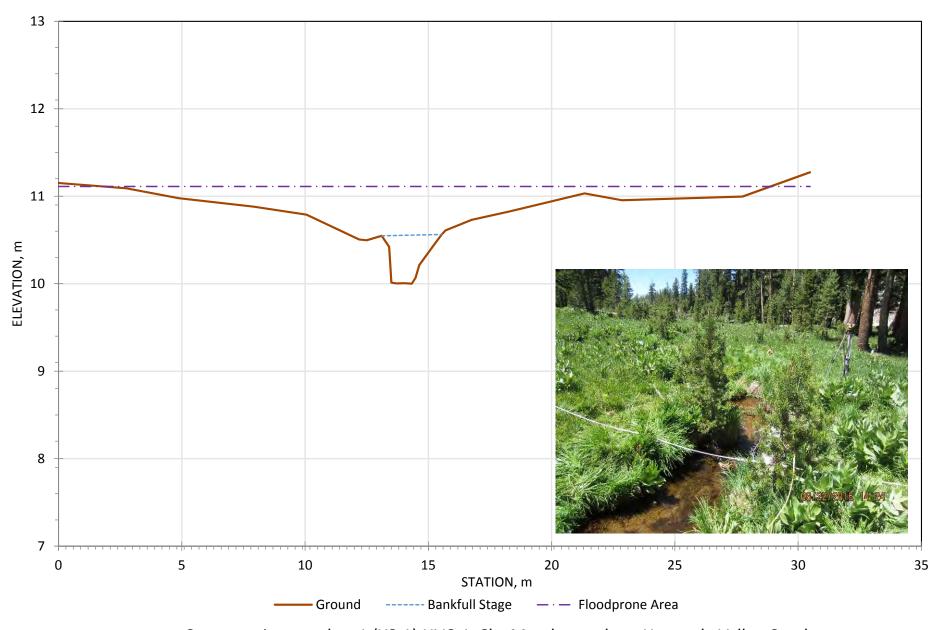




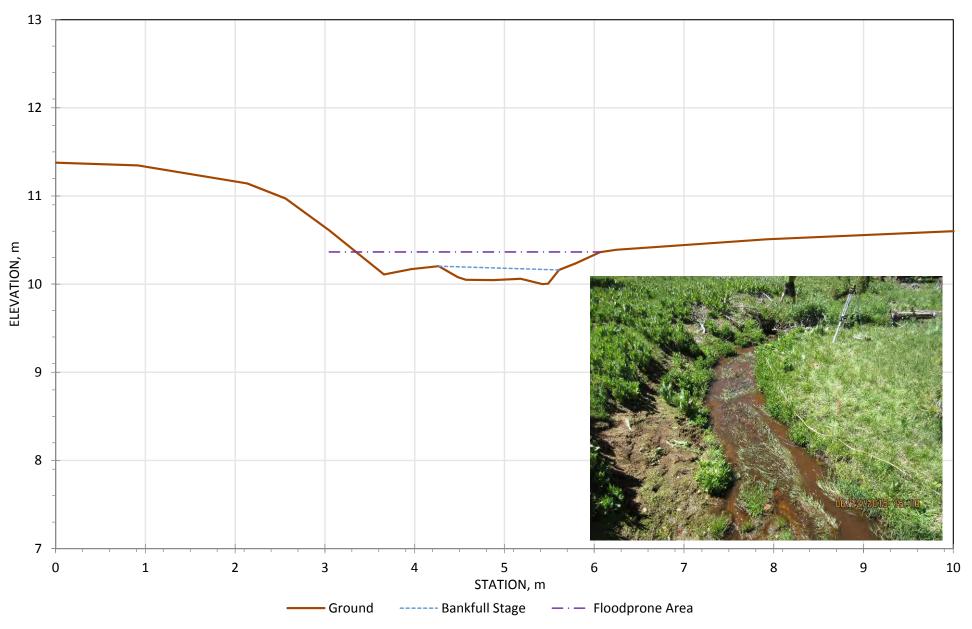
Heavenly Mountain Resort Water Year 2015

APPENDIX H 2015 SCI RIPARIAN DATA

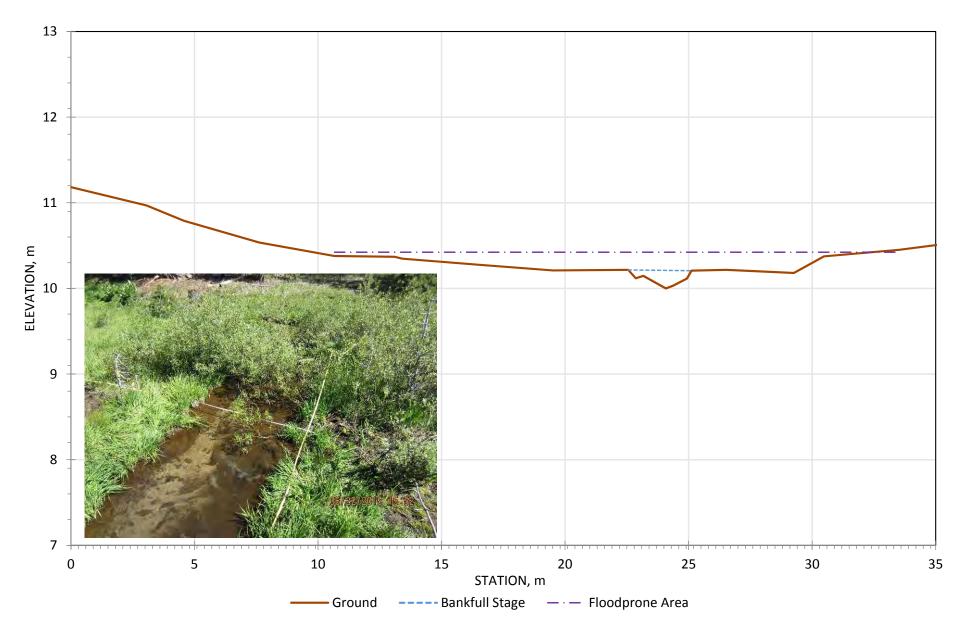




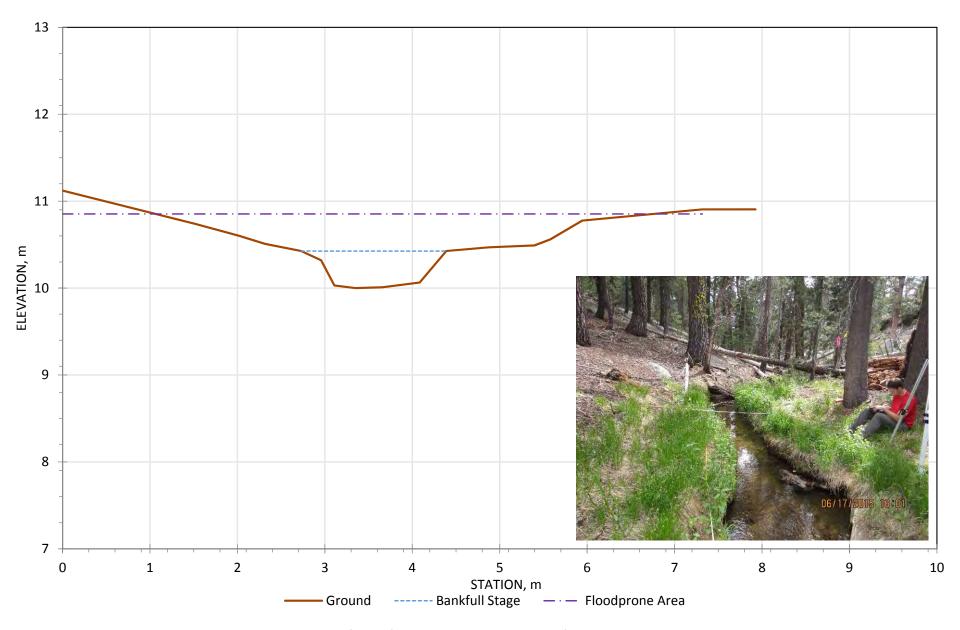
Cross-section number 1 (XS-1) HVC-1, Sky Meadows, along Heavenly Valley Creek



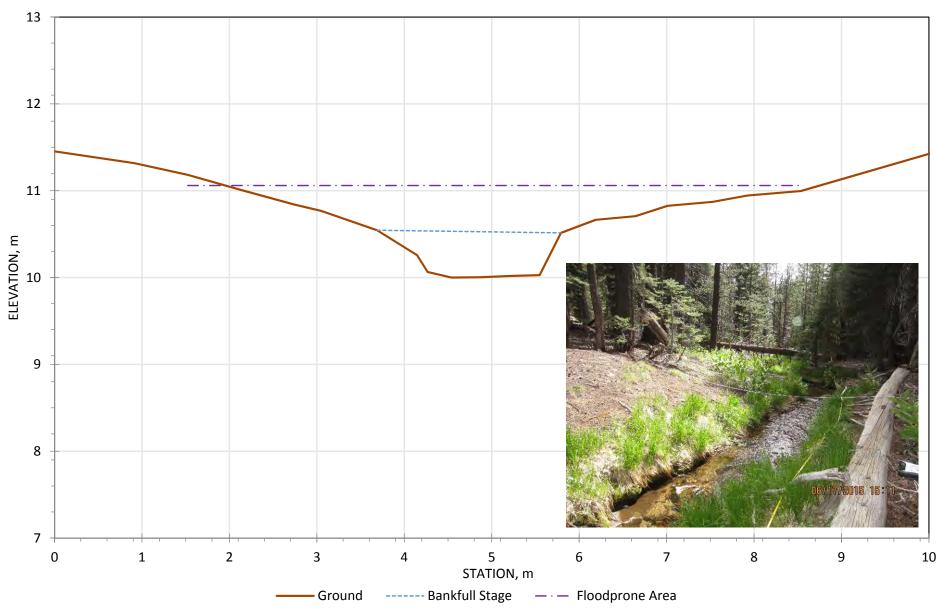
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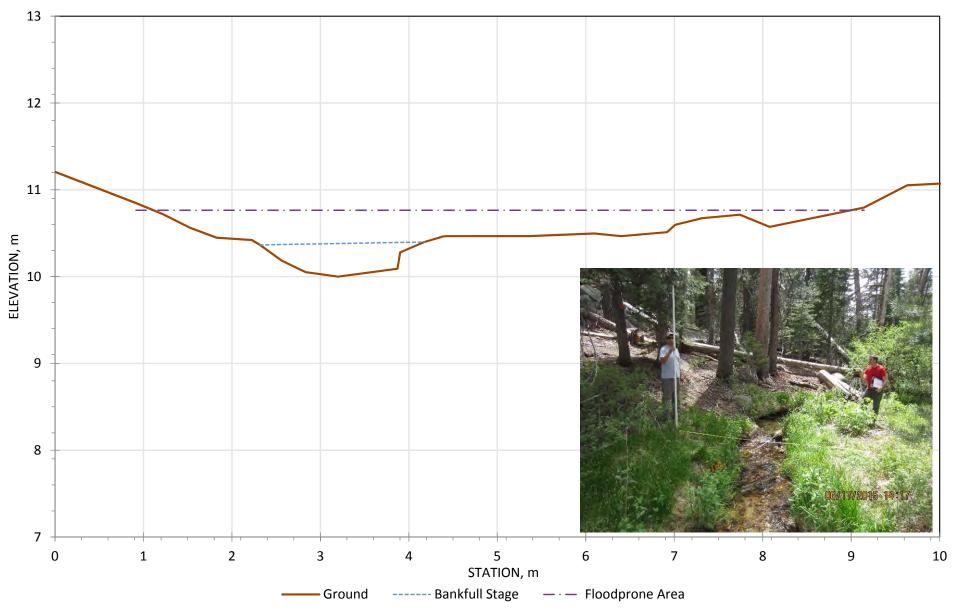
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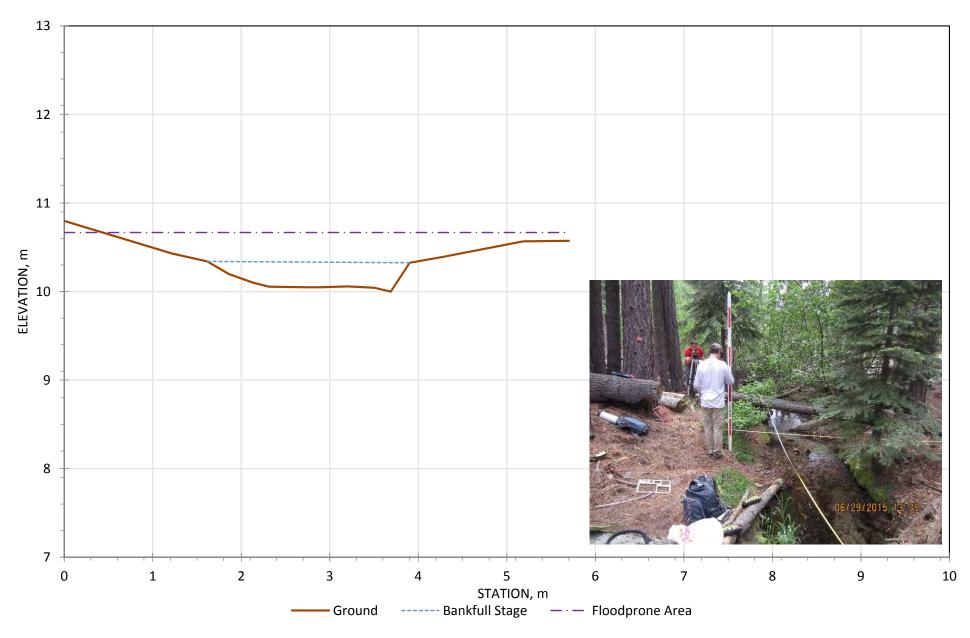
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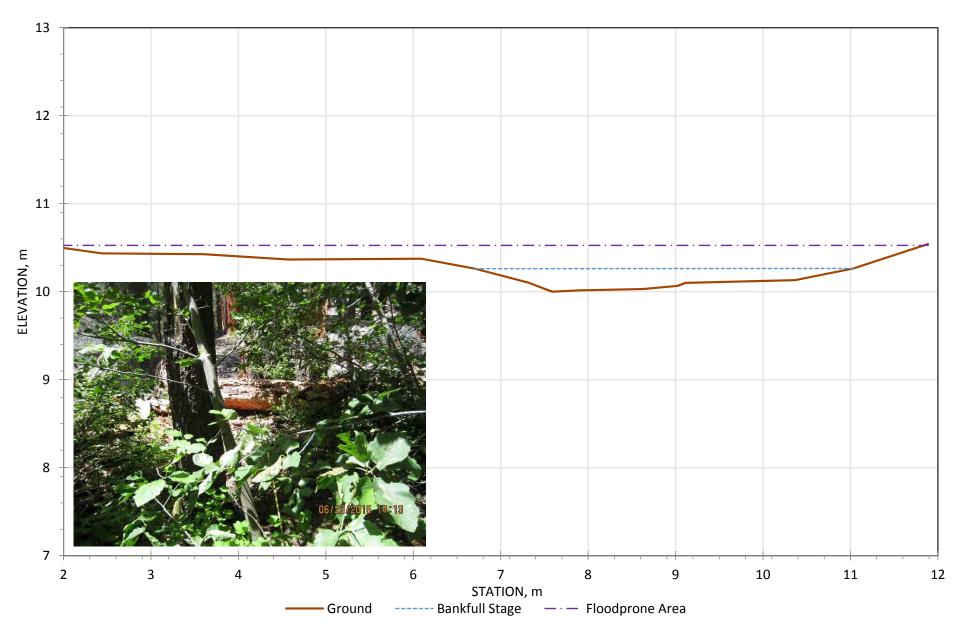
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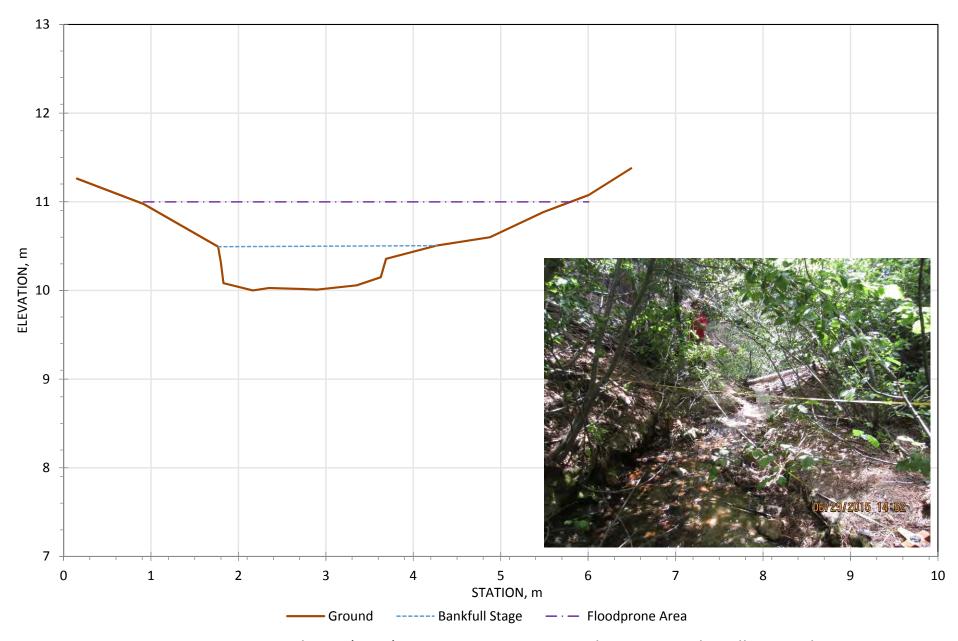
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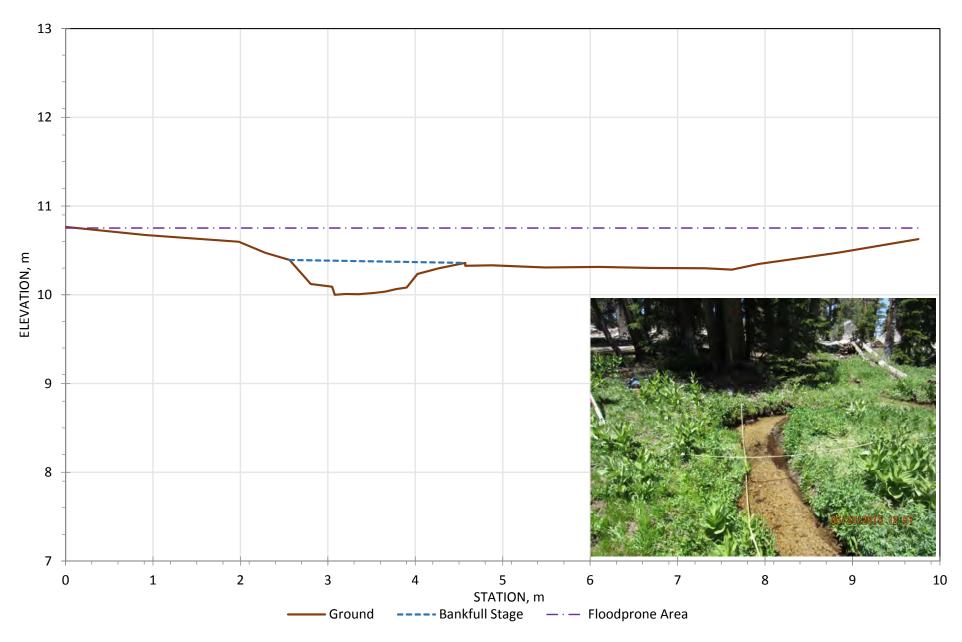
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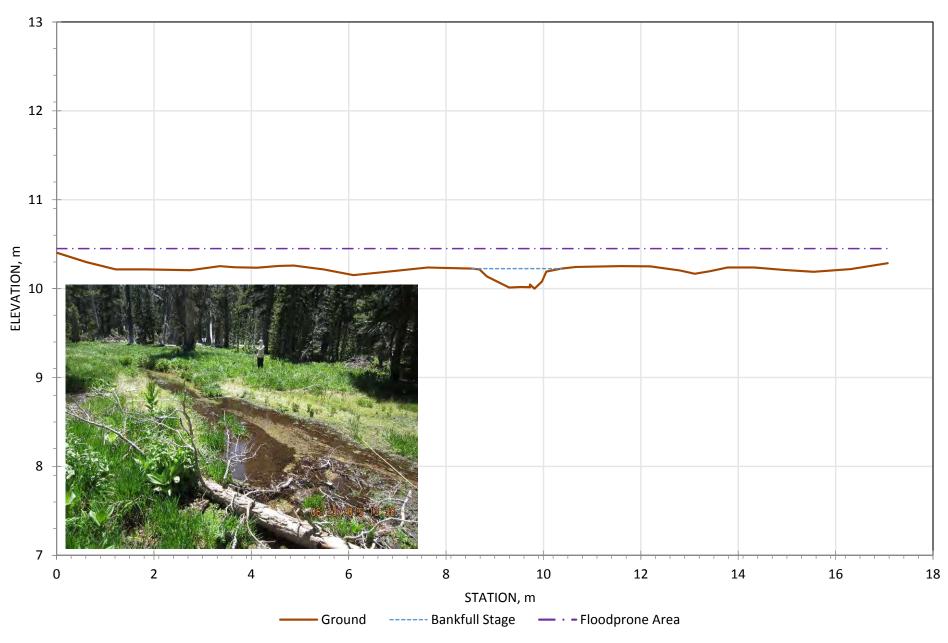
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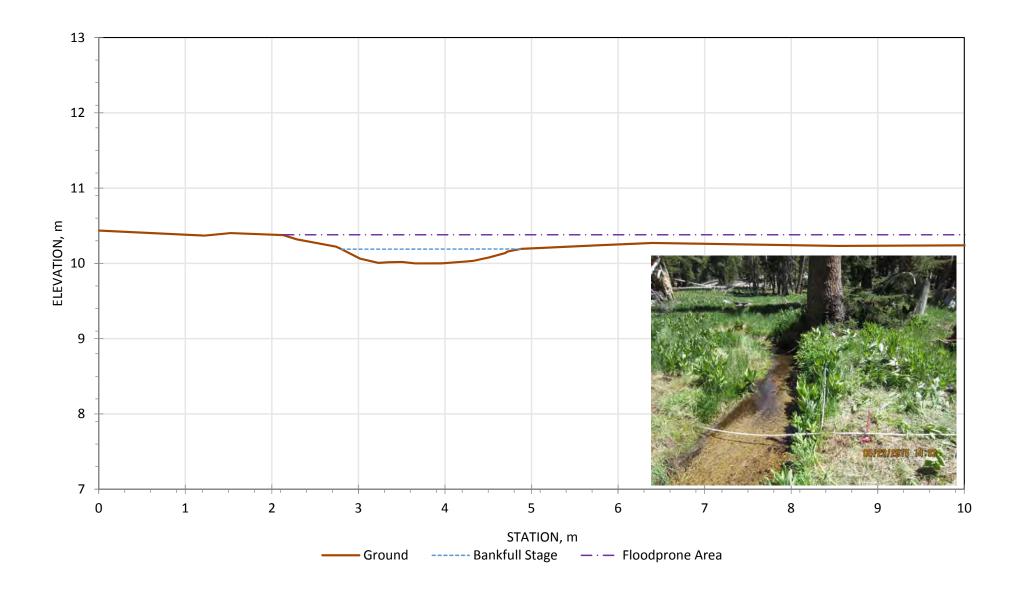
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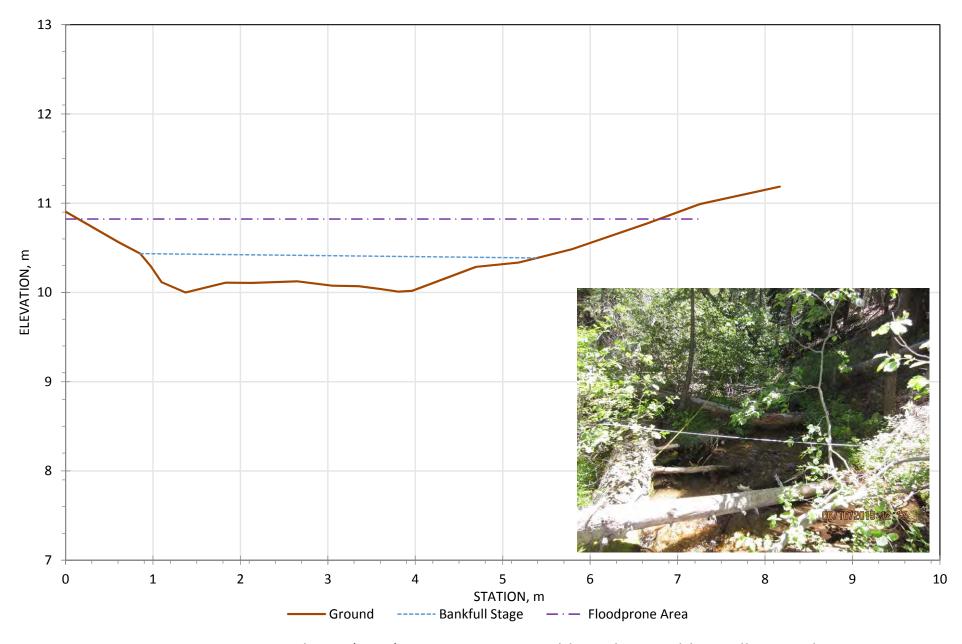
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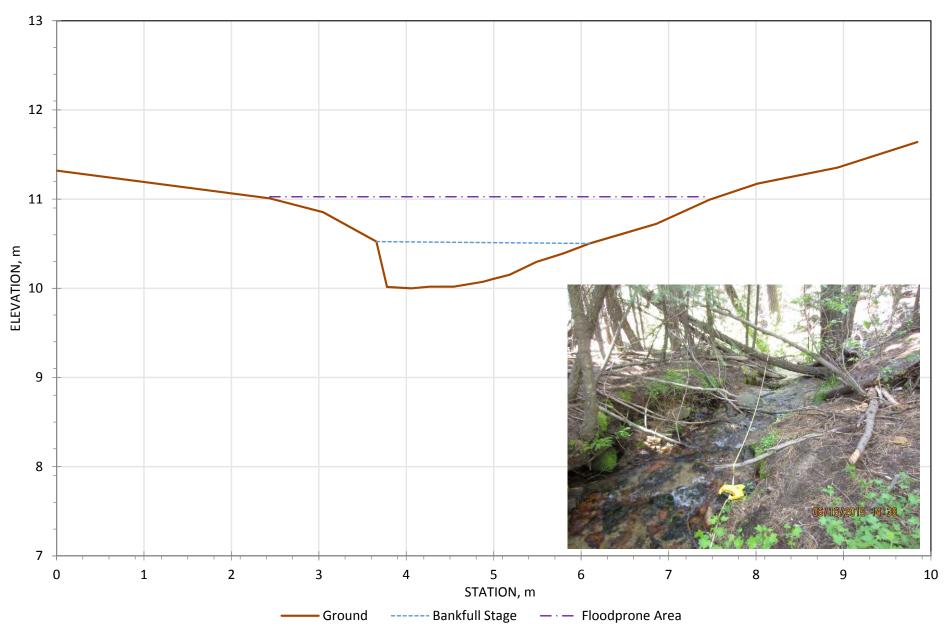
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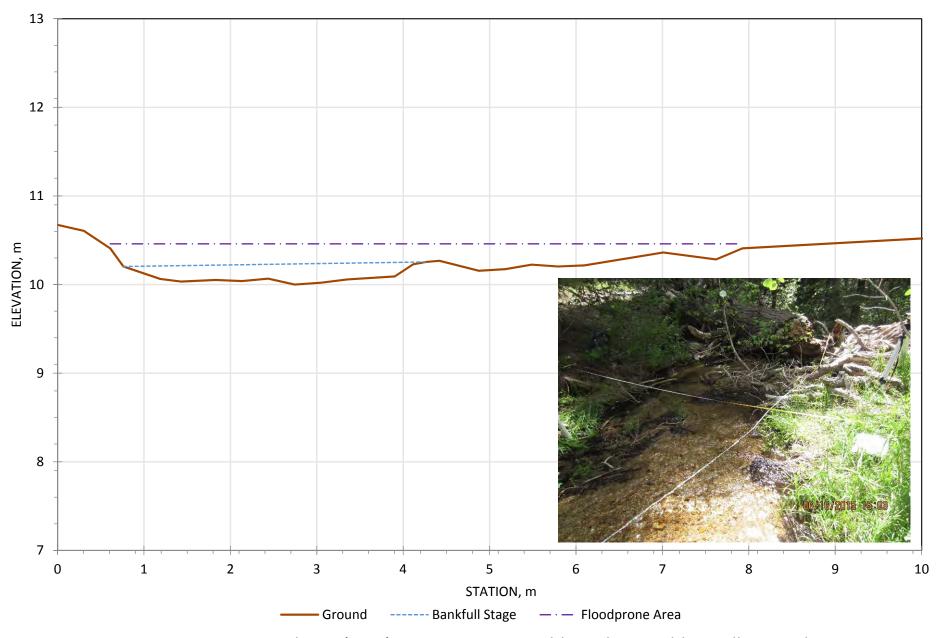
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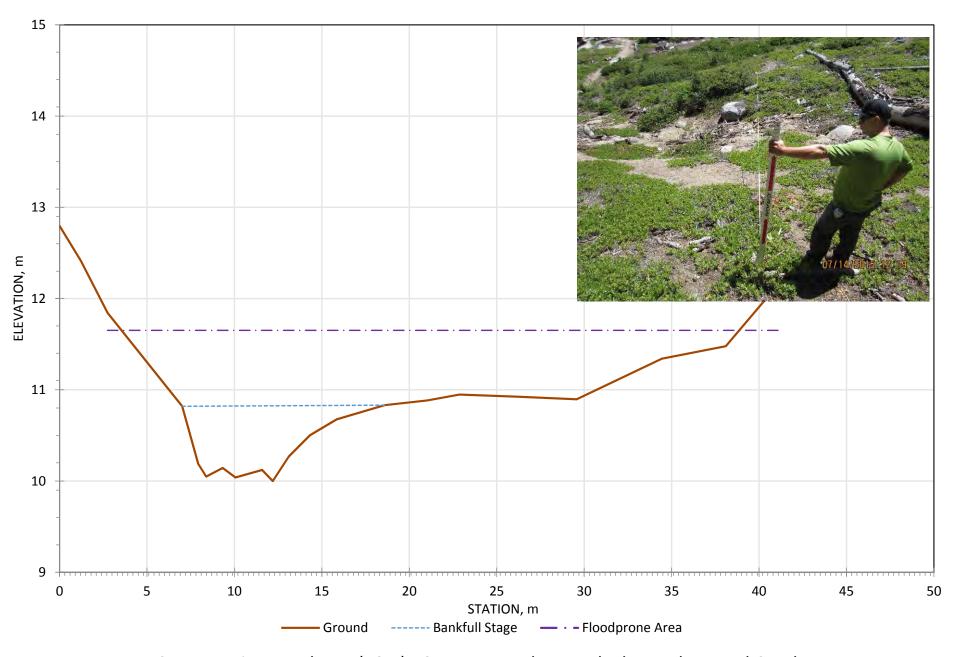
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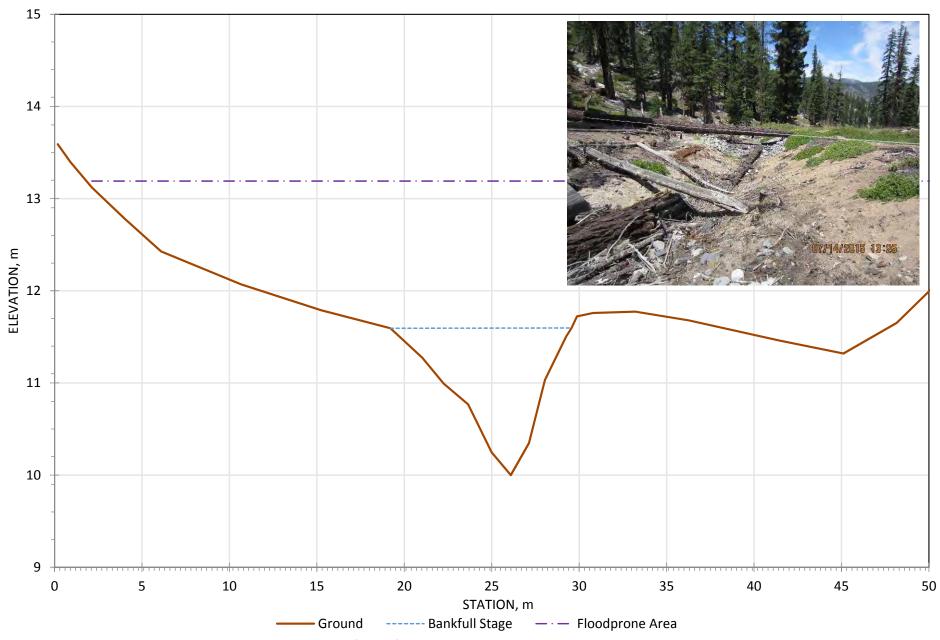
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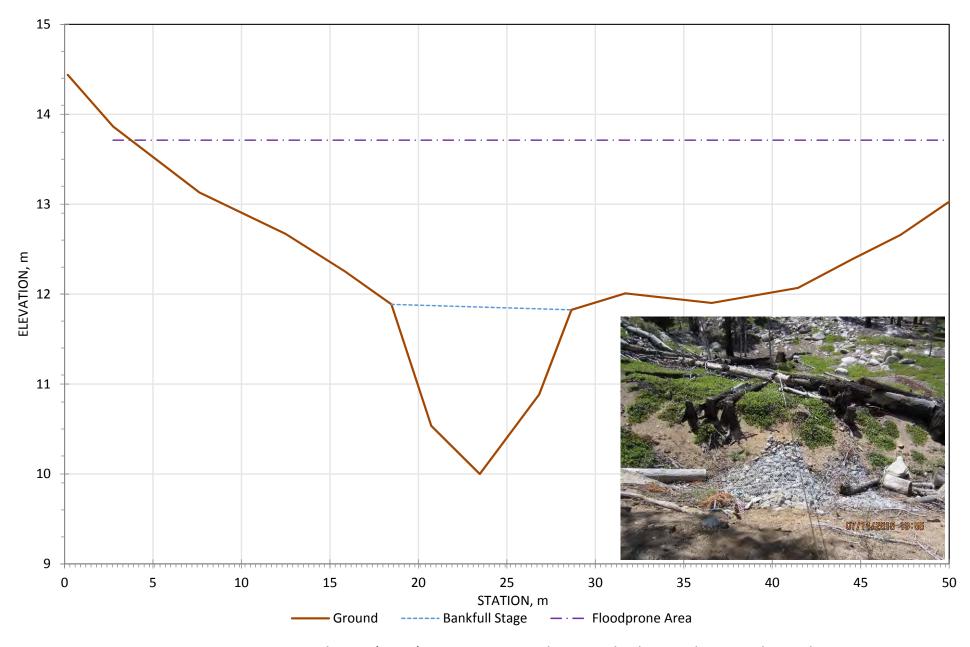
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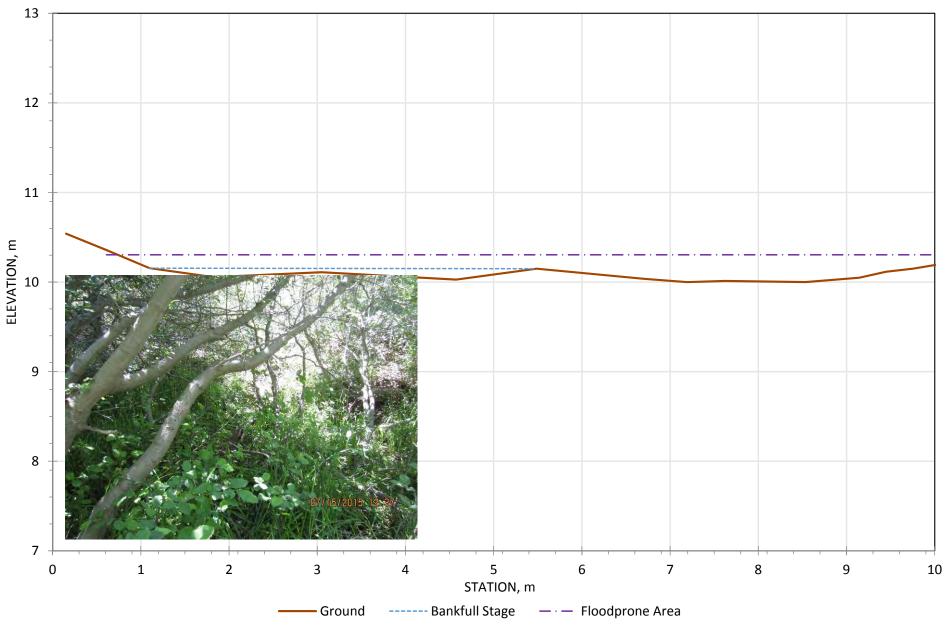
Cross-section number 1 (XS-1) EC-1, Upper Edgewood, along Edgewood Creek



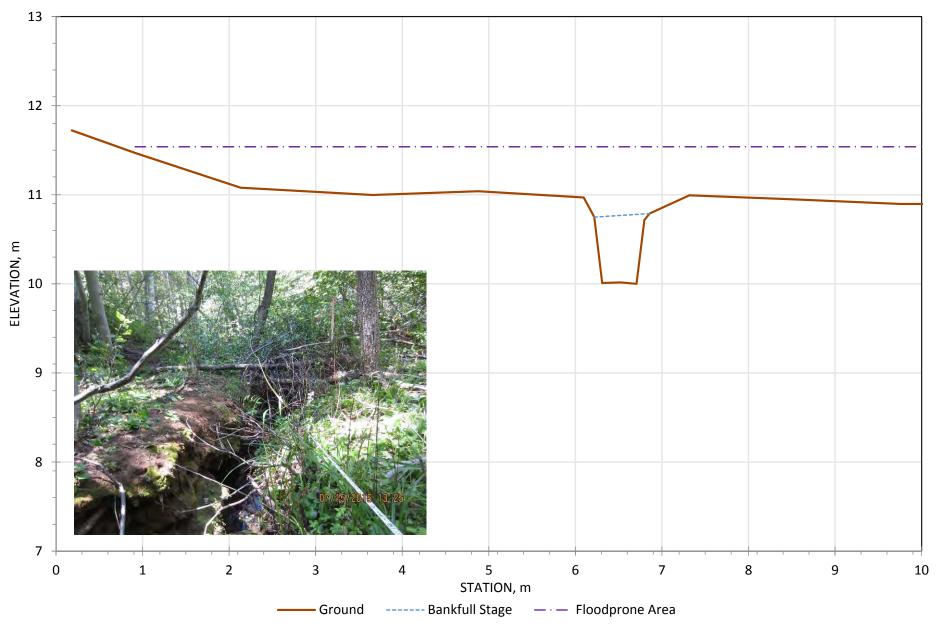
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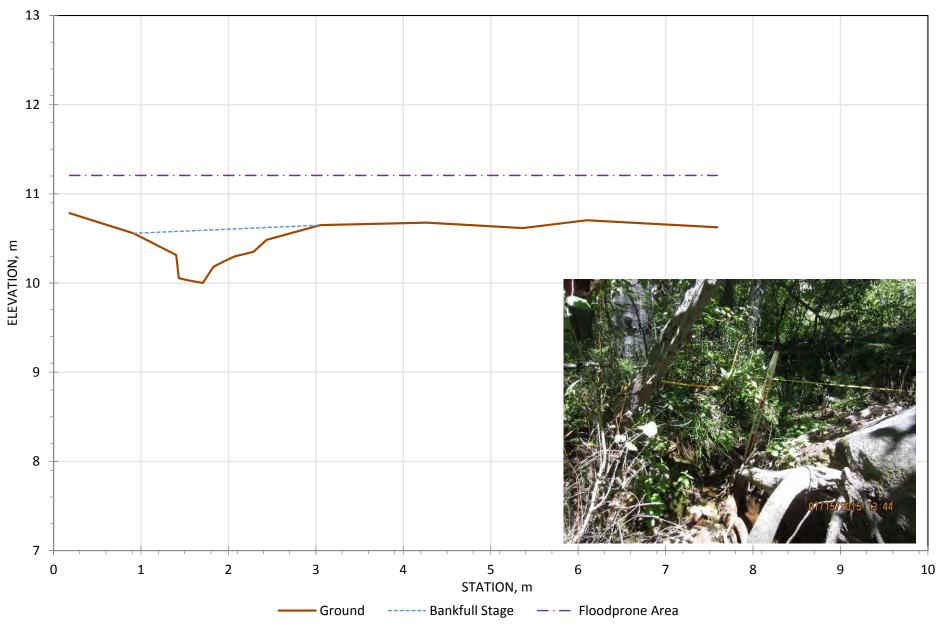
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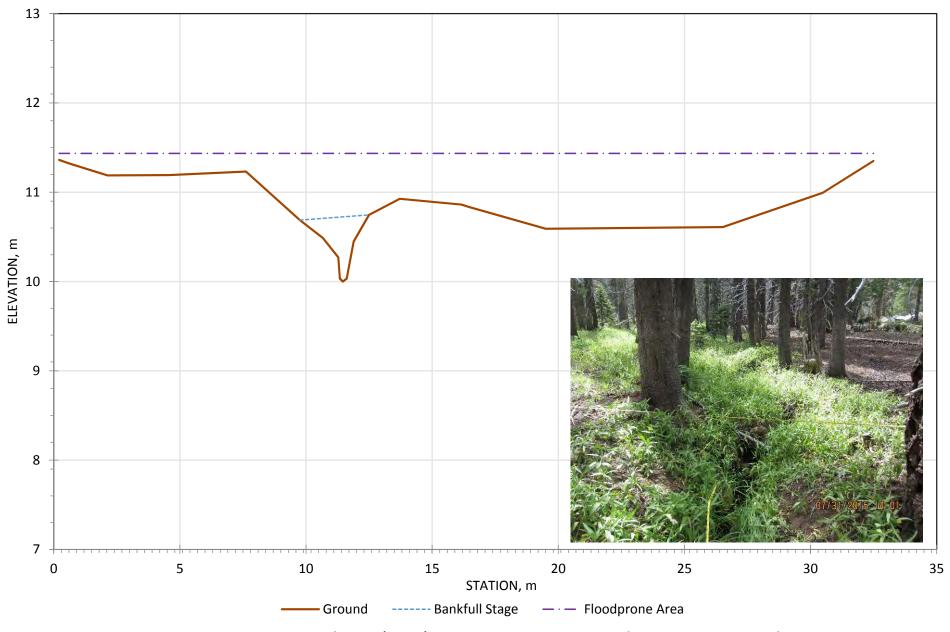
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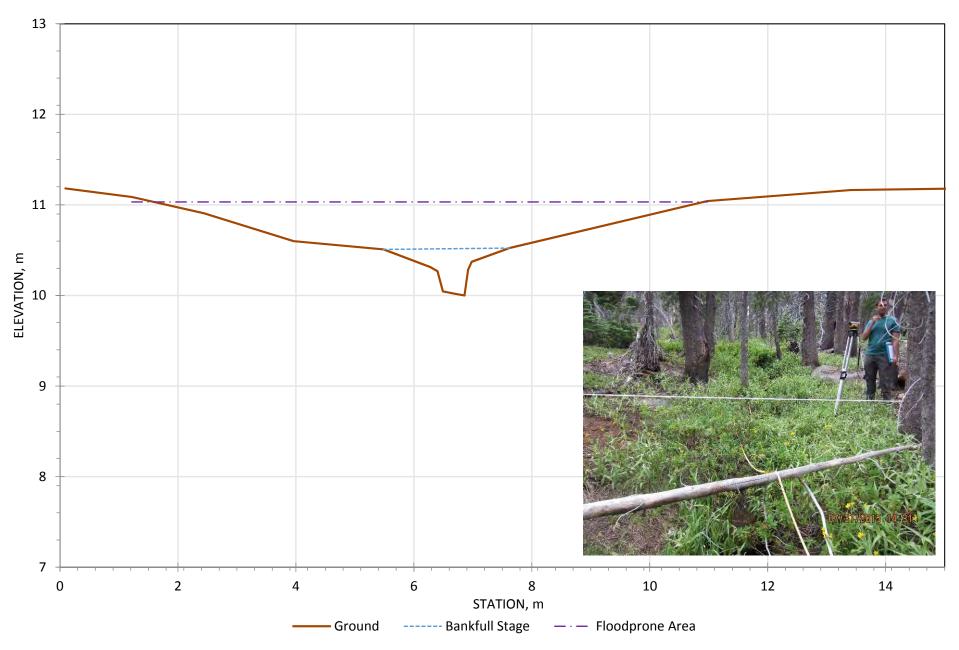
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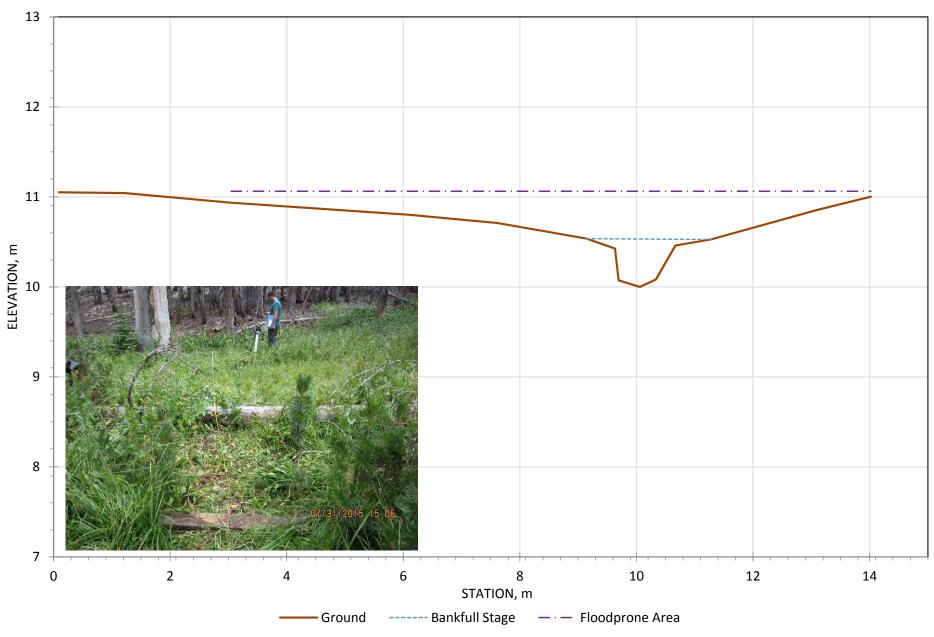
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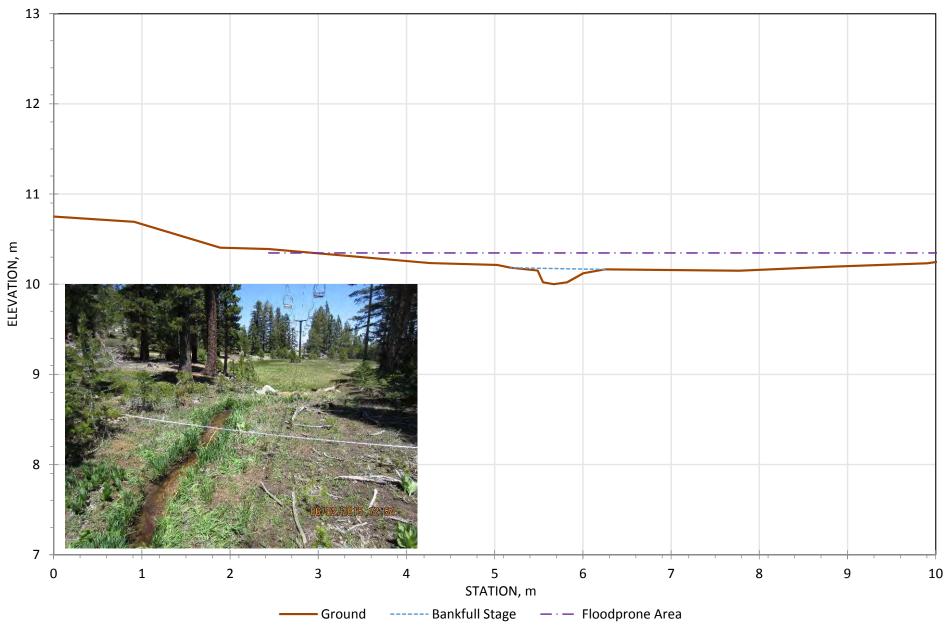
Cross-section number 1 (XS-1) DC-1, Upper Daggett, along Daggett Creek



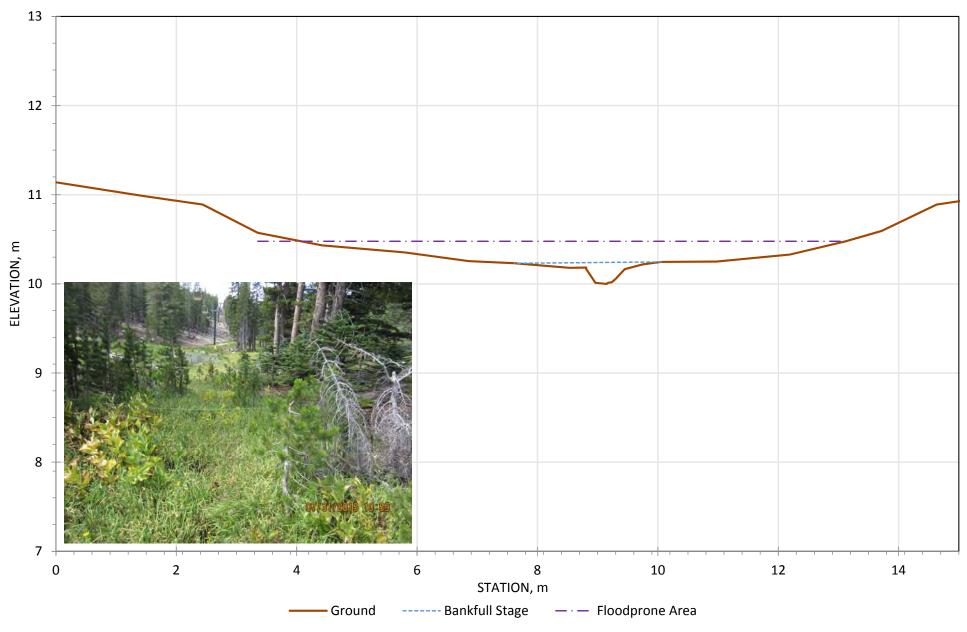
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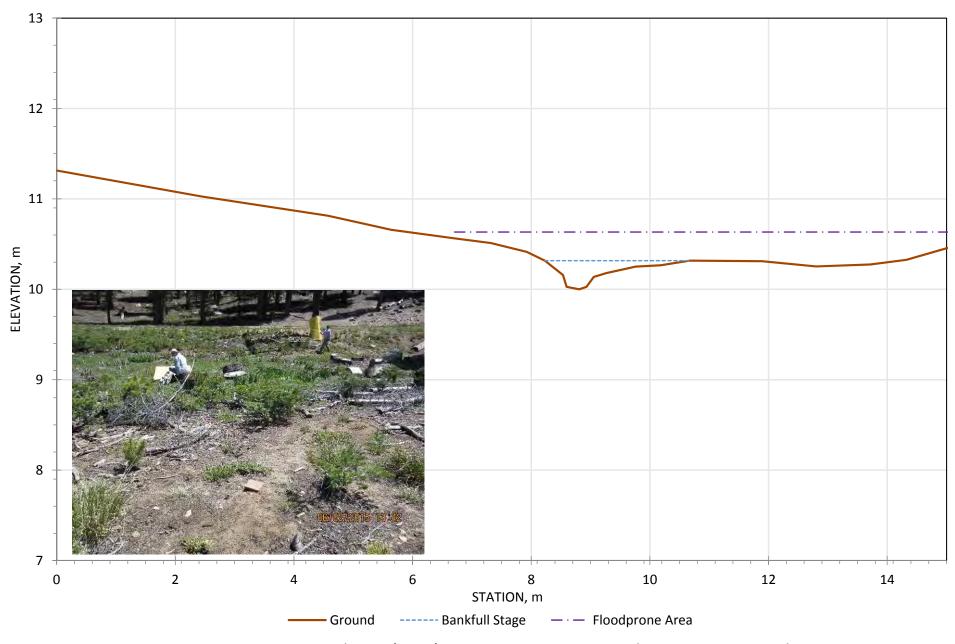
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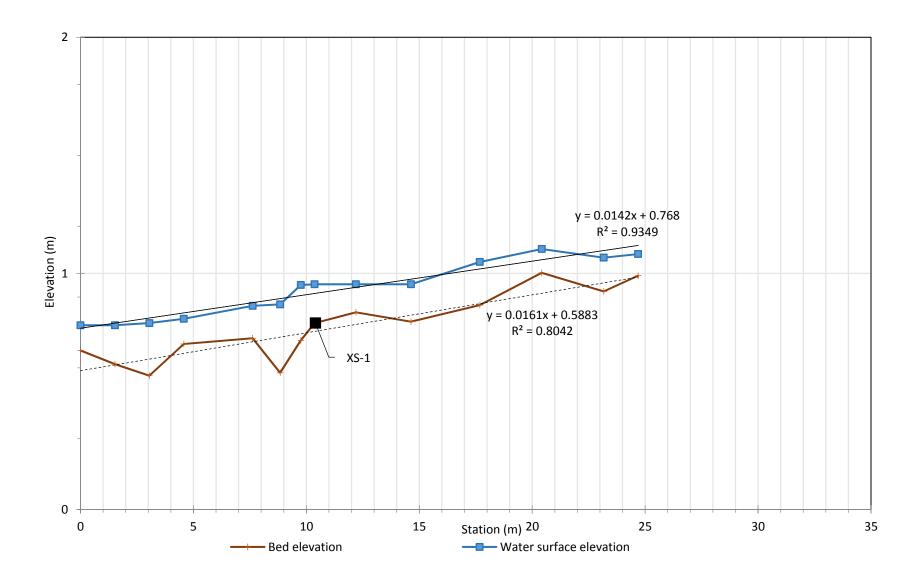
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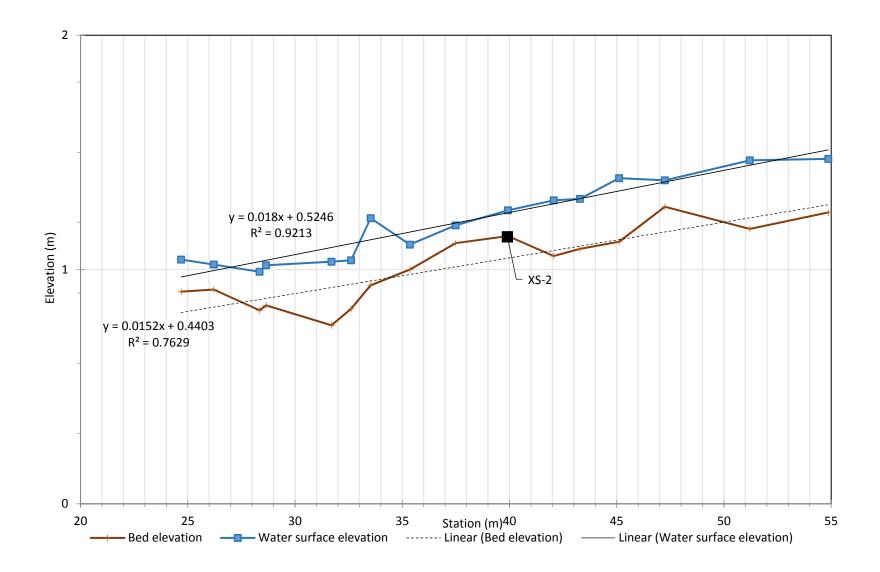
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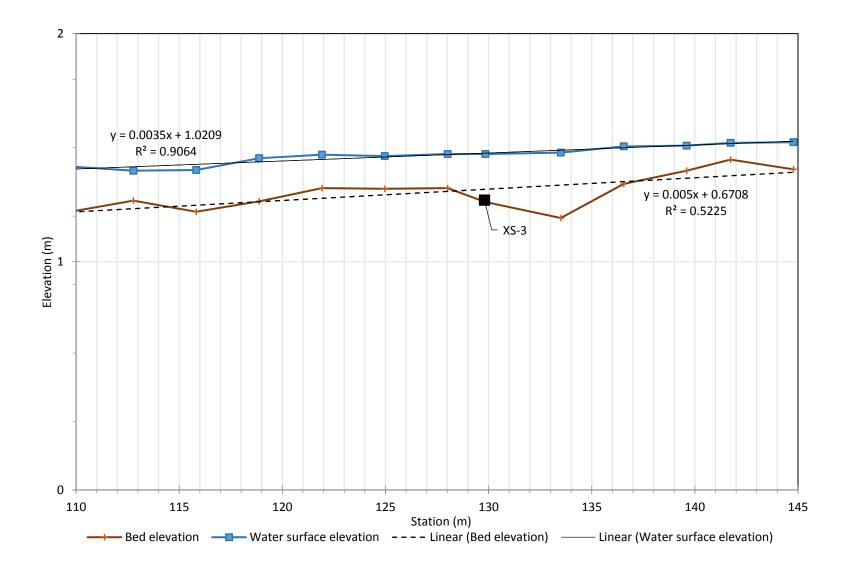
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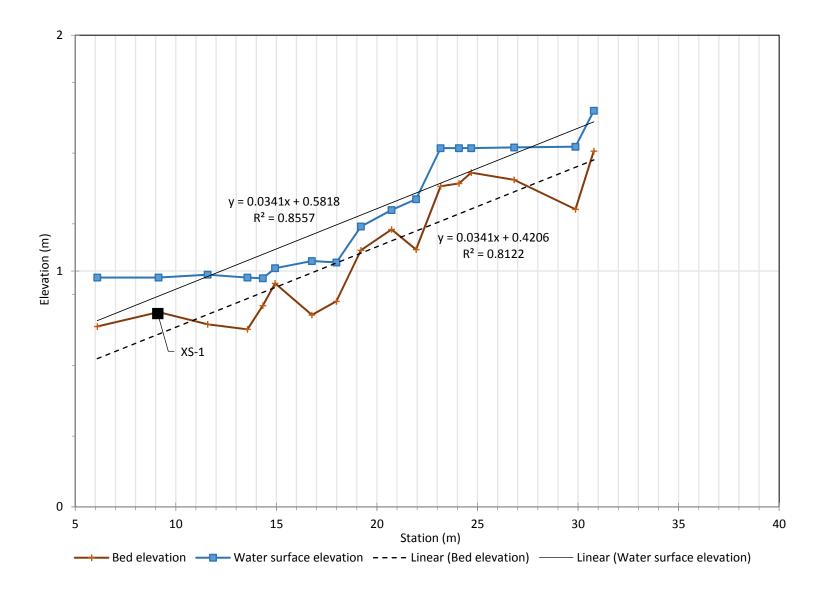
Bed and Water Surface Profiles for XS-1, HVC-1, Sky Meadows, along Heavenly Valley Creek



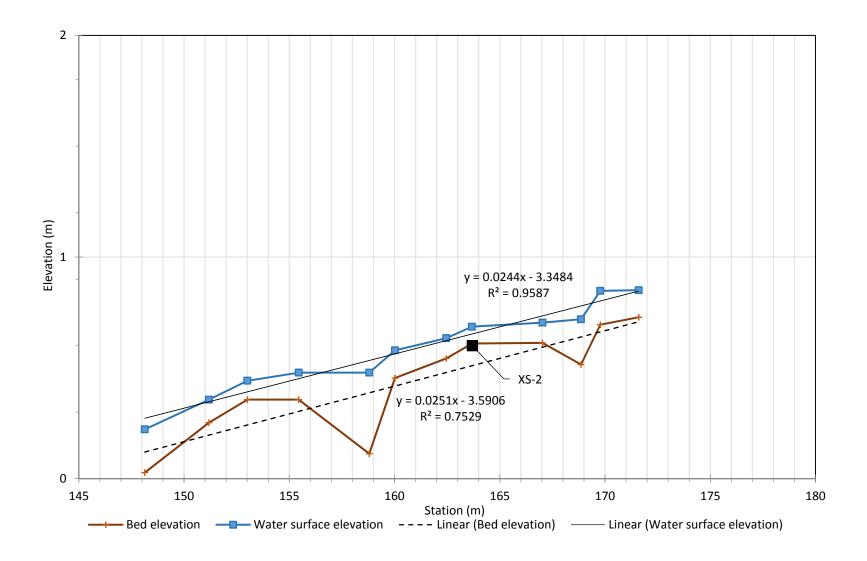
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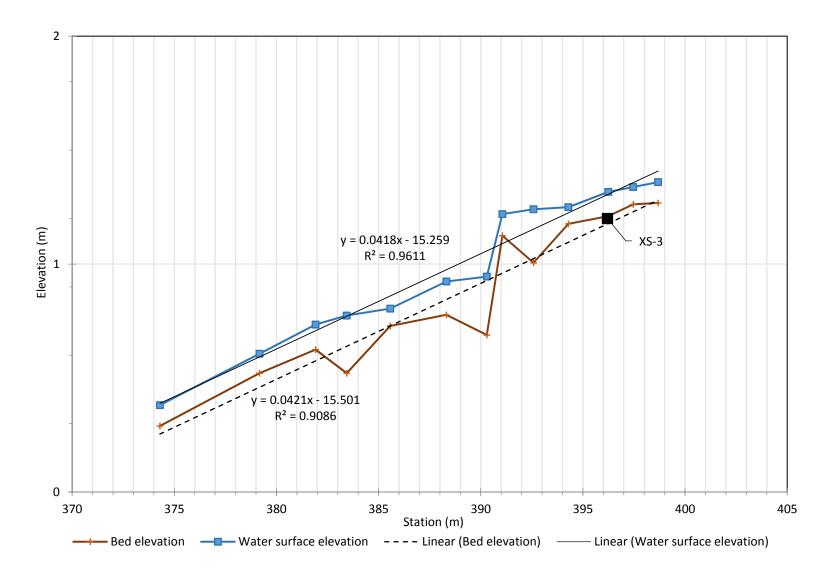
Bed and Water Surface Profiles for XS-3, HVC-1, Sky Meadows, along Heavenly Valley Creek



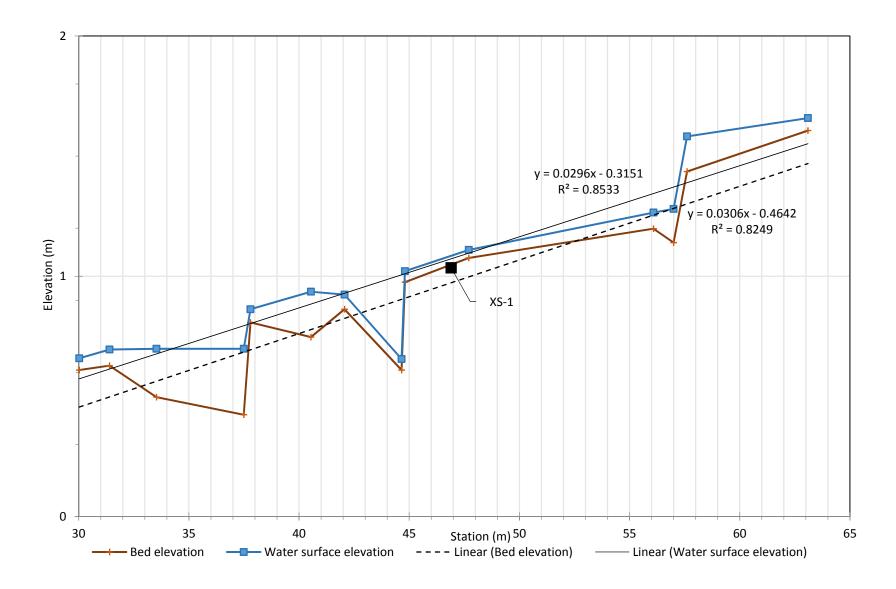
Bed and Water Surface Profiles for XS-1, HVC-2, Below Patsy's, along Heavenly Valley Creek



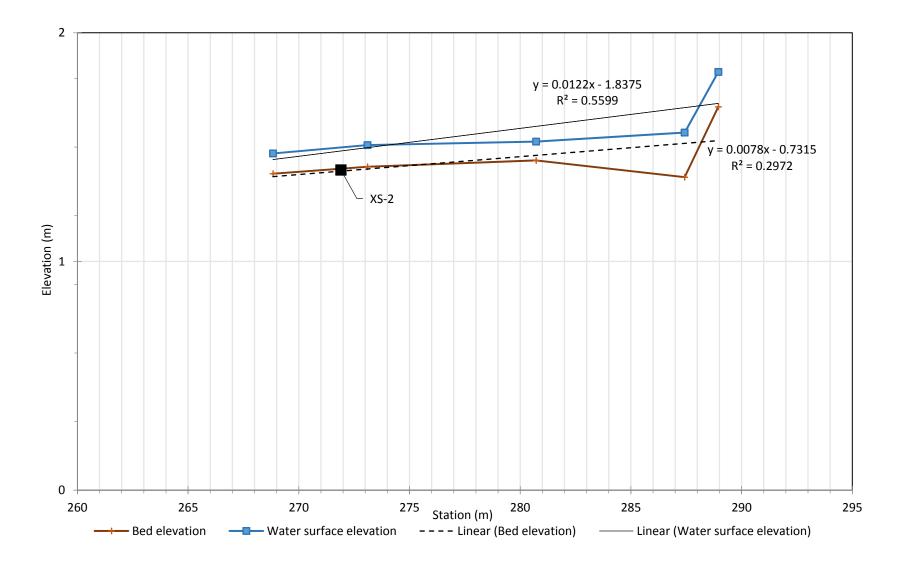
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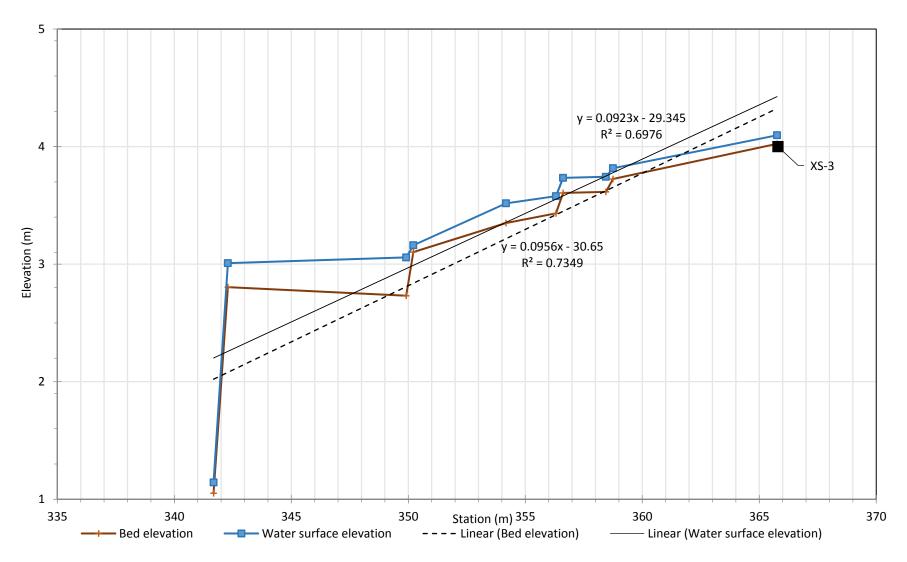
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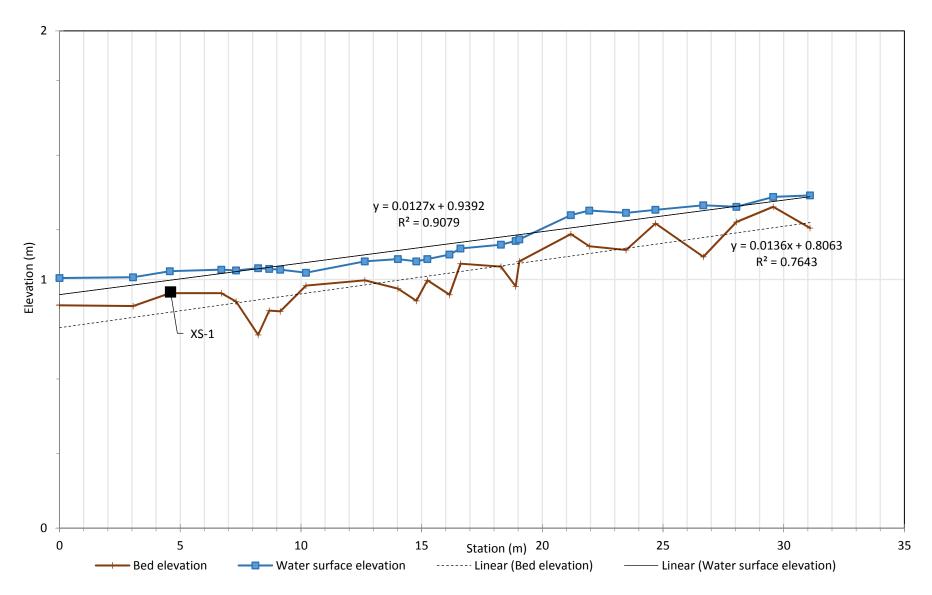
Bed and Water Surface Profiles for XS-1, HVC-3, Property Line, along Heavenly Valley Creek



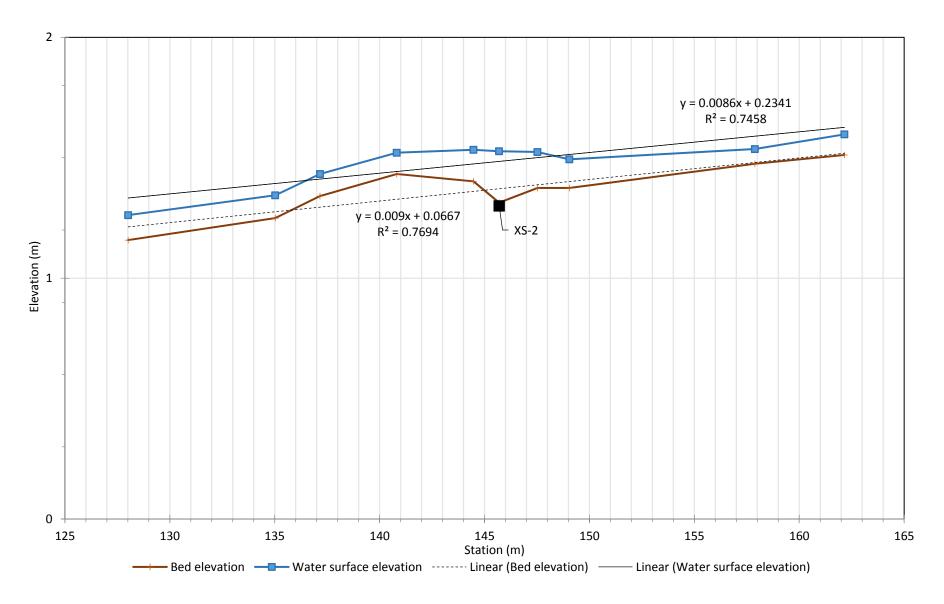
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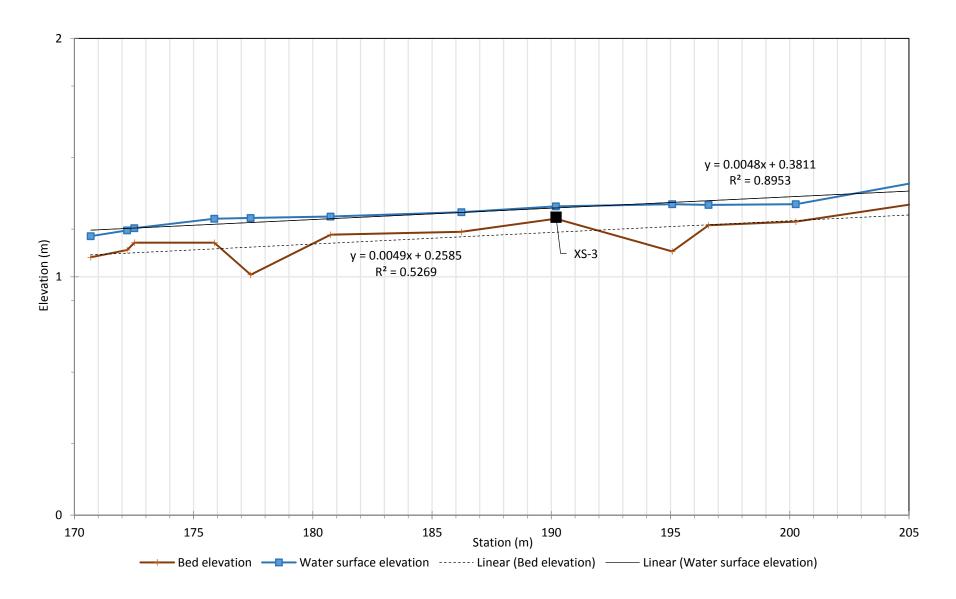
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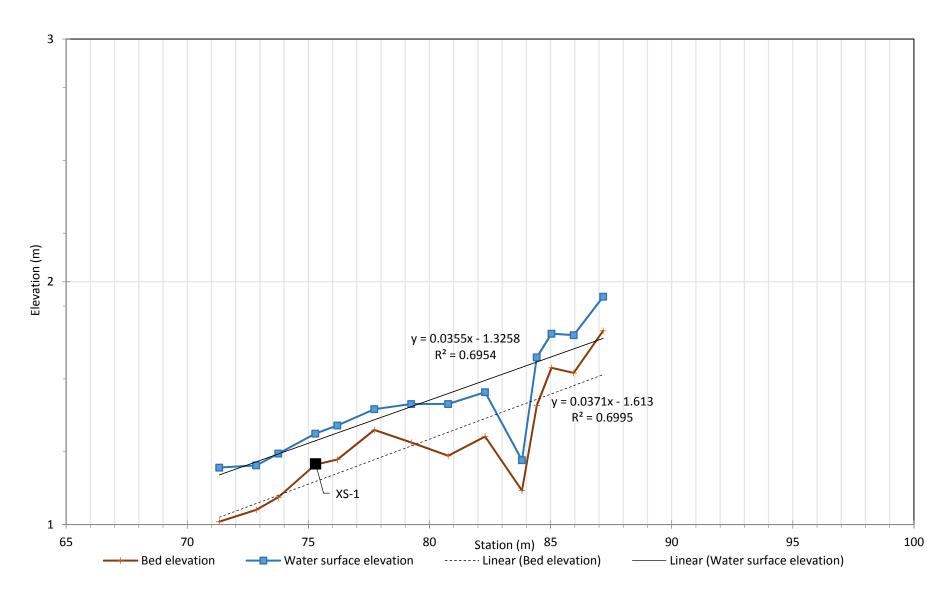
Bed and Water Surface Profiles for XS-1, HDVC-1, Upper Hidden, along Hidden Valley Creek



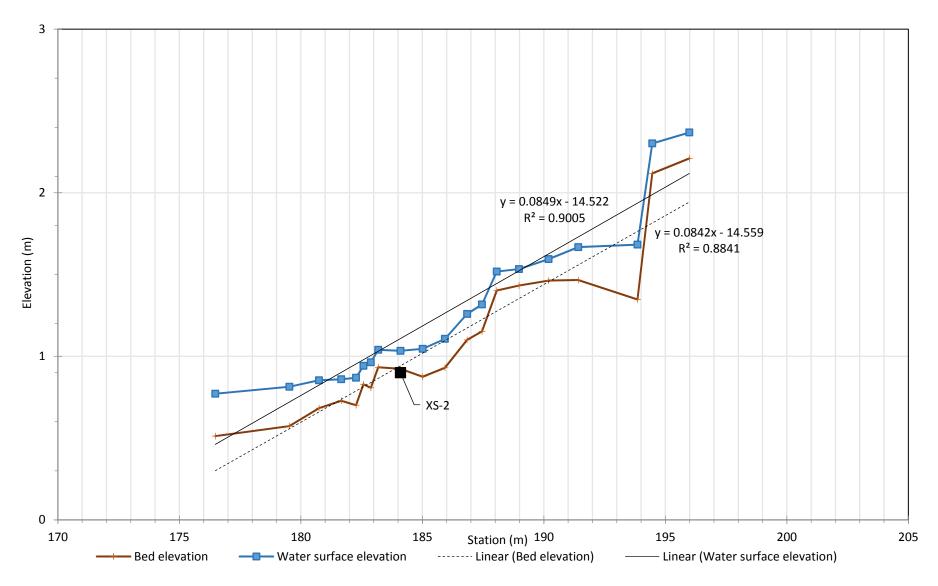
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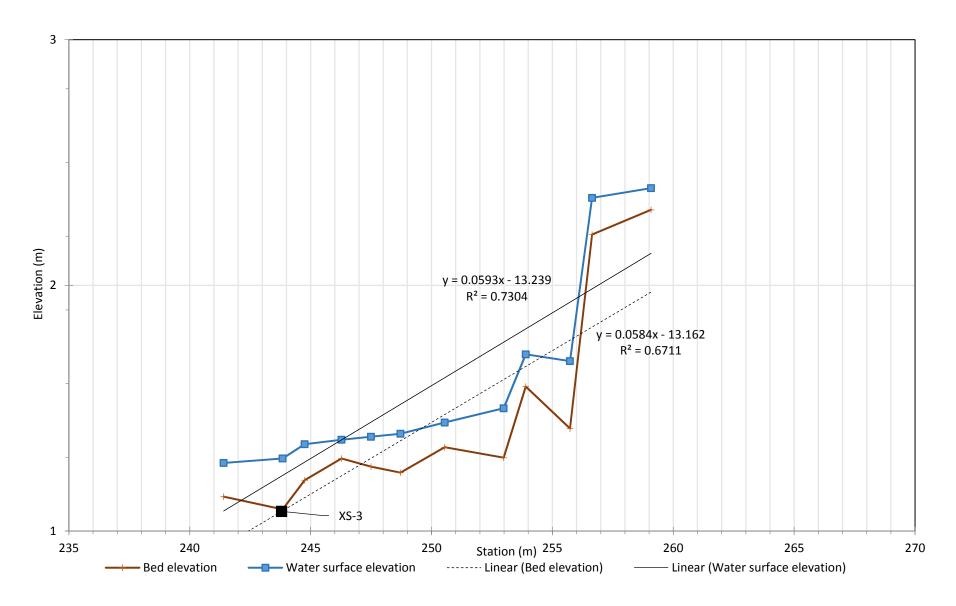
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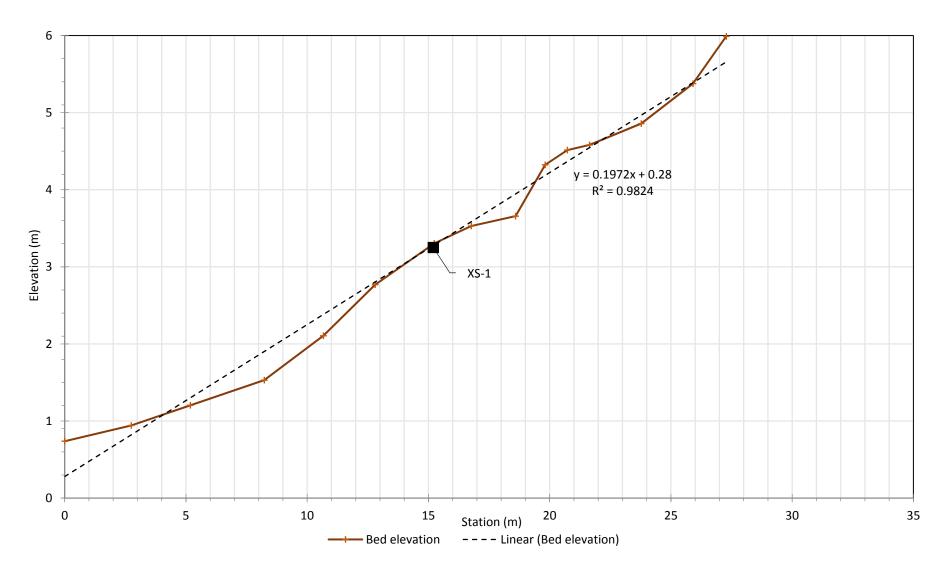
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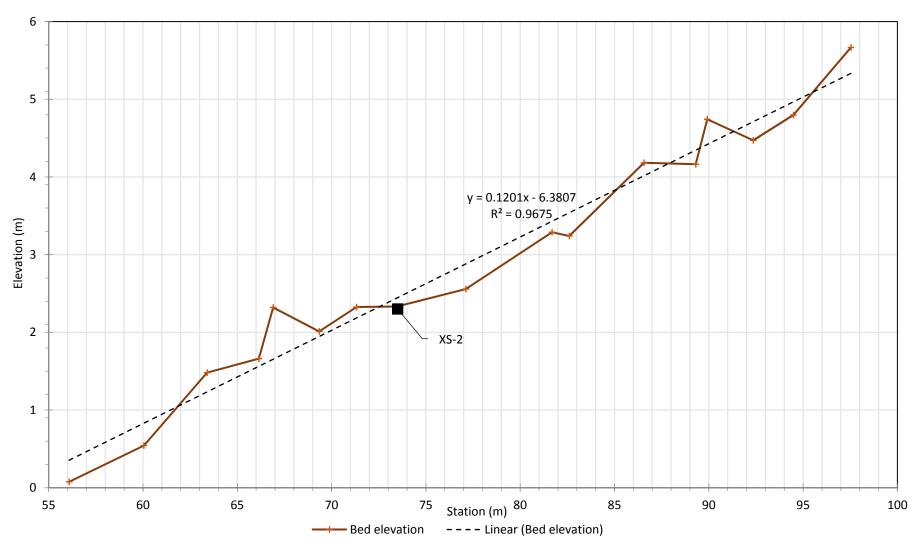
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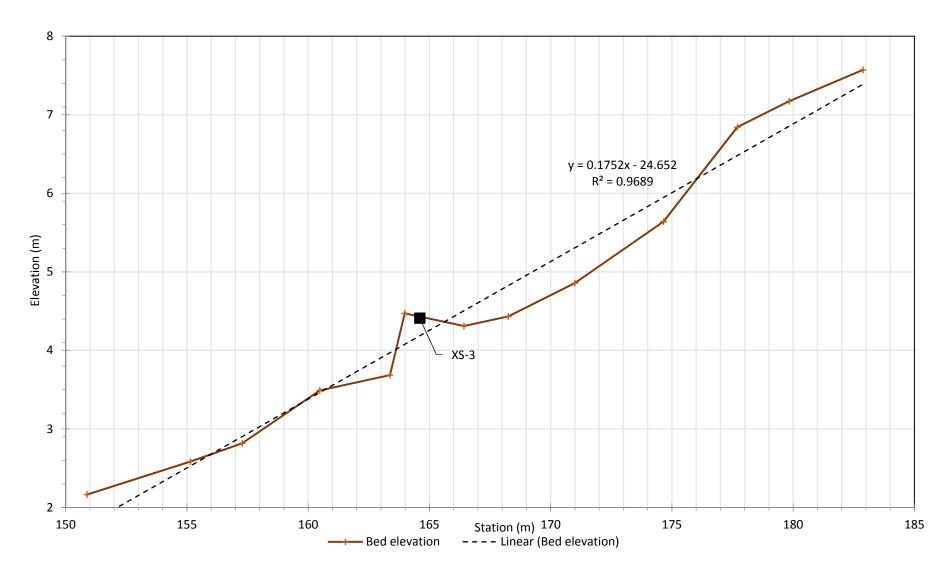
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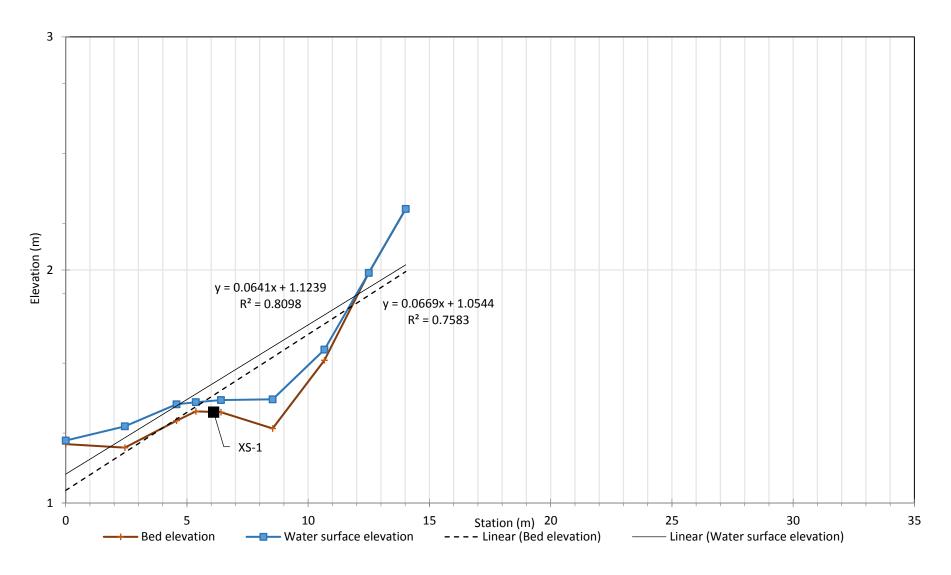
Bed and Water Surface Profile for XS-1, EC-1, Upper Edgewood, along Edgewood Creek



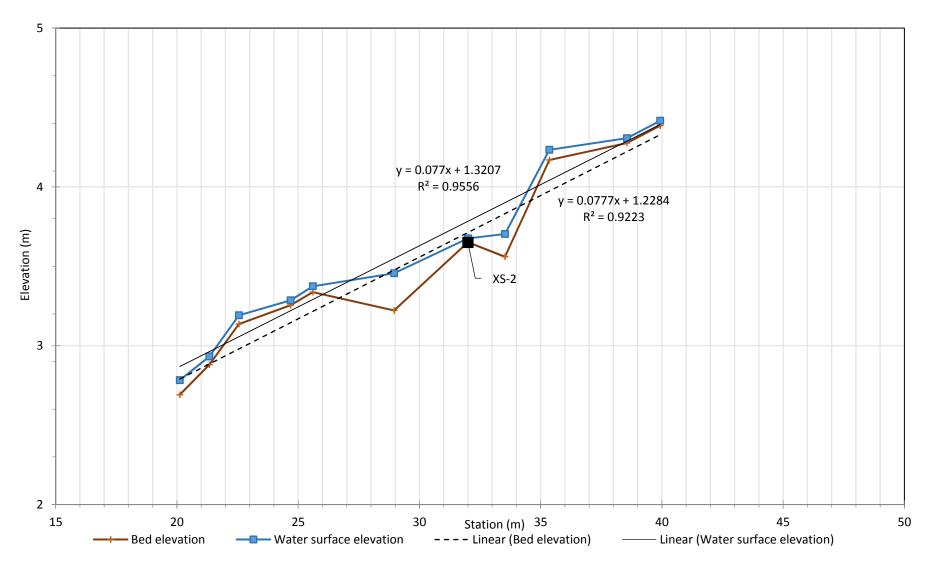
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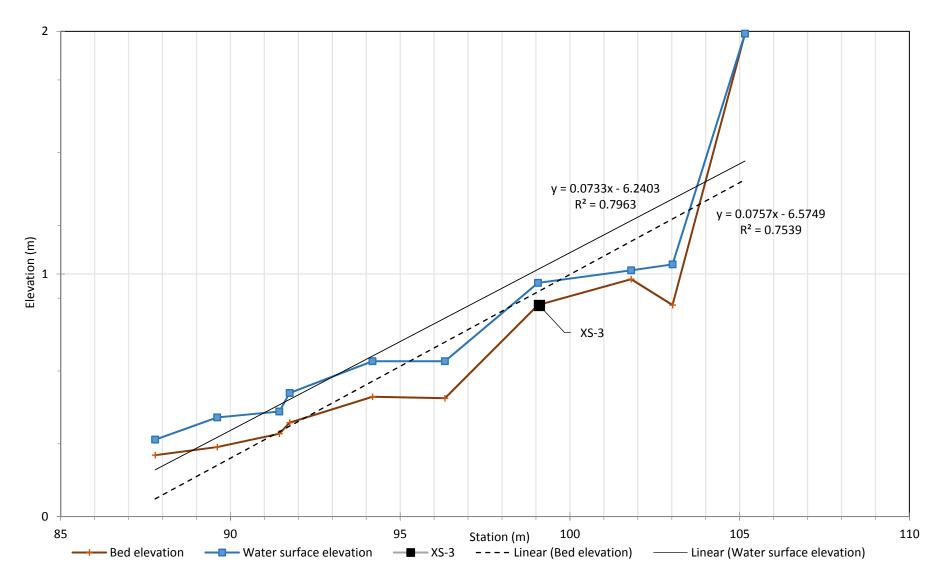
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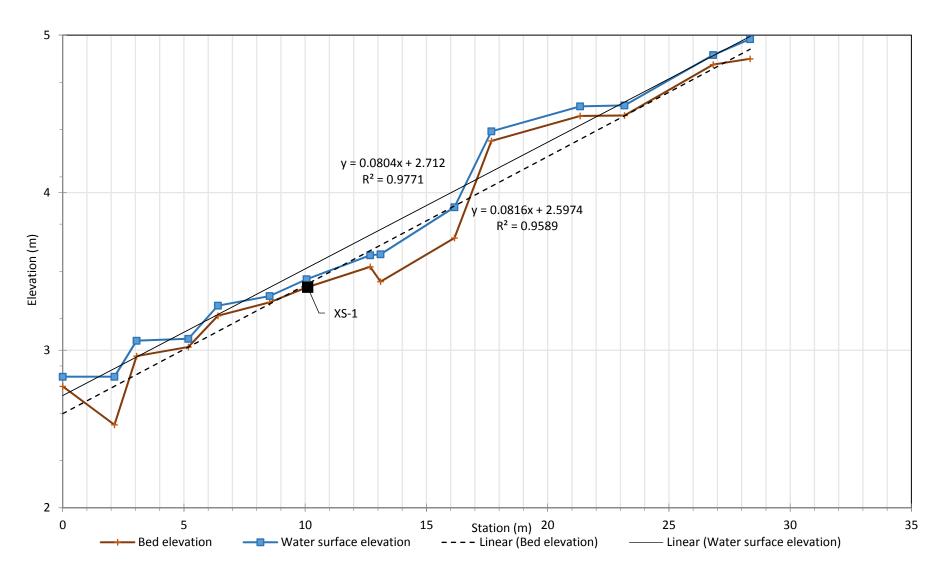
Bed and Water Surface Profiles for XS-1, EC-2, Lower Edgewood, along Edgewood Creek



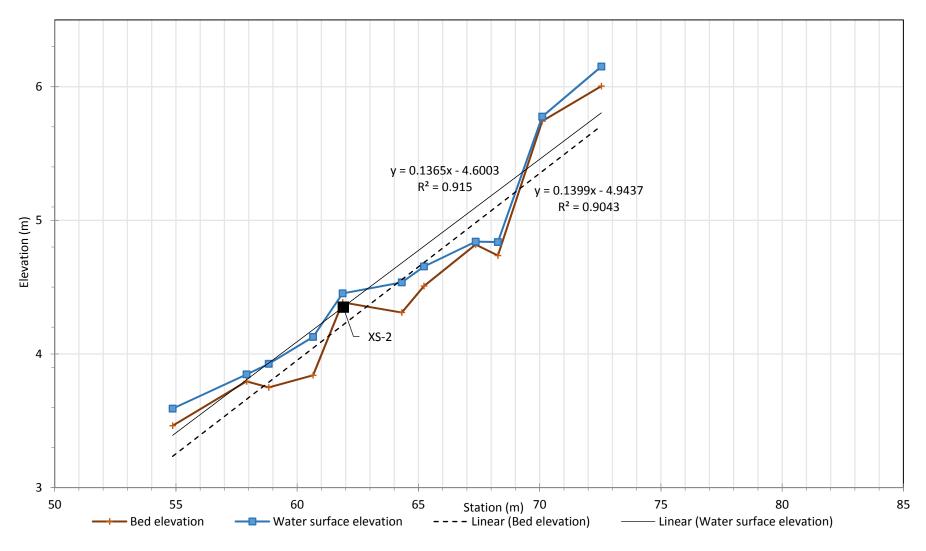
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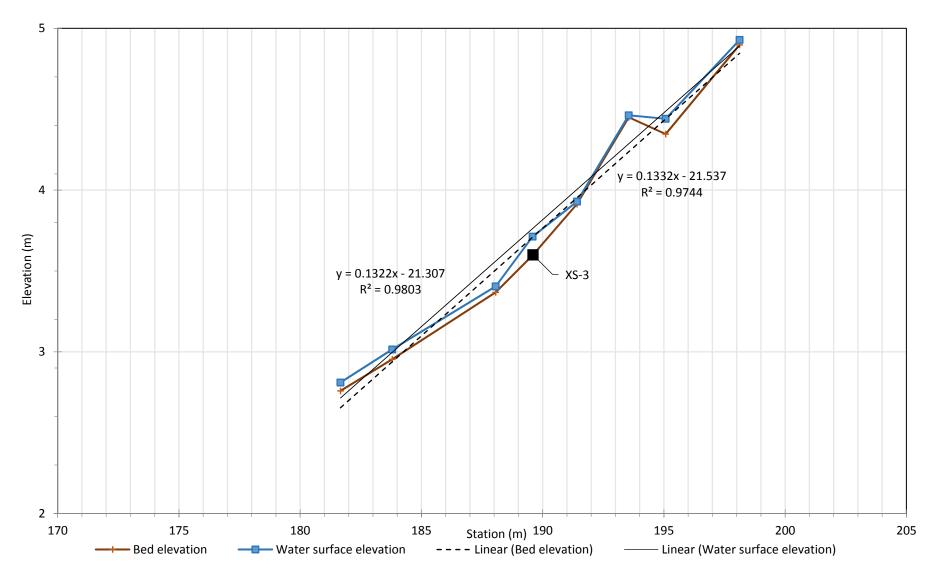
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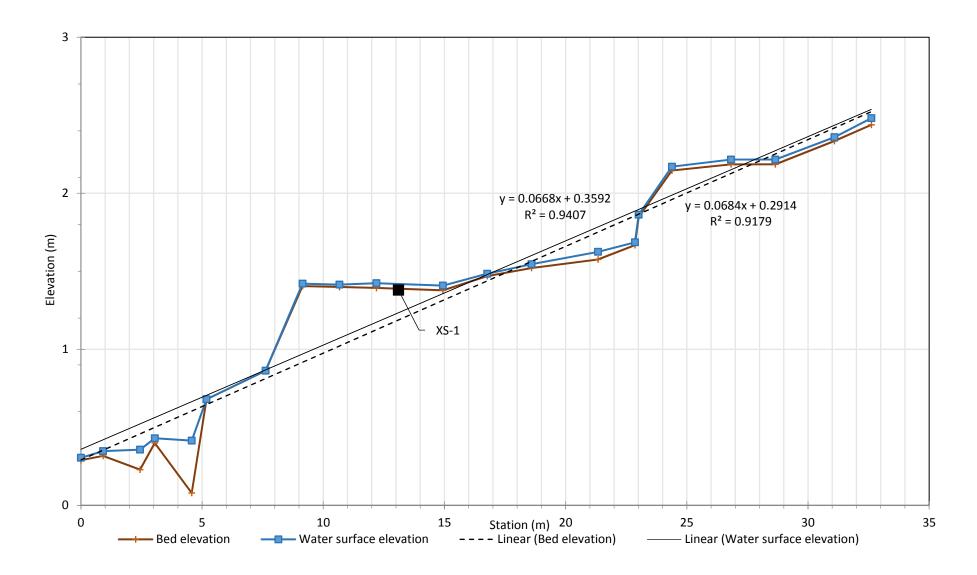
Bed and Water Surface Profiles for XS-1, DC-1, Upper Daggett, along Daggett Creek



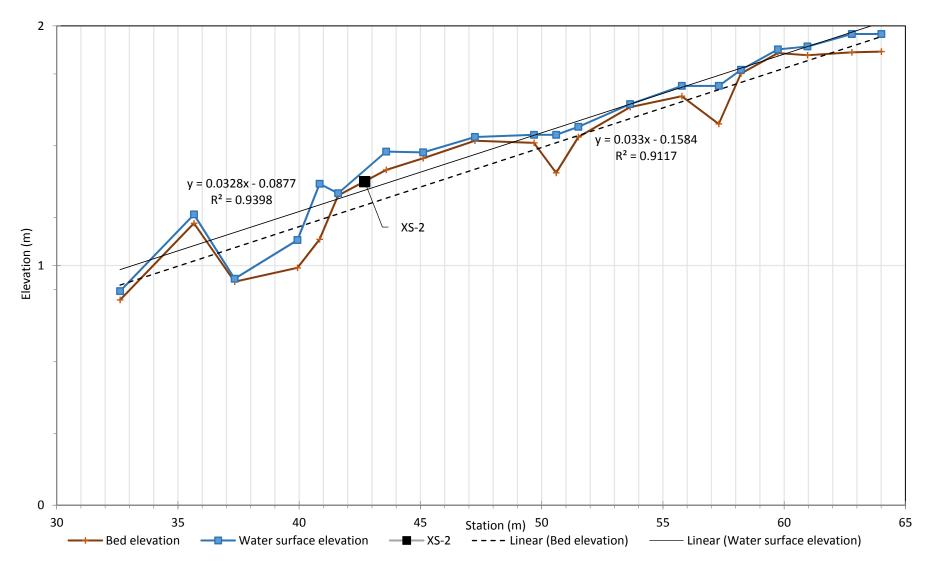
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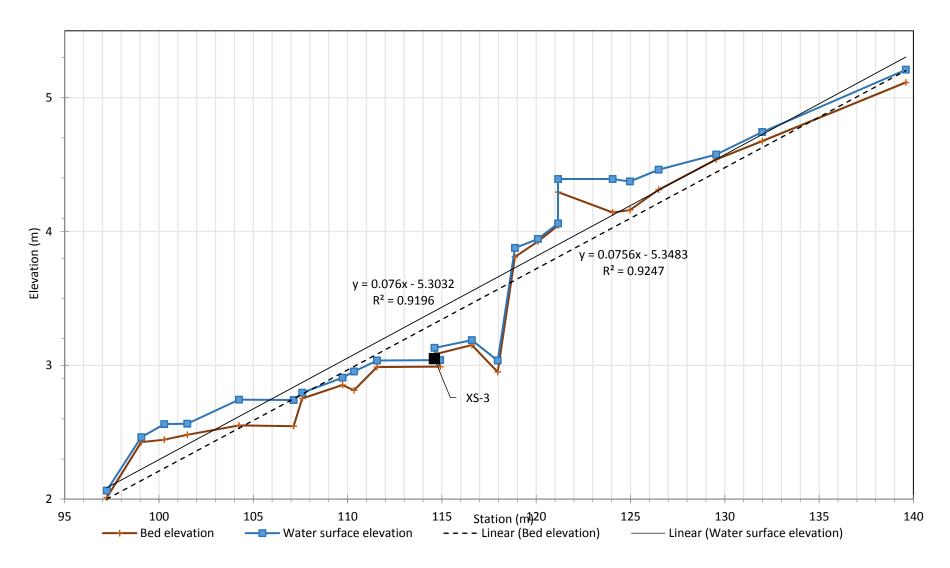
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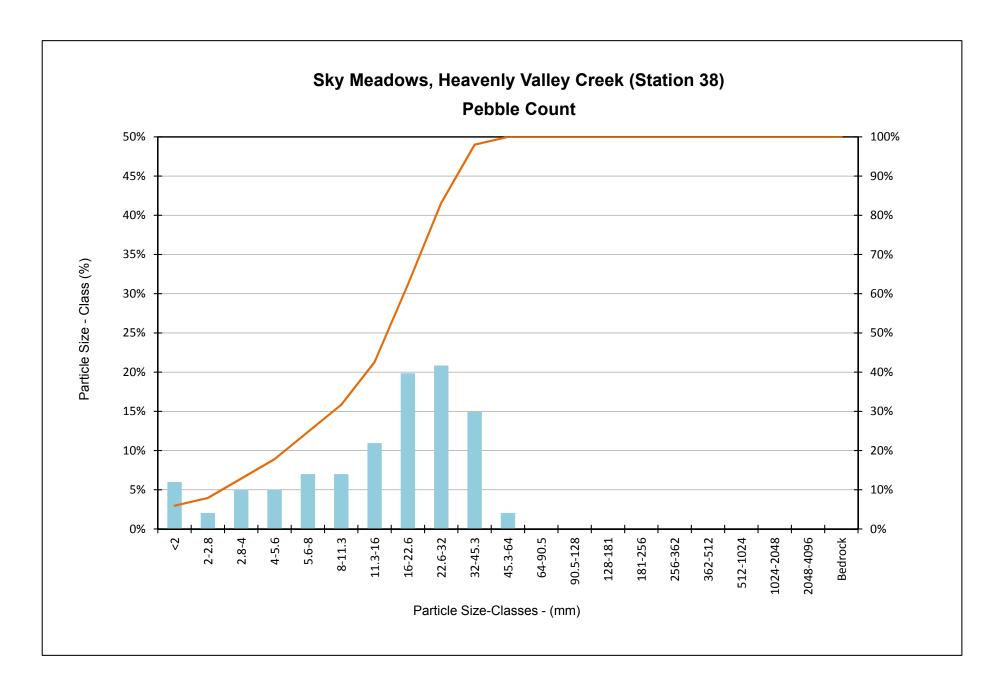
Bed and Water Surface Profiles for XS-1, DC-2, Lower Daggett, along Daggett Creek

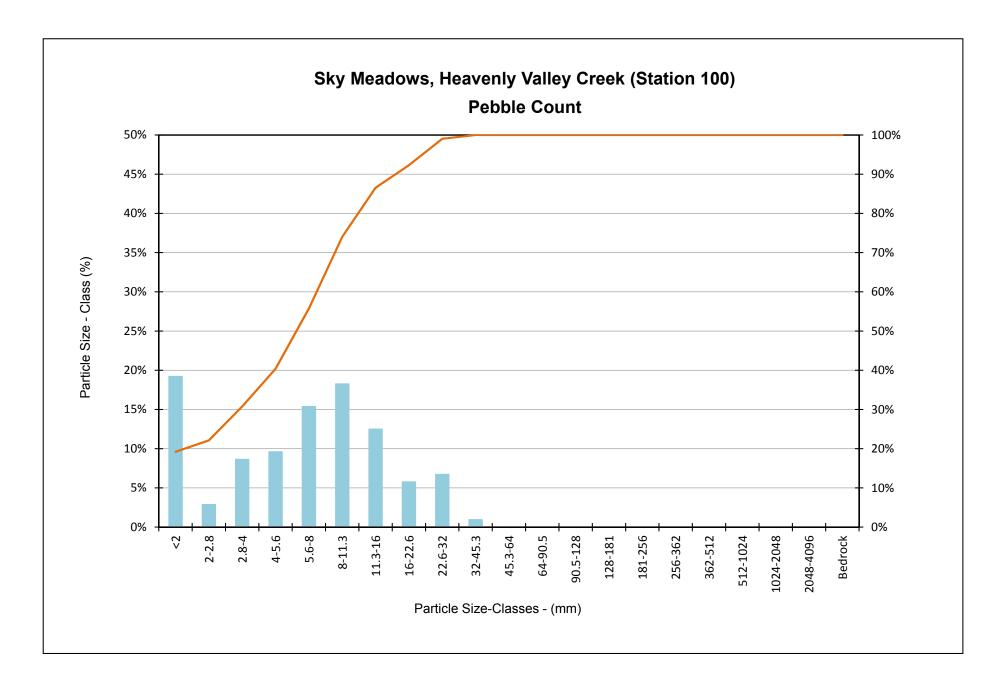


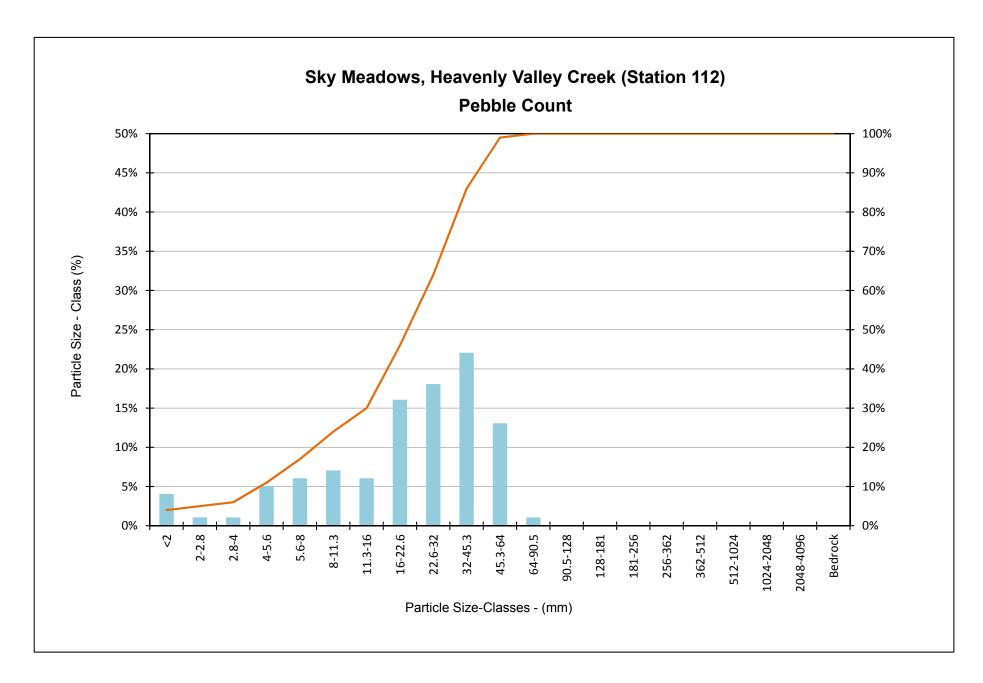
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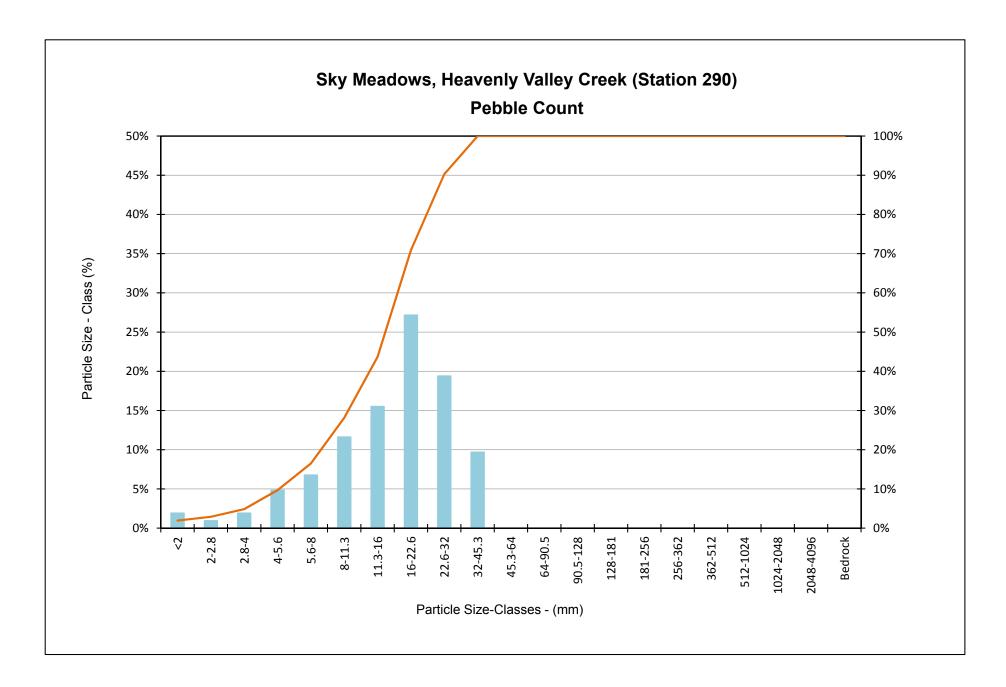
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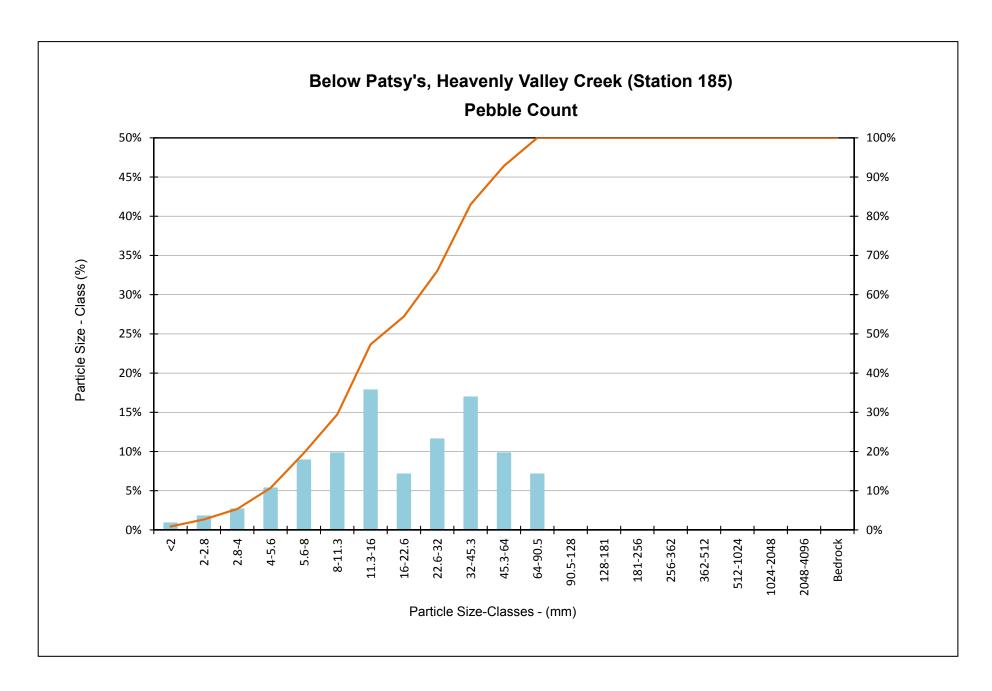


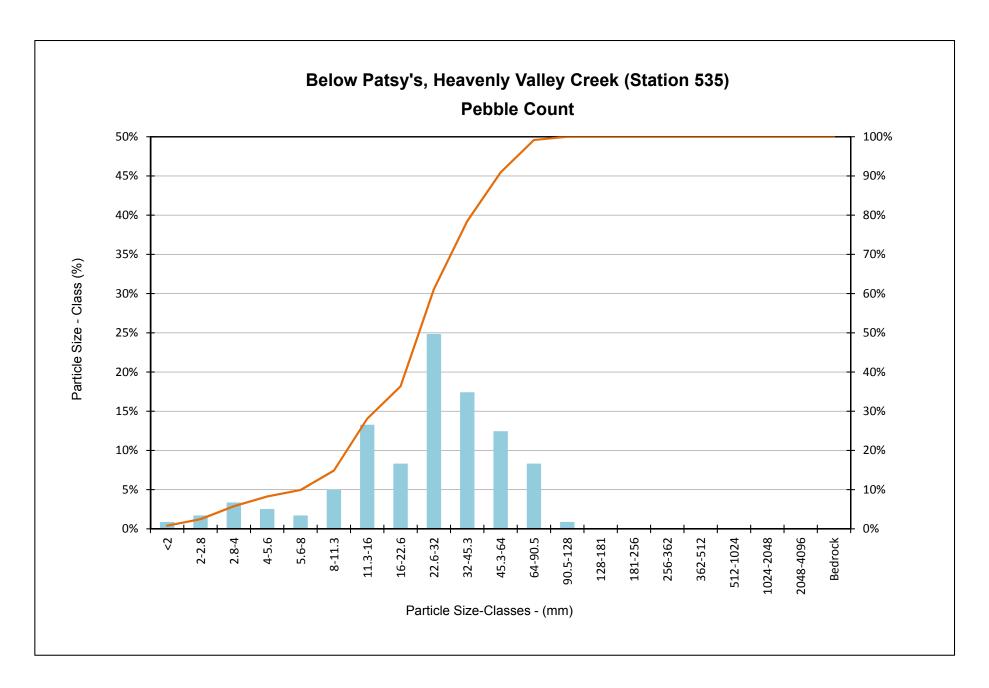


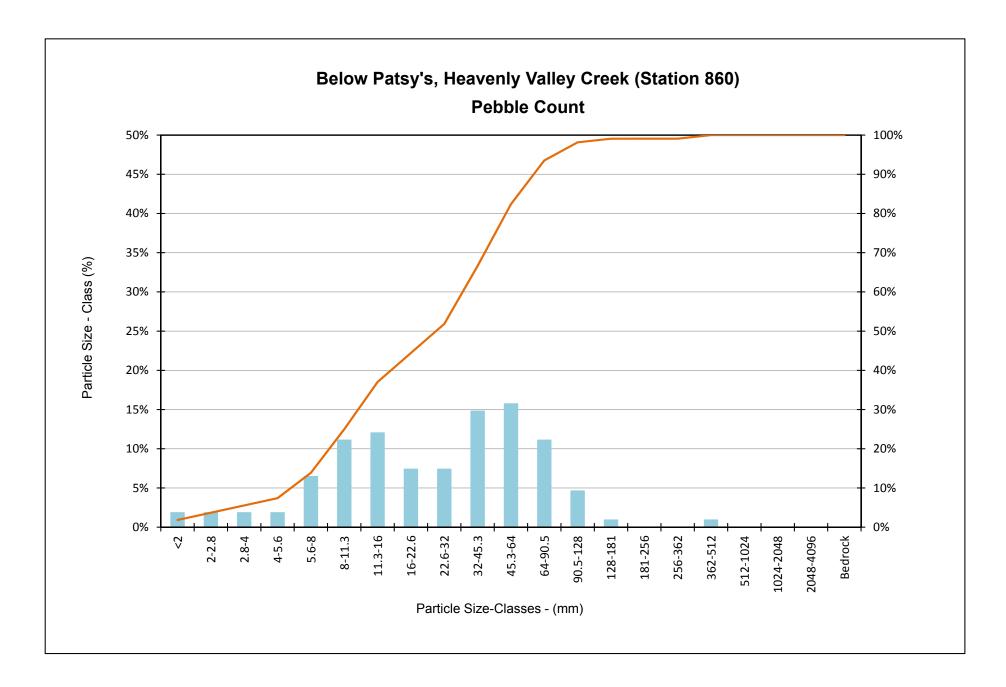


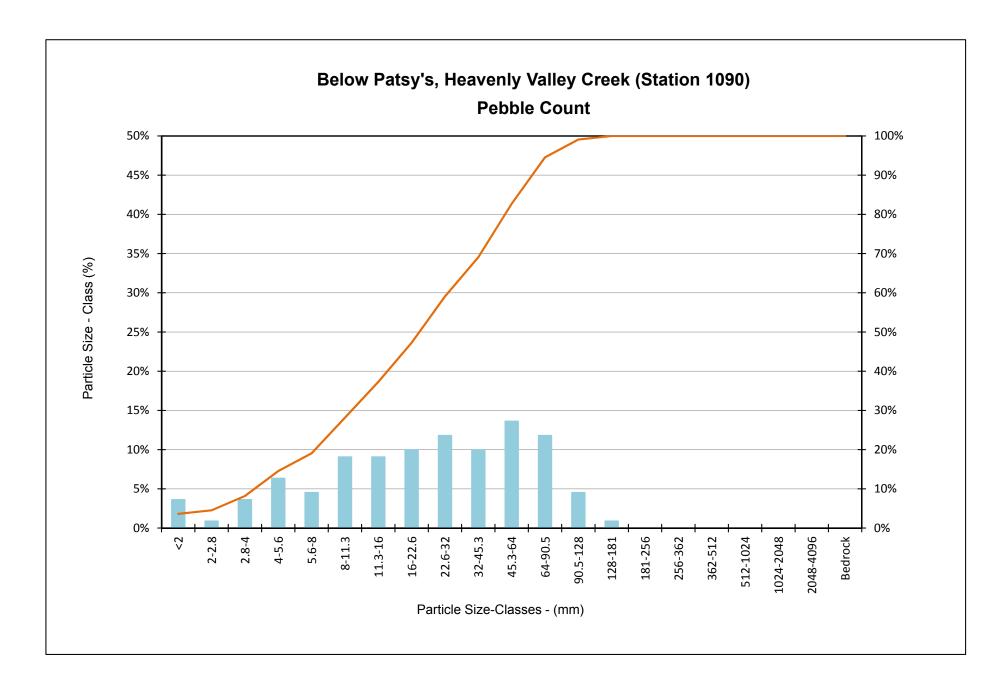
Bed Particle Size Distribution, Station 112, Sky Meadows at Heavenly Valley Creek

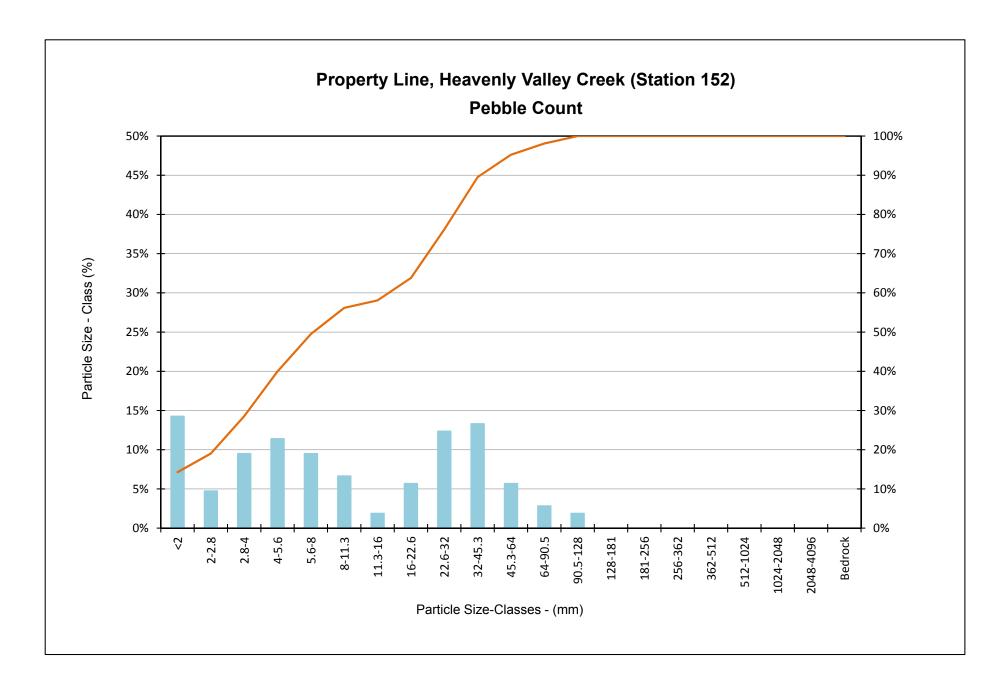


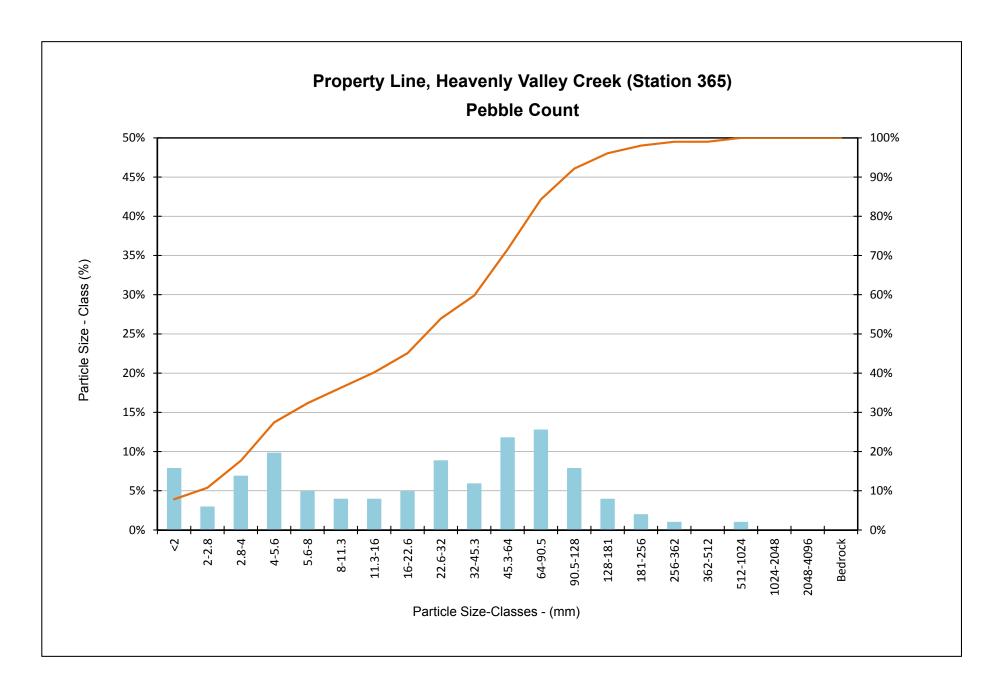


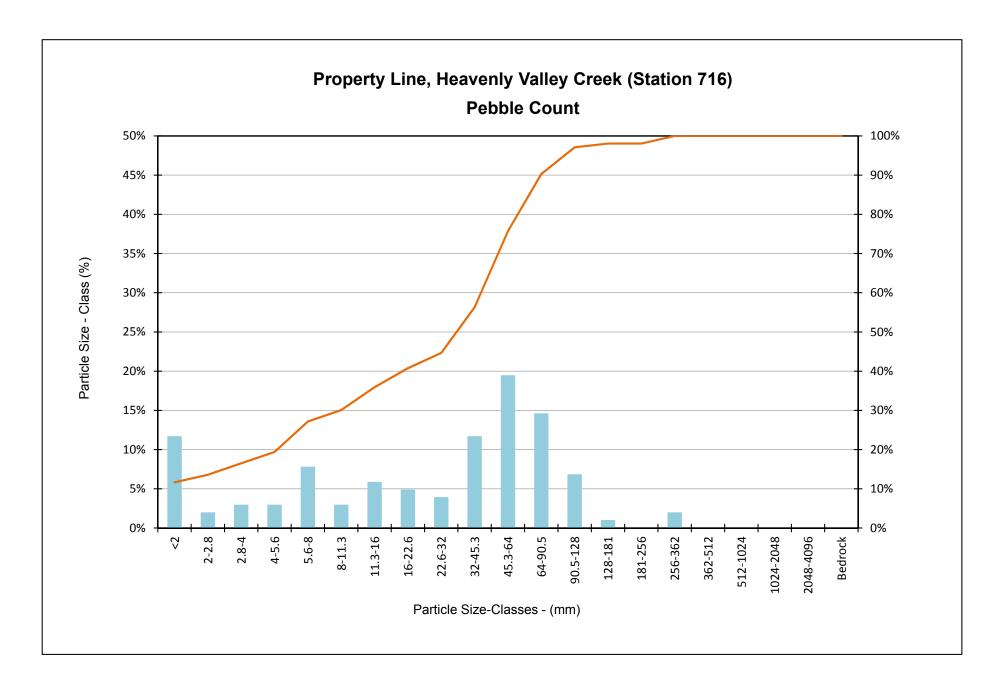




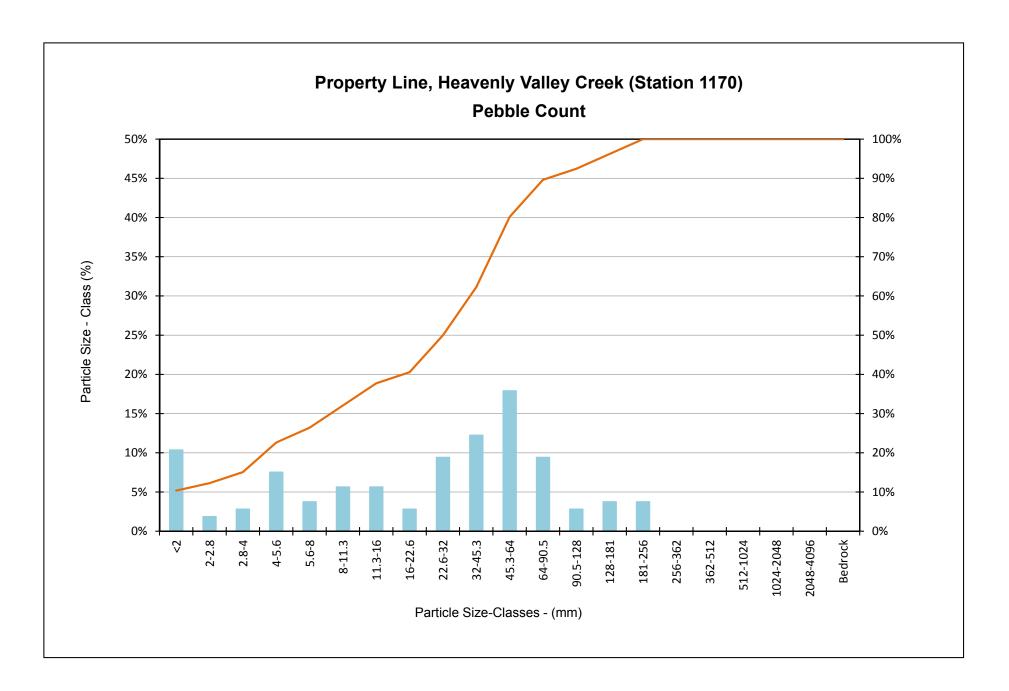


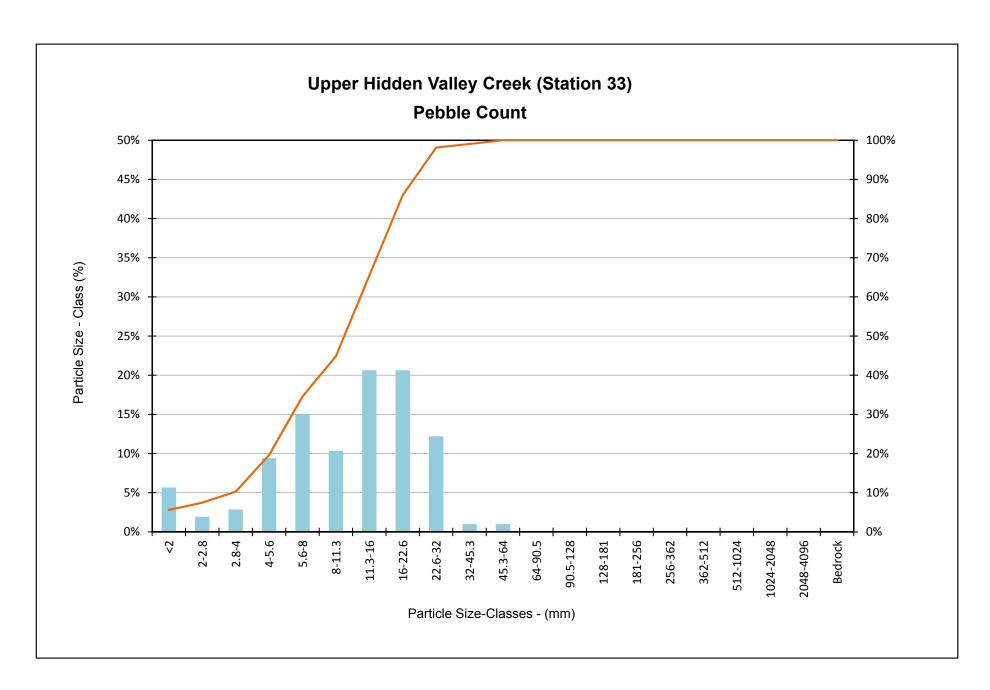


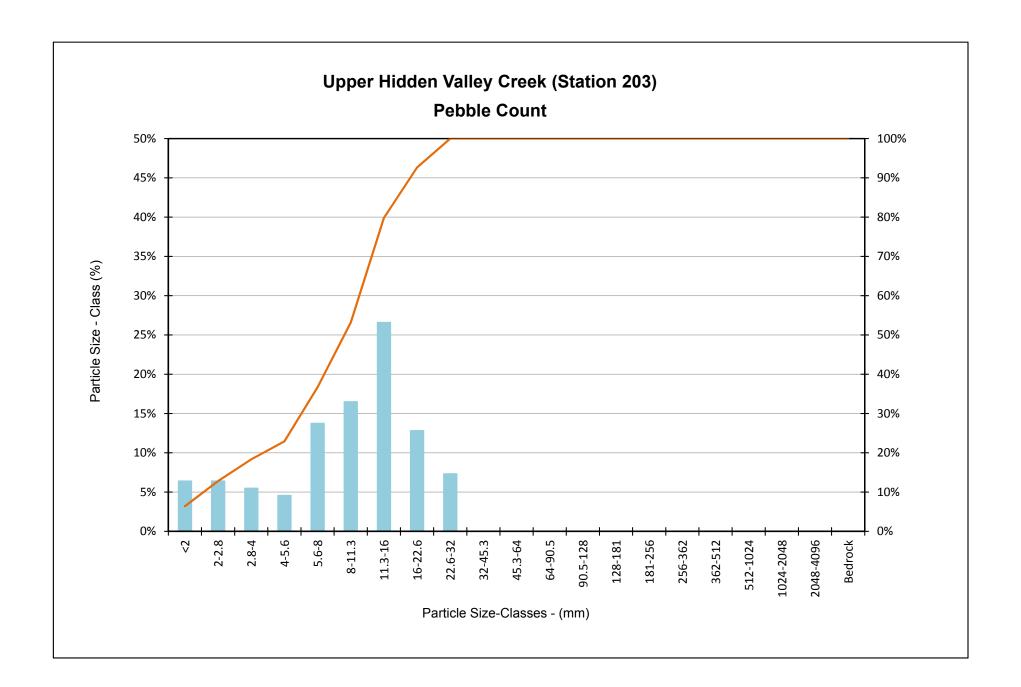


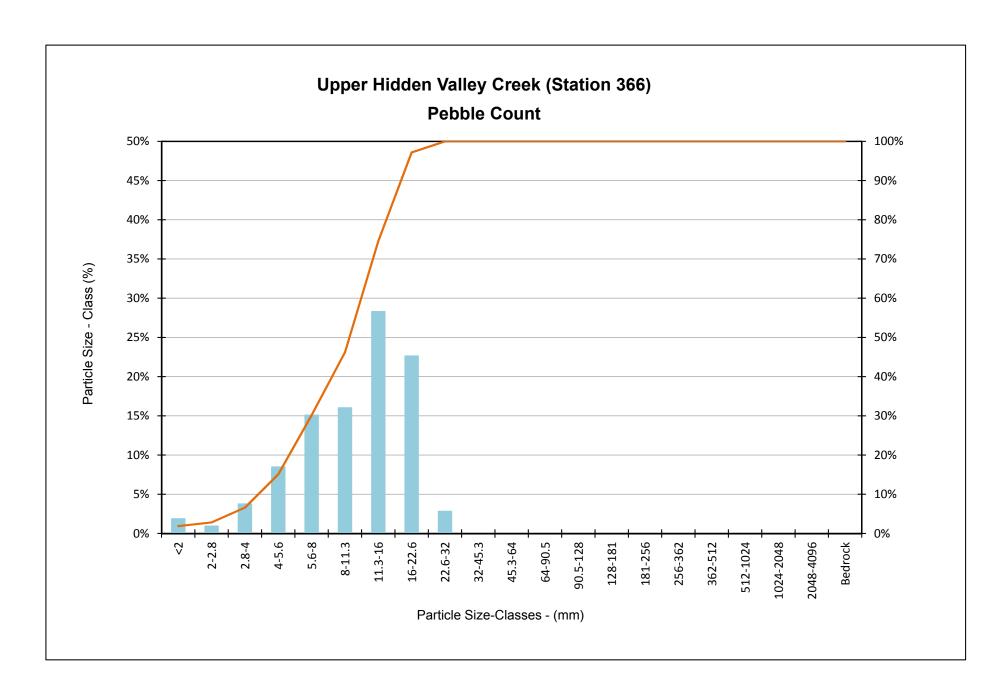


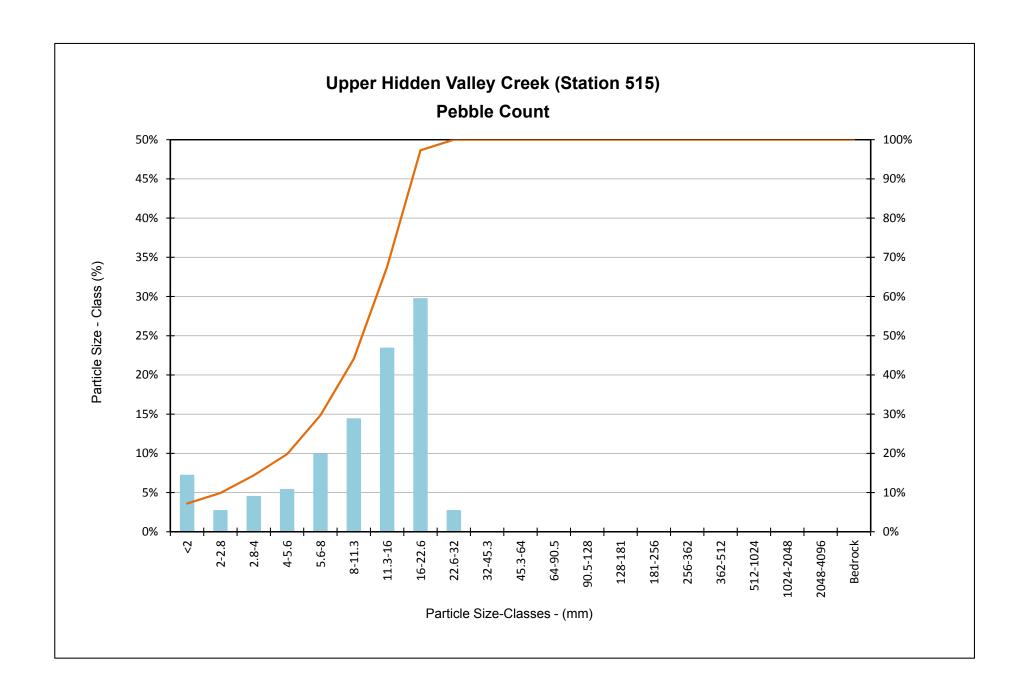
Bed Particle Size Distribution, Station 716, Property Line at Heavenly Valley Creek

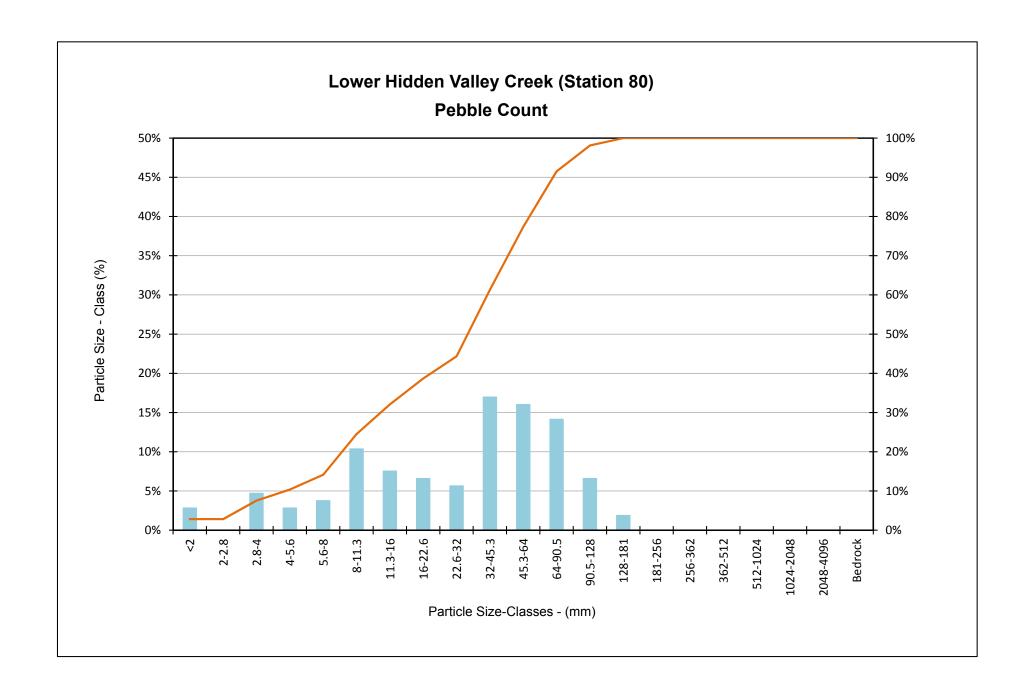


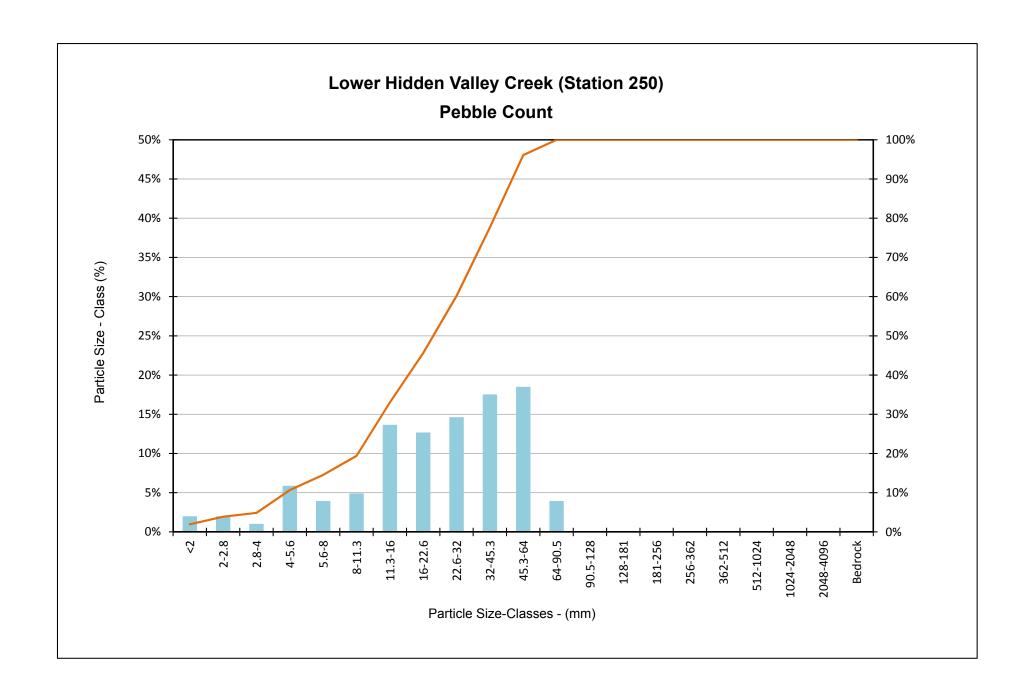


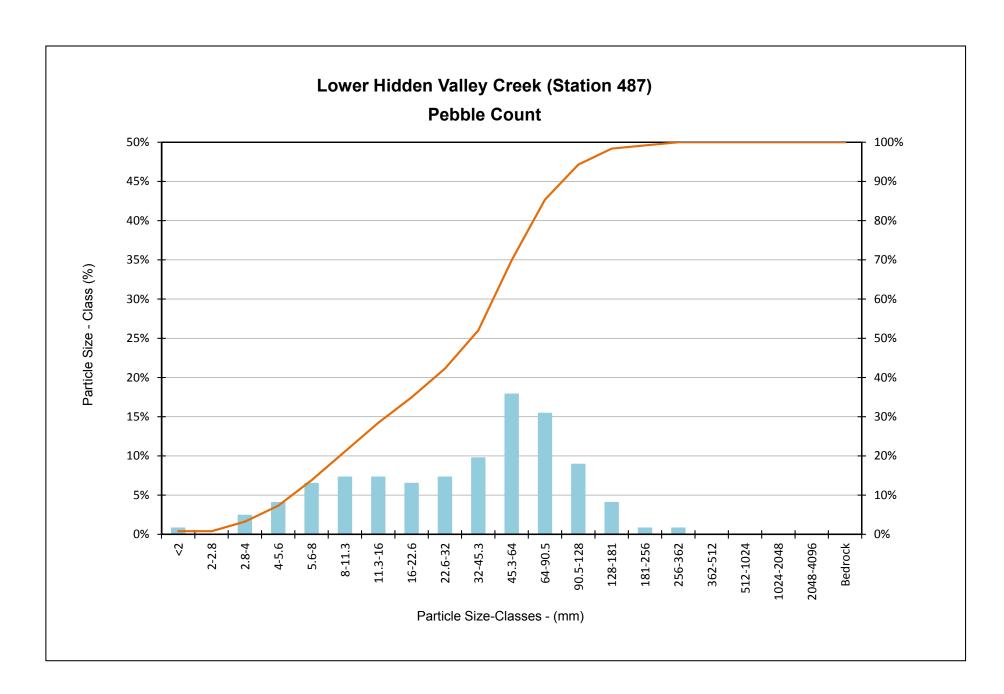


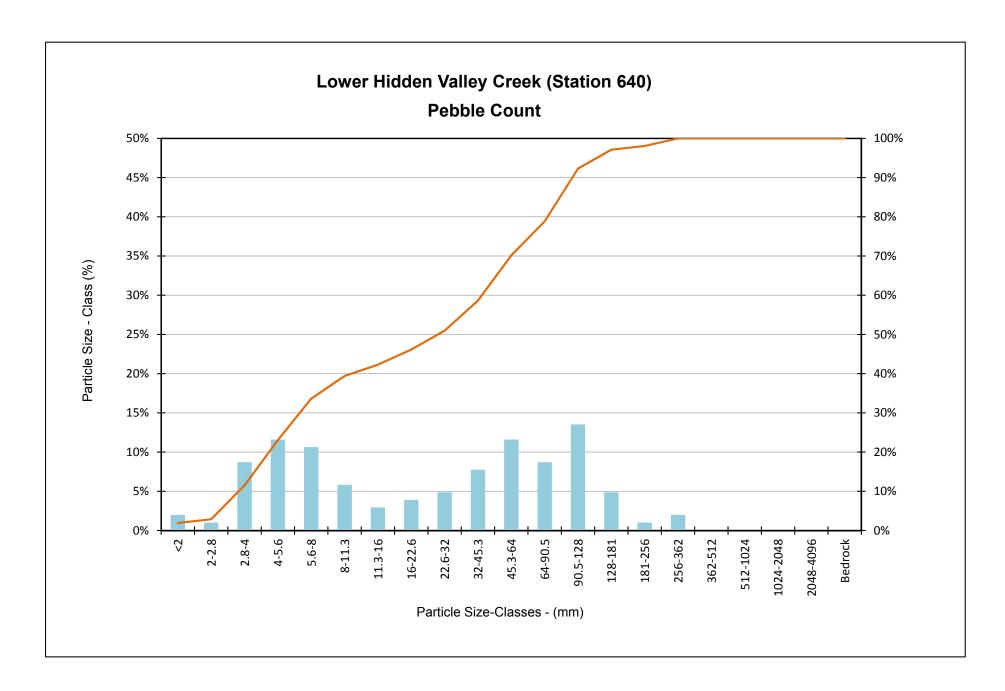


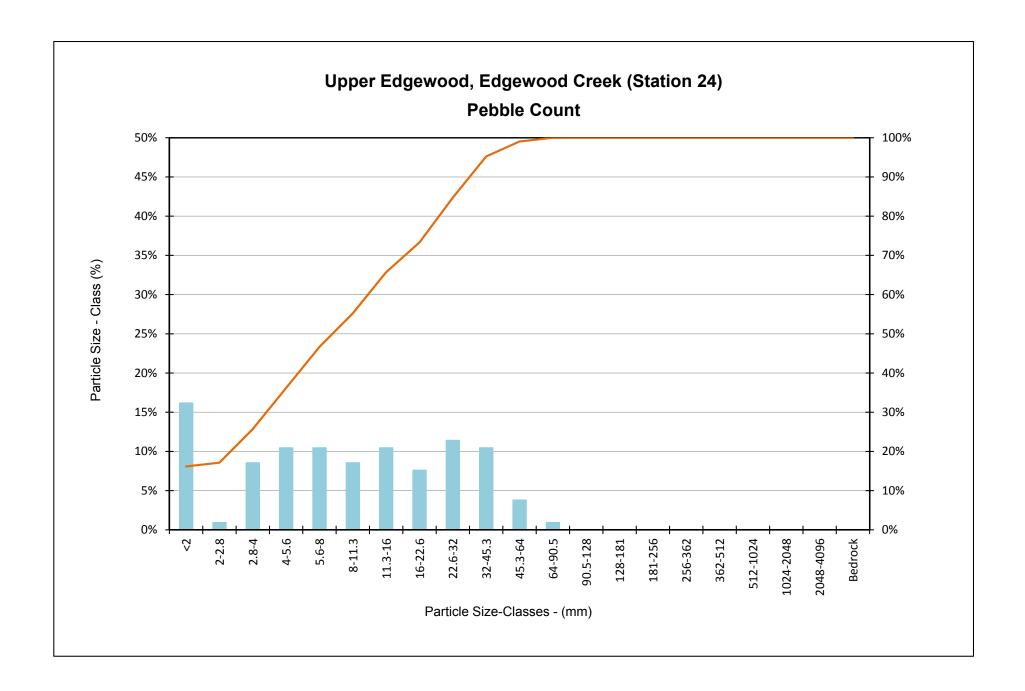


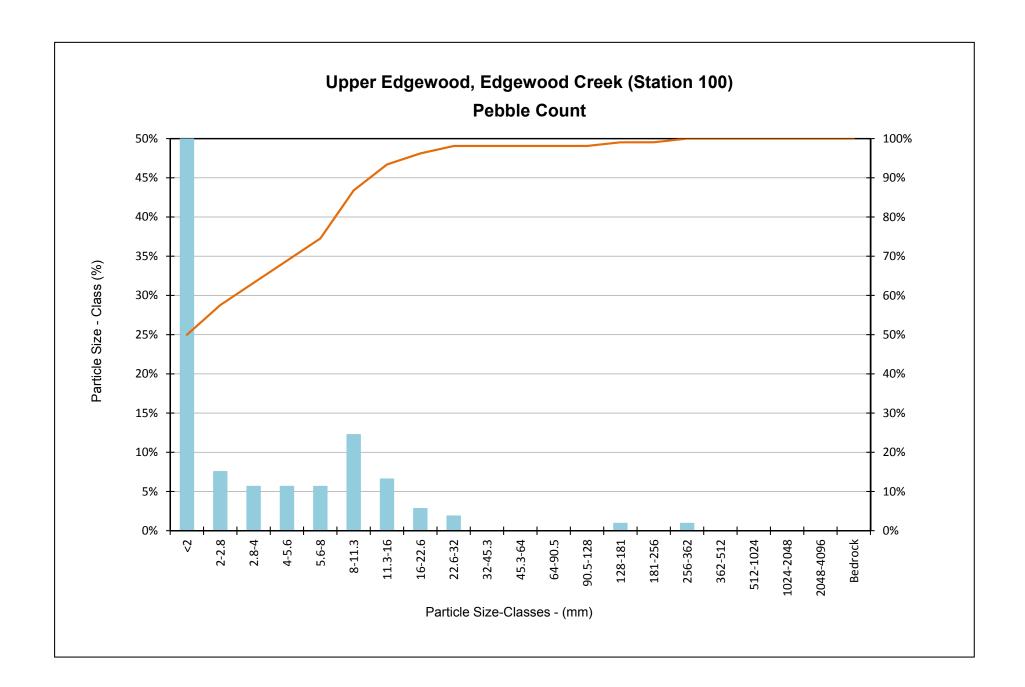


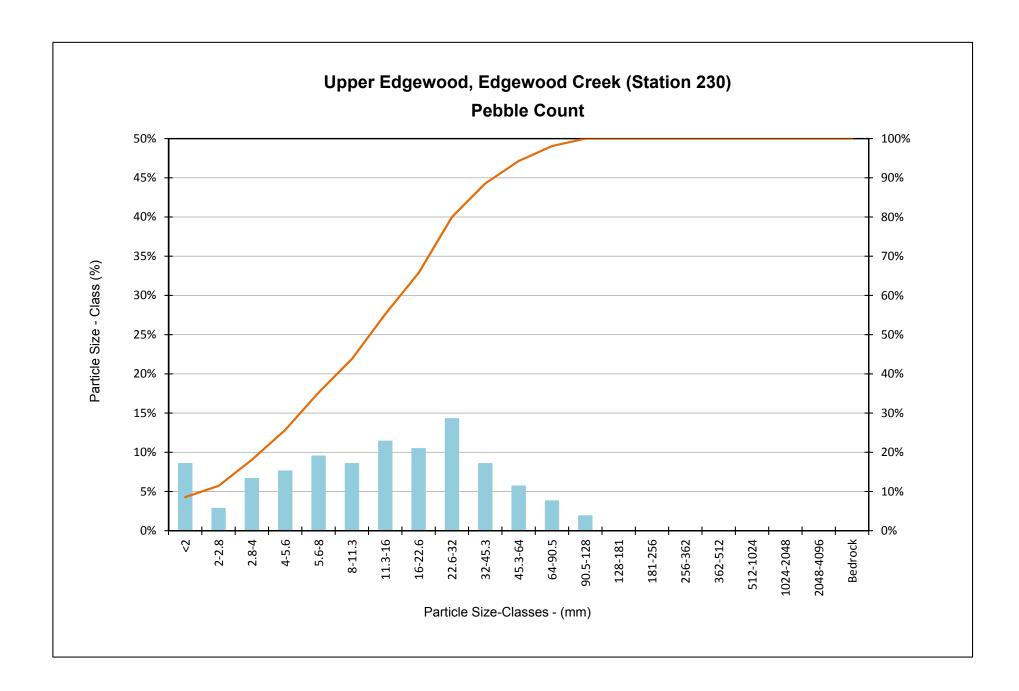


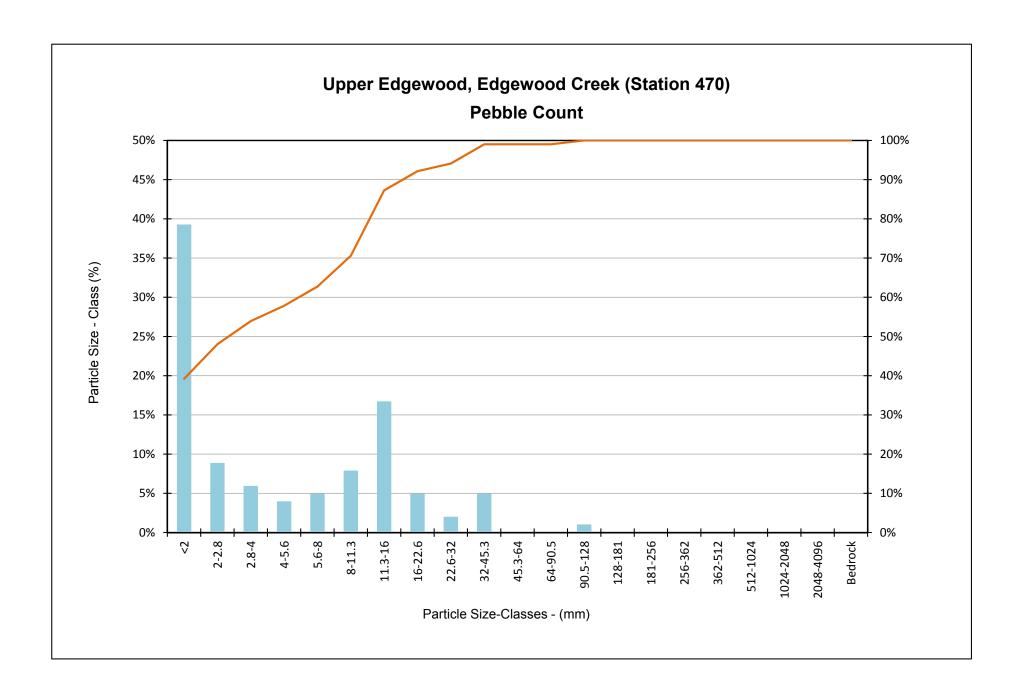


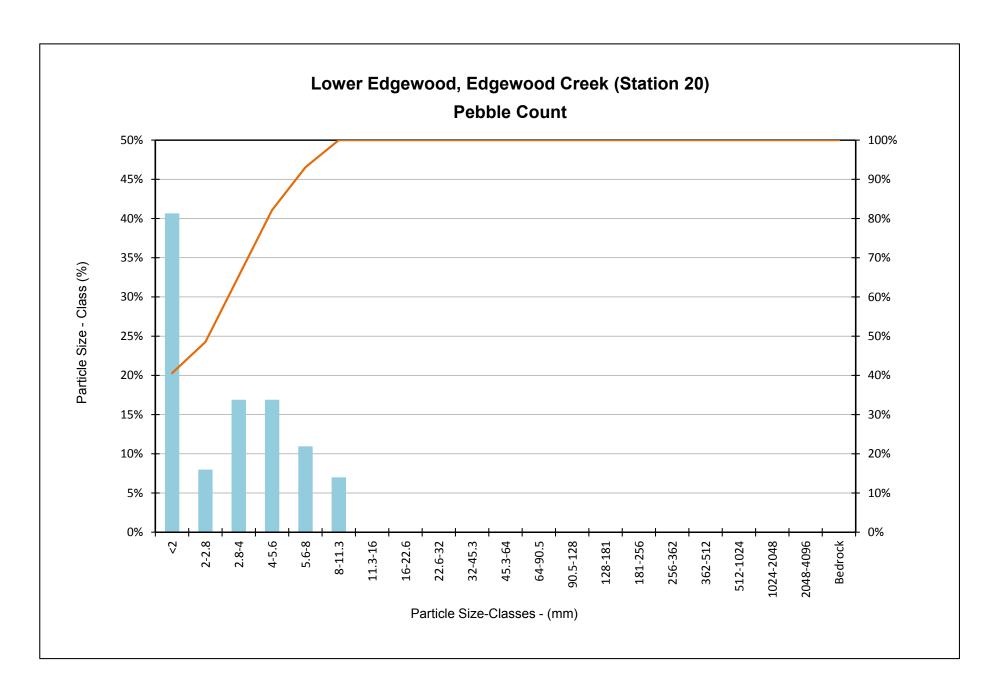


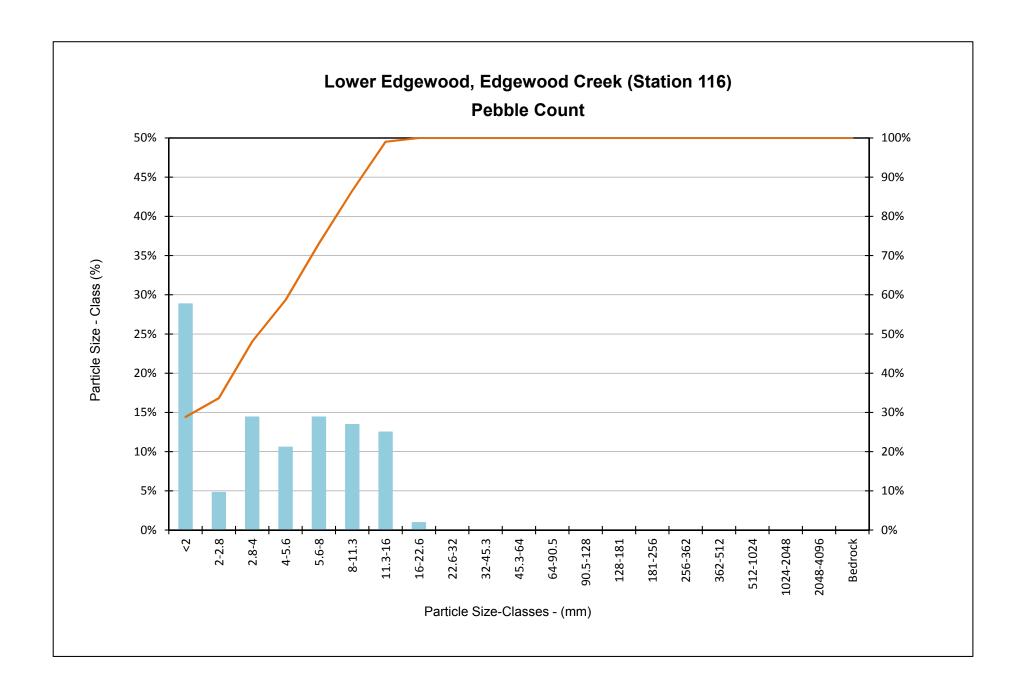


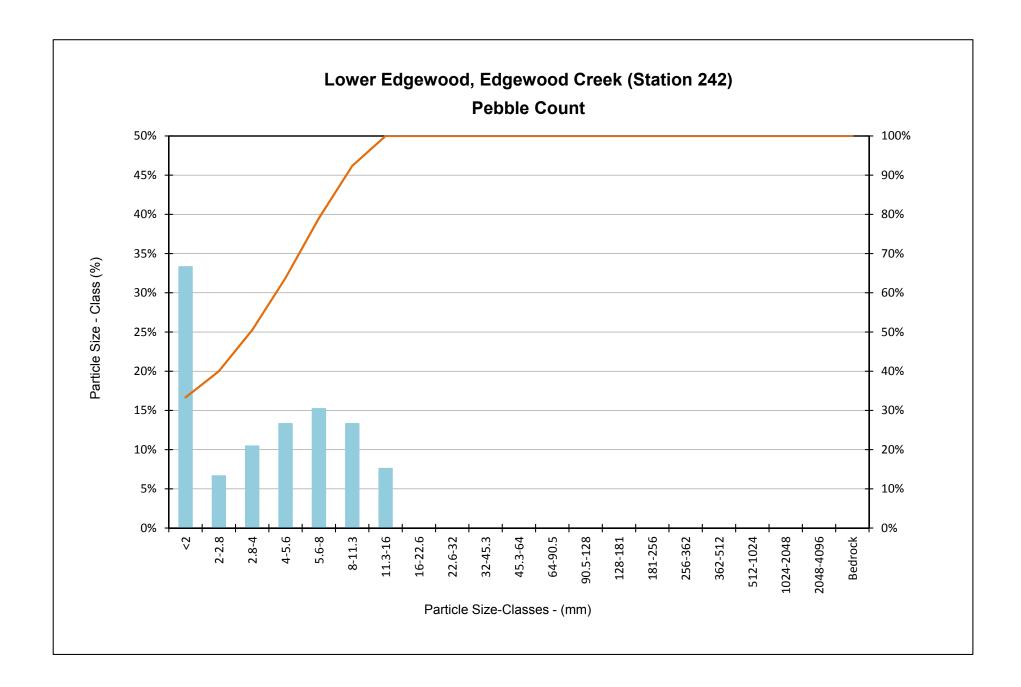


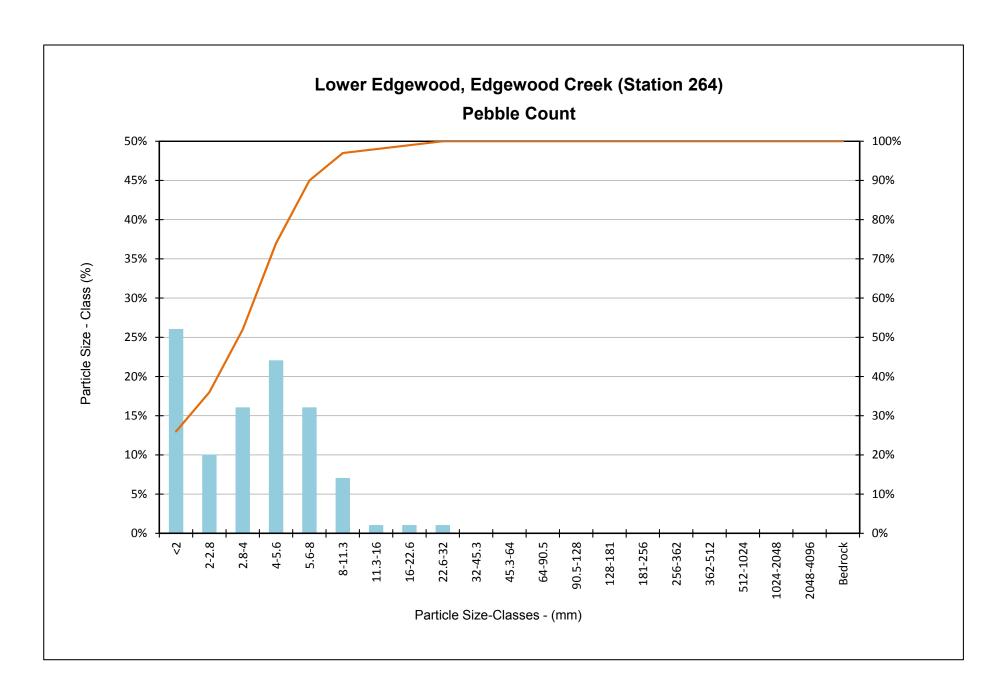


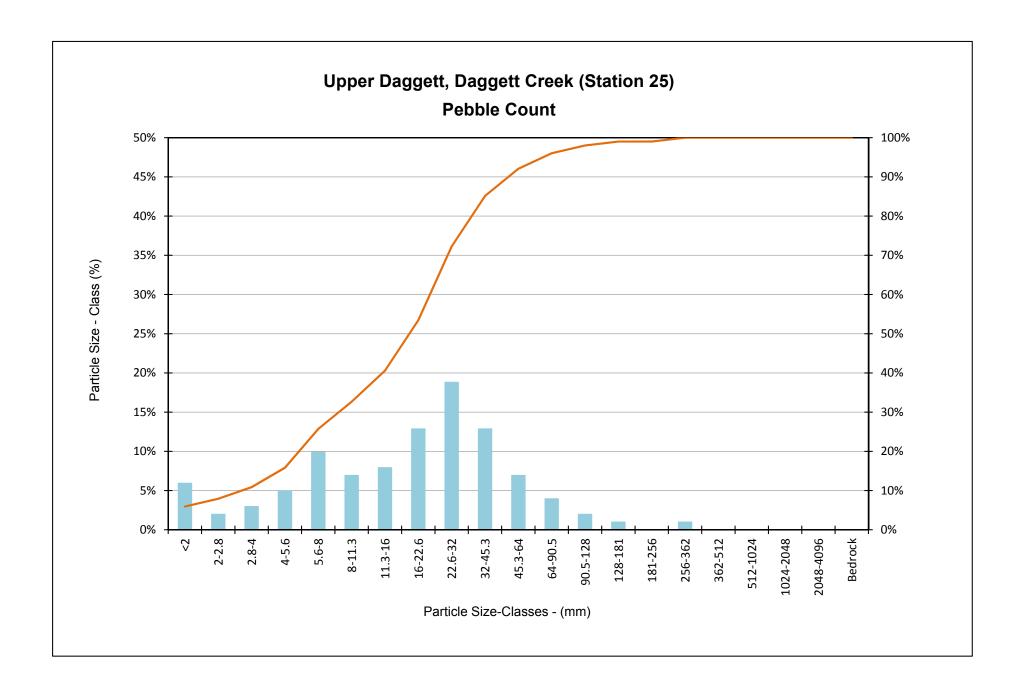


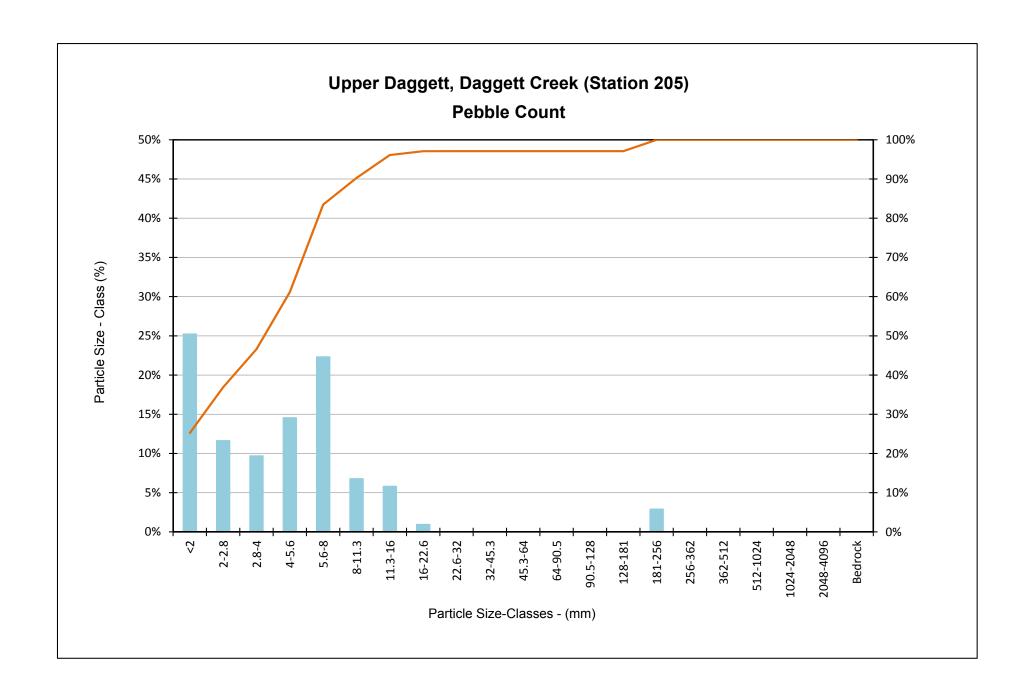


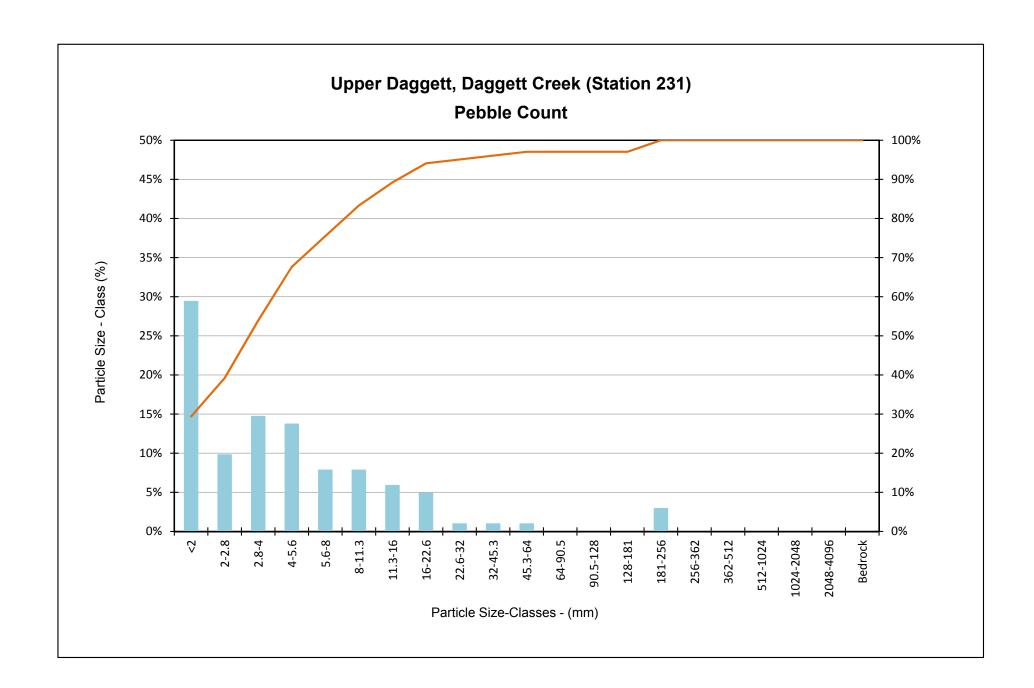


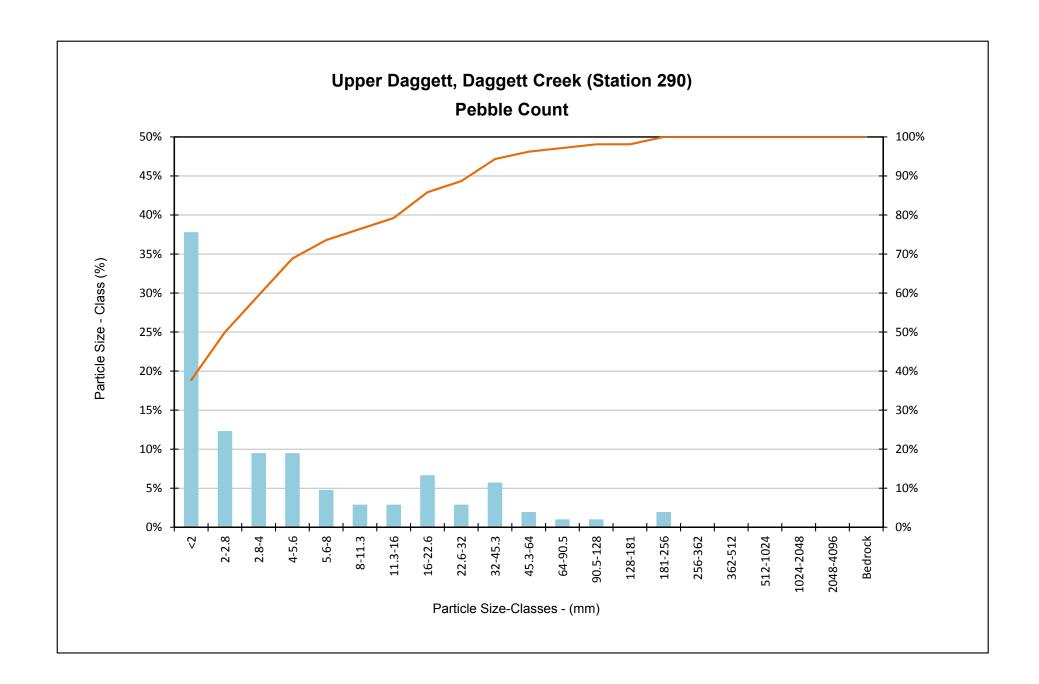


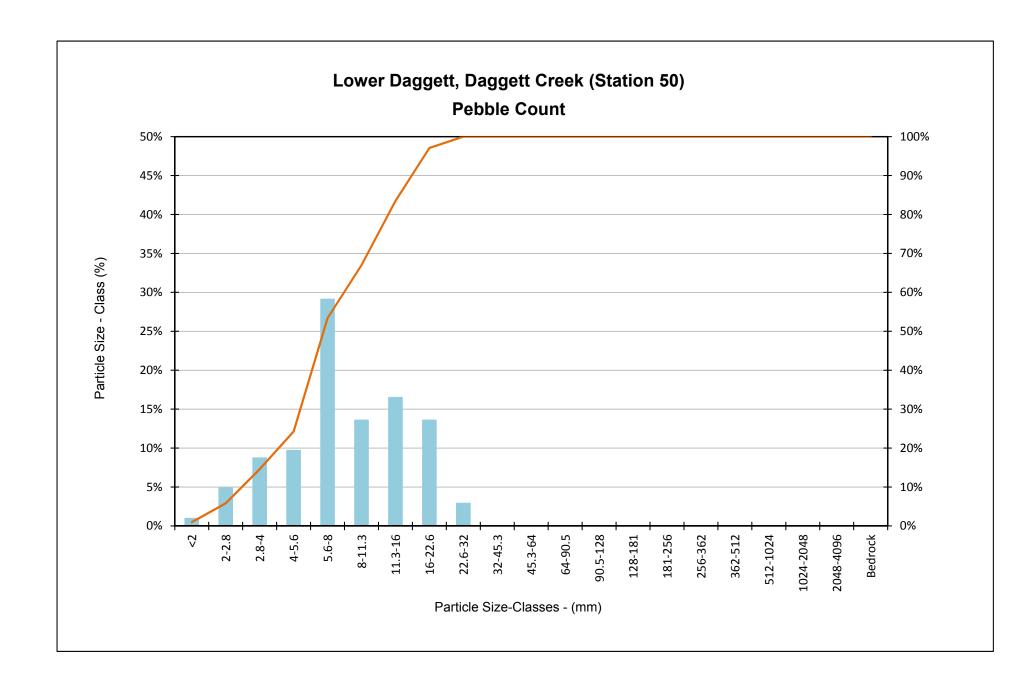


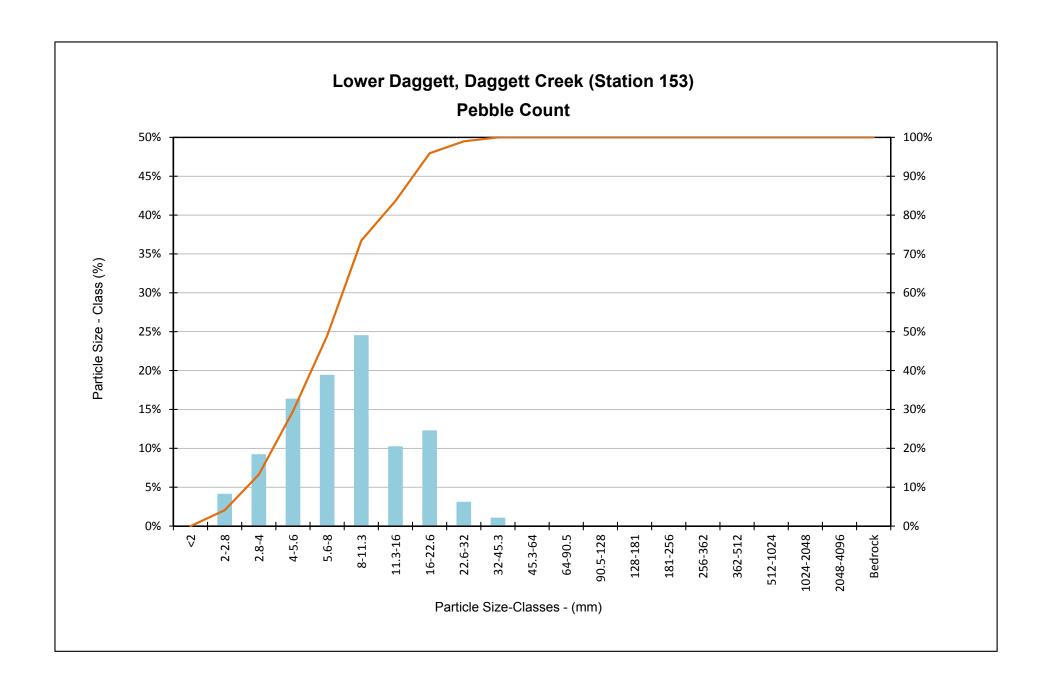


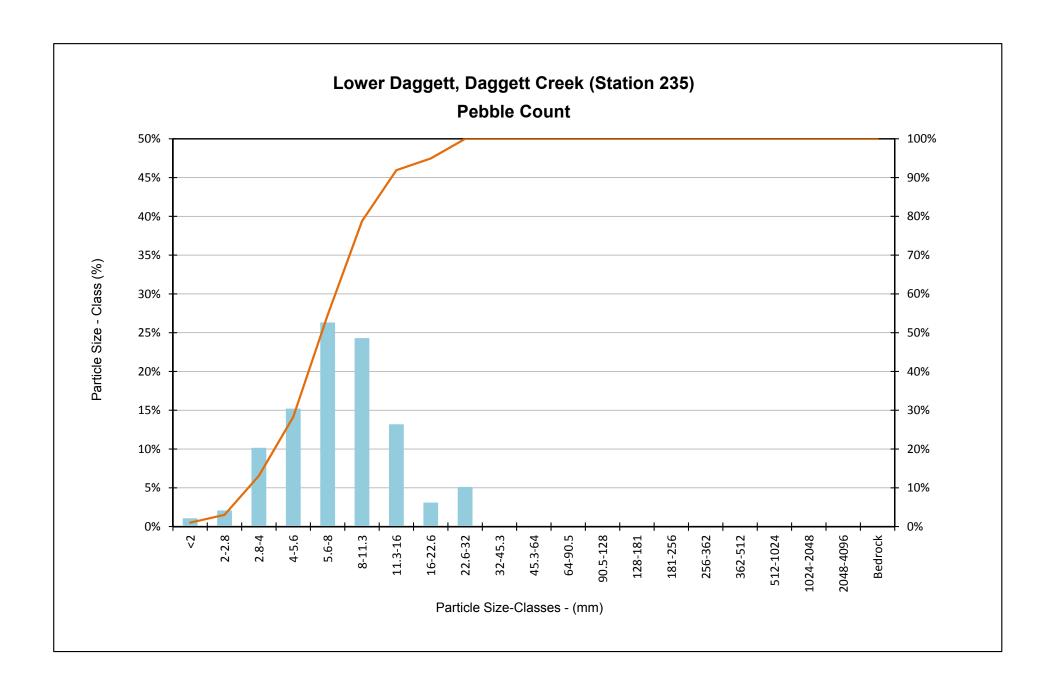


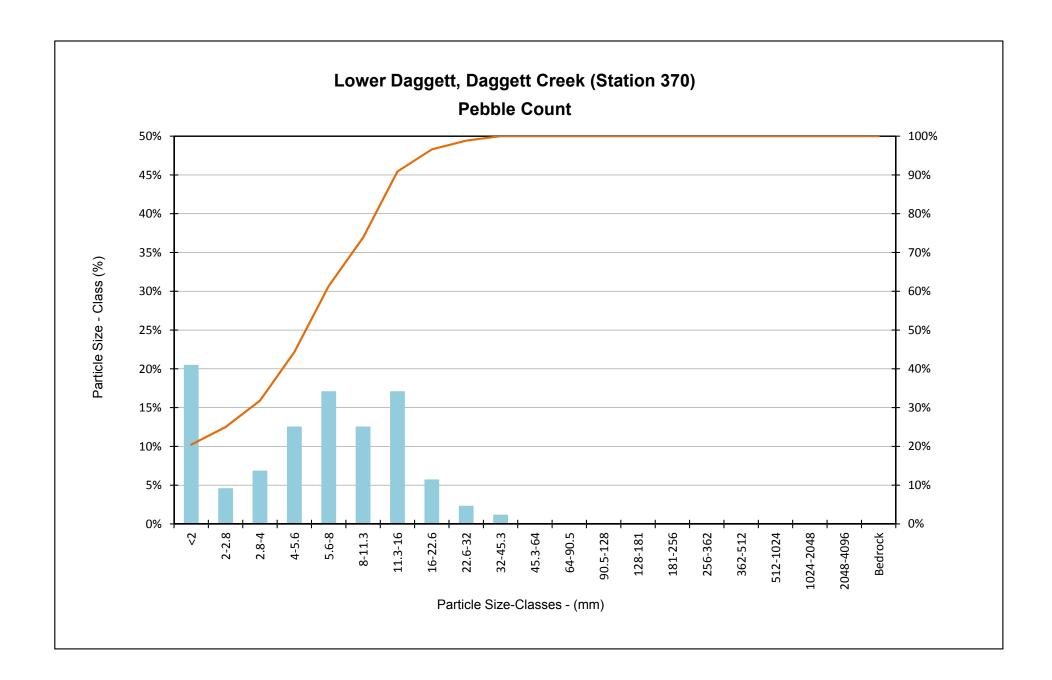








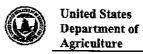




Mitigation and Monitoring Plan Annual Report (October 2014 – September 2015)

APPENDIX XIV FOREST SERVICE OLD GROWTH COMPLETION LETTER





Forest Service Lake Tahoe Basin Management Unit 35 College Drive South Lake Tahoe, CA 96150 530 543-2600

File Code:

Date: March 19, 2019

Andrew Strain Heavenly Mountain Resort PO Box 2180 Stateline, NV 89449

Dear Andrew,

The High Meadows stand identified for hand thinning to improve long-term habitat conditions for northern Goshawk per the Heavenly Master Plan Amendment was treated in the fall of 2007. All contract work was completed and accepted per the contract requirements on December 6 2007. I will fax you the signed copies of the Certificate of Final Inspection and the Contract Release for this project for your records. If you have questions, please give me a call at (530) 543-2687...

Sincerely,

Contracting Officer's Representative





	LOOUTDACT MUMPED
U.S DEPARTMENT OF AGRICULTURE	CONTRACT NUMBER
FOREST SERVICE	AG-9A63-C-08-0015
	דואט
CERTIFICATE OF FINAL INSPECTION	LTBMU
(Reference FSH 6309.31)	PROJECT
	South Shore hand Thin 2007
TO:	NAME AND ADDRESS OF CONTRACTOR
	Central Valley Forestry
Matthew Gagnon	18985C Road 256
CONTRACTING OFFICER	Exeter, CA 93221
1	

I hereby certify that the final inspection of the work under the above contract was made on 12-6-07.

The last day on which work was performed was 12-6-07 after which no calendar days should be charged against time All materials have been furnished, all the work has been performed, and all the construction required by the contract in accordance with its terms has been completed.

A copy of the inspection report is enclosed.

Enclosure(s)

SIGNATURE Robert Guebard

Contracting Officer's Representative

DATE

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70-01-51 Court

12/10/2007 14:37 FAX 530 543 2693 USDA FUREST SERVICE

2005

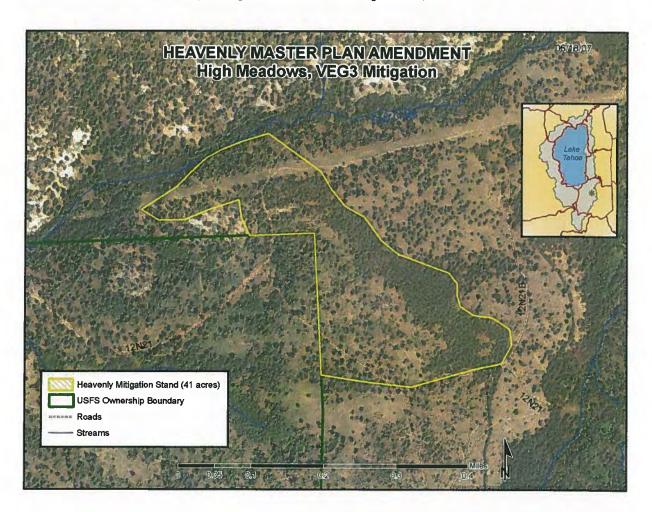
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DA - Forest Service	CONTRACT NUMBER
CONTRACT RELEASE (Reference FSH 6309.11)	AG-9A53-C-08-0015
	UNIT
	LYEMU
	PROJECT
	South Shore Hand Thin 2007
	NAME AND ADDRESS OF CONTRACTOR
Matthew Gagnon CONTRACTING OFFICER	Central Valley Forestry
	18985C Road 258
	Exeter, CA 93221
none	
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7.5-25 Late Seral/Old Growth Forest Enhancement

To mitigate for any projects that involve the removal of late seral/old growth suitable habitat, Heavenly must enhance or restore twice the area to late seral/old growth characteristics. Heavenly enhanced/restored a stand of forest equal to twice the area proposed for removal in the Master Plan Amendment. The enhanced forest was restored during the fall of 2007 and is located in the High Meadows area and is undergoing monitoring by the Forest Service every five years for success. The next monitoring report will be conducted in 2012. The Forest Service documentation certifying of completion of this task is located in Appendix XIII. (Text copied from the 2011 report.)

On May 1st 2013, Forest Silviculturist Rita Mustatia and Assistant VUFF Staff Officer David Fournier visited the Heavenly Mitigation Stand (see map below).



Portions of the mitigation stand included high levels of tree mortality that posed a high risk of stand replacing fire and relatively large older trees that were susceptible to bark beetle mortality.

The objectives of the mitigation were three-fold: 1) To reduce the fire hazard to the older forest portion of the stand, and 2) to improve the resiliency of the old forest stand to fire and insects, and 3) to monitor natural regeneration of early seral portions of the stand.

The result of the site visit to monitor the completion of these objectives proved satisfactory. The high levels of lodgepole mortality (from Mountain Pine Beetle) were cut, piled and burned, reducing the risk of stand replacing fire. The understory in the older portions of the stand was thinned to levels that would effectively improve resiliency for the long-term. There was evidence of adequate stocking of naturally regenerating seedlings throughout the treated area of the stand.

The photos below highlight the result of these treatments:

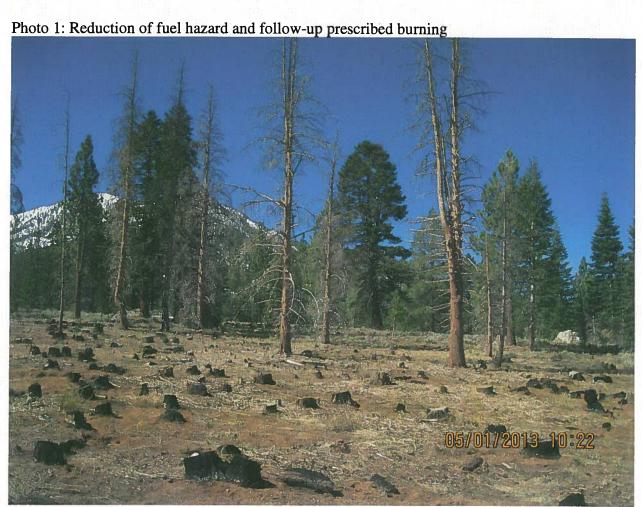
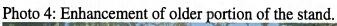


Photo 2: Natural regeneration occurring within the stand.



Photo 3: Enhancement of older forest portion of the stand.







This report certifies that the treatment goals for the mitigation stand have been met. As a result of the monitoring conducted, there is no further need for monitoring.

David Fournier, Assistant Staff Officer

Rita Mustatia, Silviculturist

4/10/2014

About Cardno

Cardno is a professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange

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