Official Draft Public Notice Version **October 21, 2025**
The findings, determinations, and assertions contained in this document are not final and subject to change following the public comment period.

FACT SHEET
AIRBUILD INC.
GREEN RIVER BIOREMEDIATION
PERMIT: DISCHARGE
UPDES PERMIT NUMBER: UT0026344
MINOR INDUSTRIAL

FACILITY CONTACTS

Operator Name:	Airbuild Inc.
Contact:	John Bucur
Position:	Director
Phone Number:	602-384-6134

Permittee Name:	Airbuild Inc.
Facility Name:	Green River Bioremediation
Mailing and Facility Address:	1245 S Sillman Ln Green River, Utah 84525
Telephone:	602-384-6134

DESCRIPTION OF FACILITY

Airbuild Inc. (Permittee) has designed a modular, algae-based water treatment systems to produce potable water from non-potable sources. Using photobioreactors and UV-C, the systems biologically remove nutrients, contaminants, and solids, returning treated water to the environment in compliance with discharge regulations. The systems operate off-grid using solar power. In addition to water purification, the process generates biomass byproducts such as biochar.

Green River Bioremediation (Airbuild) is a site that is being used by Airbuild Inc. to test and prove the systems. They plan to take water from the Green River, treat it, and return it to the Green River. Almost all pollutants that would be monitored for when discharging to the Green River should be reduced when compared to the influent, resulting in cleaner effluent, that they will then discharge.

DISCHARGE

DESCRIPTION OF DISCHARGE

Aibuild will be treating water from the Green River and discharging the resulting treated effluent back to the Green River. This is a new discharge permit so no previous sampling results are available.

Outfall	Description of Discharge Point
001	Located at latitude 38°54'50" and longitude 110°09'08". The discharge is by a pipe to the Green River.

RECEIVING WATERS AND STREAM CLASSIFICATION
When a discharge occurs, it will be to the Green River, which is a Class 1C, 2A, 3B, 4 according to Utah Administrate Code (UAC) R317-2-13:

Class 1C -- Protected for domestic purposes with prior treatment by treatment processes as required by the Utah Division of Drinking Water
Class 2A -- Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.
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 (Utah Division of Water Quality(DWQ), 2024), the receiving water for Outfall 001 discharge "*Green River and tributaries, from confluence with Colorado River to state line except as listed below* (Green River-4, AU ID: UT14060008-001_00)" was listed as "Fully Supporting".

BASIS FOR EFFLUENT LIMITATIONS
In accordance with regulations promulgated in 40 Code of Federal Regulations Part 122.44 and UAC R317-8-4.2, effluent limitations are derived from technology-based effluent limitations guidelines, Utah Secondary Treatment Standards (UAC R317-1-3.2) or Utah Water Quality Standards (UAC R317-2) as applicable. In cases where multiple limits have been developed, those that are more stringent 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 Wasteload Analyis (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 new UPDES Permit development, a WLA and ADR Level I were completed as appropriate and determined that this discharge will not cause a violation of water quality standards. This is a new discharge source for the Green River, so an ADR Level II (L2ADR) review was required. The L2ADR determined that there should be no to minimal degradation from this discharge since it will be taking river water, treating it, and then discharging it bake to the river, reducing the constituents that are already in the river, as per UAC R317-2-3.5.b.1.(b). The WLA indicates that the effluent limitations will be sufficiently protective of water quality, in order to meet State water quality standards in the receiving waters. The WLA with ADR information is attached to this Fact Sheet in Attachment 1. The L2ADR information is attached to this Fact Sheet in Attachment 2.

Limitations on pH are based on current Utah Secondary Treatment Standards, UAC R317-1-3.2. The oil and grease is based on BPJ. Total dissolved solids (TDS) are limited according to Utah Water Quality Standards and policies established by the Colorado River Basin Salinity Control Forum. TDS are limited by both mass loading and concentration requirements as described below:

a. The discharge is to the Green River, which is a direct tributary to the Colorado River, TDS mass loading is limited according to policies established by the Colorado River Basin Salinity Control Forum (Forum), as authorized in UAC R317-2-4 to further control salinity in the Utah portion of the Colorado River Basin. On February 28, 1977 the Forum produced the "Policy For Implementation of Colorado River Salinity Standards Through the NPDES Permit Program" (Policy), with the most current subsequent triennial revision dated October 2023. Based on Forum Policy, provisions can be made for salinity-offset projects to account for any TDS loading in excess of the permit requirement. Forum Policy requires the TDS loading limitation of 1-ton per day (or 366 tons per year) as a sum from all discharge points, unless the average concentration of TDS is 500 mg/L or less. If the concentration of TDS at any Outfall is less than or equal to 500 mg/L as a thirty-day average, then no loading limit applies for that Outfall (fresh water waiver). The 1-ton per day (or 366 tons per year) loading limit applies only to those Outfalls exceeding 500 mg/L as a thirty-day average. Those Outfalls exceeding 500 mg/L as a thirty-day average, collectively, need to meet the 1-ton per day (or 366 tons per year) limit. If 1-ton per day (or 366 tons per year) TDS cannot be achieved, then the permittee is required to remove salinity/TDS in excess of 1-ton per day (or 366 tons per year) by developing a treatment process, participating in a salinity off-set program, or developing some type of mechanism to remove the excess salinity/TDS.

b. The permit water quality based effluent limit for TDS concentration is 1,813.6 mg/L . The WQBEL is based on the Utah Water Quality Standard of 1,200 mg/L, as found in UAC R317-2-14 Table 2.14.1 and was calculated in the WLA.

There are no applicable total suspended solids (TSS), biochemical oxygen demand (BOD5), *E. coli*, dissolved oxygen (DO), or ammonia effluent limits derived from technology-based effluent limitations guidelines, or Utah Secondary Treatment Standards for the process being used, but the Division of Water Quality (DWQ) is including monitoring for TSS, DO, and ammonia to ensure there is no concern.

Reasonable Potential Analysis
Since January 1, 2016, DWQ has conducted reasonable potential analysis (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 (RP Guidance). There are four outcomes defined in the RP Guidance: Outcome A, B, C, or D. These Outcomes provide a frame work for what routine monitoring or effluent limitations are required.

This is a new discharge permit so no monitoring data is available to base a quantitative RP analysis on. It may be evaluated at the next renewal.

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

Parameter	Effluent Limitations [1]	
	Daily Minimum	Daily Maximum
Total Flow, MGD	-	0.024
TDS, mg/L	-	1,813.6
Oil & Grease, mg/L	-	10.0
pH, Standard Units	6.5	9
Mass Loading Limits		
Parameter	Annual Avg. Daily	Annual Max

TDS, Ton/Day [2] Tons/Year	1 -	- 366
MGD - Million Gallons per Day		
1. See Definitions, Part VIII, for definition of terms.		
2. The salt loading (TDS) limit is 1 ton/day, or 366 tons/year.		

SELF-MONITORING AND REPORTING REQUIREMENTS

The following self-monitoring requirements are based on the DWQ Monitoring Frequency Guidance. 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 biomonitoring, metals and toxic organics shall be attached to the DMRs.

Self-Monitoring and Reporting Requirements [1]			
Parameter	Frequency	Sample Type	Units
Total Flow [3], [4]	Continuous	Recorder	MGD
TSS	Monthly	Grab	mg/L
pH	Monthly	Grab	SU
Total Ammonia (as N)	Monthly	Grab	mg/L
DO	Monthly	Grab	mg/L
Oil & Grease [5]	Monthly, If Sheen Observed	Grab	mg/L
TDS	Monthly	Grab	mg/L
TDS, Average Daily Tons	Monthly	Calculated	Tons
TDS, Total Tons	Annually	Calculated	Tons
1. See Definitions, Part VIII, for definition of terms			
3. Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained.			
4. If the rate of discharge is controlled, the rate and duration of discharge shall be reported			
5. Oil & Grease sampled when sheen is present or visible. If no sheen is present or visible, report a no data indicator (NODI) code of 9 (Conditional Monitoring -Not Required This Period).			

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 receive, generate, treat or dispose of biosolids. Therefore 40 C.F.R. § 503 shall not apply.

STORM WATER

Separate storm water Permits may be required based on the types of activities occurring on site.

Permit coverage under the Multi Sector General Permit (MSGP) for Storm Water Discharges from Industrial Activities may be required based on the Standard Industrial Classification (SIC) code for the facility and the types of industrial activities occurring.

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

Any wastewaters discharged to the sanitary sewer, either as a direct discharge or as a hauled waste, are subject to Federal, State and local pretreatment regulations. Pursuant to Section 307 of *The Water Quality Act of 1987*, the permittee shall comply with all applicable federal General Pretreatment Regulations promulgated at *40 CFR 403*, the State Pretreatment Requirements at *UAC R317-8-8*, and any specific local discharge limitations developed by the Publicly Owned Treatment Works (POTW) accepting the wastewaters.

In addition, in accordance with *40 CFR 403.12(p)(1)*, the Permittee must notify the POTW, the EPA Regional Waste Management Director, and the State hazardous waste authorities, in writing, if they discharge 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 infrequently discharging a very small amount of effluent, in which toxicity is neither an existing concern, nor likely to be present. The discharge will be going to a receiving stream that has a much greater flow. Based on these, 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
Daniel Griffin, Discharge Permit Writer, Reasonable Potential Analysis, ADR
Jennifer Robinson, Pretreatment
Lonnie Shull, Biomonitoring
Amy Dickie, TMDL/Watershed Protection
Chris Schope, Wasteload Analysis
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

Wasteload Analysis

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: **April 26, 2025**

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

Facility: **AirBuild, Inc.**
UPDES Permit No. 7CABGRP

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 is a single discharge point listed in the Pre-WLA application (Figure 1).

- Outfall 001 will discharge treated Green River effluent to Green River at a flow of 0.024 MGD.

Receiving Water

The effluent from Outfall 001 will discharge into the Green River.

Per UAC R317-2-13.1.b, the designated beneficial uses *Green River and tributaries, from confluence with Colorado River to state line except as listed below:* are *1C, 2A, 3B, 4*.

- *Class 1C - Protected for use as a raw water source for domestic water systems.*

- *Class 2A - Protected for frequent primary contact recreation where there is a high likelihood of ingestion of water or a high degree of bodily contact with the water. Examples include, but are not limited to, swimming, rafting, kayaking, diving, and water skiing.*

- *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). The 7Q10 flow for Green River was calculated using monitoring location USGS 09315000 GREEN RIVER AT GREEN RIVER, UT for the period 2014 – 2024.

Upstream receiving water quality concentration for the parameters of interest at Outfall 001 were estimated from monitoring location USGS 09315000 GREEN RIVER AT GREEN RIVER, UT and monitoring location DWQ 4931410 GREEN R AT GREEN R ST PARK AB GREEN R CITY WWTP.

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 "*Green River and tributaries, from confluence with Colorado River to state line except as listed below* (Green River-4, AU ID: UT14060008-001_00)" was listed as "Fully Supporting".

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 into the Green 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. 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: total dissolved solids (TDS), total suspended solids (TSS), dissolved oxygen (DO), biochemical oxygen demand (BOD_5), total phosphorus (TP), total nitrogen (TN), and total ammonia (TAN).

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 0.0021%, effectively 0.0%.

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.

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).

Since no effluent water quality values were provided, effluent limits were set to the Permittee self-reported target effluent concentrations.

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.

A Level II Antidegradation Review (ADR) is required for this facility. This is a new construction with a single effluent outfall discharge into receiving water.

Location Map

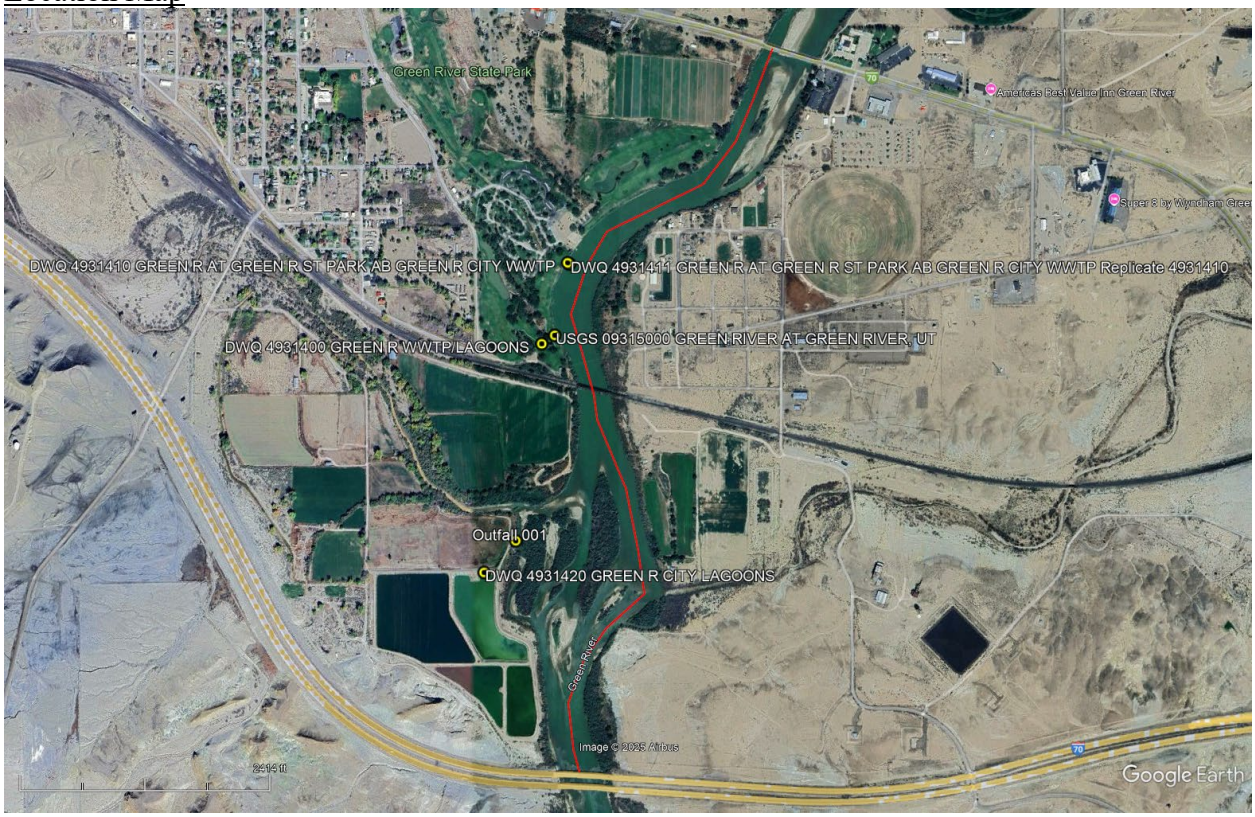

Figure 1: Location map of outfalls, monitoring locations, and surface water channels.

Documents:
WLA Document*: 250422-AirBuild_WLA_2025.docx*
Wasteload Analysis and Addendums: *250422-AirBuild_WLA_2025.xlsm*

References:

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. 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
Salt Lake City, Utah

WASTELOAD ANALYSIS [WLA] = not included in the WLA
Addendum: Statement of Basis

5/19/2025
4:00 PM

Facilities: **AirBuild, Inc.** **UPDES No: UT-7CABGRP**
Discharging to: **Green 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

Green River:	1C,2A,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) 0.019 mg/l (1 Hour Average)
Chronic Dissolved Oxygen (DO)	5.5 mg/l (30 Day Average) 6.0 mg/l (7Day Average) 3.0 mg/l (1 Day Average)
Maximum Total Dissolved Solids	1200.0 mg/l

Acute and Chronic Heavy Metals (Dissolved)

Parameter	4 Day Average (Chronic) Standard Concentration		Load*		1 Hour Average (Acute) Standard Concentration		Load*	
Aluminum	87.00	ug/l**	0.017	lbs/day	750.00	ug/l	0.150	lbs/day
Arsenic	150.00	ug/l	0.030	lbs/day	340.00	ug/l	0.068	lbs/day
Cadmium	1.86	ug/l	0.000	lbs/day	5.45	ug/l	0.001	lbs/day
Chromium III	207.97	ug/l	0.042	lbs/day	4351.21	ug/l	0.871	lbs/day
ChromiumVI	11.00	ug/l	0.002	lbs/day	16.00	ug/l	0.003	lbs/day
Copper	23.39	ug/l	0.005	lbs/day	38.57	ug/l	0.008	lbs/day
Iron					1000.00	ug/l	0.200	lbs/day
Lead	12.51	ug/l	0.003	lbs/day	321.09	ug/l	0.064	lbs/day
Mercury	0.0120	ug/l	0.000	lbs/day	2.40	ug/l	0.000	lbs/day
Nickel	129.59	ug/l	0.026	lbs/day	1165.60	ug/l	0.233	lbs/day
Selenium	4.60	ug/l	0.001	lbs/day	20.00	ug/l	0.004	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	24.07	ug/l	0.005	lbs/day
Zinc	298.09	ug/l	0.060	lbs/day	298.09	ug/l	0.060	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 293.2 mg/l as CaCO3

IV. Numeric Stream Standards for Protection of Agriculture

	4 Day Average (Chronic) Standard Concentration	Load*	1 Hour Average (Acute) Standard Concentration	Load*
Arsenic			100.0 ug/l	lbs/day
Boron			750.0 ug/l	0.08 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	0.12 tons/day

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

Metals	4 Day Average (Chronic) Standard Concentration	Load*	1 Hour Average (Acute) Standard Concentration	Load*
Arsenic			50.0 ug/l	473.175 lbs/day
Barium			1000.0 ug/l	9463.500 lbs/day
Cadmium			10.0 ug/l	94.635 lbs/day
Chromium			50.0 ug/l	473.175 lbs/day
Lead			50.0 ug/l	473.175 lbs/day
Mercury			2.0 ug/l	18.927 lbs/day
Selenium			10.0 ug/l	94.635 lbs/day
Silver			50.0 ug/l	473.175 lbs/day
Fluoride (3)			1.4 ug/l	13.249 lbs/day
to			2.4 ug/l	22.712 lbs/day
Nitrates as N			10.0 ug/l	94.635 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	14.0 ug/l	132.49 lbs/day		
Arsenic	50.0 ug/l	473.18 lbs/day	4300.00 ug/l	40693.05 lbs/day
Asbestos	7.00E+06 ug/l	6.62E+07 lbs/day		
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				
Copper				
Cyanide	1.30E+03 ug/l	12302.55 lbs/day	2.2E+05 ug/l	2081970.03 lbs/day
Lead	700.0 ug/l	6624.45 lbs/day		
Mercury			0.15 ug/l	1.42 lbs/day
Nickel			4600.00 ug/l	43532.10 lbs/day
Selenium	0.1 ug/l	1.32 lbs/day		
Silver	610.0 ug/l	5772.74 lbs/day		
Thallium			6.30 ug/l	59.62 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)	1755.7	22.2	8.0	0.03	2.23	6.73	0.00	1813.6
Fall	1378.6	7.2	8.1	0.03	1.28	---	0.00	1605.8
Winter	1432.9	4.3	8.0	0.05	1.35	---	0.00	1605.8
Spring	2071.4	16.2	8.0	0.05	1.91	---	0.00	1605.8

	Dissolved Metals	As	Cd	CrIII	CrVI	Copper	Fe	Pb
	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l
All Seasons	10.00	2.00	0.50	2.00	2.65*	10.00	18.0	100.00

	Dissolved Metals	Hg	Ni	Se	Ag	Zn	Boron	
		ug/l	ug/l	ug/l	ug/l	ug/l	ug/l	
All Seasons		0.0000	3.00	2.00	0.50	30.00	10.0	* 1/2 MDL

Projected Discharge Information

Season	Flow, MGD	Temp.	TDS mg/l	TDS tons/day

Summer	0.02400	NA	600.00	0.06004
Fall	0.02400	NA		
Winter	0.02400	NA		
Spring	0.02400	NA		

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	0.024 MGD	0.037 cfs
Fall	0.024 MGD	0.037 cfs
Winter	0.024 MGD	0.037 cfs
Spring	0.024 MGD	0.037 cfs

Flow Requirement or Loading Requirement

The calculations in this wasteload analysis utilize the maximum effluent discharge flow of 0.024 MGD. If the discharger is allowed to have a flow greater than 0.024 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 > 0.0% Effluent [Acute]
IC25 > 0.0% 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	1755.71	0.0	0.0	1755.8	NO	0.0%	0.0%
Fall	1378.57	0.0	0.0	1378.6	NO	0.0%	0.0%
Winter	1432.86	0.0	0.0	1432.9	NO	0.0%	0.0%
Spring	2071.43	0.0	0.0	2071.5	NO	0.0%	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	10.0 mg/l as BOD5	2.0 lbs/day
Fall	10.0 mg/l as BOD5	2.0 lbs/day
Winter	10.0 mg/l as BOD5	2.0 lbs/day
Spring	10.0 mg/l as BOD5	2.0 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	6.00
Fall	6.00
Winter	6.00
Spring	6.00

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	64960.8	mg/l as N	13,000.0	lbs/day
	1 Hour Avg. - Acute	101635.8	mg/l as N	20,339.4	lbs/day
Fall	4 Day Avg. - Chronic	64896.7	mg/l as N	12,987.1	lbs/day
	1 Hour Avg. - Acute	134470.8	mg/l as N	26,910.3	lbs/day
Winter	4 Day Avg. - Chronic	47622.5	mg/l as N	9,530.2	lbs/day
	1 Hour Avg. - Acute	107935.6	mg/l as N	21,600.1	lbs/day
Spring	4 Day Avg. - Chronic	43230.4	mg/l as N	8,651.3	lbs/day
	1 Hour Avg. - Acute	89527.5	mg/l as N	17,916.2	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	472.831	mg/l	94.62	lbs/day
	1 Hour Avg. - Acute	425.557	mg/l	85.16	lbs/day
Fall	4 Day Avg. - Chronic	371.265	mg/l	74.30	lbs/day
	1 Hour Avg. - Acute	334.148	mg/l	66.87	lbs/day
Winter	4 Day Avg. - Chronic	385.885	mg/l	77.22	lbs/day
	1 Hour Avg. - Acute	347.305	mg/l	69.50	lbs/day
Spring	4 Day Avg. - Chronic	557.854	mg/l	111.64	lbs/day
	1 Hour Avg. - Acute	502.078	mg/l	100.48	lbs/day

Effluent Limitations for Total Dissolved Solids based upon Water Quality Standards

Season		Concentration		Load	
Summer	Maximum, Acute	1813.6	mg/l	0.18	tons/day
Fall	Maximum, Acute	1813.6	mg/l	0.18	tons/day
Winter	Maximum, Acute	1813.6	mg/l	0.18	tons/day
Spring	4 Day Avg. - Chronic	1813.6	mg/l	0.18	tons/day

Colorado Salinity Forum Limits Determined by Permitting Section

Effluent Limitations for Total Recoverable Metals based upon Water Quality Standards

Utah Division of Water Quality
Salt Lake City, Utah

In-stream criteria of downstream segments for Dissolved Metals will be met with an effluent limitation as follows (based upon a hardness of 293.2 mg/l):

	4 Day Average Concentration		Load		1 Hour Average Concentration		Load	
Aluminum	N/A		N/A		17,497,364.0	ug/l	3502.0	lbs/day
Arsenic	#########	ug/l	905.4	lbs/day	7,992,036.7	ug/l	1599.6	lbs/day
Cadmium	64,493.02	ug/l	8.3	lbs/day	116,961.9	ug/l	23.4	lbs/day
Chromium III	#########	ug/l	1260.0	lbs/day	##########	ug/l	20582.5	lbs/day
Chromium VI	332,210.23	ug/l	43.0	lbs/day	284,336.0	ug/l	56.9	lbs/day
Copper	633,183.05	ug/l	81.9	lbs/day	675,566.1	ug/l	135.2	lbs/day
Iron	N/A		N/A		23,219,479.7	ug/l	4647.3	lbs/day
Lead	-	ug/l	0.0	lbs/day	5,227,747.3	ug/l	1046.3	lbs/day
Mercury	567.00	ug/l	0.1	lbs/day	56,747.9	ug/l	11.4	lbs/day
Nickel	#########	ug/l	774.4	lbs/day	27,489,809.4	ug/l	5502.0	lbs/day
Selenium	122,953.78	ug/l	15.9	lbs/day	425,613.3	ug/l	85.2	lbs/day
Silver	N/A	ug/l	N/A	lbs/day	557,366.4	ug/l	111.6	lbs/day
Zinc	#########	ug/l	1640.0	lbs/day	6,338,920.9	ug/l	1268.7	lbs/day
Cyanide (free)	245,903.56	ug/l	31.8	lbs/day	520,191.6	ug/l	104.1	lbs/day

Effluent Limitations for Heat/Temperature based upon Water Quality Standards

Summer	100.0	Deg. C.	212.0	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	1.0	lbs/day
Nitrates as N	4.0	mg/l	0.8	lbs/day
Total Phosphorus as P	0.05	mg/l	0.0	lbs/day
Total Suspended Solids	90.0	mg/l	18.0	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	662048.04	ug/l	132.49	lbs/day
Arsenic	2269881.01	ug/l	454.25	lbs/day
Asbestos	3.31E+11	ug/l	6.62E+07	lbs/day
Beryllium				
Cadmium				
Chromium (III)				
Chromium (VI)				

Copper	61475889.84	ug/l	12302.55	lbs/day
Cyanide	33102402.22	ug/l	6624.45	lbs/day
Lead	0.00		0.00	
Mercury	6620.01	ug/l	1.32	lbs/day
Nickel	28846379.08	ug/l	5772.74	lbs/day
Selenium	0.00		0.00	
Silver	0.00		0.00	
Thallium	80391.55	ug/l	16.09	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		17497364.0				17497364.0	N/A
Antimony			662048.0	203343327.9		662048.0	
Arsenic	4728914.6	7992036.7	2269881.0		0.0	2269881.0	6998795.6
Asbestos			3.31E+11			3.31E+11	
Barium					47289146.0	47289146.0	
Beryllium						0.0	
Cadmium	449247.4	116961.9			0.0	116961.9	64493.0
Chromium (III)		102837372.8			0.0	102837372.8	9740317.4
Chromium (VI)	4634338.3	284336.0			0.0	284335.98	332210.23
Copper	8984947.7	675566.1	61475889.8			675566.1	633183.0
Cyanide		520191.6	##########			520191.6	245903.6
Iron		23219479.7				23219479.7	
Lead	100.0	5227747.3			0.0	100.0	0.0
Mercury		56747.94	6620.0	7093.37	0.0	6620.01	566.997
Nickel		27489809.4	28846379.1	217530071.7		27489809.4	5986450.7
Selenium	2269881.0	425613.3			0.0	425613.3	122953.8
Silver		557366.4			0.0	557366.4	
Thallium			80391.5	297921.6		80391.5	
Zinc		6338920.9				6338920.9	12677543.6
Boron	27900756.2					27900756.2	

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	17497364.0	N/A	
Antimony	662048.04		
Arsenic	2269881.0	6998795.6	Acute Controls
Asbestos	3.31E+11		
Barium			
Beryllium			
Cadmium	116961.9	64493.0	
Chromium (III)	102837372.8	9740317	
Chromium (VI)	284336.0	332210.2	Acute Controls
Copper	675566.1	633183.0	
Cyanide	520191.6	245903.6	
Iron	23219479.7		
Lead	100.0	0.0	
Mercury	6620.008	566.997	
Nickel	27489809.4	5986451	
Selenium	425613.3	122953.8	
Silver	557366.4	N/A	
Thallium	80391.5		
Zinc	6338920.9	12677543.6	Acute Controls

Boron	27900756.16

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: 250519-AirBuild_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
0.210	0.000	0.233	1.454	0.000	1.533	0.400	0.475

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	4.432	0.000	0.000	32.000	36.444

BENTHIC DEMAND (SOD)20 gm/m2/day	BENTHIC DEMAND (SOD)T gm/m2/day
1.000	1.151

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:	7.98	8.09	8.04	7.98
Beneficial use classification:	3B	3B	3B	3B

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Acute (Class 3A):	5.878	4.761	5.188	5.855
Acute (Class 3B, 3C, 3D):	**8.801**	**7.129**	**7.768**	**8.766**

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

INPUT	Summer	Fall	Winter	Spring
Temperature (deg C):	22.23	7.19	4.35	16.23
pH:	7.98	8.09	8.04	7.98
Are fish early life stages present?	Yes	Yes	Yes	Yes

OUTPUT				
Total ammonia nitrogen criteria (mg N/L):				
Chronic - Fish Early Life Stages Present:	**1.532**	**2.140**	**2.290**	**2.250**
Chronic - Fish Early Life Stages Absent:	1.532	3.434	3.718	2.250

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ATTACHMENT 2

Antidegradation Review, Level II

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Industrial Permit Application

Part X. Antidegradation Review

The objective of antidegradation rules and policies is to protect existing high quality waters and set forth a process for determining where and how much degradation is allowable for socially and/or economically important reasons. In accordance with Utah Administrative Code (UAC R317-2-3), an antidegradation review (ADR) is a permit requirement for any project that will increase the level of pollutants in waters of the state. The rule outlines requirements for both Level I and Level II ADRs, as well as public comment procedures. This review form is intended to assist the applicant and Division of Water Quality (DWQ) staff in complying with the rule but is not a substitute for the complete rule in R317-2-3.5. Additional details can be found in the *Utah Antidegradation Implementation Guidance* and relevant sections of the guidance are cited in this review form.

ADRs should be among the first steps of an application for a UPDES permit because the review helps establish treatment expectations. The level of effort and amount of information required for the ADR depends on the nature of the project and the characteristics of the receiving water. To avoid unnecessary delays in permit issuance, DWQ recommends that the process be initiated at least one year prior to the date a final approved permit is required.

DWQ will determine if the project will impair beneficial uses (Level I ADR) using information provided by the applicant and whether a Level II ADR is required. The applicant is responsible for conducting the Level II ADR. For the permit to be approved, the Level II ADR must document that all feasible measures have been undertaken to minimize pollution for socially, environmentally or economically beneficial projects resulting in an increase in pollution to waters of the state.

For permit requiring a Level II ADR, this antidegradation form must be completed and approved by DWQ before any UPDES permit can be issued. Typically, the ADR form is completed in an iterative manner in consultation with DWQ. The applicant should first complete the statement of social, environmental and economic importance (SEEI) in Section C and determine the parameters of concern (POCs) in Section D. Once the POCs are agreed upon by DWQ, the alternatives analysis and selection of preferred alternative Section E can be conducted based on minimizing degradation resulting from discharge of the POCs. Once the applicant and DWQ agree upon the preferred alternative, the review is considered complete, and the form is submitted to DWQ.

What are the designated uses of the receiving water (R317-2-6)? (check all that apply)

- ■ Domestic Water Supply
- ■ Recreation
- ■ Aquatic Life
- ■ Agricultural Water Supply
- ☐ Great Salt Lake

Antidegradation Category 1, 2 or 3 of receiving water? (R317-2-3.2, -3.3, and -3.4): _____

_____

UPDES Industrial Permit Application

Part X. Antidegradation Review *continued*

Effluent flow reviewed: *typically, this should be the maximum daily discharge at the design capacity of the facility. Exceptions should be noted.*

What is the application for? (Check all that apply)

- ■ A UPDES permit for a new facility, project, or outfall.
- ☐ A UPDES permit renewal with an expansion of modification of an existing wastewater treatment works.
- ☐ A UPDES permit renewal requiring limits for a pollutant not covered by the previous permit and/or an increase to existing permit limits.
- ☐ A UPDES permit renewal with no charges in facility operations.

Section B. Is a Level II ADR required?

This section of the form is intended to help applicants determine if a Level II ADR is required for specific permitted activities. In addition, the Executive Secretary/Director may require a Level II ADR for an activity with the potential for major impact on the quality of waters of the state (R317-2-3.5a.1).

B1. The UPDES permit is new or is being renewed and the proposed effluent concentration and loading limits are higher than the concentration and loading limits in the previous permit and any previous antidegradation review(s).

- ■ YES – (Proceed/Skip to **B3** of the Form)
- ☐ NO – No Level II ADR is required and there is no need to proceed further with the review questions. Continue to the Certification Statement and Signature page.

B2. Will any pollutants use assimilative capacity of the receiving water, i.e. do the pollutant concentrations in the effluent exceed those in the receiving waters at critical conditions? For most pollutants, effluent concentrations that are higher than the ambient concentrations require an antidegradation review? For a few pollutants such as dissolved oxygen, and antidegradation review is required if the effluent concentrations are less than the ambient concentrations in the receiving water. (Section 3.3.3 of Implementation Guidance)

- ☐ YES – (Proceed to **B3** of the Form)
- ☐ NO – No Level II ADR is required and there is no need to proceed further with the review questions. Continue to the Certification Statement and Signature page.

UPDES Industrial Permit Application

Part X. Antidegradation Review *continued*

B3. Are water quality impacts of the proposed project temporary and limited (Section 3.3.4 of Implementation Guidance)? Proposed projects that will have temporary and limited effects on water quality can be exempted form a Lev le II ADR.

■ YES – Identify the reason used to justify this determination if B4.1 and proceed to Section G. No Level II ADR is required.

☐ NO – A Level II ADR is required (Proceed to Section C)

B3.1 Complete this question only if the applicant is requesting a Level II review exclusion for temporary and limited projects (See R317-2-3.5(b)(3) and R317-2-3.5(b)(4)). For projects requesting a temporary and limited exclusion please indicate the factor(s) used to justify this determination (check all that apply and provide details as appropriate) (Section 3.3.4 of Implementation Guidance):

☐ Water quality impacts will be temporary and related exclusively to sediment or turbidity and fish spawning will not be impaired.

Factors to be considered in determining whether water quality impacts will be temporary and limited:

a) The length of time during which water quality will be lowered:	
b) The perfect change in ambient concentrations of pollutants:	
c) Pollutants affected:	
d) Likelihood for long-term water quality benefits:	Yes
e) Potential for any residual long-term influences on existing uses:	
f) Impairment of fish spawning, survival and development of aquatic fauna excluding fish removal efforts:	
Additional justification, as needed:	

The aim of the project is to reduce the contaminant levels in the river water, thereby biore

UPDES Industrial Permit Application

Part X. Antidegradation Review *continued*

Level II ADR

Section C, D, E, and F of the form constitute the Level II ADR Review. The applicant must provide as much detail as necessary for DWQ to perform the antidegradation review. Questions are provided for the convenience of applicants; however, for more complex permits it may be more effective to provide the required information in a separate report. Applicants that prefer a separate report should record the report name here and proceed to Section G of the form.

Option Report Name: _____

Section C. Is the degradation from the project socially and economically necessary to accommodate important social or economic development in the area in which the waters are located? *The applicant must provide as much detail as necessary for DWQ to concur that the project is socially and economically necessary when answering the questions in the section. More information is available in Section 6.2 of the Implementation Guidance.*

C1. Describe the social and economic benefits that would be realized through the proposed project, including the number and nature of jobs created and anticipated tax revenues.

The project would lead to the development of jobs for the community in the process of building out the system, as well the benefits to the local farming communities through the production of biochar, which can be used for soil enhancement.

C2. Describe any environmental benefits to be realized through implementation of the proposed project.

The project would reduce high nutrient levels in the green river, thus restoring ecological balance of the aquatic ecosystem and reducing the potential for such impacts such as algae blooms and eutrophication.

C3. Describe any social and economic losses that may result from the project, including impacts to recreation or commercial development.

C4. Summarize any supporting information from the affected communities on preserving assimilative capacity to support future growth and development.

UPDES Industrial Permit Application

Part X. Antidegradation Review *continued*

C5. Please describe any structures or equipment associated with the project that will be placed within or adjacent to the receiving water.

We would have Solar power battery and inverter storage areas, we would have a algae biomass harvester, we would have a pyrolysis machine for biochar production, we would have a UVC reactor for further water treatment before discharge to the river.

C6. Will the discharge potentially impact a drinking water source, e.g., Class 1C waters? Depending upon the locations of the discharge and its proximity to downstream drinking water diversions, additional treatment or more stringent effluent limits or additional monitoring, beyond that which may otherwise be required to meet minimum technology standards or in stream water quality standards, may be required by the Director in order to adequately protect public health and the environment (R317-2-3.5 d.).

☐ YES
■ NO

Section D. Identify and rank (from increasing to decreasing potential threat to designated uses) the parameters of concern. *Parameters of concern are parameters in the effluent at concentrations greater than ambient concentrations in the receiving water. The applicant is responsible for identifying parameter concentrations in the effluent and DWQ will provide parameter concentrations for the receiving water. More information is available in Section 3.3.3 of the Implementation Guidance.*

Parameters of Concern:

Rank	Pollutant	Ambient Concentration	Effluent Concentration
1. N/A			
2.			
3.			
4.			
5.			

UPDES Industrial Permit Application

Part X. Antidegradation Review *continued*

Pollutants Evaluated that are not Considered Parameters of Concern:

Pollutant	Ambient Concentration	Effluent Concentration	Justification
1. N/A			
2.			
3.			
4.			
5.			

Section E. Alternative Analysis Requirements of Level II Antidegradation Review. *Level II ADRs require the applicant to determine whether there are feasible less-degrading alternatives to the proposed project. More information is available in Section 5.5 and 5.6 of the Implementation Guidance.*

E1. The UPDES permit is being renewed without any changes to flow or concentrations. Alternative treatment and discharge options including changes to operations and maintenance were considered and compared to the current processes. NO economically feasible treatment or discharge alternatives were identified that were not previously considered for any previous antigradation review(s).

☐ YES – (Proceed to Section F)
■ NO or Does Not Apply (Proceed to E2)

E2. Attach as an appendix to this form a report that describes that following factors for all alternative treatment options (see 1) a technical descriptions of the treatment process, including construction costs and continued operation and maintenance expenses, 2) the mass and concentration of discharge constituents, and 3) a description of the reliability of the system, including the frequency where recurring operation and maintenance may lead to temporary increases in discharged pollutants. Most of this information is typically available from a Facility Plan, if available.

Report Name: _____

E3. Describe the proposed method and cost of the baseline treatment alternative. The baseline treatment alternative is the minimum treatment required to meet water quality based effluent limits (WQBEL) as determined by the preliminary or final wasteload analysis (WLC) and any secondary or categorical effluent limits.

The Airbuild system operates using an enclosed open algae pond, where river water is pumped into the pond. Algae inoculum is introduced to cultivate growth in the nutrient-rich river water. As the algae thrive, they absorb essential nutrients such as nitrogen, phosphorus, and organic carbon, while also harnessing sunlight to produce oxygen and store the nutrients they have absorbed. Once the algae reach their optimal growth stage, they are harvested using a specialized machine that separates the algae biomass from the water. The water is then processed through a 0.5-micron filter, followed by a UVC reactor for further treatment before being discharged back into the river. Meanwhile, the algae biomass is sent for pyrolysis to be converted into biochar.

UPDES Industrial Permit Application

Part X. Antidegradation Review *continued*

E4. Were any of the following alternatives feasible and affordable?

Alternative	Feasible	Reason Not Feasible/Affordable
Pollutant Trading	☐ YES ☐ NO	N/A
Water Recycling/Reuse	☐ YES ☐ NO	
Land Application	☐ YES ☐ NO	
Connection to Other Facilities	☐ YES ☐ NO	
Upgrade to Existing Facility	☐ YES ☐ NO	
Total Containment	☐ YES ☐ NO	
Improved O&M of Existing Systems	☐ YES ☐ NO	
Seasonal or Controlled Discharge	☐ YES ☐ NO	
New Construction	☐ YES ☐ NO	
No Discharge	☐ YES ☐ NO	

E5. From the applicant's perspective, what is the preferred treatment option?

N/A

UPDES Industrial Permit Application

Part X. Antidegradation Review *continued*

E6. Is the preferred option also the least polluting feasible alternative?

☐ YES ☐ NO

If No, what were less degrading feasible alternative(s)?

N/A

If No, provide a summary of the justification for not selecting the least polluting feasible alternative and if appropriate, provide a more detailed justification as an attachment.

Section F. Optional Information

F1. Does the applicant want to conduct optional public review(s) in addition to the mandatory public review? Level II ADRs are public noticed for a thirty day comment period. More information is available in Section 3.7.1 of the Implementation Guidance.

☐ YES ■ NO

F2. Does the project include an optional mitigation plan to compensate for the proposed water quality degradation?

☐ YES ■ NO

Report Name: N/A

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Industrial Permit Application

Part XI. Certification Statement and Signature

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with system designed to assure that quailed personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, 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 of knowing violations.

John Bucur		COO	07/03/2025
PRINT NAME of Signatory Authority	**Signature**	**Title**	**Date**

The Division of Water Quality may request addition information.

Important: The UPDES Permit Application will not be considered complete unless you answer every question. If an item does not apply to you, enter "Not Applicable" to show that you considered the question.

The UPDES Permit Application, must be signed as follows:

1) For a corporation, a responsible corporate officer shall sign the NOT, a responsible corporate officer means:
   a. A President, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation; or
   b. The manager of one or more manufacturing, production, or operating facilities, if
      i. The manager is authorized to make management decisions that govern the operation of the regulated facility, including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental statutes and regulations:
      ii. The manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and
      iii. Authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
2) For a partnership of sole proprietorship, the general partner or the proprietor, respectively; or
3) For a municipality, state or other public agency, either a principal executive officer or ranking elected official shall sign the application; in this subsection, a principal executive officer of any agency means;
   a. The chief executive officer of the agency; or
   b. A senior executive officer having responsibility for the overall operations of a principal geographic unit or division of the agency.

Where to File the UPDES Permit Application form:

Please submit the original form with a signature in ink to the below address. Remember to retrain a copy for your records.

UPDES sent by mail:

Division of Water Quality
195 North 1950 West
PO Box 144870
Salt Lake City, UT 84114-4870

OFFICE USE ONLY

Date received: ___/___/___ **Received by:** _____ **Document No:** _____

via: ☐ Email ☐ Fax ☐ Webportal ☐ Mail ☐ Hand Delivery

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Industrial Permit Application

Appendix A. Testing Requirements for Organic Toxic Pollutants
Industry Categories*

	Industry Category	Volatile	Gas Chromatography/Mass Spectrometry (GS/MS) Fraction(s)†		Pesticide
			Acid	Base/Neutral	
1.	Adhesives and sealants	X	X	X	☐
2.	Aluminum forming	X	X	X	☐
3.	Auto and other laundries	X	X	X	X
4.	Battery manufacturing	X	☐	X	☐
5.	Coal mining	☐	☐	☐	☐
6.	Coil coating	X	X	X	☐
7.	Copper forming	X	X	X	☐
8.	Electric and electronic compounds	X	X	X	X
9.	Electroplating	X	X	X	☐
10.	Explosives manufacturing	☐	X	X	☐
11.	Foundries	X	X	X	☐
12.	Gum and wood chemicals (all subparts except D and F)	X	X	☐	☐
13.	Gum and wood chemicals, Subpart D (tall oil rosin)	X	X	X	☐
14.	Gum and wood chemicals, Subpart F (rosin-based derivatives)	X	X	X	☐
15.	Inorganic chemicals manufacturing	X	X	X	☐
16.	Iron and steel manufacturing	X	X	X	☐
17.	Leather tanning and finishing	X	X	X	☐
18.	Mechanical products manufacturing	X	X	X	☐
19.	Nonferrous metals manufacturing	X	X	X	X
20.	Ore mining, Subpart B (base and precious metals)	☐	X	☐	☐
21.	Organic chemicals manufacturing	X	X	X	X
22.	Paint and ink formulation	X	X	X	☐
23.	Pesticides	X	X	X	X
24.	Petroleum refining	X	☐	☐	☐
25.	Pharmaceutical preparations	X	X	X	☐
26.	Photographic equipment and supplies	X	X	X	☐
27.	Plastic and synthetic materials manufacturing	X	X	X	X
28.	Plastic processing	X	☐	☐	☐
29.	Printing and publishing	X	X	X	X
30.	Pulp and paperboard mills	X	X	X	X
31.	Rubber processing	X	X	X	☐
32.	Soap and detergent manufacturing	X	X	X	☐
33.	Steam electric power plants	X	X	☐	☐
34.	Textile mills (except Subpart C, Greige Mills)	X	X	X	☐
35.	Timber products processing	X	X	X	X

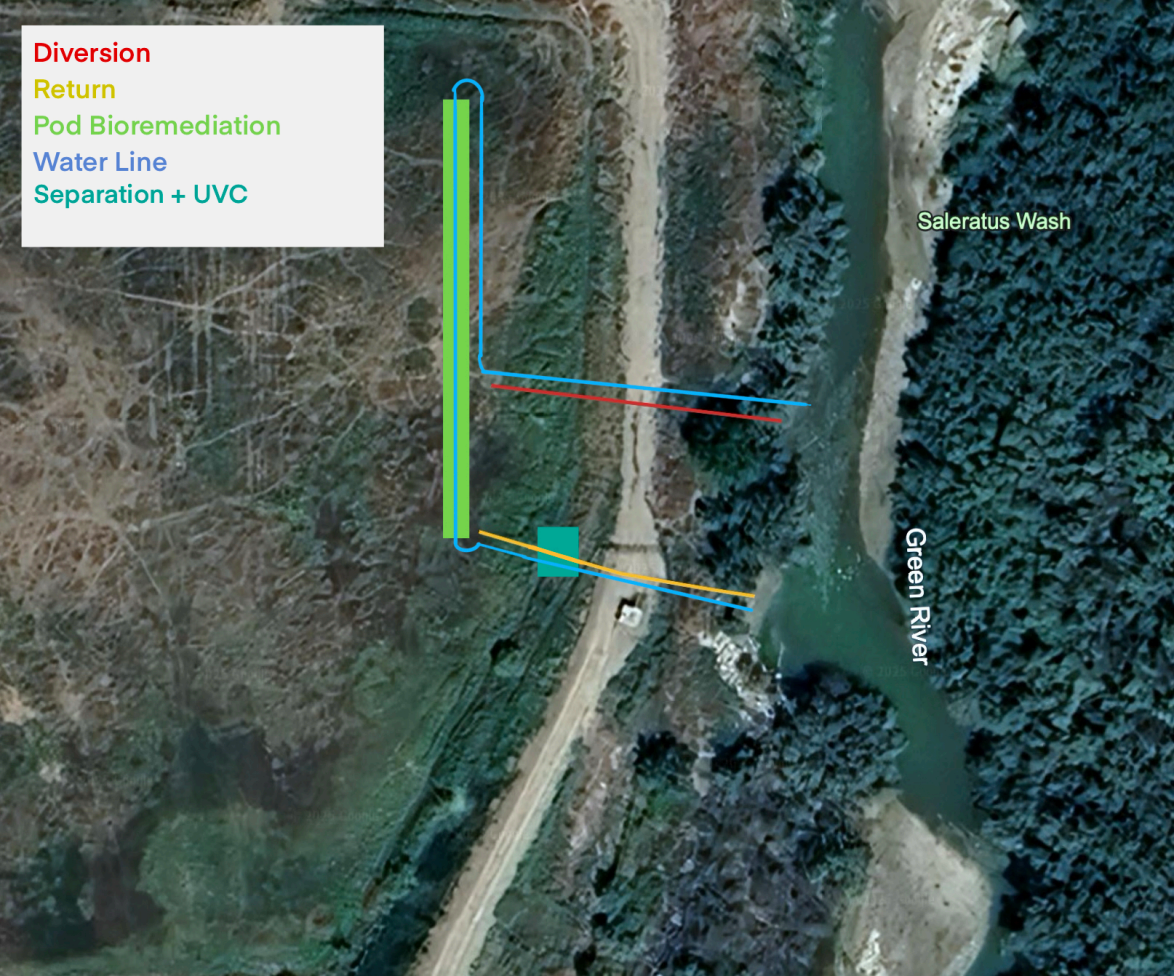
Key

* See note at conclusion of 40 CFR 122, Appendix D (1983) for explanation of effect of suspensions on testing requirements for primary industry categories

† The pollutants in each fraction are listed in Table B

X Testing is required

☐ Testing is not required


Diversion
Return
Pod Bioremediation
Water Line
Separation + UVC
Saleratus Wash
Green River

AIRBUILD

Supplemental Report for Airbuild's Water Right Permit

Airbuild's Biological Water Treatment Process

Written By: Manasi Gokhale and Ejike Ken-Opurum

18th July 2025

One of the primary functions of the Airbuild pods is to treat water from the Green River in Utah. Several water quality parameters require monitoring, including Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), pH, Dissolved Oxygen (DO), temperature, and various pollutants of concern present in the river. In Green River, Utah, the primary pollutants of concern include waterborne pathogens, cyanotoxins, sediments, trace elements, and metals. Excess nutrients, such as nitrogen and phosphorus, along with heavy metals like selenium, primarily stem from agricultural runoff, natural geological deposits, and irrigation drainage.(Gerner et al. 2006; Hamilton et al. 2000). A fact sheet detailing the renewal permit for the USBR Flaming Gorge Wastewater Treatment Plant indicates that Total Suspended Solids (TSS) come from riverbanks, agricultural fields, construction sites, and stormwater runoff. Another fact sheet for the Green River wastewater treatment facility notes that disinfection residuals, such as Total Residual Chlorine (TRC), result from treated wastewater effluent and urban runoff. The Utah Department of Environmental Quality states that microbial pathogens are introduced through fecal waste from livestock, wildlife, and septic systems. One consequence of excess nutrients is the growth of cyanobacteria, which is fueled by both agricultural activities and natural sources (EPA 2023).

The Airbuild pods will effectively absorb excess nutrients through algae cultivation, helping to reduce total suspended solids (TSS) and heavy metal concentrations by filtering water through a 0.5-micron filter before it is passed through a UVC system at the outlet, which reduces microbial contaminants. In addition to enhancing water quality, the algae biomass produced at the conclusion of each filtration cycle will be combined with other feedstocks and subjected to pyrolysis, transforming the organic material into biochar. This biochar can subsequently be utilized for carbon capture, soil enhancement, or renewable energy generation. A study conducted by the University of Massachusetts investigated Scenedesmus acuminatus, a particular type of algae, and the findings revealed that it serves as an effective method for water purification while also effectively capturing carbon. The research demonstrated its capability to remove Total Nitrogen (TN) and Total Phosphorus (TP) from the water during its growth (Wittbold and Gikonyo 2025). This, in turn, prevents algal blooms. The nutrient removal charts below clearly depict a significant decrease in TN and TP concentrations towards the end of the operation cycles (Wittbold and Gikonyo 2025).

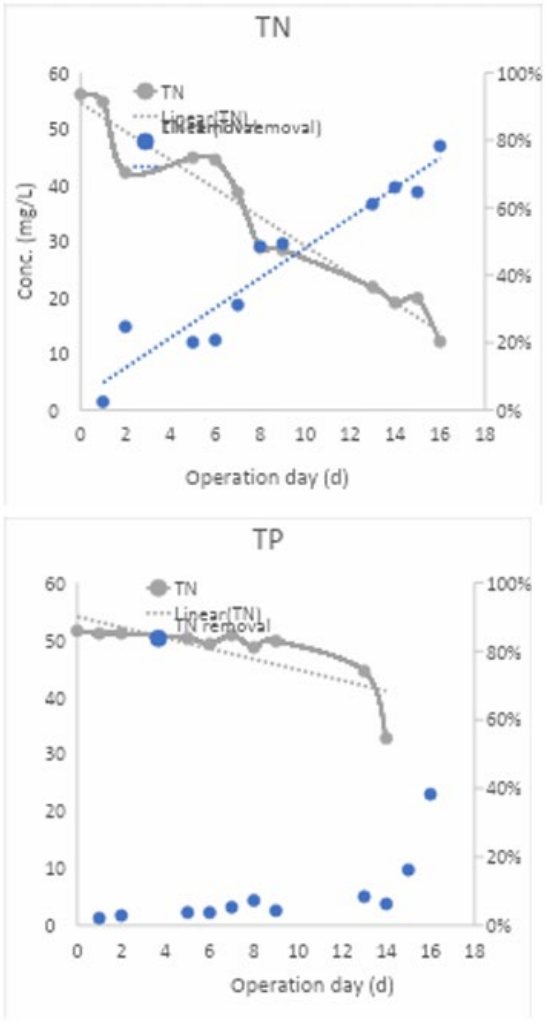


Figure 1 Nutrients removal during the growth period. A) TN and b)TP with removal as % (Wittbold and Gikonyo 2025).

References:

EPA. 2023. 'The Effects: Dead Zones and Harmful Algal Blooms', *Nutrient Pollution*.

Gerner, SJ, LE Spangler, BA Kimball, Dale E Wilberg, and DL Naftz. 2006. "Hydrology and water quality in the Green River and surrounding agricultural areas near Green River in Emery and Grand Counties, Utah, 2004-05." In.: US Geological Survey.

Hamilton, SJ, RT Muth, B Waddell, and TW May. 2000. 'Hazard assessment of selenium and other trace elements in wild larval razorback sucker from the Green River, Utah', *Ecotoxicology and environmental safety*, 45: 132-47.

Wittbold, Patrick, and Joseph Gitau Gikonyo. 2025. *Algal Solar Panels for Carbon Sequestration and Energy Generation*. Phase 1 Report.

Daniel Griffin <dgriffin@utah.gov>

Airbuild Industrial Permit Application

8 messages

John Bucur <john@airbuildinc.com> Thu, Jul 3, 2025 at 12:58 PM
To: Danielle Lenz <dlenz@utah.gov>, dgriffin@utah.gov, Ejike Ken-Opurum <ejike@airbuildinc.com>

Hey everyone,

Thanks for your help on the permit application. Files are attached below:

John

2 attachments

UPDES Industrial AIRBUILD.pdf
4749K

Blueprint.pdf
1634K

Daniel Griffin <dgriffin@utah.gov> Wed, Jul 9, 2025 at 11:51 AM
To: John Bucur <john@airbuildinc.com>
Cc: Danielle Lenz <dlenz@utah.gov>, Ejike Ken-Opurum <ejike@airbuildinc.com>

While reviewing the application I checked the Lat and Long and they were off.
You indicated
38°54'22.6"N 110°09'08.8"W

Can you inform me of the source you used for that?

thanks
Dan
[Quoted text hidden]
--
Daniel Griffin,
Daniel Griffin P.E. | Environmental Engineer | Individual Permitting Section
801.536.4387 (office) | 801.536.4301 (fax)

John Bucur <john@airbuildinc.com> Wed, Jul 9, 2025 at 12:34 PM
To: Daniel Griffin <dgriffin@utah.gov>
Cc: Danielle Lenz <dlenz@utah.gov>, Ejike Ken-Opurum <ejike@airbuildinc.com>

Hey Dan,

Thanks for bringing this to my attention. I was having nonstop issues when calculating minutes. It seemed as if when I did a reverse calc on other sites it would just pin the closest marked city. I don't remember the exact websites.

Here are the coordinates though:

Water Return: 38.98063° N, 110.15242° W
Actual Project Area (Where the pod is getting built): 38.98098° N, 110.15295° W
[Quoted text hidden]

Daniel Griffin <dgriffin@utah.gov> Thu, Jul 17, 2025 at 9:09 AM
To: John Bucur <john@airbuildinc.com>
Cc: Danielle Lenz <dlenz@utah.gov>, Ejike Ken-Opurum <ejike@airbuildinc.com>

John,

I had the ADR reviewed in our office and everything looks reasonable, but a few items were suggested to look into. Mainly, no pollutants of concern (POCs) are identified. For a majority of dischargers with related processes we would look into BOD, TSS, pH, DO, Temperature, heavy metals and disinfection residuals like TRC. Could you add a discussion of these POC's?
Really what we need is a description of where they come from (sourced from the Green River), what the treatment process will do to them, and how the effluent (discharged) concentrations/loading will compare to the levels in the river.

Also, since a part of the process is to grow algae to reduce nutrients, what is going to happen to the algae? is it going to be discharged, collected, separated and reused? It is part of the process, so it can be considered a POC also.

Answering these does not require a resubmittal of the application, just a supplemental report.

Thanks
Dan

[Quoted text hidden]

John Bucur <john@airbuildinc.com> Thu, Jul 17, 2025 at 9:16 AM
To: Daniel Griffin <dgriffin@utah.gov>
Cc: Danielle Lenz <dlenz@utah.gov>, Ejike Ken-Opurum <ejike@airbuildinc.com>

Sure thing, our CTO Ejike will prepare a 1 page report addressing these points. Is that format sufficient?
[Quoted text hidden]

Daniel Griffin <dgriffin@utah.gov> Thu, Jul 17, 2025 at 9:22 AM
To: John Bucur <john@airbuildinc.com>
Cc: Danielle Lenz <dlenz@utah.gov>, Ejike Ken-Opurum <ejike@airbuildinc.com>

Yes. It is.

[Quoted text hidden]

John Bucur <john@airbuildinc.com> Thu, Jul 17, 2025 at 9:22 AM
To: Daniel Griffin <dgriffin@utah.gov>
Cc: Danielle Lenz <dlenz@utah.gov>, Ejike Ken-Opurum <ejike@airbuildinc.com>

Awesome!
[Quoted text hidden]

John Bucur <john@airbuildinc.com> Mon, Jul 21, 2025 at 1:13 PM
To: Daniel Griffin <dgriffin@utah.gov>
Cc: Danielle Lenz <dlenz@utah.gov>, Ejike Ken-Opurum <ejike@airbuildinc.com>

Dan, attached are Ejike's answers.

Thank you.
[Quoted text hidden]

Supplemental Short Report.docx
2021K

UTAH DEPARTMENT of ENVIRONMENTAL QUALITY
WATER QUALITY

Division of Water Quality (DWQ)
UPDES Program

UPDES Industrial Permit Application

Replaced With Updated Corrected Page.

Part V. Outfalls and Receiving Water(s)

Provide the latitude and longitude to the nearest second for each dewatering outfall. The specified location should be after all treatment and before release to the receiving water. Provide the name of the initial receiving water. If the initial receiving water is unnamed, please also indicate the closed named drainage the receiving water flows into (i.e. unnamed tributary of City Creek). Attach additional sheets if necessary for more outfalls.

Each outfall to a different receiving water segment is subject to additional application fees and annual fees.

Outfall No.	Average daily flow rate	Latitude	Longitude	Receiving Surface Waters (Name)
001	.024 mgd	38 O 54 ‘ 22.57 “	-110 O 9 ‘ 8.769 “	Green River
	mgd	O ‘ “	O ‘ “	
	mgd	O ‘ “	O ‘ “	

Do any of the outfalls described above have a season or periodic discharges?

■ YES ☐ NO

If so, provide the following information for each applicable outfall.

	Outfall No. 001	Outfall No.	Outfall No.
Number of times per year discharges occurs	24		
Average duration of each discharge (specify units)	36 hours		
Average flow of each discharge	50,000 mgd	mgd	mgd
Months in which discharge occurs	Every Month Bi-Monthly		

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