Official Draft Public Notice Version **December 17th, 2025**
The findings, determinations, and assertions contained in this document are not final and subject to change following the public comment period.

**FACT SHEET**
**CASPER'S ICE CREAM, INC.**
**RENEWAL PERMIT: DISCHARGE & REUSE**
**UPDES PERMIT NUMBER: UT0025526**
**MINOR INDUSTRIAL**

## FACILITY CONTACTS

| | |
|---|---|
| Operator Name: | Casper's Ice Cream, Inc. |
| Contact: | Mike Lawler |
| Position: | Safety Manager |
| Phone Number: | (435) 258-2477, Ext 40 |
| | |
| Person Name: | John Apedaile |
| Position: | Facility Engineer |
| Phone Number: | (435) 258-2477, Ext. 13 |
| | |
| Permittee Name: | Casper's Ice Cream, Inc. |
| Facility Name: | Casper's Ice Cream Facility |
| Mailing and | 11805 North 200 East |
| Facility Address: | Richmond, UT 84333 |
| Telephone: | (435) 258-2477 |

## DESCRIPTION OF FACILITY

Casper's Ice Cream, Inc. (Permittee) is an ice cream manufacturing company that produces novelty products, including ice cream sandwiches, as well as hard ice cream. The Casper's Ice Cream Facility (Facility) is located approximately 1.5 miles north of Richmond, Utah, at 11805 North 200 East, Richmond, Utah 84333, at latitude 41°58.81' North and longitude 111°49.89' West. The Facility's Standard Industrial Classification (SIC) code is 2024, with a North American Industry Classification System (NAICS) Code of 311520 for Ice Cream and Frozen Dessert Manufacturing.

The Facility has two separate wastewater systems that serve the Facility. The first system conveys non-contact cooling water, and the second system conveys process wastewater. The Facility generates approximately 0.080 million gallons per day (MGD) of process wastewater per day. The process wastewater is currently being treated through several grease traps and septic tanks before discharge to an aerated containment pond. Process water is blended with irrigation water and non-contact cooling water, then land applied on cropland located east and west of the Facility through Outfall 001R.

The Facility generates up to approximately 75,000 gallons of non-contact cooling water effluent per day. The non-contact cooling water is collected and discharged through Outfall 001 to a pond located between the Facility's property and a farm to the west. The pond discharges to the Cub River. During the months when irrigation is needed for the fields, the non-contact cooling water is diverted and blended with the process water to be used for makeup water in the irrigation system. This operational practice results in extended periods of no discharge from Outfall 001. Based on discharge monitoring reports submitted

between April 2022 and May 2025 (Attachment 1), the Facility experienced no discharge for approximately 28% of all monitoring periods, with the highest frequency of no discharge occurring during the irrigation season from April through November.

In 2005, the Facility constructed two wastewater storage lagoons to contain 100% of its process water and a portion of the plant non-contact cooling water, which eliminated the process water discharge to the Cub River. The process wastewater passes through grease interceptors to help settle out solids prior to being pumped to the lagoons. The lagoons are located east of the processing building, near the irrigation fields. Aerators are installed to help prevent odors, and solids settle to the bottom of the lagoons prior to the water being applied to the farmland. During the winter months, December through February, the process water is stored in the two lagoons, which have an approximate combined capacity of 3.0 million gallons.

During the summer months, the stored process water is used to irrigate approximately 12 acres of alfalfa located on land east of the process building and west of the storage lagoons, as well as 90 acres under a center pivot system located east of the processing building. The total land application area for Outfall 001R is approximately 102 acres. The previous permit anticipated expansion to additional 28-acre and 86-acre parcels; however, according to the 2025 permit application, these additional sites were not developed and are not currently being utilized for land application.

The Facility is on the fifth UPDES permit renewal cycle. The initial permit issued in 2005 included Chemical Oxygen Demand (COD) and Biological Oxygen Demand (BOD) monitoring requirements because the Facility did not have its disposal system finalized for the process washdown water, which was connected with the cooling water system at that time. Prior to the 2010 permit issuance, the Facility separated the process wastewater and non-contact cooling water systems and installed the land application system. As a result of these changes, COD and BOD monitoring were removed from the permit, and monitoring frequency for pH and Total Suspended Solids (TSS) were adjusted. During the 2020 permit renewal, annual metals monitoring was added for Outfall 001 to collect data for Reasonable Potential Analysis (RP), and the daily minimum Dissolved Oxygen (DO) requirement was revised to 5.5 mg/L based on 2020 wasteload analysis (WLA).

In 2022, Outfall 001R was formally added to the permit to authorize land application of industrial process wastewater. DWQ applied monitoring requirements comparable to Type II Reuse standards to ensure that wastewater is applied at appropriate agronomic rates and in accordance with best management practices.

## SUMMARY OF CHANGES FROM PREVIOUS PERMIT

The Permittee has not made any physical improvements or modifications to the Facility's wastewater treatment infrastructure since the previous permit was issued in 2021. The Facility continues to operate the same treatment systems, including grease interceptors, septic tanks, aerated storage lagoons, and land application system that were in place during the 2020 permit cycle. The permit renewal process is a simple renewal of the existing UPDES permit with no changes to flow or concentration of pollutants.

**Flow:**
The 2025 WLA represents an update to the receiving water analysis methodology, incorporating refined seasonal modeling that was not included in the 2020 WLA. A critical improvement in the 2025 WLA is the incorporation of actual seasonal flow variability in the Cub River, whereas the 2020 WLA utilized a constant upstream flow of 11.6 cubic feet per second (cfs) for all seasons. The 2025 analysis accounts for summer low flows of 3.12 cfs, fall flows of 11.66 cfs, winter flows of 33.36 cfs, and spring high flows of 108.37 cfs. This seasonal flow characterization more accurately reflects the natural hydrology of the

receiving water during critical low flow periods. As all the permit limitations included in this renewal are not flow-based, this did not have an impact on permit limitations.

**Reuse:**
This permit renewal includes Outfall 001R for land application of industrial process wastewater. While this is not domestic wastewater, the monitoring requirements comparable to Type II Reuse standards will remain in the permit due to the absence of specific industrial reuse guidelines and to maintain consistency with the previous permit. The Division of Water Quality is developing an Industrial Reuse Operating Permit, which the Permittee may need to obtain in the future to continue this operation. It is possible that a Reuse Project Plan would be required under the Industrial Reuse Operating Permit.

## DISCHARGE

### DESCRIPTION OF DISCHARGE

The Facility has two outfalls authorized under this permit. Outfall 001 discharges non-contact cooling water to the Cub River, and Outfall 001R is designated for beneficial reuse of process wastewater through land application on approximately 102 acres of agricultural land adjacent to the Facility. Discharge monitoring data from April 2022 through May 2025 shows that Outfall 001 has averaged 0.058 MGD, with a median monthly flow of 0.014 MGD. The Facility has demonstrated an increasing trend toward beneficial reuse, with approximately 28% of monitoring periods reporting no discharge. During winter months when land application is not feasible, excess non-contact cooling water is discharged to the Cub River via Outfall 001.

| Outfall | Description of Discharge Point |
|---|---|
| 001 | Located at latitude 41°56'59" North and longitude 111°49'55" West. Non-contact cooling water generated from refrigeration and process cooling operations is collected and discharged through a pipeline to an unnamed detention pond located between the Permittee's property and adjacent farmland to the west. The pond outlets to the Cub River, which serves as the ultimate receiving water for this discharge (Figure 1). |
| 001R | Located at latitude 41°56'53" North and longitude 111°49'37" West. This outfall designates the beneficial reuse of treated process wastewater through Type II land application on agricultural lands surrounding the Facility.<br><br>During the irrigation season, stored and treated process wastewater is blended with non-contact cooling water and makeup irrigation water and applied to approximately 102 acres of agricultural land through spray irrigation systems. During winter months, December through February, process wastewater is accumulated in the two storage lagoons located near the irrigation fields. |


**Facility map showing discharge locations and wastewater flow schematic for Outfall 001 and Outfall 001R**

## RECEIVING WATERS AND STREAM CLASSIFICATION

The receiving water for Outfall 001 is a pond, which discharges to the Cub River.

Per Utah Administrative Code (UAC) R317-2-13.3.a, the designated beneficial uses Cub River and tributaries, from confluence with Bear River to state line, are 2B, 3B, and 4.

> Class 2B - *Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*
>
> Class 3B - *Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.*
>
> Class 4 - *Protected for agricultural uses including irrigation of crops and stock watering.*

## TOTAL MAXIMUM DAILY LOAD (TMDL) REQUIREMENTS

According to the Utah's Final 2024 Integrated Report on Water Quality dated April 30, 2024 (UDWQ, 2024), the receiving water for Outfall 001 discharge "*Cub River and tributaries, from confluence with Bear River to state line, except as listed below* (AU name: *Cub River*, AU ID: *UT16010202-010_00*)" was listed as "Not Supporting but has Approved TMDL for some parameters". The parameters not supporting are E. coli, Sediment, and Total Phosphorus as P. A TMDL (38238) for total phosphorus was completed and

approved for the Middle Bear River on February 23, 2010 (UDWQ 2010). The TMDL identified an in-stream total phosphorus concentration goal of 0.05 mg/l for the Cub River.

## BASIS FOR EFFLUENT LIMITATIONS

Effluent limitations are derived from the application and subsequent incorporation of both TBELs and water quality-based effluent limitations (WQBELs), which together represent the minimum required control necessary to protect the receiving water in accordance with 40 Code of Federal Regulations (CFR) Part 122.44 and UAC R317-8-4.2. In instances where multiple limitations are developed for a single constituent, the more stringent limitation must apply. In cases where no limits or multiple limits have been developed, Best Professional Judgment (BPJ) of the permitting authority may be used where applicable. BPJ refers to a discretionary, best professional decision made by the permit writer based upon precedent, prevailing regulatory standards, or other relevant information.

Permit limits can also be derived from the WLA, which incorporates Secondary Treatment Standards, Water Quality Standards (including any applicable TMDL impairments as appropriate), Antidegradation Reviews (ADR), and designated uses into a water quality model that projects the effects of discharge concentrations on receiving water quality. Effluent limitations are those that the model demonstrates are sufficient to meet State water quality standards in the receiving waters. During this UPDES renewal permit development, a WLA and ADR Level I review were completed (Attachment 2). The ADR Level I review concluded that an ADR Level II review was not required since this is a simple renewal of an existing UPDES permit with no increase in flow or concentration of pollutants over those authorized in the existing permit (as per UAC R317-2-3.5.b.1.(b)). The WLA identified temperature and total phosphorus as the parameters of concern for this discharge and receiving waters, and indicates that the effluent limitations will be sufficiently protective of water quality to meet state water quality standards in the receiving waters.

Limitations for Outfall 001 are established as follows. The flow limitation of 0.08 MGD daily maximum is based on the WLA. The temperature limit of 84°C was established in consultation with the Watershed Coordinator for Class 3B warm water aquatic life and is carried forward from the previous permit. The DO daily minimum of 5.5 mg/L is necessary to maintain water quality standards for Class 3B waters as determined through Utah Rivers Model analysis. Limitations for conventional pollutants, including total suspended solids (TSS) and pH, are based upon the current Utah Secondary Treatment Standards (UAC R317-1-3.2). The limitation for oil and grease is established based on BPJ.

Total phosphorus is limited to 0.05 mg/L monthly average based on the approved Middle Bear River and Cutler Reservoir Total Maximum Daily Load completed on February 23, 2010. The Cub River is listed on Utah's 2024 Integrated Report as not supporting designated beneficial uses for total phosphorus, and the TMDL established an in-stream concentration goal of 0.05 mg/L to prevent excessive algal growth and protect beneficial uses.

Annual metals monitoring for arsenic, cadmium, chromium, copper, cyanide, lead, mercury, nickel, selenium, silver, and zinc is required to collect data for reasonable potential analysis (RP). No effluent limitations for metals have been established based on current monitoring data.

The permit does not establish numeric effluent limitations for Outfall 001R because the wastewater is not discharged to surface waters of the state. The permit requires seasonal monitoring during the land application period for flow, $BOD_5$, TSS, pH, total phosphorus, nitrate, nitrite, and total nitrogen to ensure that land application operations are conducted in accordance with best management practices and at appropriate agronomic rates. The Facility is also required to report annual information on crop type, crop harvest, land application area, and number of application days per season to demonstrate that application rates are appropriate for crop uptake and soil assimilation.

The Permittee is expected to be able to comply with these limitations.

## REASONABLE POTENTIAL ANALYSIS

Since January 1, 2016, the Division of Water Quality (DWQ) has conducted RP on all new and renewal applications received after that date. RP for this permit renewal was conducted following DWQ's September 10, 2015, Reasonable Potential Analysis Guidance. To conduct a statistically valid quantitative RP, more than 10 data points per parameter are needed. Since the 2020 permit cycle, the Facility has been required to conduct annual metals monitoring to collect data for RP evaluation. Due to the limited number of sampling events completed to date, insufficient data are available to conduct a complete quantitative RP for metals and other pollutants of concern. Annual metals monitoring will continue to be required in this permit to support future reasonable potential determinations.

The permit limitations are:

| Parameter | Outfall 001 Effluent Limitations[a] | | | | |
|---|---|---|---|---|---|
| | Maximum Monthly Avg | Maximum Weekly Avg | Daily Minimum | Daily Maximum | Units |
| Total Flow | -- | -- | -- | 0.080 | MGD |
| TSS | 25 | 35 | | | mg/L |
| DO | -- | -- | 5.5 | -- | mg/L |
| Total Phosphorus | -- | -- | -- | 0.050 | mg/L |
| Oil & Grease | -- | -- | -- | 10.0 | mg/L |
| pH | -- | -- | 6.5 | 9 | Standard Units |
| Temperature | -- | -- | -- | 84 | ºC |

## SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are the same as in the previous permit. The permit requires reports to be submitted monthly and annually, as applicable, on Discharge Monitoring Report (DMR) forms due 28 days after the end of the monitoring period. Effective January 1, 2017, monitoring results shall be submitted using NetDMR unless the Permittee has successfully petitioned for an exception. Lab sheets for metals shall be attached to the DMRs.

| Outfall 001 Self-Monitoring and Reporting Requirements[a] | | | |
|---|---|---|---|
| Parameter | Frequency | Sample Type | Units |
| Total Flow[b][c] | Continuous | Recorder | MGD |
| TSS | Monthly | Grab | mg/L |
| pH | Monthly | Grab | SU |
| DO | Monthly | Grab | mg/L |
| Oil & Grease[d] | When Sheen Observed | Grab | mg/L |
| Total Phosphorus | Monthly | Grab | mg/L |
| Temperature | Monthly | Grab | Celsius |
| Metals[e][f] | Annually | Grab/Composite | mg/L |

| Outfall 001R<br>Self-Monitoring and Reporting Requirements[a][g][h][i] | | | |
|---|---|---|---|
| **Parameter** | **Frequency** | **Sample Type** | **Units** |
| Total Flow[b][c] | Continuous/Seasonal | Recorder | MGD |
| BOD | Monthly/Seasonal | Grab | mg/L |
| TSS | Monthly/Seasonal | Grab | mg/L |
| pH | Monthly/Seasonal | Grab | SU |
| Total Phosphorus | Monthly/Seasonal | Grab | mg/L |
| Nitrate | Monthly/Seasonal | Grab | mg/L |
| Nitrite | Monthly/Seasonal | Grab | mg/L |
| Total Nitrogen | Monthly/Seasonal | Grab | mg/L |

| Land Application Annual Reporting by Crop Type[j] | |
|---|---|
| Crop Type | List of crops grown on each site |
| Crop Harvest (tons/year) | Total harvest measured from harvest records |
| Land Application Area (acres) | Total acreage where treated effluent was applied |
| Number of Days per Season | Total days effluent was applied during growing season (~180 days/growing season) |

a. See Definitions, Part VIII, for definition of terms.
b. Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained.
c. If the rate of discharge is controlled, the rate and duration of discharge shall be reported.
d. Oil & Grease shall be sampled when sheen is present or visible. If no sheen is present or visible, report NA.
e. Metals samples should be analyzed using a method that meets minimum detection limit (MDL) requirements. If a test method is not available, the permittee must submit documentation to the Director regarding the method that will be used. The sample type (composite or grab) should be performed according to the methods requirements.
f. Metals are being sampled in support of the work being done for the Reasonable Potential Analysis. The metals will be monitored and reported annually by the facility on Discharge Monitoring Report but will not have a limit associated with them. If the Permittee decides to sample more frequently for these metals, the additional data will be welcome. Metals include Arsenic, Cadmium, Total Chromium, Copper, Cyanide, Lead, Mercury, Nickel, Selenium, Silver, and Zinc.
g. Monitoring results for Recycled Process Water discharges (Outfall 001R) shall be submitted to NetDMR no later than the 28th day following the end of the previous month during each month of seasonal use.
h. Recycled Process Water monitoring shall be conducted during months of seasonal usage. For months when recycled process water is not used, "No Discharge" shall be reported in NetDMR.
i. E.coli shall not be present in the discharge.
j. Land Application Reports shall be submitted annually by January 28th. Reports must summarize application activities by crop type for the previous calendar year.

## MANAGEMENT PRACTICES FOR LAND APPLICATION OF TREATED EFFLENT

(1) The application of treated effluent to frozen, ice-covered, or snow-covered land is prohibited.
(2) No person shall apply treated effluent where the slope of the site exceeds 6 percent.
(3) The use shall not result in a surface water runoff.

(4) The use shall not result in the creation of an unhealthy or nuisance condition, as determined by the local health department.
(5) Any irrigation with treated effluent shall be at least 300 feet from a potable well.
(7) Any irrigation shall be at least 300 feet from any potable water well.
(8) Spray irrigation shall be at least 100 feet from areas intended for public access. This distance may be reduced or increased by the Director.
(9) Impoundments of treated effluent, if not sealed, shall be at least 500 feet from any potable well.
(10) Public access to effluent storage and irrigation or disposal sites shall be restricted by a stock-tight fence or other comparable means which shall be posted and controlled to exclude the public (Compliance Schedule for a Particular Parameter if necessary)

## BIOSOLIDS

The State of Utah has adopted the 40 C.F.R. § 503 federal regulations for the disposal of sewage sludge (biosolids) by reference. However, this facility does not generate, receive, treat or dispose of biosolids. Therefore 40 C.F.R. § 503 shall not apply.

## STORM WATER

Permit coverage under the Multi Sector General Permit (MSGP) for Storm Water Discharges from Industrial Activities is required based on the Standard Industrial Classification (SIC) code for the facility and the types of industrial activities occurring. If the facility is not already covered, it has 30 days from when this permit is issued to submit the appropriate Notice of Intent (NOI) for the MSGP or exclusion documentation. Previously storm water discharge requirements and coverage were combined in this individual permit. These have been separated to provide consistency among permittees, electronic reporting for storm water discharge monitoring reports, and increase flexibility to changing site conditions.

Permit coverage under the Construction General Storm Water Permit (CGP) is required for any construction at the facility which disturb an acre or more, or is part of a common plan of development or sale that is an acre or greater. A Notice of Intent (NOI) is required to obtain a construction storm water permit prior to the period of construction.

Information on storm water permit requirements can be found at http://stormwater.utah.gov

## PRETREATMENT REQUIREMENTS

Casper's Ice Cream, Inc. does not discharge process wastewater to a Publicly Owned Treatment Works (POTW). Any process wastewater that Casper's Ice Cream, Inc. may discharge to a POTW, either as a direct discharge or as a hauled waste, is subject to federal, state, and local pretreatment regulations. Pursuant to section 307 of the Clean Water Act, the Mine shall comply with all applicable federal general pretreatment regulations promulgated, found in 40 CFR 403, the pretreatment requirements found in UAC R317-8-8, and any specific local discharge limitations developed by the POTW accepting the waste.

In addition, in accordance with 40 CFR 403.12(p)(1), Casper's Ice Cream, Inc. must notify the POTW, the EPA Regional Waste Management Director, the DWQ Director and the State hazardous waste authorities in writing if the Casper's Ice Cream, Inc. discharges any substance into a POTW that if otherwise disposed of would be considered a hazardous waste under 40 CFR 261. This notification must

include the name of the hazardous waste, the EPA hazardous waste number, and the type of discharge (continuous or batch).

## BIOMONITORING REQUIREMENTS

A nationwide effort to control toxic discharges where effluent toxicity is an existing or potential concern is regulated in accordance with the Utah Pollutant Discharge Elimination System Permit and Enforcement Guidance Document for Whole Effluent Toxicity Control (biomonitoring), dated February 2018. Authority to require effluent biomonitoring is provided in Permit Conditions, UAC R317-8-4.2, Permit Provisions, UAC R317-8-5.3 and Water Quality Standards, UAC R317-2-5 and R317 -2-7.2.

The permittee is a minor industrial facility that will be discharging an infrequent amount of effluent, in which toxicity is neither an existing concern, nor likely to be present. Based on these considerations, and the absence of receiving stream water quality monitoring data, there is no reasonable potential for toxicity in the permittee's discharge (per State of Utah Permitting and Enforcement Guidance Document for WET Control). As such, there will be no numerical WET limitations or WET monitoring requirements in this permit. However, the permit will contain a toxicity limitation re-opener provision that allows for modification of the permit should additional information indicate the presence of toxicity in the discharge.

## PERMIT DURATION

It is recommended that this permit be effective for a duration of five (5) years.

**Drafted and Reviewed by**
Jordan Bentley, Discharge Permit Writer, Reasonable Potential Analysis
Daniel Griffin, Biosolids
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Carl Adams, Storm Water
Mike Allred, TMDL/Watershed Protection
Christopher Shope, Wasteload Analysis/ADR
Utah Division of Water Quality, (801) 536-4300

## PUBLIC NOTICE INFORMATION (to be updated after)

Began: Month Day, Year
Ended: Month Day, Year

Comments will be received at: 195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

The Public Notice of the draft permit was published on State of Utah and/or DWQ's website for at least 30 days as required.

During the public notice and comment period provided under UAC R317-8-6.5, any interested person may submit written comments on the draft permit and may request a public hearing, if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments will be considered in making the final decision and shall be answered as provided in UAC R317-8-6.12.

## ADDENDUM TO FACT SHEET

During finalization of the Permit certain dates, spelling edits and minor language corrections were completed. Due to the nature of these changes, they are considered minor changes and the permit is not required to be re Public Noticed as provided in UAC R317-8-5.6(3)

### Responsiveness Summary

(Explain any comments received and response sent. Actual letters can be referenced, but not required to be included).

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# ATTACHMENT 1

*Effluent Monitoring Data*

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# Effluent Monitoring Data.

| Data Period: April 2022 - May 2025 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Date** | **Flow** | **Temp** | **DO** | **pH Min** | **pH Max** | **TSS** | **TSS** | **Total P** | **Oil & Grease** | | |
| | Monthly Avg | Daily Max | Daily Min | (SU) | (SU) | Monthly Avg | Weekly Avg | Daily Max | Visual | | |
| | (MGD) | (°C) | (mg/L) | | | (mg/L) | (mg/L) | (mg/L) | (0=No) | | |
| Apr-22 | 0.02 | 11.1 | 8.8 | 7.5 | 7.5 | 1 | 1 | 0.02 | 0 | | |
| May-22 | 0.014 | 11.7 | 8 | 7 | 7 | 1 | 1 | 0.01 | 0 | | |
| Jun-22 | 0.013 | 21.1 | 7.6 | 7.5 | 7.5 | 1 | 1 | 0.01 | 0 | | |
| Jul-22 | *No Discharge* | | | | | | | | | | |
| Aug-22 | *No Discharge* | | | | | | | | | | |
| Sep-22 | *No Discharge* | | | | | | | | | | |
| Oct-22 | 0.009 | 15.6 | 5.7 | 7.5 | 7.5 | BDL | BDL | 0.02 | 0 | | |
| Nov-22 | 0.007 | 21.1 | 7.5 | 7 | 7 | BDL | BDL | 0.02 | 0 | | |
| Dec-22 | 0.009 | 21.1 | 7.5 | 7 | 7 | BDL | BDL | 0.01 | 0 | | |
| Jan-23 | 0.005 | 11.1 | 8.3 | 7.5 | 7.5 | BDL | BDL | 0.01 | 0 | | |
| Feb-23 | 0.005 | 11.1 | 8.3 | 7.5 | 7.5 | BDL | BDL | 0.02 | 0 | | |
| Mar-23 | 0.004 | 15.6 | 8.3 | 7.5 | 7.5 | BDL | BDL | 0.01 | 0 | | |
| Apr-23 | 0.003 | 17.2 | 7.5 | 7.2 | 7.2 | BDL | BDL | BDL | 0 | | |
| May-23 | 0.004 | 21.1 | 6.6 | 6.5 | 6.5 | BDL | BDL | 0.02 | 0 | | |
| Jun-23 | *No Discharge* | | | | | | | | | | |
| Jul-23 | *No Discharge* | | | | | | | | | | |
| Aug-23 | *No Discharge* | | | | | | | | | | |
| Sep-23 | *No Discharge* | | | | | | | | | | |
| Oct-23 | *No Discharge* | | | | | | | | | | |

Template updated 6/23/2025

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nov-23 | 0.008 | 8.9 | 7.3 | 7 | 7 | BDL | BDL | 0.03 | 0 | | |
| Dec-23 | 0.004 | 7.9 | 7.3 | 7 | 7 | BDL | BDL | 0.01 | 0 | | |
| Jan-24 | 0.05 | 10 | 7.3 | 6.5 | 6.5 | BDL | BDL | 0.02 | 0 | | |
| Feb-24 | 0.02 | 10 | 5.5 | 7 | 7 | BDL | BDL | 0.04 | 0 | | |
| Mar-24 | *No Discharge* | | | | | | | | | | |
| Apr-24 | 0.003 | 15.6 | 6.5 | 7.7 | 7.7 | BDL | BDL | BDL | 0 | | |
| May-24 | *No Discharge* | | | | | | | | | | |
| Jun-24 | *No Discharge* | | | | | | | | | | |
| Jul-24 | *No Discharge* | | | | | | | | | | |
| Aug-24 | *No Discharge* | | | | | | | | | | |
| Sep-24 | *No Discharge* | | | | | | | | | | |
| Oct-24 | - | 12.2 | 8 | 7 | 7 | BDL | BDL | BDL | BDL | | |
| Nov-24 | 0.037 | 12.4 | 7.8 | 7 | 7 | BDL | BDL | 0.05 | BDL | | |
| Dec-24 | - | 10 | 6.4 | 7 | 8.2 | BDL | BDL | 0.02 | BDL | | |
| Jan-25 | 0.003 | 10 | 9.2 | 7 | 7 | BDL | BDL | 0.02 | BDL | | |
| Feb-25 | 0.04 | BDL | 8.2 | 7 | 7 | BDL | BDL | 0.01 | BDL | | |
| Mar-25 | 0 | 12.4 | 7.6 | 7 | 7 | BDL | BDL | 0.1 | BDL | | |
| Apr-25 | - | 10 | 12.7 | 7 | 7 | BDL | BDL | BDL | BDL | | |
| May-25 | 0.034 | 24 | 13.4 | 7 | 7 | BDL | BDL | 0.01 | BDL | | |
| | | | | | | | | | | | |
| BDL = Below Detection Limit; "-" = No data reported | | | | | | | | | | | |
| **Annual Metals Data** | | | | | | | | | | | |
| **Reporting Date** | **Arsenic** | **Cadmium** | **Chromium** | **Copper** | **Cyanide** | **Lead** | **Mercury** | **Nickel** | **Selenium** | **Silver** | **Zinc** |
| | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) | (mg/L) |
| 31-Dec-22 | BDL | BDL | 0.0033 | 0.0143 | BDL | BDL | BDL | 0.0023 | BDL | BDL | 0.07 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 31-Dec-23 | BDL | *No Discharge* | 0.0016 | 0.0087 | BDL | BDL | BDL | BDL | BDL | BDL | BDL |
| 31-Dec-24 | 0.0008 | BDL | 0.0073 | 0.001 | BDL | 0.0018 | *Not Sampled* | 0.0041 | BDL | BDL | 0.013 |

# ATTACHMENT 2

*Wasteload Analysis*

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State of Utah
SPENCER J. COX
*Governor*

DEIDRE HENDERSON
*Lieutenant Governor*

Department of
Environmental Quality

Tim Davis
*Executive Director*

DIVISION OF WATER QUALITY
John K. Mackey, P.E.
*Director*

**Utah Division of Water Quality**
**Statement of Basis ADDENDUM**
**Wasteload Analysis and Antidegradation Level I Review**

**Date:** **August 5, 2025**

**Prepared by:** **Christopher L. Shope, PhD**
**Standards and Technical Services**

**Facility:** **Casper's Ice Cream, Inc.**
**UPDES Permit No. UT-0025526**

This addendum summarizes the wasteload analysis that was performed to determine water quality based effluent limits (WQBEL) for this discharge. Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses (UAC R317-2-8). Projected concentrations are compared to numeric water quality standards to determine acceptability. The numeric criteria in this wasteload analysis may be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

Discharge

There are two current effluent discharge points (001 and 001R) listed in the application (Figure 1). In 2004, discharge of process water to the Cub River was discontinued and was discharged to two wastewater lagoons. A portion of the non-contact plant cooling water is also stored in the lagoons. The stored water in the lagoons is used for irrigation at fields adjacent to the property. The system is designed to store the effluent during the irrigation season and use the effluent under reuse during the cultivation season. During the winter, excess non-contact cooling water is discharged to a pond which drains into the Cub River.

- Outfall 001 discharges effluent into a pond, which then discharges to the Cub River at a design flow rate of 0.08 MGD.

Receiving Water

The receiving water for Outfall 001 is a pond, which discharges to the Cub River.

Per UAC R317-2-13.3.a, the designated beneficial uses *Cub River and tributaries, from confluence with Bear River to state line, except as listed below:* are *2B, 3B, 4*.

- *Class 2B - Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.*

- *Class 3B - Protected for warm water species of game fish and other warm water aquatic life, including the necessary aquatic organisms in their food chain.*

- *Class 4 - Protected for agricultural uses including irrigation of crops and stock watering.*

Water Quality Standards

Numeric criteria based on designated beneficial uses are specified in UAC R317-2-14. In addition, narrative water quality standards must not be violated per UAC R317-2-7.2:

> *It shall be unlawful, and a violation of these rules, for any person to discharge or place any waste or other substance in such a way as will be or may become offensive such as unnatural deposits, floating debris, oil, scum or other nuisances such as color, odor or taste; or cause conditions which produce undesirable aquatic life or which produce objectionable tastes in edible aquatic organisms; or result in concentrations or combinations of substances which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, or undesirable human health effects, as determined by bioassay or other tests performed in accordance with standard procedures; or determined by biological assessments in Subsection R317-2-7.3.*

Critical Low Flow

Typically, the critical flow for the receiving water in a wasteload analysis is considered the lowest stream flow for seven consecutive days with a ten-year return frequency (7Q10). Due to a lack of flow records for the Cub River, the 20th percentile of available flow measurements was calculated to approximate the 7Q10 low flow condition. The source of flow data was monitoring location DWQ 4904340 CUB R @ 800 SOUTH AB HIGH CREEK. Seasonal upstream, background critical flow conditions are provided in Table 1.

**Table 1-Seasonal upstream critical flow conditions and DWQ 4904340.**

| Season | $20^{th}$ % ($ft^3/s$) |
|---|---|
| Summer | 3.12 |
| Fall | 11.66 |
| Winter | 33.36 |
| Spring | 108.37 |
| Average | 48.17 |

Upstream receiving water quality concentration for the parameters of interest at Outfall 001 were estimated from monitoring location DWQ 4904340 CUB R @ 800 SOUTH AB HIGH CREEK.

Effluent discharge flow and water quality conditions were characterized using data from the Discharge Monitoring Report (DMR) and monitoring station DWQ 4904238 CASPER ICE CREAM DISCHARGE 001.

Total Maximum Daily Load (TMDL)

According to the Utah's Final 2024 Integrated Report on Water Quality dated April 30, 2024 (UDWQ, 2024), the receiving water for Outfall 001 discharge "*Cub River and tributaries, from confluence with Bear River to state line, except as listed below* (AU name: *Cub River*, AU ID: *UT16010202-010_00*)" was listed as "Not Supporting but has Approved TMDL for some parameters". The parameters not supporting are E. coli, Sediment, and Total Phosphorus as P. A TMDL (38238) for total phosphorus was completed and approved for the Middle Bear River on February 23, 2010 (UDWQ 2010). The TMDL identified an in-stream total phosphorus concentration goal of 0.05 mg/l in the Cub River.

Mixing Zone

Per UAC R317-2-5, the maximum allowable mixing zone is 15 minutes of travel time for acute conditions, not to exceed 50% of stream width, and 2,500 feet for chronic conditions. Water quality standards must be met at the end of the regulatory mixing zone.

For Outfall 001, the effluent flow from the pond into the Cub River is allowed a mixing zone. The actual length of the mixing zone was not delineated as part of this wasteload analysis; however, it was presumed to remain within the maximum allowable mixing zone dimensions. The mixing zone analysis shows the discharge to be fully mixed by the end of the mixing zone. Acute limits were calculated using 50% of the annual critical low flow.

Parameters of Concern

The potential parameters of concern identified for the discharge/receiving water were determined in consultation with the UPDES Permit Writer, the Utah Water Quality Assessment Reports, and the industry SIC codes from https://www.osha.gov/data/sic-search. The potential parameters of concern for this facility include: temperature and total phosphorous.

WET Limits

The percent of effluent in the receiving water in a fully mixed condition, and acute and chronic dilution in a not fully mixed condition are calculated in the WLA in order to generate WET limits. The $LC_{50}$ (lethal concentration, 50%) percent effluent for acute toxicity and the $IC_{25}$ (inhibition concentration, 25%) percent effluent for chronic toxicity, as determined by the WET test, needs to be below the WET limits, as determined by the WLA. The WET limit for $LC_{50}$ is typically 100% effluent and does not need to be determined by the WLA. The $IC_{25}$ WET limits are provided in Table 2.

**Table 2-Seasonal IC25 WET limits for Outfall 001.**

| Season | % effluent |
|---|---|
| Summer | 3.8 |
| Fall | 1.1 |
| Winter | 0.4 |
| Spring | 0.1 |

Wasteload Allocation Methods

Effluent limits were determined for conservative constituents using a simple mass balance mixing analysis (UDWQ, 2021). The mass balance analysis is summarized in the Wasteload Addendums.

Effluent limits for total phosphorous are based on the approved Middle Bear River TMDL (UDWQ 2010).

The Utah Rivers Model was used to evaluate the DO sag and implications on nutrients and $BOD_5$. The analysis is summarized in the Wasteload Addendum. The water quality standard for chronic ammonia toxicity is dependent on temperature and pH, and the water quality standard for acute ammonia toxicity is dependent on pH. The AMMTOX Model developed by University of Colorado and adapted by Utah DWQ and EPA Region VIII was used to determine ammonia effluent limits (Lewis et al. 2002). This analysis is further summarized in the Wasteload Addendum.

Models and supporting documentation are available for review upon request.

Antidegradation Level I Review

The objective of the Level I ADR is to ensure the protection of existing uses, defined as the beneficial uses attained in the receiving water on or after November 28, 1975. No evidence is known that the existing uses deviate from the designated beneficial uses for the receiving water. Therefore, the beneficial uses will be protected if the discharge remains below the WQBELs presented in this wasteload.

The proposed permit is a simple renewal of an existing UPDES permit. No increase in flow or concentration of pollutants over those authorized in the existing permit is being requested. Therefore, a Level II Antidegradation Review (ADR) is not required.

Location Map


**Figure 1-Location map of outfalls, monitoring locations, and surface water channels.**

Documents:
WLA Document*: 250804-Casper Ice Cream WLA_2025.docx*
Wasteload Analysis and Addendums: *250804-Casper Ice Cream WLA_2025.xlsm*

References:
Lewis, B., J. Saunders, and M. Murphy. 2002. Ammonia Toxicity Model (AMMTOX, Version2): A Tool for Determining Effluent Ammonia Limits. University of Colorado, Center for Limnology. August 2002. https://drive.google.com/file/d/11R0lxOu8a1ixkZwthKWsSMqco4D5vJO1/view

Utah Division of Water Quality. 2010. Middle Bear River and Cutler Reservoir Total Maximum Daily Load (TMDL), February 23, 2010. https://lf-public.deq.utah.gov/WebLink/DocView.aspx?id=15321&dbid=0&repo=Public

Utah Division of Water Quality. 2021. Utah Wasteload Analysis Procedures Version 2.0. https://documents.deq.utah.gov/water-quality/standards-technical-services/DWQ-2021-000684.pdf

Utah Division of Water Quality. 2024. Final 2024 Integrated Report on Water Quality. https://lf-public.deq.utah.gov/WebLink/DocView.aspx?id=87957&repo=Public&searchid=fcd9ea4c-51e1-4227-aa29-fb1921c2cc19&cr=1

**Utah Division of Water Quality**
**Salt Lake City, Utah**

**WASTELOAD ANALYSIS [WLA]** **8/4/2025**
**Addendum: Statement of Basis**

**Facilities:** **Casper's Ice Cream, Inc.** **UPDES No: UT-7UT0025526**
**Discharging to:** **Pond to Cub River**

## I. Introduction

Wasteload analyses are performed to determine point source effluent limitations necessary to maintain designated beneficial uses by evaluating projected effects of discharge concentrations on in-stream water quality. The wasteload analysis also takes into account downstream designated uses [R317-2-8, UAC]. Projected concentrations are compared to numeric water quality standards to determine acceptability. The anti-degradation policy and procedures are also considered. The primary in-stream parameters of concern may include metals (as a function of hardness), total dissolved solids (TDS), total residual chlorine (TRC), un-ionized ammonia (as a function of pH and temperature, measured and evaluated interms of total ammonia), and dissolved oxygen.

Mathematical water quality modeling is employed to determine stream quality response to point source discharges. Models aid in the effort of anticipating stream quality at future effluent flows at critical environmental conditions (e.g., low stream flow, high temperature, high pH, etc).

The numeric criteria in this wasteload analysis may always be modified by narrative criteria and other conditions determined by staff of the Division of Water Quality.

## II. Receiving Water and Stream Classification

| | |
|---|---|
| Pond to Cub River: | 2B,3B,4 |
| Antidegradation Review: | Level I review completed. Level II review is required. |

## III. Numeric Stream Standards for Protection of Aquatic Wildlife

| | |
|---|---|
| Total Ammonia (TNH3) | Varies as a function of Temperature and pH Rebound. See Water Quality Standards |
| Chronic Total Residual Chlorine (TRC) | 0.011 mg/l (4 Day Average)<br>0.019 mg/l (1 Hour Average) |
| Chronic Dissolved Oxygen (DO) | 5.5 mg/l (30 Day Average)<br>6.0 mg/l (7Day Average)<br>3.0 mg/l (1 Day Average) |
| Maximum Total Dissolved Solids | 1200.0 mg/l |

**Acute and Chronic Heavy Metals (Dissolved)**

| | 4 Day Average (Chronic) Standard | | | 1 Hour Average (Acute) Standard | | |
|---|---|---|---|---|---|---|
| **Parameter** | **Concentration** | | **Load*** | **Concentration** | | **Load*** |
| Aluminum | 87.00 | ug/l** | 0.058 lbs/day | 750.00 | ug/l | 0.500 lbs/day |
| Arsenic | 150.00 | ug/l | 0.100 lbs/day | 340.00 | ug/l | 0.227 lbs/day |
| Cadmium | 1.40 | ug/l | 0.001 lbs/day | 3.83 | ug/l | 0.003 lbs/day |
| Chromium III | 155.06 | ug/l | 0.103 lbs/day | 3244.25 | ug/l | 2.164 lbs/day |
| ChromiumVI | 11.00 | ug/l | 0.007 lbs/day | 16.00 | ug/l | 0.011 lbs/day |
| Copper | 17.22 | ug/l | 0.011 lbs/day | 27.52 | ug/l | 0.018 lbs/day |
| Iron | | | | 1000.00 | ug/l | 0.667 lbs/day |
| Lead | 7.93 | ug/l | 0.005 lbs/day | 203.45 | ug/l | 0.136 lbs/day |
| Mercury | 0.0120 | ug/l | 0.000 lbs/day | 2.40 | ug/l | 0.002 lbs/day |
| Nickel | 95.69 | ug/l | 0.064 lbs/day | 860.70 | ug/l | 0.574 lbs/day |
| Selenium | 4.60 | ug/l | 0.003 lbs/day | 20.00 | ug/l | 0.013 lbs/day |
| Silver | N/A | ug/l | N/A lbs/day | 12.99 | ug/l | 0.009 lbs/day |
| Zinc | 220.01 | ug/l | 0.147 lbs/day | 220.01 | ug/l | 0.147 lbs/day |

* Allowed below discharge
**Chronic Aluminum standard applies only to waters with a pH < 7.0 and a Hardness < 50 mg/l as CaCO3

Metals Standards Based upon a Hardness of 204.87 mg/l as CaCO3

**IV. Numeric Stream Standards for Protection of Agriculture**

| | 4 Day Average (Chronic) Standard | | 1 Hour Average (Acute) Standard | |
|---|---|---|---|---|
| | **Concentration** | **Load*** | **Concentration** | **Load*** |
| Arsenic | | | 100.0 ug/l | lbs/day |
| Boron | | | 750.0 ug/l | lbs/day |
| Cadmium | | | 10.0 ug/l | 0.00 lbs/day |
| Chromium | | | 100.0 ug/l | lbs/day |
| Copper | | | 200.0 ug/l | lbs/day |
| Lead | | | 100.0 ug/l | lbs/day |
| Selenium | | | 50.0 ug/l | lbs/day |
| TDS, Summer | | | 1200.0 mg/l | 0.40 tons/day |

**V. Numeric Stream Standards for Protection of Human Health (Class 1C Waters)**

| | 4 Day Average (Chronic) Standard | | 1 Hour Average (Acute) Standard | |
|---|---|---|---|---|
| **Metals** | **Concentration** | **Load*** | **Concentration** | **Load*** |
| Arsenic | | | ug/l | lbs/day |
| Barium | | | ug/l | lbs/day |
| Cadmium | | | ug/l | lbs/day |
| Chromium | | | ug/l | lbs/day |
| Lead | | | ug/l | lbs/day |
| Mercury | | | ug/l | lbs/day |
| Selenium | | | ug/l | lbs/day |
| Silver | | | ug/l | lbs/day |
| Fluoride (3) | | | ug/l | lbs/day |
| to | | | ug/l | lbs/day |
| Nitrates as N | | | ug/l | lbs/day |

**VI. Numeric Stream Standards the Protection of Human Health from Water & Fish Consumption [Toxics]**

| | Maximum Conc., ug/l - Acute Standards | | | |
|---|---|---|---|---|
| | **Class 1C** | | **Class 3A, 3B** | |
| **Metals** | | | | |
| Antimony | ug/l | lbs/day | | |
| Arsenic | ug/l | lbs/day | 640.00 ug/l | 11.19 lbs/day |
| Asbestos | ug/l | lbs/day | | |
| Beryllium | | | | |
| Cadmium | | | | |
| Chromium (III) | | | | |
| Chromium (VI) | | | | |
| Copper | | | | |
| Cyanide | ug/l | lbs/day | 4.0E+02 ug/l | 6.99 lbs/day |
| Lead | ug/l | lbs/day | | |
| Mercury | | | 0.15 ug/l | 0.00 lbs/day |
| Nickel | | | 4600.00 ug/l | 80.43 lbs/day |
| Selenium | ug/l | lbs/day | | |
| Silver | ug/l | lbs/day | | |
| Thallium | | | 0.50 ug/l | 0.01 lbs/day |
| Zinc | | | | |

**There are additional standards that apply to this receiving water, but were not considered in this modeling/waste load allocation analysis.**

**VII. Mathematical Modeling of Stream Quality**

Model configuration was accomplished utilizing standard modeling procedures. Data points were plotted and coefficients adjusted as required to match observed data as closely as possible.

The modeling approach used in this analysis included one or a combination of the following models.

(1) The Utah River Model, Utah Division of Water Quality, 1992. Based upon STREAMDO IV (Region VIII) and Supplemental Ammonia Toxicity Models; EPA Region VIII, Sept. 1990 and QUAL2E (EPA, Athens, GA).

(2) Utah Ammonia/Chlorine Model, Utah Division of Water Quality, 1992.

(3) AMMTOX Model, University of Colorado, Center of Limnology, and EPA Region 8

(4) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

Coefficients used in the model were based, in part, upon the following references:

(1) Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling. Environmental Research Laboratory, Office of Research and Development, U.S. Environmental Protection Agency, Athens Georgia. EPA/600/3-85/040 June 1985.

(2) Principles of Surface Water Quality Modeling and Control. Robert V. Thomann, et.al. Harper Collins Publisher, Inc. 1987, pp. 644.

## VIII. Modeling Information

The required information for the model may include the following information for both the upstream conditions at low flow and the effluent conditions:

| | |
|---|---|
| Flow, Q, (cfs or MGD) | D.O. mg/l |
| Temperature, Deg. C. | Total Residual Chlorine (TRC), mg/l |
| pH | Total NH3-N, mg/l |
| BOD5, mg/l | Total Dissolved Solids (TDS), mg/l |
| Metals, ug/l | Toxic Organics of Concern, ug/l |

### Other Conditions

In addition to the upstream and effluent conditions, the models require a variety of physical and biological coefficients and other technical information. In the process of actually establishing the permit limits for an effluent, values are used based upon the available data, model calibration, literature values, site visits and best professional judgement.

### Model Inputs

The following is upstream and discharge information that was utilized as inputs for the analysis. Dry washes are considered to have an upstream flow equal to the flow of the discharge.

**Current Upstream Information**

| | Stream Critical Low Flow cfs | Temp. Deg. C | pH | T-NH3 mg/l as N | BOD5 mg/l | DO mg/l | TRC mg/l | TDS mg/l |
|---|---|---|---|---|---|---|---|---|
| Summer (Irrig. Season) | 3.1 | 16.9 | 7.9 | 0.04 | 5.25 | 7.40 | 0.00 | 294.9 |
| Fall | 11.7 | 3.9 | 8.2 | 0.03 | 4.33 | --- | 0.00 | 259.3 |
| Winter | 33.4 | 3.4 | 8.0 | 0.15 | 4.33 | --- | 0.00 | 259.3 |
| Spring | 108.4 | 10.6 | 8.1 | 0.05 | 2.50 | --- | 0.00 | 259.3 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Dissolved Metals | Al ug/l | As ug/l | Cd ug/l | CrIII ug/l | CrVI ug/l | Copper ug/l | Fe ug/l | Pb ug/l |
| All Seasons | 15.00 | 3.80 | 0.50 | 2.50 | 2.65* | 6.00 | 15.4 | 1.50 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dissolved Metals | Hg ug/l | Ni ug/l | Se ug/l | Ag ug/l | Zn ug/l | Boron ug/l | |
| All Seasons | 0.0000 | 2.50 | 0.50 | 1.00 | 15.00 | 10.0 | * 1/2 MDL |

### Projected Discharge Information

| Season | Flow, MGD | Temp. | TDS mg/l | TDS tons/day |
|---|---|---|---|---|
| Summer | 0.08000 | 12.4 | 500.00 | 0.16677 |
| Fall | 0.08000 | 14.2 | | |
| Winter | 0.08000 | 12.3 | | |
| Spring | 0.08000 | 17.0 | | |

All model numerical inputs, intermediate calculations, outputs and graphs are available for discussion, inspection and copy at the Division of Water Quality.

## IX. Effluent Limitations

Current State water quality standards are required to be met under a variety of conditions including in-stream flows targeted to the 7-day, 10-year low flow (R317-2-9).

Other conditions used in the modeling effort coincide with the environmental conditions expected at low stream flows.

### Effluent Limitation for Flow based upon Water Quality Standards

In-stream criteria of downstream segments will be met with an effluent flow maximum value as follows:

| Season | Daily Average | |
|---|---|---|
| Summer | 0.080 MGD | 0.124 cfs |
| Fall | 0.080 MGD | 0.124 cfs |
| Winter | 0.080 MGD | 0.124 cfs |
| Spring | 0.080 MGD | 0.124 cfs |

### Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.08 MGD. If the discharger is allowed to have a flow greater than 0.08 MGD during 7Q10 conditions, and effluent limit concentrations as indicated, then water quality standards will be violated. In order to prevent this from occuring, the permit writers must include the discharge flow limititation as indicated above; or, include loading effluent limits in the permit.

### Effluent Limitation for Whole Effluent Toxicity (WET) based upon WET Policy

Effluent Toxicity will not occur in downstream segements if the values below are met.

WET Requirements LC50 > 13.2% Effluent [Acute]
IC25 > 3.8% Effluent [Chronic]

| Season | Receiving Water Flow (cfs) | Effluent Flow (MGD) | Effluent Flow (cfs) | Combined Flow (cfs) | Totally Mixed | Chronic IC25 % Effluent | Acute LC50 % Effluent |
|---|---|---|---|---|---|---|---|
| Summer | 3.12 | 0.1 | 0.1 | 3.2 | NO | 3.8% | 0.2% |
| Fall | 11.66 | 0.1 | 0.1 | 11.8 | NO | 1.1% | 0.1% |
| Winter | 33.36 | 0.1 | 0.1 | 33.5 | NO | 0.4% | 0.0% |
| Spring | 108.37 | 0.1 | 0.1 | 108.5 | NO | 0.1% | 0.0% |

### Effluent Limitation for Biological Oxygen Demand (BOD) based upon Water Quality Standards or Regulations

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent BOD limitation as follows:

| Season | Concentration | |
|---|---|---|
| Summer | 25.0 mg/l as BOD5 | 16.7 lbs/day |
| Fall | 25.0 mg/l as BOD5 | 16.7 lbs/day |

| | | |
|---|---|---|
| Winter | 25.0 mg/l as BOD5 | 16.7 lbs/day |
| Spring | 25.0 mg/l as BOD5 | 16.7 lbs/day |

**Effluent Limitation for Dissolved Oxygen (DO) based upon Water Quality Standards**

In-stream criteria of downstream segments for Dissolved Oxygen will be met with an effluent D.O. limitation as follows:

| Season | Concentration |
|---|---|
| Summer | 5.50 |
| Fall | 5.50 |
| Winter | 5.50 |
| Spring | 5.50 |

**Effluent Limitation for Total Ammonia based upon Water Quality Standards**

In-stream criteria of downstream segments for Total Ammonia will be met with an effluent limitation (expressed as Total Ammonia as N) as follows:

| Season | | Concentration | | Load | |
|---|---|---|---|---|---|
| Summer | 4 Day Avg. - Chronic | 59.2 | mg/l as N | 39.5 | lbs/day |
| | 1 Hour Avg. - Acute | 106.5 | mg/l as N | 71.0 | lbs/day |
| Fall | 4 Day Avg. - Chronic | 1198.1 | mg/l as N | 799.2 | lbs/day |
| | 1 Hour Avg. - Acute | 1821.9 | mg/l as N | 1,215.3 | lbs/day |
| Winter | 4 Day Avg. - Chronic | 494.3 | mg/l as N | 329.7 | lbs/day |
| | 1 Hour Avg. - Acute | 796.5 | mg/l as N | 531.3 | lbs/day |
| Spring | 4 Day Avg. - Chronic | 135.7 | mg/l as N | 90.5 | lbs/day |
| | 1 Hour Avg. - Acute | 236.8 | mg/l as N | 157.9 | lbs/day |

Acute limit calculated with an Acute Zone of Initial Dilution (ZID) to be equal to 50.%.

**Effluent Limitation for Total Residual Chlorine based upon Water Quality Standards**

In-stream criteria of downstream segments for Total Residual Chlorine will be met with an effluent limitation as follows:

| Season | | Concentration | | Load | |
|---|---|---|---|---|---|
| Summer | 4 Day Avg. - Chronic | 0.263 | mg/l | 0.18 | lbs/day |
| | 1 Hour Avg. - Acute | 0.246 | mg/l | 0.16 | lbs/day |
| Fall | 4 Day Avg. - Chronic | 0.953 | mg/l | 0.64 | lbs/day |
| | 1 Hour Avg. - Acute | 0.867 | mg/l | 0.58 | lbs/day |
| Winter | 4 Day Avg. - Chronic | 2.706 | mg/l | 1.81 | lbs/day |
| | 1 Hour Avg. - Acute | 2.445 | mg/l | 1.63 | lbs/day |
| Spring | 4 Day Avg. - Chronic | 8.766 | mg/l | 5.85 | lbs/day |
| | 1 Hour Avg. - Acute | 7.899 | mg/l | 5.27 | lbs/day |

**Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards**

| Season | | Concentration | | Load | |
|---|---|---|---|---|---|
| Summer | Maximum, Acute | 24017.9 | mg/l | 8.01 | tons/day |
| Fall | Maximum, Acute | 24916.4 | mg/l | 8.31 | tons/day |
| Winter | Maximum, Acute | 23866.7 | mg/l | 7.96 | tons/day |
| Spring | 4 Day Avg. - Chronic | 26799.7 | mg/l | 8.94 | tons/day |

Colorado Salinity Forum Limits Determined by Permitting Section

**Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards**

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 204.87 mg/l):

| | 4 Day Average Concentration | | Load | 1 Hour Average Concentration | | Load |
|---|---|---|---|---|---|---|
| Aluminum | N/A | | N/A | 10,014.7 | ug/l | 6.7 lbs/day |
| Arsenic | 3,835.71 | ug/l | 1.7 lbs/day | 4,577.8 | ug/l | 3.1 lbs/day |
| Cadmium | 24.10 | ug/l | 0.0 lbs/day | 45.9 | ug/l | 0.0 lbs/day |
| Chromium III | 4,001.22 | ug/l | 1.7 lbs/day | 44,106.6 | ug/l | 29.4 lbs/day |
| Chromium VI | 188.10 | ug/l | 0.1 lbs/day | 167.6 | ug/l | 0.1 lbs/day |
| Copper | 300.04 | ug/l | 0.1 lbs/day | 298.7 | ug/l | 0.2 lbs/day |
| Iron | N/A | | N/A | 13,410.9 | ug/l | 8.9 lbs/day |
| Lead | 169.98 | ug/l | 0.1 lbs/day | 2,749.0 | ug/l | 1.8 lbs/day |
| Mercury | 0.31 | ug/l | 0.0 lbs/day | 32.7 | ug/l | 0.0 lbs/day |
| Nickel | 2,445.09 | ug/l | 1.1 lbs/day | 11,678.3 | ug/l | 7.8 lbs/day |
| Selenium | 107.96 | ug/l | 0.0 lbs/day | 265.8 | ug/l | 0.2 lbs/day |
| Silver | N/A | ug/l | N/A lbs/day | 164.2 | ug/l | 0.1 lbs/day |
| Zinc | 5,388.27 | ug/l | 2.3 lbs/day | 2,804.1 | ug/l | 1.9 lbs/day |
| Cyanide (free) | 136.29 | ug/l | 0.1 lbs/day | 299.3 | ug/l | 0.2 lbs/day |

**Effluent Limitations for Heat/Temperature based upon Water Quality Standards**

| | | | |
|---|---|---|---|
| Summer | 62.8 | Deg. C. | 145.1 Deg. F |
| Fall | 100.0 | Deg. C. | 212.0 Deg. F |
| Winter | 100.0 | Deg. C. | 212.0 Deg. F |
| Spring | 100.0 | Deg. C. | 212.0 Deg. F |

**Effluent Targets for Pollution Indicators Based upon Water Quality Standards**

In-stream criteria of downstream segments for Pollution Indicators will be met with an effluent limit as follows:

| | 1 Hour Average Concentration | | Loading |
|---|---|---|---|
| Gross Beta (pCi/l) | 50.0 | pCi/L | |
| BOD (mg/l) | 5.0 | mg/l | 3.3 lbs/day |
| Nitrates as N | 4.0 | mg/l | 2.7 lbs/day |
| Total Phosphorus as P | 0.05 | mg/l | 0.0 lbs/day |
| Total Suspended Solids | 90.0 | mg/l | 60.0 lbs/day |

Note: Pollution indicator targets are for information purposes only.

**Effluent Limitations for Protection of Human Health [Toxics Rule] Based upon Water Quality Standards (Most stringent of 1C or 3A & 3B as appropriate.)**

In-stream criteria of downstream segments for Protection of Human Health [Toxics] will be met with an effluent limit as follows:

| | Maximum Concentration Concentration | | Load |
|---|---|---|---|
| **Metals** | | | |
| Antimony | | ug/l | lbs/day |

| | | |
|---|---|---|
| Arsenic | ug/l | lbs/day |
| Asbestos | ug/l | lbs/day |
| Beryllium | | |
| Cadmium | | |
| Chromium (III) | | |
| Chromium (VI) | | |
| Copper | ug/l | lbs/day |
| Cyanide | ug/l | lbs/day |
| Lead | | |
| Mercury | ug/l | lbs/day |
| Nickel | ug/l | lbs/day |
| Selenium | | |
| Silver | | |
| Thallium | ug/l | lbs/day |
| Zinc | | |

**Metals Effluent Limitations for Protection of All Beneficial Uses**
**Based upon Water Quality Standards and Toxics Rule**

| | Class 4 Acute Agricultural ug/l | Class 3 Acute Aquatic Wildlife ug/l | Acute Toxics Drinking Water Source ug/l | Acute Toxics Wildlife ug/l | 1C Acute Health Criteria ug/l | Acute Most Stringent ug/l | Class 3 Chronic Aquatic Wildlife ug/l |
|---|---|---|---|---|---|---|---|
| Aluminum | | 10014.7 | | | | 10014.7 | N/A |
| Antimony | | | | 16774.5 | | 16774.5 | |
| Arsenic | 2621.0 | 4577.8 | | | 0.0 | 2621.0 | 3835.7 |
| Asbestos | | | | | | 0.00E+00 | |
| Barium | | | | | | 0.0 | |
| Beryllium | | | | | | 0.0 | |
| Cadmium | 249.5 | 45.9 | | | 0.0 | 45.9 | 24.1 |
| Chromium (III) | | 44106.6 | | | 0.0 | 44106.6 | 4001.2 |
| Chromium (VI) | 2558.0 | 167.6 | | | 0.0 | 167.58 | 188.10 |
| Copper | 5090.8 | 298.7 | | | | 298.7 | 300.0 |
| Cyanide | | 299.3 | 10484.0 | | | 299.3 | 136.3 |
| Iron | | 13410.9 | | | | 13410.9 | |
| Lead | 2583.2 | 2749.0 | | | 0.0 | 2583.2 | 170.0 |
| Mercury | | 32.65 | | 3.93 | 0.0 | 3.93 | 0.314 |
| Nickel | | 11678.3 | | 120566.4 | | 11678.3 | 2445.1 |
| Selenium | 1297.9 | 265.8 | | | 0.0 | 265.8 | 108.0 |
| Silver | | 164.2 | | | 0.0 | 164.2 | |
| Thallium | | | | 13.1 | | 13.1 | |
| Zinc | | 2804.1 | | | | 2804.1 | 5388.3 |
| Boron | 18538.2 | | | | | 18538.2 | |

**Summary Effluent Limitations for Metals [Wasteload Allocation, TMDL]**
[If Acute is more stringent than Chronic, then the Chronic takes on the Acute value.]

| | WLA Acute ug/l | WLA Chronic ug/l | |
|---|---|---|---|
| Aluminum | 10014.7 | N/A | |
| Antimony | 16774.45 | | |
| Arsenic | 2621.0 | 3835.7 | Acute Controls |
| Asbestos | 0.00E+00 | | |
| Barium | | | |
| Beryllium | | | |
| Cadmium | 45.9 | 24.1 | |
| Chromium (III) | 44106.6 | 4001 | |
| Chromium (VI) | 167.6 | 188.1 | Acute Controls |
| Copper | 298.7 | 300.0 | Acute Controls |
| Cyanide | 299.3 | 136.3 | |
| Iron | 13410.9 | | |

| | | | |
|---|---|---|---|
| Lead | 2583.2 | 170.0 | |
| Mercury | 3.932 | 0.314 | |
| Nickel | 11678.3 | 2445 | |
| Selenium | 265.8 | 108.0 | |
| Silver | 164.2 | N/A | |
| Thallium | 13.1 | | |
| Zinc | 2804.1 | 5388.3 | Acute Controls |
| Boron | 18538.24 | | |

Other Effluent Limitations are based upon R317-1.

| | | |
|---|---|---|
| E. coli | 126.0 | organisms per 100 ml |

## X. Antidegradation Considerations

The Utah Antidegradation Policy allows for degradation of existing quality where it is determined that such lowering of water quality is necessary to accommodate important economic or social development in the area in which the waters are protected [R317-2-3]. It has been determined that certain chemical parameters introduced by this discharge will cause an increase of the concentration of said parameters in the receiving waters. Under no conditions will the increase in concentration be allowed to interfere with existing instream water uses.

The antidegradation rules and procedures allow for modification of effluent limits less than those based strictly upon mass balance equations utilizing 100% of the assimilative capacity of the receiving water. Additional factors include considerations for "Blue-ribbon" fisheries, special recreational areas, threatened and endangered species, and drinking water sources.

An Antidegradation Level I Review was conducted on this discharge and its effect on the receiving water. Based upon that review, it has been determined that an Antidegradation Level II Review is not required because it is a consistent permit renewal.

## XI. Colorado River Salinity Forum Considerations

Discharges in the Colorado River Basin are required to have their discharge at a TDS loading of less than 1.00 tons/day unless certain exemptions apply. Refer to the Forum's Guidelines for additional information allowing for an exceedence of this value.
This doesn't apply to facilities that do not discharge to the Colorado River Basin.

## XII. Summary Comments

The mathematical modeling and best professional judgement indicate that violations of receiving water beneficial uses with their associated water quality standards, including important down-stream segments, will not occur for the evaluated parameters of concern as discussed above if the effluent limitations indicated above are met.

## XIII. Notice of UPDES Requirement

This Addendum to the Statement of Basis does not authorize any entity or party to discharge to the waters of the State of Utah. That authority is granted through a UPDES permit issued by the Utah Division of Water Quality. The numbers presented here may be changed as a function of other factors. Dischargers are strongly urged to contact the Permits Section for further information. Permit writers may utilize other information to adjust these limits and/or to determine other limits based upon best available technology and other considerations provided that the values in this wasteload analysis [TMDL] are not compromised. See special provisions in Utah Water Quality Standards for adjustments in the Total Dissolved Solids values based upon background concentration.

Utah Division of Water Quality
801-538-6052
File Name: 250804-Casper Ice Cream WLA_2025.xlsm

## APPENDIX - Coefficients and Other Model Information

| CBOD Coeff. (Kd)20 1/day | CBOD Coeff. FORCED (Kd)/day | CBOD Coeff. (Ka)T 1/day | REAER. Coeff. (Ka)20 (Ka)/day | REAER. Coeff. FORCED 1/day | REAER. Coeff. (Ka)T 1/day | NBOD Coeff. (Kn)20 1/day | NBOD Coeff. (Kn)T 1/day |
|---|---|---|---|---|---|---|---|
| 2.000 | 0.000 | 1.732 | 49.400 | 0.000 | 45.864 | 0.400 | 0.314 |

| Open Coeff. (K4)20 1/day | Open Coeff. (K4)T 1/day | NH3 LOSS (K5)20 1/day | NH3 (K5)T 1/day | NO2+NO3 LOSS (K6)20 1/day | NO2+NO3 (K6)T 1/day | TRC Decay K(Cl)20 1/day | TRC K(Cl)(T) 1/day |
|---|---|---|---|---|---|---|---|
| 0.000 | 0.000 | 4.000 | 3.464 | 0.000 | 0.000 | 32.000 | 26.663 |

| BENTHIC DEMAND (SOD)20 gm/m2/day | BENTHIC DEMAND (SOD)T gm/m2/day |
|---|---|
| 1.000 | 0.821 |

| K1 CBOD {theta} | K2 Reaer. {theta} | K3 NH3 {theta} | K4 Open {theta} | K5 NH3 Loss {theta} | K6 NO2+3 {theta} | K(Cl) TRC {theta} | S Benthic {theta} |
|---|---|---|---|---|---|---|---|
| 1.0 | 1.0 | 1.1 | 1.0 | 1.0 | 1.0 | 1.1 | 1.1 |

## Antidegredation Review

**An antidegradation review (ADR) was conducted to determine whether the proposed activity complies with the applicable antidegradation requirements for receiving waters that may be affected. The Level I ADR evaluated the criteria of R317-2-3.5(b) and determined that a Level II antidegradation Review is not required because there is not a change to potential contaminants or increased effluent flow.**

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Acute

| INPUT | Summer | Fall | Winter | Spring |
|---|---|---|---|---|
| pH: | 7.90 | 8.21 | 7.99 | 8.07 |
| Beneficial use classification: | 3B | 3B | 3B | 3B |

| OUTPUT | | | | |
|---|---|---|---|---|
| Total ammonia nitrogen criteria (mg N/L): | | | | |
| Acute (Class 3A): | 6.745 | 3.745 | 5.707 | 4.932 |
| **Acute (Class 3B, 3C, 3D):** | **10.100** | **5.608** | **8.545** | **7.385** |

Freshwater total ammonia criteria based on Title R317-2-14 Utah Administrative Code
Chronic

| INPUT | Summer | Fall | Winter | Spring |
|---|---|---|---|---|
| Temperature (deg C): | 16.87 | 3.90 | 3.39 | 10.61 |
| pH: | 7.90 | 8.21 | 7.99 | 8.07 |
| Are fish early life stages present? | Yes | Yes | Yes | Yes |

| OUTPUT | | | | |
|---|---|---|---|---|
| **Total ammonia nitrogen criteria (mg N/L):** | | | | |
| **Chronic - Fish Early Life Stages Present:** | **2.399** | **1.762** | **2.464** | **2.201** |
| Chronic - Fish Early Life Stages Absent: | 2.399 | 2.862 | 4.001 | 2.831 |

# ATTACHMENT 3

*Reasonable Potential Analysis*

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**REASONABLE POTENTIAL ANALYSIS**

DWQ has worked to improve our RP for the inclusion of limits for parameters in the permit by using an EPA provided model. As a result of the model, more parameters may be included in the renewal permit. RP for this permit renewal was not conducted because of lack of discharge data obtained from previous permit cycles.

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