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January 17, 2023

Ms. Liz van Diepen
Engineering Geologist
Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Re: Heavenly Mountain Resort 2022 Environmental Monitoring Program Annual Report

Dear Ms. van Diepen:

Enclosed, please find for your review the Environmental Monitoring Program Annual Report for the 2022 water year submitted in fulfillment of the monitoring and reporting requirements set forth in the California Regional Water Quality Control Board Lahontan Region Monitoring and Reporting Program No. 2015-0021 for Heavenly Mountain Resort. This report also fulfills the fourth quarter sampling, covering the months of July, August, and September 2022. The annual reporting requirements and location found in the report are listed below:

- Raw Water Quality Constituents, Water Year 2022, and Laboratory Analysis for Fourth Quarter (Appendix A)
- Raw Water Quality Constituents, CA Filter Vaults, Water Year 2022, and Laboratory Analysis (Appendix B)
- California Vault Inspection Reports (Appendix C)
- Facilities Maintenance Monitoring Reports for the Fourth Quarter (Appendix D)
- 2022 Roads Monitoring (Appendix E)
- Facilities Watershed Awareness Training (Appendix F)
- On-Mountain Monitoring for Fourth Quarter (Appendix G)
- Traction Sand Analysis for May 2022 (Appendix H)

Should you require additional information or have questions regarding this report and its contents, please contact Chris Donley of Stantec at 208-272-9178.

Sincerely,

DocuSigned by:
Tom Fortune
4527A03B0D8A496...

Tom Fortune,
Vice President & COO

Cc: Stephanie Heller, USDA Forest Service LTBMU
Julie Roll, Tahoe Regional Planning Agency

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Date: January 17, 2023

California Regional Water Quality Control Board
Lahontan Region
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Facility Name: Heavenly Mountain Resort

Address: Post Office Box 2180
Stateline, Nevada 89449

Contact Person: Tom Fortune

Job Title: Vice President & COO

Phone: (775) 586-2311

Email: tfortune@vailresorts.com

WDR/NPDES Order Number: R6T-2015-0021

WDID Number: 6A090033000

Type of Report (circle one)**:** Monthly Quarterly Semi-Annual **Annual** Other

Month(s) (circle applicable month(s)*:

JAN FEB MAR APR MAY JUN
JUL AUG SEP **OCT** NOV DEC

***Annual Reports** (circle the first month of the reporting period)

Year: Water Year 2022

Violation(s)? (Please check one)
NO _____ **YES*** X
***If YES is marked complete a-g (Attach Additional information as necessary)**

a) Brief Description of Violation:

1. Heavenly Valley Creek Sky Meadow's monitoring site (43HVC-1A) has an annual average value exceedance of the Lahontan standards for: Total Phosphorus and Chloride.
2. Heavenly Valley Creek Below Patsy's monitoring site (43HVC-2) has an annual average value exceedance of the Lahontan standards for: Total Phosphorus and Chloride.
3. Heavenly Valley Creek Property Line monitoring site (43HVC-3) has an annual average value exceedance of the Lahontan standards for: Total Phosphorus and Chloride.
4. Bijou Park Creek monitoring site (43HVC-4) has annual average exceedances of the Lahontan standards for: Turbidity, Total Suspended Sediment (TSS), Total Nitrogen, Total Phosphorus, and Chloride.

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5. California Parking Lot Filter Vault Effluent monitoring site (43HVP-2) has exceedances of the Lahontan standards for: Turbidity, Total Nitrogen, and Total Phosphorus.

b) Section(s) of WDRs/ NPDES Permit Violated: Board Order No. R6T-2015-0021, WDID NO. 6A090033000

c) Reported Value(s) or Volume:

43HVC-1A (Annual Average):
Total Phosphorus: 0.023 mg/L
Chloride: 0.49 mg/L

43HVC-2 (Annual Average):
Total Phosphorus: 0.023 mg/L.
Chloride: 1.05 mg/L

43HVC-3 (Annual Average):
Total Phosphorus: 0.019 mg/L.
Chloride: 0.80 mg/L

43BPC-4 (Annual Average):
TSS (90% Percentile): 89.0 (90% percentile)
Total Nitrogen: 0.78 mg/L
Total Phosphorus: 0.201 mg/L
Chloride: 67.3 mg/L

43BPC-4 (Turbidity Exceedances > 20.0 NTU):
Turbidity (1/11/22): 302 NTU
Turbidity (2/22/22): 67.9 NTU
Turbidity (3/14/22): 50.8 NTU
Turbidity (4/19/22): 92.3 NTU
Turbidity (8/24/22): 23.8 NTU
Turbidity (9/21/22): 38.1 NTU

43HVP-2: (Results from 10/22/21)
Turbidity: 130 NTU
Total Phosphorus: 0.35 mg/L
Total Nitrogen: 2.2 mg/L

43HVP-2: (Results from 4/19/22)
Turbidity: 45 NTU
Total Phosphorus: 0.17 mg/L
Total Nitrogen: 1.0 mg/L

43HVP-2: (Results 9/19/22)
Turbidity: 49 NTU
Total Phosphorus: 0.29 mg/L
Total Nitrogen: 1.7 mg/L

d) WDRs/NPDES Limit/Condition: Maximum receiving water concentrations for discharge in the Heavenly Valley Creek watershed to Trout Creek, annual averages unless otherwise noted (applies to 43HVC-1A, 43HVC-2, 43HVC-3, and reference reach 43HDVC-5):

Total Nitrogen: 0.19 mg/L
Total Phosphorus: 0.015 mg/L
Chloride: 0.15 mg/L
TSS: 60 mg/L[1]

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Effluent limits for surface water runoff in the Lake Tahoe Hydrologic Unit and Additional Receiving Water Limits for Lake Tahoe, annual averages unless otherwise noted (applies to the Bijou Park Creek Site 43BPC-4):

Turbidity: 20 NTU[2]
Total Nitrogen: 0.15 mg/L
Total Phosphorus: 0.008 mg/L
Chloride: 3.0 mg/L
TSS: 60 mg/L[1]

Maximum concentrations not to exceed for discharge to surface waters in the Lake Tahoe Hydrologic Unit, daily average unless otherwise noted (applies to the Effluent Storm Filter Site 43HVP-2):

Turbidity: 20.0 NTU
Total Nitrogen: 0.5 mg/L
Total Phosphorus: 0.10 mg/L
Oil and Grease: 2.0 mg/L

[1]TSS value based on Lake Tahoe Basin 90th percentile value, equivalent to TRPA's regional environmental threshold carrying capacity standard.
[2]The turbidity maximum surface water runoff effluent value is based on the average daily samples collected from a single discharge point for the Lake Tahoe Hydrologic Unit.

e) Date(s) and Duration of Violation(s):

Water Year 2022 (October 1, 2021 – September 30, 2022)

f) Explanation of Cause(s):

Heavenly Valley Creek – Annual averages for total phosphorus and chloride were exceeded at each of the three monitoring sites along Heavenly Valley Creek (43HVC-1A, 43HVC-2, and 43HVC-3) as well as the reference reach monitoring site (Hidden Valley Creek: 43HDVC-5). The total nitrogen annual average was also exceeded at the reference monitoring site (43HDVC-5). Annual averages for total phosphorus and total nitrogen were higher at the reference reach compared all the Heavenly Valley Creek monitoring sites. The reference reach is experiencing higher than normal concentrations of water quality constituents because of the Caldor Fire. However, annual averages of total phosphorus have been higher at the reference reach than the Heavenly Valley Creek sites during several of the past years; therefore, Heavenly Mountain Resort operations are not solely responsible for water quality exceedances. Samples could not be collected at Sky Meadows (43HVC-1A) on two occasions and at Patsy's (43HVC-2) on one occasion because the sites were inaccessible. Samples could not be collected at Patsy's (43HVC-2) on one occasion and Property Line (43HVC-3) on seven occasions due to low or no flow conditions at the site.

Bijou Park Creek – Annual averages of TSS, total nitrogen, total phosphorus, and chloride exceeded the state standard for the below California Parking Lot sampling site along Bijou Park Creek (43BPC-4). Daily averages of turbidity exceeded the state standard on 6 out of 17 sampling dates (~35% of the time). Total nitrogen, total phosphorus, and chloride were also exceeded at the reference site along Hidden Valley Creek (43HDVC-5); however, the annual averages for Bijou Park Creek (43BPC-4) are well above the reference reach exceedance values. The highest daily values of all constituents were associated with a riparian tree fall that was rooted in the channel upstream of the monitoring site.

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California Parking Lot Filter Vault Effluent Monitoring Site (43HVP-2)
Three storm samples were collected during water year 2022, and turbidity, total nitrogen, and total phosphorus exceeded the state standards in all samples. These parameters were also in exceedance of the standard at the two inlet locations (43HVP-1A and 43HVP-1B). Comparison of the inlet and effluent concentrations shows limited reduction in total phosphorus and chloride constituents; however, filtration through the vaults with regards to turbidity and total nitrogen was inconclusive. Oil and grease values were considered estimates and non-detect results provide no data review. Annual maintenance of the vaults and cartridge replacement continued in 2022 (September 2022), however storm and snow melt runoff samples through the vault and filtration system continue to be in exceedance and problematic. The Bijou Park Creek Evaluation Report, submitted with the Comprehensive Report in January 2017, outlines additional vault improvement recommendations that Heavenly should undertake in the future to help improve the filter vault water quality results.

g) Corrective Action(s): (Specify actions taken and a schedule for actions to be taken)

Heavenly continues to inspect, maintain, and implement annual filter replacement as needed for the vault system. At a minimum, all sacrificial filters (14) are replaced annually, and additional filter replacement is determined based on filter media inspections. Filter and vault inspections, clean out, and filter replacement occurred in September 2022. Parking lot improvements in 2022 included the repair and replacement of asphalt at the lower lot at California Main Lodge.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision following a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my knowledge of the person(s) who manage the system or those directly responsible for data gathering, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

If you have any questions or require additional information, please contact Tom Fortune at the number provided above.

Sincerely,

Signature: DocuSigned by: Tom Fortune 4527A03B0D8A496...

Name: Tom Fortune

Title: Vice President & COO

Stantec

Project # 237801818

Environmental Monitoring Program Annual Report

Heavenly Mountain Resort—Water Year 2022

January 2023

ENVIRONMENTAL MONITORING PROGRAM ANNUAL REPORT

Heavenly Mountain Resort—Water Year 2022

January 15, 2023

Prepared for:
Heavenly Mountain Resort
224 Kingsbury Grade
(State Route 207), Suite 202,
Stateline, NV 89449

Lahontan Regional Water Quality Control Board
2501 Lake Tahoe Boulevard
South Lake Tahoe, CA 96150

Lake Tahoe Basin Management Unit (LTBMU)
USFS
35 College Drive
South Lake Tahoe, CA 96150

Prepared by:
Stantec Consulting Services Inc.
5390 Kietzke Lane, Suite 103, Reno, NV 89511

Project Number:
237801818

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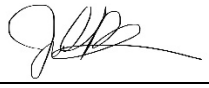
The conclusions in the Report titled **Environmental Monitoring Program Annual Report** are Stantec's professional opinion, as of the time of the Report, and concerning the scope described in the Report. The opinions in the document are based on conditions and information existing at the time the scope of work was conducted and do not take into account any subsequent changes. The Report relates solely to the specific project for which Stantec was retained and the stated purpose for which the Report was prepared. The Report is not to be used or relied on for any variation or extension of the project, or for any other project or purpose, and any unauthorized use or reliance is at the recipient's own risk.

Stantec has assumed all information received from **Heavenly Mountain Resort, Lahontan Regional Water Quality Control Board, Lake Tahoe Basin Management Unit** (the "Client") and third parties in the preparation of the Report to be correct. While Stantec has exercised a customary level of judgment or due diligence in the use of such information, Stantec assumes no responsibility for the consequences of any error or omission contained therein.

This Report is intended solely for use by the Client in accordance with Stantec's contract with the Client. While the Report may be provided to applicable authorities having jurisdiction and others for whom the Client is responsible, Stantec does not warrant the services to any third party. The report may not be relied upon by any other party without the express written consent of Stantec, which may be withheld at Stantec's discretion.

Prepared by: 

Signature

Julia Beals, Staff Scientist

Printed Name

Reviewed by: 

Signature

Michelle Hochrein, Project Scientist

Printed Name

Approved by: 

Signature

Chris Donley, Senior Consultant

Printed Name

Table of Contents

List of Tables

List of Figures

List of Appendices

Acronyms / Abbreviations

Annual Report	Environmental Monitoring Program Annual Report
BAER	Burn Area Emergency Response
BMI	benthic macroinvertebrate
BMP(s)	best management practice
CEDEN	California Environmental Data Exchange Network
CEQA	
cfs	cubic feet per second
City	City of South Lake Tahoe
CSCI	California Stream Condition Index
EIR/EIS	environmental impact report / environmental impact statement
ESIBI	Eastern Sierra Index of Biological Integrity
IBI	Index of Biological Integrity
kg	kilogram
Lahontan	Lahontan Regional Water Quality Control Board (of the state of California)
LTBMU	Lake Tahoe Basin Management Unit (US Forest Service)
mg/L	milligram/liter
mmhos	millimhos per centimeter
MMP	Mitigation and Monitoring Plan
Monitoring Program	Water Quality and Best Management Practices Monitoring Program
ND	non-detect
NDEP	Nevada Division of Environmental Protection
NTU	nephelometric turbidity units
QA	quality assurance
QAPP	Quality Assurance Project Plan
RCI	Resource Concepts Inc.
SCI	stream condition inventory
SNOTEL	Snow Telemetry
SOPs	standard operating procedures
SWAMP	Surface Water Ambient Monitoring Program
SWE	snow water equivalent
TMDL	Total Maximum Daily Load
TRPA	Tahoe Regional Planning Agency
USDA	US Department of Agriculture
USFS	US Forest Service
Vail Resorts	Vail Resorts, Inc.
WDR	Waste Discharge Requirements
WMRP	Watershed Maintenance and Restoration Program
ZPG™	Zeolite, Perlite and Granular Activated Carbon media

1 Introduction

Vail Resorts, Inc. (Heavenly), operates Heavenly Mountain Resort located on lands mostly owned or administered by the US Forest Service (USFS), Lake Tahoe Basin Management Unit (LTBMU).This Environmental Monitoring Program Annual Report (Annual Report) summarizes monitoring and evaluation activities conducted at Heavenly Mountain Resort during water year 2022 as a result of the implementation of the Water Quality and Best Management Practices Monitoring Program (Monitoring Program), a component of the Heavenly Mountain Resort Master Plan (Parsons 1996) and the Heavenly Mountain Resort Master Plan Amendments (Parsons 2007, Hauge Breuek 2015). Submittal of this Annual Report is in partial fulfilment of monitoring and reporting requirements set forth by the Lahontan Regional Water Quality Control Board (Lahontan) in Monitoring and Reporting Program Order No. R6T-2015-0021.

The Monitoring Program was originally developed and implemented by USFS as part of the Heavenly Master Plan Draft Environmental Impact Statement (USFS 1996) and was later incorporated into the Heavenly Ski Resort Master Plan as Chapter 7 (Parsons 1996). In 2003, Lahontan issued a revised Board Order and a revised Monitoring Plan. In 2005, monitoring and reporting duties were transferred from USFS to ENTRIX, Inc. (first Cardno, now Stantec) which was retained by Heavenly. The stipulations in the 2007 amendment to the Heavenly Mountain Resort Master Plan, approved by the Tahoe Regional Planning Agency (TRPA) on April 25, 2007, went into effect and began the implementation stage of the plan by Heavenly in collaboration with Lahontan, USFS, and TRPA. Modifications in the Master Plan Amendment included the incorporation of all mitigation monitoring into a single report that is to be submitted annually in May to TRPA, USFS, and Lahontan. The Mitigation and Monitoring Report schedule and submittal is ongoing and due annually.

Because of newly proposed on-mountain expansion plans, a joint environmental document was developed and approved in spring 2015 (Hauge Brueck 2015), as an amendment to the Master Plan. The joint environmental document followed the past report format and submittal and provided updated and refined mitigation measures from the previous Master Plan (where appropriate). The Master Plan represents a comprehensive 20-year development plan for Heavenly Mountain Resort. Master Plan and Master Plan Amendment implementation objectives of Heavenly, TRPA, and USFS regarding protection of the environment include the following (Parsons 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 (USFS);
- Providing a quality ski experience within the resort with ski runs and other disturbed areas stabilized to reduce the potential for soil erosion (USFS);
- Improving the visual quality of the area (USFS); and
- Providing for long-term preservation and restoration of Stream Environment Zones (TRPA).

The requirements of the annual Monitoring Program reports remain the same, following approval of the Master Plan Amendment. As the California Environmental Quality Act lead agency, Lahontan is the responsible party for ensuring all mitigation measures are implemented in compliance with the program. Lahontan recognizes “another agency (Forest Service or TRPA) has responsibilities for ensuring

implementation" for monitoring mitigation measures outside its authority.[1] As with prior Annual Reports, the Best Management Practices Monitoring Program Report will be submitted with the TRPA's Annual Mitigation and Monitoring Report due on May 1 of the following year, i.e., May 2023.

Implementation of the Collection/Monitoring Agreement between Heavenly and the USFS (Monitoring Program) provides sufficient data to determine compliance with agency water quality standards and validate the efficiency of management practices in protecting against adverse cumulative watershed effects.

1.1 Location

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 USFS and Heavenly. Heavenly operates on National Forest System lands under a special use permit that was renewed in 2002 for a period of 40 years. Heavenly has had a USFS special use permit from USFS since 1955. In 2002, the current owner Vail Resorts, Inc., acquired Heavenly Mountain Resort.

The California/Nevada state line divides the special use permit boundary with approximately 60 percent of the ski area in Nevada and 40 percent in California. Approximately 60 percent of Heavenly Mountain Resort falls under the jurisdiction of TRPA in the Lake Tahoe Basin (Parsons 1996).

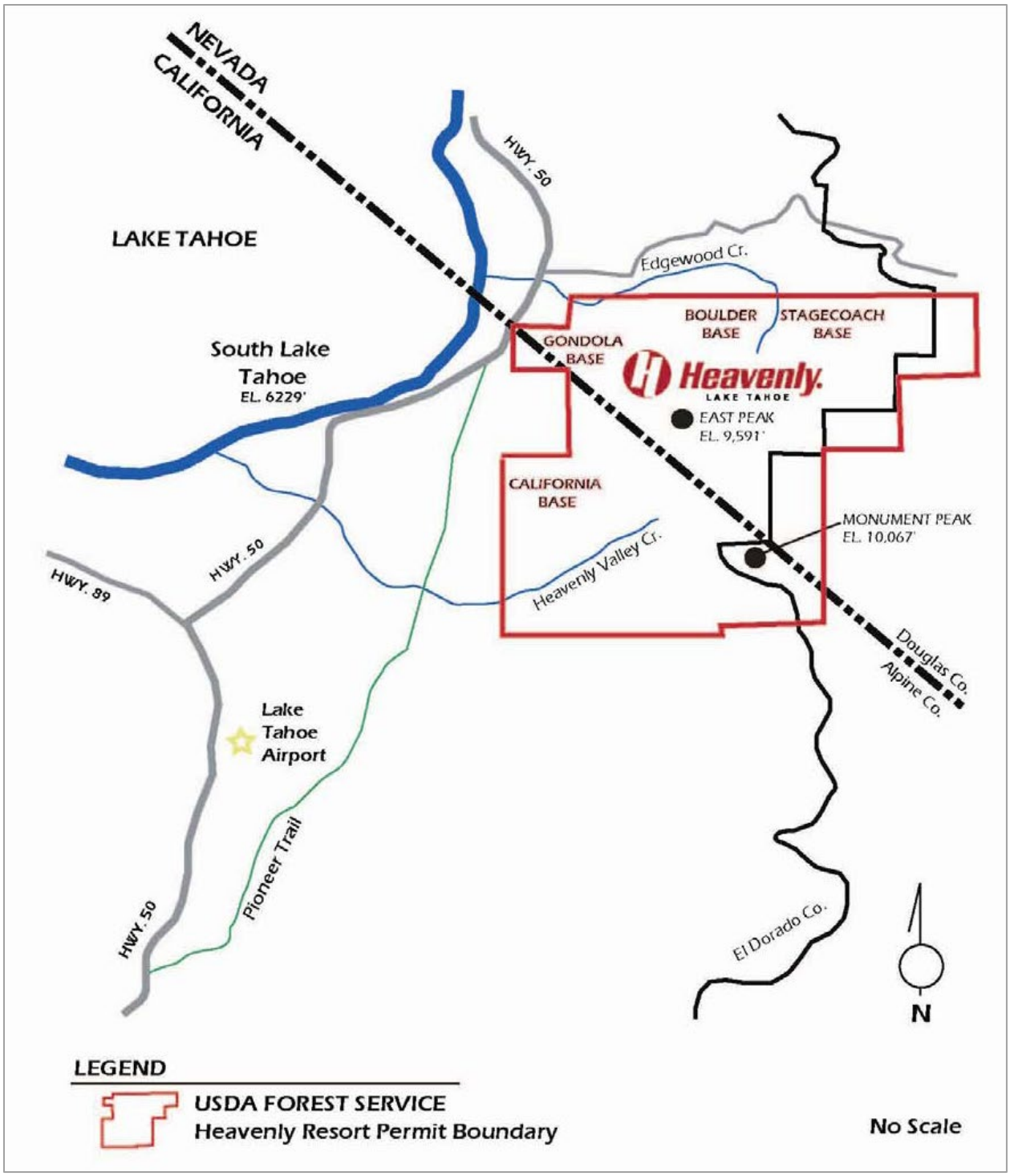
1.2 Environmental Monitoring Program

The overall objective of the Environmental Monitoring Program is to evaluate and monitor water quality and overall ecological health of Heavenly Mountain creeks and watersheds while satisfying California, Nevada, and TRPA regulatory water quality requirements.

Four of the objectives of the Environmental Monitoring Program have not changed; however, amendments and modifications regarding the objectives have been implemented with acceptance of the joint environmental document (Hauge Brueck 2015), so soil cover monitoring (strikethrough below) was removed as a standalone objective because of the difficulty monitoring and assessing improvement. This objective is now covered under BMP monitoring (hot spot and roadways monitoring) and overall watershed condition monitoring. The Environmental Monitoring Program included the following five major components (USFS 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 (see Hauge Brueck 2015 for this revision);
- Monitoring to determine best management practices (BMP) effectiveness under the various conditions at the ski area;
- Riparian conditions monitoring to determine riparian area response to Heavenly Mountain Resort activities; and
- Overall watershed condition and trend monitoring.

[1] California Regional Water Quality Control Board-Lahontan Region. 2015a. Board Order No. R6T-2015-0021. WDID No. 6A090033000.Waste Discharge Requirements for Heavenly Mountain Resort (pages 16–17).



Source: Parsons (2007)

Figure 1-1 Location of Heavenly Mountain Resort

1.3 Mitigation and Monitoring Plan

The Mitigation and Monitoring Plan (MMP) was Chapter 7 of the Draft Master Plan Amendment (updated in 2007). Revised measures were addressed in the joint environmental document and replace and update the Heavenly Master Plan measures (Hauge Brueck 2015). The MMP was designed to satisfy the requirements of Lahontan Board Order No. R6T-2015-0021. The MMP addresses the four objectives planning measures stated above. Key plan requirement updates are summarized as below. Updated Heavenly Valley Creek Total Maximum Daily Load (TMDL) targets included in the Lahontan Board Order No. R6T-2015-0021 are presented in Table 1-1.

Table 1-1 Heavenly Valley Creek Sediment TMDL Targets

Parameter	Target	Section/Report Reference
Instream sediment load	Maximum of 58 tons/year as a 5-year rolling average, as measured at the Property Line sampling station.	2022 results are presented in Section 2.4 of this report.
Stream Condition Index	Rating of "Good" or better.[1]	A summary of the sampling schedule and upcoming monitoring is included in Section 3 of this report. Long-term trend analysis, based on 2019 monitoring results (most recent results based on the required sampling schedule) and comparison to past data, was discussed in the past 5-year comprehensive report (submitted in January 2022 for water years 2017–2021).
Benthic macroinvertebrate health	Improving trend in benthic macroinvertebrate community metrics within conditions comparable to Hidden Valley Creek.	A summary of the sampling schedule and upcoming monitoring is included in Section 3 of this report. 2019 monitoring results (most recent results based on the required sampling schedule) are presented in Section 3 of this report. A more detailed discussion of long-term trend analysis is included in the past 5-year comprehensive report (submitted in January 2022 for water years 2017–2021).
Best management practices effectiveness	Rating of "Good" or better.[1]	These ratings are discussed in detail in Chapters 3, 4, and 5 of the Mitigation and Monitoring Plan Annual Report (MMP Annual Report, 2023). Information on many activities related to these parameters are included in Sections 4-9 of this report and are discussed in more detail in the MMP Annual Report.
Watershed Maintenance and Restoration Program	Rating of "Good" or better.[1]	These ratings are discussed in detail in Chapters 3, 4, and 5 of the Mitigation and Monitoring Plan Annual Report (MMP Annual Report 2023). Information on many activities related to these parameters are included in Sections 4-9 of this report and are discussed in more detail in the MMP Annual Report.

[1] Rating criteria for these parameters are included in Attachment C of Lahontan Board Order No. R6T-2015-0021.

1.3.1 Water Quality Monitoring

Lahontan Board Order Number R6T-2003-0032 updated waste discharge requirements, monitoring, and reporting 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 (California Regional Water Quality Control Board, Lahontan Region 2011, 2013). In conjunction with the joint environmental document (Hauge Brueck 2015) to protect water quality, Lahontan 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 sampling stations and three California Base parking area StormFilter™ sampling stations. Monitoring and sampling are stated 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™ sampling station will be conducted to collect data regarding rainfall and snow runoff and to assess performance of the StormFilters™.[2] The *Heavenly Valley WQ QAPP* includes standard operating procedures (SOPs) and quality assurance (QA) requirements for water quality sampling and was approved by Lahontan on August 4, 2022. In 2022, water quality data for water years 2010-2021 at all California sites were submitted to the California Environmental Data Exchange Network (CEDEN).

Results and discussion are reported to Heavenly, TRPA, and Lahontan in this Annual Report, with data included in Appendices A, B, and C. Constituents are identified in the Monitoring Program for sampling at each of the sites. The following primary list of constituents (also described as the “Full Suite”) are monitored at each of the receiving water sampling stations:

- Discharge (flow)
- Turbidity
- Suspended sediment
- Total nitrogen (total Kjeldahl nitrogen + nitrate + nitrite)
- Total phosphorus
- Chloride

The following additional constituents are sampled at sampling stations in Nevada, based on Nevada Division of Environmental Protection (NDEP) and USFS requirements:

- Specific conductivity
- Soluble reactive phosphorus
- Dissolved phosphorus

Results of the influent and effluent samples collected from the StormFilters™ at the California Base parking lot will be used to monitor the following constituents:

- Oil and grease with silica gel treatment
- Total nitrogen (total Kjeldahl nitrogen + nitrate + nitrite)
- Total phosphorus
- Turbidity
- Chloride

[2] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort (pages 1-2).

1.3.2 Best Management Practices Effectiveness

The Environmental Monitoring Program includes BMP monitoring to determine the effectiveness of the BMPs in preventing soil erosion and protecting water quality under various conditions. The BMP component of the Environmental Monitoring Program was developed and initiated by LTBMU in 2004. Resource Concepts Inc. (RCI) assisted with finalizing the monitoring methods and began conducting the monitoring in 2005 through the Revised Environmental Monitoring Program (December 2005) as set forth in the 1996 Master Plan and the approved Master Plan Amendment (Parsons 2007). The joint environmental document (Hauge Brueck 2015) included updates to the Environmental Monitoring Program at Heavenly Mountain Resort, while the current Lahontan Waste Discharge Requirements (WDR) (May 2015) provide additional monitoring requirements. The Watershed Maintenance and Restoration Program (WMRP) updates the requirement for status updates of restoration/mitigation projects and annual hot spot assessments on the mountain. This monitoring and reporting effort complies with regulatory jurisdictions Lahontan, TRPA, NDEP, and USFS.

Resource Concepts Inc. is currently implementing the BMP monitoring. Implementation and monitoring results for both temporary and permanent BMPs for the 2022 construction season (through the end of November 2022) will be presented in the TRPA Mitigation and Monitoring Plan Annual Report (MMP Annual Report) scheduled to be submitted in May 2023 as outlined by the WDR.

1.3.3 Riparian Conditioning Monitoring

The WDR outlines the following sampling schedule and monitoring requirements for stream condition inventory (SCI) monitoring and benthic macroinvertebrate (BMI) monitoring to assess the desired conditions for Heavenly Valley Creek[3]:

- Over time, show a trend of increasing stability in channel morphology; and
- Over time, there should be improving trends in BMI community metrics, approaching conditions in Hidden Valley Creek (reference reaches).

The Riparian Condition Monitoring Program has evolved over time according to federal and state monitoring protocol changes. SCI monitoring follows standard USFS protocols (Frazier et al. 2005) and BMI monitoring follows standard SWAMP protocols (Ode et al. 2016). SCI and BMI monitoring locations, methods, and schedule are discussed in more detail in the most recent Comprehensive Report (*Environmental Monitoring Program Comprehensive Report – WYs 2017-2021)* Comprehensive Report. Cardno (now Stantec) developed the *Heavenly Valley BMI QAPP*, which was approved by Lahontan in 2018, that includes SOPs according to SWAMP protocols and QA requirements for BMI sampling. The Riparian Condition Monitoring schedule is discussed in Section 3.

[3] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort. Attachment A: Heavenly Mountain Resort Epic Discovery Project Environmental Impact Report (CEQA), page 8.

1.3.4 Condition and Trend Monitoring

Condition and trend monitoring encompasses many requirements outlined in the Monitoring and Reporting Program. Monitoring requirements pertinent to this report are listed below and annual results are presented in the body of this report.

1.3.4.1 Facilities Maintenance Monitoring

As required by the Mitigation and Reporting Program in the WDR, the operation and maintenance measures require quarterly inspection at all lodges, maintenance shops and paved parking areas where snow removal and deicing activities are conducted[4]. At a minimum, storm water collection facilities and erosion control and sediment vaults are inspected for damage, blockage, and sediment build-up. If required, corrective measures are documented. In a good faith effort, Heavenly provides monthly inspections of the California Base lodge parking lot facility. Fourth quarter facilities and maintenance inspection monitoring logs covering the months of July, August, and September are included in Appendix D. Detailed discussion of the monitoring findings are discussed below in Section 4. During the summer months when on-mountain vehicular access is available, Heavenly photo monitors on-mountain erosion control and drainage infrastructure for documentation and potential maintenance concerns, as included in Appendix G. See Section 9 for additional information regarding on-mountain monitoring.

1.3.4.2 Snow Conditioning and Snowmaking Materials

Heavenly actively tracks and reports monthly snow conditioning totals. During the winter, salt is added on and around pedestrian walkways and heavily congested areas to prevent slip and falls. In addition, huck salt can be applied in terrain parks at jump feature interfaces (lips) to melt the very top snow layer, which essentially freezes and hardens to increase the longevity and durability of the snow at the jump. No on-mountain snow operations occurred during the fourth quarter (July, August, and September), as no snow was present. Similarly, snowmaking did not occur during the fourth quarter. Heavenly does not add any additional snowmaking enhancement chemicals during snowmaking, and the snowmaking equipment only uses water and compressed air. An annual summary of huck salt application is included in Section 5.

1.3.4.3 Deicer and Abrasives Application and Recovery

Heavenly actively tracks the amount of deicer and abrasives it applies to the parking lot and roadways leading to and from the California Base parking lot as required by the WDR and Monitoring and Reporting Program. Fourth quarter monthly application and recovery (sweeping) totals are reported with the monthly inspection and monitoring logs found in Appendix D. Typically, no application occurs during the fourth quarter, and recovery typically occurs during the third and fourth quarters of the water year, following winter resort operations, when roadways and parking areas are free of snow. Recovered materials are collected and delivered to South Tahoe Refuse for disposal. Heavenly includes the dumpster material weight sheets with the maintenance and inspection logs for recovery tracking purposes. The annual totals for application and recovery in water year 2022 are discussed in Section 6.

[4] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort (page 7).

As part of the WDR and Monitoring and Reporting Program, Heavenly is also required to analyze the chemical composition of the deicer applied to the roadways and apply deicers that meet the Caltrans "specifications H" or similar.[5] In the past, Heavenly provided this information to Lahontan for deicer samples, but through discussions with Lahontan, it was determined that if the material (sand and ice) is purchased from the same vendor and same source, no additional analysis is needed. Initial analysis of the source material was performed in December 2015, and analysis was performed again in March 2018. Heavenly received a new stockpile of abrasives sand in late November 2021, and laboratory analysis was conducted again in November 2021. Results of this sample were first included in the *Environmental Monitoring Program Second Quarter Report – WY 2022* and are also included in Section 6 of this report. Future laboratory analysis will be conducted when either the abrasive sample is derived from a new source, a new vendor, or at a minimum annually upon delivery of additional material.

1.3.4.4 USFS Roads Monitoring

The WDR and Monitoring and Reporting Program requires that Heavenly conduct road monitoring in accordance with the Road Maintenance Agreement (between Heavenly and LTBMU)[6]. The signed agreement outlining Heavenly's maintenance and inspection requirements USFS standards regarding on-mountain roadways is included in Appendix E. Additional discussion regarding the roadway monitoring requirements is discussed in Section 7.

1.3.4.5 Facilities Watershed Awareness Training

Heavenly provides awareness training for its summer employees, subcontractors, and vendors annually as part the WDR and Monitoring and Reporting Program. Confirmation and discussion of this training is provided in Section 8 and Appendix F.

[5] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort (page 8).

[6] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort (page 9).

2 Water Quality

2.1 Station Description

Heavenly measures water quality parameters along four creeks to determine the effects of ski area development on background conditions. Water samples were collected at seven stations in water year 2022. The sampling station identification number and sampling rationale are presented in Table 2-1 and include the required filter vault sampling stations. The approximate location of each sampling station is shown on Figure 2-1.

Table 2-1 Heavenly Valley Mountain Resort Monitoring Program Water Quality Sampling Stations

Sampling Station ID	Sampling Station Description	Sampling Station Name[1]	Rationale
43HVC-1A	Heavenly Valley Creek at Sky Meadows, above Snowmaking Pond	Sky Meadows	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	Patsy's	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	Property Line	Characterized water quality in Heavenly Valley Creek leaving National Forest System land below Heavenly Mountain Resort
43BPC-4	Bijou Park Creek located below the Heavenly Parking Lot	Bijou Park Creek	Characterized water quality in Bijou Park Creek below the California Main Lodge and parking area
43HDVC-5	Hidden Valley Creek baseline/reference station	Hidden Valley Creek	Characterized water quality in creek draining a similar, mostly undeveloped watershed
43HVE-1	Edgewood Creek above Boulder Parking Lot	Upper Edgewood	Characterized water quality in Edgewood Creek above the Boulder parking lot and below the ski runs
43HVE-2	Edgewood Creek below Boulder Parking Lot	Lower Edgewood	Characterized water quality in Edgewood Creek below the Boulder parking lot
43HVP-1A	North Manhole Influent Pipe into the Filter System	Storm Vault Influent North	Characterized water quality inflow from the lower parking lot into the filter system
43HVP-1B	South Manhole Influent Pipe into the Filter System	Storm Vault Influent South	Characterized water quality inflow from the upper parking lot into the filter system
43HVP-2	West Manhole Effluent Pipe Out of the Filter System	Storm Vault Effluent	Characterized water quality exiting the filter system

[1] In the text of the document, these sampling stations are referred to by these abbreviated names.

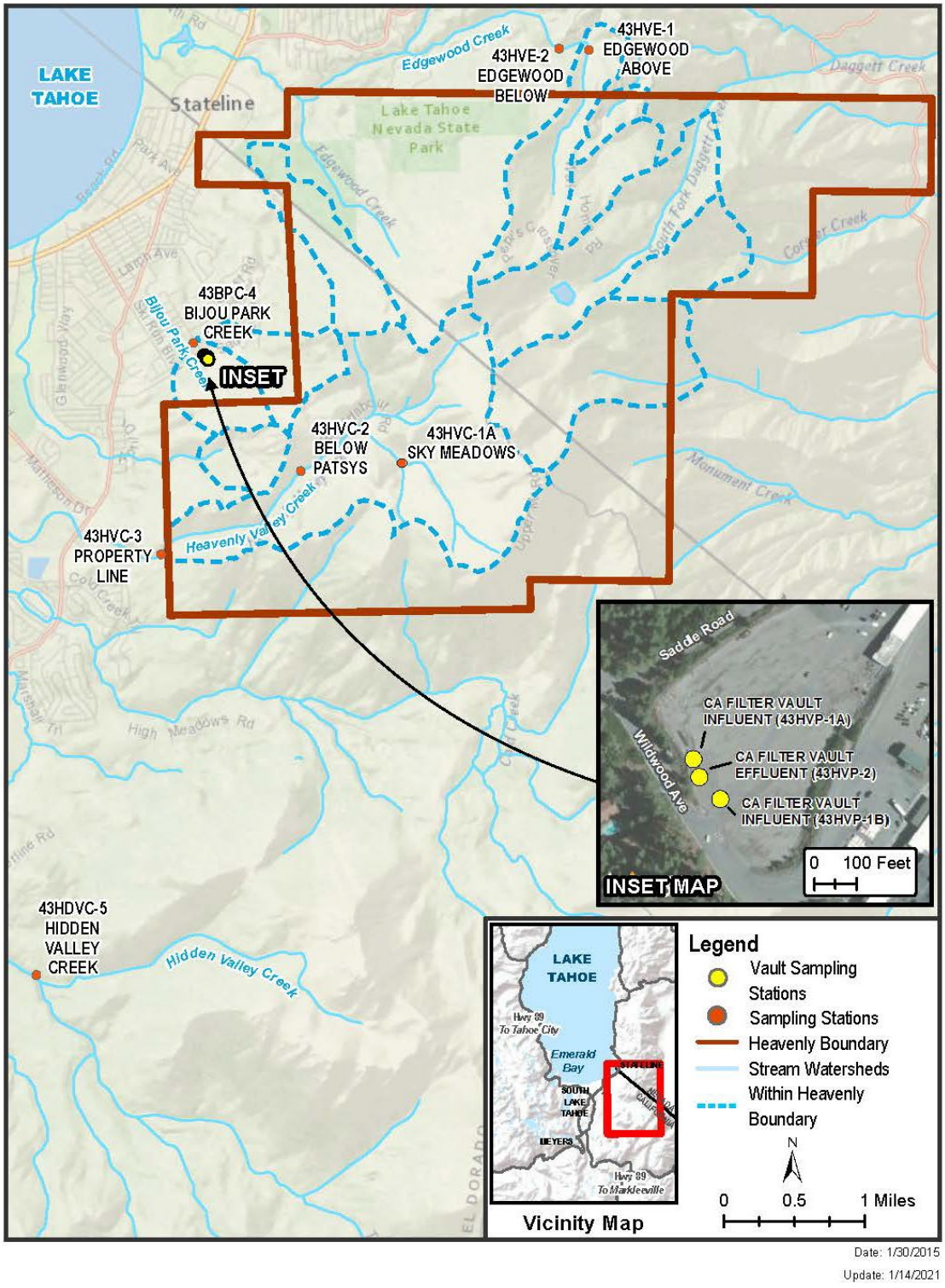
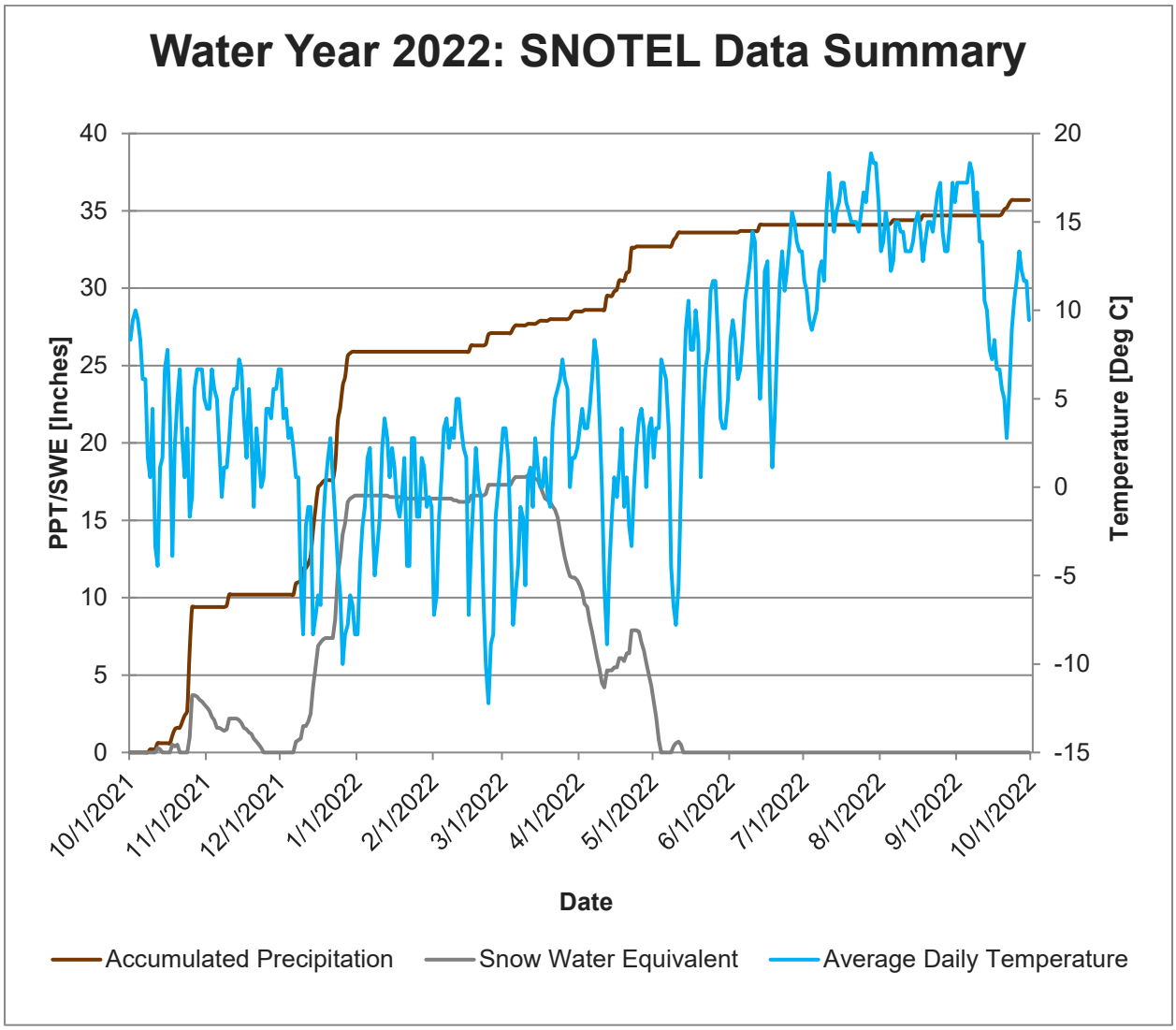


Figure 2-1 Approximate Locations of Water Quality Sampling Stations

2.2 Precipitation Summary

Figure 2-2 presents precipitation data for water year 2022, as summarized by the Natural Resource Conservation Service on the National Water and Climate Center web site (http://www.wcc.nrcs.usda.gov). This figure depicts accumulated precipitation and snow water equivalent (SWE) measured at Snow Telemetry (SNOTEL) Station 19L24S (Heavenly Valley), operated by the Natural Resources Conservation Service. This station is in the upper watershed of Heavenly Valley Creek near the current Sky Meadows sampling station at latitude 38° 56' N, longitude 119° 54' W, and elevation 8,850 feet.



Note: PPT – liquid precipitation, SNOTEL – snow telemetry, SWE – snow water equivalent

Figure 2-2 SNOTEL Weather Graph for the Water Year 2022

2.3 Sampling Frequency and Analysis

Seventeen water quality sampling events are scheduled annually (12 monthly monitoring samples and an additional 5 samples collected during spring runoff), although the total number of samples collected can vary by site due to site access, flow conditions, or resort activities. In water year 2022, an additional sampling event was scheduled in November, to account for several samples that were lost in transit to the laboratory. A total of 104 water quality samples were collected during water year 2022.

Along streams in California, 16 samples were collected at the each of the Sky Meadows and Patsy's sampling stations, 11 samples were collected at the Property Line sampling station, and 18 samples were collected at each of the Bijou Park Creek sampling station and the Hidden Valley Creek reference station. Fewer samples were collected than scheduled at the on-mountain monitoring sites (Sky Meadows and Patsy's) because of inclement weather contributing to unsafe roadway conditions which restricted on-mountain access. Fewer samples were collected than scheduled at Property Line due to low flow conditions.

In Nevada, the number of samples collected at the two Edgewood Creek sampling stations typically varies because low flow conditions and resort activities can prevent sampling. Eight samples were collected at the Upper Edgewood monitoring site due to low/no flow conditions during the first and fourth quarters, and ice/snow cover across the channel during the part of the second quarter. Seventeen samples were collected at the Lower Edgewood monitoring site. Three storm water samples were collected at the storm water monitoring sites: Storm Vault Influent North, Storm Vault Influent South, and Storm Vault Effluent. Storm water samples were collected in October, April, and September during water year 2022. Table 2-2 presents a summary of sampling and analysis for water year 2022.

Stream samples analyses for specific conductivity, turbidity, suspended sediment, total nitrogen (nitrate/nitrite and total Kjeldahl nitrogen), total phosphorus, soluble reactive phosphorus, and dissolved phosphorus were performed by High Sierra Water Lab, located in Oakland, Oregon. Stream sample analysis of chloride was performed by ExcelChem Laboratories in Rocklin, California, or by ExcelChem's parent company, Silver State Analytical Laboratories, in Las Vegas, Nevada. Western Environmental Testing in Sparks, Nevada, performed all analysis of the influent and effluent filter water quality vault samples. Where applicable, water samples are packed with ice and shipped in an ice cooler to the appropriate laboratories. Analytical laboratory results for the fourth quarter for each monitoring site are included in Appendix A and Appendix B. The prior 2022 laboratory results were submitted with the previous quarterly reports and are omitted in this report.

Table 2-2 Summary of Sampling Analysis—Water Year 2022

Sampling Station ID	Sampling Station Name	No. of Samples	Constituents Tested
43HVC-1A	Sky Meadows	16	Full suite [1, 2]
43HVC-2	Patsy's	16	Full Suite [1, 2]
43HVC-3	Property Line	11	Full suite [1, 2]
43BPC-4	Bijou Park Creek	18	Full suite [1, 2]
43HDVC-5	Hidden Valley Creek	18	Full suite [1, 2]
43HVE-1	Upper Edgewood	8	Full suite, specific conductivity, soluble reactive phosphorus, and dissolved phosphorus[1, 2]
43HVE-2	Lower Edgewood	17	Full suite, specific conductivity, soluble reactive phosphorus, and dissolved phosphorus [1, 2]
43HVP-1A	Storm Vault Influent North	3	Full suite and oil and grease [1, 2, 3]
43HVP-1B	Storm Vault Influent South	3	Full suite and oil and grease [1, 2, 3]
43HVP-2	Storm Vault Effluent	3	Full suite and oil and grease [1, 2, 3]

[1] Full suite = Discharge, turbidity, suspended sediment, nitrate/nitrite, total Kjeldahl nitrogen, total nitrogen, total phosphorus, and chloride.
[2] Samples collected on November 15, 2021, that were shipped to High Sierra Water Lab, were lost in transit. Only discharge and chloride were reported for the sampling event.
[3] Suspended sediment analysis is not required for the filter system sampling stations.

2.4 Discharge Results

Stream flow was measured using a Marsh-McBirney meter at all monitoring sites, except at Patsy's, where flow was calculated from stage values by a Parshall flume. The Sky Meadows sampling station also has a Parshall flume; however, the outlet of the flume has become partially submerged over time, thus reducing the accuracy of the stage-discharge relationship. Consequently, flow is also measured using the Marsh-McBirney meter at this sampling station when conditions permit. During the winter, the flume is the only viable option for estimating flow because significant snow depths and ice cover often create difficult or unsafe conditions for accessing the stream.

Peak runoff along Heavenly Valley Creek occurred on May 17, May 31, and June 14 for the Property Line, Patsy's, and Sky Meadows monitoring sites, respectively. Peak runoff at the Hidden Valley Creek reference site occurred on May 31. At Bijou Park Creek, peak runoff occurred on April 19. Peak runoff along Edgewood Creek occurred on April 5 and April 19 for Upper Edgewood and Lower Edgewood, respectively. While the timing of peak flows varied at the monitoring locations throughout the spring runoff period, the peaks occurred within the April to June window, as is typical of the Sierra Nevada Mountain range. However, the runoff trend over time is moving toward occurring during earlier months. Variations in watershed size and elevation are likely to be the cause for the earlier runoff peaks along Edgewood Creek and Bijou Park Creek. It does not appear that the snowmaking efforts performed during the 2021/2022 ski season had a significant impact on the Heavenly Valley Creek watershed because

discharge at the high elevation sampling stations, including the Hidden Valley Creek reference station, occurred within a similar time frame.

Accumulated precipitation during water year 2022 was 35.7 inches, which is higher than the 1991-2020 average of 34.5 inches. Peak flow conditions were higher relative to 2021, and bank full flows were observed at the Sky Meadows and Hidden Valley Creek monitoring sites. Property Line had low to no flow during the first and second quarters, and Upper Edgewood had no to low flow during the first and fourth quarters; as a result, discharge results were limited at both monitoring sites. Water year 2022 follows two water years of below average precipitation accumulation; precipitation accumulation during water year 2020 was 23 inches, while water year 2021 was 22.2 inches. Prior to 2020, water years 2016-2019 were either slightly below average or significantly above average, ranging from 32.5 inches in 2019 to 70.5 inches in 2017. These water years were preceded by four years of drought (2012–2015).

The SWE measurement for 2022 (17.9 inches) was like conditions experienced during the 2020 and 2021 water years. SWE measures the amount of water in the snow column and does not measure rain that does not fall on snow and is absorbed by snow. The large difference between accumulated precipitation and SWE in water year 2022 is due in part to a large rainstorm that occurred in late October 2021, which produced over six inches of precipitation, which was mostly rain. Additionally, a rainstorm occurred in September 2021 that prevented access to the upper elevation sites on Heavenly Valley Creek, (Sky Meadows and Patsy's), due to on-mountain road closures to prevent road erosion. Figure 2-3 presents the past 15 water years of SNOTEL precipitation data at the Heavenly Valley station (19L24S). Figure 2-4 through Figure 2-7 represent the annual hydrographs at each of the seven sampling stations and associated creeks.

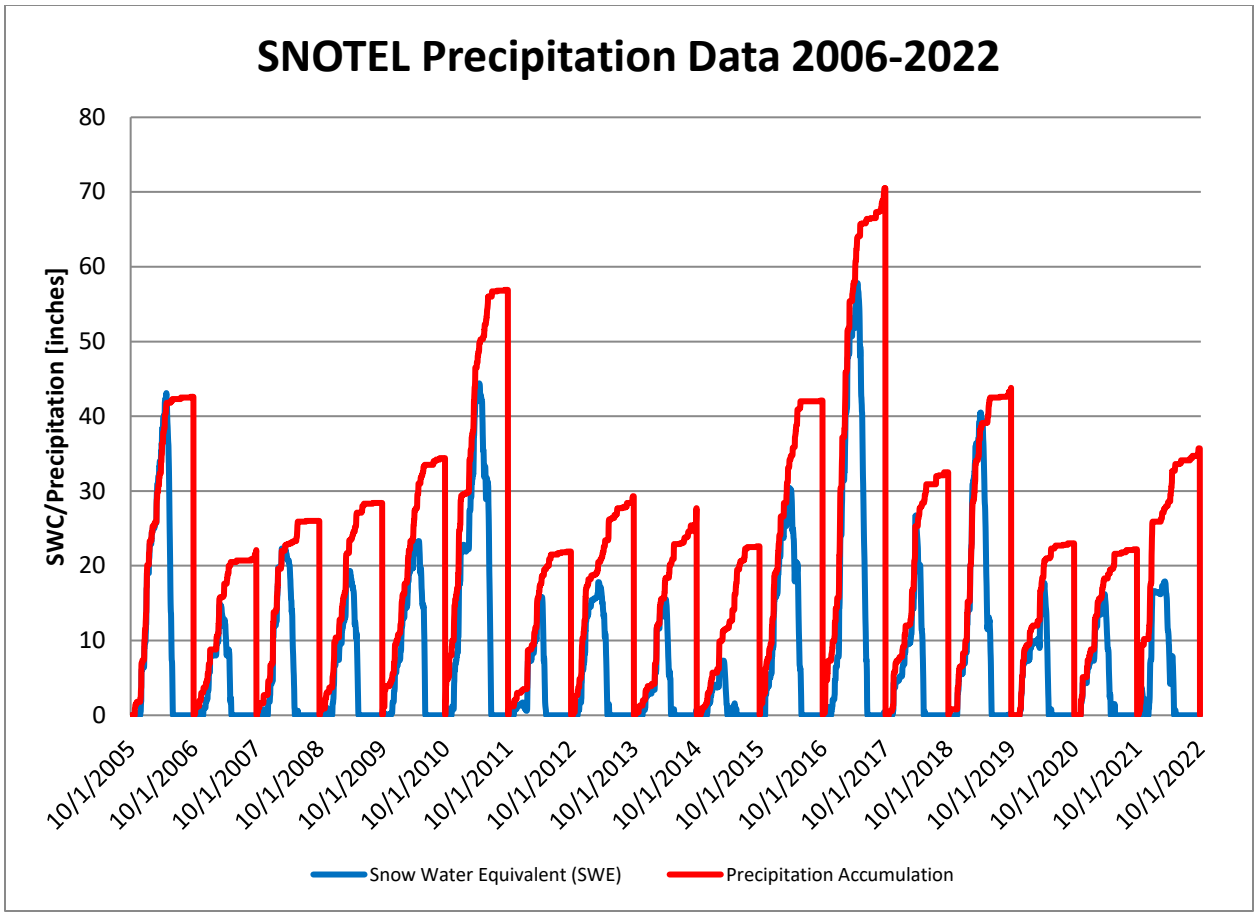


Figure 2-3 SNOTEL Precipitation Graph—Water Years 2006—2022

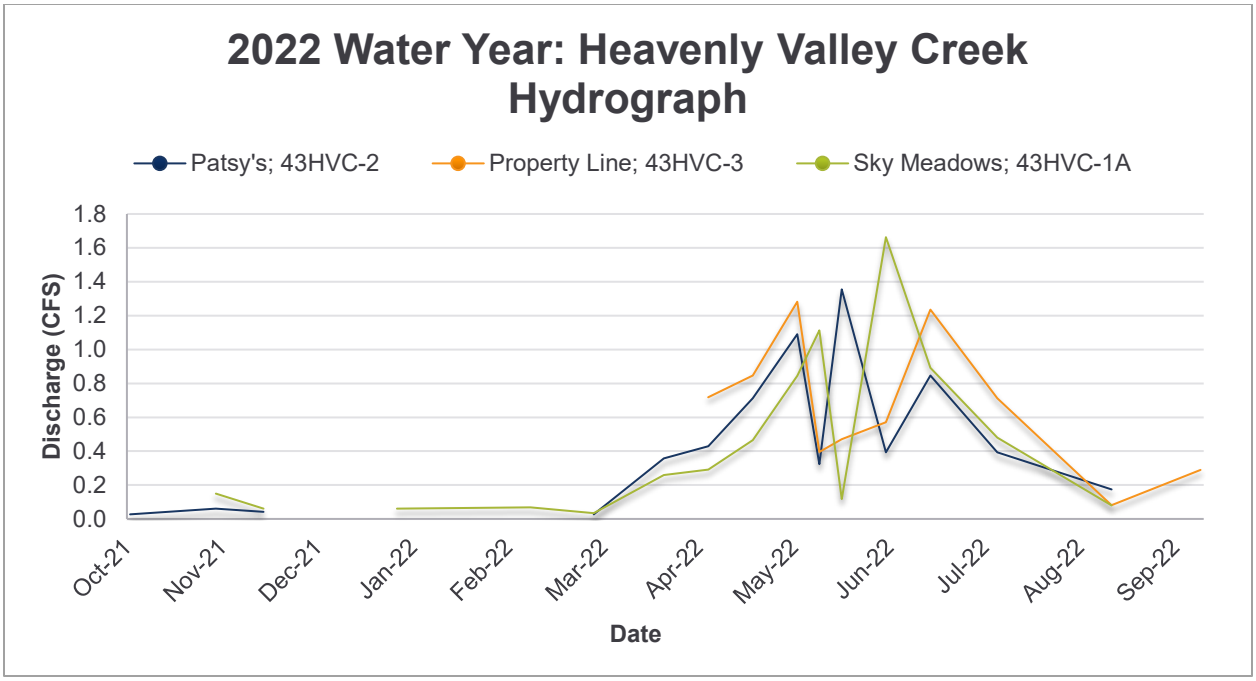


Figure 2-4 Hydrographs of Heavenly Valley Creek Sampling Stations—Water Year 2022

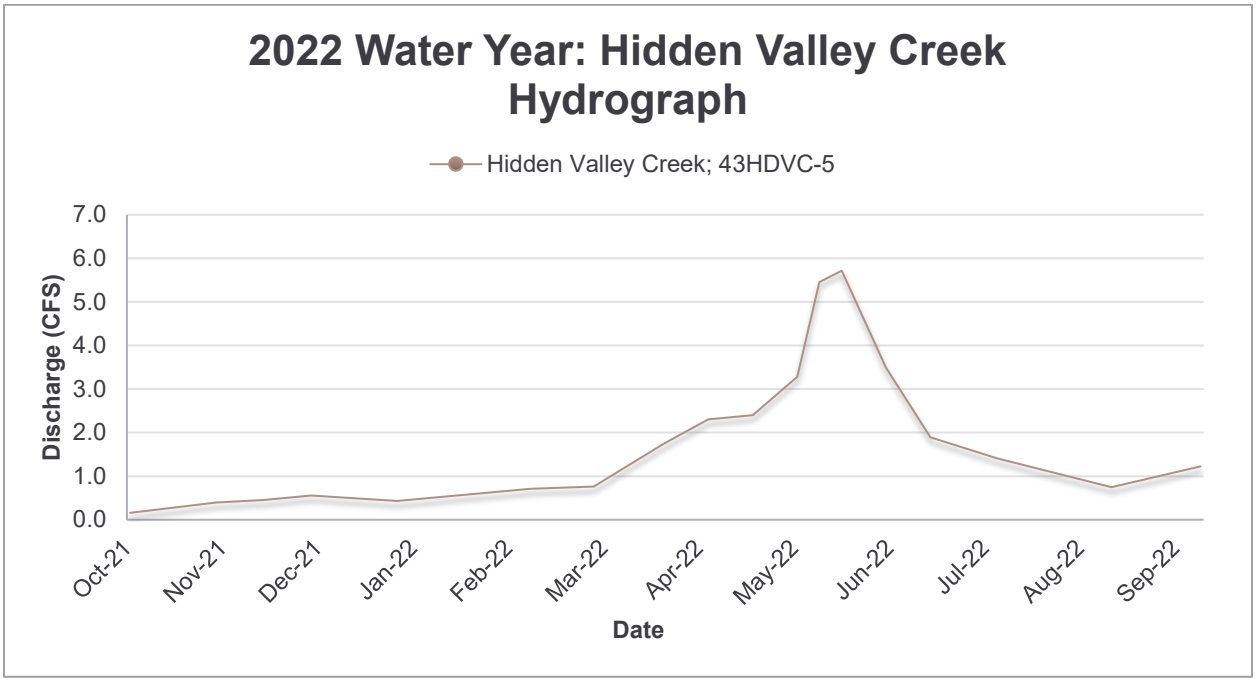


Figure 2-5 Hydrograph of the Hidden Valley Creek Baseline/Reference Station—Water Year 2022

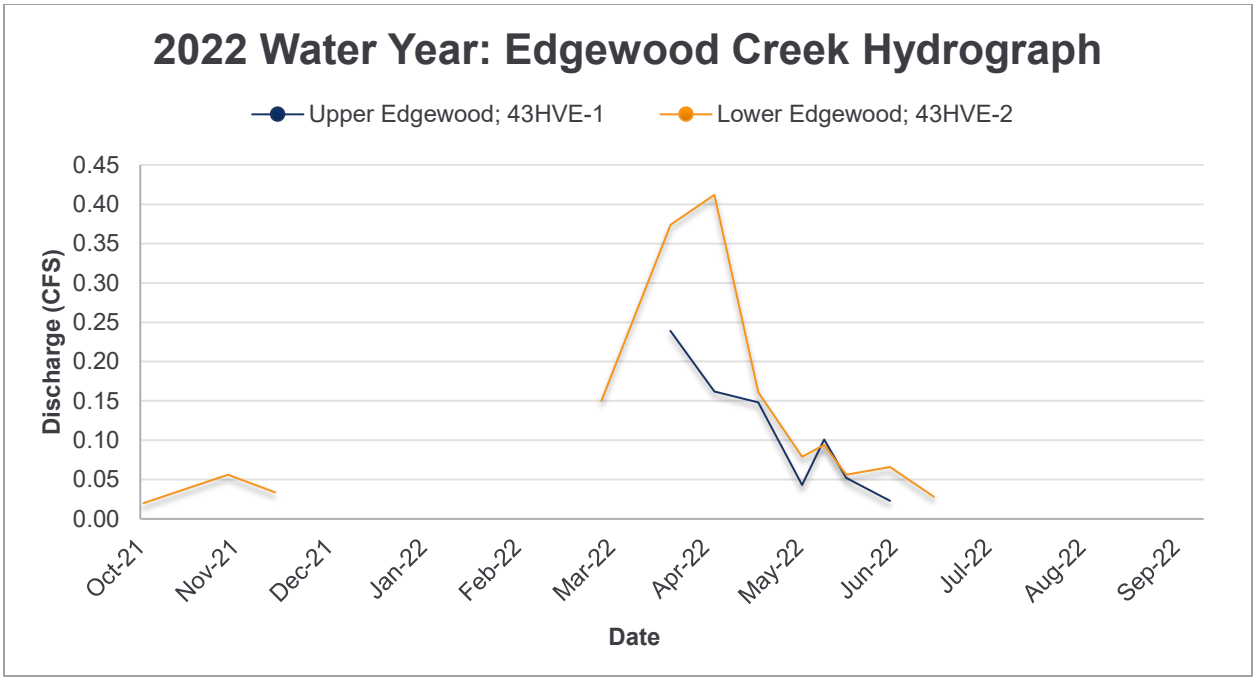


Figure 2-6 Hydrographs for Edgewood Creek Sampling Stations—Water Year 2022

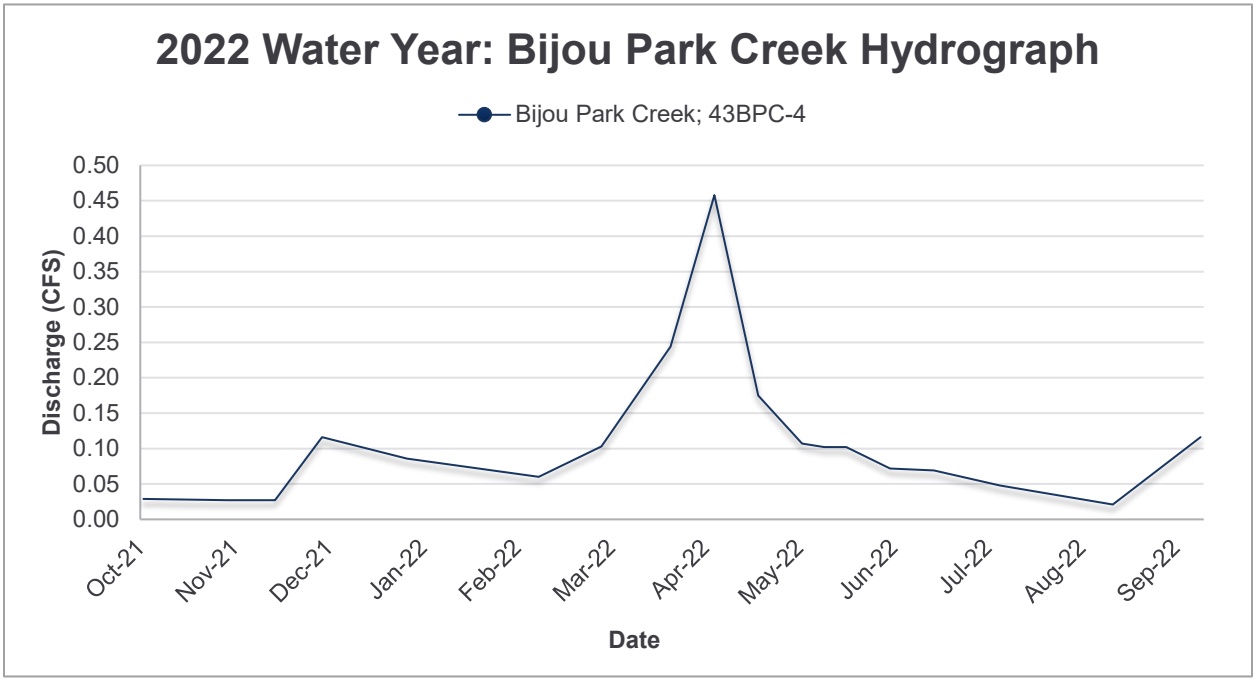


Figure 2-7 Hydrograph for Bijou Park Creek Sampling Stations—Water Year 2022

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 TSS for the Property Line monitoring site and the Hidden Valley Creek reference site from water years 2018–2022 (5-year cycle). Annual load values are calculated by weighting the number of days between sample collections and multiplying the weighted average and the discharge measurements collected in the field. This calculated value represents the weighted flow. Laboratory values for total nitrogen, total phosphorus, and TSS are multiplied and summed, and the final unit conversion is applied. The methodology has been used in previously submitted Annual and Comprehensive Report(s) and was verified by Lahontan staff in spring 2010 (Cardno 2017).

The annual TSS load for Heavenly Valley Creek in water year 2022 was calculated as 0.86 tons/year, a slight increase relative to water year 2021 (0.10 tons/year) but is relatively low compared to some previous years. The TMDL for TSS at Heavenly Valley Creek is a 5-year rolling average of 58 tons/year. The calculated 5-year rolling average for water years 2018–2022 is 3.31 tons/year along Heavenly Valley Creek, which is over 10 times less than the 2021 rolling average of 35.5 tons/year (Table 2-4). The water years 2018-2022 rolling average is the lowest since water year 2016 (1.95 tons/year), which is a marked improvement from the rolling averages over the past five water years (all of which exceeded 30 tons/year). The large reduction in the 5-year rolling average of suspended sediment at Heavenly Valley Creek is largely attributed to the 5-year rolling average no longer including water year 2017 annual sediment load (161.84 tons/year), which was much higher than years prior or after. As discussed in Section 2.4, water year 2017 was a very high precipitation year, with well above average flows at Heavenly Valley Creek. Annual sediment loads following 2017 have been considerably low.

Conversely, suspended sediment load at the reference site (Hidden Valley Creek) increased from 0.83 tons/year in water year 2021 to 17.13 tons/year in water year 2022, which is the highest sediment load at the reference site since water year 2017 (50.5 tons/year). The higher-than-normal suspended sediment load at Hidden Valley Creek is likely due to increased sediment mobilizations due to the 2021 Caldor Fire. The loss of vegetation within the upper watershed appears to have contributed to more surface runoff, and therefore higher flows and mobilization of surface sediment, through the Hidden Valley Creek watershed. During water years 2018-2020, total discharge at the Hidden Valley Creek reference site was typically 1-3 times higher than the Property Line monitoring site. However, during both water years 2021 and 2022, discharge at the Hidden Valley Creek reference site was approximately 5-6 times higher than at the Property Line. Until vegetation is reestablished within the Hidden Valley Creek watershed, flows (and water quality constituents associated with high flows such as suspended sediment) are expected to be high.

Table 2-3 Annual Load Values at Heavenly Valley Creek Property Line Sampling Station and Hidden Valley Creek Reference Station

Year	Discharge (m^3/year)	Total Nitrogen (kg/year)	Total Phosphorus (kg/year)	Suspended Sediment (tons/year)
Property Line				
2018	966,860	94	20	2.47
2019	1,299,751	162	47	12.16
2020	361,017	30	7	0.94
2021	76,007	11	2	0.10
2022	250,117	15	4	0.86
Hidden Valley Creek				
2018	1,339,792	117	26	2.5
2019	1,958,182	205	48	7.09
2020	815,928	72	18	2.34
2021	451,734	39	9	0.83
2022	1,196,302	337	168	17.13

Note: m^3 – cubic meters; kg – kilograms

Table 2-4 Five Year Suspended Sediment Rolling Average at Heavenly Valley Creek Property Line Sampling Station and at the Hidden Valley Creek Reference Station

Water Year	Property Line Suspended Sediment (tons/year)	Hidden Valley Creek Suspended Sediment (tons/year)
Standard	**58 ton/year: 5-year rolling average**	**58 ton/year: 5-year rolling average**
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
2016	6.63	18.8
2017	161.84	50.5
2018	2.47	2.5
2019	12.16	7.09
2020	0.94	2.34
2021	0.10	0.83
2022	0.86	17.13
5-Year Rolling Average	**3.31**	**5.98**

[1] The discharge values for water year 2010 were revisited and changed the annual load calculations.

2.6 Heavenly Valley and Hidden Valley Creeks: Summary Statistics

The Lahontan state standards for Trout Creek Receiving Waters govern Heavenly Valley and Hidden Valley Creeks (Table 2-5). Statistical summaries for Heavenly Valley and Hidden Valley Creeks for water year 2022 are shown in Table 2-6 through Table 2-9 (exceedance values are shown in bold). Raw data are provided in Appendix A. The statistics were computed over the total samples for each sampling station, which typically consisted of 12 monthly monitoring samples and an additional 5 samples collected during spring runoff in April, May, and June at each sampling stations, although the actual number of samples collected varied at each site, as discussed in Section 2.3. Annual average values for total phosphorus and chloride exceeded the Lahontan state standard at all Heavenly Valley Creek monitoring sites, as well as the reference site. Annual average values for total nitrogen were below the Lahontan state standard at all Heavenly Valley Creek monitoring sites, but total nitrogen at the reference site exceeded the Lahontan state standard (0.268 mg/L).

Table 2-5 Summary of the Sampling Analysis Limits for Heavenly Valley Creek and Hidden Valley Creek—Water Year 2022

Constituents	Units	Trout Creek Receiving Water Limits[1]
Total dissolved solids	mg/L	60[2]
Total nitrogen	mg/L	0.19
Total phosphorus	mg/L	0.015
Chloride	mg/L	0.15

[1] Standards are annual averages for the receiving waters of Trout Creek.
[2] Standards are for receiving waters of Trout Creek, 90th percentile.

Table 2-6 Statistical Summary for Heavenly Valley Creek at the Sky Meadows Monitoring Site—Water Year 2022

Sky Meadows: California Lake Tahoe Receiving Water Limits (exceedances in bold)						
	Q (cfs)	Turbidity (NTU)	Total Suspended Sediment (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)	Chloride (mg/L)
Standard	--	--	**60**	**0.19**	**0.015**	**0.15**
# of samples	15	15	15	15	15	16
Minimum	0.034	1.23	1.5	0.07	0.011	**0.27**
Maximum	1.663	7.45	7.0	**0.33**	**0.036**	**0.94**
Annual average	0.509	2.89	4.1	0.14	**0.023**	**0.49**
90th percentile	--	--	6.4	--	--	--

Notes: cfs – cubic feet per second; mg/L – milligram per liter; NTU – nephelometric turbidity unit

Table 2-7 Statistical Summary for Heavenly Valley Creek at the Patsy's Monitoring Site—Water Year 2022

Patsy's: California Lake Tahoe Receiving Water Limits (exceedances in bold)						
	Q (cfs)	**Turbidity (NTU)**	**Total Suspended Sediment (mg/L)**	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**Chloride (mg/L)**
Standard	**--**	**--**	**60**	**0.19**	**0.015**	**0.15**
# of samples	15	15	15	15	15	16
Minimum	0.027	0.46	1.0	0.06	0.012	**0.43**
Maximum	1.355	5.62	7.0	**0.25**	**0.044**	**1.80**
Annual average	0.417	2.04	3.1	0.14	**0.023**	**1.05**
90th percentile	--	--	6.1	--	--	--

Notes: cfs – cubic feet per second; mg/L – milligram per liter; NTU – nephelometric turbidity unit

Table 2-8 Statistical Summary for Heavenly Valley Creek at the Property Line Monitoring Site—Water Year 2022

Property Line: California Lake Tahoe Receiving Water Limits (exceedances in bold)						
	Q (cfs)	**Turbidity (NTU)**	**Total Suspended Sediment (mg/L)**	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**Chloride (mg/L)**
Standard	**--**	**--**	**60**	**0.19**	**0.015**	**0.15**
# of samples	10	11	11	11	11	11
Minimum	0.081	0.20	0.5	0.01	0.011	0.50
Maximum	1.282	2.58	20.0	0.14	0.036	0.96
Annual average	0.660	0.99	3.4	0.07	0.019	0.80
90th percentile	--	--	16.9	--	--	--

Notes: cfs – cubic feet per second; mg/L – milligram per liter; NTU – nephelometric turbidity unit

Table 2-9 Statistical Summary for Hidden Valley Creek Reference Site—Water Year 2022

Hidden Valley Creek: Lake Tahoe Receiving Water Limits for Trout Creek (exceedances in bold)						
	Q (cfs)	**Turbidity (NTU)**	**Total Suspended Sediment (mg/L)**	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**Chloride (mg/L)**
Standard	**--**	**--**	**60**	**0.19**	**0.015**	**0.15**
# of samples	18	17	17	17	17	18
Minimum	0.158	0.46	1.5	0.09	**0.041**	**0.30**
Maximum	5.716	13.7	51.0	**0.77**	**0.760**	**1.64**
Annual average	1.841	4.38	10.9	**0.27**	**0.137**	**0.65**
90th percentile	--	--	30.6	--	--	--

Notes: cfs – cubic feet per second; mg/L – milligram per liter; NTU – nephelometric turbidity unit

All monitoring sites on Heavenly Valley and Hidden Valley Creeks had total suspended sediment (TSS) values below the 90th percentile Lahontan state standard value of 60 mg/L. The highest daily peak TSS result along Heavenly Valley Creek occurred at the Property Line site, which reached 20 mg/L on September 21. TSS values at the Sky Meadows and Patsy's sites both peaked at 7 mg/L. Annual average values for TSS at the Sky Meadows, Patsy's, and Property Line monitoring sites were 4.12 mg/L, 3.07 mg/L, and 3.36 mg/L. TSS values were substantially higher at the Hidden Valley Creek reference site during the 2022 water year, reaching a peak value of 51.0 mg/L on May 24. The annual average TSS value was 10.85 mg/L, over twice as high as any of the monitoring sites along Heavenly Valley Creek. The high TSS values are likely associated with the ongoing impacts of the Caldor Fire on the watershed, as discussed in Section 2.5.

The maximum observed TSS concentrations typically coincide with the rising limb and peak of the spring runoff hydrograph, which is expected because suspended sediment is often mobilized along the stream banks and transported during spring runoff. Higher TSS concentrations were correlated with spring runoff flows at the Sky Meadows, Patsy's, and Hidden Valley Creek monitoring sites, which had peak TSS values during April and May. Peak TSS occurred at the Property Line monitoring site during an autumn storm. On-mountain access was restricted during this storm event, so samples were unable to be obtained at the Sky Meadows and Patsy's monitoring sites for comparison.

The Lahontan state standard for total nitrogen (0.19 mg/L annual average) is the sum of the total Kjeldahl nitrogen, which is representative of the ammonia and organic nitrogen concentrations, total nitrate, and total nitrite. Single values that exceeded the Lahontan annual average standard value occurred four times at the Sky Meadows and Patsy's monitoring sites along Heavenly Valley Creek. However, the annual average values for both sites were below the standard (0.143 mg/L at Sky Meadows; 0.142 mg/L at Patsy's). All values reported at Property Line were below the Lahontan state standard, but limited samples were collected due to low flows. Total nitrogen values at the Hidden Valley Creek reference site were abnormally high, with 12 out of the 16 total reported values exceeding the Lahontan standard. The annual average total nitrogen concentration was 0.268 mg/L, approximately 40% higher than the Lahontan standard. Like TSS, these high total nitrogen values are likely associated with the ongoing impacts of the Caldor Fire. Identifying impacts that resort operations may have on total nitrogen will be constrained until water quality conditions at the reference site return to normal values.

The Lahontan state standard of total phosphorus at Heavenly Valley Creek and Hidden Valley Creek is an annual average not to exceed 0.015 mg/L. The annual average total phosphorus concentrations for water year 2022 were above the Lahontan state standard at the three Heavenly Valley Creek monitoring sites and the Hidden Valley Creek reference site. Average values for these sampling stations were as follows:

- Sky Meadows—0.023 mg/L;
- Patsy's—0.023 mg/L;
- Property Line—0.019 mg/L; and
- Hidden Valley Creek—0.137 mg/L.

All daily samples collected throughout the water year at the Hidden Valley Creek reference site exceeded the annual average Lahontan state standard for phosphorus. Daily samples collected at the Sky Meadows monitoring site were below the annual average Lahontan state standard on two occasions during the first and second quarters of the water year, on four occasions during the second, third, and fourth quarters at the Patsy's monitoring site, and on four occasions during the third and fourth quarters at the Property Line monitoring site. Some forms of phosphorus are particle-bound; therefore, a portion of the phosphorus levels can be attributed to mobilized sediments that occur during sustained high flows. In prior years, resort activities along Heavenly Valley Creek appeared to have a limited impact on total phosphorus levels because concentrations in the reference reach also exceeded Lahontan state standards in relatively similar concentrations. However, as discussed previously, the ongoing impacts of the Caldor Fire on the water quality of Hidden Valley Creek have complicated such comparisons, as phosphorus at the Hidden Valley Creek reference site was much higher than it was in past years, and in water year 2022, was higher than any of the monitoring sites along Heavenly Valley Creek.

Annual average chloride values along Heavenly Valley Creek and Hidden Valley Creek for water year 2022 were above the annual average Lahontan state standard of 0.15 mg/L at all three of the monitoring sites and the reference site. In addition, all daily samples collected during the water year also exceeded the annual average Lahontan state standard value. Unlike TSS, total nitrogen, and total phosphorus, the annual average for chloride was lower at the Hidden Valley Creek reference site (0.65 mg/L) as compared to two of the Heavenly Valley Creek monitoring sites (1.05 mg/L at Patsy's; 0.80 mg/L at Property Line). However, the annual average for chloride at the Sky Meadows monitoring site was lower than the Hidden Valley Creek reference site (0.49 mg/L).

Chloride levels at these monitoring sites have exceeded the Lahontan state standard over the past decade. The cause for the increasing chloride levels along Heavenly Valley Creek is unknown. Application of salts on the terrain parks or other areas within the Heavenly Valley watershed may be one possible contributor. Like the other water quality parameters, the impacts of the Caldor Fire constrain the ability to parse meaningful comparisons between resort operations as compared to background conditions within the previously undisturbed watershed along Hidden Valley Creek. However, the annual average chloride concentration at the Hidden Valley Creek has consistently exceeded the Lahontan state standard, which suggests that chloride is either naturally occurring or other impacts that are present in both watersheds are contributing to levels above Lahontan state standard.

2.7 Bijou Park Creek and California Parking Lot Effluent: Summary Statistics

Raw data for the Bijou Park Creek and Storm Vault Effluent sampling stations can be found in Appendices A and B, respectively. Table 2-10 summarizes the past Lahontan state standards relative to Bijou Park Creek and the Storm Vault Effluent. The Lahontan state standards that apply to the Bijou Park Creek sampling station are governed by the Lake Tahoe receiving water limits for TSS, total nitrogen, total phosphorus, and chloride. The maximum concentration for discharge to a surface water governs the turbidity standard at the Bijou Park Creek sampling station. Likewise, the Storm Vault Effluent sampling station 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, and were incorporated into the revised Monitoring and Reporting Programs in 2015. Table 2-11 shows the water quality analysis results for Bijou Park Creek sampling station for water year 2020.

Table 2-10 Summary of the Sampling Analysis Limits for the Bijou Park Creek and Storm Vault Effluent Sampling Stations—Water Year 2022

Constituents	Units	Maximum Concentration for Discharge to Land Treatment[1]	Maximum Concentration for Discharge to Surface Water[2]	Lake Tahoe Receiving Water Limits[3]
Turbidity	NTU	200	20	20[4]
Total suspended sediment	mg/L	--	--	60[5]
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

Notes: mg/L – milligram per liter; NTU – nephelometric turbidity unit

1 The effluent limits for discharge to land were effective for discharge from the California Base area on December 31, 2004. Value calculated as the daily average of all effluent samples collected from a single discharge point.

2 The effluent not-to-exceed limits for discharge to surface waters were effective for discharge from the California Base area beginning November 30, 2008. Value calculated as the daily average of all effluent samples collected from a single discharge point.

3 The Amended Monitoring and Reporting Program, effective May 30, 2011, for water year 2012 and beyond required monitoring of the outfall of the filter vault system. Bijou Park 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 daily concentration for discharge to surface waters. Standards are annual averages unless otherwise noted.

4 Turbidity standard for Bijou Park Creek mimic the maximum discharge to surface water because there is no upstream background sampling station for comparison. Therefore, the standard is compared to values calculated as the daily average collected from a single discharge point, rather than an annual average.

5 The total suspended sediment standard for tributary streams into the Lake Tahoe 90th percentile is 60 mg/L. This standard is equivalent to the Tahoe Regional Planning Agency's regional "environmental threshold carrying capacity" standard for suspended sediment in tributaries (California Regional Water Quality Control Board, Lahontan Region 2015a).

Table 2-11 Statistical Summary for the Bijou Park Creek Sampling Station—Water Year 2022

Bijou Park Creek: California Lake Tahoe Receiving Water Limits (exceedances in bold)						
	Q (cfs)	**Turbidity (NTU)**	**Total Suspended Sediment (mg/L)**	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**Chloride (mg/L)**
Standard	**--**	**20**	**60**	**0.15**	**0.008**	**3.0**
# of samples	18	17	17	17	17	18
Min	0.021	0.40	4.0	**0.29**	**0.056**	**5.6**
Max	0.458	**302**	**169**	**1.29**	**1.07**	**256**
Annual Average	0.109	**41.9**	25.4	**0.78**	**0.201**	**67.3**
90th Percentile	--	--	**89.0**	--	--	--

Notes: cfs – cubic feet per second; mg/L – milligram per liter; NTU – nephelometric turbidity unit

Six out the 17 samples collected at the Bijou Park Creek monitoring site exceeded the average daily turbidity standard (20 NTU). The highest turbidity reading (302 NTU) occurred during the second quarter on January 11, which is one of the highest turbidity values recorded at this monitoring site to date. The abnormally high turbidity value may have been due to a fallen Scouler's willow tree (*Salix Scouleriana*), which was rooted within the channel approximately 10 feet upstream of the cross section, that was partially uprooted and fell downstream. Stream flow along the newly exposed bank and channel bottom may have contributed to localized, higher-than-normal turbidity values at the monitoring site. Turbidity values decreased in February and March (67.9 and 50.8 NTU, respectively), but each remained over 2 times higher than the standard. Turbidity values further decreased during the third and fourth quarter, remaining below the 20 NTU standard during eight out of the 11 samples collected between April and September.

The annual average for TSS of 25.4 mg/L was below the Lahontan state standard of 60 mg/L at the Bijou Park Creek sampling station. The maximum daily measurement for TSS was 169 mg/L, which occurred during the January 11 sampling event described above. A high TSS recording of 69.0 mg/L also occurred on the April 19 sampling event, which coincided with peak flow at the monitoring site. All other TSS values during the water year were below the Lahontan state standard.

The annual average for total phosphorus at the Bijou Park Creek sampling station during water year 2022 was 0.201 mg/L, which is 2.5 times higher than the Lahontan state standard of 0.008 mg/L. All 17 daily samples collected were well above the Lahontan state standard, with a maximum daily value of 1.07 mg/L on January 11. As discussed in the previous section, the annual average concentrations of total phosphorus also exceeded the state receiving water standard at the reference site on Hidden Valley Creek in water year 2022 (all individual daily samples exceeded the standard), indicating that phosphorus is naturally present within the watersheds surrounding Heavenly Mountain Resort.

The annual average for total nitrogen at the Bijou Park Creek sampling station of 0.78 mg/L was above the Lahontan state standard of 0.15 mg/L. All 17 daily samples collected were well above the Lahontan state standard. Since the Lahontan state standard for total nitrogen was lowered from 0.50 mg/L to 0.15 mg/L, starting in water year 2012, the concentrations at the Bijou Park Creek sampling station have consistently exceeded the standard. Table 2-12 shows the annual average total nitrogen concentrations

for the Bijou Park Creek sampling station over the past 14 years of monitoring, clearly demonstrating these exceedances, although the annual straight average for total nitrogen concentrations has been reduced since 2007.Total phosphorus and total nitrogen concentrations in surface water can vary with vegetation uptake, decay, and removal and changes in the hydrologic cycle, such as fluctuations in precipitation and flows.

Table 2-12 Total Chloride and Nitrogen Annual Average Values Compared with Flow at the Bijou Park Creek Sampling Station

Water Year	Annual Average Total Chloride Values (mg/L)	Annual Average Total Nitrogen Values (mg/L)	Annual Average Flows (cfs)
2006	98	1.096	0.52
2007	82	1.47	0.26
2008	144.88	1.88	0.33
2009	119.79	0.88	0.20
2010	94.88	0.73	0.15
2011	76.29	0.66	0.46
2012	93.6	0.61	0.24
2013	73.64	0.74	0.22
2014	56.3	0.54	0.14
2015	45.9	0.54	0.11
2016	87.2	0.69	0.12
2017	61.1	0.57	0.39
2018	50.8	0.54	0.21
2019	58.5	0.55	0.27
2020	56.2	0.52	0.17
2021	51.7	0.57	0.14
2022	67.3	0.78	0.11

Notes: cfs – cubic feet per second; mg/L – milligram per liter

All 17 daily samples collected exceeded the Lahontan state standard for annual average chloride concentrations at the Bijou Park Creek sampling station during water year 2022. The annual average for chloride was 67.3 mg/L, which is over 20 times higher than the Lahontan state standard of 3.0 mg/L. The annual average for chloride was also exceeded at the Hidden Valley Creek reference site. Chloride readings have been problematic at Bijou Park Creek for the past decade because Heavenly and the City of South Lake Tahoe apply deicer to the roadways during storm events and prolonged freezing periods. Icy roads and entrances that can lead to potential vehicular accidents are a public safety concern. Residual chloride is known to accumulate in the environment and removal mechanisms/processes are not readily available or affordable.

The filter vault system collects storm and snow melt runoff from both the upper and lower parking lots. Table 2-13 provides a summary of the results for water year 2022. Three storm samples were collected and analyzed during water year 2022 during the first, third, and fourth quarters (October 22, April 19, and

September 19). See Appendix B for the storm filter sampling results for the Storm Vault Influent North, Storm Vault Influent South, and the Storm Vault Effluent sampling stations.

Table 2-13 Statistical Summary for California Base Storm Filter Outlet—Water Year 2022

Storm Vault Effluent Sampling Station: California Maximum Concentration for Discharge to Surface Water Limits (exceedances in bold)					
	Turbidity (NTU)	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**Chloride (mg/L)**	**Oil and Grease (mg/L)**
Standard	**20**	**0.5**	**0.10**	--	**2.0**
# of samples	3	3	3	3	3
Min	**45**	**1.0**	**0.17**	15	ND[1]
Max	**130**	**2.2**	**0.35**	92	ND[1]
% of the time in Exceedance	**100%**	**100%**	**100%**	**--**	**0%**

Notes: cfs – cubic feet per second; mg/L – milligram per liter; NTU – nephelometric turbidity unit

[1] Samples were analyzed for oil and grease, but oil and grease were not detected above the level of the reported sample reporting/quantitation limit. The reported result should be considered an estimate.

All three of the samples collected at the Storm Vault Effluent sampling station in water year 2022 exceeded the not-to-exceed limit for turbidity (20 NTUs). All samples collected during the water year also exceeded the not-to-exceed limit for total nitrogen (0.50 mg/L) and for total phosphorus (0.10 mg/L). The first two samples did not indicate any filtration of nitrogen through the system compared to the Storm Vault Influent North and Storm Vault Influent South sampling stations, but the third sample collected on September 19 did indicate that some filtration occurred (3.5 mg/L at 43HPV-1A and 2.5 mg/L at 43HVP-1B vs. 1.7 mg/L at 43HVP-2). The first sample collected on October 22 had higher total phosphorus (0.35 mg/L) relative to both inlets (0.31 mg/L at 43HVP-1A; 0.34 mg/L at 43HVP-1B), but the second two samples indicate that some filtration of phosphorus did occur. All three storm samples were analyzed for oil and grease, but oil and grease were not detected above the level of the reported sampling reporting/quantitation limit; therefore, the reported result should be considered an estimate. Storm water samples typically reflect the first flush effect, where the highest concentrations of constituents are expected to be mobilized and transported into and through the filter system.

Across the six underground vaults under the California Base Parking Lot, there are 14 filters with PhosphoSorb™ media (also referred to as sacrificial filters throughout past reports), intended to specifically capture total phosphorus and TSS, and 441 ZPG™ media filters, intended to treat a range of water quality constituents. The underground vaults in the California Base Parking Lot also include an oil and grease separator. An additional underground vault at Wildwood contains ZPG™ media filters. Since 2011, the sacrificial filters have been inspected annually. Due to the variable storm and sediment loading, not all filters require replacement each year. In September 2013, the media in the sacrificial filters (Units 3 and 9) were changed from the originally installed Zeolite, Perlite and Granular Activated Carbon media (ZPG™) to a PhosphoSorb™ absorbent media in hopes to reduce total phosphorus exceedances. Because of the added cost associated with the PhosphoSorb™ media, only the sacrificial filters have this media. The remaining filters are still using and being replaced with ZPG™ media.

Full-service maintenance of the stormwater filtration system occurred on September 28, 2022, and filters were inspected and cleaned. All units were inspected, sediment and static water was removed, and the internal components were power washed. The ZPG™ media filters in Units 5 and Wildwood were replaced and the PhosphoSorb™ media filters in Units 3 and 9 were replaced. Filter media at Units 4, 10, and 11 did not require replacement during the inspection event. Maintenance records along with photographs of the units, the filter replacement, and separators are included with the Appendix C, *California Vault Inspection Reports*.

As done in the past, maintenance and replacement of the filter media occurred at the end of the water year after all three of the storm samples had been collected. Maintenance and filter replacement in water year 2021 occurred in mid-September 2021, approximately one month prior to the collection of the first storm sample in water year 2022. It is unclear whether supplemental annual maintenance would have resulted in enhanced filtration of constituents in the effluent sample relative to the influent samples. Continued annual maintenance and filter replacement appear to show some water quality improvement as exceedance and maximum constituent values (spikes) have not risen substantially over time. However, results from all samples collected during the water year remain high. The collection of additional stormwater runoff samples is needed to draw any type of conclusion regarding the vault system's filtration and treatment efficiency.

2.8 Edgewood Creek: Summary Statistics

Edgewood Creek is in Nevada, outside of Lahontan's jurisdiction. Water quality statistics for Edgewood Creek are included in this report for compliance with the Master Plan Amendments that are within TRPA's basin jurisdiction. The two Edgewood Creek locations are sampled for compliance with NDEP standards, as shown in Table 2-14. Sampling results for water year 2022 are summarized in Table 2-15 and Table 2-16, and the raw data tables are provided in Appendix A. All standards are for single not-to-exceed values, with the exception of total nitrogen and total phosphorus, which also have not-to-exceed annual average standard values.

Table 2-14 Summary of the Sampling Analysis Limits for Edgewood Creek at Palisades Drive—Water Year 2022

Constituents	Units	NDEP Standards
Turbidity	NTU	10[1]
Total suspended sediment	mg/L	25[1]
Total nitrogen	mg/L	0.6[1] / 0.6[2]
Total phosphorus	mg/L	0.1[1]/ 0.05[2]

[1] Not to exceed standard for a single value.
[2] Not to exceed standard for the annual average.

Of the 8 daily samples collected at the Upper Edgewood monitoring site, no exceedances occurred. All single values of turbidity, TSS, total nitrogen, and total phosphorus were below the NDEP standards. In addition, the annual average for total nitrogen and total phosphorus were also below the NDEP standard. The lack of exceedances during the 2022 water year is a substantial improvement relative to prior years; however, this may also be because sampling was much more limited during this water year due to both low flows and snow/ice cover, also sampling has been similarly inconsistence in past years. A statistical summary of water quality at the Upper Edgewood monitoring site is included in Table 2-15.

Of the 17 daily samples collected at the Lower Edgewood Creek monitoring site, four turbidity exceedances occurred, one TSS exceedance occurred, one single value total nitrogen exceedance occurred, and one single value total phosphorus exceedance occurred. The annual average for total nitrogen remained below the NDEP state standard, but the single value exceedances of total phosphorus was high enough to bring the annual average value above the NDEP standard. Turbidity exceedances occurred on March 13, April 5, and April 19 during the spring runoff period with turbidity ranging from 13.5 NTU to 22.7 NTU, as well as the September 21 sampling event which coincided with an autumn rain event and had the highest turbidity value for the water year (71.5 NTU). The single TSS exceedance during the water year also occurred on September 21 (53.5 mg/L); TSS values otherwise ranged from 1.0 to 18.0 mg/L. Both single value exceedances for total nitrogen and total phosphorus also occurred during the September 21 sampling event, suggesting that these exceedances are likely correlated with sediment transport during storm events. Exceedance values are included in Table 2-16.

Table 2-15 Statistical Summary for Upper Edgewood—Water Year 2022

Edgewood Creek Above the Boulder Parking Lot: NDEP Standards for the Truckee Region – Edgewood Creek at Palisades Drive (exceedances in bold)								
	Q (cfs)	**Specific Conductivity (mmhos)**	**Turbidity (NTU)**	**Suspended Sediment (mg/L)**	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**SRP (mg/L)**	**DP (mg/L)**
Standards[1]	--	--	10.0[2]	25[2]	0.6[2] / 0.6[3]	0.1[2] / 0.05[3]	--	--
# of samples	7	8	8	8	8	8	8	8
Min	0.023	54.9	0.51	0.5	0.08	0.02	0.002	0.010
Max	0.239	79.5	2.51	7.0	0.22	0.05	0.010	0.021
Annual Average	0.110	64.2	1.37	2.4	0.15	0.03	0.008	0.018

Notes: cfs – cubic feet per second; DP – dissolved phosphorus; mg/L – milligram per liter; mmhos – millimhos per centimeter; NDEP – Nevada Division of Environmental Protection; NTU – nephelometric turbidity unit; SRO – soluble reactive phosphorus

[1] NDEP standards are from the Nevada Administrative Code Chapter 445A.1664.
[2] Not-to-exceed standard for a single value.
[3] Not-to-exceed standard for the annual average.

Table 2-16 Statistical Summary Lower Edgewood—Water Year 2022

Edgewood Creek Below the Boulder Parking Lot: NDEP Standards for the Truckee Region – Edgewood Creek at Palisades Drive (exceedances in bold)								
	Q (cfs)	**Specific Conductivity (mmhos)**	**Turbidity (NTU)**	**Suspended Sediment (mg/L)**	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**SRP (mg/L)**	**DP (mg/L)**
Standards [1]	--	--	**10.0**[2]	**25**[2]	**0.6**[2] **/ 0.6**[3]	**0.1**[2] **/ 0.05**[3]	--	--
# Samples	13	16	16	16	16	16	16	16
Min	0.020	84.8	1.99	1.00	0.15	0.02	0.001	0.009
Max	0.412	197.7	**71.5**	**53.50**	**0.94**	**0.27**	0.009	0.025
Annual Average	0.129	137.8	**11.4**	10.59	0.30	**0.06**	0.005	0.016

Notes: cfs – cubic feet per second; DP – dissolved phosphorus; mg/L – milligram per liter; NDEP – Nevada Division of Environmental Protection; NTU – nephelometric turbidity unit; SRO – soluble reactive phosphorus

[1] NDEP standards are from the Nevada Administrative Code Chapter 445A.1664.
[2] Not-to-exceed standard for a single value.
[3] Not-to-exceed standard for the annual average.

2.9 Conclusions and Recommendations

Water year 2022 had slightly above average precipitation (35.7 inches), which primarily came in concentrated storms over the course of several days to a week (rainstorms in October 2021 and September 2022, and snowstorms in December 2021 and April 2022). Water year 2022 followed two years of below average precipitation. In the recent past, water year 2017 was the highest precipitation year (70.5 inches) and had annual average noncompliance values higher than observed in other years.

SWE measurements for 2022 (17.7 inches) were lower than the accumulated precipitation and Figure 2-3 presents a comparison of the SWE and precipitation totals since 2005. SWE measures the amount of water in the snow column and does not measure rainfall that does not fall on and is absorbed by on snow. The difference between accumulated precipitation and SWE in water year 2022 is due in part to a large rainstorm that occurred in late October, which produced over six inches of precipitation, which was mostly rain. Rainstorm events can cause short bursts of increased discharge, which can impact water quality.

Annual noncompliance values are typically lower and less common in low water years compared to higher precipitation years because of the increased stream flows during storm events and spring runoff during higher precipitation years. However, in the recent past, as storms become more intense due to climate change, spikes in water quality noncompliance values can be correlated to single storm events (typically rain), even in low or average precipitation years, as was observed in October 2021 and September 2022. The upper elevation sites on Heavenly Valley Creek, (Sky Meadows and Patsy's), could not be accessed during the September 2022 rainstorm, due to on-mountain road closures to prevent road erosion. Inclusion of water quality data at these sites in annual averages may have further increased noncompliance values at these sites, as water quality was generally poorer at other sites than would be expected for the time of year.

The monitoring results demonstrate that constituent values in noncompliance are not solely due to mountain operations associated with the resort activities because values at the reference site at Hidden Valley Creek has continued to also exceed standards. However, ongoing impacts of the Caldor Fire on the reference site currently prevents meaningful comparisons to sites impacted by resort operations. The following sections include a summary of the Monitoring Program and the 2020 findings for each creek and applicable recommendations.

2.9.1 Heavenly Valley Creek

Annual average values for both total phosphorus and chloride were exceeded at all three sampling stations along Heavenly Valley Creek. Annual averages for these two constituents were also exceeded for the last six water years (2016–2021). In the past several years, total phosphorus and chloride annual average values have also been consistently exceeded at the reference site along Hidden Valley Creek. In water year 2022, annual average exceedances at the Hidden Valley Creek site were higher than ever observed in the past, due to impacts from the Caldor Fire. However, the pattern of continued exceedances observed at the reference site demonstrate that resort operations and development within the watershed are not solely responsible for these exceedances along Heavenly Valley Creek.

In water year 2022, total phosphorus values at Heavenly Valley Creek tended to be lower at lower elevation monitoring sites compared upper elevation monitoring sites. Total nitrogen followed a similar, but less noticeable pattern. Some forms of phosphorus are particle-bound; therefore, a portion of the phosphorus levels can be attributed to mobilized sediments that occur during sustained high flows. However, other forms of phosphorus and nitrogen within soils can be utilized by vegetation. Good vegetative cover between the upper and lower elevation sites may be decreasing total phosphorus and nitrogen levels in the surface water as it moves through the watershed. In contrast, chloride, which is not utilized by plants, tended to be higher at lower elevation sites.

The weighted annual average values for the TSS TMDL have been calculated since 2001, and the 5-year rolling average has been below the limit (58 tons/year) since 2005. At the Property Line Heavenly Valley Creek compliance monitoring station, the calculated 5-year rolling average for water years 2018–2022 is 3.31 tons/year, which is over 10 times less than the 2021 rolling average of 35.5 tons/year (Table 2-4). The large reduction is largely attributed to the 5-year rolling average no longer including water year 2017 annual sediment load (161.84 tons/year), which was much higher than years prior or after. As discussed in Section 2.4, water year 2017 was a very high precipitation year, and annual values were higher than in other years. Erosion control resources (BMPs), increased employee awareness, and on-mountain improvements may have continued to reduce overall sediment loading. While TSS values are in compliance for Heavenly Valley Creek, other metrics such as BMI and SCI results (Section 3), will need to show improvement before possible discussion and potential (TMDL) de-listing of Heavenly Valley Creek.

2.9.2 Bijou Park Creek / California Parking Lot Effluent

Since the Lahontan state standards along Bijou Park Creek were lowered to the Lake Tahoe receiving water limits, the annual average values have consistently not met the standards for total nitrogen, total phosphorus, and chloride, and in water year 2022, turbidity and TSS standards were also exceeded. The Amended Monitoring and Reporting Program in 2011 lowered the standards by almost a factor of 10 for these three constituents. As discussed above, total phosphorus and chloride levels were also consistently exceeded at the reference station along Hidden Valley Creek (and in water year 2022 the total nitrogen standard was also exceeded), suggesting concentrations of these constituents can be elevated due to

natural factors. However, the exceedances at the Bijou Park Creek sampling station relative to Lahontan state standards were substantially greater than those at Hidden Valley Creek or Heavenly Valley Creek. The highest daily values of all constituents (January 11, 2022) at Bijou Park Creek were associated with a riparian tree fall that was rooted in the channel directly upstream of the monitoring site.

The Monitoring and Reporting Program in 2015 lists turbidity "contributing to a condition of pollution or nuisance in Bijou Park Creek and its downstream receiving waters (Lake Tahoe)."[7] Continued elevated turbidity values at this sampling station are likely due to the increased impervious area in this smaller watershed contributing sheet flow and dissolved nutrient loading to the creek. Corrective recommendations are discussed in detail in the Bijou Park Creek Evaluation Report (Catalyst 2017) and summarized in the most recent Comprehensive Report (*Environmental Monitoring Program Comprehensive Report – WYs 2017-2021).*

Water year 2022 was the tenth year that Heavenly reported outlet results for the California parking lot filter vault system (Storm Vault Effluent monitoring site) to the State Water Board. The three effluent storm samples collected in water year 2022 exceeded the Lahontan state standards for turbidity, total phosphorus, and total nitrogen. Oil and grease were below the detectable limit (2.0 mg/L, which is also the Lahontan state standard) in all three samples; while these samples did not exceed the Lahontan state standard, these sample results should not be considered zero values. There is no Lahontan state standard for chloride at the Storm Vault Effluent sampling station; however, chloride values in samples ranged from 15 – 92 mg/L in the effluent samples, while the annual average value was 47 mg/L. The 2022 annual average for chloride is similar to the annual average value observed in water year 2021. The annual average chloride values the Storm Vault Effluent monitoring site are consistently lower than the average chloride values at the Bijou Park Creek, which is located just downstream. This suggests there are additional inputs to Bijou Park Creek other than the parking lot effluent, which are contributing additional chloride. The Lahontan waste discharge language states that the metric for exceedance is 10% above background levels; however, there is no background level data available, as there is no sampling station upstream of the parking lot sampling stations.

As further discussed in Section 4, the filter vault system was inspected, cleaned, and filters were replaced in September 2022. Water year 2020 was the seventh year of data collection using the new PhosphoSorb™ media in the sacrificial vaults. Water quality results demonstrate that the use of this different media has limited the total phosphorus, although not to below Lahontan state standards. Phosphorus levels have remained lower in the effluent samples compared to samples prior to the use of the PhosphoSorb™ media, and the phosphorus values show a decrease through the system based on influent and effluent value comparisons. Turbidity and chloride values are also substantially reduced through the filtration system, however, the filters had less of an impact on total nitrogen. Heavenly continues to be proactive in attempting to limit discharge exceedances by replacing cartridges, maintaining the system, updating sampling equipment, and using new filtration media. Heavenly annually budgets for recontinued filter inspections, maintenance, and replacement, and the next round of inspections is scheduled to occur after the 2022/2023 winter season.

Chloride exceedances continue to be problematic at the Bijou Park Creek and the Storm Vault Effluent sampling stations, although levels are elevated at other California stream sampling stations (i.e., Heavenly Valley Creek and Hidden Valley Creek). Water year 2016—the 2015/2016 ski season—marked the first year that Heavenly implemented a 5:1 Washoe sand to salt mixture as its deicer for parking lots

[7] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort (page 10).

and roadways assessing the California base lodge. The smaller spreader truck and sensor allows for adequate deicer application, where in the past the large dump truck had problems dispensing a Washoe sand mixture. Heavenly continued this practice and the mixture use for water year 2022—the 2019/2020) ski season. Although Heavenly has contracted an outside vendor to apply liquid brine (salt/chlorine mixture) in lieu of excess deicer abrasives, no liquid brine was used in water year 2022 due to the timing of storms and lack of communication with application prior to storm cycles. Heavenly has continued to recover abrasives through mechanical sweeping of the parking areas and roads leading to the resort during extended breaks between storms and during the spring and summer months following snow melt, which removes potential materials from the entering streams. Further discussion of deicer and abrasives can be found in Section 6.

2.9.3 Edgewood Creek

As typical in most years, fewer samples were collected at the Edgewood Creek monitoring sites compared to other sites. Fewer total samples were collected due to resort activities, full ice or snow cover at the sites during the winter months, and a lack of flow and heavy perennial herbaceous vegetation growth within the Upper Edgewood channel during the summer months.

No exceedances of NDEP state standards (either single value or annual averages) occurred at the Upper Edgewood Creek monitoring site during water year 2022, which is an improvement over the past years. This may be due to the low number of samples collected, although sample collection at this site has been typically low. Additionally, samples could only be collected during runoff season, when there was flowing water in the stream and it was not cover with snow, which is typically when water quality constituents are high.

NDEP standards at the Lower Edgewood Creek sampling station were exceeded for single values of turbidity, TSS, total nitrogen, and total phosphorus. Single values standards of turbidity were exceeded during the runoff period, but all other exceedances occurred during the September rainstorm event. NDEP annual average standards for total phosphorus was also exceeded. Since the 2007 restoration project in along Edgewood Creek below the Boulder parking lot, there have been nine water years in which the daily not-to-exceed NDEP stream effluent limits were not met for all three constituents (Table 2-17). Exceedances that occurred in the past several water years along Edgewood Creek are likely related to sediment transport, constituents bound to particles/sediment, at higher flows during runoff season (March through May), or during rainstorm events. It is also possible that the 2007 restoration project may require maintenance or additional actions to continue to reduce exceedances.

Table 2-17 shows exceedances of single value results for turbidity, suspended sediment, and total phosphorus at the Lower Edgewood Creek sampling station, which is below the Boulder parking lot. The number of occasions the single value standard was exceeded is included in parenthesis, and the shaded rows highlight years when all three constituents exceeded the single value standard on at least one occasion. Heavenly is committed to comprehensive improvements at the Boulder parking lot and began a long-term plan to repair the parking lot, which began during the 2020 construction season and is discussed further in Section 4. These parking lot improvements should improve future water quality results.

Table 2-17 Constituent Results for the Lower Edgewood Creek Sampling Station—Water Years 2007–2022

Water Year	Turbidity Standard: (10 NTUs)	Suspended Sediment Standard (25.0 mg/L)	Total Phosphorus Standard (0.1 mg/L)
2007	Not exceeded	**Exceeded (1)**	**Exceeded (1)**
2008[1]	**Exceeded (1)**	**Exceeded (2)**	**Exceeded (2)**
2009	**Exceeded (1)**	**Exceeded (2)**	**Exceeded (1)**
2010	Not exceeded	**Exceeded (2)**	Not exceeded
2011	Not exceeded	**Exceeded (1)**	Not exceeded
2012	Not exceeded	Not exceeded	Not exceeded
2013	**Exceeded (1)**	**Exceeded (1)**	**Exceeded (4)**
2014	Not exceeded	**Exceeded (1)**	Not exceeded
2015	Not exceeded	Not exceeded	Not exceeded
2016	**Exceeded (1)**	**Exceeded (1)**	**Exceeded (1)**
2017	**Exceeded (1)**	**Exceeded (2)**	**Exceeded (2)**
2018	**Exceeded (2)**	**Exceeded (3)**	**Exceeded (2)**
2019	**Exceeded (4)**	**Exceeded (4)**	**Exceeded (4)**
2020	**Exceeded (4)**	**Exceeded (1)**	**Exceeded (3)**
2021	**Exceeded (4)**	Not exceeded	**Exceeded (2)**
2022	**Exceeded (4)**	**Exceeded (1)**	**Exceeded (1)**

Notes: Shaded results highlight years when all three constituents have exceeded the single value state standard. The number is parenthesis indicates the number of occasions the standard was exceeded.

[1] Restoration along Edgewood Creek occurred during the summer of 2007. Water year 2008 was the first year after construction.

In 2022, NDEP newly listed Edgewood Creek from its origin to Palisades Drive as impaired (category 5) for beryllium and phosphorus in the 2020-2022 Integrated Report (NDEP 2022). Both Edgewood Creek sampling stations fall within this reach. The section of Edgewood Creek downstream of Palisades Drive (contributing to Lake Tahoe) is not listed as impaired.

3 Riparian Condition Summary

The objective of riparian condition long-term monitoring is to assess the effectiveness of erosion control measures and restoration activities on riparian health. Monitoring is conducted to characterize stream and riparian conditions along selected stream reaches within the Heavenly Mountain Resort area and along the reference reaches that are unaffected by Heavenly Mountain Resort activity. The evaluation and comparison of monitoring data are used to assess changes in stream and riparian conditions over time, and if changes are encountered, determine whether they are associated with operations at Heavenly Mountain Resort.

In accordance with the joint environmental document (Hauge Brueck 2015) and subsequent TMDL criteria from the Monitoring and Reporting Program, Heavenly is required to collect BMI samples (using Surface Water Ambient Monitoring Program [SWAMP] protocols) two consecutive years within every four years, and conduct Stream Condition Index (SCI, a USFS protocol) surveys once every four years corresponding with the second year of the BMI sampling on Heavenly Valley and Hidden Valley Creeks.7F[8] The monitoring schedule is documented in Lahontan's Monitoring and Reporting Program No. 2015-002 (WDID NO. 6A090033000).

Prior to 2022, the most recent SCI and BMI surveys were completed in 2019. 2019 SCI results were included in the *Environmental Monitoring Program Annual Report – WY 2019*. BMI results from 2019 were not available when the 2019 annual report was prepared; therefore, the 2019 BMI results were presented in the *Environmental Monitoring Program Annual Report – WY 2020*.

According to the monitoring schedule, BMI samples were collected in summer 2022, and the second consecutive year of BMI sampling will occur 2023, along with SCI surveys.

Analysis and comparison of all past SCI and BMI data was included in the *2017-2022 Heavenly Monitoring Program Comprehensive Report*, and summarized changes in riparian condition overtime. BMI and SCI data collected in 2022 and 2023 will be analyzed in the next Comprehensive Report (due January 2027).

3.1 Benthic Macroinvertebrate Surveys

BMI data were collected at all five sampling reaches during August 2022, and laboratory results are expected to be received during the winter of water year 2023. Results will be included in the *Environmental Monitoring Program Annual Report – WY 2023*. Because of the start of the new contract with Cardno (now Stantec) (start date August 1, 2022) and scheduling conflicts, BMI data collection was split over two separate weeks, and was conducted August 4, 5, 22 and 23, 2022. Pebble counts and cobble embeddedness data was collected at all reaches according to SWAMP protocols, and these results will be presented along with the BMI results in water year 2023.

As previously discussed, the Caldor Fire burned through the Hidden Valley Creek watershed. The Lower Hidden Valley Creek (LHC-1) BMI site burned with "moderate severity" (based on Burn Area Emergency Response [BAER] mapping), and while the immediately adjacent riparian vegetation either was not

[8] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program No. 2015-0021 WDID NO. 6A090033000 for Heavenly Mountain Resort (pages 3-4).

burned or is resprouting, the surrounding conifer forest experienced substantial mortality. Upper Hidden Valley Creek (UHC-1) BMI site burned with “low severity” (based on BAER mapping) and while the surrounding conifer forest experienced some mortality, the riparian area was largely untouched. Burn severity Impacts of the fire on BMI presence and diversity are unknown.

Starting in water year 2016, and as discussed in the *2017-2022 Heavenly Monitoring Program Comprehensive Report,* Cardno and Heavenly restarted the collection of BMI data from the Sky Meadows reach along Heavenly Valley Creek (a meadow within the Heavenly Mountain Resort Boundaries) and began collection along the Upper Hidden Creek reach (a undistributed meadow at a similar elevation) to provide data on high elevation sites. These sites have been included in subsequent monitoring events. Future BMI samples along with snowpack and stream flow data may be needed to help determine variability and stream health at these high elevation sites.

4 Facilities Maintenance Monitoring

Appendix D presents the facilities monitoring checklist for July, August, and September of Q4 water year 2022. Previous monthly facility monitoring checklists (October through June) can be found in past quarterly reports for water year 2022 (Cardno 2022a, 2022b, 2022c). No deicer or salt application occurred on-mountain or in and around the parking lots during the fourth quarter as snow was not present and no snow-related resort activities occurred. Deicer and abrasive recovery (sweeping) in and around the California parking lot facilities occurred in July 2022. Parking lot inspections continued monthly. A work order was issued for repair of minor damages to two drop inlets at the California Main Lodge parking lot, which were first reported as damaged in Q2 of water year 2022. The damage did not appear to be affecting drainage patterns, and repairs were completed prior to resort winter opening. Sweeping and recovery are discussed in greater detail in Section 6.

Pacific Stormwater BMP Solutions inspected storm vaults and replaced filters in September 2022. Appendix C presents the filter vaults maintenance inspection report and photographs from Pacific Stormwater BMP Solutions. All storm vault filters were inspected, and regular maintenance and sediment removal was conducted. A total of 155 cartridges (14 PhosphoSorb™ and 141 ZPG™ filters) across four vaults were replaced in September 2022. The other three vaults were inspected and required sediment removal, but they did not require filter cartridge replacement. The next inspection is recommended in spring 2023.

Graymar Environmental inspected the oil and grease separator and replaced oil booms at California Main Lodge between September 9-14, 2022, ensuring that the system continues to work as designed. Graymar Environmental also removed sediment accumulation within the sediment drop inlets around the California Main Lodge and Boulder parking areas.

Over the past several years, Heavenly has continued to repair and paved deteriorating parking surfaces at Boulder and California Main Lodge parking lots. A portion of the lower parking lot of the California Main Lodge was repaved in September 2022. Inspection of these parking surfaces occurs on a regular basis, as deterioration of the pavement at the parking lots can increase the sediment and nutrient loading into the creek and vault systems.

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5 Snow Condition and Snowmaking Materials

Table 5-1 summarizes the annual water year's total application of huck salt applied at monitored sites around the mountain. Four sites were initially monitored in 2011, and monitoring has expanded to include additional sites overtime. Huck salt application at the Adventure Peak Tubing location ceased in water year 2014 due to procedural changes, and this originally monitored site is no longer included in annual summaries of huck salt. The California parking lot location was added in water year 2015, and beginning in water year 2017, monitoring began at three additional sites: Tamarack Lodge, Tram Base, and World Cup Foundation Building. These sites have been added to adequately track all salt (deicer) applied in and around Heavenly Mountain Resort during winter operations. Table 5-1 summarizes the annual application and water year totals, noting that no huck salt was applied during the fourth quarter of water year 2022.

Table 5-1 Location and Application Amount of Huck Salt (Obtained from the Monthly Monitoring Logs)—Water Year 2022

Month/ Year	Top of the Gondola	World Cup Race Course	Terrain Park	CA Parking Lot Application	Tamarack Lodge Deck	Tram Base Deck	World Cup Foundation Building
	(pounds)						
October 2021	0	0	0	0	0	0	0
November 2021	0	0	0	0	0	0	0
December 2021	0	0	0	680	0	9	0
January 2022	0	0	0	620	0	0	0
February 2022	0	0	0	1,300	0	0	0
March 2022	0	0	740	740	0	0	0
April 2022	0	0	0	60	0	0	0
May 2022	0	0	0	0	0	0	0
June 2022	0	0	0	0	0	0	0
July 2022	0	0	0	0	0	0	0
August 2022	0	0	0	0	0	0	0
September 2022	0	0	0	0	0	0	0
Totals	**0**	**0**	**740**	**3,400**	**0**	**9**	**0**

Snow and ice melt products are applied to heavily used pedestrian areas including parking lots, walkways, and tram egress locations to provide safer guest access during the ski/snowboarding season. Heavenly has limited application and usage of salt around the mountain due to higher chloride concentrations recorded in the stream samples; however, huck salt is often necessary for safety. Salt application at the California parking lot (main lodge), Tamarack Lodge, tram base and World Cup Foundation Building are addressed using a hand spreader or similar, although salt has not been applied at the World Cup Foundation Building since water year 2017.

Table 5-2 summarizes the past twelve water years of salt application for each of the eight locations. Water year 2017 was the first year that the Tamarack Lodge, tram base and World Cup Foundation Building sites were monitored. Salt application increased during the 2022 water year relative to water years 2020 and 2021, which were both below average years with respect to winter snowfall. Salt application was also limited during water years 2020 and 2021 due to the resort closures and changes associated with the COVID-19 pandemic. Employee training and manager's salt application approval have been implemented over the years helping to limit salt usage and correlated chloride levels in water samples. As mentioned above, salt application at the Adventure Peak Tubing location has ceased since water year 2014 due to procedural changes, and although this site is no longer included in future monitoring submittals, it is included in Table 5-2 as a past reference. Additional monitoring records over a longer period, and over varying precipitation years, will help to verify the application relationship with water year precipitation (snow fall) totals.

Table 5-2 Annual Huck Salt Application Records—Water Years 2011–2022[1]

Water Year	Top of the Gondola	World Cup Race Course	Terrain Park	Adventure Peak—Tubing Area	CA Parking Lot Application	Tamarack Lodge Deck	Tram Base Deck	World Cup Foundation Building	Total Summary
	(pounds)								
2011	250	900	3,360	3,400	--	--	--	--	7,910
2012	300	800	1,962	100	--	--	--	--	3,162
2013	450	1,680	4,160	400	--	--	--	--	6,690
2014	80	60	2,840	0	--	--	--	--	2,980
2015[2]	16	50	418	0	544	--	--	--	1,028
2016	38	240	0	0	2,982	--	--	--	3,260
2017[3]	0	0	555	0	3,295	463	1,050	31	5,394
2018	0	0	370	0	675	200	641	0	1,886
2019	40	0	1,580	0	1,737	359	380	0	4,096
2020	6	0	700	0	1,900	125	285	0	3,016
2021	10	0	705	0	2,626	10	55	0	3,406
2022	0	0	740	0	3,400	0	9	0	4,149

[1] Salt application at each location rounded to the nearest pound.
[2] Water year 2015 was the first year that deicer/salt application near and around the California lodge was tracked on a monthly basis. Application has occurred in the past water years; however, the amounts were not recorded.
[3] Water year 2017 was the first year that deicer/salt application near and around the following locations: Tamarack Lodge, tram base and World Cup Foundation Building was tracked on a monthly basis. Application likely occurred in the past water years; however, the amounts were not recorded.

6 Deicer and Abrasives Application and Recovery

Application of deicer and abrasives began on October 25, 2021, following the large storm that began on October 24. Application continued through the winter/ski season into April 2022 and ceased following resort closure on April 24. No deicer/abrasive application occurred during the fourth quarter according to the daily and monthly deicer logs. December had the highest rate of deicer application (42,614 pounds), which coincides with heavy snowfall that occurred toward the end of the month. Deicer application was also high in February (20,398 pounds) and March (8,886 pounds). Deicers were primarily applied during the winter holiday season, and again during the early March storm cycle, and was typical of application rates in below average precipitation years.

Deicer recovery (sweeping and recovery) typically occurs in the late spring and summer months after the resort operations have concluded for the year, or during breaks in weather allowing recovery to occur. Deicer recovery occurred in February, March, May, and July during the 2022 water year. A total of 29,560 pounds of deicer were recovered, the majority of which occurred in May following the end of the ski season.

The City of South Lake Tahoe also sweeps the roadways leading to Heavenly Mountain Resort, collecting debris, cinders, and sand that either it or 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 (specifically for these areas) should be added to the tracked recovery volumes below. However, the City of South Lake Tahoe also applies deicer to the roadways adjacent Heavenly Mountain Resort, and at this time, neither application nor recovery is tracked and accounted for.

Heavenly attempts to use liquid brine as an alternative to deicer and abrasives. Liquid brine is composed of dissolved magnesium and sodium chloride and was first used by Heavenly in 2017 to pre-treat roadways before storms. Unlike deicer, sprayed application of the liquid brine does not bounce off the asphalt roadway surface (like sand particles do) and provides more complete coverage in cracks, helping to melt snow and prevent ice build-up. Liquid brine application did not occur during the 2022 water year. Brine application must be requested by Heavenly staff prior the start of a storm, and brine must be applied to dry asphalt. Due to storm cycles, staff turnover, and lack of historical knowledge regarding the request requirements, brine application did not occur. Daily and monthly deicer logs for the fourth quarter can be found in Appendix D. Table 6-1 provides volumes of deicer application and recovery for water year 2022.

Table 6-1 Summary of Deicer Application and Recovery (Water Year 2022)

Month/Year	Total Amount of Deicer and Abrasives Applied (pounds)	Total Amount of Deicer and Abrasives Recovered (pounds)	Total Amount of Liquid Brine Applied (gallons)
October 2021	2,020	0	0
November 2021	0	0	0
December 2021	42,614	0	0
January 2022	1,414	0	0
February 2022	20,398	480	0
March 2022	8,886	300	0
April 2022	4,241	0	0
May 2022	0	19,500	0
June 2022	0	0	0
July 2022	0	9,280	0
August 2022	0	0	0
September 2022	0	0	0
Totals	**79,573**	**29,560**	**0**

Annual application and recovery amounts for the past nine seasons (since application and recovery have been tracked) are shown in Table 6-2 . In water year 2022, the percentage of recovered material compared to applied material was relatively low at 37%. However, overall, Heavenly has increased its effort and effectiveness of removing abrasives from the watershed. Heavenly continues to actively rebuild and repair sections of the parking lot over time to help eliminate future pavement failures. Maintaining the significant paving upgrades that took place at both the California Main Lodge parking lot and Boulder parking lot during the summers of 2018, 2019, 2020 and fall of 2022 will help to reduce the potential for deteriorated asphalt and associated sediment from entering local watersheds and improve the effectiveness of mechanical sweeping recovery.

Table 6-2 Deicer Application and Recovery 11-Year Totals

Yearly Totals	Total Amount of Deicer and Abrasives Applied (pounds)	Total Amount of Deicer and Abrasives Recovered (pounds)	Percent Recovered
2012	255,570	88,600	35
2013	390,121	105,020	27
2014	124,824	66,060	53
2015	59,076	33,900	57
2016	178,735	124,240	70
2017	230,644	171,620	74
2018	76,543	127,180	166
2019	28,982	120,080	414
2020	115,925	39,040	34
2021	71,292	102,040	300
2022	79,573	29,560	37
Total	**1,611,285**	**1,007,340**	**63**

The 2021/2022 ski season marked the seventh year that Heavenly applied Washoe sand deicer. The previously used deicer consisted of a cinder base with greater porous spaces. This deicer had greater negative impacts to the environment due to the larger porous void space, nutrient attachment, and durability. Improvements to the spreader equipment allowed Heavenly to switch to the Lahontan-preferred abrasive/deicer material (Washoe sand). El Dorado County also uses the same “spec H aggregate” Washoe sand from Cinderlite as traction sand. Heavenly has also maintained a sand to salt ratio of 5:1, limiting the amount of salt applied to the roadways and entering the waterways. Heavenly received a new stockpile of abrasives in November 2021. Samples of this material were delivered to El Dorado County and its in-house laboratory for analysis and comparison. Results from this analysis are included in Appendix H and summarized below. Laboratory analysis was performed in November 2021 on the Washoe sand sample. The results of this analysis are presented below in Table 6-3.

Table 6-3 Abrasives Results for Stockpile Received in November 2021[1]

Parameter	Method of Testing Preferred	Minimum Reporting Limit	Results
Sand equivalent	CTM 217	80 minutes	94
Durability	CTM 229	55 minutes	75
Moisture content	CTM 226	< 5%	2.6%
Gradation	CTM 202	NA	Pass
Turbidity[2]	CalTrans 6	150 NTU	56 NTU

Notes: NTU – nephelometric turbidity unit

[1] Results provided by El Dorado County Public Works Department
[2] Turbidity testing was performed using El Dorado County-developed turbidity methodology

The Monitoring and Reporting Program No. 2015-0021 lists the parameters and method for testing required for abrasive usage. The testing methodology provided in Table 3-2 denotes Lahontan's preferred testing methods. County testing methods were not provided at this time; however, future analysis will request this information. Heavenly and El Dorado County's joint testing effort provides a good faith effort that the aggregate usage "meets required specifications for both environmental protection as well as public safety requirements/standards". Future laboratory analysis will be conducted again when either the abrasive sample is derived from a new source, a new vendor, or at a minimum annually upon delivery.

7 USFS Roads Monitoring

The latest Monitoring and Reporting Program requires USFS roads within the boundary of Heavenly Mountain Resort.[9] In March 2015, Heavenly and the LTBMU entered into a roads maintenance and reporting agreement to coordinate future maintenance and monitoring of the on-mountain roadway network.[10] This agreement lays out the framework for roadway maintenance, new roadway construction, annual meetings, and annual reporting activities.

The Heavenly Roads Maintenance Report for 2022 was submitted to the LTBMU on October 10, 2022. The 2022 roads maintenance summary table and map are included in this report as Appendix E. During the 2022 construction season, 14.06 miles of the on-mountain roadway network were improved and/or maintained. Of this total, 14.03 miles of roads were maintained, and 0.3 miles of roads were improved. No roads were decommissioned during the 2022 water year.

USFS Region 5 has phased out the Regional BMP Evaluation Program for forest roads. Previously, the Regional BMP Evaluation Program prescribed roadway maintenance and monitoring protocols (USFS 1992). In the future, USFS will require the new National US Forest Service BMP Standards and Monitoring Program that will address roadways, ski runs, and facilities. The program and protocol are still in draft form; however, the agency has actively been using the protocols over the past few years. A final version of the technical guide is not currently available to the public. The new BMP standards and monitoring programmatically assess BMP implementation and effectiveness for roadways and other land management practices (facilities and ski runs for example). All management practices associated with Heavenly Mountain Resort will be included in the sample pool for random selection and annual monitoring, which the USFS staff will conduct and report.

Because of the low number of sites selected and random monitoring associated with the National BMP monitoring targets (approximately six evaluations per National Forest per year), Heavenly and its consultants will continue to identify and address erosion and BMP effectiveness on resort roadways, ski runs, and facilities annually.

[9] California Regional Water Quality Control Board-Lahontan Region. 2015b. Monitoring and Reporting Program for Heavenly Mountain Resort. Board Order 2015-0021. WDID No. 6A090033000 (page 9. Section D).

[10] US Forest Service, Lake Tahoe Basin Management Unit. Forest Road Maintenance and Reporting Agreement between the USDA USFS LTBMU and Heavenly Mountain Resort. March 23, 2015.

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8 Facilities Watershed Awareness Training

As required by the Monitoring and Reporting Program, Appendix F includes the attendee list and a copy of the Facilities Watershed Awareness Training presentation, which was completed on May 18, 2022. This training is typically referred to as the “BMP Breakfast Training” and had 100 attendees. The training covers the following topics: recent on-mountain projects, resort maintenance operations, identification of noxious weeds and sensitive species (*Draba*), lessons learned from past projects, information regarding the conditions of summer road usage (speed and dust), and information regarding new BMP technologies and correct BMP installation and implementation.

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9 On-Mountain Monitoring

Additional on-mountain monitoring documentation can be found in Appendix G. The inspection log table and associated project photographs show maintenance and monitoring inspections conducted during the fourth quarter of water year 2022 (July through September) and as serves as a starting point for the development of a draft of annual work list submitted with the Mitigation and Monitoring Report (May 2023). Because of snow cover and limited on-mountain access, project photo monitoring and documentation is typically limited to once per water year (typically in the fourth quarter). On-mountain erosion issues were addressed by the summer maintenance crews. On-mountain road and drainage repairs are included in the Road Maintenance Report in Appendix E. Restoration projects along Hand Grenade and Ridge Bowl were monitored, and revegetation has progressed. Rip-rap pits along Maggie's were cleaned out and maintained following storm events during the summer. Sediment basins were regularly maintained throughout the summer and were observed to have adequate capacity for the winter season. Rock-lined ditches at Groove chair and above Stagecoach were observed to be in good condition with adequate sediment holding capacity. No water bar failures were observed on the California or Nevada sides of the mountain. BMPs were installed around all construction project areas and stockpiles and were regularly inspected over the course of active construction. Additionally, all on-mountain culverts were inspected and were noted to be adequate at this time. As stated earlier in the report, annual storm vault inspections were performed, and filter replacement occurred in September 2022 (as discussed in Section 2.7 and Section 4).

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APPENDIX A
RAW WATER QUALITY CONSTITUENTS, WATER YEAR 2022

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Appendix A
Raw Water Quality Constituents, Water Year 2022

Table B-1:			Heavenly Mountain Resort water year 2021-2022 water quality monitoring data from station 43HVC-1A, Heavenly Valley Creek at Sky Meadows. This station is located above the snowmaking pond at an elevation of 8,525 feet.										
Date	**Notes**	**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)**	**Site Water Temperature (Deg C)**	**Site Ambient 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	N/A
First Quarter WY 2021-2022													
10/19/21		N/A	Site was inaccesable due to early season storm making roadways impassable, yet not enough snow to ski/hike/snowmobile.										0.4
11/15/21	[3]	15:00	0.150	-	**-**	-	-	**-**	**-**	**0.94**	4.3	6.7	0.0
11/30/21		13:25	0.060	1.54	2.0	0.007	0.064	0.071	0.012	**0.70**	5.2	19.6	0.0
12/15/21	[4]	15:20	N/A	2.00	3.0	0.025	0.056	0.081	**0.018**	**0.62**	-0.3	-4.8	1.5
Second Quarter WY 2021-2022													
1/11/22		14:30	0.060	2.17	2.5	0.027	0.060	0.087	0.011	**0.90**	1.7	1.2	0.0
2/22/22		14:18	0.069	3.91	5.0	0.027	0.124	0.151	**0.027**	**0.60**	0.4	-9.1	0.1
3/14/22		13:25	0.034	2.27	2.0	0.024	0.080	0.104	**0.016**	**0.60**	2.4	5.1	0.0
Third Quarter WY 2021-2022													
4/5/22		13:30	0.259	4.01	5.0	0.083	0.243	**0.326**	**0.032**	**0.49**	4.7	11.0	0.0
4/19/22		13:35	0.291	2.22	2.5	0.046	0.112	0.158	**0.020**	**0.44**	1.7	0.1	0.0
5/3/22	[5]	13:30	0.465	3.27	4.5	0.058	0.151	**0.209**	**0.023**	**0.41**	5.8	10.7	0.0
5/17/22		13:40	0.844	3.20	5.0	0.055	0.178	**0.233**	**0.029**	**0.50**	7.0	11.7	0.0
5/24/22		13:00	1.113	2.68	7.0	0.034	0.180	**0.214**	**0.036**	**0.41**	8.3	16.7	0.0
5/31/22		14:30	0.117	3.53	6.0	0.039	0.142	0.181	**0.034**	**0.50**	8.0	11.8	0.0
6/14/22		13:00	1.663	1.23	1.5	0.043	0.107	0.150	**0.023**	**0.50**	9.3	17.7	0.0
6/28/22	[5]	13:30	0.891	2.02	5.5	0.029	0.050	0.079	**0.020**	**0.40**	11.6	21.6	0.0
Fourth Quarter WY 2021-2022													
7/19/22		13:25	0.480	2.29	6.0	0.027	0.098	0.125	**0.026**	**0.27**	11.7	26.7	0.0
8/24/22		12:55	0.079	7.45	3.5	0.037	0.068	0.105	**0.016**	**0.40**	10.4	28.2	0.0
9/21/22		N/A	Site was inaccessible due to rain, which closed access to the mountain.										0.1
Annual Summary		**Minimum**	0.034	1.23	1.5	0.007	0.050	0.071	0.011	**0.27**	-0.28	-9.10	0.0
		Maximum	1.663	7.45	7.0	0.083	0.243	**0.326**	**0.036**	**0.94**	11.7	28.2	1.5
		Average	0.509	2.89	4.1	0.035	0.108	0.143	**0.023**	**0.49**	6.27	12.0	0.12
		90th Percentile			6.4								

[1] Standards are annual averages for the receiving waters of Trout Creek.

[2] 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.

[3] November water quality samples collected on 11/15/21 were lost in shipping. Only flow and chloride values are reported and the sites were resampled on 11/30/21.

[4] Ice and slush build-up within the flume artifically inflated stage reading values, thus, readings are not reported.

[5] For Chloride, batch MS and/or MSD were outside acceptance limits. Batch LCS was acceptable.

Table B-2:			Heavenly Mountain Resort water year 2021-2022 water quality monitoring data from station 43HVC-2, Heavenly Valley Creek below Patsy's Chair. This station is located just beyond ski area development within this watershed at an elevation of 8,000 feet.										
Date	**Notes**	**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)**	**Site Water Temperature (Deg C)**	**Site Ambient 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	N/A
First Quarter WY 2021-2022													
10/19/21		13:00	0.027	1.22	3.0	0.039	0.215	**0.254**	**0.037**	**1.59**	2.5	3.5	0.4
11/15/21	[3]	15:45	0.060	-	-	-	-	-	-	**1.66**	5.2	6.2	0.0
11/30/21		13:05	0.042	2.01	2.0	0.008	0.089	0.097	**0.024**	**0.50**	4.9	8.1	0.0
12/15/21	[4]	14:25	N/A	1.72	3.5	0.013	0.059	0.072	**0.025**	**1.64**	-	-	1.5
Second Quarter WY 2021-2022													
1/11/22		15:20	0.027	0.5	1.0	0.016	0.043	0.059	0.012	**1.70**	2.4	0.7	0.0
2/22/22		14:50	No samples collected or flow measured due to extremely low flow conditions as the site.									-8.7	0.1
3/14/22		13:45	0.027	0.9	1.0	0.017	0.054	0.071	**0.019**	**1.80**	2.5	6.0	0.0
Third Quarter WY 2021-2022													
4/5/22		14:00	0.358	5.62	7.0	0.065	0.178	**0.243**	**0.044**	**1.15**	3.2	11.0	0.0
4/19/22		14:00	0.429	0.76	1.5	0.058	0.093	0.151	**0.019**	**0.851**	2.4	0.0	0.0
5/3/22	[5]	13:05	0.712	2.83	3.0	0.071	0.126	**0.197**	**0.023**	**0.794**	5.9	11.9	0.0
5/17/22		13:15	1.091	3.13	4.0	0.035	0.160	**0.195**	**0.027**	**0.700**	8.8	14.4	0.0
5/24/22		12:45	0.324	0.71	1.5	0.087	0.079	0.166	0.015	**1.180**	7.4	17.0	0.0
5/31/22		14:15	1.355	4.41	5.5	0.022	0.147	0.169	**0.032**	**0.600**	9.5	11.4	0.0
6/14/22		12:50	0.393	1.13	1.0	0.030	0.085	0.115	0.012	**0.791**	9.3	17.7	0.0
6/28/22	[5]	13:15	0.847	1.12	4.5	0.017	0.088	0.105	**0.017**	**0.546**	12.6	31.9	0.0
Fourth Quarter WY 2021-2022													
7/19/22		13:10	0.393	1.77	5.5	0.022	0.095	0.117	**0.023**	**0.429**	14.2	21.7	0.0
8/24/22		12:35	0.174	2.79	2.0	0.043	0.073	0.116	0.015	**0.80**	11.9	23.3	0.0
9/21/22		N/A	Site was inaccessible due to rain, which closed access to the mountain.										0.1
Annual Summary		**Minimum**	0.027	0.46	1.0	0.008	0.043	0.059	0.012	**0.43**	2.4	-8.7	0.0
		Maximum	1.355	5.62	7.0	0.087	0.215	**0.254**	**0.044**	**1.80**	14.2	31.9	1.5
		Average	0.417	2.04	3.1	0.036	0.106	0.142	**0.023**	**1.05**	6.8	11.0	0.1
		90th Percentile			6.1								

[1] Standards are annual averages for the receiving waters of Trout Creek.

[2] 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.

[3] November water quality samples collected on 11/15/21 were lost in shipping. Only flow and chloride values are reported and the sites were resampled on 11/30/21.

[4] Ice and slush build-up within the flume artifically inflated stage reading values, thus, readings are not reported.

[5] For Chloride, batch MS and/or MSD were outside acceptance limits. Batch LCS was acceptable.

Table B-3:			Heavenly Mountain Resort water year 2021-2022 water quality monitoring data from station 43HVC-3, Heavenly Valley Creek at the Property Line. This station is located just above the Forest Service property line and subdivision development at an elevation of 6,620 feet.										
Date	**Notes**	**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)**	**Site Water Temperature (Deg C)**	**Site Ambient 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	N/A
First Quarter WY 2021-2022													
10/19/21		11:45	No samples collected or flow measured due to extremely low flow conditions as the site.										0.4
11/15/21		12:50	No samples collected or flow measured due to extremely low flow conditions as the site.										0.0
11/30/21		11:45	No samples collected or flow measured due to extremely low flow conditions as the site.										0.0
12/15/21		13:00	No samples collected or flow measured due to extremely low flow conditions as the site.										1.5
Second Quarter WY 2021-2022													
1/11/22		13:00	No samples collected or flow measured due to extremely low flow conditions as the site.										0.0
2/22/22		12:40	No samples collected or flow measured due to extremely low flow conditions as the site.										0.1
3/14/22		11:50	No samples collected or flow measured due to extremely low flow conditions as the site.										0.0
Third Quarter WY 2021-2022													
4/5/22	[3]	11:50	-	2.30	3.0	0.004	0.139	0.143	**0.036**	**0.85**	6.9	13.4	0.0
4/19/22		11:50	0.718	0.85	1.5	0.002	0.105	0.107	**0.021**	**0.96**	2.7	1.0	0.0
5/3/22	[4]	11:45	0.847	0.72	1.0	0.002	0.062	0.064	**0.016**	**0.82**	4.7	13.3	0.0
5/17/22		11:45	1.282	0.31	0.5	0.001	0.072	0.073	**0.017**	**0.80**	6.5	15.3	0.0
5/24/22		11:30	0.395	0.32	1.5	0.001	0.071	0.072	0.015	**0.85**	7.5	20.3	0.0
5/31/22		12:45	0.470	0.20	0.5	0.002	0.055	0.057	0.014	**0.90**	8.2	13.8	0.0
6/14/22		11:25	0.571	2.58	0.5	0.001	0.011	0.012	0.011	**0.75**	9.4	15.2	0.0
6/28/22	[4]	11:45	1.235	0.39	2.0	0.001	0.040	0.041	**0.016**	**0.61**	11.0	25.9	0.0
Fourth Quarter WY 2021-2022													
7/19/22		11:40	0.712	0.36	4.5	0.002	0.053	0.055	**0.022**	**0.50**	13.1	25.8	0.0
8/24/22		11:05	0.081	2.34	2.0	0.002	0.047	0.049	0.015	**0.80**	12.0	23.9	0.0
9/21/22		12:10	0.290	0.53	20.0	0.001	0.091	0.092	**0.022**	**0.90**	9.0	7.2	0.1
Annual Summary		**Minimum**	0.081	0.20	0.50	0.001	0.011	0.012	0.011	**0.50**	2.7	1.0	0.0
		Maximum	1.282	2.58	20.0	0.004	0.139	0.143	**0.036**	**0.96**	13.1	25.9	1.5
		Average	0.660	0.99	3.4	0.002	0.068	0.070	**0.019**	**0.80**	8.3	15.9	0.117
		90th Percentile			16.9								

[1] Standards are annual averages for the receiving waters of Trout Creek.

[2] 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.

[3] Collected water quality samples approximately 3' downstream of cross-section, but could not measure flow due to extremely low flow at cross-section.

[4] For Chloride, batch MS and/or MSD were outside acceptance limits. Batch LCS was acceptable.

Bijou Park Creek - Below California Parking Lot
(43BPC-4)

Table B-4:			Heavenly Mountain Resort water year 2021-2022 water quality monitoring data from station 43BPC-4, Bijou Park Creek below California Parking Lot. This station is located 1/4 miles below the culvert outlet draining the parking lot off of Wildwood Avenue at an elevation of 6,530 feet.										
Date	**Notes**	**Time**	**Discharge (cfs)**	**Turbidity (NTU) [2]**	**Suspended Sediment [3] (mg/L)**	**Total Nitrite/ Nitrate (mg/L)**	**Total Kjeldahl N (mg/L)**	**Total Nitrogen (mg/L)**	**Total Phosphorus (mg/L)**	**Chloride (mg/L)**	**Site Water Temperature (Deg C)**	**Site Ambient Temperature (Deg C)**	**Precipitation (in)**
Lahontan Standards	[1]		N/A	**20**	**60**	N/A	N/A	**0.15**	**0.008**	**3.0**	N/A	N/A	N/A
First Quarter WY 2021-2022													
10/19/21		12:20	0.029	11.9	4.5	0.163	0.294	**0.457**	**0.071**	**32.5**	10.1	5.4	0.4
11/15/21	[4]	13:35	0.027	-	-	-	-	-	-	**36.8**	11.3	12.4	0.0
11/30/21		12:15	0.027	10.4	5.5	0.133	0.161	**0.294**	**0.068**	**39.0**	9.6	10.3	0.0
12/15/21		16:10	0.116	0.4	21.0	0.167	0.359	**0.526**	**0.156**	**64.4**	5.8	-2.1	1.5
Second Quarter WY 2021-2022													
1/11/22		16:02	0.086	**302**	**169**	0.169	1.623	**1.792**	**1.07**	**256**	4.7	1.3	0.0
2/22/22		15:35	0.060	**67.9**	34.0	0.227	0.772	**0.999**	**0.203**	**191**	3.8	-7.0	0.1
3/14/22		12:20	0.103	**50.8**	32.0	0.193	0.453	**0.646**	**0.165**	**76.5**	6.3	6.6	0.0
Third Quarter WY 2021-2022													
4/5/22		12:20	0.244	12.5	6.0	0.488	0.231	**0.719**	**0.560**	**55.0**	8.2	11.5	0.0
4/19/22		12:35	0.458	**92.3**	**69.0**	0.357	0.811	**1.168**	**0.314**	**83.6**	5.2	3.3	0.0
5/3/22	[5]	12:30	0.175	17.7	7.5	0.662	0.252	**0.914**	**0.083**	**49.5**	9.3	11.9	0.0
5/17/22		12:30	0.107	14.2	4.5	0.600	0.253	**0.853**	**0.059**	**64.5**	11.5	16.2	0.0
5/24/22		12:00	0.102	15.3	7.0	0.580	0.297	**0.877**	**0.067**	**55.3**	12.0	21.9	0.0
5/31/22	[6]	13:20	0.102	12.4	4.0	0.592	0.254	**0.846**	**0.056**	**5.60**	12.4	15.7	0.0
6/14/22		12:10	0.072	13.9	4.5	0.551	0.216	**0.767**	**0.060**	**45.7**	12.7	17.7	0.0
6/28/22	[5]	12:25	0.069	15.6	9.5	0.445	0.200	**0.645**	**0.108**	**75.4**	14.0	27.4	0.0
Fourth Quarter WY 2021-2022													
7/19/22		12:25	0.048	13.8	9.5	0.338	0.163	**0.501**	**0.085**	**33.4**	15.6	22.9	0.0
8/24/22		11:55	0.021	**23.8**	12.0	0.173	0.187	**0.360**	**0.115**	**33.1**	15.9	21.2	0.0
9/21/22		12:50	0.116	**38.1**	31.5	0.182	0.692	**0.874**	**0.182**	**14.6**	12.0	8.9	0.1
Annual Summary		**Minimum**	0.021	0.4	4.0	0.133	0.161	**0.294**	**0.056**	**5.6**	3.8	-7.0	0.0
		Maximum	0.458	**302.0**	**169.0**	0.662	1.623	**1.792**	**1.070**	**256.0**	15.9	27.4	1.5
		Average	0.109	**41.9**	25.4	0.354	0.425	**0.779**	**0.201**	**67.3**	10.0	11.4	0.1
		90th Percentile			**89.0**								

[1] Standards are for receiving water objectives from the Lahontan Basin Plan expressed as an annual average.

[2] Turbidiy standard value, for discharge from California Base Area, is calculated as the daily average of all effluent samples collected from a single discharge point.

[3] 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.

[4] November water quality samples collected on 11/15/21 were lost in shipping. Only flow and chloride values are reported and the sites were resampled on 11/30/21.

[5] For Chloride, batch MS and/or MSD were outside acceptance limits. Batch LCS was acceptable.

[6] The chloride sample was diluted due to matrix interference, resulting in elevated reporting limits.

Table B-5:			Heavenly Mountain Resort water year 2021-2022 water quality monitoring data from station 43HDVC-5, Hidden Valley Creek baseline station. This station is located just above the confluence with Trout Creek, at an elevation of 6,680 feet.										
Date	**Notes**	**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)**	**Site Water Temperature (Deg C)**	**Site Ambient 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	N/A
First Quarter WY 2021-2022													
10/19/21		10:30	0.158	0.46	1.5	0.002	0.086	0.088	**0.059**	**0.480**	2.8	0.9	0.4
11/15/21	[3]	10:55	0.393	-	**-**	-	-	**-**	**-**	**0.953**	6.0	12.1	0.0
11/30/21		10:30	0.455	2.25	3.0	0.067	0.159	**0.226**	**0.105**	**0.700**	4.0	4.4	0.0
12/15/21		10:30	0.553	8.28	14.0	0.073	0.260	**0.333**	**0.162**	**1.640**	0.5	-5.2	1.5
Second Quarter WY 2021-2022													
1/11/22		10:30	0.434	0.96	3.0	0.076	0.143	**0.219**	**0.080**	**0.900**	2.8	-1.1	0.0
2/22/22		10:40	0.709	2.66	5.0	0.093	0.156	**0.249**	**0.096**	**0.800**	-0.9	-6.5	0.1
3/14/22		10:30	0.763	1.78	2.5	0.103	0.147	**0.250**	**0.091**	**1.000**	1.8	2.5	0.0
Third Quarter WY 2021-2022													
4/5/22		10:30	1.748	2.83	4.5	0.113	0.166	**0.279**	**0.760**	**0.694**	4.2	8.8	0.0
4/19/22		10:30	2.301	7.39	16.0	0.060	0.347	**0.407**	**0.117**	**0.516**	1.6	1.1	0.0
5/3/22	[4]	10:30	2.400	3.98	9.5	0.049	0.181	**0.230**	**0.080**	**0.469**	3.5	8.7	0.0
5/17/22		10:30	3.284	11.50	25.5	0.029	0.364	**0.393**	**0.131**	**0.500**	5.9	13.8	0.0
5/24/22		10:30	5.456	13.70	51.0	0.024	0.749	**0.773**	**0.217**	**0.310**	7.0	17.1	0.0
5/31/22		11:15	5.716	7.46	19.5	0.020	0.329	**0.349**	**0.118**	**0.300**	6.5	12.1	0.0
6/14/22		10:30	3.495	2.25	2.5	0.019	0.106	0.125	**0.041**	**0.304**	6.9	12.7	0.0
6/28/22	[4]	10:30	1.892	1.26	4.5	0.013	0.093	0.106	**0.056**	**0.355**	11.1	24.7	0.0
Fourth Quarter WY 2021-2022													
7/19/22		10:30	1.410	1.19	9.5	0.002	0.129	0.131	**0.074**	**0.351**	14.7	23.0	0.0
8/24/22		10:30	0.743	3.33	6.0	0.021	0.130	0.151	**0.063**	**0.600**	12.6	23.4	0.0
9/21/22		10:30	1.226	3.26	7.0	0.002	0.242	**0.244**	**0.082**	**0.8**	8.5	6.7	0.1
Annual Summary		**Minimum**	0.158	0.46	1.50	0.002	0.086	0.088	**0.041**	**0.30**	-0.9	-6.5	0.0
		Maximum	5.716	13.70	51.00	0.113	0.749	**0.773**	**0.760**	**1.64**	14.7	24.7	1.5
		Average	1.841	4.38	10.85	0.045	0.223	**0.268**	**0.137**	**0.65**	5.5	8.8	0.1
		90th Percentile			30.60								

[1] Standards are annual averages for the receiving waters of Trout Creek.

[2] 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.

[3] November water quality samples collected on 11/15/21 were lost in shipping. Only flow and chloride values are reported and the sites were resampled on 11/30/21.

[4] For Chloride, batch MS and/or MSD were outside acceptance limits. Batch LCS was acceptable.

Table B-6:			Heavenly Mountain Resort water year 2021-2022 water quality monitoring data from station 43HVE-1, Edgewood Creek above Boulder Parking Lot. This station is located in Edgewood Bowl above the learn-to-ski center, at an elevation of 7,280 feet.												
Date	**Notes**	**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) [3]**	**Soluble Reactive P (mg/L)**	**Dissolved P (mg/L)**	**Site Water Temperature (Deg C)**	**Site Ambient Temperature (Deg C)**	**Precipitation (in)**
NDEP Standards	[1]		N/A	N/A	**10**	**25**	N/A	N/A	**0.6 [2]**	**0.1 (SV) 0.05 (AA)**	N/A	N/A	N/A	N/A	N/A
First Quarter WY 2021-2022															
10/19/21		14:25	No samples collected or flow measured due to extremely low flow conditions as the site.												0.4
11/15/21	[4]	17:00	No samples collected or flow measured due to extremely low flow conditions as the site.												0.0
11/30/21		14:50	No samples collected or flow measured due to extremely low flow conditions as the site.												0.0
12/15/21		17:45	No samples collected or flow measured due to extremely low flow conditions as the site.												1.5
Second Quarter WY 2021-2022															
1/11/22		17:30	No samples collected or flow measured due to extremely low flow conditions as the site.												0.0
2/22/22		17:10	No samples collected or flow measured due to extremely low flow conditions as the site.												0.1
3/14/22	[5]	15:40	-	63.0	1.24	2.0	0.002	0.179	0.181	0.030	0.008	0.019	2.7	6.2	0.0
Third Quarter WY 2021-2022															
4/5/22		15:15	0.239	55.8	0.77	1.0	0.003	0.081	0.084	0.023	0.010	0.021	12.2	12.7	0.0
4/19/22		15:20	0.162	54.9	0.59	1.0	0.003	0.132	0.135	0.020	0.009	0.018	8.0	5.4	0.0
5/3/22		14:50	0.148	59.5	1.10	1.0	0.003	0.105	0.108	0.023	0.010	0.019	14.9	16.2	0.0
5/17/22		15:35	0.043	64.4	2.51	4.0	0.001	0.161	0.162	0.048	0.008	0.021	18.2	21.6	0.0
5/24/22		14:35	0.101	67.0	2.47	7.0	0.003	0.218	0.221	0.053	0.01	0.019	20.3	25.1	0.0
5/31/22		10:45	0.052	69.6	0.51	0.5	0.003	0.124	0.127	0.019	0.002	0.016	9.2	7.9	0.0
6/14/22		14:30	0.023	79.5	1.80	3.0	0.003	0.213	0.216	0.036	0.006	0.010	20.1	20.4	0.0
6/28/22		14:50	No samples collected or flow measured due to extremely low flow conditions as the site.												
Fourth Quarter WY 2021-2022															0.0
7/19/22		15:00	No samples collected or flow measured due to extremely low flow conditions as the site.												0.0
8/24/22		14:20	No samples collected or flow measured due to extremely low flow conditions as the site.												0.1
9/21/22		13:55	No samples collected or flow measured due to extremely low flow conditions as the site.												
Annual Summary		**Minimum**	0.023	54.9	0.51	0.5	0.001	0.081	0.084	0.019	0.002	0.010	2.7	5.4	0.0
		Maximum	0.239	79.5	2.51	7.0	0.003	0.218	0.221	0.053	0.010	0.021	20.3	25.1	1.5
		Average	0.110	64.2	1.37	2.4	0.003	0.152	0.154	0.032	0.008	0.018	13.2	14.4	0.1

[1] NDEP Standards are from the Nevada Administrative Code Chapter 445A.1664 Truckee Region: Edgewood Creek at Palisades Dr. All listed numbers are standards for single values no greater than a given parameter unless otherwise noted.

[2] The Total Nitrogen Standard shown is for both single values as well as annual average values no greater than 0.6 mg/L listed.

[3] There are two standards for Total Phosphorus provided by NDEP Code 445A.1664. The single value of 0.1 mg/L for all samples collected, as well the annual average standard value of 0.05 mg/L.

[4] November water quality samples collected on 11/15/21 were lost in shipping. Only flow and chloride values are reported and the sites were resampled on 11/30/21.

[5] Collected water quality samples, but could not measure flow due to partial snow cover across channel

Table B-7:			Heavenly Mountain Resort water year 2021-2022 water quality monitoring data from station 43HVE-2, Edgewood Creek below Boulder Parking Lot. This station is located 1/4 mile below the parking lot, underneath the power lines at an elevation of 7,120 feet.												
Date	**Notes**	**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) [3]**	**Soluble Reactive P (mg/L)**	**Dissolved P (mg/L)**	**Site Water Temperature (Deg C)**	**Site Ambient Temperature (Deg C)**	**Precipitation (in)**
NDEP Standards	[1]		N/A	N/A	**10**	**25**	N/A	N/A	**0.6 [2]**	**0.1(SV) 0.05 (AA)**	N/A	N/A	N/A	N/A	N/A
First Quarter WY 2021-2022															
10/19/21		14:00	0.020	151.6	2.22	3.0	0.005	0.171	0.176	0.026	0.001	0.015	3.9	2.8	0.4
11/15/21	[4]	16:35	0.056	-	-	-	-	-	-	-	-	-	5.4	4.9	0.0
11/30/21		14:25	0.034	145.1	1.99	2.5	0.052	0.098	0.150	0.018	0.006	0.015	4.0	4.7	0.0
12/15/21	[5]	17:15	-	135.9	4.30	4.0	0.058	0.177	0.235	0.030	0.006	0.014	-	-	1.5
Second Quarter WY 2021-2022															
1/11/22	[6]	17:00	-	160.5	7.72	5.0	0.095	0.281	0.376	0.027	0.004	0.011	2.0	0.5	0.0
2/22/22	[6]	16:40	-	148.6	2.90	1.5	0.078	0.125	0.203	0.022	0.006	0.014	-	-	0.1
3/14/22		15:10	0.150	164.1	**22.7**	18.0	0.069	0.275	0.344	0.083	0.007	0.021	3.1	5.6	0.0
Third Quarter WY 2021-2022									0.000						
4/5/22		14:55	0.374	84.8	**13.5**	10.0	0.04	0.219	0.259	0.068	0.008	0.025	7.1	9.5	0.0
4/19/22		14:55	0.412	197.7	**15.1**	12.0	0.044	0.232	0.276	0.059	0.005	0.015	3.5	1.5	0.0
5/3/22		14:30	0.161	107.5	9.7	13.5	0.053	0.259	0.312	0.052	0.007	0.014	8.6	11.3	0.0
5/17/22		15:00	0.079	121.6	9.53	15.5	0.058	0.29	0.348	0.057	0.006	0.019	11.3	17.4	0.0
5/24/22		14:00	0.094	103.0	6.5	7.0	0.044	0.185	0.229	0.042	0.009	0.016	11.8	20.6	0.0
5/31/22		10:30	0.056	136.5	2.17	1.0	0.061	0.126	0.187	0.020	0.003	0.018	8.3	6.3	0.0
6/14/22		14:05	0.066	143.4	7.71	9.5	0.046	0.223	0.269	0.043	0.005	0.009	10.8	16.1	0.0
6/28/22		14:30	0.028	148.1	2.95	7.0	0.074	0.126	0.200	0.035	0.004	0.015	11.6	23.9	0.0
Fourth Quarter WY 2021-2022															
7/19/22	[7]	14:45	-	144.0	2.17	6.5	0.08	0.268	0.348	0.035	0.002	0.021	12.4	21.3	0.0
8/24/22		14:05	No samples collected or flow measured due to extremely low flow conditions as the site.												0.0
9/21/22		13:40	0.153	112.2	**71.5**	**53.5**	0.08	0.862	**0.942**	**0.273**	0.005	0.016	8.5	8.0	0.1
Annual Summary		**Minimum**	0.020	84.80	1.99	1.00	0.005	0.098	0.150	0.018	0.001	0.009	2.00	0.5	0.0
		Maximum	0.412	197.7	**71.50**	**53.50**	0.095	0.862	**0.942**	**0.273**	0.009	0.025	12.4	23.9	1.5
		Average	0.129	137.8	**11.41**	10.59	0.059	0.245	0.303	**0.056**	0.005	0.016	7.49	10.3	0.1

[1] NDEP Standards are from the Nevada Administrative Code Chapter 445A.1664 Truckee Region: Edgewood Creek at Palisades Dr. All listed numbers are standards for single values no greater than a given parameter unless otherwise noted.

[2] The Total Nitrogen Standard shown is for both single values as well as annual average values no greater than 0.6 mg/L listed.

[3] There are two standards for Total Phosphorus provided by NDEP Code 445A.1664. The single value of 0.1 mg/L for all samples collected, as well the annual average standard value of 0.05 mg/L.

[4] November water quality samples collected on 11/15/21 were lost in shipping. Only flow and chloride values are reported and the sites were resampled on 11/30/21.

[5] Flow was not sampled due to poor visibility (darkness) during sampling.

[6] Flow was not sampled due to tree fall over cross-section.

[7] Flow was too low to measure discharge.

EXCELCHEM
Laboratories, Inc.

A Silver State Analytical Company

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449

ELAP Certificate No. : 2119

08 August 2022

Michelle Hochrein

Cardno

5496 Reno Corporate Drive

Reno, NV 89511

RE: Heavenly

Work order number:2207154

Enclosed are the results of analyses for samples received by the laboratory on 07/20/22 14:50. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Joshua Cox, Lab Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	08/08/22 11:15

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HDVC-5	2207154-01	Water	07/19/22 10:30	07/20/22 14:50
HVC-3	2207154-02	Water	07/19/22 11:40	07/20/22 14:50
BPC-4	2207154-03	Water	07/19/22 12:25	07/20/22 14:50
HVC-2	2207154-04	Water	07/19/22 13:10	07/20/22 14:50
HVC-1A	2207154-05	Water	07/19/22 13:25	07/20/22 14:50

Excelchem Laboratories, Inc.

Laboratory Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	08/08/22 11:15

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes

Laboratory Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	08/08/22 11:15

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes

Excelchem Laboratories, Inc.

Laboratory Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	08/08/22 11:15

Notes and Definitions

ND Analyte not detected at reporting limit.

NR Not reported

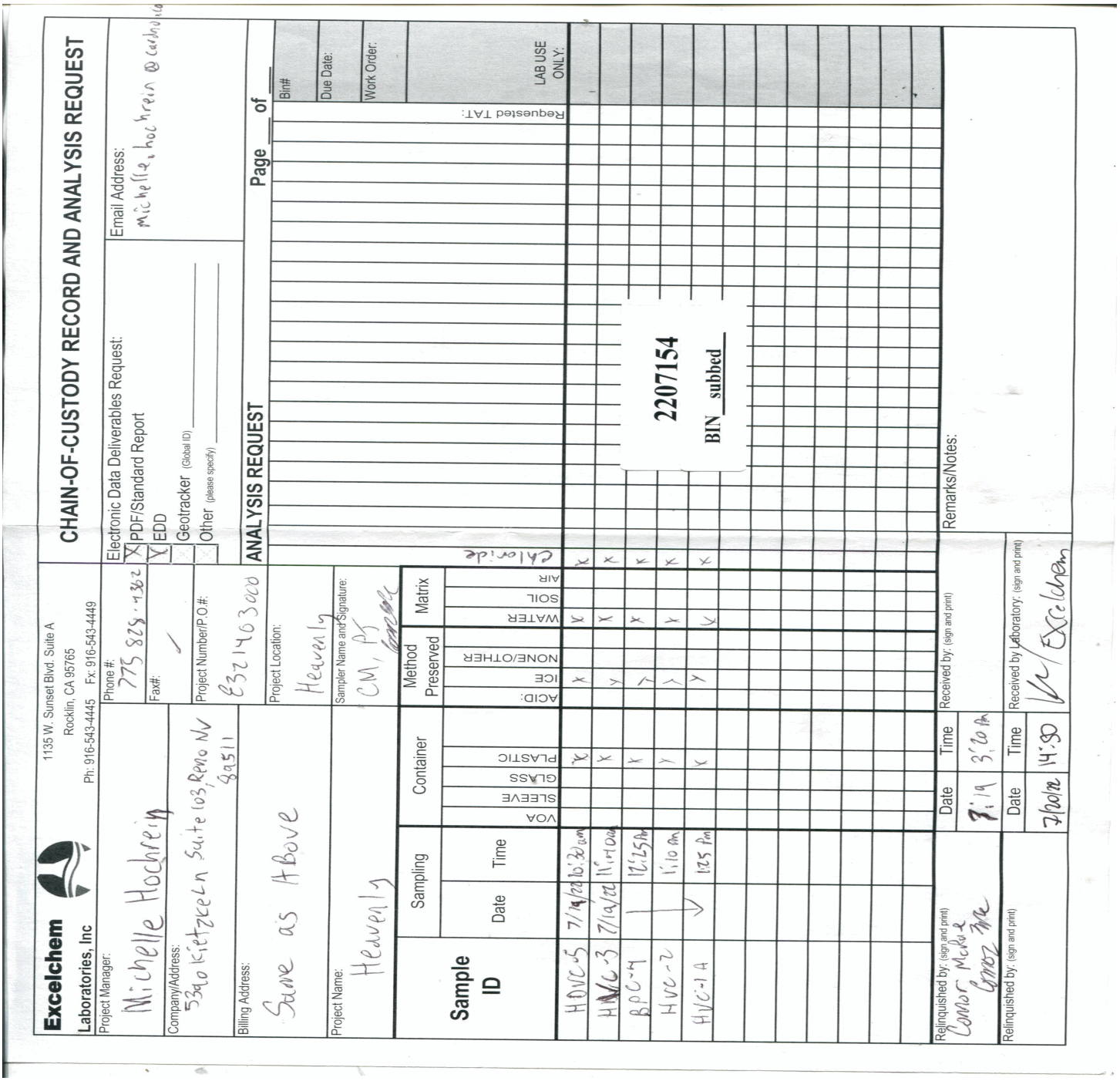
Excelchem Laboratories, Inc.

Laboratory Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	08/08/22 11:15



CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Excelchem Laboratories, Inc
1135 W. Sunset Blvd. Suite A
Rocklin, CA 95765
Ph: 916-543-4445 Fx: 916-543-4449

Project Manager: Michelle Hochrein
Company/Address: 5390 Kietzke Ln, Suite 103, Reno NV 89511
Billing Address: Same as Above
Project Name: Heavenly
Phone #: 775 823-1382
Fax#:
Project Number/P.O.#: E321403000
Project Location: Heavenly
Sampler Name and Signature: CM, PJ

Electronic Data Deliverables Request:
X PDF/Standard Report
X EDD
Geotracker (Global ID)
Other (please specify)

Email Address: Michelle.hochrein@cardno.com

ANALYSIS REQUEST

Page ___ of ___

Requested TAT:

Bin#
Due Date:
Work Order:
LAB USE ONLY:

Chloride

Sample ID	Sampling Date	Sampling Time	Container VOA	SLEEVE	GLASS	PLASTIC	Method Preserved ACID:	ICE	NONE/OTHER	Matrix WATER	SOIL	AIR
HVE-5	7/19/22	10:30am				X	X			X		
HVE-3	7/19/22	11:40am				X	X			X		
BDC-4		12:25PM				X	X			X		
HVE-2		1:10 pm				X	X			X		
HVE-1A		1:25 pm				X	X			X		

2207154
BIN subbed

Remarks/Notes:

Relinquished by: (sign and print) Connor Mickel Gomez
Date 7/19 Time 3:20 PM
Received by: (sign and print)

Relinquished by: (sign and print)
Date 7/20/22 Time 14:30
Received by Laboratory: (sign and print) Excelchem

Excelchem Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Laboratory Representative

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	08/08/22 11:15

Sample Integrity

WORK ORDER: 2207154

Date Received: 7/20/22

Company Name: Cardno
New Client: Y (N)

Section 1 – Sample Arrival Information

Sample Transport: ONTRAC UPS USPS Walk-In EXCELCHEM Courier Fed-Ex Other:_____
Transported In: Ice Chest Box Hand
Packing materials: Bubble Wrap Foam Packing Peanuts Paper Other:_____
Has chilling process begun? Y N **Samples Received:** Chilled to Touch / Ambient / On Ice
Temperature of Samples (°C): 18.9 +1.6° CF **Ice Chest Temperature(s) (°C):** 19.4 +1.6° CF

Section 2 – Bottle/Analysis Info.

	Yes	No	N/A	Comments
Did all bottles arrive unbroken and intact?	Y			
Did all bottle labels agree with COC?	Y			
Were correct containers used for the tests requested?	Y			
Were correct preservations used for the tests requested?	Y			
Was a sufficient amount of sample sent for tests indicated?	Y			
Were bubbles present in VOA Vials?: **(Volatile Methods Only)**			N	
Is there head space in the VOA vials? **(Volatile Methods Only)**			N	

Section 3– COC Information

	Yes	No	Comments		Yes	No
COC Received	Y			Analysis Requested	Y	
Date Sampled	Y			Samples arrived within holding time	Y	
Time Sampled	Y			Hold times less than 72 hours		N
Sample ID	Y			Client Name	Y	
Rush Turn Around Time		Y		Client Contact Information	Y	

SHORT HOLD LIST (<72 hours)

pH	Chlorine	Corrosivity	Coliform	Dissolved Oxygen	Odor	Nitrate	Nitrite	Ortho-phosphate
MB As	Asbestos	Settable Solids	Turbidity	Biochemical Oxygen Demand	HPC	Color	Tedlars	Ammonia/TKN (unpreserved)

Section 4 – Comments / Discrepancies

Client notified of discrepancies: Yes / No **Notified by:**
Comments:

Bin Number/ Location:	SW
COC Scanned/Attached by:	SP
Samples labeled by:	SP
Sample labels reviewed by:	SP

Filled out by: Kate Alberdon **Date:** 7/20/22 **Time:** 14:50

Excelchem Laboratories, Inc.

Laboratory Representative

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

August 05, 2022

Kate Albertsen
Excelchem Laboratories, Inc.
1135 W. Sunset Blvd. Suite A
Rocklin, CA 95765

Lab ID:
☒ Las Vegas, NV (NV930, CA3029)
☐ Reno, NV (NV015, CA2526)

Project: 2207154

Workorder No.: 22071129

Dear Kate Albertsen:

Silver State Labs-Las Vegas received 5 sample(s) on 7/22/2022 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted below. Analytical results reported as non-detect (ND) in the result field are below the Practical Quantification Limit (PQL). Analytical results above the PQL are reported as the measured value in the results field.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Michael Mitchell
Laboratory Director
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

Analytical Report

WO#: **22071129**
Date Reported: **8/5/2022**

CLIENT: Excelchem Laboratories, Inc.
Collection Date: 7/19/2022 10:30:00 AM
Project: 2207154
Lab ID: 22071129-01
Matrix: WATER
Client Sample ID HDVC-5

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ANIONS-CWA (CL, F, NO2, NO3, SO4)				**EPA 300.0**		Analyst: **DB**
Chloride	0.351	0.100		mg/L	1	7/22/2022 8:09:00 PM

Qualifiers: (Qual)

DF	Dilution Factor.
MCL	Maximum Contaminant Level.
PQL	Practical Quantitation Limit.
H	Holding times for preparation or analysis exceeded.
ND	Not Detected at the PQL.

Original

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

Analytical Report

WO#: **22071129**
Date Reported: **8/5/2022**

CLIENT: Excelchem Laboratories, Inc.
Collection Date: 7/19/2022 11:40:00 AM
Project: 2207154
Lab ID: 22071129-02
Matrix: WATER
Client Sample ID HVC-3

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ANIONS-CWA (CL, F, NO2, NO3, SO4)				**EPA 300.0**		Analyst: **DB**
Chloride	0.504	0.100		mg/L	1	7/22/2022 8:30:00 PM

Qualifiers: (Qual)

DF	Dilution Factor.
MCL	Maximum Contaminant Level.
PQL	Practical Quantitation Limit.
H	Holding times for preparation or analysis exceeded.
ND	Not Detected at the PQL.

Original

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

Analytical Report

WO#: **22071129**
Date Reported: **8/5/2022**

CLIENT: Excelchem Laboratories, Inc.
Collection Date: 7/19/2022 12:25:00 PM
Project: 2207154
Lab ID: 22071129-03
Matrix: WATER
Client Sample ID BPC-4

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ANIONS-CWA (CL, F, NO2, NO3, SO4)				**EPA 300.0**		Analyst: **DB**
Chloride	33.4	0.200		mg/L	2	7/22/2022 8:51:00 PM

Qualifiers: (Qual)

DF	Dilution Factor.
MCL	Maximum Contaminant Level.
PQL	Practical Quantitation Limit.
H	Holding times for preparation or analysis exceeded.
ND	Not Detected at the PQL.

Original

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

Analytical Report

WO#: **22071129**
Date Reported: **8/5/2022**

CLIENT: Excelchem Laboratories, Inc.
Collection Date: 7/19/2022 1:10:00 PM
Project: 2207154
Lab ID: 22071129-04
Matrix: WATER
Client Sample ID HVC-2

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ANIONS-CWA (CL, F, NO2, NO3, SO4)				**EPA 300.0**		Analyst: **DB**
Chloride	0.429	0.100		mg/L	1	7/22/2022 9:12:00 PM

Qualifiers: (Qual)

DF	Dilution Factor.
MCL	Maximum Contaminant Level.
PQL	Practical Quantitation Limit.
H	Holding times for preparation or analysis exceeded.
ND	Not Detected at the PQL.

Original

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

Analytical Report

WO#: **22071129**
Date Reported: **8/5/2022**

CLIENT: Excelchem Laboratories, Inc.
Collection Date: 7/19/2022 1:25:00 PM
Project: 2207154
Lab ID: 22071129-05
Matrix: WATER
Client Sample ID HVC-1a

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
ANIONS-CWA (CL, F, NO2, NO3, SO4)				**EPA 300.0**		Analyst: **DB**
Chloride	0.265	0.100		mg/L	1	7/22/2022 9:33:00 PM

Qualifiers: (Qual)

DF	Dilution Factor.
MCL	Maximum Contaminant Level.
PQL	Practical Quantitation Limit.
H	Holding times for preparation or analysis exceeded.
ND	Not Detected at the PQL.

Original

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

QC SUMMARY REPORT

WO#: **22071129**

05-Aug-22

Client: Excelchem Laboratories, Inc.

Project: 2207154 **TestCode:** **ANIONS-CWA**

Sample ID: **ICB-220722-1** SampType: **ICB** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **ICB** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730167**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									

Sample ID: **ICV-220722-1** SampType: **ICV** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **ICV** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730169**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.74	0.100	5.000	0	94.7	90	110				

Sample ID: **MB-220722-1** SampType: **MBLK** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **PBW** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730170**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									

Sample ID: **LCS-220722-1** SampType: **LCS** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **LCSW** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730171**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.70	0.100	5.000	0	94.0	90	110				

Qualifiers: H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL.

Original

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

QC SUMMARY REPORT

WO#: **22071129**

05-Aug-22

Client: Excelchem Laboratories, Inc.

Project: 2207154 **TestCode:** **ANIONS-CWA**

Sample ID: **LCS-220722-1** SampType: **LCS** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **LCSW** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730171**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: **22070644-01D DUP** SampType: **DUP** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **BatchQC** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730173**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	12.0	0.100						11.95	0.000837	10	

Sample ID: **22070644-01D MS** SampType: **MSD** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **BatchQC** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730174**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	21.4	0.100	10.00	11.95	94.8	90	110				

Sample ID: **CCV-220722-1** SampType: **CCV** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**
Client ID: **CCV** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730184**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	4.67	0.100	5.000	0	93.3	90	110				

Qualifiers: H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL.

Original

Silver State Labs-Las Vegas
3626 E. Sunset Road, Suite 100
Las Vegas, NV 89120
(702) 873-4478 FAX: (702) 873-7967
www.ssalabs.com

QC SUMMARY REPORT

WO#: **22071129**

05-Aug-22

Client: Excelchem Laboratories, Inc.

Project: 2207154 **TestCode:** **ANIONS-CWA**

Sample ID: **CCB-220722-1** SampType: **CCB** TestCode: **ANIONS-CWA** Units: **mg/L** Prep Date: **7/22/2022** RunNo: **69059**

Client ID: **CCB** Batch ID: **R69059** TestNo: **E300.0** Analysis Date: **7/22/2022** SeqNo: **1730185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Chloride	ND	0.100									

Qualifiers: H Holding times for preparation or analysis exceeded. MCL Maximum Contaminant Level. ND Not Detected at the PQL.

Original

Excelchem

1135 W. Sunset Blvd. Suite A
Rocklin, CA 95765
Ph: 916-5-4445 Fx: 916-5-4449

CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Project Manager: Kate Albertsen | Phone #: See above

Company/Address: See above | Fax #: See above

Project Number/P.O#: 2207154 | Project Name: 2207154

Project Location: Rocklin, CA | Sampler Signature:

Electronic Data Deliverables Request:
- [X] .PDF
- [ ] Geotracker (Global ID) _____
- [ ] Other (please specify) _____

Email Address:
ChrisC@excelchem.net
KateA@excelchem.net

Invoice to:
ChrisC@excelchem.net

ANALYSIS REQUEST Page ___ of ___

Bin#:
Due Date:
Work Order:

Sample ID	Sampling Date	Sampling Time	Container: VOA Clear	Container: amber glass	Container: plastic 125 ml	Container: poly	Method Preserved: HCl	Method Preserved: HNO3	Method Preserved: ICE/NONE	Method Preserved: Na2S2O3	Matrix: Drinking Water	Matrix: WATER	Matrix: SOIL	LL Chloride EPA 300.0	DUE: Standard	LAB USE ONLY:
22071129																
HDVC-5 1A	07/19/22	10:30			X				X			X		X	X	
HVC-3 2A	07/19/22	11:40			X				X			X		X	X	
BPC-4 3A	07/19/22	12:25			X				X			X		X	X	
HVC-2 4A	07/19/22	13:10			X				X			X		X	X	
HVC-1a 5A	07/19/22	13:25			X				X			X		X	X	

Relinquished by:	Date	Time	Received by:	Remarks/Condition of Sample:
[signature]	7/21/22	1650	[signature]	SSAL Vegas
Relinquished by:	Date	Time	Received by Laboratory:	Bill To:
			7-22 0910	

Client: Cardno - Heavenly Sampling
chris.donley@cardno.com

Analysis Report

Lab: High Sierra Water Lab
collin@highsierrawaterlab.com

StationCode	SampleDate	ProjectCode	CollectionTime	SampleTypeCode	AnalysisDate	MatrixName	MethodName	AnalyteName	FractionName	UnitName	LabReplicate	Result	RL	QACode	ComplianceCode	DilutionFactor	ExpectedValue	PrepPreservationName
HVC-1a	19/Jul/2022	HeavenlyValley_TMDL_2022	13:25	Grab	24/Jul/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	27	1	None	NR	1		LabFiltered
HVC-2	19/Jul/2022	HeavenlyValley_TMDL_2022	13:10	Grab	24/Jul/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	22	1	None	NR	1		LabFiltered
HVC-3	19/Jul/2022	HeavenlyValley_TMDL_2022	11:40	Grab	24/Jul/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	2	1	None	NR	1		LabFiltered
HDVC-5	19/Jul/2022	HeavenlyValley_TMDL_2022	10:30	Grab	24/Jul/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	2	1	None	NR	1		LabFiltered
BPC-4	19/Jul/2022	HeavenlyValley_TMDL_2022	12:25	Grab	24/Jul/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	338	1	None	NR	1		LabFiltered
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	24/Jul/2022 00:00	blankwater	EPA 353.1	Nitrate + Nitrite as N	Total	ug/L	1	<1	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	24/Jul/2022 00:00	blankwater	EPA 353.1	Nitrate + Nitrite as N	Total	ug/L	1	399	1	None	NR	1	401	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	24/Jul/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	91	1	QAX	NR	1		LabFiltered
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	24/Jul/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	2	91	1	QAX	NR	1		LabFiltered
HVC-1a	19/Jul/2022	HeavenlyValley_TMDL_2022	13:25	Grab	29/Jul/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	26	1	None	NR	1		None
HVC-2	19/Jul/2022	HeavenlyValley_TMDL_2022	13:10	Grab	29/Jul/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	23	1	None	NR	1		None
HVC-3	19/Jul/2022	HeavenlyValley_TMDL_2022	11:40	Grab	29/Jul/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	22	1	None	NR	1		None
HDVC-5	19/Jul/2022	HeavenlyValley_TMDL_2022	10:30	Grab	29/Jul/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	74	1	None	NR	1		None
BPC-4	19/Jul/2022	HeavenlyValley_TMDL_2022	12:25	Grab	29/Jul/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	85	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	29/Jul/2022 00:00	blankwater	EPA 365.3	Phosphorus as P	Total	ug/L	1	<1	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	29/Jul/2022 00:00	blankwater	EPA 365.3	Phosphorus as P	Total	ug/L	1	97	1	None	NR	1	98	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	29/Jul/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	75	1	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	29/Jul/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	2	73	1	QAX	NR	1		None
HVC-1a	19/Jul/2022	HeavenlyValley_TMDL_2022	13:25	Grab	01/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	98	35	None	NR	1		None
HVC-2	19/Jul/2022	HeavenlyValley_TMDL_2022	13:10	Grab	01/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	95	35	None	NR	1		None
HVC-3	19/Jul/2022	HeavenlyValley_TMDL_2022	11:40	Grab	01/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	53	35	None	NR	1		None
HDVC-5	19/Jul/2022	HeavenlyValley_TMDL_2022	10:30	Grab	01/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	129	35	None	NR	1		None
BPC-4	19/Jul/2022	HeavenlyValley_TMDL_2022	12:25	Grab	01/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	163	35	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	01/Aug/2022 00:00	blankwater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	<35	35	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	01/Aug/2022 00:00	blankwater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	84	35	None	NR	1	100	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	01/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	470	35	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	01/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	2	463	35	QAX	NR	1		None
HVC-1a	19/Jul/2022	HeavenlyValley_TMDL_2022	13:25	Grab	20/Jul/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	6.0	0.3	None	NR	1		None
HVC-2	19/Jul/2022	HeavenlyValley_TMDL_2022	13:10	Grab	20/Jul/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	5.5	0.3	None	NR	1		None
HVC-3	19/Jul/2022	HeavenlyValley_TMDL_2022	11:40	Grab	20/Jul/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	4.5	0.3	None	NR	1		None
HDVC-5	19/Jul/2022	HeavenlyValley_TMDL_2022	10:30	Grab	20/Jul/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	9.5	0.3	None	NR	1		None
BPC-4	19/Jul/2022	HeavenlyValley_TMDL_2022	12:25	Grab	20/Jul/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	9.5	0.3	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	20/Jul/2022 00:00	blankwater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	<0.3	0.3	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	20/Jul/2022 00:00	blankwater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	25	0.3	None	NR	1	25	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	20/Jul/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	6.0	0.3	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	20/Jul/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	2	6.0	0.3	QAX	NR	1		None
HVC-1a	19/Jul/2022	HeavenlyValley_TMDL_2022	13:25	Grab	20/Jul/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	2.29	0.1	None	NR	1		None
HVC-2	19/Jul/2022	HeavenlyValley_TMDL_2022	13:10	Grab	20/Jul/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	1.77	0.1	None	NR	1		None
HVC-3	19/Jul/2022	HeavenlyValley_TMDL_2022	11:40	Grab	20/Jul/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	0.36	0.1	None	NR	1		None
HDVC-5	19/Jul/2022	HeavenlyValley_TMDL_2022	10:30	Grab	20/Jul/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	1.19	0.1	None	NR	1		None
BPC-4	19/Jul/2022	HeavenlyValley_TMDL_2022	12:25	Grab	20/Jul/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	13.8	0.1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	20/Jul/2022 00:00	blankwater	EPA 180.1	Turbidity	Total	NTU	1	<0.1	0.1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	20/Jul/2022 00:00	blankwater	EPA 180.1	Turbidity	Total	NTU	1	50	0.1	None	NR	1	50	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	20/Jul/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	1.19	0.1	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	20/Jul/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	2	1.10	0.1	QAX	NR	1		None

Client: Cardno - Heavenly Sampling
chris.donley@cardno.com

Analysis Report

Lab: High Sierra Water Lab
collin@highsierrawaterlab.com

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)*
ED Below	HVE-2	7/19/2022	14:45	80	2	21	35	268	6.5	144	2.17

EXCELCHEM
Laboratories, Inc.

A Silver State Analytical Company

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449

ELAP Certificate No. : 2119

10 October 2022

Michelle Hochrein

Cardno

5496 Reno Corporate Drive

Reno, NV 89511

RE: Heavenly

Work order number:2208163

Enclosed are the results of analyses for samples received by the laboratory on 08/25/22 12:45. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Doug Selby, Technical Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HDVC-5	2208163-01	Water	08/24/22 10:30	08/25/22 12:45
HVC-3	2208163-02	Water	08/24/22 11:05	08/25/22 12:45
BPC-4	2208163-03	Water	08/24/22 11:55	08/25/22 12:45
HVC-2	2208163-04	Water	08/24/22 12:35	08/25/22 12:45
HVC-1A	2208163-05	Water	08/24/22 12:55	08/25/22 12:45

Excelchem Laboratories, Inc.

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

HDVC-5
2208163-01 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**0.6**	0.1	mg/L	A`I0050	09/08/22	09/09/22	EPA 300.0	

Excelchem Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Doug Selby, Technical Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

HVC-3
2208163-02 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**0.8**	0.1	mg/L	A`I0050	09/08/22	09/09/22	EPA 300.0	

Excelchem Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Doug Selby, Technical Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

BPC-4
2208163-03 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**33.1**	0.1	mg/L	A`I0050	09/08/22	09/09/22	EPA 300.0	

Excelchem Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Doug Selby, Technical Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

HVC-2
2208163-04 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**0.8**	0.1	mg/L	A`I0050	09/08/22	09/09/22	EPA 300.0	

Excelchem Laboratories, Inc.

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

HVC-1A
2208163-05 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**0.4**	0.1	mg/L	A`I0050	09/08/22	09/09/22	EPA 300.0	

Excelchem Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Doug Selby, Technical Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A`I0050 - EPA 300.0										
Blank (A`I0050-BLK1)				Prepared: 09/08/22 Analyzed: 09/09/22						
Chloride	ND	0.1	mg/L							
LCS (A`I0050-BS1)				Prepared: 09/08/22 Analyzed: 09/09/22						
Chloride	0.5	0.1	mg/L	0.500		109	90-110			
LCS Dup (A`I0050-BSD1)				Prepared: 09/08/22 Analyzed: 09/09/22						
Chloride	0.5	0.1	mg/L	0.500		109	90-110	0.110	20	
Duplicate (A`I0050-DUP1)		**Source: 2208163-01**		Prepared: 09/08/22 Analyzed: 09/09/22						
Chloride	0.6	0.1	mg/L		0.6			0.252	20	
Matrix Spike (A`I0050-MS1)		**Source: 2208163-01**		Prepared: 09/08/22 Analyzed: 09/09/22						
Chloride	1.1	0.1	mg/L	0.500	0.6	111	75-125			
Matrix Spike Dup (A`I0050-MSD1)		**Source: 2208163-01**		Prepared: 09/08/22 Analyzed: 09/09/22						
Chloride	1.1	0.1	mg/L	0.500	0.6	111	75-125	0.00	20	

Excelchem Laboratories, Inc.

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

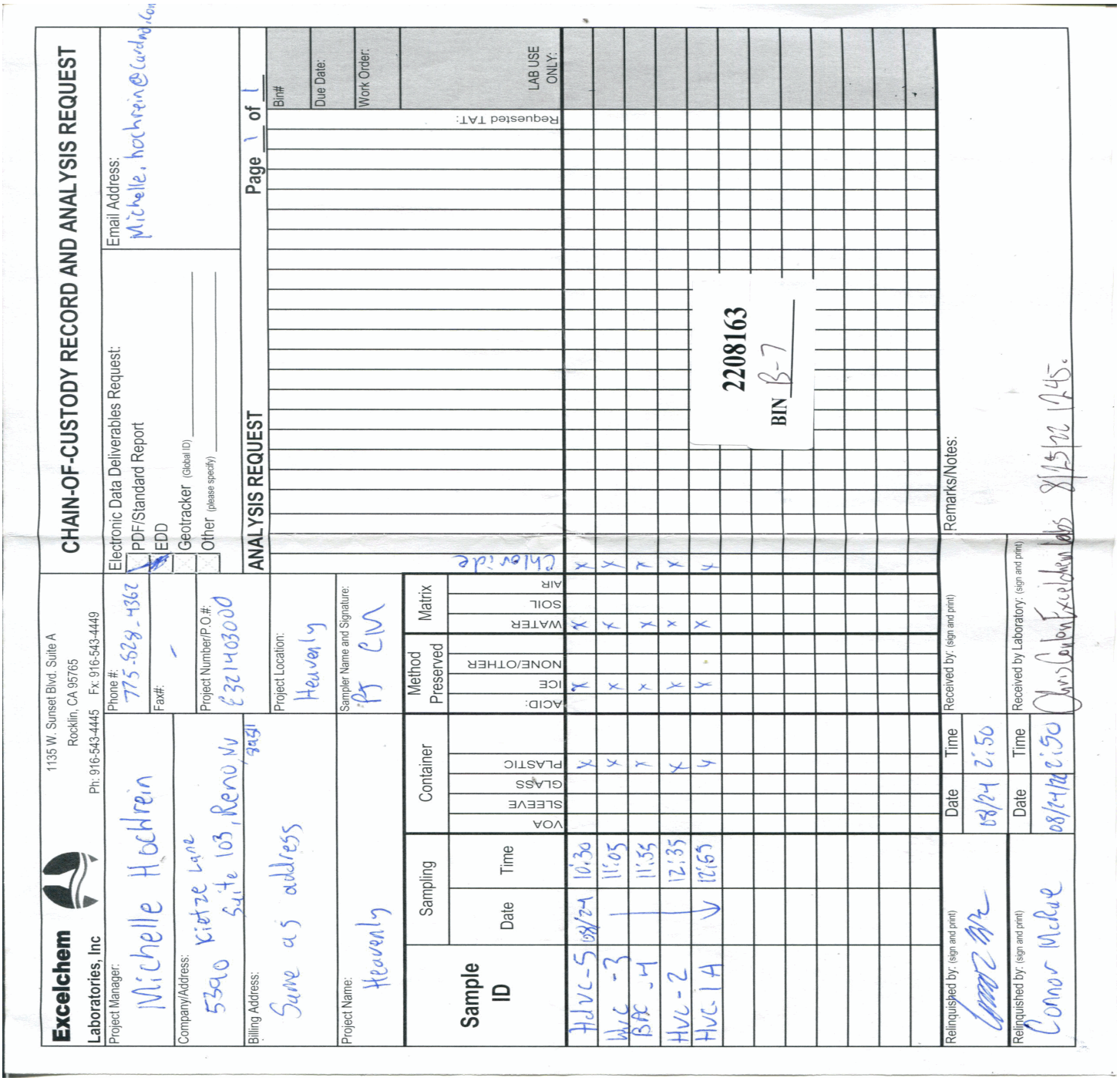
Notes and Definitions

ND Analyte not detected at reporting limit.

NR Not reported

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09



CHAIN-OF-CUSTODY RECORD AND ANALYSIS REQUEST

Excelchem Laboratories, Inc
1135 W. Sunset Blvd. Suite A
Rocklin, CA 95765
Ph: 916-543-4445 Fx: 916-543-4449

Project Manager: Michelle Hochrein
Phone #: 775-629-4362
Company/Address: Cardno 5390 Kietzke Lane Suite 103, Reno NV 89511
Fax#: -
Billing Address: Same as address
Project Number/P.O.#: E321403000
Project Location: Heavenly
Project Name: Heavenly
Sampler Name and Signature: BT CM

Electronic Data Deliverables Request: PDF/Standard Report; EDD; Geotracker (Global ID) ____; Other (please specify) ____
Email Address: Michelle, hochrein@cardno.com

Page 1 of 1

ANALYSIS REQUEST

Requested TAT:

LAB USE ONLY:
Work Order: 2208163
Due Date:
Bin#: BIN B-7

Sample ID	Sampling Date	Sampling Time	Container: VOA	SLEEVE	GLASS	PLASTIC	Method Preserved: ACID:	ICE	NONE/OTHER	Matrix: WATER	SOIL	AIR
HVC-5	08/24	10:30				X	X			X		
HVC-3		11:05				X	X			X		
BAC-4		11:55				X	X			X		
HVC-2		12:35				X	X			X		
HVC-1A		12:55				4	4			X		

Relinquished by: (sign and print) [signature] Date 08/24 Time 2:50
Received by: (sign and print)
Relinquished by: (sign and print) Connor McRae Date 08/24/22 Time 2:50
Received by Laboratory: (sign and print) [signature] Date 8/25/22 Time 1145

Remarks/Notes:

Excelchem Laboratories, Inc.

Doug Selby

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E321403000	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	10/10/22 09:09

Sample Integrity

WORK ORDER: 2208163

Date Received: 8/25/22

Company Name: Cardno

New Client: Y (N)

Section 1 – Sample Arrival Information

Sample Transport: ONTRAC UPS USPS Walk-In EXCELCHEM Courier (Fed-Ex) Other:

Transported In: Ice Chest (Box) Hand

Packing materials: Bubble Wrap (Foam) Packing Peanuts Paper Other:

Has chilling process begun? Y (N) **Samples Received:** Chilled to Touch / Ambient (On Ice)

Temperature of Samples (°C): 7.4 +1.6° CF **Ice Chest Temperature(s) (°C):** 4.8 +1.6° CF

Section 2 – Bottle/Analysis Info.

	Yes	No	N/A	Comments
Did all bottles arrive unbroken and intact?	✓			
Did all bottle labels agree with COC?	✓			
Were correct containers used for the tests requested?	✓			
Were correct preservations used for the tests requested?			X	
Was a sufficient amount of sample sent for tests indicated?	✓			
Were bubbles present in VOA Vials?: **(Volatile Methods Only)**			X	
Is there head space in the VOA vials? **(Volatile Methods Only)**			X	

Section 3– COC Information

	Yes	No	Comments		Yes	No
COC Received	✓			Analysis Requested	✓	
Date Sampled	✓			Samples arrived within holding time	✓	
Time Sampled	✓			Hold times less than 72 hours		X
Sample ID	✓			Client Name	✓	
Rush Turn Around Time		X		Client Contact Information	✓	

SHORT HOLD LIST (<72 hours)

pH	Chlorine	Corrosivity	Coliform	Dissolved Oxygen	Odor	Nitrate	Nitrite	Ortho-phosphate
MB As	Asbestos	Settable Solids	Turbidity	Biochemical Oxygen Demand	HPC	Color	Tedlars	Ammonia/TKN (unpreserved)

Section 4 – Comments / Discrepancies

Client notified of discrepancies: Yes / No **Notified by:**

Comments:

Bin Number/ Location:	B-7
COC Scanned/Attached by:	SD
Samples labeled by:	SD
Sample labels reviewed by:	SD

Filled out by: Chris Conlon

Date: 8/25/22

Time: 1250

Excelchem Laboratories, Inc.

Doug Selby

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client: Cardno - Heavenly Sampling
chris.donley@cardno.com

Analysis Report

Lab: High Sierra Water Lab
collin@highsierrawaterlab.com

StationCode	SampleDate	ProjectCode	CollectionTime	SampleTypeCode	AnalysisDate	MatrixName	MethodName	AnalyteName	FractionName	UnitName	LabReplicate	Result	RL	QACode	ComplianceCode	DilutionFactor	ExpectedValue	PrepPreservationName
HVC-1a	24/Aug/2022	HeavenlyValley_TMDL_2022	12:55	Grab	28/Aug/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	37	1	None	NR	1		LabFiltered
HVC-2	24/Aug/2022	HeavenlyValley_TMDL_2022	12:35	Grab	28/Aug/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	43	1	None	NR	1		LabFiltered
HVC-3	24/Aug/2022	HeavenlyValley_TMDL_2022	11:05	Grab	28/Aug/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	2	1	None	NR	1		LabFiltered
HDVC-5	24/Aug/2022	HeavenlyValley_TMDL_2022	10:30	Grab	28/Aug/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	21	1	None	NR	1		LabFiltered
BPC-4	24/Aug/2022	HeavenlyValley_TMDL_2022	11:55	Grab	28/Aug/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	173	1	None	NR	1		LabFiltered
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	28/Aug/2022 00:00	blankwater	EPA 353.1	Nitrate + Nitrite as N	Total	ug/L	1	<1	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	28/Aug/2022 00:00	blankwater	EPA 353.1	Nitrate + Nitrite as N	Total	ug/L	1	400	1	None	NR	1	401	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	28/Aug/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	17	1	QAX	NR	1		LabFiltered
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	28/Aug/2022 00:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	2	17	1	QAX	NR	1		LabFiltered
HVC-1a	24/Aug/2022	HeavenlyValley_TMDL_2022	12:55	Grab	02/Sep/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	16	1	None	NR	1		None
HVC-2	24/Aug/2022	HeavenlyValley_TMDL_2022	12:35	Grab	02/Sep/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	15	1	None	NR	1		None
HVC-3	24/Aug/2022	HeavenlyValley_TMDL_2022	11:05	Grab	02/Sep/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	15	1	None	NR	1		None
HDVC-5	24/Aug/2022	HeavenlyValley_TMDL_2022	10:30	Grab	02/Sep/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	63	1	None	NR	1		None
BPC-4	24/Aug/2022	HeavenlyValley_TMDL_2022	11:55	Grab	02/Sep/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	115	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	02/Sep/2022 00:00	blankwater	EPA 365.3	Phosphorus as P	Total	ug/L	1	<1	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	02/Sep/2022 00:00	blankwater	EPA 365.3	Phosphorus as P	Total	ug/L	1	98	1	None	NR	1	98	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	02/Sep/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	26	1	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	02/Sep/2022 00:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	2	26	1	QAX	NR	1		None
HVC-1a	24/Aug/2022	HeavenlyValley_TMDL_2022	12:55	Grab	29/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	68	35	None	NR	1		None
HVC-2	24/Aug/2022	HeavenlyValley_TMDL_2022	12:35	Grab	29/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	73	35	None	NR	1		None
HVC-3	24/Aug/2022	HeavenlyValley_TMDL_2022	11:05	Grab	29/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	47	35	None	NR	1		None
HDVC-5	24/Aug/2022	HeavenlyValley_TMDL_2022	10:30	Grab	29/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	130	35	None	NR	1		None
BPC-4	24/Aug/2022	HeavenlyValley_TMDL_2022	11:55	Grab	29/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	187	35	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	29/Aug/2022 00:00	blankwater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	<35	35	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	29/Aug/2022 00:00	blankwater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	91	35	None	NR	1	100	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	29/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	504	35	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	29/Aug/2022 00:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	2	530	35	QAX	NR	1		None
HVC-1a	24/Aug/2022	HeavenlyValley_TMDL_2022	12:55	Grab	25/Aug/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	3.5	0.3	None	NR	1		None
HVC-2	24/Aug/2022	HeavenlyValley_TMDL_2022	12:35	Grab	25/Aug/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	2.0	0.3	None	NR	1		None
HVC-3	24/Aug/2022	HeavenlyValley_TMDL_2022	11:05	Grab	25/Aug/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	2.0	0.3	None	NR	1		None
HDVC-5	24/Aug/2022	HeavenlyValley_TMDL_2022	10:30	Grab	25/Aug/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	6.0	0.3	None	NR	1		None
BPC-4	24/Aug/2022	HeavenlyValley_TMDL_2022	11:55	Grab	25/Aug/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	12.0	0.3	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	25/Aug/2022 00:00	blankwater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	<0.3	0.3	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	25/Aug/2022 00:00	blankwater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	25	0.3	None	NR	1	25	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	25/Aug/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	2.0	0.3	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	25/Aug/2022 00:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	2	2.0	0.3	QAX	NR	1		None
HVC-1a	24/Aug/2022	HeavenlyValley_TMDL_2022	12:55	Grab	25/Aug/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	7.45	0.1	None	NR	1		None
HVC-2	24/Aug/2022	HeavenlyValley_TMDL_2022	12:35	Grab	25/Aug/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	2.79	0.1	None	NR	1		None
HVC-3	24/Aug/2022	HeavenlyValley_TMDL_2022	11:05	Grab	25/Aug/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	2.34	0.1	None	NR	1		None
HDVC-5	24/Aug/2022	HeavenlyValley_TMDL_2022	10:30	Grab	25/Aug/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	3.33	0.1	None	NR	1		None
BPC-4	24/Aug/2022	HeavenlyValley_TMDL_2022	11:55	Grab	25/Aug/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	23.8	0.1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	25/Aug/2022 00:00	blankwater	EPA 180.1	Turbidity	Total	NTU	1	<0.1	0.1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	25/Aug/2022 00:00	blankwater	EPA 180.1	Turbidity	Total	NTU	1	50	0.1	None	NR	1	50	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	25/Aug/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	2.34	0.1	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	25/Aug/2022 00:00	samplewater	EPA 180.1	Turbidity	Total	NTU	2	2.39	0.1	QAX	NR	1		None

Client: Cardno - Heavenly Sampling
chris.donley@cardno.com

Analysis Report

Lab: High Sierra Water Lab
collin@highsierrawaterlab.com

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)*
Upper Edgewood		Not sampled									
Lower Edgewood		Not sampled									

EXCELCHEM
Laboratories, Inc.

A Silver State Analytical Company

1135 W Sunset Boulevard
Suite A
Rocklin, CA 95765
Phone# 916-543-4445
Fax# 916-543-4449

ELAP Certificate No. : 2119

27 September 2022

Michelle Hochrein

Cardno

5496 Reno Corporate Drive

Reno, NV 89511

RE: Heavenly

Work order number:2209131

Enclosed are the results of analyses for samples received by the laboratory on 09/22/22 11:40. All Quality Control results are within acceptable limits except where noted as a case narrative. If you have any questions concerning this report, please feel free to contact the laboratory.

Sincerely,

Doug Selby, Technical Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
HDVC-5	2209131-01	Water	09/21/22 10:30	09/22/22 11:40
HVC-3	2209131-02	Water	09/21/22 12:10	09/22/22 11:40
BPC-4	2209131-03	Water	09/21/22 12:50	09/22/22 11:40

Excelchem Laboratories, Inc.

Doug Selby, Technical Director

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Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24

HDVC-5
2209131-01 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**0.8**	0.1	mg/L	A`I0185	09/23/22	09/23/22	EPA 300.0	

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24

HVC-3
2209131-02 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**0.9**	0.1	mg/L	A`I0185	09/23/22	09/23/22	EPA 300.0	

Excelchem Laboratories, Inc.

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24

BPC-4
2209131-03 (Water)

Analyte	Result	Reporting Limit	Units	Batch	Date Prepared	Date Analyzed	Method	Notes
Ion Chromatography								
Chloride	**14.6**	0.1	mg/L	A`I0185	09/23/22	09/23/22	EPA 300.0	

Excelchem Laboratories, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Doug Selby, Technical Director

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24

Ion Chromatography - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A`I0185 - EPA 300.0										
Blank (A`I0185-BLK1)				Prepared & Analyzed: 09/23/22						
Chloride	ND	0.1	mg/L							
LCS (A`I0185-BS1)				Prepared & Analyzed: 09/23/22						
Chloride	0.5	0.1	mg/L	0.500		107	90-110			
LCS Dup (A`I0185-BSD1)				Prepared & Analyzed: 09/23/22						
Chloride	0.5	0.1	mg/L	0.500		107	90-110	0.0373	20	
Duplicate (A`I0185-DUP1)		**Source: 2209131-01**		Prepared & Analyzed: 09/23/22						
Chloride	0.8	0.1	mg/L		0.8			0.444	20	
Matrix Spike (A`I0185-MS1)		**Source: 2209131-01**		Prepared & Analyzed: 09/23/22						
Chloride	1.6	0.1	mg/L	0.500	0.8	152	75-125			E, QM-01
Matrix Spike Dup (A`I0185-MSD1)		**Source: 2209131-01**		Prepared & Analyzed: 09/23/22						
Chloride	1.6	0.1	mg/L	0.500	0.8	153	75-125	0.463	20	E, QM-01

Excelchem Laboratories, Inc.

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24

Notes and Definitions

QM-01	The spike recovery for this QC sample is outside of established control limits due to sample matrix interference.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate (CLP E-flag).
ND	Analyte not detected at reporting limit.
NR	Not reported

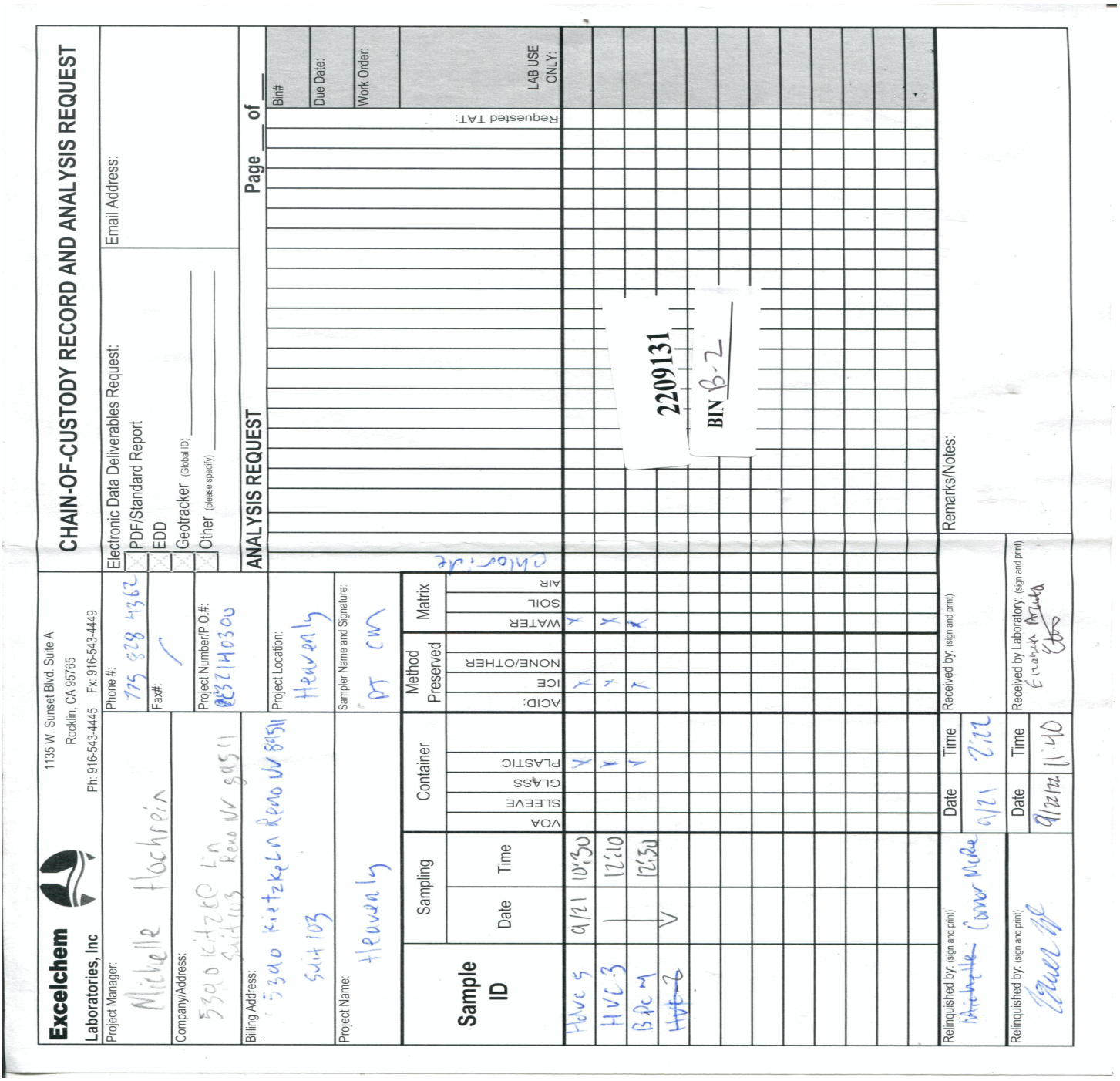
Excelchem Laboratories, Inc.

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24



Excelchem Laboratories, Inc.

Doug Selby

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Excelchem Laboratories, Inc.

Cardno	Project:	Heavenly	
5496 Reno Corporate Drive	Project Number:	E32140300	Date Reported:
Reno, NV 89511	Project Manager:	Michelle Hochrein	09/27/22 16:24

Sample Integrity

WORK ORDER: 220913 1

Date Received: 9/22/22

Company Name: Cardno

New Client: Y (N)

Section 1 – Sample Arrival Information

Sample Transport: ONTRAC UPS USPS Walk-In EXCELCHEM Courier (Fed-Ex) Other:_____

Transported In: (Ice Chest) Box Hand

Packing materials: Bubble Wrap Foam Packing Peanuts Paper Other:_____

Has chilling process begun? Y (N) **Samples Received:** Chilled to Touch / Ambient / (On Ice)

Temperature of Samples (°C): _____ +1.6° CF **Ice Chest Temperature(s) (°C):** 4.4 +1.6° CF

Section 2 – Bottle/Analysis Info.

	Yes	No	N/A	Comments
Did all bottles arrive unbroken and intact?	✓			
Did all bottle labels agree with COC?	✓			
Were correct containers used for the tests requested?	✓			
Were correct preservations used for the tests requested?	✓			
Was a sufficient amount of sample sent for tests indicated?	✓			
Were bubbles present in VOA Vials?: **(Volatile Methods Only)**			✓	
Is there head space in the VOA vials? **(Volatile Methods Only)**			✓	

Section 3– COC Information

	Yes	No	Comments		Yes	No
COC Received	✓			Analysis Requested	✓	
Date Sampled	✓			Samples arrived within holding time	✓	
Time Sampled	✓			Hold times less than 72 hours		✓
Sample ID	✓			Client Name	✓	
Rush Turn Around Time		✓		Client Contact Information	✓	

SHORT HOLD LIST (<72 hours)

pH	Chlorine	Corrosivity	Coliform	Dissolved Oxygen	Odor	Nitrate	Nitrite	Ortho-phosphate
MB	Asbestos	Settable Solids	Turbidity	Biochemical Oxygen Demand	HPC	Color	Tedlars	Ammonia/TKN (unpreserved)
As								

Section 4 – Comments / Discrepancies

Client notified of discrepancies: Yes / No **Notified by:**

Comments:

Bin Number/ Location:	B-2
COC Scanned/Attached by:	EA
Samples labeled by:	EA
Sample labels reviewed by:	EA

Filled out by: _____ **Date:** 9/22/22

Time: 11:40

Excelchem Laboratories, Inc.

Doug Selby, Technical Director

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Client: Cardno - Heavenly Sampling
chris.donley@cardno.com

Analysis Report

Lab: High Sierra Water Lab
collin@highsierrawaterlab.com

StationCode	SampleDate	ProjectCode	CollectionTime	SampleTypeCode	AnalysisDate	MatrixName	MethodName	AnalyteName	FractionName	UnitName	LabReplicate	Result	RL	QACode	ComplianceCode	DilutionFactor	ExpectedValue	PrepPreservationName
HVC-3	21/Sep/2022	HeavenlyValley_TMDL_2022	12:10	Grab	25/Sep/2022 08:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	1	1	None	NR	1		LabFiltered
HDVC-5	21/Sep/2022	HeavenlyValley_TMDL_2022	10:30	Grab	25/Sep/2022 08:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	2	1	None	NR	1		LabFiltered
BPC-4	21/Sep/2022	HeavenlyValley_TMDL_2022	12:50	Grab	25/Sep/2022 08:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	182	1	None	NR	1		LabFiltered
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	25/Sep/2022 08:00	blankwater	EPA 353.1	Nitrate + Nitrite as N	Total	ug/L	1	<1	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	25/Sep/2022 08:00	blankwater	EPA 353.1	Nitrate + Nitrite as N	Total	ug/L	1	404	1	None	NR	1	401	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	25/Sep/2022 08:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	1	53	1	QAX	NR	1		LabFiltered
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	25/Sep/2022 08:00	samplewater	EPA 353.1	Nitrate + Nitrite as N	Dissolved	ug/L	2	53	1	QAX	NR	1		LabFiltered
HVC-3	21/Sep/2022	HeavenlyValley_TMDL_2022	12:10	Grab	23/Sep/2022 08:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	22	1	None	NR	1		None
HDVC-5	21/Sep/2022	HeavenlyValley_TMDL_2022	10:30	Grab	23/Sep/2022 08:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	82	1	None	NR	1		None
BPC-4	21/Sep/2022	HeavenlyValley_TMDL_2022	12:50	Grab	23/Sep/2022 08:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	182	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	23/Sep/2022 08:00	blankwater	EPA 365.3	Phosphorus as P	Total	ug/L	1	<1	1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	23/Sep/2022 08:00	blankwater	EPA 365.3	Phosphorus as P	Total	ug/L	1	97	1	None	NR	1	98	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	23/Sep/2022 08:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	1	25	1	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	23/Sep/2022 08:00	samplewater	EPA 365.3	Phosphorus as P	Total	ug/L	2	25	1	QAX	NR	1		None
HVC-3	21/Sep/2022	HeavenlyValley_TMDL_2022	12:10	Grab	29/Sep/2022 08:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	91	35	None	NR	1		None
HDVC-5	21/Sep/2022	HeavenlyValley_TMDL_2022	10:30	Grab	29/Sep/2022 08:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	242	35	None	NR	1		None
BPC-4	21/Sep/2022	HeavenlyValley_TMDL_2022	12:50	Grab	29/Sep/2022 08:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	692	35	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	29/Sep/2022 08:00	blankwater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	<35	35	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	29/Sep/2022 08:00	blankwater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	110	35	None	NR	1	100	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	29/Sep/2022 08:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	1	277	35	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	29/Sep/2022 08:00	samplewater	EPA 351.2	Nitrogen, Total Kjeldahl	Total	ug/L	2	287	35	QAX	NR	1		None
HVC-3	21/Sep/2022	HeavenlyValley_TMDL_2022	12:10	Grab	22/Sep/2022 08:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	20.0	0.3	None	NR	1		None
HDVC-5	21/Sep/2022	HeavenlyValley_TMDL_2022	10:30	Grab	22/Sep/2022 08:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	7.0	0.3	None	NR	1		None
BPC-4	21/Sep/2022	HeavenlyValley_TMDL_2022	12:50	Grab	22/Sep/2022 08:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	31.5	0.3	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	22/Sep/2022 08:00	blankwater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	<0.3	0.3	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	22/Sep/2022 08:00	blankwater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	25	0.3	None	NR	1	25	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	22/Sep/2022 08:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	1	7.0	0.3	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	22/Sep/2022 08:00	samplewater	EPA 160.2	Total Suspended Solids	Total	mg/L	2	7.0	0.3	QAX	NR	1		None
HVC-3	21/Sep/2022	HeavenlyValley_TMDL_2022	12:10	Grab	22/Sep/2022 08:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	0.53	0.1	None	NR	1		None
HDVC-5	21/Sep/2022	HeavenlyValley_TMDL_2022	10:30	Grab	22/Sep/2022 08:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	3.26	0.1	None	NR	1		None
BPC-4	21/Sep/2022	HeavenlyValley_TMDL_2022	12:50	Grab	22/Sep/2022 08:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	38.1	0.1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LabBlank	22/Sep/2022 08:00	blankwater	EPA 180.1	Turbidity	Total	NTU	1	<.01	0.1	None	NR	1		None
LABQA	01/Jan/1950	Not Applicable	00:00	LCS	22/Sep/2022 08:00	blankwater	EPA 180.1	Turbidity	Total	NTU	1	50	0.1	None	NR	1	50	None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	22/Sep/2022 08:00	samplewater	EPA 180.1	Turbidity	Total	NTU	1	0.53	0.1	QAX	NR	1		None
000NONPJ	01/Jan/1950	Not Applicable	00:00	MS1	22/Sep/2022 08:00	samplewater	EPA 180.1	Turbidity	Total	NTU	2	.050	0.1	QAX	NR	1		None

Client: Cardno - Heavenly Sampling
chris.donley@cardno.com

Analysis Report

Lab: High Sierra Water Lab
collin@highsierrawaterlab.com

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)*
ED Below	HVE-2	9/21/2022	13:40	80	5	16	273	862	53.5	112.2	71.5

APPENDIX B
RAW WATER QUALITY CONSTITUENTS, CA FILTER VAULTS, WATER YEAR 2022

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Appendix B
Raw Water Quality Constituents, CA Filter Vaults Water Year 2022

B.1 43HVP-1a – CA Parking Lot Filter Vault Northern Influent Sampling Station Water Quality Data

B.2 43HVP-1b – CA Parking Lot Filter Vault Southern Influent Sampling Station Water Quality Data

B.3 43HVP-2 – CA Parking Lot Filter Vault Effluent Sampling Station Water Quality Data

B.4 WetLab Vault Analysis

Table C-1	Heavenly Mountain Resort water year 2022 water quality monitoring data from influent station 43HVP-1a (North), California Parking Lot Filter Vault influent point one. 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 Standards			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
First Quarter WY 2022										
10/22/2021	[1, 2]	11:00	140	0.31	0.11	0.021	2.2	2.3	53	ND
Second Quarter WY 2022										
No samples collected during the second quarter of Water Year 2022										
Third Quarter WY 2022										
4/19/2022	[2]	10:31	55	0.32	0.18	ND	0.90	1.1	120	ND
Fourth Quarter WY 2022										
9/19/2022	[3, 4]	20;30	380	0.41	1.5	0.16	1.8	3.5	110	4.6

Notes:

[1] The analysis of the method blank for Total Kjeldahl Nitrogen revealed concentrations of the target analyte above the reporting limit. The client results were greater than ten times the blank amount or non-detect; therefore, the data was not impacted.

[2] The Oil & Grease analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit. The reported result should be considered an estimate.

[3] For total phosphorous, 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 repo

[4] For Oil & Grease, there was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

Table C-2	Heavenly Mountain Resort water year 2022 water quality monitoring data from influent station 43HVP-1b (South), California Parking Lot Filter Vault influent point two. 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 Standards			N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
First Quarter WY 2022										
10/22/2021	[1, 2]	11:00	89	0.34	0.088	ND	2.0	2.1	10	ND
Second Quarter WY 2022										
No samples collected during the second quarter of Water Year 2022										
Third Quarter WY 2022										
4/19/2022	[2, 3]	10:20	61	0.22	0.26	ND	0.80	1.1	88	ND
Fourth Quarter WY 2022										
9/19/2022	[4]	20:02	140	0.46	0.20	0.022	2.3	2.5	11.0	5.7

Notes:

[1] The analysis of the method blank for Total Kjeldahl Nitrogen revealed concentrations of the target analyte above the reporting limit. The client results were greater than ten times the blank amount or non-detect; therefore, the data was not impacted.

[2] The Oil & Grease analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit. The reported result should be considered an estimate.

[3] The Chloride Spike recovery was not calculated. Sample concentration >4X the spike amount; therefore, the spike could not be adequately recovered.

[4] For Oil & Grease, there was insufficient sample available to perform a spike and/or duplicate on this analytical batch.

Table C-3	Heavenly Mountain Resort water year 2022 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 Standards[1]			**20.0**	**0.10**	N/A	N/A	N/A	**0.5**	N/A	**2.0**
First Quarter WY 2022										
10/22/2021	[2, 3]	11:45	**130**	**0.35**	0.27	ND	1.9	**2.2**	35	ND
Second Quarter WY 2022										
No samples collected during the second quarter of Water Year 2022										
Third Quarter WY 2022										
4/19/2022	[3]	12:32	**45**	**0.17**	0.21	ND	0.79	**1.0**	92	ND
Fourth Quarter WY 2022										
9/19/2022	[3]	22:23	**49**	**0.29**	0.21	ND	1.5	**1.7**	15	ND
Annual Summary		**Min**	**45**	**0.17**	0.21	0	0.79	**1**	15	0
		Max	**130**	**0.35**	0.27	0	1.9	**2.2**	92	0
		# of Samples	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
# of Noncompliance Samples			3.0	3.0	-	-	-	**3.0**	-	**0.0**
% of Noncompliance Samples			**100%**	**100%**	-	-	-	**100%**	-	**0%**

Notes:

[1] Standards are maximum concentration for discharge to surface waters not to exceed, effective November 30, 2008.

[2] The analysis of the method blank for Total Kjeldahl Nitrogen revealed concentrations of the target analyte above the reporting limit. The client results were greater than ten times the blank amount or non-detect; therefore, the data was not impacted.

[3] The Oil & Grease analyte was analyzed for, but was not detected above the level of the reported sample reporting/quantitation limit. The reported result should be considered an estimate.

11/8/2021

Cardno
PO Box 1533
Zephyr Cove, NV 89448
Attn: Michelle Hochrein

OrderID: *21100742*

Dear: Michelle Hochrein

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 10/22/2021. 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,

Cory Baker
QA Specialist

Mckenna Oh
Project Manager

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Western Environmental Testing Laboratory
Report Comments

Cardno - 21100742

Specific Report Comments

The analysis of the laboratory method blank revealed concentrations of Total Kjeldahl Nitrogen above the method required limit during the analysis of samples 21100742-001, 002 and 003. We apologize for any inconvenience this may have caused.

Report Legend

B	--	The analysis of the method blank revealed concentrations of the target analyte above the reporting limit. The client results were greater than ten times the blank amount or non-detect; therefore, the data was not impacted.
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. The reported result should be considered an estimate.
K	--	The TPH Diesel Concentration reported here likely includes some heavier TPH Oil hydrocarbons reported in the TPH Diesel range as per EPA 8015.
L	--	The TPH Oil Concentration reported here likely includes some lighter TPH Diesel hydrocarbons reported in the TPH Oil range as per EPA 8015.
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
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	--	Spike recovery not calculated. 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. The reported result should be considered an estimate.

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.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

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Western Environmental Testing Laboratory
Analytical Report

Cardno
PO Box 1533
Zephyr Cove, NV 89448
Attn: Michelle Hochrein
Phone: (775) 588-9069 **Fax:** (775) 588-9219

Date Printed: 11/8/2021
OrderID: *21100742*

PO\Project: *Heavenly*

Customer Sample ID: HVP-1A (North) **Collect Date/Time:** 10/22/2021 11:00
WETLAB Sample ID: 21100742-001 **Receive Date:** 10/22/2021 17:05

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.31		mg/L	1	0.020	10/27/2021	NV00925
Total Suspended Solids (TSS)	SM 2540D	62		mg/L	1	10	10/26/2021	NV00925
Total Nitrogen	Calc.	2.3		mg/L	1	0.25	10/26/2021	NV00925
Turbidity (Nephelometric)	EPA 180.1	140		NTU	30	3.0	10/22/2021	NV00925
Oil & Grease (HEM)	EPA 1664	ND	U	mg/L	1	2.0	10/28/2021	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	53		mg/L	1	0.25	10/23/2021	NV00925
Nitrate Nitrogen	EPA 300.0	0.11		mg/L	1	0.030	10/23/2021	NV00925
Nitrite Nitrogen	EPA 300.0	0.021		mg/L	1	0.020	10/23/2021	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	2.2	B	mg/L	0.5	0.20	10/26/2021	NV00925

Customer Sample ID: HVP-1B (South) **Collect Date/Time:** 10/22/2021 11:00
WETLAB Sample ID: 21100742-002 **Receive Date:** 10/22/2021 17:05

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.34		mg/L	1	0.020	10/27/2021	NV00925
Total Suspended Solids (TSS)	SM 2540D	82		mg/L	1	10	10/26/2021	NV00925
Total Nitrogen	Calc.	2.1		mg/L	1	0.25	10/26/2021	NV00925
Turbidity (Nephelometric)	EPA 180.1	89		NTU	10	1.0	10/22/2021	NV00925
Oil & Grease (HEM)	EPA 1664	ND	U	mg/L	1	2.0	10/28/2021	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	10		mg/L	1	0.25	10/23/2021	NV00925
Nitrate Nitrogen	EPA 300.0	0.088		mg/L	1	0.030	10/23/2021	NV00925
Nitrite Nitrogen	EPA 300.0	ND		mg/L	1	0.020	10/23/2021	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	2.0	B	mg/L	0.5	0.20	10/26/2021	NV00925

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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Customer Sample ID: HVP-2 (Outlet) **Collect Date/Time:** 10/22/2021 11:45

WETLAB Sample ID: 21100742-003 **Receive Date:** 10/22/2021 17:05

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.35		mg/L	1	0.020	10/27/2021	NV00925
Total Suspended Solids (TSS)	SM 2540D	17		mg/L	1	10	10/26/2021	NV00925
Total Nitrogen	Calc.	2.2		mg/L	1	0.25	10/26/2021	NV00925
Turbidity (Nephelometric)	EPA 180.1	130		NTU	15	1.5	10/22/2021	NV00925
Oil & Grease (HEM)	EPA 1664	ND	U	mg/L	1	2.0	10/28/2021	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	35		mg/L	1	0.25	10/23/2021	NV00925
Nitrate Nitrogen	EPA 300.0	0.27		mg/L	1	0.030	10/23/2021	NV00925
Nitrite Nitrogen	EPA 300.0	ND		mg/L	1	0.020	10/23/2021	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	1.9	B	mg/L	0.5	0.20	10/26/2021	NV00925

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC21100915	Blank 1	Turbidity (Nephelometric)	EPA 180.1	ND			NTU
QC21100919	Blank 1	Chloride	EPA 300.0	ND			mg/L
		Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC21100949	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC21101039	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC21101098	Blank 1	Oil & Grease (HEM)	EPA 1664	ND			mg/L
QC21110007	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC21100915	LCS 1	Turbidity (Nephelometric)	EPA 180.1	5.06	5.00	101	NTU
QC21100919	LCS 1	Chloride	EPA 300.0	10.4	10.0	104	mg/L
		Nitrate Nitrogen	EPA 300.0	0.504	0.500	101	mg/L
		Nitrite Nitrogen	EPA 300.0	0.480	0.500	96	mg/L
QC21100949	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.01	1.00	101	mg/L
QC21101039	LCS 1	Total Phosphorous as P	SM 4500-P E	0.243	0.250	97	mg/L
QC21101098	LCS 1	Oil & Grease (HEM)	EPA 1664	16.6	20.0	83	mg/L
QC21110007	LCS 1	Total Suspended Solids (TSS)	SM 2540D	201	200	100	mg/L
QC21110007	LCS 2	Total Suspended Solids (TSS)	SM 2540D	198	200	99	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC21100915	Duplicate 1	Turbidity (Nephelometric)	EPA 180.1	21100722-004	14.4	14.3	NTU	1 %
QC21100915	Duplicate 2	Turbidity (Nephelometric)	EPA 180.1	21100742-001	138	126	NTU	8 %
QC21110007	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	21100561-002	ND	ND	mg/L	<1%
QC21110007	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	21100649-009	ND	ND	mg/L	<1%

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC21100919	MS 1	Chloride	EPA 300.0	21100742-002	10.2		11.5	11.5	1.25	mg/L	110	110	<1
		Nitrate Nitrogen	EPA 300.0	21100742-002	0.088		0.641	0.640	0.5	mg/L	111	110	<1
		Nitrite Nitrogen	EPA 300.0	21100742-002	ND		0.132	0.132	0.125	mg/L	95	95	<1
QC21100949	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	21100635-004	ND	B,M	0.631	0.588	0.5	mg/L	NC	NC	NC
QC21101039	MS 1	Total Phosphorous as P	SM 4500-P E	21100706-001	0.047		0.282	0.297	0.25	mg/L	94	100	5
QC21101039	MS 2	Total Phosphorous as P	SM 4500-P E	21100842-004	0.094		0.311	0.339	0.25	mg/L	87	98	9
QC21101098	MS 1	Oil & Grease (HEM)	EPA 1664	21100737-001	ND		10.2		10	mg/L	96	NA	NA

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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WETLAB
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WETLAB Order ID. 21100742
Sparks Control # _____
Elko Control # _____
LV Control # _____
Report Due Date
Page _____ of _____

Client CARDNO
Address 295 HIGHWAY 50, SUITE 1
City, State & Zip ZEPHYR COVE, NV, 89448
Contact MICHELLE HOCHREIN
Phone 775-588-9069 | Collector's Name RAPH TOWNSEND
Fax | PWS/Project Name HEAVENLY
P.O. Number | PWS/Project Number
Email michelle.hochrein@cardno.com

Billing Address (if different than Client Address)
Company _____
Address _____
City, State & Zip _____
Contact _____
Phone _____ Fax _____
Email

Turnaround Time Requirements
Standard X
5 Day* (25%) _____ 72 Hour* (50%) _____
48 Hour* (100%) _____ 24 Hour* (200%) _____
*Surcharges Will Apply

Samples Collected From Which State? NV ____ CA X Other ____
Compliance Monitoring? (Yes) No
Report to Regulatory Agency? (Yes) No
Report Results Via (PDF) EDD Other _____
Standard QC Required? (Yes) No

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Analyses Requested: OIL & GREASE (LOW RL LEVEL)	TOTAL PHOSPHOROUS	CHLORIDE	NITRATE AS NITROGEN	NITRITE AS NITROGEN	TKN (KJELDAHL)	TOTAL NITROGEN	TURBIDITY	TSS	Spl. No.
HVP-1A (NORTH)	10/22/21	11:00 AM	1,2,4	SW	4	X	X	X	X	X	X	X	X	X	
HVP-1B (SOUTH)	10/22/21	11:00 AM	1,2,4	SW	4	X	X	X	X	X	X	X	X	X	
HVP-2 (OUTLET)	10/22/21	11:45 AM	1,2,4	SW	6	X	X	X	X	X	X	X	X	X	
*RL'S:															
- O&G = 2.0 mg/L															
- TP = 0.01 mg/L															
- TN = 0.1 mg/L															
- TURBIDITY = 1 NTU															
- Cl = 0.1 mg/L															

2110 4
0742 3

Instructions/Comments/Special Requirements: OIL & GREASE - 2 FOR INLETS (N AND S), 4 FOR OUTLET. 1 PINK, 1 WHITE, FOR EACH LOC.

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: _____

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
2.8 °C	Y N None	14	10/22/21	1705		
°C	Y N None					
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

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, 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. Please contact your Project Manager for details. _____ initial

301.2E

5/6/2022

Cardno
PO Box 1533
Zephyr Cove, NV 89448
Attn: Melanie Greene

OrderID: *22040554*

Dear: Melanie Greene

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 4/20/2022. 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,

Jennifer Delaney
QA Manager

Mckenna Oh
Project Manager

MckennaO@wetlaboratory.com
(775) 200-9876

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Western Environmental Testing Laboratory
Report Comments

Cardno - 22040554

Specific Report Comments

None

Report Legend

B	--	The analysis of the method blank revealed concentrations of the target analyte above the reporting limit. The client results were greater than ten times the blank amount or non-detect; therefore, the data was not impacted.
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. The reported result should be considered an estimate.
K	--	The TPH Diesel Concentration reported here likely includes some heavier TPH Oil hydrocarbons reported in the TPH Diesel range as per EPA 8015.
L	--	The TPH Oil Concentration reported here likely includes some lighter TPH Diesel hydrocarbons reported in the TPH Oil range as per EPA 8015.
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
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	--	Spike recovery not calculated. 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. The reported result should be considered an estimate.

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.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

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Western Environmental Testing Laboratory
Analytical Report

Cardno
PO Box 1533
Zephyr Cove, NV 89448
Attn: Melanie Greene
Phone: (775) 588-9069 **Fax:** (775) 588-9219

Date Printed: 5/6/2022
OrderID: *22040554*

PO\Project: *Heavenly*

Customer Sample ID: HVP - 1a (NORTH) **Collect Date/Time:** 4/19/2022 10:31
WETLAB Sample ID: 22040554-001 **Receive Date:** 4/20/2022 09:38

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.32		mg/L	1	0.020	4/27/2022	NV00925
Total Suspended Solids (TSS)	SM 2540D	180		mg/L	1	10	4/25/2022	NV00925
Total Nitrogen	Calc.	1.1		mg/L	1	0.25	5/4/2022	NV00925
Turbidity (Nephelometric)	EPA 180.1	55		NTU	10	1.0	4/20/2022	NV00925
Oil & Grease (HEM)	EPA 1664	ND	U	mg/L	1	2.0	4/21/2022	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	120		mg/L	1	0.25	4/21/2022	NV00925
Nitrate Nitrogen	EPA 300.0	0.18		mg/L	1	0.030	4/21/2022	NV00925
Nitrite Nitrogen	EPA 300.0	ND		mg/L	1	0.020	4/21/2022	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	0.90		mg/L	0.5	0.20	5/4/2022	NV00925

Customer Sample ID: HVP - 1b (SOUTH) **Collect Date/Time:** 4/19/2022 10:20
WETLAB Sample ID: 22040554-002 **Receive Date:** 4/20/2022 09:38

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.22		mg/L	1	0.020	4/27/2022	NV00925
Total Suspended Solids (TSS)	SM 2540D	200		mg/L	1	10	4/25/2022	NV00925
Total Nitrogen	Calc.	1.1		mg/L	1	0.25	5/4/2022	NV00925
Turbidity (Nephelometric)	EPA 180.1	61		NTU	10	1.0	4/20/2022	NV00925
Oil & Grease (HEM)	EPA 1664	ND	U	mg/L	1	2.0	4/21/2022	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	88	SC	mg/L	1	0.25	4/21/2022	NV00925
Nitrate Nitrogen	EPA 300.0	0.26		mg/L	1	0.030	4/21/2022	NV00925
Nitrite Nitrogen	EPA 300.0	ND		mg/L	1	0.020	4/21/2022	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	0.80		mg/L	0.5	0.20	5/4/2022	NV00925

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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fax (702) 622-2868
EPA LAB ID: NV00932

Customer Sample ID: HVP - 2 (OUTLET) **Collect Date/Time:** 4/19/2022 12:32

WETLAB Sample ID: 22040554-003 **Receive Date:** 4/20/2022 09:38

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.17		mg/L	1	0.020	4/27/2022	NV00925
Total Suspended Solids (TSS)	SM 2540D	100		mg/L	1	10	4/25/2022	NV00925
Total Nitrogen	Calc.	1.0		mg/L	1	0.25	5/4/2022	NV00925
Turbidity (Nephelometric)	EPA 180.1	45		NTU	10	1.0	4/20/2022	NV00925
Oil & Grease (HEM)	EPA 1664	ND	U	mg/L	1	2.0	4/21/2022	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	92		mg/L	1	0.25	4/21/2022	NV00925
Nitrate Nitrogen	EPA 300.0	0.21		mg/L	1	0.030	4/21/2022	NV00925
Nitrite Nitrogen	EPA 300.0	ND		mg/L	1	0.020	4/21/2022	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	0.79		mg/L	0.5	0.20	5/4/2022	NV00925

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC22040848	Blank 1	Turbidity (Nephelometric)	EPA 180.1	ND			NTU
QC22040866	Blank 1	Chloride	EPA 300.0	ND			mg/L
		Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC22040891	Blank 1	Oil & Grease (HEM)	EPA 1664	ND			mg/L
QC22040990	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC22041126	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC22050184	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC22040848	LCS 1	Turbidity (Nephelometric)	EPA 180.1	5.02	5.00	100	NTU
QC22040866	LCS 1	Chloride	EPA 300.0	10.3	10.0	103	mg/L
		Nitrate Nitrogen	EPA 300.0	0.500	0.500	100	mg/L
		Nitrite Nitrogen	EPA 300.0	0.517	0.500	103	mg/L
QC22040891	LCS 1	Oil & Grease (HEM)	EPA 1664	18.1	20.0	90	mg/L
QC22040990	LCS 1	Total Suspended Solids (TSS)	SM 2540D	197	200	99	mg/L
QC22040990	LCS 2	Total Suspended Solids (TSS)	SM 2540D	199	200	99	mg/L
QC22041126	LCS 1	Total Phosphorous as P	SM 4500-P E	0.247	0.250	99	mg/L
QC22050184	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	1.04	1.00	104	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC22040848	Duplicate 1	Turbidity (Nephelometric)	EPA 180.1	22040544-001	0.636	0.631	NTU	1 %
QC22040848	Duplicate 2	Turbidity (Nephelometric)	EPA 180.1	22040544-011	1.78	1.76	NTU	1 %
QC22040990	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	22040554-001	176	168	mg/L	5 %
QC22040990	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	22040554-003	104	96.0	mg/L	8 %

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC22040866	MS 1	Chloride	EPA 300.0	22040554-002	88.0	SC	88.4	88.6	1.25	mg/L	NC	NC	NC
		Nitrate Nitrogen	EPA 300.0	22040554-002	0.260		0.789	0.779	0.5	mg/L	106	104	1
		Nitrite Nitrogen	EPA 300.0	22040554-002	ND		0.111	0.110	0.125	mg/L	88	88	<1
QC22040891	MS 1	Oil & Grease (HEM)	EPA 1664	22040554-003	ND	U	11.7		10	mg/L	98	NA	NA
QC22041126	MS 1	Total Phosphorous as P	SM 4500-P E	22040474-002	0.104		0.348	0.344	0.25	mg/L	98	96	1
QC22041126	MS 2	Total Phosphorous as P	SM 4500-P E	22040552-002	0.094		0.338	0.342	0.25	mg/L	98	99	1
QC22050184	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	22040624-001	0.321	M	0.727	0.766	0.5	mg/L	NC	NC	NC
QC22050184	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	22040630-002	0.256	M	0.692	0.678	0.5	mg/L	NC	NC	NC

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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WETLAB Order ID. 22040554
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 1 of 1

Client CARDNO
Address 295 HWY 50 SUITE 1
City, State & Zip Zephyr COVE NV 89448
Contact Melanie Greene
Phone 775 339 3328 | Collector's Name RAPHT
Fax | PWS/Project Name Heavenly
P.O. Number | PWS/Project Number

Turnaround Time Requirements
Standard ✓
5 Day* (25%) | 72 Hour* (50%)
48 Hour* (100%) | 24 Hour* (200%)
*Surcharges Will Apply

Samples Collected From Which State? NV ___ CA ✓ Other ___
Compliance Monitoring? (Yes) No
Report to Regulatory Agency? (Yes) No
Report Results Via (PDF) EDD Other ___
Standard QC Required? (Yes) No

Email melanie.greene@cardno.com

Billing Address (if different than Client Address)
Company
Address
City, State & Zip
Contact
Phone | Fax
Email

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Analyses Requested: Oil+Grease	Total Phosphorus	Chloride	Total Nitrogen	Nitrate+Nitrite N	TKN	Total Nitrogen	Turbidity	TSS	Spl. No.
~~HVP~~-1a (NORTH)	4/19/22	0936 1031		SW	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
HVP-1b (SOUTH)		0925 1020		SW	4	✓	✓	✓	✓	✓	✓	✓	✓	✓	
HVP-2 (OUTLET)	↓	1137 1232		SW	6	✓	✓	✓	✓	✓	✓	✓	✓	✓	
LAKE TAHOE RL's															

Instructions/Comments/Special Requirements: Lake Tahoe Reporting Limits/LOW
~~NO ICE~~ 4/20/22 ice
pH'd - CS

Sample Matrix Key** DW = Drinking Water WW = Wastewater (SW = Surface Water) MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER:

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
°C	Y N (None)	14	4/20/22	1800	M Greene	
4.9 °C	Y N ~~None~~		4/20/22	9:38		
°C	Y N None					
°C	Y N None					

WETLAB'S Standard Terms and Conditions apply unless written agreements specify otherwise. Payment terms are Net 30.

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, 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. Please contact your Project Manager for details. ___ initial

301.2E

10/7/2022

Cardno
PO Box 1533
Zephyr Cove, NV 89448
Attn: Parker Johnson

OrderID: *22090640*

Dear: Parker Johnson

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 9/20/2022. 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,

Jennifer Delaney
QA Manager

Mckenna Oh
Project Manager

MckennaO@wetlaboratory.com
(775) 200-9876

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LAS VEGAS
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tel (702) 475-8899
fax (702) 622-2868
EPA LAB ID: NV00932

Western Environmental Testing Laboratory
Report Comments

Cardno - 22090640

Specific Report Comments

None

Report Legend

B	--	The analysis of the method blank revealed concentrations of the target analyte above the reporting limit. The client results were greater than ten times the blank amount or non-detect; therefore, the data was not impacted.
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. The reported result should be considered an estimate.
K	--	The TPH Diesel Concentration reported here likely includes some heavier TPH Oil hydrocarbons reported in the TPH Diesel range as per EPA 8015.
L	--	The TPH Oil Concentration reported here likely includes some lighter TPH Diesel hydrocarbons reported in the TPH Oil range as per EPA 8015.
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
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	--	Spike recovery not calculated. 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. The reported result should be considered an estimate.

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.

Per federal regulation the holding time for the following parameters in aqueous/water samples is 15 minutes: Residual Chlorine, pH, Dissolved Oxygen, Sulfite.

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Western Environmental Testing Laboratory
Analytical Report

Cardno
PO Box 1533
Zephyr Cove, NV 89448
Attn: Parker Johnson
Phone: (775) 588-9069 **Fax:** (775) 588-9219

Date Printed: 10/7/2022
OrderID: *22090640*
PO\Project: *Heavenly*

Customer Sample ID: HVP-1A (North) **Collect Date/Time:** 9/19/2022 20:30
WETLAB Sample ID: 22090640-001 **Receive Date:** 9/20/2022 14:39

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.41	M	mg/L	1	0.020	9/28/2022	NV00925
Total Suspended Solids (TSS)	SM 2540D	130		mg/L	1	5.0	9/21/2022	NV00925
Total Nitrogen	Calc.	3.5		mg/L	1	0.25	9/27/2022	NV00925
Turbidity (Nephelometric)	EPA 180.1	380		NTU	5	0.50	9/20/2022	NV00925
Oil & Grease (HEM)	EPA 1664	4.6	N	mg/L	1	2.7	10/3/2022	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	110		mg/L	1	0.25	9/21/2022	NV00925
Nitrate Nitrogen	EPA 300.0	1.5		mg/L	1	0.030	9/21/2022	NV00925
Nitrite Nitrogen	EPA 300.0	0.16		mg/L	1	0.020	9/21/2022	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	1.8		mg/L	0.5	0.20	9/27/2022	NV00925

Customer Sample ID: HVP-1B (South) **Collect Date/Time:** 9/19/2022 20:02
WETLAB Sample ID: 22090640-002 **Receive Date:** 9/20/2022 14:39

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.46		mg/L	1	0.020	9/29/2022	NV00925
Total Suspended Solids (TSS)	SM 2540D	230		mg/L	1	5.0	9/21/2022	NV00925
Total Nitrogen	Calc.	2.5		mg/L	1	0.25	9/27/2022	NV00925
Turbidity (Nephelometric)	EPA 180.1	140		NTU	10	1.0	9/20/2022	NV00925
Oil & Grease (HEM)	EPA 1664	5.7	N	mg/L	1	2.5	10/3/2022	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	11		mg/L	1	0.25	9/21/2022	NV00925
Nitrate Nitrogen	EPA 300.0	0.20		mg/L	1	0.030	9/21/2022	NV00925
Nitrite Nitrogen	EPA 300.0	0.022		mg/L	1	0.020	9/21/2022	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	2.3		mg/L	0.5	0.20	9/27/2022	NV00925

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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tel (702) 475-8899
fax (702) 622-2868
EPA LAB ID: NV00932

Customer Sample ID: HVP-2 (Outlet) **Collect Date/Time:** 9/19/2022 22:23

WETLAB Sample ID: 22090640-003 **Receive Date:** 9/20/2022 14:39

Analyte	Method	Results		Units	DF	RL	Analyzed	LabID
General Chemistry								
Total Phosphorous as P	SM 4500-P E	0.29		mg/L	1	0.020	9/29/2022	NV00925
Total Suspended Solids (TSS)	SM 2540D	75		mg/L	1	5.0	9/21/2022	NV00925
Total Nitrogen	Calc.	1.7		mg/L	1	0.25	9/27/2022	NV00925
Turbidity (Nephelometric)	EPA 180.1	49		NTU	5	0.50	9/20/2022	NV00925
Oil & Grease (HEM)	EPA 1664	ND	U	mg/L	1	2.0	9/27/2022	NV00925
Anions by Ion Chromatography								
Chloride	EPA 300.0	15		mg/L	1	0.25	9/22/2022	NV00925
Nitrate Nitrogen	EPA 300.0	0.21		mg/L	1	0.030	9/22/2022	NV00925
Nitrite Nitrogen	EPA 300.0	ND		mg/L	1	0.020	9/22/2022	NV00925
Flow Injection Analyses								
Total Kjeldahl Nitrogen	EPA 351.2	1.5		mg/L	0.5	0.20	9/27/2022	NV00925

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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Western Environmental Testing Laboratory
QC Report

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC22091056	Blank 1	Turbidity (Nephelometric)	EPA 180.1	ND			NTU
QC22091079	Blank 1	Total Suspended Solids (TSS)	SM 2540D	ND			mg/L
QC22091085	Blank 1	Chloride	EPA 300.0	ND			mg/L
		Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC22091162	Blank 1	Chloride	EPA 300.0	ND			mg/L
		Nitrate Nitrogen	EPA 300.0	ND			mg/L
		Nitrite Nitrogen	EPA 300.0	ND			mg/L
QC22091291	Blank 1	Total Kjeldahl Nitrogen	EPA 351.2	ND			mg/L
QC22091368	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC22091435	Blank 1	Total Phosphorous as P	SM 4500-P E	ND			mg/L
QC22100023	Blank 1	Oil & Grease (HEM)	EPA 1664	ND			mg/L
QC22100124	Blank 1	Oil & Grease (HEM)	EPA 1664	ND			mg/L

QCBatchID	QCType	Parameter	Method	Result	Actual	% Rec	Units
QC22091056	LCS 1	Turbidity (Nephelometric)	EPA 180.1	4.81	5.00	96	NTU
QC22091079	LCS 1	Total Suspended Solids (TSS)	SM 2540D	194	200	97	mg/L
QC22091079	LCS 2	Total Suspended Solids (TSS)	SM 2540D	191	200	95	mg/L
QC22091085	LCS 1	Chloride	EPA 300.0	10.8	10.0	108	mg/L
		Nitrate Nitrogen	EPA 300.0	0.485	0.500	97	mg/L
		Nitrite Nitrogen	EPA 300.0	0.467	0.500	93	mg/L
QC22091162	LCS 1	Chloride	EPA 300.0	10.8	10.0	108	mg/L
		Nitrate Nitrogen	EPA 300.0	0.492	0.500	98	mg/L
		Nitrite Nitrogen	EPA 300.0	0.477	0.500	96	mg/L
QC22091291	LCS 1	Total Kjeldahl Nitrogen	EPA 351.2	0.941	1.00	94	mg/L
QC22091368	LCS 1	Total Phosphorous as P	SM 4500-P E	0.276	0.250	110	mg/L
QC22091435	LCS 1	Total Phosphorous as P	SM 4500-P E	0.266	0.250	106	mg/L
QC22100023	LCS 1	Oil & Grease (HEM)	EPA 1664	17.7	20.0	88	mg/L
QC22100124	LCS 1	Oil & Grease (HEM)	EPA 1664	18.3	20.0	92	mg/L

QCBatchID	QCType	Parameter	Method	Duplicate Sample	Sample Result	Duplicate Result	Units	RPD
QC22091056	Duplicate 1	Turbidity (Nephelometric)	EPA 180.1	22090621-001	0.190	0.180	NTU	5 %
QC22091056	Duplicate 2	Turbidity (Nephelometric)	EPA 180.1	22090653-004	91.4	86.2	NTU	6 %
QC22091079	Duplicate 1	Total Suspended Solids (TSS)	SM 2540D	22090500-001	314	290	mg/L	8 %
QC22091079	Duplicate 2	Total Suspended Solids (TSS)	SM 2540D	22090615-004	26.0	ND	mg/L	<1%

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC22091085	MS 1	Chloride	EPA 300.0	22090675-007	6.42		7.82	7.84	1.25	mg/L	112	113	<1
		Nitrate Nitrogen	EPA 300.0	22090675-007	0.642		1.15	1.17	0.5	mg/L	102	106	2
		Nitrite Nitrogen	EPA 300.0	22090675-007	ND		0.125	0.128	0.125	mg/L	85	86	2
QC22091085	MS 2	Chloride	EPA 300.0	22090696-007	28.8		30.1	30.2	1.25	mg/L	104	114	<1
		Nitrate Nitrogen	EPA 300.0	22090696-007	ND		0.526	0.535	0.5	mg/L	105	107	2
		Nitrite Nitrogen	EPA 300.0	22090696-007	0.022	M	0.088	0.087	0.125	mg/L	NC	NC	NC
QC22091162	MS 1	Chloride	EPA 300.0	22090653-002	122		127	128	1.25	mg/L	91	99	<1
		Nitrate Nitrogen	EPA 300.0	22090653-002	ND	HT,	2.57	2.53	0.5	mg/L	103	101	2
		Nitrite Nitrogen	EPA 300.0	22090653-002	ND	HT,	0.482	0.474	0.125	mg/L	NC	NC	NC

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tel (702) 475-8899
fax (702) 622-2868
EPA LAB ID: NV00932

QCBatchID	QCType	Parameter	Method	Spike Sample	Sample Result		MS Result	MSD Result	Spike Value	Units	MS %Rec	MSD %Rec	RPD %
QC22091162	MS 2	Chloride	EPA 300.0	22090653-008	13.1		14.4	14.5	1.25	mg/L	108	113	<1
		Nitrate Nitrogen	EPA 300.0	22090653-008	ND	HT	0.532	0.535	0.5	mg/L	106	107	<1
		Nitrite Nitrogen	EPA 300.0	22090653-008	ND	HT,	0.069	0.072	0.125	mg/L	NC	NC	NC
QC22091291	MS 1	Total Kjeldahl Nitrogen	EPA 351.2	22090723-008	0.561		1.09	1.15	0.5	mg/L	105	117	5
QC22091291	MS 2	Total Kjeldahl Nitrogen	EPA 351.2	22090653-005	2.12	SC	2.78	3.68	0.5	mg/L	NC	NC	NC
QC22091368	MS 1	Total Phosphorous as P	SM 4500-P E	22090579-002	0.052		0.311	0.302	0.25	mg/L	104	100	3
QC22091368	MS 2	Total Phosphorous as P	SM 4500-P E	22090640-001	0.415	M	0.468	0.436	0.25	mg/L	NC	NC	NC
QC22091435	MS 1	Total Phosphorous as P	SM 4500-P E	22090640-002	0.456		0.718	0.700	0.25	mg/L	105	98	2
QC22091435	MS 2	Total Phosphorous as P	SM 4500-P E	22090663-001	0.762	M	0.990	0.999	0.25	mg/L	NC	NC	NC
QC22100023	MS 1	Oil & Grease (HEM)	EPA 1664	22090640-003	ND	U	9.06		10	mg/L	79	NA	NA

DF=Dilution Factor, RL = Reporting Limit (minimum 3X the MDL), ND = Not Detected <RL or <MDL (if listed)

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WETLAB
WESTERN ENVIRONMENTAL TESTING LABORATORY
Specializing in Soil, Hazardous Waste and Water Analysis.

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WETLAB Order ID. 2209064O
Sparks Control #
Elko Control #
LV Control #
Report Due Date
Page 1 of 1

Client Cardno
Address 295 Hwy 50, Suite #1
City, State & Zip Zephyr Cove, NV 89448
Contact ~~Shaun Buckman~~ PARKER JOHNSON
Phone 775.588.9069 | Collector's Name Frank P.
Fax | PWS/Project Name Heavenly
P.O. Number parker.johnson@ | PWS/Project Number
Email ~~shaun.buckman@cardno.com~~ CARDO.COM

Billing Address (if different than Client Address)
Company
Address
City, State & Zip
Contact
Phone Fax
Email shaun.buckman@cardno.com

Turnaround Time Requirements
Standard ✓
5 Day* (25%) | 72 Hour* (50%)
48 Hour* (100%) | 24 Hour* (200%)
*Surcharges Will Apply

Samples Collected From Which State? NV | CA ✓ | Other
Compliance Monitoring? Yes ✓ | No
Report to Regulatory Agency? Yes ✓ | No
Report Results Via: PDF ✓ | EDD | Other
Standard QC Required? Yes ✓ | No

SAMPLE ID/LOCATION	DATE	TIME	PRES TYPE *	SAMPLE TYPE **	NO. OF CONTAINERS	Oil and Grease w/ Silica Gel	Total Phosphorus	Chloride	Nitrate as Nitrogen	Nitrite as Nitrogen	TKN (Kjeldahl)	Total Nitrogen	Turbidity	TSS		Spl. No.
HVP-1A (North)	9/19/2022	0830	2,4	SW	4	✓	✓	✓	✓	✓	✓	✓	✓	✓		1
HVP-1B (South)	9/19/2022	0832	2,4	SW	4	✓	✓	✓	✓	✓	✓	✓	✓	✓		2
HVP-2 (Outlet)	9/19/2022	2239	2,4	SW	6	✓	✓	✓	✓	✓	✓	✓	✓	✓		3
						2209	4									
*TAHOE LOW RL'S						0640	3									
O+G = 2.0 mg/L RL																

Instructions/Comments/Special Requirements: Oil and Grease - Amber bottles 2 Each for inlets (North and South)

4 Amber bottles for the Outlet (add acid).. 1 Pink Bottle (add acid) and 1 White Bottle (General) for each of the 3 locations.

Sample Matrix Key** DW = Drinking Water WW = Wastewater SW = Surface Water MW = Monitoring Well SD = Solid/Sludge SO = Soil HW = Hazardous Waste OTHER: SW

***SAMPLE PRESERVATIVES:** 1=Unpreserved 2=H2SO4 3=NaOH 4=HCl 5=HNO3 6=Na2S2O3 7=ZnOAc+NaOH 8=HCl/VOA Vial

Temp	Custody Seal	# of Containers	DATE	TIME	Samples Relinquished By	Samples Received By
°C	Y N None	14	9/20/22	1800		
4.1 °C	Y N None	14	9/20/22	2:39		in house
°C	Y N None					
°C	Y N None					

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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). SB 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, unless other agreements are made in writing. This limitation shall apply regardless of the cause of action or legal theory pled or asserted. SB initial

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

APPENDIX C
CALIFORNIA VAULT INSPECTION REPORTS

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Appendix C
California Vault Inspection Reports

C.1 Pacific Stormwater Inspection Report – Units 3, 4, 5, 9, 10, and 11

C.2 Pacific Stormwater Inspection Report – Wildwood Vaults

Pacific Stormwater BMP Solutions
P.O. Box 12246
Santa Rosa , Ca
(707)544-5012 office
www.pacstorm.com

Stormwater Maintenance Report 2022

Heavenly Ski Resort Main Lodge Unit 3, 5 & 9

REPORT CONTENTS

This report contains information regarding the results off the BMP(s) maintenance performed at the Heavenly Ski site.
The following information is provided for each BMP:

Inspection Date
Inspector Information
Weather Conditions
BMP Location
BMP Designation, Type and Configuration
Sediment, Water, and Hydrocarbon Levels if present
BMP overall Condition
BMP Components Condition
Additional Comments and Observations
Inspection Photos
Any further recommended Action

MAINTENANCE SUMMARY

Based on the results of an inspection of BMP(s), the following action was completed:

☑ All maintained BMPs appear to be operating within manufacturer's established specifications. Next inspection to take place Spring 2023

☐ Repairs to one or more off the inspected BMPs is required.

☑ Full service maintenance was performed on Units #3, #5 and #9. See report specifics for details.

Pacific Stormwater BMP Solutions

Stormwater Maintenance Report

PROJECT INFORMATION

Name Heavenly Main Lodge **Unit #** 5

Address 1504 Wildwood Dr, South Lake Tahoe, Ca.

MAINTENANCE DETAILS

Field Manager Gordon Clem **System ID** .05

Date 9/28/2022 **GPS Coordinates**

Weather Dry

SYSTEM TYPE StormFilter SF **MEDIA TYPE** ZPG

CONFIGURATION Vault **CARTRIDGE#** 114

SIZE **11x34**

Sediment Depth - inlet bay 5" **Pronounced Scum Line?** Yes

Sediment Depth - Cartridge Bay 2" **Excessive Hydrocarbons?** No

Sediment Depth - Annular N/A

Water Level - Static 1"

Physical Condition of Unit: Unit appears to be in good working condition.

Field Manager Comments:

Full service maintenance was completed. Consist of Sediment and spent filter removal, power washing of internal components and replacement of spent media filters with manufacturer OEM filters.

Maintenance completed? Yes **Repairs Required?** No

MAINTENANCE AUTHENTICITY

This hereby certifies that the information contained in this report is accurate and was obtained using accepted industry practices.

By: Gordon Clem **Company:** **Pacific Stormwater Solutions**

Signature: Gordon Clem **Date:** 9/28/22

Title: Maintenance Manager

Pacific Stormwater BMP Solutions

Stormwater Maintenance Report

PROJECT INFORMATION

Name Heavenly Main Lodge **Unit#** 3

Address 1504 Wildwood Dr, South Lake Tahoe, Ca.

MAINTENANCE DETAILS

Inspector Gordon Clem **System ID** .03

Date 9/28/2022 **GPS Coordinates**

Weather Dry

SYSTEM TYPE StormFilter SF **MEDIA TYPE** Phoso

CONFIGURATION Manhole **CARTRIDGE#** 7

SIZE 72"

Sediment Depth - inlet bay N/A **Pronounced Scum Line?** Yes

Sediment Depth - Cartridge Bay 5" **Excessive Hydrocarbons?** No

Sediment Depth - Annular N/A

Water Level - Static 13"

Physical Condition of Unit: Unit appears to be in good working condition.

Comments:
Full service maintenance was completed. Consist of Sediment and spent filter removal, power washing of internal components and replacement of spent media filters with manufacturer OEM filters.

Maintenance completed? No **Repairs Required?** No

AUTHENTICITY

This hereby certifies that the information contained in this report is accurate and was obtained using accepted industry practices.

By: Gordon Clem **Company:** **Pacific Stormwater Solutions**

Signature: Gordon Clem **Date:** 9/28/22

Title: Maintenance Manager

Pacific Stormwater BMP Solutions

Stormwater Maintenance Report

PROJECT INFORMATION

Name Heavenly Main Lodge **Unit #** 9

Address 1504 Wildwood Dr, South Lake Tahoe, Ca.

MAINTENANCE DETAILS

Inspector Gordon Clem **System ID** .09

Date 9/28/2022 **GPS Coordinates**

Weather Dry

SYSTEM TYPE StormFilter SF **MEDIA TYPE** Phoso

CONFIGURATION Manhole **CARTRIDGE#** 7

SIZE 72"

Sediment Depth - inlet bay N/A **Pronounced Scum Line?** Yes

Sediment Depth - Cartridge Bay 3" **Excessive Hydrocarbons?** No

Sediment Depth - Annular N/A

Water Level - Static 1"

Physical Condition of Unit: Unit appears to be in good working condition.

Comments:

Full service maintenance was completed. Consist of Sediment and spent filter removal, power washing of internal components and replacement of spent media filters with manufacturer OEM filters.

Maintenance completed? No **Repairs Required?** No

AUTHENTICITY

This hereby certifies that the information contained in this report is accurate and was obtained using accepted industry practices.

By: Gordon Clem **Company:** Pacific Stormwater Solutions

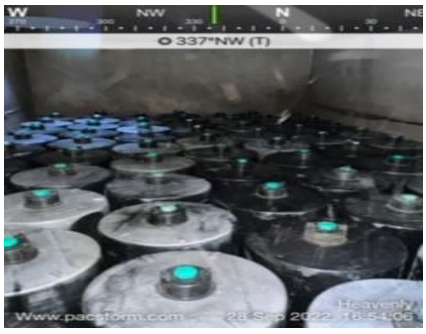
Signature: Gordon Clem **Date:** 9/28/22

Title: Maintenance Manager

Pacific Stormwater BMP Solutions

Stormwater Maintenance Report

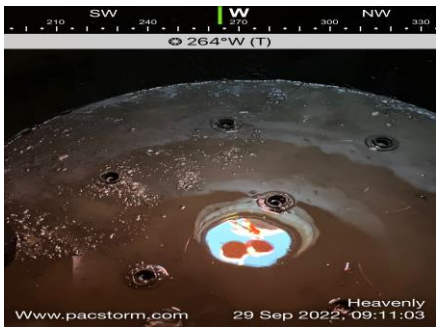
MAINTENANCE PHOTOS



Unit #5 During maintenance Completed

Unit #3 During maintenance Completed

All systems had sediment and spent filters removed. Power washed internal components



Unit #5 During maintenance Completed

Above systems had OEM manufacturer supplied filters installed.

STORMWATER TREATMENT UNIT

MAINTENANCE COMPLIANCE 2022

Heavenly Main Lodge
1504 Wildwood Ave
South Lake Tahoe, Ca.

Let it be known that on September 28th, 2022 Three CONTECH stormwater Media Filter systems were maintained by a qualified professional at a frequency and in a manner consistent with the manufacturer's guidelines for general inspection and maintenance. All systems appear to be operating as designed. Maintenance with filter replacement performed on units #3, #5,#9 and Wildwood. Sediment removal only on unit #4, #10 and #11 as Filter media was loose and unimpacted. recommend Inspection Spring 2023.

Therefore, based on these activities and by signed authorization below, this hereby certifies that the StormFilter Stormwater treatment systems at the above referenced location are currently performing as designed.

CERTIFICATE AUTHORIZATION

Gordon Clem
Maintenance Manager
Pacific Stormwater BMP Solutions
12/16/22

Pacific Stormwater BMP Solutions
P.O. Box 12246
Santa Rosa , Ca
(707)544-5012 office
www.pacstorm.com

Stormwater Maintenance Report 2022

Heavenly Ski Resort Main Lodge Wildwood Ave

REPORT CONTENTS

This report contains information regarding the results off the BMP(s) maintenance performed at the Heavenly Ski site.
The following information is provided for each BMP:

Maintenance Date
Maintenance Information
Weather Conditions
BMP Location
BMP Designation, Type and Configuration
Sediment, Water, and Hydrocarbon Levels if present
BMP overall Condition
BMP Components Condition
Additional Comments and Observations
Maintenance Photos
Any further recommended Action

MAINTENANCE SUMMARY

Based on the results of an inspection of BMP(s), the following action was completed:

☑ All inspected BMPs are operating within manufacturer's established specifications. Next inspection to take place Spring 2023.

☐ Repairs to one or more off the inspected BMPs is required.

☑ Maintenance of one or more of the BMP systems completed. See report specifics for details.

Pacific Stormwater BMP Solutions

Stormwater Maintenance Report

PROJECT INFORMATION

Name Heavenly Main Lodge **Unit #** 11

Address Wildwood Ave, South Lake Tahoe, Ca.

MAINTENANCE DETAILS - WILDWOOD AVE Unit

Field Manager Gordon Clem **System ID**

Date 09/28/22 **GPS Coordinates** Wildwood Ave

Weather Dry

SYSTEM TYPE StormFilter SF **MEDIA TYPE** ZPG

CONFIGURATION Vault **CARTRIDGE#** 27

SIZE

Sediment Depth - inlet bay N/A **Pronounced Scum Line?** Yes

Sediment Depth - Cartridge Bay 9" **Excessive Hydrocarbons?** No

Sediment Depth - Annular N/A

Water Level - Static 17"

Physical Condition of Unit: Unit appears to be in good working condition.

Field Managers Comments:

Maintenance completed and system is treating runoff as designed. Sediment and static water removed from StormFilter and CDS unit. Manufacturer supplied OEM filters replaced at this time.

Maintenance completed? Yes **Repairs Required?** No

MAINTENANCE AUTHENTICITY

This hereby certifies that the information contained in this report is accurate and was obtained using accepted industry practices.

By: Gordon Clem **Company:** Pacific Stormwater Solutions

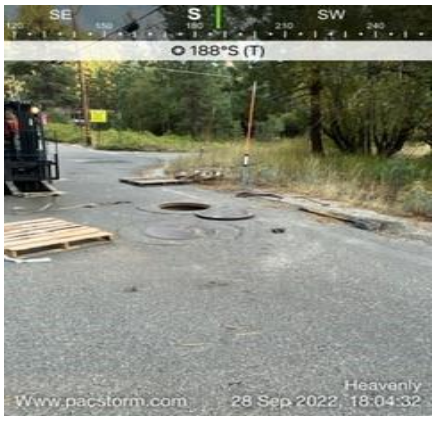
Signature: Gordon Clem **Date:** 9/28/22

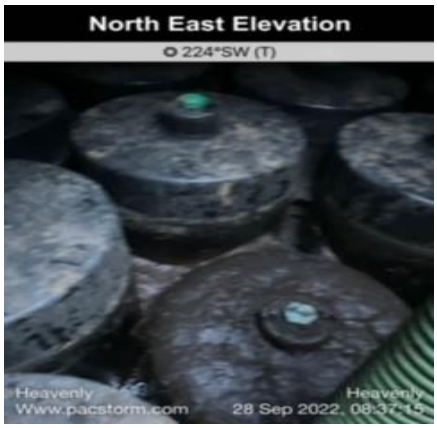
Title: Maintenance Manager

Pacific Stormwater BMP Solutions

Stormwater Maintenance Report

MAINTENANCE PHOTOS

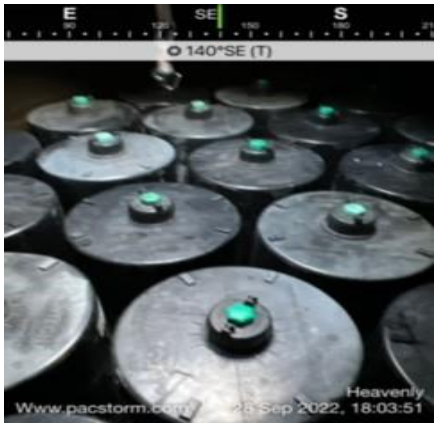




Before maintenance

During maintenance

Wildwood unit



CDS unit had sediment and static water removed.

STORMWATER TREATMENT UNIT

MAINTENANCE COMPLIANCE 2022

Heavenly Main Lodge
1504 Wildwood Ave
South Lake Tahoe, Ca.

Let it be known that on September 28th, 2022 Wildwood CONTECH stormwater filtration system and One CDS hydrodynamic separater were maintained by a qualified professional at a frequency and in a manner consistent with the manufacturer's guidelines for general inspection and maintenance. System is operating as designed. Full service maintenance with OEM filter replacement was completed. Recommend next inspection Spring 2023.

Therefore, based on these activities and by signed authorization below, this hereby certifies that the StormFilter Stormwater treatment systems at the above referenced location are currently performing as designed.

CERTIFICATE AUTHORIZATION

Gordon Clem
Maintenance Manager
Pacific Stormwater BMP Solutions
12/16/22

APPENDIX D
FACILITIES MAINTENANCE MONITORING REPORTS (FOURTH QUARTER)

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Appendix D
Facilities Maintenance Monitoring Reports (Fourth Quarter)

D.1 July 2022 Monthly Maintenance Inspection Logs

D.2 August 2022 Monthly Maintenance Inspection Logs

D.3 September 2022 Monthly Maintenance Inspection Logs

HEAVENLY SKI RESORT
DEICERS and ABRASIVES APPLICATION

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

DAILY LOG

MONTH/YEAR: Jul-22

LOCATION NAME: California Main Lodge

For days when Heavenly Ski Resort (discharger) applies abrasives or ice control agents on parking lots and roadways, Heavenly Personnel shall record the following daily use for weekly submittal to supervisors and monthly submittal to Anthony D'Angelo for input into Quarterly reporting to LRWQCB:

Location Codes:
1 H/UL – Cal Base Upper Lot
2 H/LL – Cal Base Lower Lot
3 H/W – Entrance Road (Wildwood above Saddle)
4 C/WN CSLT – Wildwood – Needle Peak
5 C/SR CSLT - Ski Run
6 C/K CSLT – Keller
7 C/S CSLT-Sherman Way
8 C/R CSLT- Regina
9 Other – **Describe**:

Material Codes
C – Cinders
NaCl- Salt
S - Sand
Other – **Describe:**
B - Brine

Date/Time	Quantity (lbs)	Location Code	Type of Material

Total Monthly APPLICATION Heavenly (lbs?)	**salt**		**sand**	
		0.0		0.0
	salt		**sand**	
Total Monthly APPLICATION in CSLT (lbs?)		0.0		0.0
Submit Weekly to Supervisor.				
Time period covered		**7/1/2022**	**7/31/2022**	

Employee Signature/DATE
Steven Kirkpatrick / 7/31/22

HEAVENLY SKI RESORT
DEICERS and ABARSIVES APPLICATION and RECOVERY

Monthly Summary Report

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

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 Anthony D'Angelo for Quarterly reporting to LRWQCB:

Month and Year: Jul-22 **Reporter:** Steven Kirkpatrick

Location Name: Heavenly California Base and City of South Lake Tahoe Roads
Total Monthly Application: 0 lbs
Total Monthly Recovery: 9,280 lbs

Location of Disposal Facilities: Carson Landfill (by Tahoe Refuse)

Steven Kirkpatrick
Employee Signature

Oncall Material Tracking by Account

Date	Service Order Nbr	Act Nbr	Vehicle Nbr	Cont Size/Type	Landfill Ticket Nbr	Tons	Weight	Rate	Taxes	Cost
3/2022										
Landfill Site:	**STR BUNKERS**									
Material:	**CONCRETE/DIRT/ASPHALT**									
03/30/2022	536938	50400424	105	DB-10Y-SP	3139930	7.75	7.75	$0.00	$0.00	$0.00
03/31/2022	537062	50400424	118	DB-10Y-SP	3140034	10.81	10.81	$0.00	$0.00	$0.00
	Totals by Material:					**18.56**	**18.56**	**$0.00**	**$0.00**	**$0.00**
	Totals by Landfill Site:					**18.56**	**18.56**	**$0.00**	**$0.00**	**$0.00**
5/2022										
Landfill Site:	**STR BUNKERS**									
Material:	**CONCRETE/DIRT/ASPHALT**									
05/18/2022	543127	50400424	119	DB-10Y-SP	3143572	9.75	9.75	$0.00	$0.00	$0.00
	Totals by Material:					**9.75**	**9.75**	**$0.00**	**$0.00**	**$0.00**
	Totals by Landfill Site:					**9.75**	**9.75**	**$0.00**	**$0.00**	**$0.00**
7/2022										
Landfill Site:	**STR BUNKERS**									
Material:	**CONCRETE/DIRT/ASPHALT**									
07/19/2022	551800	50400424	117	DB-10Y-SP	3148506	4.64	4.64	$0.00	$0.00	$0.00
	Totals by Material:					**4.64**	**4.64**	**$0.00**	**$0.00**	**$0.00**
	Totals by Landfill Site:					**4.64**	**4.64**	**$0.00**	**$0.00**	**$0.00**
8/2022										
Landfill Site:	**STR AMFAB**									
Material:	**MSW**									
08/03/2022	554503	50400424	105	DB-33Y	3149651	2.71	2.71	$0.00	$0.00	$0.00
08/31/2022	558886	50400424	117	DB-33Y	3151757	1.21	1.21	$0.00	$0.00	$0.00
	Totals by Material:					**3.92**	**3.92**	**$0.00**	**$0.00**	**$0.00**
	Totals by Landfill Site:					**3.92**	**3.92**	**$0.00**	**$0.00**	**$0.00**
Landfill Site:	**STR RRF**									
Material:	**GREEN WASTE**									
08/23/2022	557260	50400424	117	DB-40Y	3151197	4.45	4.45	$0.00	$0.00	$0.00
	Totals by Material:					**4.45**	**4.45**	**$0.00**	**$0.00**	**$0.00**
Material:	**SLASH/MILLED WOOD**									
08/12/2022	556042	50400424	105	DB-40Y	3150431	4.83	4.83	$0.00	$0.00	$0.00

Date	Service Order Nbr	Act Nbr	Vehicle Nbr	Cont Size/Type	Landfill Ticket Nbr	Tons	Weight	Rate	Taxes	Cost
Totals by Material:						**4.83**	**4.83**	**$0.00**	**$0.00**	**$0.00**
Totals by Landfill Site:						**9.28**	**9.28**	**$0.00**	**$0.00**	**$0.00**
Grand Total:						**46.15**	**46.15**	**$0.00**	**$0.00**	**$0.00**

HEAVENLY SKI RESORT
DEICERS and ABRASIVES RECOVERY

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

DAILY LOG

MONTH/YEAR: Jul-22

LOCATION NAME: Heavenly Upper Lot (15 min, bus drop, tram)

For abrasives or ice control agents that Heavenly Ski Resort (discharger) **removed** from parking lots and roadways, Heavenly Personnel shall record the following in a daily log for weekly submittal to supervisors and monthly submittal to Anthony D'Angelo for input into Quarterly reporting to LRWQCB:

Location Codes:
H/UL – Cal Base Upper Lot
H/LL – Cal Base Lower Lot
H/W – Entrance Road (Wildwood above Sad
C/WN CSLT – Wildwood – Needle Peak
C/SR CSLT - Ski Run
C/K CSLT – Keller
C/S CSLT- Sherman Way
C/R CSLT - Regina
Other – **Describe**:

Material Codes
DG - Spec H Sand
NaCl - Salt
S - Sand
Other – **Describe:**

Equipment/Method Used: (first three loads fromdraingage improvement.
Sweeping

Date	Type of Material	Quantity (lbs)

Total Monthly RECOVERY Heavenly (lbs?) 9,280 Sand 0 salt

Total Monthly RECOVERY in CSLT (lbs?) 9,280 Sand 0 salt

Submit Monthly to Supervisor. Time period covered 7/1/2022 to 7/31/2022

Steven Kirkpatrick
Employee Signature

Steven Kirkpatrick
Supervisor Signature

HEAVENLY SKI RESORT
CALIFORNIA PARKING LOT, LODGE and ROADS
MONITORING CHECKLIST

(MONITORING AND REPORTING PROGRAM NO.R6T-2015-0021)

Date: Jul-22 Inspector: Steven Kirkwpatrick

Complete the following inspection at the **CA Parking Lot, CA Base Lodge, and associated roads**, at least once monthly and after significant storm events. Turn in Checklists to Supervisor for submittal to Anthony D'Angelo for input into Quarterly reports to LRWQCB.

Were any of the following Observed?	Yes	No	Comments
a. Drop Inlets (CA parking Lot and Roads)			Describe Problems, Locations and Corrective Actions
1) Clogged by Debris, ice, or sediment?		X	
2) Runoff movement into the infiltration gallery?		X	
3) Damaged by vehicles or snow plow?	X		2 Drop inlet minor damage that does not effect drainage or H&S Work order in place.
b. Drainage Collection System (Ca Parking Lot, Roads)			Describe Problems, Locations and Corrective Actions
1) Clogged by debris, ice, or sediment?	X		Groundwater seep culvert on Wildwood Avenue blocked by sediment. Will open culvert back up.
2) Movement of water through pipes, channels and appurtenances impeded?		X	
3) Drainage collection system damages?		X	
4) Inadequate energy dissipation?		X	
c. Sediment Traps and Vaults (CA Prkng Lot & Roads)			Describe Problem and Corrective Actions
1) Sediment accumulated in each chamber of trap vaults, or galleries? If Yes, estimate depth and volume.	X		Vaults were inspected in July by Pacific Stormwater; will be cleaned in August 2022.
2) Traps and Vaults recently cleaned? List date of last cleaning.		X	Clean Harbors DIC 07/30/2021 Pacific Stormwater Filters 07/15/2021
3) Presence of sheen, foam trash or scum?		X	

d. <u>Erosion Control</u> (CA parking Lot, Lodges, and Maintenance Shops)		Please Note Locations and Corrective Actions
1) Vegetation appears unhealthy?	X	
2) Gully or rill erosion on slopes?	X	
3) Sediment buildup at toes of slopes?	X	
4) Vegetation damages by vehicles or heavy foot traffic?	X	
e. <u>Culvert Outlet (west of Wildwood Ave)</u>		Please Note Locations and Corrective Actions
1) Inadequate energy dissipation	X	
2) Trash or debris needs to be removed from drainage way?	X	
f. Upstream Drainage Diversion (Located on First Ride Run)		Please Note Locations and Corrective Actions
1) Inadequate energy dissipation	X	
2) Trash or debris needs to be removed from drainage way?	X	
g. Spilled Chemicals, Paints, Fuels, Sealants, Oils,	X	
h. Sediment/Sand Buildup in CA parking Lot?	X	No build up as recent street sweeping was performed
i. Grease Interceptor Not Operating Properly? (CA Base Lodge)	X	

<u>Describe any problems / activities, dates and times of problems/activities and the personnel to which problems were reported:</u>

Documentation of resulting actions and dates problems corrected:

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

CHECKLIST FOR OPERATION AND MAINTENANCE INSPECTION RECORD

Name of Area: California Base Lodge Parking Lot

Date of Inspection: 07/31/22

Name of Inpector: Steven Kirkpatrick

System/Structure Inspected: Wildwood Culvert

Structure ID or Location	Comments and Observations	Acceptable	Unacceptable	Required maintenance
Wildwood Culvert	steady water flow	X		N/A

HEAVENLY SKI RESORT SNOW CONDITIONING and SNOW ENHANCEMENT Water Year 2021	**(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021 WDID 6A090033000 WASTE DISCHARGE REQUIREMENTS**	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: ***Heavenly Ski Resort*** Department : **Base Operations** Reporter**: Anthony D'Angelo**	California Main Lodge	**Type of Materials Applied "traction melt "** **Approximate Acreage: 1 *ACRE)***

Date	Pounds used	ACRES
7/1/2022	0.00	0.00
7/2/2022	0.00	0.00
7/3/2022	0.00	0.00
7/4/2022	0.00	0.00
7/5/2022	0.00	0.00
7/6/2022	0.00	0.00
7/7/2022	0.00	0.00
7/8/2022	0.00	0.00
7/9/2022	0.00	0.00
7/10/2022	0.00	0.00
7/11/2022	0.00	0.00
7/12/2022	0.00	0.00
7/13/2022	0.00	0.00
7/14/2022	0.00	0.00
7/15/2022	0.00	0.00
7/16/2022	0.00	0.00
7/17/2022	0.00	0.00
7/18/2022	0.00	0.00
7/19/2022	0.00	0.00
7/20/2022	0.00	0.00
7/21/2022	0.00	0.00
7/22/2022	0.00	0.00
7/23/2022	0.00	0.00
7/24/2022	0.00	0.00
7/25/2022	0.00	0.00
7/26/2022	0.00	0.00
7/27/2022	0.00	0.00
7/28/2022	0.00	0.00
7/29/2022	0.00	0.00
7/30/2022	0.00	0.00
7/31/2022	0.00	0.00
Total	0.00	0.00

Employee sign off, **Steven Kirkpatrick**

HEAVENLY SKI RESORT
DEICERS and ABRASIVES APPLICATION

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

DAILY LOG

MONTH/YEAR: Aug-22

LOCATION NAME: California Main Lodge

For days when Heavenly Ski Resort (discharger) applies abrasives or ice control agents on parking lots and roadways, Heavenly Personnel shall record the following daily use for weekly submittal to supervisors and monthly submittal to Anthony D'Angelo for input into Quarterly reporting to LRWQCB:

Location Codes:
1 H/UL – Cal Base Upper Lot
2 H/LL – Cal Base Lower Lot
3 H/W – Entrance Road (Wildwood above Saddle)
4 C/WN CSLT – Wildwood – Needle Peak
5 C/SR CSLT - Ski Run
6 C/K CSLT – Keller
7 C/S CSLT-Sherman Way
8 C/R CSLT- Regina
9 Other – **Describe**:

Material Codes
C – Cinders
NaCl- Salt
S - Sand
Other – **Describe:**
B - Brine

Date/Time	Quantity (lbs)	Location Code	Type of Material

Total Monthly APPLICATION Heavenly (lbs?)	**salt**		**sand**	
		0.0		0.0
	salt		**sand**	
Total Monthly APPLICATION in CSLT (lbs?)		0.0		0.0
Submit Weekly to Supervisor.				
Time period covered		**8/1/2022**	**8/31/2022**	

Employee Signature/DATE
Steven Kirkpatrick / 8/31/22

HEAVENLY SKI RESORT
DEICERS and ABARSIVES APPLICATION and RECOVERY

Monthly Summary Report

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

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 Anthony D'Angelo for Quarterly reporting to LRWQCB:

Month and Year: Aug-22 **Reporter:** Steven Kirkpatrick

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)

Steven Kirkpatrick
Employee Signature

HEAVENLY SKI RESORT
DEICERS and ABRASIVES RECOVERY

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

DAILY LOG

MONTH/YEAR: Jul-22

LOCATION NAME: Heavenly Upper Lot (15 min, bus drop, tram)

For abrasives or ice control agents that Heavenly Ski Resort (discharger) **removed** from parking lots and roadways, Heavenly Personnel shall record the following in a daily log for weekly submittal to supervisors and monthly submittal to Anthony D'Angelo for input into Quarterly reporting to LRWQCB:

Location Codes:
H/UL – Cal Base Upper Lot
H/LL – Cal Base Lower Lot
H/W – Entrance Road (Wildwood above Sad
C/WN CSLT – Wildwood – Needle Peak
C/SR CSLT - Ski Run
C/K CSLT – Keller
C/S CSLT- Sherman Way
C/R CSLT - Regina
Other – **Describe**:

Material Codes
DG - Spec H Sand
NaCl - Salt
S - Sand
Other – **Describe:**

Equipment/Method Used: (first three loads fromdraingage improvement.
Sweeping

Date	**Type of Material**	**Quantity (lbs)**

Total Monthly RECOVERY Heavenly (lbs?) 0 Sand 0 salt

Total Monthly RECOVERY in CSLT (lbs?) 0 Sand 0 salt

Submit Monthly to Supervisor. Time period covered 8/1/2022 to 8/31/2022

Steven Kirkpatrick
Employee Signature

Steven Kirkpatrick
Supervisor Signature

HEAVENLY SKI RESORT
CALIFORNIA PARKING LOT, LODGE and ROADS
MONITORING CHECKLIST

(MONITORING AND REPORTING PROGRAM NO.R6T-2015-0021)

Date: Aug-22 Inspector: Steven Kirkwpatrick

Complete the following inspection at the **CA Parking Lot, CA Base Lodge, and associated roads**, at least once monthly and after significant storm events. Turn in Checklists to Supervisor for submittal to Anthony D'Angelo for input into Quarterly reports to LRWQCB.

Were any of the following Observed?	Yes	No	Comments
a. <u>Drop Inlets</u> (CA parking Lot and Roads)			Describe Problems, Locations and Corrective Actions
1) Clogged by Debris, ice, or sediment?		X	
2) Runoff movement into the infiltration gallery?		X	
3) Damaged by vehicles or snow plow?	X		2 Drop inlet minor damage that does not effect drainage or H&S Work order in place.
b. <u>Drainage Collection System</u> (Ca Parking Lot, Roads)			Describe Problems, Locations and Corrective Actions
1) Clogged by debris, ice, or sediment?	X		Groundwater seep culvert on Wildwood Avenue blocked by sediment. Will open culvert back up.
2) Movement of water through pipes, channels and appurtenances impeded?		X	
3) Drainage collection system damages?		X	
4) Inadequate energy dissipation?		X	
c. <u>Sediment Traps and Vaults</u> (CA Prkng Lot & Roads)			Describe Problem and Corrective Actions
1) Sediment accumulated in each chamber of trap vaults, or galleries? If Yes, estimate depth and volume.	X		Vaults were inspected in July by Pacific Stormwater; will be cleaned in August 2022.
2) Traps and Vaults recently cleaned? List date of last cleaning.		X	Clean Harbors DIC 07/30/2021 Pacific Stormwater Filters 07/15/2021
3) Presence of sheen, foam trash or scum?		X	

d. <u>Erosion Control</u> (CA parking Lot, Lodges, and Maintenance Shops)		Please Note Locations and Corrective Actions
1) Vegetation appears unhealthy?	X	
2) Gully or rill erosion on slopes?	X	
3) Sediment buildup at toes of slopes?	X	
4) Vegetation damages by vehicles or heavy foot traffic?	X	
e. <u>Culvert Outlet (west of Wildwood Ave)</u>		Please Note Locations and Corrective Actions
1) Inadequate energy dissipation	X	
2) Trash or debris needs to be removed from drainage way?	X	
f. Upstream Drainage Diversion (Located on First Ride Run)		Please Note Locations and Corrective Actions
1) Inadequate energy dissipation	X	
2) Trash or debris needs to be removed from drainage way?	X	
g. Spilled Chemicals, Paints, Fuels, Sealants, Oils,	X	
h. Sediment/Sand Buildup in CA parking Lot?	X	No build up as recent street sweeping was performed July 2022
i. Grease Interceptor Not Operating Properly? (CA Base Lodge)	X	

<u>Describe any problems / activities, dates and times of problems/activities and the personnel to which problems were reported:</u>

Documentation of resulting actions and dates problems corrected:

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

CHECKLIST FOR OPERATION AND MAINTENANCE INSPECTION RECORD

Name of Area: California Base Lodge Parking Lot

Date of Inspection: 08/29/22

Name of Inpector: Steven Kirkpatrick

System/Structure Inspected: Wildwood Culvert

Structure ID or Location	Comments and Observations	Acceptable	Unacceptable	Required maintenance
Wildwood Culvert	steady water flow	X		N/A

HEAVENLY SKI RESORT SNOW CONDITIONING and SNOW ENHANCEMENT Water Year 2021	**(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021 WDID 6A090033000 WASTE DISCHARGE REQUIREMENTS**	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: ***Heavenly Ski Resort*** Department : **Base Operations** Reporter**: Anthony D'Angelo**	California Main Lodge	**Type of Materials Applied "traction melt "** **Approximate Acreage: 1 *ACRE)***

Date	Pounds used	ACRES
8/1/2022	0.00	0.00
8/2/2022	0.00	0.00
8/3/2022	0.00	0.00
8/4/2022	0.00	0.00
8/5/2022	0.00	0.00
8/6/2022	0.00	0.00
8/7/2022	0.00	0.00
8/8/2022	0.00	0.00
8/9/2022	0.00	0.00
8/10/2022	0.00	0.00
8/11/2022	0.00	0.00
8/12/2022	0.00	0.00
8/13/2022	0.00	0.00
8/14/2022	0.00	0.00
8/15/2022	0.00	0.00
8/16/2022	0.00	0.00
8/17/2022	0.00	0.00
8/18/2022	0.00	0.00
8/19/2022	0.00	0.00
8/20/2022	0.00	0.00
8/21/2022	0.00	0.00
8/22/2022	0.00	0.00
8/23/2022	0.00	0.00
8/24/2022	0.00	0.00
8/25/2022	0.00	0.00
8/26/2022	0.00	0.00
8/27/2022	0.00	0.00
8/28/2022	0.00	0.00
8/29/2022	0.00	0.00
8/30/2022	0.00	0.00
8/31/2022	0.00	0.00
Total	0.00	0.00

Employee sign off, **Steven Kirkpatrick**

HEAVENLY SKI RESORT
DEICERS and ABRASIVES APPLICATION

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

DAILY LOG

MONTH/YEAR: Sep-22

LOCATION NAME: California Main Lodge

For days when Heavenly Ski Resort (discharger) applies abrasives or ice control agents on parking lots and roadways, Heavenly Personnel shall record the following daily use for weekly submittal to supervisors and monthly submittal to Anthony D'Angelo for input into Quarterly reporting to LRWQCB:

Location Codes:
1 H/UL – Cal Base Upper Lot
2 H/LL – Cal Base Lower Lot
3 H/W – Entrance Road (Wildwood above Saddle)
4 C/WN CSLT – Wildwood – Needle Peak
5 C/SR CSLT - Ski Run
6 C/K CSLT – Keller
7 C/S CSLT-Sherman Way
8 C/R CSLT- Regina
9 Other – **Describe**:

Material Codes
C – Cinders
NaCl- Salt
S - Sand
Other – **Describe:**
B - Brine

Date/Time	Quantity (lbs)	Location Code	Type of Material

Total Monthly APPLICATION Heavenly (lbs?)	**salt**	0.0	**sand**	0.0
Total Monthly APPLICATION in CSLT (lbs?)	**salt**	0.0	**sand**	0.0
Submit Weekly to Supervisor.				
Time period covered	**9/1/2022**		**9/30/2022**	

Employee Signature/DATE
Anthony D'Angelo / 9/30/22

HEAVENLY SKI RESORT
DEICERS and ABARSIVES APPLICATION and RECOVERY

Monthly Summary Report

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

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 Anthony D'Angelo for Quarterly reporting to LRWQCB:

Month and Year: Sep-22 **Reporter:** Anthony D'Angelo

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)

Steven Kirkpatrick
Employee Signature

HEAVENLY SKI RESORT
DEICERS and ABRASIVES RECOVERY

(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021
WDID 6A090033000
WASTE DISCHARGE REQUIREMENTS

DAILY LOG

MONTH/YEAR: Sep-22

LOCATION NAME: Heavenly Upper Lot (15 min, bus drop, tram)

For abrasives or ice control agents that Heavenly Ski Resort (discharger) **removed** from parking lots and roadways, Heavenly Personnel shall record the following in a daily log for weekly submittal to supervisors and monthly submittal to Anthony D'Angelo for input into Quarterly reporting to LRWQCB:

Location Codes:
H/UL – Cal Base Upper Lot
H/LL – Cal Base Lower Lot
H/W – Entrance Road (Wildwood above Sad
C/WN CSLT – Wildwood – Needle Peak
C/SR CSLT - Ski Run
C/K CSLT – Keller
C/S CSLT- Sherman Way
C/R CSLT - Regina
Other – **Describe**:

Material Codes
DG - Spec H Sand
NaCl - Salt
S - Sand
Other – **Describe:**

Equipment/Method Used: (first three loads fromdraingage improvement.
Sweeping

Date	**Type of Material**	**Quantity (lbs)**

Total Monthly RECOVERY Heavenly (lbs?) 0 Sand 0 salt

Total Monthly RECOVERY in CSLT (lbs?) 0 Sand 0 salt

Submit Monthly to Supervisor. Time period covered 9/1/2022 to 9/30/2022

Anthony D'Angelo
Employee Signature

Anthony D'Angelo
Supervisor Signature

HEAVENLY SKI RESORT
CALIFORNIA PARKING LOT, LODGE and ROADS
MONITORING CHECKLIST

(MONITORING AND REPORTING PROGRAM NO.R6T-2015-0021)

Date: Sep-22 Inspector: Anthony D'Angelo

Complete the following inspection at the **CA Parking Lot, CA Base Lodge, and associated roads**, at least once monthly and after significant storm events. Turn in Checklists to Supervisor for submittal to Anthony D'Angelo for input into Quarterly reports to LRWQCB.

Were any of the following Observed?	Yes	No	Comments
a. Drop Inlets (CA parking Lot and Roads)			Describe Problems, Locations and Corrective Actions
1) Clogged by Debris, ice, or sediment?		X	
2) Runoff movement into the infiltration gallery?		X	
3) Damaged by vehicles or snow plow?	X		2 Drop inlet minor damage that does not effect drainage or H&S Work order in place.
b. Drainage Collection System (Ca Parking Lot, Roads)			Describe Problems, Locations and Corrective Actions
1) Clogged by debris, ice, or sediment?		X	
2) Movement of water through pipes, channels and appurtenances impeded?		X	
3) Drainage collection system damages?		X	
4) Inadequate energy dissipation?		X	
c. Sediment Traps and Vaults (CA Prkng Lot & Roads)			Describe Problem and Corrective Actions
1) Sediment accumulated in each chamber of trap vaults, or galleries? If Yes, estimate depth and volume.	X		Vaults were inspected in July by Pacific Stormwater; and cleaned by Gramar Environmental in September. Maintenance on vaults occurred on Septmber 28, 2022.
2) Traps and Vaults recently cleaned? List date of last cleaning.		X	Graymar DIC 09/12/2022 Pacific Stormwater Filters 09/28/2022
3) Presence of sheen, foam trash or scum?		X	

d. Erosion Control (CA parking Lot, Lodges, and Maintenance Shops)		Please Note Locations and Corrective Actions
1) Vegetation appears unhealthy?	X	
2) Gully or rill erosion on slopes?	X	
3) Sediment buildup at toes of slopes?	X	
4) Vegetation damages by vehicles or heavy foot traffic?	X	
e. Culvert Outlet (west of Wildwood Ave)		Please Note Locations and Corrective Actions
1) Inadequate energy dissipation	X	
2) Trash or debris needs to be removed from drainage way?	X	
f. Upstream Drainage Diversion (Located on First Ride Run)		Please Note Locations and Corrective Actions
1) Inadequate energy dissipation	X	
2) Trash or debris needs to be removed from drainage way?	X	
g. Spilled Chemicals, Paints, Fuels, Sealants, Oils,	X	
h. Sediment/Sand Buildup in CA parking Lot?	X	No build up as recent street sweeping was performed July 2022
i. Grease Interceptor Not Operating Properly? (CA Base Lodge)	X	

Describe any problems / activities, dates and times of problems/activities and the personnel to which problems were reported:

A portion of the lower lot of Cal Base was repaved with asphalt during the month of September. Storm filter maintenance performed on September 28th did not indicate execessive hydrocarbors present in the vault.

Documentation of resulting actions and dates problems corrected:

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

CHECKLIST FOR OPERATION AND MAINTENANCE INSPECTION RECORD

Name of Area: California Base Lodge Parking Lot

Date of Inspection: 09/29/22

Name of Inpector: Anthony D'Angelo

System/Structure Inspected: Wildwood Culvert

Structure ID or Location	Comments and Observations	Acceptable	Unacceptable	Required maintenance
Wildwood Culvert	steady water flow	X		N/A

HEAVENLY SKI RESORT SNOW CONDITIONING and SNOW ENHANCEMENT Water Year 2021	**(MONITORING AND REPORTING PROGRAM) BOARD ORDER NO. R6T-2015-0021 WDID 6A090033000 WASTE DISCHARGE REQUIREMENTS**	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: ***Heavenly Ski Resort*** Department : **Base Operations** Reporter**: Anthony D'Angelo**	California Main Lodge	**Type of Materials Applied "traction melt "** **Approximate Acreage: 1 *ACRE)***

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9/5/2022	0.00	0.00
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9/7/2022	0.00	0.00
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9/11/2022	0.00	0.00
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9/14/2022	0.00	0.00
9/15/2022	0.00	0.00
9/16/2022	0.00	0.00
9/17/2022	0.00	0.00
9/18/2022	0.00	0.00
9/19/2022	0.00	0.00
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9/25/2022	0.00	0.00
9/26/2022	0.00	0.00
9/27/2022	0.00	0.00
9/28/2022	0.00	0.00
9/29/2022	0.00	0.00
9/30/2022	0.00	0.00
Total	0.00	0.00

Employee sign off, **Anthony D'Angelo**

APPENDIX E
2022 ROADS MONITORING

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Appendix E
2022 Roads Monitoring

E.1 2022 Road Report Transmission to LTBMU

E.2 Heavenly Road Maintenance Table 2022

E.3 Heavenly Road Maintenance Map

From: Blair Davidson
To: michael.gabor@usda.gov; paul.potts@usda.gov
Cc: Frederick Newberry; Anthony D"Angelo; Chris Donley; Bryan Hickman
Subject: Heavenly Roads Maintenance Report 2022
Date: Monday, October 10, 2022 8:30:28 PM
Attachments: image001.png
2022 Heavenly Roads Maintenance Report-bh.xlsx

Hi Mike and Paul,

Attached is our roads maintenance report for summer 2022. Please let us know if you have any questions.

Thank you,

Blair Davidson
Mountain Operations | Senior Administrative Assistant
Heavenly Mountain Resort
Cell: (949)887-7812
Office Hours: Monday - Friday 7:30am – 4:00pm

The information contained in this message is confidential and intended only for the use of the individual or entity named above, and may be privileged. Any unauthorized review, use, disclosure, or distribution is prohibited. If you are not the intended recipient, please reply to the sender immediately, stating that you have received the message in error, then please delete this e-mail. Thank you.

Summer 2022

Road Section	Road	Distance	Treatment
NV			
NV Gate to Titos Corner	13N53B	0.1	Water Bar Maintenance & Road Base where needed
Titos	13N53.5	0.2	Water Bar Maintenance & Road Base where needed- NVE Line Work
Chute to Midway Switchbacks	13N53	0.4	Water Bar Maintenance & Road Base where needed- NVE Line Work
*Titos to base of NB	13N53C	0.3	Road realignment for NB lift project
Stage switchbacks	13N53	0.6	Water Bar Maintenance & Road Base where needed
NV Trail Stage to EP	13N53	0.8	Water Bar Maintenance & Road Base where needed
Pepis/Comet to base EP to top NB	13N54	0.5	Water Bar Maintenance & Road Base where needed
T7 Road	13N54	0.2	Inspect, minor maintenance- no road base needed- NVE Line Work
Steve's & Crossover	13N54	0.9	Inspect, minor maintenance- no road base needed
Power Station Road	13N53A	0.4	Inspect, minor maintenance- no road base needed
Galaxy	13N53E.1	1.2	Water Bar Maintenance & Road Base/Drain Rock where needed
Orion's	13N52B	0.6	Water Bar Maintenance & Road Base where needed
Top of Dipper Road	13N52F	0.2	Water Bar Maintenance & Road Base
Total		6.4	
CA			
Groove RD to Upper Shop	12N41	0.6	Water Bar Maintenance, Sed pond cleanout & Road Base where needed
Maggies- Creek to Cal Dam	12N40	0.9	Water Bar Maintenance, Sed pond cleanout & Road Base where needed
Cal Dam to Sky Deck	12N40	0.3	Inspect, minor maintenance- no road base needed
Hellwinkle's	12N40	0.4	BMPs, Road Base, compaction and water
LCT to VS/TOG	12N40	1.4	Water Bar Maintenance & Road Base where needed
TOG Tam to Coaster	12N40.5	0.2	Compaction of walking trails. Water Bar @ Tube hill
Upper CA- Ridge	13N52	1.2	Water Bar Maintenance, Grade work & Road Base
Upper CA Switchbacks	13N52i	0.33	Grade, compaction and BMPs (Woods Trail to Upper Ridge Run)
Roundabout			
Top WC-Pistol	12N40	0.7	Water Bar Maintenance & Road Base where needed
Pistol-Cut	12N40	1.1	Water Bar Maintenance & Road Base where needed
Cut-Creek	12N40	0.5	Water Bar Maintenance & Road Base where needed, V-ditch cleanout
Total		7.63	

	ML4
Roads Improved	0.3
Roads Maintained	14.03
Roads Decommissioned	0

USFS and Heavenly Designated Roads

Legend

- Heavenly_Roads_20150106
- Roads
- Lifts

13N52.9
13N52.8
13N52H
13N52I
13N52.7
13N52.6
Sky Express
12N40E
12N40C
12N40.3
12N40B
12N40D
12N40.5
12N40
12N41A
12N41
12N41B
12N41.1
Pioneer
12N40.2B
12N40.1
Aerial Tramway
12N40A
Carpet
13N52F
13N52.10
13N52D
Tamarack Express
12N40F
Dipper Express
Comet Express
Big Easy
Red Fir
Mott Canyon
13N52B
13N52A
13N53E
13N52
13N54.1
13N54.2A
13N54.2
Galaxy
13N53E.1
13N53E.1A
13N53
13N54
13N54A
Olympic Express
Gondola
Stagecoach Express
13N53D
North Bowl
13N53.6
13N53.5
13N53C
13N53A
13N53B
Boulder
Carpet

Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL,

APPENDIX F
FACILITIES WATERSHED AWARENESS TRAINING

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Appendix F
Facilities Watershed Awareness Training

F.1 June 2022 BMP Breakfast Workshop Presentation

F.2 June 2022 BMP Breakfast Workshop Sign-In Sheets


2022 BMPs, Facilities, &
Watershed Awareness Training
May 18, 2022
Heavenly
LAKE TAHOE

Purpose/Agenda

- Water Quality Agency Partners and Consultants
- Heavenly's Watershed Protection Commitment
- Effective Stormwater Management and BMPs
- Sensitive Plants and Invasive Weeds
- Summer Rules of the Road
- Hot Work Permits
- Summer Weather Hazards and Rain Shut Down Process
- Wildland Fire Hazards
- USFS Wildlife Trash Management and Education Program

Water Quality Agency Partners and Consultants

- **Federal:** United States Forest Service (USFS) Lake Tahoe Basin Management Unit (LTBMU)
- **Bi-State (CA & NV):** Tahoe Regional Planning Agency (TRPA)
- **State (CA):** Lahontan Regional Water Quality Control Board – South Lake Tahoe Office
- **State (NV):** Nevada Department of Environmental Protection (NDEP) – Bureau of Water Pollution Control/Stormwater Branch
- **Consultant:** Resource Concepts, Inc. (RCI)

Our Commitment

- USFS LTBMU: Our partner in outdoor recreation & resource/watershed management
- TRPA: The Master Plan, Mitigation & Monitoring, Project Permit Conditions
- State of California Lahontan Regional Water Quality Control Board: Waste Discharge Requirements (WDRs) & SWPPP's/Stormwater Requirements.
- Nevada Department of Env. Protection (NDEP) SWPPP's/Stormwater Requirements

Effects of Stormwater Runoff

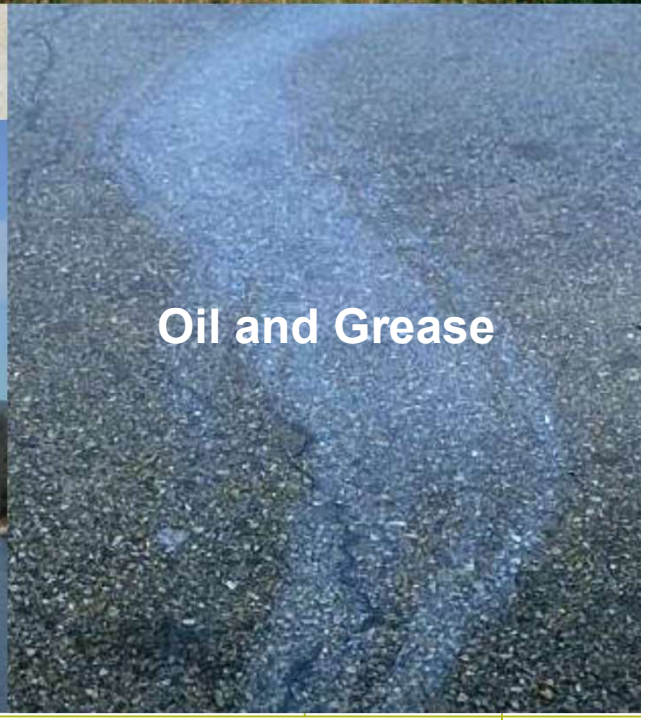
Developed and disturbed land contributes to:

- Water *quality* impacts
  - Pollutants
  - Warmer water temperature
  - Turbidity
- Water *quantity* impacts
  - Increased runoff/reduced infiltration
  - Changes to stream geomorphology
  - Disturbed aquatic habitat

Water Quality

EPA defines the water quality goals for a waterbody by designating its uses, setting criteria to protect those uses, and establishing provisions to protect the water from pollutants.

Pollutants That Affect Water Quality



Impacts of Sediment Discharges

- The rates of sediment runoff from uncontrolled construction sites are typically:
  - 1,000 to 2,000 times more than from forested lands
  - 10 to 20 times more than from agricultural lands
  - 6,700 pounds of sediment/acre
- 84,000 miles of rivers and streams are impaired by excessive sediment
  - To put that in perspective, the earth is approx. 25,000 miles in circumference

Impacts of Sediment Discharges (cont.)

- Ecological
  - Destroys aquatic ecosystem
  - Kills fish, smothers fish eggs and other aquatic organisms
  - Reduces dissolved oxygen levels
  - Blocks light for aquatic plants (macrophytes)
  - Inundates creek bottom substrate (spawning)
- Physical
  - Alters stream/creek flow
  - Alters stream/creek shape
  - Bank scouring
  - Re-deposition of sediment

Forest Policy Publication

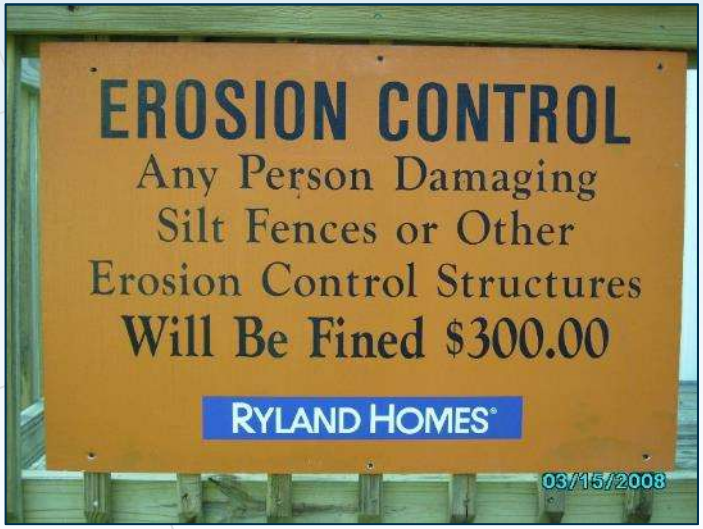
Stormwater BMPs

BMP = Best management practice

EPA

BMP purpose is to…

- Control pollutants at their source
- Reduce/eliminate pollutants from comingling with runoff



Construction Stormwater BMPs

In construction, BMPs help "keep dirt in place"

- *Erosion control BMPs* = prevent surfaces from eroding
- *Sediment control BMPs* = keep eroded soils onsite

Many other pollutants at construction sites besides "dirt"

- Concrete, mortar, stucco
- Paint
- Fuel
- Equipment fluids and oils
- Solvents
- Release agents
- Herbicides
- Human waste

PG Environmental

Other pollutant sources are controlled by *pollution prevention BMPs*

Effective BMPs

- BMPs are most effective when:
  - Used in combination with other BMPs
  - Customized to meet specific needs (e.g., drainage, materials, activities) of a site
  - INSTALLED CORRECTLY!
- Focus of stormwater general permits is preventive BMPs
  - Limit the release of pollutants into stormwater
- Treatment control BMPs needed where pollutants have already comingled with stormwater

Incorrectly Installed BMPs are Ineffective BMPs

PG Environmental

BMP Types

BMPStore.com

- "Structural" BMPs
  - Devices installed or constructed on a site
  - E.g., sediment basins, check dams, silt fence
- "Non-structural" BMPs
  - Institutional changes, ordinance development, procedures, planning, inventories, etc.
  - E.g., employee education, SOPs, housekeeping standards
- Variety of BMPs available
- Selection typically depends on site characteristics and pollutant removal objectives

Structural Controls

- Structural control examples:
  - Silt fences
  - Socks and wattles
  - Hay bales
  - Storm drain inlet protection
  - Sedimentation ponds
  - Rip rap
  - Check dams and gravel bags
  - Diversion structures
  - Slope drains
  - Drainage swales
  - Stabilized construction entrances/exits

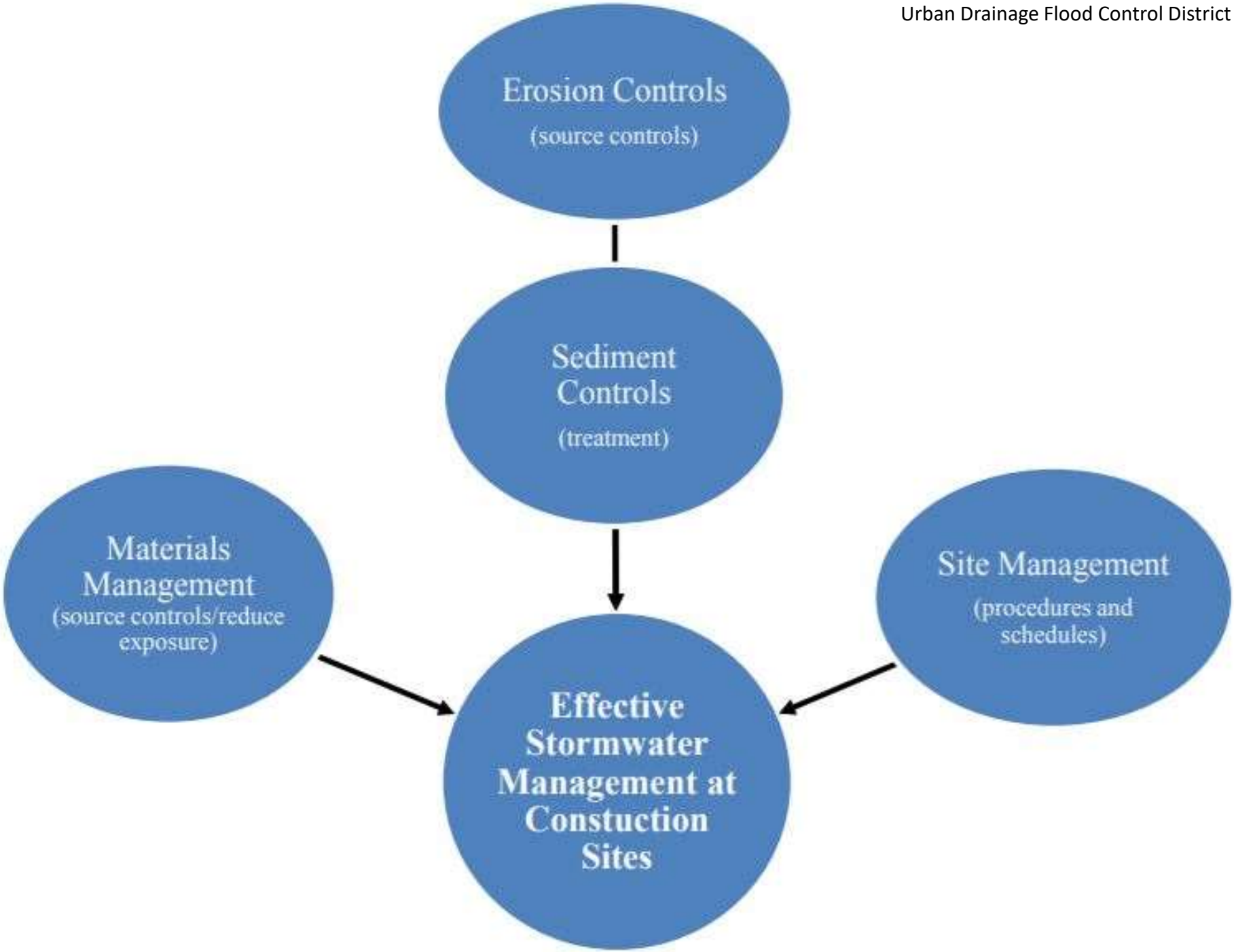
PG Environmental

Non-Structural Controls

- Non-structural control examples:
  - Employee training
  - Construction phasing
  - Good housekeeping
  - Waste management
  - Street cleaning
  - Equipment wash area
  - Designated maintenance area
  - Concrete washout area
  - Chemical treatment

EPA

Flickr


Erosion Controls
(source controls)
Sediment Controls
(treatment)
Materials Management
(source controls/reduce exposure)
Site Management
(procedures and schedules)
Effective Stormwater Management at Constuction Sites

Stormwater and the Construction Industry

Protect Natural Features

Bad

Good

- Minimize clearing.
- Minimize the amount of exposed soil.
- Identify and protect areas where existing vegetation, such as trees, will not be disturbed by construction activity.
- Protect streams, stream buffers, wild wood lands, wetlands, or other sensitive areas from any disturbance or construction activity by fencing or otherwise clearly marking these areas.

Construction Phasing

Bad

Good

- Sequence construction activities so that the soil is not exposed for long periods of time.
- Schedule or limit grading to small areas.
- Install key sediment control practices before site grading begins.
- Schedule site stabilization activities, such as landscaping, to be completed immediately after the land has been graded to its final contour.

Vegetative Buffers

Bad

Good

- Protect and install vegetative buffers along waterbodies to slow and filter stormwater runoff.
- Maintain buffers by mowing or replanting periodically to ensure their effectiveness.

Silt Fencing

Bad

Good

- Inspect and maintain silt fences after each rainstorm.
- Make sure the bottom of the silt fence is buried in the ground.
- Securely attach the material to the stakes.
- Don't place silt fences in the middle of a waterway or use them as a check dam.
- Make sure stormwater is not flowing around the silt fence.

Maintain your BMPs!

www.epa.gov/npdes/menuofbmps

Site Stabilization

Bad

Good

- Vegetate, mulch, or otherwise stabilize all exposed areas as soon as land alterations have been completed.

Construction Entrances

Bad

Good

- Remove mud and dirt from the tires of construction vehicles before they enter a paved roadway.
- Properly size entrances (BMPs) for all anticipated vehicles.
- Make sure that the construction entrance does not become buried in soil.

Slopes

Bad

Good

- Rough grade or terrace slopes.
- Break up long slopes with sediment barriers, stormdrain drains, or divert stormwater away from slopes.

Dirt Stockpiles

Bad

Good

- Cover or seed all dirt stockpiles.

Storm Drain Inlet Protection

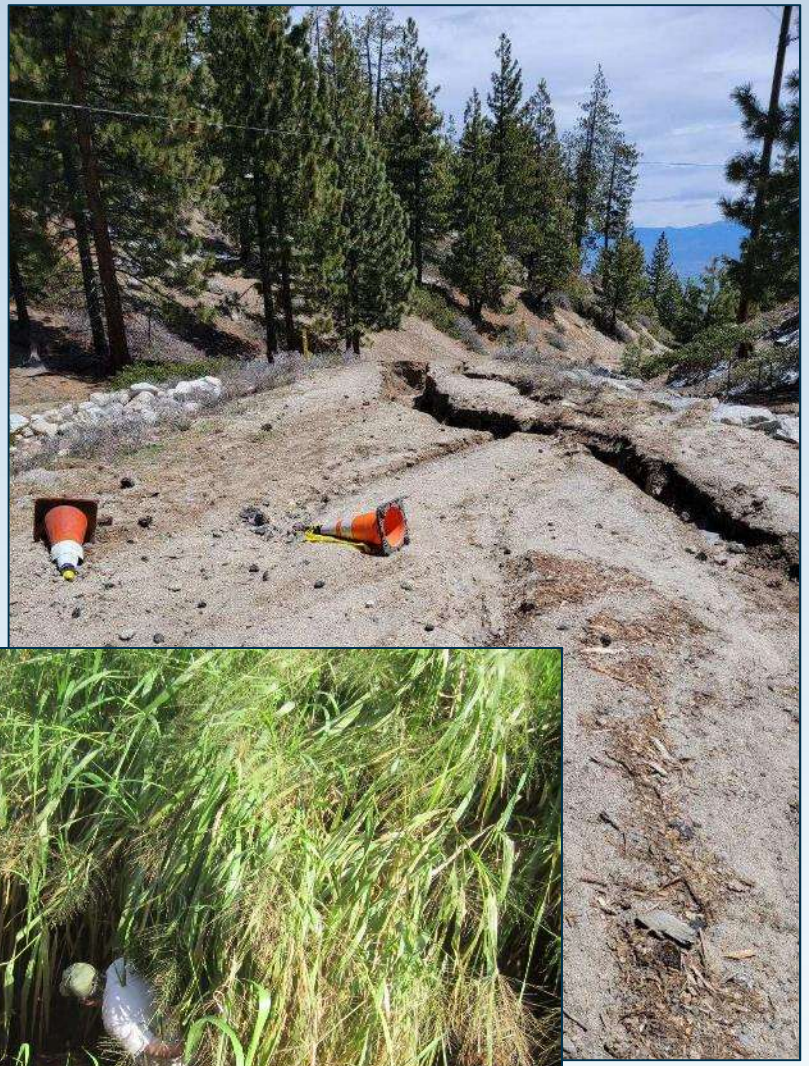
Bad

Good

- Use rock or other appropriate materials to cover the storm drain inlet to filter out trash and debris.
- Make sure the rock size is appropriate (usually 1 to 2 inches in diameter).
- If you use inlet filters, maintain them regularly.

Major Erosion/Rilling:

Major Erosion/Rilling:



Restoration Work at Heavenly:

Sediment Barriers

- Down-gradient barriers intended to intercept sheet flow runoff and settle out sediment upslope while allowing runoff to filter through
  - Examples include silt fences, fiber rolls, straw wattles
- Installed along contours
- Not be used as check dams or where concentrated flow is expected
- Require regular and routine maintenance
- Sediment should be removed when ½ the height of the barrier
- Should be staked and entrenched per control specifications
  - E.g., stakes used to hold the silt fence must be on the down-slope side

Wattles & Coir Logs

Straw wattle with silt fence

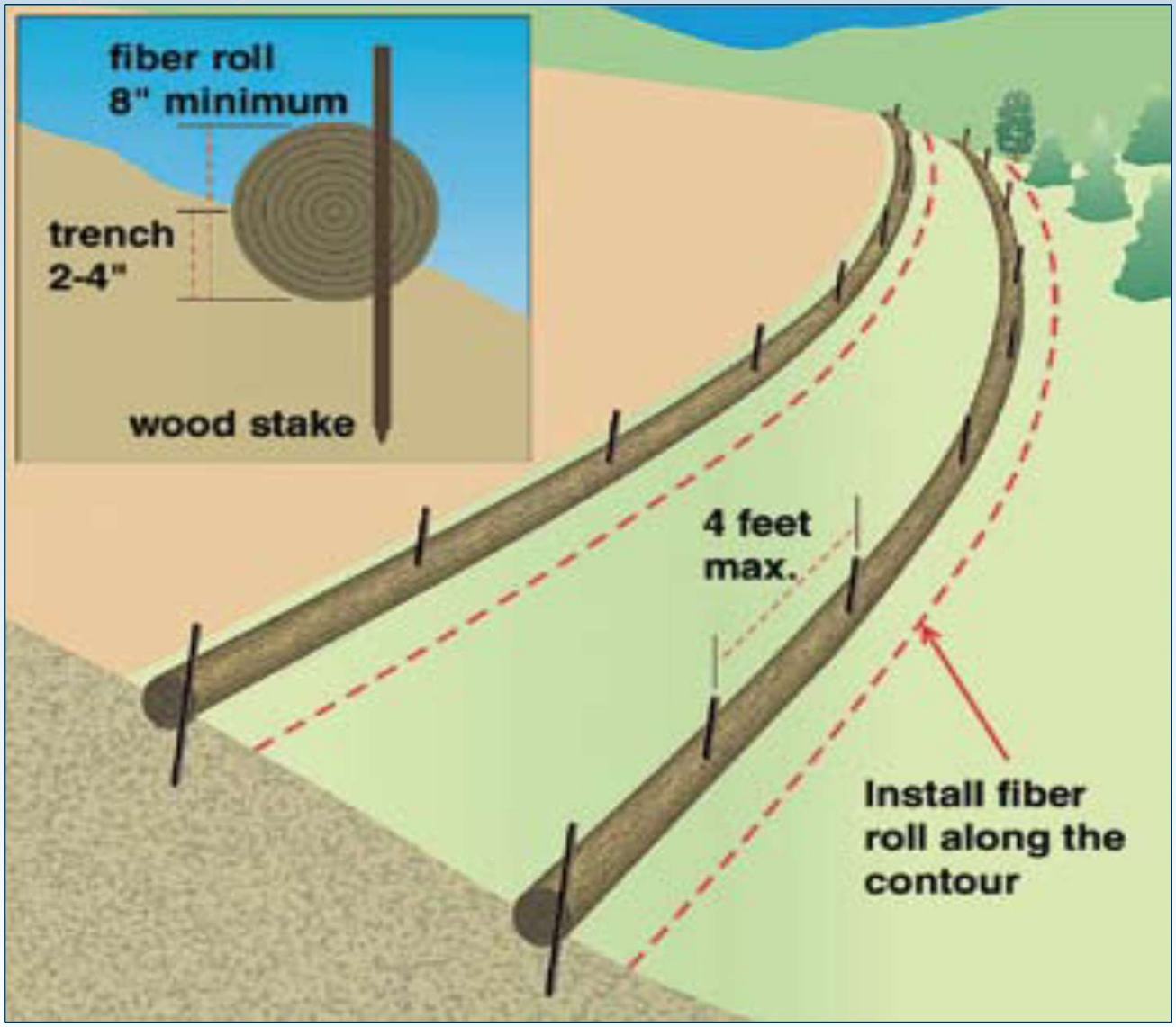
Pine needle wattle

Pine Needle Wattles

Manufacturing by trails crew began in 2013! Now in Year 9

On mountain use for erosion control, and roads materials stockpiles

Sediment Control Log (cont.)



MNPCA

Sediment Control Logs…Not for Concentrated Flow!

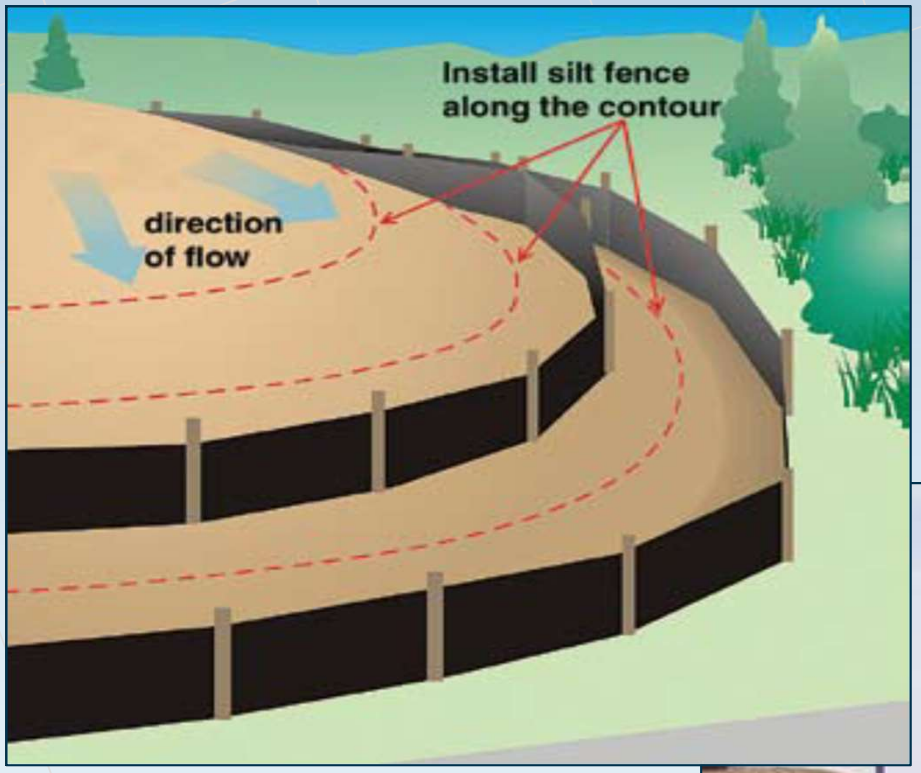
PG Environmental

Silt Fences

- Purpose:
  - Prevent sediment carried by sheet flow from leaving site and entering waterways/drainage systems by slowing runoff and causing sediment to deposit at structure
- Silt fencing encourages sheet flow and reduces the potential for development of rills and gullies

PG Environmental

Silt Fence on Contours



MNPCA

Land and Water Magazine

Silt fence should be installed along contours

Silt Fence J-Hooks

MNPCA

PG Environmental

When silt fence is not installed along the contour, a "J-hook" installation may be appropriate to ensure that the BMP does not create concentrated flow parallel to silt fence

Unmaintained Silt Fence: From Bad to Worse

HI Dept. of Health

Stockpile Management

- Implement control measures to minimize erosion and sediment transport from soil stockpiles
- Locate stockpiles away from drainage systems and waterways
- Stabilize stockpiles
- Protect stockpile perimeters using sediment control BMPs
  - Sediment control logs
  - Silt fence
  - Straw bale barriers
  - Sand bags

PG Environmental

Concrete Washout

- Specific area designated and properly managed for washing of concrete-related equipment
- Designed to receive wash water from washing of tools and concrete mixer chutes, liquid concrete waste from dump trucks, mobile batch mixers, or pump trucks
- Three basic approaches:
  1. Excavation of a pit in the ground in conjunction with an impervious liner (*some localities do allow unlined pits*)
  2. Use of an aboveground storage area
  3. Use of prefabricated haul-away concrete washout containers

Concrete Washout (cont.)

- Key considerations:
  - Adequate signage identifying location of washout area
  - Adequate capacity (typically needs maintenance when filled to two-thirds capacity)
  - Washout location(s) specified in SWPPP
  - Washout structure is constructed per SWPPP
  - Concrete waste spilled on ground surface around and outside washout structure/area should be cleaned up

PG Environmental

Concrete Washout (cont.)

- Final Disposal Method of Concrete Wash Water
  - Pump any remaining wash water out of the washout container and haul wash water offsite to WWTP
  - Concrete wash water can be retained in washout container and allowed to evaporate
  - Infiltration into ground provided local and state regulations allow this practice
- Final Disposal Method for Hardened Concrete
  - Crush and reuse as construction materials (e.g., fill)
  - Haul hardened concrete offsite back to batch plant that conducts concrete crushing/recycling operations

Contain Me!

PG Environmental

Clean Me!

PG Environmental

Cover Me!

PG Environmental

Concrete Should Not Be Washed into Storm Drains!

PG Environmental

Keys to Success

1. Minimize soil disturbance and protect natural features
2. Phase construction activity to minimize disturbed area
3. Control stormwater quantity and velocity flowing onto and through the project
4. Stabilize soils and protect slopes
5. Protect storm drain inlets
6. Establish perimeter controls
7. Detain runoff to provide time for sediment to settle out
8. Establish stabilized construction entrances
9. Inspect, RESPECT, and maintain BMPs

Important takeaways for you to ponder, with regards to BMPs:

- 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. Look uphill of problem areas to determine if there is a root cause of the erosion issue…
- Heavenly Prioritization – address the highest risk spot first (e.g., nearest to creek, most erosive, problem spots)
- Goal: keeping turbid stormwater out of waterways

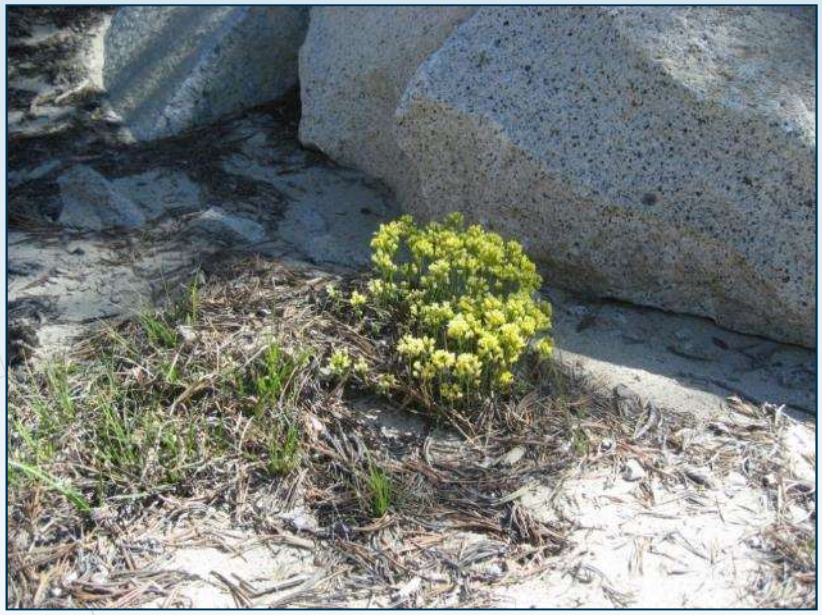
Tahoe Draba - Sensitive Plant

Interpretive Signage at Top of Tamarack Express

Photo of a plant from Heavenly

Protect Tahoe Draba Populations – Do Not Disturb

Full grown plants - Mostly grow above 9,000 Ft. Elevation



Draba like to grow in disturbed areas, & under drip lines of rocks

White Bark Pines

NPS

Sierra Nevada Yellow-Legged Frogs

NPS

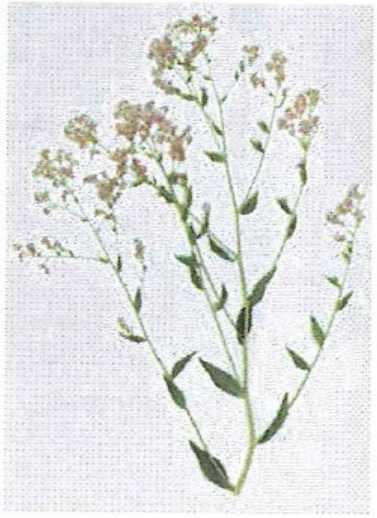
Salamanders

Invasive Weeds

Invasive Weeds are known to exist on top of Heavenly Mountain. Siting and treatments by the USFS continue annually and Most are now eradicated.

Tall Whitetop Identification: 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

Invasive Weeds (cont.)

Bull Thistle

Bull Thistle flower

Canada Thistle

Canada Thistle flowers are smaller than most other thistle flowers

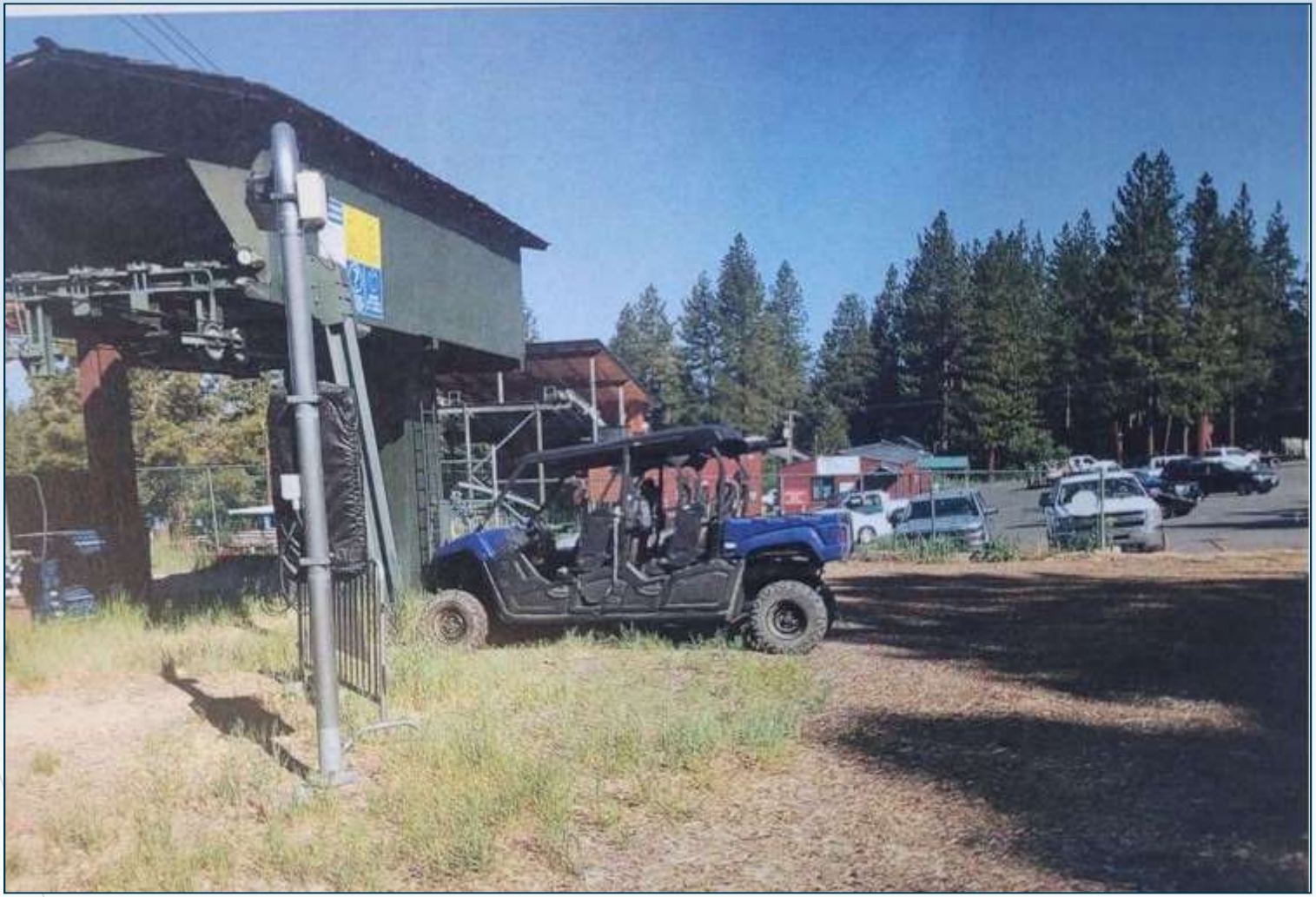
Summer Rules of the Road

- Drive on Designated Roads only, DO NOT Park on Vegetation
- Park only in Designated Parking Areas
- If you see someone not complying, tell your supervisor
- Just because you drive an ATV/Rhino does not mean you can drive onto a ski slope or down a decommissioned road or Ski Trail. This creates unnecessary disturbance and erosion.
- When accessing the mountain, all vehicles MUST be in 4WD to prevent erosion on the roads. Stay at or below 20 mph. Be especially aware of Fugitive Dust.
- All Vehicles MUST call 530-542-6900 upon entering and exiting through a mountain gates.

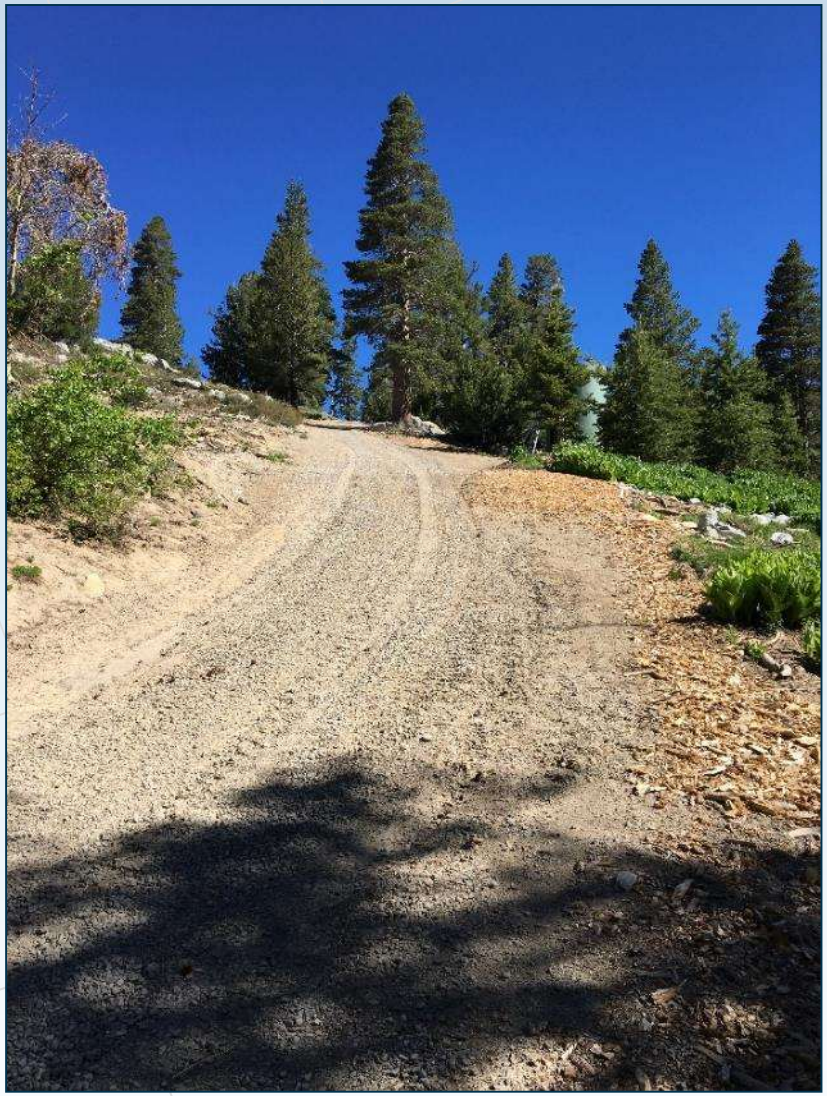
More Summer Rules of the Road

- Stay out of erosion control project areas.
- Report obvious erosion, water quality, or sediment problem to your supervisor or RCM.
- All outside contractors and vendors must have a Mountain Access Permit issued by the Central Dispatch Dept., except utilities.
- Prior to accessing mountain roads, anyone from outside the Tahoe Basin MUST spray the bottom of vehicle to prevent the spread of invasive weeds. Heavenly may require proof.
- If you don't see a mountain access permit, stop them & ask to see their permit. If you see utility trucks (e.g., SW Gas or Liberty), ask them if they need any guidance or direction.

Be Smart Where You Park

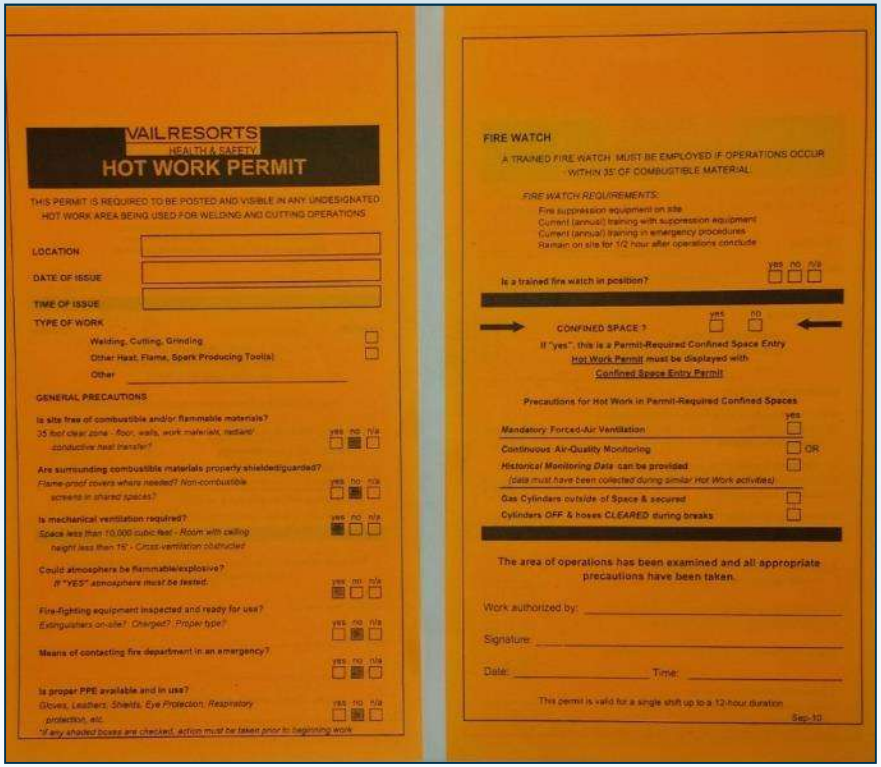


Hellwinkel's - Low & Slow!



Heavenly Hot Work Permit

- Required for any hot work outside of a designated weld shop; proper tools in trucks, fire caches on hill
- Know the PAL code for the day
- Issued by Kevin Higgins, Bryan Hickman, & Curtis Kezich
- Must be posted on site



VAIL RESORTS
HEALTH & SAFETY
HOT WORK PERMIT

THIS PERMIT IS REQUIRED TO BE POSTED AND VISIBLE IN ANY UNDESIGNATED HOT WORK AREA BEING USED FOR WELDING AND CUTTING OPERATIONS

LOCATION

DATE OF ISSUE

TIME OF ISSUE

TYPE OF WORK

Welding, Cutting, Grinding

Other Heat, Flame, Spark Producing Tool(s)

Other

GENERAL PRECAUTIONS

Is site free of combustible and/or flammable materials?
35 feet clear zone - floor, walls, work materials, radiant/conductive heat transfer?

Are surrounding combustible materials properly shielded/guarded?
Flame-proof covers where needed? Non-combustible screens in shared spaces?

Is mechanical ventilation required?
Space less than 10,000 cubic feet - Room with ceiling height less than 15' - Cross-ventilation obstructed

Could atmosphere be flammable/explosive?
If "YES" atmosphere must be tested.

Fire-fighting equipment inspected and ready for use?
Extinguishers on-site? Charged? Proper type?

Means of contacting fire department in an emergency?

Is proper PPE available and in use?
Gloves, Leathers, Shields, Eye Protection, Respiratory protection, etc.

*If any shaded boxes are checked, action must be taken prior to beginning work

FIRE WATCH

A TRAINED FIRE WATCH MUST BE EMPLOYED IF OPERATIONS OCCUR WITHIN 35' OF COMBUSTIBLE MATERIAL

FIRE WATCH REQUIREMENTS:
Fire suppression equipment on site
Current (annual) training with suppression equipment
Current (annual) training in emergency procedures
Remain on site for 1/2 hour after operations conclude

Is a trained fire watch in position?

CONFINED SPACE?

If "yes", this is a Permit-Required Confined Space Entry
Hot Work Permit must be displayed with
Confined Space Entry Permit

Precautions for Hot Work in Permit-Required Confined Spaces

Mandatory Forced-Air Ventilation

Continuous Air-Quality Monitoring OR

Historical Monitoring Data can be provided
(data must have been collected during similar Hot Work activities)

Gas Cylinders outside of Space & secured

Cylinders OFF & hoses CLEARED during breaks

The area of operations has been examined and all appropriate precautions have been taken.

Work authorized by:

Signature:

Date: Time:

This permit is valid for a single shift up to a 12-hour duration

Sep-10

Be Aware of Hazardous Summer Weather

Be especially aware during Thunderstorm activity and listen to weather updates from Central Dispatch on Radio. Contact dispatch if you hear thunder. Shut downs may impacts operations, work sites, and the mountain might be shelter in place. Major weather “Events” can cause environmental damage. If you see damage occurring Call Dispatch @ 530-542-6900. Take a picture if possible.

Rain Shut Down Process Information:

- View current custom Weather Forecast and Construction Activity Guidelines. Be sure to listen to Dispatch.
- 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.**

Absolutely NO SMOKING

- Due to EXTREME fire danger, smoking is prohibited on the mountain
- This includes smoking in Heavenly company or 3rd party vehicles

Wildland Fire Awareness- Be alert and aware / report any smoke to Dispatch.

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 is implemented annually and reviewed by Heavenly and the US Forest Service LTBMU. The Heavenly Mountain Resort Master Redevelopment 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/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.

- Animal resistant “bear box” receptacles are in place @ TOG in summer

Thank you for your commitment to environmental protection and for keeping Heavenly beautiful





Heavenly
LAKE TAHOE

BMP's/Facilities and Watershed Training and Construction Activities Safety Orientation

FIRST NAME	LAST NAME	Employee ID/Company Name
Jason	Mandelli	311531
Tim	McCALL	223339
Kyndis	Mlodnosky	215212
~~Chris~~	Burks	Summit
Kelli	Renzi	128597
Michael	Mecadon	162696
Sold & Ashleigh ~~Minshall~~	Minshall	279054
Kevin	Cleland	192249
Zach	Swarts	356430
Lupe	Barrientos	128669
Jared	Peabody	297091
LEE	ALLEN	130441
John	TontaucHe	195625
~~Erik~~	BATES	130290
Ryan	Smith	197095
Frederick	Newberry	198259
Richard	Hart	365668
Anthony ~~D'Angelo~~	D'Angelo	353431
KATHERINE ~~AL~~	ALVORD	208280
Aaron ~~Costa~~	Cosma	350571
Ryan	Self	353798
~~MATT~~	COHEN	241571

Heavenly
LAKE TAHOE

BMP's/Facilities and Watershed Training and Construction Activities Safety Orientation

FIRST NAME	LAST NAME	Employee ID/Company Name
Mark ~~Hummel~~	Hummel	148726
Derrick ~~Ley~~	Ley	229549
Aubrey	Felton	284178
Jesse	Zerr	324229
JEFF	ASHLEY	185130
Rafael	Lizalde	142438
JEF	ELLSWORTH	DYER
Gabe	Ramos	356449
BRAD	LEIGH	130272
DAN	Schramm	179885

Heavenly
LAKE TAHOE

BMP's/Facilities and Watershed Training and Construction Activities Safety Orientation

FIRST NAME	LAST NAME	Employee ID/Company Name
Christine	Averett	218486
Jake	Burt	237455
RJ	Mitchell	208281
Chris	Hansen	148370
Ben	Shonk	192768
Glen K	Reed	195512
Chris H	Howie	316929
Frank	Papandrea	LIBERTY
Chris	Cadman	245498
Tom	FORTUNE	180197
BRYAN	HICHMAN	142876
Aaron	Green	353467
TOM	MANSON	148646

Heavenly
LAKE TAHOE

BMP's/Facilities and Watershed Training and Construction Activities Safety Orientation

FIRST NAME	LAST NAME	Employee ID/Company Name
Curtis	Kezich	128566
Shannon	Smith	339766
David	Caputo	170769
Chris	Anaya	Summit Install
Tanner	Chavez	Summit Install
Victor	Gutierrez	156012
Dria	[illegible]	198429
KENDRA	TERRY	355978
Gabe Decker	Decker	312379
Don	Abicht	128681
MIKE	Schopfer	OSHA
STEPHEN	GREIG	262472
Brandon	Commander	216357
Sara	Violett	LTBMU
Blair	Davidson	214932
JIM	[illegible]	211831

Heavenly
LAKE TAHOE

BMP's/Facilities and Watershed Training and Construction Activities Safety Orientation

FIRST NAME	LAST NAME	Employee ID/Company Name
Phil	Domanic	175256
John	Lavandette	216563
Kyle	Nelson	257694
Donna	Spencer	343146
Nathan	Derby	
Stefan	Chandler	Dyer
Brandon	Gardner	Summit Install
Ross	Bonson	339089
Mary	Fitzgerald	226417
William	Clark	129456
John	Tarmey	157041
MOCK	LUNDBERG	128572
Ryan	Rose	354411
Paul	Bergeron	312614
Mitch	Cowles	NDEP
Scott	Rohde	Veh. Maint.

Heavenly
LAKE TAHOE

BMP's/Facilities and Watershed Training and Construction Activities Safety Orientation

FIRST NAME	LAST NAME	Employee ID/Company Name
Sara	Snow	219193
Steve	Kremin	129876
Elana	Katchian	RCI
Jill ~~Sutherland~~	Sutherland	RCI
Shay	Navarro	TRPA
Chris	Williams	194981
Matt	Cabrera	217720
Rich	M'Aron	130254
Conor	Blake	255049
Matt	Lighthart	247203
Richard	Swift	222587
Julian ~~Lyons~~	Lyons	Summit install
J. Clancy		139283
Leo ~~OSeda~~	OSeda	355096
Joe	Flores	318857
Kelly	Murphy	234772
Cole	Meyers	291632
~~Graeme~~	~~Graeme~~	~~128648~~
Sean	Hutchinson	291656
Matt	Collins	230360
Preston	Cochran	RCI
Kevin	Higgins	128598
Ralph	Bowman	128674

APPENDIX G
ON-MOUNTAIN MONITORING (FOURTH QUARTER)

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Appendix G
On-Mountain Monitoring (Fourth Quarter)

G.1 2022 Fourth Quarter Erosion Control and Facilities Monitoring Inspection Report

Heavenly Mountain Resort Quarter Fourth Year 2022

Erosion Control and Facilities Maintenance Monitoring
Inspection Log
by:
Bryan Hickman &
Anthony D'Angelo

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
a.	9/22/2022	A. D'Angelo & B. Hickman	Hand Grenade corner in great condition on Roundabout. Restoration appears to be holding well. Sediment trap will need attention next spring. Ridge Bowl restoration also holding well.	None	N/A
b.	9/22/2022	A. D'Angelo & B. Hickman	All 12", 24", and 36" culverts inspected clear and free of any obstructions. Maggie's, HV Creek, and High Five Area clear and unobstructed.	None	N/A

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
c.	9/22/2022	A. D'Angelo & B. Hickman	Designated roadways are being used by employee vehicles and 3rd party vehicles. NV Energy line pole installation project caused off-road damage which has been repaired by trail crews.	Roads maintenance with Trails Crew ongoing, tracked, and shared with USFS. 0.3 miles of roadways improved and 14.03 miles of roadway network maintained in 2022.	2022 USFS Road Report
d.	9/22/2022	A. D'Angelo & B. Hickman	Rope closure BMP's in place.	None	N/A
e.	9/22/2022	A. D'Angelo & B. Hickman	Energy dissipater condition acceptable. Multiple rip-rap pits at Maggie's cleaned out and maintained after summer storm events.	None	Ready for Winter

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
f.	9/22/2022	A. D'Angelo & B. Hickman	Sediment basins maintained by trail crews throughout summer 2022 and have adequate capacity.	None	Ready for Winter
g.	9/22/2022	A. D'Angelo & B. Hickman	Rock-lined channels are in good shape. Rock-lined ditches at Groove chair and above Stagecoach have adequate sediment holding capacity.	None	Ready for Winter
h.	9/22/2022	A. D'Angelo & B. Hickman	Rip Rap at various locations on the mountain in great shape.	None	Ready for Winter
i.	9/22/2022	A. D'Angelo & B. Hickman	No water bar failures observed on the CA or NV side of the mountain.	None	Ready for Winter

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
j.	9/22/2022	A. D'Angelo & B. Hickman	All infrastructure utility lines on the mountain performing adequately. Multiple snowmaking line repairs completed summer 2022. Building Maintenance continues to monitor performance of sewer and drinking water lines.	None	N/A
k.	9/22/2022	A. D'Angelo & B. Hickman	Stockpiles of soils or road base materials observed on the mountain have proper BMP's. Stockpiles at North Bowl construction project actively being used up and/or removed.	None	N/A
l.	9/22/2022	A. D'Angelo & B. Hickman	Infiltration trenches functioning properly.	None	Ready for Winter
m.	9/22/2022	A. D'Angelo & B. Hickman	Gullies and rills on slopes and roadways ok. After any major rain events, Heavenly Trails Crews and Heavy Equipment Operators address any problems right away.	N/A	N/A

Location*	Date Inspected	Inspector's Name	Notes/Observations/ Any Problems Identified	Corrective Measures Taken	Schedule for Completion of Corrective Measures
n.	September & October 2022	A. D'Angelo	Annual Boulder Base and CA Base BMP's System Routine Maintenance.	3rd party annual BMP routine maintenance completed in September/October 2022. All drop inlets at CA Base and Boulder Base were cleaned out with a vacuum truck and oil booms were replaced by Graymar Environmental from September 9-14, 2022, . The CA Base storm filter vaults maintenance work was completed In early October 2022 by Pacific Stormwater BMP Solutions. All filter vaults cleaned of loose sediment; multiple filters cartridges replaced.	Completed September/October 2022

* Location Notes:

a. Re-vegetated Areas
b. 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. Water Bars
j. Water Supply, sewer, snowmaking, and irrigation water line 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

RCI Photos: Cal Base Summer Access Road (2021 Project)

Before

After

Before

After

RCI Photos: Groove Erosion Resistance Project (2021)

Before

After

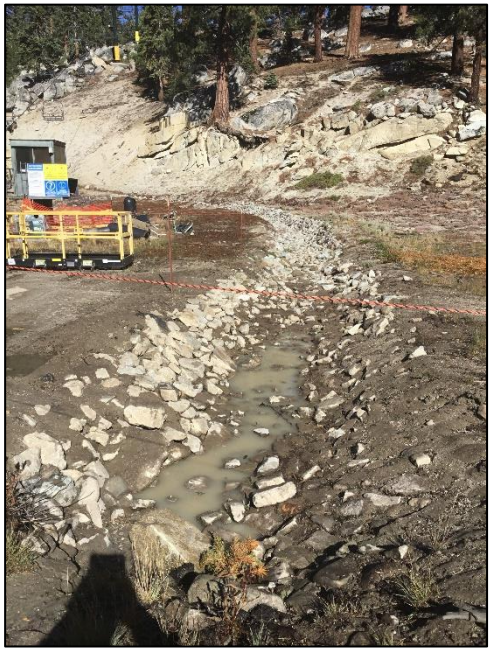
Heavenly On-Mountain Photos September 22, 2022

Hand Grenade

Heavenly On-Mountain Photos September 22, 2022

Rock-lined Channel Bottom of Powderbowl/Groove

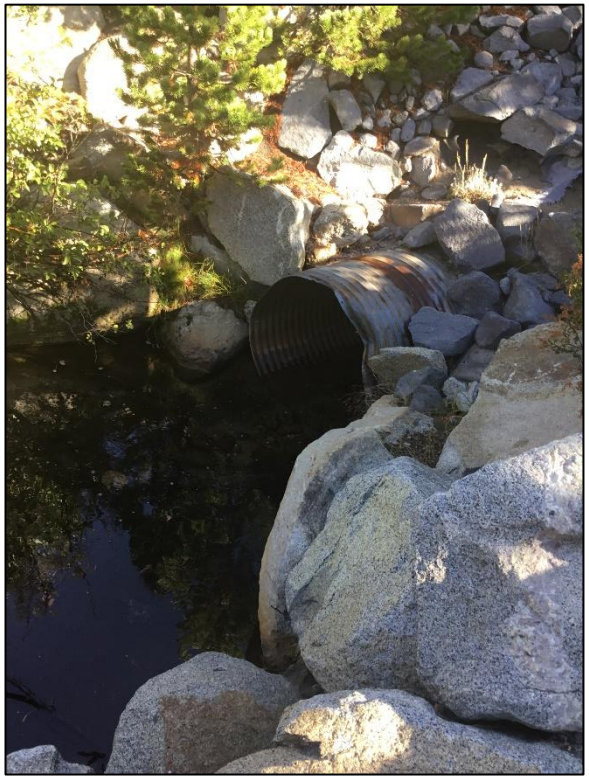




Heavenly On-Mountain Photos September 22, 2022

Heavenly Valley Creek Culvert Bottom of Powderbowl

Upper



Lower

Heavenly On-Mountain Photos September 22, 2022

Heavenly Valley Creek Culvert Maggie's

Upper

Lower

Heavenly On-Mountain Photos September 22, 2022

Ridge Bowl

Heavenly On-Mountain Photos September 22, 2022

Rope along Maggie's above Cal Dam Reservoir to Protect Vegetation

Heavenly On-Mountain Photos September 22, 2022

Heavenly Valley Creek Culvert Sky Deck

Upper

Lower

Heavenly On-Mountain Photos September 22, 2022

Crossover Restoration below $100 Saddle

APPENDIX H
TRACTION SAND ANALYSIS (NOVEMBER 2021)

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Appendix H
Traction Sand Analysis (November 2021)

H.1 El Dorado County Traction Sand Analysis (November 2021)

To: Chris Donley, Cardno

From: Russell Wigart, Stormwater Coordinator - Tahoe Basin

Regarding: Spec H Traction Sand

Chris,

Below find the analysis for Spec H traction sand samples taken from Heavenly Valley Ski Area in November 2021 and provided to El Dorado County. The Spec H material is supplied by Cinderlite and meets both the California DOT and El Dorado County traction sand specification. The County performed gradation and turbidity tests on the traction sand material. The results of the sampled gradation were as follows.

COUNTY OF EL DORADO

Aggregate Sample Gradation

PROJECT:	NPDES-SLT		
SAMPLE #:	Heav Spec H	CONTRACT NO:	99230 Index 346000
MATERIAL:	Soil		
DATE SAMPLED:	11/19/2021		

Sieve Size	mm	Wt. Retained	% Retained	% Passing	Spec. Limit Lower	Spec. Limit Upper	Sand Equivalent		
2"	50	0	0	**100**			**Sand**	**Clay**	
1.5"	38	0	0	**100**			3.6	3.8	**95**
1"	25	0	0	**100**			3.6	3.9	**93**
3/4"	19	0	0	**100**			3.6	3.9	**93**
1/2"	12.5	0	0	**100**			**Test SE Average**		**94**
3/8"	9.5	0	0	**100**					
#4	4.75	25	5	**95**			**Durability= 75**		
#8	2.36	218	44	**56**					
#16	1.18	401	80	**20**			**Moisture Content: 2.6%**		
#30	0.6	459	92	**8**					
#50	0.3	477	95	**5**					
#100	0.15	485	97	**3**			**Total Sample Weight:**		500
#200	0.075	490	98.0	**2.0**					

The Spec H traction sand met all allowable criteria for traction sand specifications designed to protect water quality and improve public safety. The #200 was slightly elevated however associated turbidity tests indicate very low levels of fine particulates that exceed design specifications.

Turbidity Tests of this material were run using the County traction sand protocol with material meeting design sepcifications.

Heavenly Abrasive	
30 Grams / 1 Liter H2O	
11/19/2021	Turbidity (ntu)
Result	56
Spec	150
Specification Met	
Turbidity	**Yes**

Tests were completed for SE, DF and Moisture with material meeting design specifications.

Test	Value	Result	Meets Spec
Sand Equivalent (SE)	80	94	Yes
Durability Fine (DF)	55	75	Yes
Moisture	5	2.6	Yes

Discussion

Altering abrasives application material type is a critical component of meeting the TMDL. Previous studies conducted by El Dorado County (EDOT 15_01) indicated that the total load generated by El Dorado County in the Tahoe Basin could be reduced by greater than 5%. Based on the analysis of the data and the distribution of material in various size classes from this material, the data indicates a reduction of a factor of 10 in fine particle aggregates <16 micron by switching from the Volcanic cinders to the Washoe Sand (DG). This equates to an approximate 90% load reduction compared to baseline conditions pre 2004 when evaluating cinders vs. granite (spec H). The fine particles associated with the Spec H DG are a denser particle; settle out quicker and breakdown less into fine fractions. The density and hardness of the material indicate it will last longer on the road, breakdown less and be easier to sweep up once conditions permit. Cal Trans conducted a study on many different aggregates for possible road abrasives and determined Washoe Sand (DG) to be ranked #2 out of the 22 materials tested for ultrafine particles (Cal Trans 2010).

The County along with its local partners will continue to refine this specification as needed in the interest of the environment and public safety. To date the modification to this winter management practice has resulted in large fine sediment load reductions when compared to previously used traction control materials. The material reported above meets required specifications for environmental protection as well as public safety requirements / standards.