Fact Sheet for IPDES Permit No. ID0030031

Idaho Department of Environmental Quality (DEQ) Proposes to Issue an
Idaho Pollutant Discharge Elimination System (IPDES) Permit to Discharge Pollutants
Pursuant to the Provisions of IDAPA 58.01.25 to:

Idaho Wildlife and Water Quality Group, LLC
Mason Creek Activated Wetland Pilot Project

Public Comment Start Date:	09/13/2021
Public Comment Expiration Date:	10/13/2021
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Purpose of this Fact Sheet

This fact sheet explains and documents the decisions the Idaho Department of Environmental Quality (DEQ) made in drafting the proposed Idaho Pollutant Discharge Elimination System (IPDES) permit for Mason Creek Activated Wetland Pilot Project.

This fact sheet complies with IDAPA 58.01.25.108.02 of the Idaho Administrative Code, which requires DEQ to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an NPDES permit.

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Acronyms

1Q10	1 day, 10 year low flow
7Q10	7 day, 10 year low flow
30B3	Biologically-based design flow intended to ensure an excursion frequency of less than once every three years, for a 30-day average flow.
30Q10	30 day, 10 year low flow
ACR	Acute-to-Chronic Ratio
AML	Average Monthly Limit
AWL	Average Weekly Limit
BA	Biological Assessment
BAT	Best Available Technology economically achievable
BCT	Best Conventional pollutant control Technology
BE	Biological Evaluation
BO or BiOp	Biological Opinion
BOD_5	Biochemical oxygen demand, five-day
BMP	Best Management Practices
BPT	Best Practicable control Technology currently available
°C	Degrees Celsius
$CBOD_5$	Carbonaceous Biochemical Oxygen Demand, five-day
CFR	Code of Federal Regulations
cfs	Cubic Feet per Second
COD	Chemical Oxygen Demand
CV	Coefficient of Variation
CWA	Clean Water Act
DMR	Discharge Monitoring Report
DO	Dissolved Oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FDF	Fundamentally Different Factor
gpd	Gallons per day

IC	Inhibition Concentration
ICIS	Integrated Compliance Information System
DEQ	Idaho Department of Environmental Quality
I/I	Inflow and Infiltration
IPDES	Idaho Pollutant Discharge Elimination System
LA	Load Allocation
lb/day	Pounds per day
LC	Lethal Concentration
LC_{50}	Concentration at which 50% of test organisms die in a specified time period
LD_{50}	Dose at which 50% of test organisms die in a specified time period
LOEC	Lowest Observed Effect Concentration
LTA	Long Term Average
LTCP	Long Term Control Plan
MDL	Maximum Daily Limit or Method Detection Limit
mgd	Million gallons per day
mg/L	Milligrams per liter
ml	Milliliters
ML	Minimum Level
MPN	Most Probable Number
N	Nitrogen
NAICS	North American Industry Classification System
NEPA	National Environmental Policy Act
NOEC	No Observable Effect Concentration
NSPS	New Source Performance Standards
O&M	Operations and maintenance
POTW	Publicly Owned Treatment Works
PSES	Pretreatment Standards for Existing Sources
PSNS	Pretreatment Standards for New Sources
QAPP	Quality Assurance Project Plan
RP	Reasonable Potential
RPMF	Reasonable Potential Multiplier Factor
RWC	Receiving Water Concentration

SIC	Standard Industrial Classification
SPCC	Spill Prevention, Control, and Countermeasure
SS	Suspended Solids
SSO	Sanitary Sewer Overflow
s.u.	Standard Units
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load
TOC	Total Organic Carbon
TRC	Total Residual Chlorine
TRE	Toxicity Reduction Evaluation
TSD	Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001)
TSS	Total suspended solids
TU_a	Toxic Units, Acute
TU_c	Toxic Units, Chronic
UV	Ultraviolet
WET	Whole Effluent Toxicity
WLA	Wasteload allocation
WQBEL	Water quality-based effluent limit
WQS	Water Quality Standards
WWTP	Wastewater treatment plant

1 Introduction

This fact sheet provides information used in the Idaho Department of Environmental Quality (DEQ) Idaho Pollutant Discharge Elimination System (IPDES) permit for Mason Creek Activated Wetland Pilot Project (MCAWPP). This fact sheet complies with the Rules Regulating the Idaho Pollutant Discharge Elimination System Program (IDAPA 58.01.25), which requires DEQ to prepare a draft permit and accompanying fact sheet for public evaluation before issuing an IPDES permit.

DEQ proposes to issue the IPDES permit for MCAWPP. The draft permit places conditions on the discharge of pollutants from the facility to waters of the United States. In order to ensure protection of water quality and human health, the permit places limits on the types and amounts of pollutants that can be discharged from the facility.

This Fact Sheet includes:

- a map and description of the discharge location;
- a listing of effluent limits and other conditions the facility must comply with;
- documentation supporting the effluent limits;
- technical material supporting the conditions in the permit; and
- information on public comment, public hearing, and appeal procedures.

Terms used in this fact sheet are defined in Section 5, Definitions, in the permit.

Public Comment

The permit application, draft permit, and fact sheet describing the terms and conditions applicable to the permit are available for public review and comment during a public comment period. The public is provided at least 30 days to provide comments to DEQ. Persons wishing to request a public meeting for this facility's draft permit must do so in writing within 14 calendar days of public notice being published that a draft permit has been prepared; request for public meetings must be submitted to DEQ by 09/21/2021. Requests for extending a public comment period must be provided to DEQ in writing before the last day of the comment period. For more details on preparing and filing comments about these documents, please see the IPDES guidance *Public Participation in the Permitting Process* at "*http://www.deq.idaho.gov/media/60178029/ipdes-public-participation-permitting-process-0216.pdf*". For more information, contact the permit writer.

After the close of the public comment period, DEQ considers information provided by the public, prepares a document summarizing the public comments received, and may make changes to the draft permit in response to the public comments. DEQ will include the summary and responses to comments in the final fact sheet in Appendix Appendix E. DEQ may request more information from the applicant in order to respond to public comments (IDAPA 58.01.25.109.02.h.). After the public comment period and prior to issuing the final permit decision, DEQ will also provide the applicant an opportunity to submit additional information to address proposed changes and support the response to public comments.

The Environmental Protection Agency (EPA) may take up to 90 days from the publication of public notice of the draft permit to develop and document specific grounds for objections to a

proposed permit. If EPA objects to a proposed permit DEQ must satisfactorily address the objections within the time period specified in the memorandum of agreement between EPA and DEQ (40 CFR 123.44). Otherwise, EPA may issue a permit in accordance with 40 CFR 121, 122, 124. If EPA issues the permit any state, interstate agency, or interested person may request EPA hold a public hearing regarding the objection.

Permit Issuance

Following the public comment period(s) on a draft permit, and after receipt of any comments on the proposed permit from EPA, DEQ will issue a final permit decision, the final permit, and the fact sheet. All comments received will be addressed in Appendix D of the final fact sheet and any resulting changes to the permit or fact sheet documented A final permit decision means a final decision to issue, deny, modify, revoke and reissue, or terminate a permit (IDAPA 58.01.25.107.04.). The final permit and final fact sheet will be posted on the DEQ website. Response to comments will be located in the final fact sheet as an appendix.

The permit holder or applicant and any person or entity who filed comments or who participated in a public meeting on the draft permit may file a petition for review of a permit decision as outlined in Appendix C. The petition for review must be filed with DEQ's hearing coordinator within 28 days after DEQ serves notice of the final permit decision. Any party that participated in the petition for review that is still aggrieved by the final IPDES action or determination has a right to file a petition for judicial review (IDAPA 58.01.25.204.26).

Documents are Available for Review

The IPDES permit and fact sheet can be reviewed or obtained by visiting or contacting the DEQ State office between 8:00 a.m. and 5:00 p.m., Monday through Friday at the address below. The permit, fact sheet, and other information can also be found by visiting the DEQ website at "*http://www.deq.idaho.gov.*"

DEQ
1410 N. Hilton
Boise, ID 83706
208-373-0502

The fact sheet and permits are also available at the applicable Regional Office:

Boise Regional Office
1445 N. Orchard
Boise, ID 83706

Disability Reasonable Accommodation Notice

For technical questions regarding the permit or fact sheet, contact Rakael Pope at the phone number or e-mail address at the beginning of this fact sheet. Those with impaired hearing or speech may contact a TDD operator at 1-800-833-6384 (ask to be connected to Rakael Pope at the above phone number). Additional services can be made available to a person with disabilities by contacting Rakael Pope.

2 Background Information

2.1 Facility Description

This fact sheet provides information on the IPDES permit for the following entity:

Table 1. Facility information.

NPDES / IPDES Permit #	ID0030031	
Permittee	Idaho Wildlife and Water Quality Group, LLC	
Facility Physical Address	1904 Mason Creek Road, Caldwell, ID 83605	
Facility Mailing Address	702 W. Idaho St., Suite 1100, Boise, ID 83702	
Facility Contact/Responsible Official	Responsible Official: Title: Telephone number: Contact Name: Title: Telephone number:	Don Miller Principal 208/830-6644 Mark Shumar Chief Technical Officer 208/861-2140
Facility Location	Latitude: Longitude:	43.685497 -116.638352
Receiving Water Name	Mason Slough	
Outfall Location	Latitude: Longitude:	43.686490 -116.641785
Permit Status		
Issuance or Renewal	Issuance	
Application Submittal Date	November 16, 2020	
Date Application Deemed Complete	November 19, 2020	
Inspection Status		
Date of Last Inspection	New facility, no inspection records	

2.1.1 Facility Information

Idaho Wildlife and Water Quality Group, LLC (IWWQG) has proposed to install and operate the MCAWPP located in Caldwell, Idaho, for phosphate loading reduction. The permittee provides environmental consulting service (NAICS 541620). The permittee is also considered an environmental conservation organization (NAICS 813312).

The pilot project will test phosphorus nutrient removal from water routed from Mason Creek, an agricultural drain tributary of the Lower Boise River (LBR). Effluent is discharged to Mason Slough, also a tributary of the LBR. The LBR has a total maximum daily load (TMDL) Total Phosphorus (TP) addendum, which requires reductions in current TP loads of the LBR, Mason Creek, and Mason Slough (DEQ, 2015)[1]. In addition, the LBR flows from Mason Slough to the Snake River, which also has a TMDL requiring reduction of TP loads to achieve 0.07 mg/L from

[1] DEQ, 2015. Lower Boise River TMDL: 2015 Total Phosphorus Addendum. August, 2015. Boise, ID. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/11737*

tributaries to the Snake River above the Hells Canyon Reach (SR-HC) (IDEQ and ODEQ, 2004)[2].

The permittee collected Mason Creek and Mason Slough data which demonstrates high background levels of TP relative to the 0.07 mg/L target. From March 9, 2020, to July 20, 2020. Mason Creek's TP ranged from 0.17 mg/L and to 0.47 mg/L. During the same time period, Mason Slough's TP ranged from 0.21 mg/L to 0.37 mg/L. The permittee proposes to reduce TP load entering the LBR by filtering influent from Mason Creek through one of the substrates, biochar or zeolite, prior to discharging the effluent to Mason Slough. Once the permittee's data is collected, the permittee will remove all equipment and materials associated with the project, discontinue discharge, ensure the outfall no longer exists and work with DEQ to terminate this permit.

Using this pilot project data, the permittee proposes to demonstrate anticipated TP removal when the substrates are incorporated into design and construction of a future larger-scale activated wetland, which will have separate permitting requirements.

2.1.2 Permit History

This is the initial IPDES Industrial permit for a new facility; thus, there is no permitting history for permit ID0030031.

2.1.3 Outfall Description

Outfall 001 is located in the northwest corner of the property. The discharge will occur continuously from Outfall 001. The outfall is an open pipe which flows to an exposed earthen trough that resembles a ditch. This enters Mason Slough approximately 1.5 miles upstream from Mason Slough's confluence with the LBR.

2.1.4 Intake Characterization

At the southeast corner of the site, approximately 4 cubic feet per second (cfs) will be diverted from Mason Creek to agricultural drains that will direct flow to the pilot project site. The inlet to the pilot plant site, Intake 101, is where flow will be measured and sampled for analytical work (see the site map in 8). This diverted water will be routed through substrate media for TP removal then discharged.

At the point of intake, Mason Creek (AU ID17050114SW006_02) is protected for the following designated uses (IDAPA 58.01.02.140.12): secondary contact recreation and cold water aquatic life, but Mason Creek is not supporting these uses. IWWQG reported influent data from the United States Geological Survey (USGS) station 13210980 and 13210983[3] for Mason Creek in the permit application; analytical data collected from Mason Creek by IWWQG at the Paynter

[2] IDEQ and ODEQ, 2004. Idaho Department of Environmental Quality and Oregon Department of Environmental Quality, 2004. Snake River - Hells Canyon Total Maximum Daily Load (TMDL). Revised June 2004. Boise, Idaho and Pendleton, Oregon. *http://www.deq.idaho.gov/media/454498-snake_river_hells_canyon_entire.pdf*

[3] USGS, 2021. United States Geological Survey. Water Resources, National Water Information System: Mapper. Accessed 7/21/2021. *https://maps.waterdata.usgs.gov/mapper/index.html*

Bridge; and data reported in the LBR TMDL 2015 Total Phosphorus Addendum (DEQ, 2015)[4]. The influent quality is summarized in Table 2.

Table 2. Intake characterization (Mason Creek data).

Parameter	Maximum	Minimum	Notes
Stream Temperature	20 °C	6.5 °C	Data from USGS gauge 13210983
Stream Hardness, as $CaCO_3$	220 mg/L	130 mg/L	Data supplied by permittee from USGS gauge 13210980
Stream pH As Standard Units (s.u.)	8.8	6.8	Data supplied by permittee from USGS gauge 13210980
Flow	98.9 mgd	27.3 mgd	Data collected six times by permittee between 3/9/2020 and 7/29/2020 submitted as an attachment to the permittee's application
Phosphorus (Total as P)	0.47 mg/L	0.17 mg/L	
Orthophosphate	0.240 mg/L	0.149 mg/L	
Total Kjeldahl Nitrogen, (TKN)	1.400 mg/L	0.480 mg/L	
Nitrate+Nitrite (Total as N)	24.6 mg/L	2.0 mg/L	
Total Suspended Solids (TSS)	77 mg/L	14 mg/L	
Aluminum (Total as Al)	4.28 mg/L	--	Analytical data submitted in the permittee's application
Cobalt	< 0.02 mg/L	--	
E. coli	460 MPN/100 mL	--	
Iron	2.53 mg/L	--	
Magnesium	10.2 mg/L	--	
Manganese, Total	0.069 mg/L	--	
Nitrite + Nitrate, Total as N	6.3 mg/L	--	
Nitrogen, organic, dissolved (as N)	0.0 mg/L	--	
Oil and Grease	< 5 mg/L	--	
Phosphorus, Total as P	0.32 mg/L	--	DEQ TMDL TP Table 10
Sulfate, Total as SO_4	20 mg/L	--	Analytical data submitted in the permittee's application
Sulfide, Total as S	< 0.05 mg/L	--	
Sulfite, Total as SO_3	< 3 mg/L	--	
Arsenic	0.0051 mg/L	--	
Cadmium	< 0.0005 mg/L	--	
Chromium	0.003 mg/L	--	
Copper	<0.01 mg/L	--	
Hardness (Total as CaCO3)	233 mg/L	--	
Lead	< 0.005 mg/L	--	
Mercury	< 0.0002 mg/L	--	

[4] DEQ, 2015. Lower Boise River TMDL: 2015 Total Phosphorus Addendum. August, 2015. Boise, ID. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/11737*

Parameter	Maximum	Minimum	Notes
Nickel	< 0.02 mg/L	--	
Selenium	< 0.005 mg/L	--	
Zinc	0.01 mg/L	--	

2.1.5 Effluent Characterization

This is a new facility and does not have effluent characterization data available at this time. Data will be collected, during this permit effective period, and submitted for review to support the next permit cycle. The following analytical data was produced by the permittee's pre-pilot, table-top substrate tests and was submitted with its IPDES application.

Table 3. Effluent characterization estimates from permittee's application.

Parameter	Biochar	Zeolite	DI Blank
Aluminum (Total as Al)	159 mg/L	291 mg/L	< 0.05 mg/L
Arsenic	< 0.05 mg/L	< 0.05 mg/L	< 0.05 mg/L
Cadmium	< 0.05 mg/L	< 0.05 mg/L	< 0.05 mg/L
Calcium	56.9 mg/L	420 mg/L	< 2.5 mg/L
Chromium	< 0.05 mg/L	0.05 mg/L	< 0.05 mg/L
Cobalt	< 0.10 mg/L	< 0.10 mg/L	< 0.10 mg/L
Copper	0.20 mg/L	0.11 mg/L	< 0.05 mg/L
Iron	1.03 mg/L	70.9 mg/L	< 0.25 mg/L
Lead	< 0.05 mg/L	0.16 mg/L	< 0.05 mg/L
Magnesium	287 mg/L	100 mg/L	< 2.5 mg/L
Mercury	< 0.01 mg/L	0.0204 mg/L	< 0.0002 mg/L
Nickel	< 0.10 mg/L	< 0.10 mg/L	< 0.10 mg/L
Selenium	< 0.05 mg/L	< 0.05 mg/L	< 0.05 mg/L
Silver	< 0.05 mg/L	< 0.05 mg/L	< 0.05 mg/L
Sodium	915 mg/L	0.33 mg/L	< 2.5 mg/L
Zinc	0.06 mg/L	0.33 mg/L	< 0.05 mg/L
Total Phosphate (as P)	< 0.20 mg/L	< 0.20 mg/L	< 0.05 mg/L
COD	< 1910 mg/L	117 mg/L	< 20 mg/L
Hardness	1320 mg/L	1460 mg/L	< 17 mg/L
BOD_5	< 530 mg/L	< 530 mg/L	< 16 mg/L

2.2 Description of Receiving Water

In drafting permit conditions, DEQ must analyze the effect of the facility's discharge on the receiving water. The details of that analysis are provided later in this Fact Sheet. This section summarizes characteristics of the receiving water that impact the analysis.

The outfall is located on Mason Slough, which is in the Lower Boise Subbasin. Mason Slough, a man-made waterway which collects shallow groundwater and agricultural return water from agricultural lands north and south of the slough, is not designated for beneficial uses in the WQS.

Mason Slough flows west to the LBR, Assessment Unit (AU) ID17050114SW005_06b (Boise River – Middleton (RM 50) to Indian Creek) at River Mile (RM) 25.6[5].

For more information on the outfall see the description in section 2.1.3. There are no discrete point sources that currently discharge to Mason Slough. Nearby nonpoint sources of pollutants include storm water runoff, agricultural drain maintenance, bank erosion, and agricultural operations. There are no drinking water intakes located on Mason Slough. There are also no drinking water intakes on the LBR between river mile (RM) 25.6 at Mason Slough and RM 0.0 at the confluence with the Snake River. Potential nonpoint sources present in the watershed include agricultural operations runoff and storm water runoff. Section 2.2.1 of this fact sheet provides additional information for receiving water body impairments.

The ambient background data for Mason Slough includes the following from the permittee's application, USGS Gage 13210850 at the mouth of Mason Slough, and the Boise River (Lower) TMDL: 2015 Total Phosphorus Addendum (DEQ, 2015).

Table 4. Ambient background data for Mason Slough

Parameter	Units	Percentile	Value	Source
Temperature	°C	95th	21.6	USGS gauge 13210850
pH	Standard units	5th – 95th	7.4-8.3	USGS gauge 13210850
Phosphorus, Total as P	mg/L	maximum	0.40	USGS gauge 13210850
TSS	mg/L	95th	179.8	USGS gauge 13210850

2.2.1 Water Quality Impairments

Water bodies not supporting existing or designated beneficial uses must be identified as water quality limited, and a total maximum daily load (TMDL) must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations (WLAs) for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limits that are consistent with the assumptions and requirements of WLAs that have been assigned to the discharge in an EPA-approved TMDL.

The EPA-approved Boise River (Lower) Subbasin TMDL (DEQ, 2000), Mason Creek Subbasin Assessment (DEQ, 2001), and LBR TMDL: 2015 Total Phosphorus Addendum (DEQ, 2015) establishes a WLA for phosphorus in the LBR, Mason Creek, and Mason Slough. The WLA is designed to meet narrative and numeric criteria and ultimately help restore the water body to a condition that supports existing and beneficial uses. The effluent limits and associated requirements contained in the permit are set at levels that are consistent with the TMDL.

Mason Creek directly impacts the LBR TP load by contributing TP from agricultural nonpoint sources. The LBR TMDL phosphorus addendum suggests that point sources, such as municipal treatment operations, storm water, and industrial dischargers, contribute a substantial amount of TP to the LBR. These dischargers are regulated and tracked through discharge permits. Nonpoint

[5] Etheridge, A.B., 2013. *Evaluation of Total Phosphorus Mass Balance in the Lower Boise River, Southwestern Idaho*. U.S. Geological Survey Scientific Investigations Report 2013-5220, 70 p. *http://dx.doi.org/10.3133/sir20135220*.

sources such as agricultural return water, ground water, septic systems, and unmeasured flow can also produce substantial amounts of unregulated water pollution in the form of sediment and nutrients. Excess nutrients, such as TP, increase algae and other plant growth that can be harmful to wildlife and swimmers and deplete oxygen that fish and other aquatic organisms depend on.

Mason Slough, a tributary to the LBR, has not been assessed for beneficial uses. The slough is almost entirely on private land, so accessibility is limited.

This segment of the LBR, AU 17050114SW005_06b, has been assessed and found not supporting cold water aquatic life, salmonid spawning, and primary contact recreation beneficial uses. The LBR is impaired for flow regime modification, physical substrate habitat alterations, temperature, TP, sedimentation/siltation, and fecal coliform according to IDEQ's 2018/20 Integrated Report (section 303(d)) (DEQ, 2020)[6].

2.3 Pollutants of Concern

DEQ may identify pollutants of concern (POC) for the discharge based on, but not limited to, those which:

- Have a technology-based limit (TBEL)
- Have an assigned WLA from a TMDL
- Had an effluent limit in the previous permit
- Are present in the effluent monitoring data reported in the application, DMRs, or special studies
- Are expected to be in the discharge based on the nature of the discharge
- Are impairing the beneficial uses of the receiving water

To determine POCs for further analysis, DEQ evaluated all pertinent and available information such as the permit application, USGS data, raw discharge estimation data provided by the facility, and TMDLs (if applicable). The wastewater treatment process for this facility includes routing the Mason Creek intake water through either zeolite or biochar substrates to reduce TP levels. Because of the pollutants already present in the intake, pollutants expected in the filtrate with this type of treatment, include but are not limited to:

- Phosphorus (reduction from intake level)
- Metals
- *E. coli*
- Sediment
- Temperature

3 Effluent Monitoring

Effluent monitoring requirements in the 2021permit are shown in Table 5.

[6] DEQ, 2020. *Idaho 2018/2020 Integrated Report Final*. October, 2020. Boise, Idaho. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/14888*

Table 5. Effluent monitoring for Outfall 001 to Mason Slough.

Parameter	Discharge Period	Units	Monthly Average	Instan-taneous Minimum	Instan-taneous Maximum	Daily Maximum	Maximum Daily Average	Quarterly Maximum	Sample Type	Sample Frequency	Reporting Period (DMR Months)
Flow	01/01-12/31	mgd	Report	—	—	—	Report[a]	—	Grab[b] or Recording	1/week or Continuous[c,d]	Monthly[e] (All Months)
Temperature	01/01-12/31	°C	Report	—	—	Report	—	—	Grab[b] or Recording	1/week or Continuous[c,d]	Monthly[e] (All Months)
pH	01/01-12/31	Standard units (s.u.)	—	Report	Report	—	—	—	Grab[b]	1/week	Monthly[e] (All Months)
Phosphorus (Total as P)	01/01-12/31	mg/L	Report	—	—	Report	—	—	Grab[b]	1/week	Monthly[e] (All Months)
		lb/day	Report	—	—	Report	—	—	Calculation[f]		
Net TP[h] % Removal	01/01-12/31	%	Report	—	—	Report	—	—	Calculation[h]	1/week	Monthly[e] (All Months)
Net TP[i] Removal Load	01/01-12/31	lb/day	Report	—	—	Report	—	—	Calculation[i]	1/week	
Total Suspended Solids (TSS)	01/01-12/31	mg/L	Report	—	—	Report	—	—	Grab[b]	1/week	Monthly[e] (All Months)
		lb/day	Report	—	—	Report	—	—	Calculation[f]		
Total Copper	01/01-12/31	mg/L	Report	—	—	—	—	Report	Grab[b]	1/quarter	Quarterly[j] (January, April, July, October)
		lb/day	Report	—	—	—	—	Report	Calculation[f]		
Total Lead	01/01-12/31	mg/L	Report	—	—	—	—	Report	Grab[b]	1/quarter	Quarterly[j] (January, April, July, October)
		lb/day	Report	—	—	—	—	Report	Calculation[f]		
Total Mercury	01/01-12/31	mg/L	Report	—	—	—	—	Report	Grab[b]	1/quarter	Quarterly[j] (January, April, July, October)
		lb/day	Report	—	—	—	—	Report	Calculation[f]		
Total Zinc	01/01-12/31	mg/L	Report	—	—	—	—	Report	Grab[b]	1/quarter	Quarterly[j] (January, April, July, October)
		lb/day	Report	—	—	—	—	Report	Calculation[f]		
Hardness, as $CaCO_3$	01/01-12/31	mg/L	Report	—	—	—	—	Report	Grab[b]	1/quarter	Quarterly[j] (January, April, July, October)

Parameter	Discharge Period	Units	Monthly Average	Instan-taneous Minimum	Instan-taneous Maximum	Daily Maximum	Maximum Daily Average	Quarterly Maximum	Sample Type	Sample Frequency	Reporting Period (DMR Months)
E. coli	01/01-12/31	#/100 mL	—	—	—	—	—	Report	Grab[b]	1/quarter	Quarterly[j] (January, April, July, October)
Chemical Oxygen Demand (COD)	01/01-12/31	mg/L	Report	—	—	—	—	Report	Grab[b]	1/quarter	Quarterly[j] (January, April, July, October)

a. The maximum daily average flow should be calculated for each calendar week and reported in DMR's. The weekly flow measurement would be reported as the maximum daily average until continuous flow measurement is implemented.
b. A grab sample is an individual sample collected over a 15-minute period or less.
c. Continuous flow and temperature monitoring must begin within six months of the effective date of this permit. Until that time, weekly flow and temperature monitoring must be conducted.
d. Continuous means uninterrupted measurement during discharge except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 60 minutes.
e. When the facility does not discharge during a month, it may report the appropriate No Data Indicator (NODI) code "C" on the monthly DMR.
f. Calculation means load in lb/day calculated concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in mgd) X Conversion Factor (8.34) = lb/day.
g. Net TP means Net Total Phosphorus.
h. Calculation means: $Net\ TP\ \%\ Removal = (Influent\ TP\ \left(\frac{mg}{L}\right) - Effluent\ TP\ \left(\frac{mg}{L}\right)) \div Influent\ TP\ \left(\frac{mg}{L}\right)$.
i. Calculation means: $Net\ TP\ Removal\ Load\ \left(\frac{lb}{day}\right) = [(TPi * Qi) - (TPe * Qe)] * Conversion\ Factor\ (8.34)$, where Q_i = Weekly Maximum Daily Influent Flow in mgd, Q_e = Weekly Maximum Daily Effluent Flow in mgd, TP_i = TP (Influent) in mg/l, TP_e = TP (Effluent) in mg/l.
j. Quarters are January –March, April—June, July—September, and October—December. DMR's are due the 20th day of the month following the quarter.

3.1 Basis for Effluent Limits or Monitors

Regulations require that effluent limits in an IPDES permit must be either technology-based or water quality-based.

TBELs are set according to the level of treatment that is achievable using available technology. TBELs are based upon the treatment processes used to reduce specific pollutants. TBELs are set by the EPA and published as a regulation. DEQ may develop a TBEL on a case-by-case basis (40 CFR 125.3, IDAPA 58.01.25.302, and IDAPA 58.01.25.303).

WQBELs are calculated so the effluent will comply with the Surface Water Quality Standards (IDAPA 58.01.02) or the National Toxics Rule (40 CFR 131.36) applicable to the receiving water.

DEQ must apply the most stringent of these limits to each POC. These limits are described below.

3.2 Water Quality-Based Effluent Limits or Monitors

3.2.1 Statutory and Regulatory Basis

Section 301(b)(1)(C) of the Clean Water Act (CWA) requires the development of limitations in permits necessary to meet WQS. The IPDES regulation IDAPA 58.01.25.302.06 implementing Section 301(b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any WQS, including narrative criteria for water quality. Effluent limits must also meet the applicable water quality requirements of affected States other than the State in which the discharge originates, which may include downstream States (40 CFR 122.4(d), 122.44(d)(4), see also CWA Section 401(a)(2)).

The regulations require the permitting authority to make this evaluation using procedures that account for existing controls on point and non-point sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that WQS are met and must be consistent with any available TMDL WLA for the discharge. If there are no approved TMDLs that specify WLAs for this discharge, all of the WQBELs are calculated directly from the applicable WQS.

DEQ will use data collected during this permit cycle to evaluate the project's impact on water quality; specifically achieving TP load reductions.

3.2.2 Reasonable Potential Analysis

DEQ uses the process described in the *Effluent Limit Development Guidance* (DEQ 2017) to determine whether there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria (WQC). To determine if there is reasonable potential for a given pollutant, DEQ compares the maximum projected receiving water concentration to the WQC for that pollutant. If the projected receiving water concentration exceeds the criterion,

there is reasonable potential, and a water quality-based effluent limit must be included in the permit.

3.2.3 Reasonable Potential and Water Quality-Based Effluent Limits

The reasonable potential and water quality-based effluent limit for specific parameters are summarized below. The calculations are provided in Appendix C.

3.2.3.1 pH

The Idaho WQS at IDAPA 58.01.02.250.01.a. requires pH values to be within the range of 6.5 to 9.0. Mixing zones are generally not granted for pH; therefore, the most stringent water quality criterion must be met before the effluent is discharged to the receiving water. Because this is a new facility, there is no effluent pH data available. However, data from USGS gauge 13210983 shows Mason Creek, the source of influent, has a pH range of 7.4 to 8.6, which also falls within the WQS acceptable pH range of 6.5 to 9.0. Data from USGS gauge 13210850 shows Mason Slough, receiving water for this permittee, has a pH range of 7.3 to 8.7. Therefore, monitors will be required to collect data for consideration in the next permitting cycle.

3.2.3.2 COD

Natural decomposition of chemical and organic material in wastewater impacts dissolved oxygen in the receiving water at distances far outside of the regulated mixing zone. The COD of an effluent sample yields a rapid assessment of the total amount of chemicals present that will consume oxygen in the receiving water. COD is typically greater than BOD, which is the amount of biodegradable material in the wastewater.

3.2.3.3 Phosphorus, Total as P

Total phosphorus generally has no numeric criteria, though dischargers are required to meet narrative criteria in IDAPA 58.01.02.200. Though the 2018/2020 Integrated Report does not report that Mason Slough is impaired for nutrients, the LBR assessment shows the LBR is impaired for nutrients (AU 17050114SW005_06b) (DEQ, 2020). From this location to the mouth at the Snake River, total phosphorus has been identified as the limiting nutrient.

To achieve a May through September target of 0.07 mg/L TP at the mouth of the LBR, the LBR TMDL TP Addendum has a year-round target TP concentration of 0.07 mg/L (DEQ, 2015) for LBR tributaries with no point sources. There is no assimilative capacity in the LBR or the tributaries, Mason Slough and Mason Creek, because TP concentrations are above their respective targets.

The permit proposes water quality monitoring to assess the efficacy and water quality impacts of biochar and zeolite substrates for TP reduction. This data may be used to develop permits for future activated wetland projects that will be constructed to reduce high TP levels.

Net TP removal concentration (Net TP) will be reported to demonstrate the effluent TP concentration reduction from the influent TP.

$$Net\ TP\ Removal\ \% = \left[\frac{Influent\ TP\ Concentration\left(\frac{mg}{L}\right) - Effluent\ TP\ Concentration\left(\frac{mg}{L}\right)}{Influent\ TP\ Conentration\ \left(\frac{mg}{L}\right)}\right] * 100\%$$

3.2.3.4 Metals

Substrates such as Biochar have been tested for removal of both nutrients and metals in wetland restoration projects such as the ongoing Coeur d'Alene Lake restoration project (National Academies of Sciences, Engineering, and Medicine, 2021)[7]. MCAWWP is not a suspected source of metals, but the permittee will collect total recoverable metal data to evaluate their substrate filtration efficacy. The permittee requested reporting this data in DMRs to enable DEQ to track and review the data. The metals the permittee will report on include Copper, Lead, Mercury, and Zinc.

3.2.3.5 E. Coli and Sediment

According to the *LBR TMDL: 2015 Sediment and Bacteria Addendum*, Mason Creek, the source of the intake, is not only impaired for E. coli, but also sediment (DEQ, 2015)[8].The MCAWPP substrate filtration process itself is not a suspected source of E. coli or TSS. The substrates will be contained in in-ground basins. During change out of substrates, flow will be turned off and outlets redirected to fields. Though the filtration process may reduce sediment load, the decrease is unknown. Because of the Mason Creek sediment impairment, any change in sediment load is expected to be identifiable with the monitors required by this permit. This data will be used to conduct an RPA for any future permits or renewals.

3.3 Technology-Based Effluent Monitors

3.3.1 Federal Effluent Limit Guidelines

The CWA requires industrial facilities to comply with Effluent Limit Guidelines (ELGs) applicable to their SIC or NAICS. However, there are no Effluent Limit Guidelines applicable to Environment, Conservation and Wildlife Organizations (NAICS code 813312) or for activated wetland nutrient removal operations.

3.3.2 Mass-Based Data

Idaho rules regulating the IPDES program IDAPA 58.01.25.303.06. require that permit limits be expressed in terms of mass except under certain conditions. Although this permit does not contain mass limits, Net TP will be reported to demonstrate the mass of TP removed from the influent.

$$\textit{Mass based limit (lb/day)} = \textit{concentration limit (mg/L)} \times \textit{design flow (mgd)} \times 8.34^{9}$$

Net TP load removal (Net TP Load) will be reported to estimate the TP load decrease in the Boise River. Daily maximum influent flow will be used in this calculation to negate increases in effluent flow from groundwater, storm events, or nonpoint sources.

[7] National Academies of Sciences, Engineering, and Medicine. Water and Science Technology Board. July 19, 2021. *Committee on the Future of Water Quality in Coeur d'Alene Lake, Meeting 3 Public Session.* *https://www.nationalacademies.org/event/07-19-2021/the-future-of-water-quality-in-coeur-dalene-lake-meeting-3-public-session* , accessed August 12, 2021.

[8] DEQ, 2015. (Idaho Department of Environmental Quality). *Lower Boise River TMDL 2015 Sediment and Bacteria Addendum*. June, 2015. Boise, Idaho. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/11736*

[9] 8.34 is a conversion factor with units (lb ×L)/(mg × gallon×10^6)

Net TP Removal Load Calculation

TP_i = TP (Influent) in mg/L
TP_e = TP (Effluent) in mg/L
Q_i = Maximum Daily Average Influent Flow (mgd) from the calendar week corresponding to TP_i sampling
Q_e = Maximum Daily Average Effluent Flow (mgd) during the calendar week corresponding to TP_e sampling

$$Net\ TP\ Removal\ Load\ \left(\frac{lb}{day}\right) = [(TPi * Qi) - (TPe * Qe)] * Conversion\ Factor \quad (8.34)$$

3.3.3 Narrative Criteria

DEQ must consider the narrative criteria described in IDAPA 58.01.02.200. when it determines permit limits and conditions. Narrative WQC limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge which have the potential to adversely affect designated uses, cause acute or chronic toxicity to biota, impair aesthetic attributes, or adversely affect human health.

The Idaho WQS require that surface waters of the State be free from floating, suspended, or submerged matter of any kind in concentrations impairing designated beneficial uses. The permit contains a narrative limitation prohibiting the discharge of such materials or any violation of narrative WQC.

3.4 Antidegradation

DEQ's antidegradation policy provides three levels of protection to water bodies in Idaho subject to Clean Water Act (CWA) jurisdiction (IDAPA 58.01.02.051).

- Tier I of antidegradation protection is designed to ensure that existing uses and the water quality necessary to protect those uses is maintained and protected (IDAPA 58.01.02.051.01; 58.01.02.052.01). A Tier I review is performed for all new or reissued permits or licenses (IDAPA 58.01.02.052.07).
- Tier II protection applies to any water bodies considered to be high quality waters (where the water quality exceeds levels necessary to support propagation of fish, shellfish, wildlife, and recreation in and on the water) and provides that water quality will be maintained and protected unless allowing for lower water quality is deemed by the state as necessary to accommodate important economic or social development in the area. In allowing any lowering of water quality DEQ must ensure adequate water quality to protect existing uses fully and must assure that there will be achieved the highest statutory and regulatory requirements for all new and existing point sources (IDAPA 58.01.02.051.02; 58.01.02.052.08).
- Tier III protection applies to water bodies that have been designated by the Idaho Legislature as outstanding national resource waters and provides that water quality is to be maintained and protected (IDAPA 58.01.02.051.03; 58.01.02.052.09).

DEQ employs a water body-by-water body approach to implementing Idaho's antidegradation policy. This approach means that any water body fully supporting its beneficial uses will be considered high quality (IDAPA 58.01.02.052.05.a). Any water body not fully supporting its

beneficial uses will be provided Tier I protection for that use unless specific circumstances warranting Tier II protection are met (IDAPA 58.01.02.052.05.c). The most recent federally approved Integrated Report and supporting data are used to determine support status and the tier of protection (IDAPA 58.01.02.052.05).

3.4.1 Protection and Maintenance of Existing Uses (Tier I Protection)

A Tier I review is performed for all new or reissued permits or licenses, applies to all waters subject to the jurisdiction of the Clean Water Act, and requires demonstration that existing uses and the level of water quality necessary to protect existing uses shall be maintained and protected. In order to protect and maintain existing and designated beneficial uses, a permitted discharge must comply with narrative and numeric criteria of the Idaho WQS, as well as other provisions of the WQS.

Water bodies not supporting existing or designated beneficial uses must be identified as water quality-limited, and a TMDL must be prepared for those pollutants causing impairment. A central purpose of TMDLs is to establish wasteload allocations for point source discharges, which are set at levels designed to help restore the water body to a condition that supports existing and designated beneficial uses. Discharge permits must contain limits that are consistent with wasteload allocations in the approved TMDL.

Prior to the development of the TMDL, the WQS require the application of the antidegradation policy and implementation provisions to maintain and protect uses (IDAPA 58.01.02.055.04). The EPA-approved Lower Boise River TMDL: Subbasin Assessment, Total Maximum Daily Loads (DEQ, 2000), Sediment and Bacteria Allocations Addendum to the Lower Boise River TMDL (2008), and the Lower Boise River TMDL: 2015 Total Phosphorus Addendum (DEQ, 2015) establish no WLAs for this permittee. However, the 2015 Phosphorus Addendum does establish WLAs for TP of 0.07 mg/L for tributaries of the LBR with no point sources (May to September), which includes Mason Slough. Therefore, Mason Slough will be considered impaired for TP, which can affect primary contact recreation.

A USGS 1953 aerial imaging shows Mason Slough was originally a channel of the LBR (USGS, 1953)[10]. However, an airfield was built over the eastern edge of the channel, obstructing flow from the LBR to this channel.

[10] USGS, 1953. United States Bureau of Land Management, United States Geological Services website: *https://ngmdb.usgs.gov/topoview/*, accessed 2021.

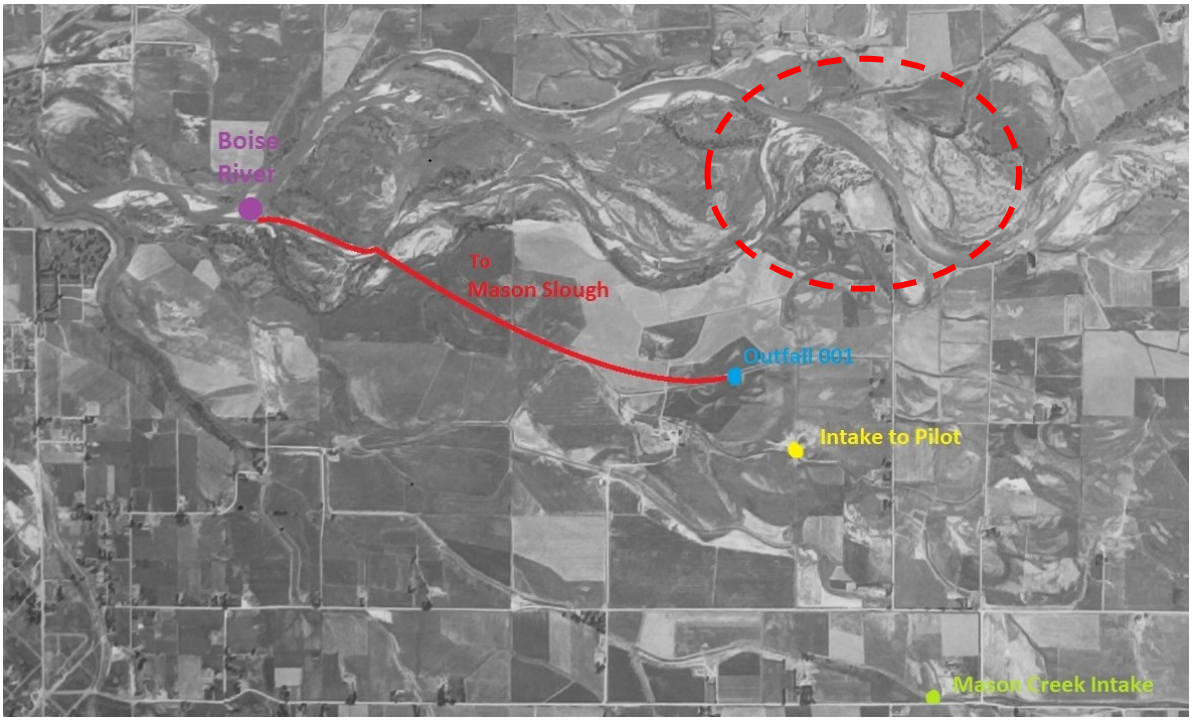

Figure 1. 1953 USGS Image showing Mason Slough was originally a channel of the LBR.

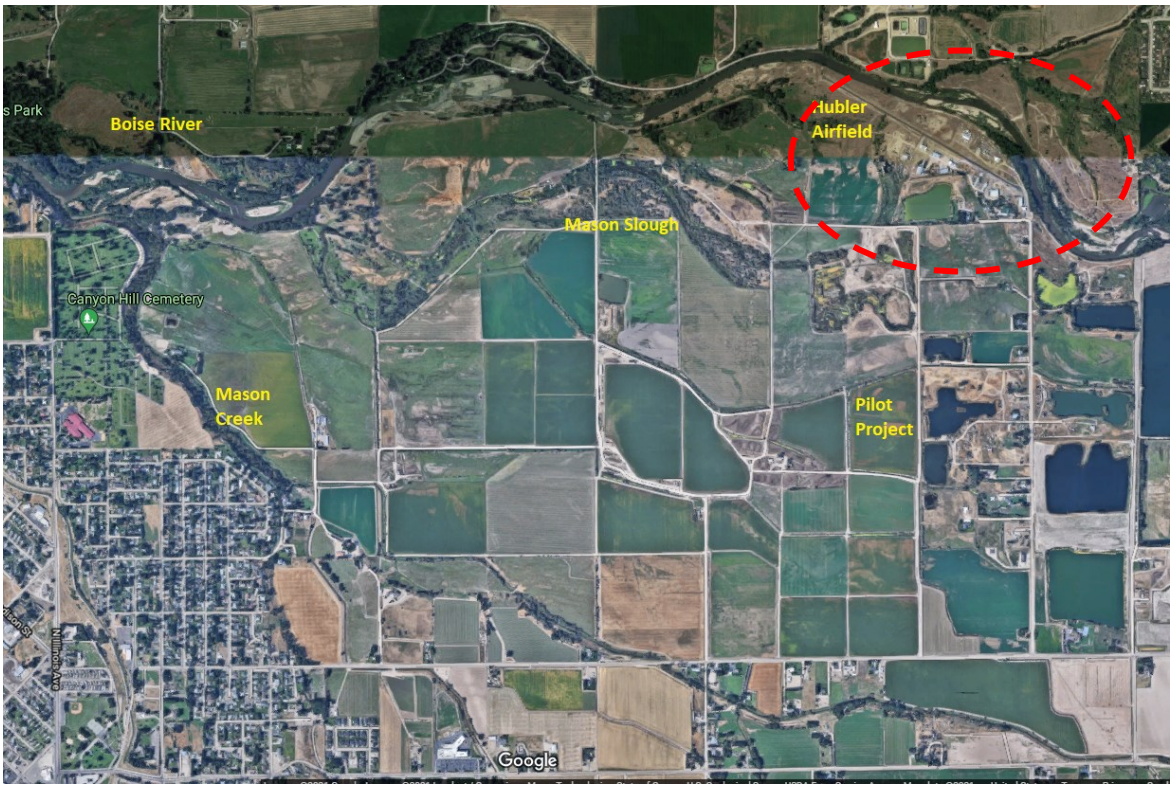

Figure 2. 2021 Google Earth Image showing Mason Slough's eastern connection to LBR was terminated from construction of an airfield.

Mason Slough has not been assessed for beneficial uses in DEQ's Integrated Report, but as a tributary to and former channel of the LBR, was evaluated against the attainment and

maintenance of downstream waters of the LBR (IDAPA 58.01.02.101.01.a.v). According to DEQ's 2018/2020 Integrated Report[11], the LBR AU (ID17050114SW005_06b) is not fully supporting one or more of its assessed uses. Causes of aquatic life impairment include flow regime modification, physical substrate habitat alterations, temperature, and sedimentation/siltation. The contact recreation beneficial use is also not fully supported because of both phosphorus and fecal coliform. DEQ will provide Tier I protection for both aquatic life and primary contact recreation beneficial uses (IDAPA 58.01.02.051.01).

4 Monitoring Requirements

4.1 Basis for Effluent and Receiving Water Monitoring

Idaho regulations IDAPA 58.01.02 and 58.01.25 require that monitoring be included in permits to determine compliance with effluent limits and other permit restrictions. Monitoring may also be required to gather data to assess the need for future effluent limits or to monitor effluent impacts on receiving water quality. Permittees are responsible for conducting the monitoring and reporting the results on monthly DMRs and in annual reports (see section 4.3).

The permittee is responsible for conducting the monitoring and for reporting results on DMRs or on the application for renewal, as appropriate, to DEQ.

4.2 Receiving Water Monitoring

In general, receiving water monitoring may be required for pollutants of concern to assess the assimilative capacity of the receiving water for the pollutant. In addition, receiving water monitoring may be required for pollutants for which the water quality criteria are dependent and to collect data for TMDL development if the facility discharges to an impaired water body.

Receiving water monitoring requirements are in Table 6. The permittee must establish receiving water monitoring at an upstream location approved by DEQ's Boise Regional office. Receiving water monitoring results must be submitted with DMRs.

Table 6. Receiving water monitoring requirements for REC1 Mason Slough upstream.

Parameter	Units	Sample Type	Frequency	Report
Temperature	°C	Grab[a] or Recording	1/week or Continuous[b,c]	Monthly[d] (All months)
pH	Standard units (s.u.)	Grab[a]	1/week	Monthly[d] (All months)
Phosphorus (Total as P)	mg/L	Grab[a]	1/week	Monthly[d] (All months)
	lb/day	Calculation[e]		
Total Suspended Solids (TSS)	mg/L	Grab[a]	1/week	Monthly[d] (All months)
	lb/day	Calculation[e]		
Hardness, as $CaCO_3$	mg/L	Grab[a]	1/quarter	Quarterly[f] (April, July, October, January)

[11] DEQ, 2020. Idaho 2018/2020 Integrated Report Final. October, 2020. Boise, Idaho. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/14888*

Parameter	Units	Sample Type	Frequency	Report
E. coli	#/100 mL	Grab[a]	1/quarter	Quarterly[f] (April, July, October, January)

a. A grab sample is an individual sample collected over a 15-minute period or less.
b. Continuous flow and temperature monitoring must begin within six months of the effective date of this permit. Until that time, weekly flow and temperature monitoring must be conducted.
c. Continuous means uninterrupted measurement during discharge except for brief lengths of time for calibration, power failure, or unanticipated equipment repair or maintenance. The time interval for the associated data logger must be no greater than 60 minutes.
d. When the facility does not discharge during a month, it must report No Data Indicator (NODI) code "C" on the monthly DMR.
e. Calculation means figured concurrently with the respective sample, using the following formula: Concentration (in mg/L) X Flow (in mgd) X Conversion Factor (8.34) = lb/day.
f. Quarters are January—March, April—June, July—September, and October—December. DMR's are due the 20th day of the month following the quarter.

4.3 Electronic Submission of Annual Reports

The permit requires that the permittee submit an annual report through the e-Permitting System by 14 months after the effective date of the permit and every 12 months thereafter. The annual report will contain raw and summary data. Additional monitoring of intake, effluent, and receiving water that are not reported on DMRs but are completed in accordance with the QAPP, should be in the annual report. Project summaries and any additional data the permittee gathers to assess the need for future effluent limitations or to monitor effluent impacts on receiving water quality will be used by DEQ for consideration in the permittee's proposed future activated wetland project.

5 Special Conditions

5.1 Spill Control Plan

A spill control plan is not needed at this facility because the facility will not be keeping hazardous chemicals onsite. There will be no engine fuel stored for pumps because the permittee will be using electric pumps.

5.2 Hazardous and Deleterious Material Storage

Hazardous and deleterious materials must not be stored, disposed of, or accumulated adjacent to or in the immediate vicinity of the permittee's pilot plant operation.

5.3 Water Quality Trading

Water quality trading is not proposed or authorized under this permit. It must be noted that any future water quality trading project must be consistent with the DEQ Pollutant Trading Guidance

(DEQ, 2016)[12], the Idaho Water Quality Standards (IDAPA 58.01.02), Clean Water Act regulatory liability.

During this permit cycle, any data the permittee does not submit through DMRs, but collects for consideration of a future trading project must be quality assured data submitted through the E-Permitting System. Data collected for any reports submitted to DEQ must be collected in accordance with the permittee's QAPP and using appropriate methods from 40 CFR 136.

5.4 Intake Credit

Intake credits were not requested and are not authorized for this permit.

6 Standard Conditions

Section 4 of the permit contains standard regulatory documents and conditions that must be included in all IPDES permits. DEQ bases the standardized Standard Conditions on state and federal law and regulations. The standard regulatory language covers requirements such as monitoring, recording, and reporting requirements, compliance responsibilities, and other general requirements.

6.1.1 Quality Assurance Project Plan

In accordance with IDAPA 58.01.25.300.05, permittees are required to develop procedures to ensure that the monitoring data submitted is accurate and explain data anomalies if they occur. The permittee is required to develop, maintain, and implement a plan for intake, effluent, and receiving water sampling. The quality assurance project plan (QAPP) shall consist of standard operating procedures for collecting, handling, storing and shipping samples, laboratory analysis, and data reporting. The plan shall be retained on site and made available to DEQ upon request.

6.1.2 Operation and Maintenance Manual

The permit requires the permittee to properly operate and maintain all facilities and systems of conveyance, treatment, and control. Proper operation and maintenance is essential to meeting discharge limits, monitoring requirements, and all other permit requirements at all times. The permittee is required to develop and implement an operation and maintenance plan for their facility. The plan must be retained on site and made available to DEQ upon request.

7 Permit Expiration or Modification

The permit will expire five years from the effective date.

DEQ may modify a permit before its expiration date only for causes specified in IDAPA58.01.25.201. A modification other than a *minor modification* requires preparing a draft permit that incorporates the proposed changes, preparing a fact sheet, and conducting a public

[12] DEQ, 2016. *Water Quality Trading Guidance*. October, 2016. Boise, Idaho. *https://www2.deq.idaho.gov/admin/LEIA/api/document/download/4839*

review period. Only the permit conditions subject to the modification will be reopened when a permit is modified. All other conditions of the existing permit will remain in effect. Modifying a permit does not change the expiration date of the original permit.

8 References

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EPA. 2010. *NPDES Permit Writers' Manual.* Environmental Protection Agency, Office of Wastewater Management, EPA-833-K-10-001.

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USGS (United States Geological Survey). Water Resources, National Water Information System: Mapper. Accessed 7/21/2021. *https://maps.waterdata.usgs.gov/mapper/index.html*

Appendix A. Facility Maps / Process Schematics

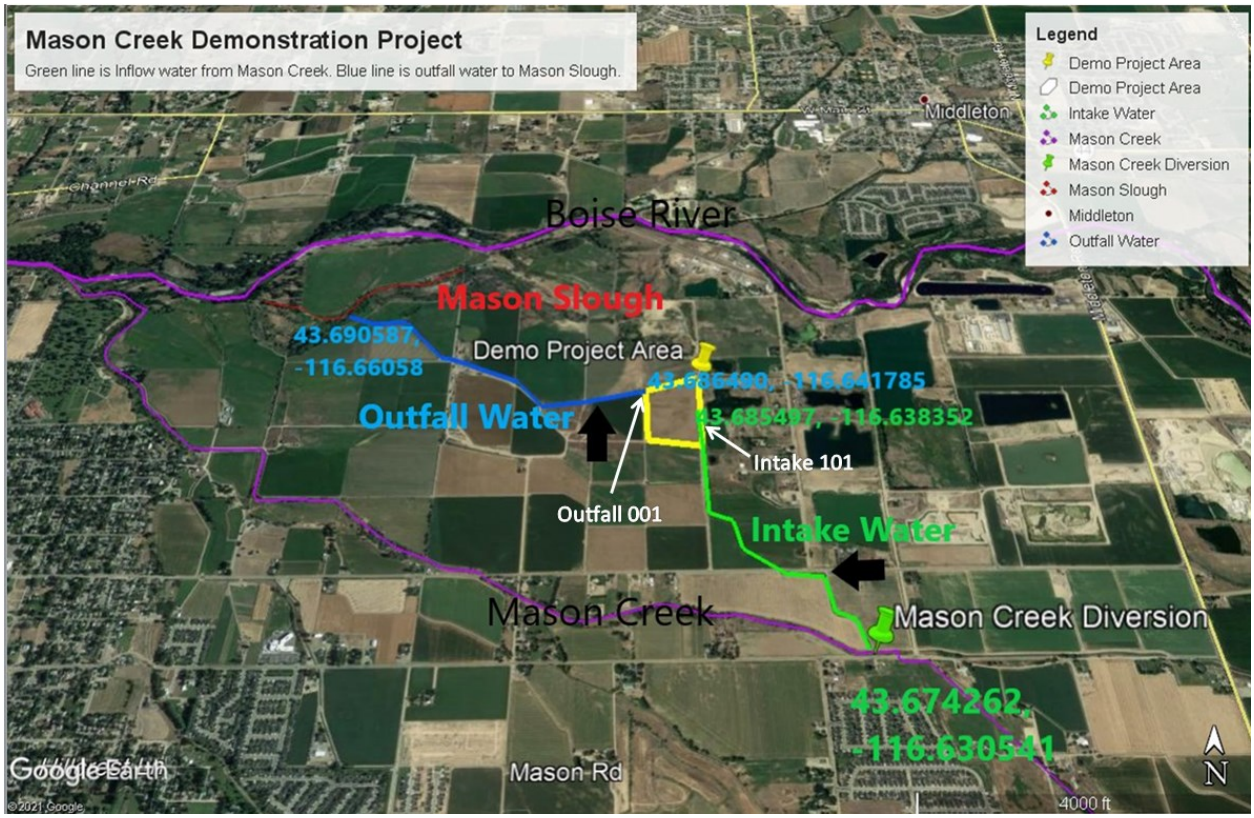


Figure 3. Site map.

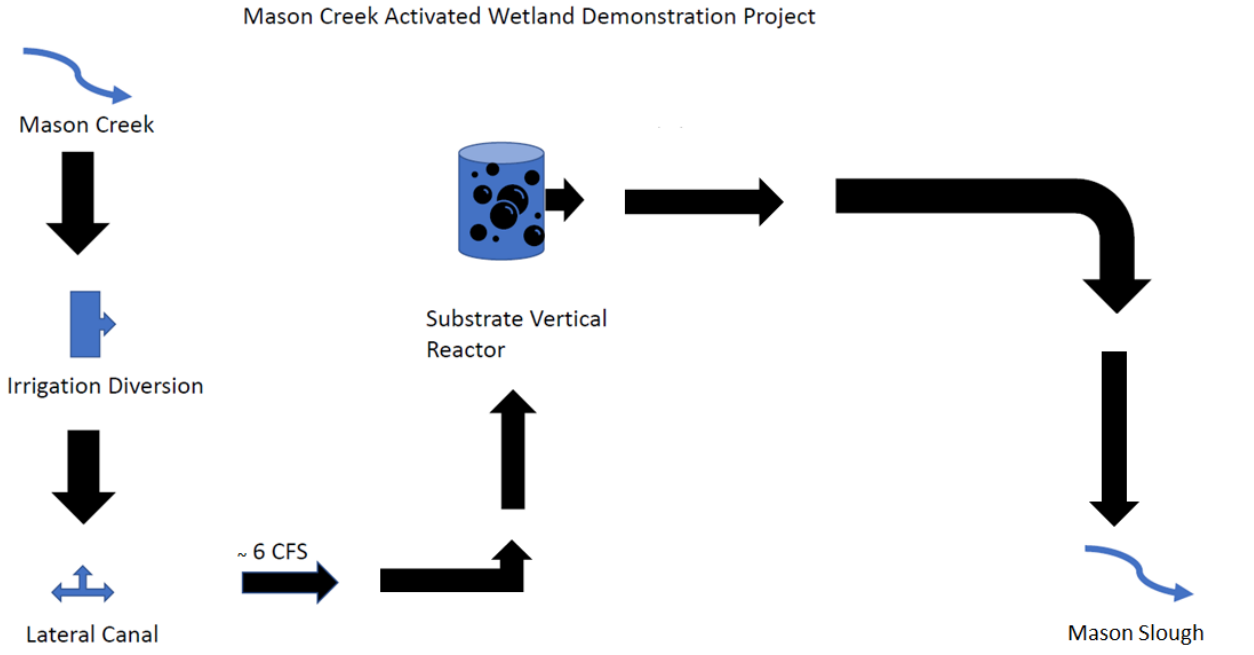


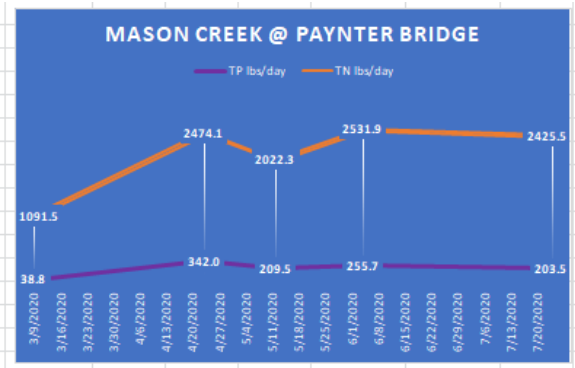
Figure 4. Flow schematic (flow is approximate).

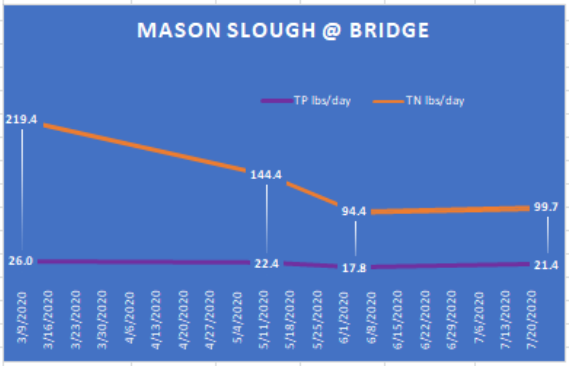
Appendix B. Data

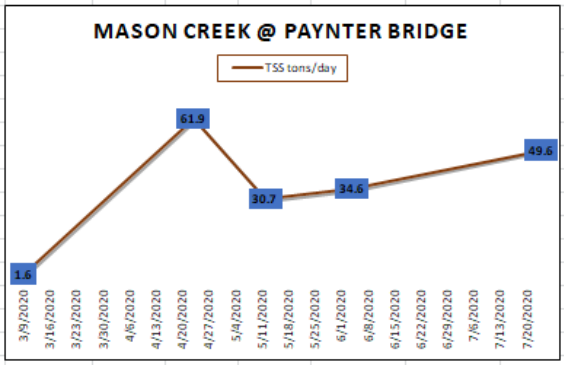
Figure 5. Permittee Total Phosphorus data

Location	Date	Flow cfs	USGS cfs	TP mg/l	OrthoP mg/l	Ortho %	TKN mg/l	NO2+NO3 mg/l	TN (TKN + Nox)	TSS mg/l	Flow MGD
Mason Creek @ Painter Xing	3/9/2020	64	42.3	0.17	0.146	85.9	0.487	4.3	4.787	14	27.3
Mason Slough @ confluence	3/9/2020	23		0.21	0.076	36.2	1	0.77	1.77	52	14.9
Mason Creek @ Painter Xing	4/23/2020	135	128	0.47	0.236	50.2	1.4	2	3.4	170	87.3
Mason Creek @ Painter Xing	5/12/2020		134	0.29	0.172	59.3	0.8	2	2.8	85	86.6
Mason Slough @ confluence	5/12/2020	13.4		0.31	0.222	71.6	1	1	2	42	8.7
Mason Creek @ Painter Xing	6/4/2020		153	0.31	0.2	64.5	0.77	2.3	3.07	84	98.9
Mason Slough @ confluence	6/4/2020	10.3		0.32	0.219	68.4	0.83	0.87	1.7	39	6.7
Mason Creek @ Painter Xing	7/24/2020		151	0.25	0.24	96.0	0.52	2.46	2.98	122	97.6
Mason Slough @ confluence	7/24/2020	10.8		0.37	0.42	113.5	0.78	0.94	1.72	24	6.9
Mason Creek @ Painter Xing	7/29/2020		139	0.23			0.48	24.6	25.08	77	89.8

Location	Date	TP lbs/day	O-P lbs/day	TKN lbs/day	Nox lbs/day	TN lbs/day	TSS lbs/day	TSS tons/day	Comments
Mason Creek @ Painter Xing	3/9/2020	38.8	33.3	111.0	980.4	1091.5	3192.1	1.6	
Mason Slough @ confluence	3/9/2020	26.0	9.4	124.0	95.5	219.4	6446.8	3.2	
Mason Creek @ Painter Xing	4/23/2020	342.0	171.7	1018.8	1455.4	2474.1	123707.0	61.9	sampling followed overnightrain event
Mason Creek @ Painter Xing	5/12/2020	209.5	124.2	577.8	1444.5	2022.3	61390.7	30.7	
Mason Slough @ confluence	5/12/2020	22.4	16.0	72.2	72.2	144.4	3033.4	1.5	
Mason Creek @ Painter Xing	6/4/2020	255.7	164.9	635.0	1896.8	2531.9	69275.9	34.6	
Mason Slough @ confluence	6/4/2020	17.8	12.2	46.1	48.3	94.4	2165.3	1.1	beaver dam construction at sampling location
Mason Creek @ Painter Xing	7/24/2020	203.5	195.3	423.2	2002.3	2425.5	99299.8	49.6	
Mason Slough @ confluence	7/24/2020	21.4	24.3	45.2	54.5	99.7	1390.7	0.7	dam construction stopped
Mason Creek @ Painter Xing	7/29/2020	172.3		359.6	18431.5	18791.2	57692.2	28.8	analyte sampling







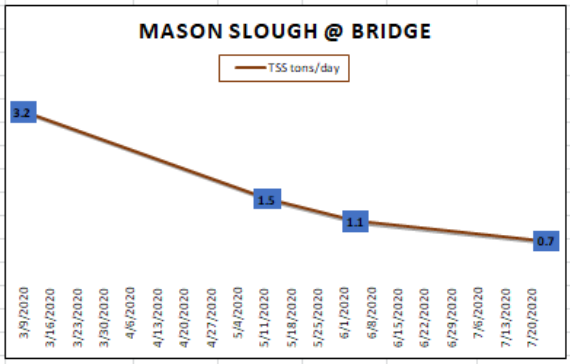


Figure 6. Analytic data from table top substrate tests

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Date Report Printed: 8/13/2020

Attn: DON MILLER
IDAHO WILDLIFE & WQ GROUP
3343 LONGLEAF WAY
BOISE, ID 83712

Collected By: M. SHUMAR
Submitted By: M. SHUMAR

Source of Sample:
MASON CREEK WETLAND - PAYNTER

Time of Collection: 11:15
Date of Collection: 7/29/2020
Date Received: 7/29/2020
Report Date: 8/13/2020
Field pH: Lab pH: PWS:
Field Temp: Temp Rcvd in Lab: 10.4 °C

Laboratory Analysis Report

Sample Number: 2036175

Test Requested	MCL		Analysis Result	Units	MDL	Method	Date Completed	Analyst
Escherichia coli			460	MPN/100mL		SM 9223	7/30/2020	DS/RB
Aluminum, Al	UR		4.28	mg/L	0.10	EPA 200.7	7/30/2020	JMS
Arsenic Low	0.01		0.0051	mg/L	0.0020	EPA 200.8	8/9/2020	JH
Cadmium Low	0.005	<	0.0005	mg/L	0.0005	EPA 200.8	8/9/2020	JH
Chromium Low	0.1		0.003	mg/L	0.002	EPA 200.8	8/9/2020	JH
Cobalt, Co		<	0.02	mg/L	0.02	EPA 200.7	7/31/2020	JMS
Copper, Cu	1.30	<	0.01	mg/L	0.01	EPA 200.7	7/30/2020	JMS
Iron, Fe	UR		2.53	mg/L	0.05	EPA 200.7	7/30/2020	JMS
Lead Low	0.015	<	0.005	mg/L	0.005	EPA 200.8	8/9/2020	JH
Magnesium, Mg	UR		10.2	mg/L	0.50	EPA 200.7	7/30/2020	JMS
Manganese, Mn	UR		0.069	mg/L	0.005	EPA 200.7	7/30/2020	JMS
Mercury, Hg	0.002	<	0.0002	mg/L	0.0002	EPA 245.1	7/30/2020	JD
Metals Digestion			*			EPA 200.2	7/29/2020	JMS
Nickel, Ni	UR	<	0.02	mg/L	0.02	EPA 200.7	7/30/2020	JMS
Selenium Low	0.05	<	0.005	mg/L	0.005	EPA 200.8	8/9/2020	JH
Zinc, Zn	UR		0.01	mg/L	0.01	EPA 200.7	7/30/2020	JMS
Ammonia Direct (as N)	UR	<	0.04	mg/L	0.04	EPA 350.1	8/3/2020	JPH
Nitrate + Nitrite (as N)	10		24.6	mg/L	0.02	EPA 353.2	8/4/2020	JPH

MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

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Laboratory Analysis Report

Sample Number: 2036175

Test Requested	MCL		Analysis Result	Units	MDL	Method	Date Completed	Analyst
Nitrogen, Total Kjeldahl (TKN)			0.48	mg/L	0.10	EPA 351.2	7/31/2020	DS
Total Nitrogen			25.1	mg/L	0.10	Calculation	8/11/2020	DS
Total Phosphate (as P)			0.23	mg/L	0.05	EPA 365.4	7/31/2020	DS
Carbon, Total Organic, TOC			3.00	mg/L	0.1	EPA 415.1	8/5/2020	RG
Chemical Oxygen Demand		<	20.0	mg/L	20.0	EPA 410.4	8/12/2020	JPH
Oil and Grease			< 5	mg/L	5	EPA 1664-B	7/31/2020	JD
pH	UR		7.8	S.U.		SM 4500-H B	7/29/2020	JD
Sulfate, SO4	UR		20	mg/L	1	EPA 300.0	7/30/2020	NC
Sulfite		<	3	ppm	3	EPA 377.1	7/29/2020	JD
The MDL was adjusted due to matrix interference.								
Biochemical Oxygen			< 3	mg/L	3	SM 5210 B	8/3/2020	BDM
Hydrogen Sulfide	UR		< 0.05	mg/L	0.05	SM 4500-S2 D	8/1/2020	GM
Total Suspended Solids			77	mg/L	2	USGS I-3765	8/1/2020	GM

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Laboratory Analysis Report

Sample Number: 2037076

Attn: DON MILLER
IDAHO WILDLIFE & WQ GROUP
3343 LONGLEAF WAY
BOISE, ID 83712

Collected By: M. SHUMAR
Submitted By: M. SHUMAR

Source of Sample:
MASON CR. WETLAND DI BLANK

Time of Collection:
Date of Collection: 7/30/2020
Date Received: 8/4/2020
Report Date: 8/14/2020

Field pH: Lab pH: **PWS#:**
Field Temp: Temp Rcvd in Lab: **PWS Name:**

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Aluminum, Al	UR	<0.50	mg/L	0.50	EPA 200.7	8/5/2020	JMS
Arsenic Low	0.01	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Cadmium Low	0.005	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Calcium, Ca	UR	<2.5	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Chromium Low	0.1	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Cobalt, Co		<0.10	mg/L	0.10	EPA 200.7	8/7/2020	JMS
Copper, Cu	1.30	<0.05	mg/L	0.05	EPA 200.7	8/5/2020	JMS
Iron, Fe	UR	<0.25	mg/L	0.25	EPA 200.7	8/5/2020	JMS
Lead Low	0.015	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Magnesium, Mg	UR	<2.5	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Mercury, Hg	0.002	<0.0002	mg/L	0.0002	EPA 245.1	8/13/2020	JD
Metals Digestion		*			EPA 200.2	8/4/2020	JMS
Nickel, Ni	UR	<0.10	mg/L	0.10	EPA 200.7	8/5/2020	JMS
Selenium Low	0.05	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Silver Low		<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Sodium, Na	UR	<2.5	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Zinc, Zn	UR	<0.05	mg/L	0.05	EPA 200.7	8/5/2020	JMS
Total Phosphate (as P)		<0.05	mg/L	0.05	EPA 365.4	8/7/2020	DS
Chemical Oxygen Demand		<20.0	mg/L	20.0	EPA 410.4	8/12/2020	JPH
Hardness	UR	<17	mg/L	17	SM 2340-B	8/6/2020	JMS
Biochemical Oxygen		< 16	mg/L	16	SM 5210 B	8/9/2020	BDM

*Limited sample quantity.

Email: markshumar@gmail.com

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Laboratory Analysis Report

Sample Number: 2037075

Attn: DON MILLER
IDAHO WILDLIFE & WQ GROUP
3343 LONGLEAF WAY
BOISE, ID 83712

Collected By: M. SHUMAR
Submitted By: M. SHUMAR

Source of Sample:
MASON CR. WETLAND BIOCHAR SUPREME #3

Time of Collection:
Date of Collection: 7/30/2020
Date Received: 8/4/2020
Report Date: 8/14/2020

Field pH: Lab pH: **PWS#:**
Field Temp: Temp Rcvd in Lab: **PWS Name:**

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Aluminum, Al	UR	159	mg/L	0.50	EPA 200.7	8/5/2020	JMS
Arsenic Low	0.01	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Cadmium Low	0.005	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Calcium, Ca	UR	56.9	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Chromium Low	0.1	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Cobalt, Co		<0.10	mg/L	0.10	EPA 200.7	8/7/2020	JMS
Copper, Cu	1.30	0.20	mg/L	0.05	EPA 200.7	8/5/2020	JMS
Iron, Fe	UR	1.03	mg/L	0.25	EPA 200.7	8/5/2020	JMS
Lead Low	0.015	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Magnesium, Mg	UR	287	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Mercury, Hg	0.002	<0.0002	mg/L	0.0002	EPA 245.1	8/13/2020	JD
Metals Digestion		*			EPA 200.2	8/4/2020	JMS
Nickel, Ni	UR	<0.10	mg/L	0.10	EPA 200.7	8/5/2020	JMS
Selenium Low	0.05	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Silver Low		<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Sodium, Na	UR	915	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Zinc, Zn	UR	0.06	mg/L	0.05	EPA 200.7	8/5/2020	JMS
Total Phosphate (as P)		<0.20	mg/L	0.20	EPA 365.4	8/10/2020	DS
Chemical Oxygen Demand		1,910	mg/L	20	EPA 410.4	8/12/2020	JPH
Hardness	UR	1,320	mg/L	17	SM 2340-B	8/6/2020	JMS
Biochemical Oxygen		< 530	mg/L	530	SM 5210 B	8/9/2020	BDM

*Limited sample quantity.

Email: markshumar@gmail.com

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Laboratory Analysis Report

Sample Number: 2037073

Attn: DON MILLER
IDAHO WILDLIFE & WQ GROUP
3343 LONGLEAF WAY
BOISE, ID 83712

Collected By: M. SHUMAR
Submitted By: M. SHUMAR

Source of Sample:
MASON CR. WETLAND ST. CLOUD ZEOLITE

Time of Collection:
Date of Collection: 7/30/2020
Date Received: 8/4/2020
Report Date: 8/14/2020

Field pH: Lab pH: **PWS#:**
Field Temp: Temp Rcvd in Lab: **PWS Name:**

Test Requested	MCL	Analysis Result	Units	MDL	Method	Date Completed	Analyst
Aluminum, Al	UR	291	mg/L	0.50	EPA 200.7	8/5/2020	JMS
Arsenic Low	0.01	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Cadmium Low	0.005	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Calcium, Ca	UR	420	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Chromium Low	0.1	0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Cobalt, Co		<0.10	mg/L	0.10	EPA 200.7	8/7/2020	JMS
Copper, Cu	1.30	0.11	mg/L	0.05	EPA 200.7	8/5/2020	JMS
Iron, Fe	UR	70.9	mg/L	0.25	EPA 200.7	8/5/2020	JMS
Lead Low	0.015	0.16	mg/L	0.05	EPA 200.8	8/11/2020	JH
Magnesium, Mg	UR	100	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Mercury, Hg	0.002	0.0204	mg/L	0.0002	EPA 245.1	8/13/2020	JD
Metals Digestion		*			EPA 200.2	8/4/2020	JMS
Nickel, Ni	UR	<0.10	mg/L	0.10	EPA 200.7	8/5/2020	JMS
Selenium Low	0.05	<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Silver Low		<0.05	mg/L	0.05	EPA 200.8	8/11/2020	JH
Sodium, Na	UR	62.5	mg/L	2.5	EPA 200.7	8/6/2020	JMS
Zinc, Zn	UR	0.33	mg/L	0.05	EPA 200.7	8/5/2020	JMS
Total Phosphate (as P)		<0.20	mg/L	0.20	EPA 365.4	8/10/2020	DS
Chemical Oxygen Demand		117	mg/L	20.0	EPA 410.4	8/12/2020	JPH
Hardness	UR	1,460	mg/L	17	SM 2340-B	8/6/2020	JMS
Biochemical Oxygen		1,250	mg/L	3	SM 5210 B	8/9/2020	BDM

Email: markshumar@gmail.com

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Figure 7. Substrate Safety Data Sheets

st. cloud zeolite

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Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

Printing date 09.11.2015 Revision: 09.11.2015

SECTION 1: Identification of the substance/mixture and of the company/ undertaking

· **1.1 Product identifier**

· **Trade name: Zeolite (Chabazite or Clinoptilolite)**
· **Other product identifiers:**
AZUB, AZLB-Ca, AZLB-Na (Bowie Chabazite)
NM-Ca (Winston Clino)
NV-Na (Ash Meadows Clino)
· **CAS Number:**
12173-10-3
· **EC number:**
215-283-8
· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.

· **Application of the substance / the mixture** Molecular Sieve, Cation Exchange Media, Dessicant
· **Uses advised against** Not FDA approved for human consumption

· **1.3 Details of the supplier of the Safety Data Sheet**
· **Manufacturer/Supplier:**
St. Cloud Mining Co., Inc.
761 St. Cloud Rd.
Winston, NM 87943
Phone: (575) 743-5215
Fax: (575) 743-3333
www.stcloudmining.com

· **1.4 Emergency telephone number:** (575) 743-5215

SECTION 2: Hazards identification

· **2.1 Classification of the substance or mixture**
· **Classification according to Regulation (EC) No 1272/2008**
The product is not classified as hazardous according to the Globally Harmonized System (GHS).
The product is not classified as hazardous according to OSHA GHS regulations within the United States.
The substance is not classified as hazardous according to the CLP regulation.

· **Additional information:**
Long term inhalation of product dust may be harmful.
There are no other hazards not otherwise classified that have been identified.

· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008** Not Regulated
· **Hazard pictograms** Not Regulated
· **Signal word** Not Regulated

· **Hazard-determining components of labelling:** None.
· **Hazard statements** Not Regulated
· **Precautionary statements** Not Regulated.
· **Additional information:**
Safety data sheet available on request.

(Cont'd. on page 2)

st. cloud zeolite

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

Printing date 09.11.2015 Revision: 09.11.2015

Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 1)

· **2.3 Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

SECTION 3: Composition/information on ingredients

· **3.1 Substances**
· **CAS No. Description**
12173-10-3 Clinoptilolite Zeolite/ Potassium, Calcium, Sodium Aluminosilicate
· **Identification number(s)**
· **EC number:** 215-283-8
· **Additional information:** Alternative CAS Number: 1318-02-1
· **Impurities and stabilising additives:**
Present below 0.1%: quartz/crystalline silica.

CAS: 14808-60-7 EINECS: 238-878-4	Quartz (SiO_2)	Carc. 1A, H350

SECTION 4: First aid measures

· **4.1 Description of first aid measures**
· **General information:** No special measures required.
· **After inhalation:**
Supply fresh air; consult doctor in case of complaints.
Provide oxygen treatment if affected person has difficulty breathing.
· **After skin contact:**
Brush off loose particles from skin.
Immediately wash with water and soap and rinse thoroughly.
If skin irritation is experienced, consult a doctor.
· **After eye contact:**
Remove contact lenses if worn.
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Rinse out mouth and then drink plenty of water.
Do not induce vomiting; call for medical help immediately.
· **4.2 Most important symptoms and effects, both acute and delayed**
Coughing
Nausea in case of ingestion.
Gastric or intestinal disorders when ingested.
· **Hazards** Coughing and wheezing from inhalation of large quantities of dust.
· **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

(Cont'd. on page 3)

st. cloud zeolite

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

Printing date 09.11.2015 Revision: 09.11.2015

Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 2)

SECTION 5: Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:**
The product is not flammable.
Use fire extinguishing methods suitable to surrounding conditions.
· **For safety reasons unsuitable extinguishing agents:** None.
· **5.2 Special hazards arising from the substance or mixture** No further relevant information available.
· **5.3 Advice for firefighters**
· **Protective equipment:**
Wear self-contained respiratory protective device.
Wear fully protective suit.
· **Additional information** No further relevant information available.

SECTION 6: Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation
Avoid formation of dust.
Avoid breathing dust.
Use personal protective equipment as required.
· **6.2 Environmental precautions:** No special measures required.
· **6.3 Methods and material for containment and cleaning up:**
Pick up mechanically.
Dispose contaminated material as waste according to section 13.
· **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

· **7.1 Precautions for safe handling**
Use only in well ventilated areas.
Prevent formation of dust.
Any unavoidable deposit of dust must be regularly removed.
· **Information about fire - and explosion protection:** No special measures required.

· **7.2 Conditions for safe storage, including any incompatibilities**
· **Storage:**
· **Requirements to be met by storerooms and receptacles:** Protect from humidity and water.
· **Information about storage in one common storage facility:** Store away from foodstuffs.
· **Further information about storage conditions:** Store in cool, dry conditions in well sealed receptacles.
· **7.3 Specific end use(s)** No further relevant information available.

(Cont'd. on page 4)

st. cloud zeolite

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

Printing date 09.11.2015 Revision: 09.11.2015

Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 3)

SECTION 8: Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see section 7.

· **8.1 Control parameters**

Ingredients with limit values that require monitoring at the workplace:	
12173-10-3 Clinoptilolite Zeolite/ Potassium, Calcium, Sodium Aluminosilicate	
OSHA Permissible Exposure Limit (PEL) (USA)	Limit Value: 15 mg/m³ (Particulates Not Otherwise Regulated (Total Dust))

· **DNELs** No further relevant information available.
· **PNECs** No further relevant information available.

· **8.2 Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Avoid breathing dust.
· **Respiratory protection:**
Not required under normal conditions of use.
For spills, respiratory protection may be advisable.
NIOSH or EU approved dust respirator should be used for operations generating dust.
Particulate mask should filter at least 99% of airborne particles.
· **Protection of hands:**



Protective gloves

Wear gloves for the protection against mechanical hazards according to NIOSH or EN 388.
· **Eye protection:**



Safety glasses

· **Body protection:** Protective work clothing
· **Limitation and supervision of exposure into the environment**
No further relevant information available.
· **Risk management measures**
See Section 7 for additional information.
No further relevant information available.

(Cont'd. on page 5)

st. cloud zeolite

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

Printing date 09.11.2015 Revision: 09.11.2015

Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 4)

SECTION 9: Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**	
· **General Information**	
· **Appearance:**	
Form:	Pulverized Rock (Granulate and Powder)
Colour:	White to off-white; Greenish; Yellowish; Reddish; Tan
· **Odour:**	Odourless
· **Odour threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	982 °C (1800 °F) (approximate)
Boiling point/Boiling range:	Not determined.
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not applicable.
· **Auto/Self-ignition temperature:**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Self-igniting:**	Product is not self-igniting.
· **Danger of explosion:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapour pressure:**	Not applicable.
· **Density:**	2,2 - 2,4 g/cm³ (18,359 - 20,02 lbs/gal)
· **Relative density**	Not determined.
· **Vapour density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with water:**	Not miscible or difficult to mix.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
· **9.2 Other information**	No further relevant information available.

SECTION 10: Stability and reactivity

· **10.1 Reactivity** No further relevant information available.

(Cont'd. on page 6)

st. cloud zeolite

Safety Data Sheet

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Printing date 09.11.2015 Revision: 09.11.2015

Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 5)

· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
· **10.3 Possibility of hazardous reactions**
As the product is supplied it is not capable of dust explosion; however enrichment with fine dust causes risk of dust explosion.
· **10.4 Conditions to avoid** Prevent formation of dust.
· **10.5 Incompatible materials:** No further relevant information available.
· **10.6 Hazardous decomposition products:** Possible in traces.

SECTION 11: Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity** Based on available data, the classification criteria are not met.

· **LD/LC50 values relevant for classification:**		
Oral	LD50	>5000 mg/kg (rat)

· **Primary irritant effect:**
· **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
· **Serious eye damage/irritation** Based on available data, the classification criteria are not met.
· **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
· **Acute effects (acute toxicity, irritation and corrosivity):** None.
· **Repeated dose toxicity:**
Repeated or long-term inhalation of product dusts may cause pulmonary disease.
· **CMR effects (carcinogenity, mutagenicity and toxicity for reproduction):**
· **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
· **Carcinogenicity** Based on available data, the classification criteria are not met.
· **Reproductive toxicity** Based on available data, the classification criteria are not met.
· **STOT-single exposure** Based on available data, the classification criteria are not met.
· **STOT-repeated exposure** Based on available data, the classification criteria are not met.
· **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

· **12.1 Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **12.2 Persistence and degradability** No further relevant information available.
· **12.3 Bioaccumulative potential** No further relevant information available.
· **12.4 Mobility in soil** No further relevant information available.
· **Additional ecological information:**
· **General notes:** Generally not hazardous for water
· **12.5 Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.

(Cont'd. on page 7)

st. cloud zeolite

Safety Data Sheet
according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

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Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 6)

· **12.6 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation**
Smaller quantities can be disposed of with household waste.
The user of this material has the responsibility to dispose of unused material, residues and containers in compliance with all relevant local, state and federal laws and regulations regarding treatment, storage and disposal for hazardous and nonhazardous wastes.

· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.

SECTION 14: Transport information

· **14.1 UN-Number** · **DOT, ADR, IMDG, IATA**	Not Regulated
· **14.2 UN proper shipping name** · **DOT, ADR, IMDG, IATA**	Not Regulated
· **14.3 Transport hazard class(es)**	
· **DOT, ADR, IMDG, IATA** · **Class**	Not Regulated
· **14.4 Packing group** · **DOT, ADR, IMDG, IATA**	Not Regulated
· **14.5 Environmental hazards:** · **Marine pollutant:**	No
· **14.6 Special precautions for user**	Not applicable.
· **14.7 Transport in bulk according to Annex II of Marpol and the IBC Code**	Not applicable.
· **UN "Model Regulation":**	Not Regulated

SECTION 15: Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **United States (USA)**
· **SARA**

· **Section 355 (extremely hazardous substances):**
Substance is not listed.

(Cont'd. on page 8)

st. cloud zeolite

Safety Data Sheet

according to 1907/2006/EC (REACH), 1272/2008/EC (CLP), and OSHA GHS

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Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 7)

· **Section 313 (Specific toxic chemical listings):**
Substance is not listed.

· **TSCA (Toxic Substances Control Act):**
Substance is listed.

· **Proposition 65 (California):**
· **Chemicals known to cause cancer:**
Present in trace quantities.

14808-60-7	Quartz (SiO2)

· **Chemicals known to cause reproductive toxicity for females:**
Substance is not listed.

· **Chemicals known to cause reproductive toxicity for males:**
Substance is not listed.

· **Chemicals known to cause developmental toxicity:**
Substance is not listed.

· **Carcinogenic Categories**

· **EPA (Environmental Protection Agency)**
Substance is not listed.

· **IARC (International Agency for Research on Cancer)**
Substance is not listed.

· **TLV (Threshold Limit Value established by ACGIH)**
Substance is not listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**
Substance is not listed.

· **Canada**

· **Canadian Domestic Substances List (DSL)**
Substance is not listed.

· **Canadian Ingredient Disclosure list (limit 0.1%)**
Substance is not listed.

· **Canadian Ingredient Disclosure list (limit 1%)**
Substance is not listed.

· **Directive 2012/18/EU**

· **Named dangerous substances - ANNEX I**
Substance is not listed.

· **Other regulations, limitations and prohibitive regulations**

· **Substances of very high concern (SVHC) according to REACH, Article 57**
Substance is not listed.

(Cont'd. on page 9)

st. cloud zeolite

Safety Data Sheet

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Printing date 09.11.2015 Revision: 09.11.2015

Trade name: Zeolite (Chabazite or Clinoptilolite)

(Cont'd. from page 8)

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPvB: very Persistent and very Bioaccumulative

· **Sources**
Website, European Chemicals Agency (http://http://echa.europa.eu/)
Website, US EPA Substance Registry Services (http://http://ofmpub.epa.gov/sor_internet/registry/substreg/home/overview/home.do)
Website, Chemical Abstracts Registry, American Chemical Society (https://www.cas.org)
Patty's Industrial Hygiene, 6th ed., Rose, Vernon, ed. ISBN: ISBN: 978-0-470-07488-6
Casarett and Doull's Toxicology: The Basic Science of Poisons, 8th Ed., Klaasen, Curtis D., ed., ISBN: 978-0-07-176923-5.
Safety Data Sheets, Individual Manufacturers
SDS Prepared by:
ChemTel Inc.
1305 North Florida Avenue
Tampa, Florida USA 33602-2902
Toll Free North America 1-888-255-3924 Intl. +01 813-248-0573
Website: www.chemtelinc.com

PRODUCT NAME :POLYALUMINIUM CHLORIDE **HENAN XUNYU CHEMICAL CO., LTD**

MATERIAL SAFETY DATA SHEET

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name: Polyaluminium Chloride **CAS #:** 1327-41-9

Formula: $[Al_2(OH)nCl_{6-n}]m$

Synonyms: Aluminum Chlorohydrate; Polyaluminium Hydroxychloride, Aluminium Chloride Hydroxide

Product Use: Water treatment chemical

COMPANY IDENTIFICATION

Manufacturer

HENAN XUNYU CHEMICAL CO.,LTD

NO.18,SHANGWU NEIHUAN RD, ZHENGDONG NEW DIS,ZHENGZHOU, HENAN,CHINA

Emergency Number: 86-371-63681121

Information Number: 86-371-63681125

SECTION 2 - COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS NUMBER	WEIGHT %	Hazardous
Polyaluminium Chloride	1327-41-9	29 - 32 (as Aluminium oxide) 40-90 (basicity)	No

SECTION 3 - HAZARD IDENTIFICATION

Emergency Overview: CORROSIVE! Inhalation, ingestion or skin contact with material may cause injury. Causes eye and skin irritation. Mist and Vapor: Causes respiratory tract and mucous membrane irritation.

Potential Health Effects:

Inhalation: Irritation to mucous membranes

Skin Contact: Possible irritation

Eye Contact: May cause irritation with redness and swelling.

Ingestion: Irritation of the mouth and stomach.

Sub-chronic Effects: No data available

Chronic Effects: None known

Carcinogenicity: Polyaluminum chloride is not classified as a carcinogen by ACGIH (American Conference of Governmental Industrial Hygienists) or IARC (International Agency for Research on Cancer), not regulated as a carcinogen by OSHA (Occupational Safety and Health Administration) and not listed as a carcinogen by NTP (National Toxicology Program).

SECTION 4 - FIRST AID MEASURES

General: If you feel unwell, seek medical advice (show the label where possible).

Inhalation: If symptoms are experienced, move victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Obtain medical attention.

Skin Contact: Remove contaminated clothing, jewelry and shoes. Immediately wash skin with soap or mild detergent and running water for at least 15 minutes, until no evidence of chemical remains. For minor skin contact, avoid spreading material on unaffected skin. Obtain medical attention if irritation persists.

Eye Contact: Immediately flush eyes with running water for at least 15 minutes, occasionally lifting upper and lower lids, until no evidence of chemical remains. Obtain medical attention if irritation persists.

Ingestion: If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Seek immediate medical attention.

NOTE TO PHYSICIAN: Antidote: There is no specific antidote for aluminum chlorohydrate. Treatment of overexposure should be directed at the control of symptoms and the clinical condition

SECTION 5 - FIRE FIGHTING MEASURES

Flash point	Not applicable.
Flammable Limits (Lower)	Not applicable
Flammable Limits (Upper)	Not applicable
Auto Ignition Temperature	Not applicable
Combustion and Thermal Decomposition Products	Hydrogen chloride, aluminum oxides
Rate of Burning	Does not burn
Explosive Power	Not applicable
Sensitivity to Static Discharge	Not available

Fire and Explosion Hazards: During a fire, irritating/toxic hydrogen chloride gas may be generated.

Extinguishing Media: Water spray, fog or regular foam appropriate for surrounding material. Cool any exposed containers with water.

Special Information:

Fire fighters should wear protective equipment and self-contained breathing apparatus with full-face piece operated in positive pressure mode. Move exposed containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.

NOTE: Also see "Section 10 - Stability and Reactivity"

SECTION 6 - ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

Dike area to contain spill. Neutralize spilled material with alkali such as soda ash. When using carbonates for neutralization, adequate precautions should be taken to minimize hazards from carbon dioxide gas generation. Collect liquid and/or residue and dispose of in accordance with applicable regulations.

SECTION 7 - HANDLING AND STORAGE

Handling: Avoid contact with skin, eyes and clothing. Do not breathe product mists. Use with adequate ventilation. Handle as material of moderate oral toxicity. Do not smoke or eat while handling. Use good housekeeping and personal hygiene. Wash thoroughly after handling.

Storage Recommendations: Store at moderate temperatures in a dry, well-ventilated area. Protect from physical damage and from freezing. Keep containers tightly closed.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

PREVENTIVE MEASURES

Recommendations listed in this section indicate the type of equipment, which will provide protection against over-exposure to this product. Conditions of use, adequacy of engineering or other control measures and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls: A ventilation system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Ensure that eyewash station and safety showers are proximal to the workstation location.

PERSONAL PROTECTIVE EQUIPMENT

Eye Protection: Wear splash resistant chemical goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

Skin Protection: Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Recommended Protective Material: Neoprene or rubber

Respiratory Protection: Under conditions of frequent use or heavy exposure, respiratory protection may be needed. For exposures under 20 mg/m^3, a NIOSH/MSHA approved air-purifying respirator with high efficiency particulate cartridge(s) may be used. For unknown concentration, use any supplied air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode.

EXPOSURE GUIDELINES

Product: ACGIH: TLV - 2mg/m3 (as Al) (Aluminum salts, soluble)

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

Alternate Name	Aluminium Chloride Hydroxide
Chemical Name	Polyaluminium Chloride
Chemical Family	Inorganic salt
Molecular Formula	$[Al_2(OH)nC_{16}\text{-}n]m$
Molecular Weight	133.5 -174.5
Appearance	Yellow to brown powder
Odor	Slight chlorine odor
pH(1% aqueous solution)	3.5-5.0
Melting Point	No Data
Solubility (Water)	100% Soluble
Solubility (Other)	Not available
Evaporation Rate	Not applicable
% Volatile Organic Compounds	Not applicable

SECTION 10 - STABILITY AND REACTIVITY

Hazardous Decomposition Products: Thermal decomposition: hydrochloric acid, aluminium oxides.

Chemical Stability: Stable at normal temperatures and pressure.

Conditions to Avoid: None

Incompatibility with other Substances: Bases (alkaline materials) such as ammonia and its solutions, carbonates, sodium hydroxide (caustic), and potassium hydroxide. Corrosive to common metals such as aluminium, stainless and mild steel, nickel, copper, and brass.

Hazardous Polymerization: Will not occur.

SECTION 11 - TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

Polyaluminum chloride: No data available

Aluminum chloride hydroxide: (base unit of polymer- monomer)

Irritation data:150mg/m^3 day(s)-intermittent skin-human mild

Toxicity data: 25mg/m^3/6 hour(s)-2 year(s) intermittent inhalation-rat TCLo;

25g/m3/6 hour(s)-2 year(s) intermittent inhalation-guinea pig TCLo

Mutagenicity: Not available

Reproductive Effects Data: ND

Teratogenicity and Fetotoxicity: Not available

Synergistic Materials: Not available

SECTION 12 - ECOLOGICAL INFORMATION

Ecotoxicological Information: fish toxicity: 10000 µg/L 24 week(s) (Mortality) Coho salmon, silver salmon (Oncorhynchus kisutch)

Persistence and Degradation: No data available

SECTION 13 - DISPOSAL CONSIDERATIONS

Review federal, state and local government requirements prior to disposal.

Whatever cannot be saved for recovery or recycling, including containers, should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options

RCRA: Hazardous if pH is less than 2. Test waste material for corrosivity, D002, prior to disposal.

SECTION 14 - TRANSPORT INFORMATION

Shipping information:

Not regulated as a hazardous material by DOT, IMO, or IATA.

Shipping Containers:

Tank Cars

Tank Trucks

Flexible Intermediate Bulk Containers

Tote Bins

Bags

SECTION 15 - REGULATORY INFORMATION

USA CLASSIFICATION:

OSHA Classification: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200)

SARA Regulations sections 313 and 40 CFR 372: N

SARA Hazard Categories, SARA SECTIONS 311/312 (40 CFR 370.21):

Acute: N

Chronic: N

Fire: N

Reactive: N

Sudden Release: N

OSHA Process Safety (29CFR1910.119): N

TSCA Inventory Status: Y

This product does not contain, nor is it manufactured with, ozone-depleting substances.

Other Regulations/Legislation which apply to this product:

California Proposition 65: N

CANADIAN CLASSIFICATION

This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all information required by the CPR.

Controlled Products Regulation (WHMIS) Classification:

E: Corrosive

CEPA / Canadian Domestic Substances List (DSL): The substance in this product is on the Canadian Domestic Substances List (CEPA DSL).

EEC CLASSIFICATION

EINECS: 215-477-2

SECTION 16 - OTHER INFORMATION

This information is given without any warranty or representation. It is believed to be correct but does not claim to be all inclusive and shall be used only as a guide.HENAN XUNYU CHEMICAL CO.,LTD shall not be held liable for any damage resulting from gandling or for contact with the above product. It is offered solely for your consideration, investigation and verification.

National Fire Protection Association (NFPA) Rating

Hazardous Materials Identification System (HMIS) Rating

	NFPA	HMIS
HEALTH	1	1
FIRE	0	0
REACTIVITY	0	0

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

REFERENCES:

1. American Water Works Association, ANSI/AWWA B408-93, "Liquid Polyaluminum Chloride", Colorado, Dec. 1993
2. RTECS-Registry of Toxic Effects of Chemical Substances, On-line search, Canadian Centre for Occupational Health and Safety RTECS database, Doris V. Sweet, Ed., National Institute for Occupational Safety and Health, U.S. Dept. of Health and Human Services, Cincinnati, Updated Nov 1998.
3. NIOSH POCKET GUIDE TO CHEMICAL HAZARDS, U.S. Department of Health and Human Services, National Institute for Occupational Safety and Health, June 1997
4. Sax, N.I., "Dangerous Properties of Industrial Materials", 7th Edition, 1989
5. "1999 Threshold Limit Values and Biological Exposure Indices", American Conference of Government Industrial Hygienists, 1999.
6. Merck, 11th Edition, 1989
7. Supplier's Material Safety Data Sheets.

Legend:

CAS # - Chemical Abstracts Service Registry Number

CERCLA- Comprehensive Environmental Response, Compensation, and Liability Act
CFR - Code of Federal Regulations
DOT- Department of Transportation
EPA - Environmental Protection Agency
LC_{50} - The concentration of material in air expected to kill 50% of a group of test animals
LD_{50} - Lethal Dose expected to kill 50% of a group of test animals
MSHA - Mine Safety and Health Administration
NIOSH - National Institute for Occupational Safety and Health
PEL - Permissible Exposure Limit
PVC - Polyvinyl chloride
RCRA - Resource Conservation and Recovery Act
SARA - Superfund Amendments and Reauthorization Act of the U.S. EPA
STEL - Short Term Exposure Limit
TDG- Transportation of Dangerous Goods Act/Regulations
TLV - Threshold Limit Value
TSCA - Toxic Substances Control Act
TWA - Time-Weighted Average

Appendix C. Technical Calculations

A. Technology-Based Effluent

Mass-Based Limits

The federal regulation at 40 CFR 122.45(f) requires that effluent limits be expressed in terms of mass, except under certain conditions. The mass based limits are expressed in pounds per day and are calculated as follows:

Mass based limit (lb/day) = concentration limit (mg/L) × design flow (mgd) × 8.3413[13]

B. Reasonable Potential and Water Quality-Based Effluent Calculations

DEQ uses the process described in the *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991) to determine reasonable potential. To determine if there is reasonable potential for the discharge to cause or contribute to an exceedance of water quality criteria for a given pollutant, DEQ compares the maximum projected receiving water concentration to the water quality criteria for that pollutant. If the projected receiving water concentration exceeds the criteria, there is reasonable potential, and a water quality-based effluent limit must be included in the permit. This following section discusses how the maximum projected receiving water concentration is determined

Mass Balance

For discharges to flowing water bodies, the maximum projected receiving water concentration is determined using the following mass balance equation:

$$C_d Q_d = C_e Q_e + C_u Q_u \qquad \text{Equation 1}$$

where,

- C_d = Receiving water concentration downstream of the effluent discharge (that is, the concentration at the edge of the mixing zone)
- C_e = Maximum projected effluent concentration
- C_u = 95th percentile measured receiving water upstream concentration
- Q_d = Receiving water flow rate downstream of the effluent discharge = Q_e+Q_u
- Q_e = Effluent flow rate (set equal to the design flow of the WWTP)
- Q_u = Receiving water low flow rate upstream of the discharge (1Q10, 7Q10 or 30B3)

When the mass balance equation is solved for C_d, it becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times Q_u}{Q_e + Q_u} \qquad \text{Equation 2}$$

The above form of the equation is based on the assumption that the discharge is rapidly and completely mixed with 100% of the receiving stream.

[13] 8.34 is a conversion factor with units (lb ×L)/(mg × gallon×10^6)

If the mixing zone is based on less than complete mixing with the receiving water, the equation becomes:

$$C_d = \frac{C_e \times Q_e + C_u \times (Q_u \times \%MZ)}{Q_e + (Q_u \times \%MZ)}$$ Equation 3

Where:

% MZ = the percentage of the receiving water flow available for mixing.

If a mixing zone is not allowed, dilution is not considered when projecting the receiving water concentration and,

$$C_d = C_e$$ Equation 4

A dilution factor (D) can be introduced to describe the allowable mixing. Where the dilution factor is expressed as:

$$D = \frac{Q_e + Q_u \times \%MZ}{Q_e} = 1 + \frac{Q_u \times \%MZ}{Q_e}$$ Equation 5

After the dilution factor simplification, the mass balance equation becomes:

$$C_d = \frac{C_e - C_u}{D} + C_u$$ Equation 6

If the criterion is expressed as dissolved metal, the effluent concentrations are measured in total recoverable metal and must be converted to dissolved metal as follows:

$$C_d = \frac{CF \times C_e - C_u}{D} + C_u$$ Equation 7

Where C_e is expressed as total recoverable metal, C_u and C_d are expressed as dissolved metal, and CF is a conversion factor used to convert between dissolved and total recoverable metal.

The above equations for C_d are the forms of the mass balance equation which were used to determine reasonable potential and calculate waste load allocations.

Appendix D. Your Right to Appeal

Persons aggrieved, as specified in IDAPA 58.01.25.204.01.a., have a right to appeal the final permit decision. A Petition for Review must be filed with the Department's Hearing Coordinator within twenty eight (28) days after the Department serves notice of the final permit decision under IDAPA 58.01.25.107 (Decision Process).

All documents concerning actions governed by these rules must be filed with the Hearing Coordinator at the following address: Hearing Coordinator, Department of Environmental Quality, 1410 N. Hilton, Boise, ID 83706-1255. Documents may also be filed by FAX at FAX No. (208) 373-0481 or may be filed electronically. The originating party is responsible for retaining proof of filing by FAX. The documents are deemed to be filed on the date received by the Hearing Coordinator. Upon receipt of the filed document, the Hearing Coordinator will provide a conformed copy to the originating party. Additional requirements for appeals of IPDES final permit decisions can be found in IDAPA 58.01.25.204

Appendix E. Public Involvement and Public Comments

A. Public Involvement Information

DEQ placed a Public Notice of Draft on September 12, 2021 in the Idaho Press Tribune to inform the public and to invite comment on the draft Idaho Pollutant Discharge Elimination System permit and fact sheet.

The notice:

- Tells where copies of the draft permit and fact sheet are available for public evaluation (a local public library, the closest regional or field office, posted on our website).
- Offers to provide the documents in an alternate format to accommodate special needs.
- Asks people to tell us how well the draft permit would protect the receiving water.
- Invites people to suggest fairer conditions, limits, and requirements for the permit.
- Invites comments on DEQ's determination of compliance with antidegradation rules.
- Urges people to submit their comments, in writing, before the end of the comment period.
- Tells how to request a public hearing about the draft IPDES permit.
- Explains the next step(s) in the permitting process.

23700 144797
1 DEQ - WATER QUALITY DIVISION

1410 N. HILTON
BOISE, ID 83706

RECEIVED BY
SEP 16 2021
IDAHO DEPT. OF
ENVIRONMENTAL QUALITY

AFFIDAVIT OF PUBLICATION
STATE OF IDAHO

County of Canyon and Ada

SHARON JESSEN
of the State of Idaho, being of first duly sworn, deposes and says:

1. That I am a citizen of the United States, and at all times hereinafter mentioned was over the age of eighteen years, and not a party to the above entitled action.
2. That I am the Principle Clerk of the Idaho Press-Tribune, a daily newspaper published in the Counties of Canyon and Ada, State of Idaho; that the said newspaper is in general circulation in the said counties of Canyon and Ada, and in the vicinity of Nampa, Caldwell, and Boise, and has been uninterruptedly published in said Counties during a period of seventy -eight consecutive weeks prior to the first publication of this notice, a copy of which is hereto attached.
3. That the notice, of which the annexed is a printed copy, was published in said newspaper 1 times(s) in the regular and entire issue of said paper, and was printed in the newspaper proper, and not in a supplement

That said notice was published the following: 09/12/2021

SHARON JESSEN
STATE OF IDAHO
County of Canyon and Ada

On this 10th day of September, in the year of 2021 before me a Notary Public, personally appeared. SHARON JESSEN, known or identified to me to be the person whose name is subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledge to me that he/she executed the same.

Notary Public of Idaho
My commission expires 6/28/23

COLLEEN R. NIELSEN NOTARY PUBLIC Comm No. 70215 STATE OF IDAHO

144797

AD# 144797AD#

LEGAL NOTICE

DEQ SEEKS COMMENT ON DRAFT IDAHO POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR Idaho Wildlife and Water Quality Group Mason Creek Activated Wetland Pilot Project

PROPOSED ACTION: The Idaho Wildlife and Water Quality Group applied to the Department of Environmental Quality (DEQ) for an Idaho Pollutant Discharge Elimination System (IPDES) wastewater discharge permit for its industrial wastewater treatment facility located 1904 Mason Creek Road, Caldwell. The DEQ is seeking public comment on the draft IPDES permit, associated fact sheet, and application for the Mason Creek Activated Wetland Pilot Project wastewater treatment facility. This proposed permit authorizes the discharge of treated industrial wastewater year round to Mason Slough, a tributary to the Boise River, for five years. The permit identifies the pollutants of concern and specifies associated discharge limits. Additionally, the permit specifies monitoring and reporting requirements necessary to ensure compliance, protect human health, and assure the integrity of Idaho's environment.

PUBLIC COMMENT PERIOD: Notice is given that DEQ has scheduled a period to receive public comments. Written comments on the draft permit and fact sheet will be accepted through October 13, 2021, at 5 p.m. MST. A public meeting may be held if requested in writing by September 21, 2021. The draft permit and fact sheet are available for public review at DEQ's state office (1410 N. Hilton St., Boise, ID), Boise Regional Office (1445 N. Orchard, Boise, Idaho), and on DEQ's website. https://www.deq.idaho.gov/public-information/newsroom/

SUBMISSION OF WRITTEN COMMENTS–ASSISTANCE ON TECHNICAL QUESTIONS: Anyone may submit written comments regarding the proposed permit. To be most effective, comments should address water quality considerations and include supporting materials where available. Comments, requests, and questions regarding the public comment process should be directed to Rakael Pope at the address below, or to the DEQ Web site at https://www.deq.idaho.gov/public-information/newsroom/. Please reference the Idaho Wildlife and Water Quality Group and permit number ID0030031 when sending comments or questions. All information regarding this matter, including the issuance of the final permit, will be available on DEQ's Web site.

Submit requests for a public meeting on the draft permit and fact sheet electronically on DEQ's website, by mail, or email to Lori Flook.

Lori Flook
Idaho Department of Environmental Quality
Surface & Wastewater Division
1410 N. Hilton St.
Boise, ID 83706 Email: Lori.Flook@deq.idaho.gov

Rakael Pope
Idaho Department of Environmental Quality
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September 12, 2021 144797

B. Public Comments and Response to Comments

Idaho Pollutant Discharge Elimination System Discharge Permit No. ID0030031

Response to Comments on Draft IWWQG Mason Creek Activated Wetland Pilot Project IPDES Permit

October 13, 2021 comment deadline

Comments in reference to Idaho DEQ application #ID0030031 Mason Creek Activated Wetlands Pilot

Ron Jones, 3717 N 2544 E, Twin Falls, ID 83301, Ronjones1977@gmail.com Jones, Twin Falls, ID 83301

Received by DEQ October 11, 2021

Comment 1 and 2 (from Mr. Ron Jones):

Summary:

1. Support for the idea of pollution credit trading
2. Need to develop stable predictable platform for credit trades
3. Questions about how the permit is regulated and monitored
4. Need for clearer design specification and operation detail to make pilot useful

These comments are my own and do not represent the position of a particular group. However, my input is based on experience gained as a supervisor of the Snake River Soil and Water Conservation District (SRSWCD) in the Twin Falls area. Over the past many years SRSWCD has purchased property and, in cooperation with the Twin Falls Canal Co., has developed several constructed basins / constructed wetlands (CBCW) to remove phosphorus from agricultural runoff. As an individual and on behalf of the three soil conservation districts in the area on the south side of the middle-Snake, I continue to be involved in the WAG working to renew and revise the TMDL for the middle-Snake.

(1) I strongly support the construction of more CBCW to reduce Phosphorus (P) entering the Snake (and in this case the Boise River). Pollution credit trading seems the most cost effective way to encourage the reduction of non-point agricultural P contributions which are currently not regulated. Stopping runoff completely would be a more thorough method but the cost of purchasing sprinklers or drip irrigation for all ag lands seems prohibitive in the near term. In addition to the cost, the funding for that approach is limited and the cost falls to taxpayers who may not be directly affected by the benefits. Pollution credit trading provides a means to fund the cost of cleanup while sharing the benefits of reduced cost with the parties providing the cleanup and those who would be forced to use some other more expensive solution to reduce their P discharge.

(2) This project is designed as a demonstration, or pilot, for a planned larger project. My understanding is that a significant portion of the funding for this project comes from a grant via the Lower Boise Watershed Council to demonstrate a novel mix of technologies and record a P credit trade as an example of the larger possibilities for a

much larger project. This anticipates that the pilot demonstration will provide convincing data that will give comfort to the buyer of the credits in order to enter a long term agreement to buy P credits rather than make large capital expenditures to control P discharge in more traditional ways. My concern is that the project, as proposed, may not provide the right type of data to support those decisions.

One of the challenges of creating a system of P credit trading has been the chicken-egg problem of needing a long term buyer commitment before building sites, while needing an assured reliable long term source of credits before the buyer is willing to commit.

The methods and techniques for removing sediment attached P from streams through settling ponds is heavily documented and we can provide many years of data showing monitored results. This project contemplates the development of long term credit sales (20 years) based on a combination of old science and the mix of several novel techniques. While many of those techniques cited in the permit application have shown some ability to remove P, the permit anticipates a new method of mixing several approaches to create an "activated wetland". These approaches will no doubt work to at least some extent but the applicant has not shown the particular engineering design and calculations as to the efficacy of this project as designed. Perhaps most importantly, it's not clear how the efficacy can be determined for future years.

My concern is that after the two years contemplated for this demonstration there won't be enough data to convince a buyer to enter into a long-term agreement. This is because the testing proposed won't show conclusively which of the "activated" enhancements has created improvements beyond traditional CBCW.

Response 1 and 2: DEQ worked with the permittee to develop appropriate IPDES monitoring requirements for the permittee's operation. The permittee may collect additional data sufficient to, "…convince a buyer to enter into a long-term agreement…" but it is not required for this IPDES permit.

Changes to draft permit: None.

Comment 3 (from Mr. Ron Jones):

(3) It's not clear to me, in reading the application and the draft permit, whether this site will be monitored under the strenuous requirements of a wastewater treatment plant, or the much lesser requirements for monitoring an agricultural drain. It seems that CBCW where no additives are used have gathered data for N, P, solids, pH, etc. sporadically. This is still expensive but nothing like the expense of sampling behind a wastewater treatment plant. It would help the whole industry if DEQ would clarify its position on the distinction of when additives like the "activated" ingredients (zeolite, biochar, alum, FeS, etc.) become managed and regulated. My personal opinion is that if the incoming water is benign, and the additives are benign then the lesser standards are appropriate. If DEQ deems any of the additives to be a concern then more

monitoring is justified. Clarifying this point would help advance the industry. A potential credit buyer would need assurance that the credits purchased would remain in compliance.

The narrative proposal anticipates measuring inflow water quality and outflow water quality and generating P credits on the difference. Without extensive long term testing of the different technology mixes proposed here it will be impossible to tell the efficacy of any one approach for the life cycle of the bigger project. The application mentions the need to harvest plant materials but doesn't provide any detail on how to do that effectively (both from a cost and mechanical standpoint). That should be clarified and explained for the particular site. We have learned through years of experience that proper pond design is critical to long term success. Likewise the application anticipates the eventual need to clean and replace the substrate materials without making an engineered calculation of the frequency required and the cost of this maintenance. This will eventually be important for the buyer to understand in ascertaining whether the seller can continuously provide the credits.

The narrative mentions the project may be able to remove N, but there is no clear indication that N will be monitored. The relationship of N and P may be of concern to some parties who would eventually comment on the larger project. N should be monitored.

Much of the literature cited refers to experiments involving relatively small flows of wastewater. It's not clear how this research will transfer to the much higher flows anticipated in ag return cleanup. In the past twenty years there have been several studies in Idaho trying to find an economic way of treating large volumes of ag return flow but none have yet shown a cost-effective means that involve additives. This may change, and of course it depends on the expected value of the credits generated. Unlike projects in the Chesapeake Bay and the Sacramento River, there are competitive options available and the capital to buy credits is not yet clear.

Response 3: The permittee may monitor nitrogen or other analytes using methods outlined in their QAPP and submit this information to DEQ in an annual report, but such monitoring is not required for this IPDES permit.

Changes to draft permit: None.

Comment 4 (Mr. Ron Jones):

(4) The proposal would be stronger if it included the Operations and Maintenance Manual as specified in Section 4.1.2 of the draft permit, including specific design details, the particular mix of additives, and the particulars of the intended maintenance of the project as proposed. Without that additional engineering design, it's not clear this will serve as an effective demonstration for a larger scale project.

If this data is not clear and conclusive it will haunt the much larger project and complicate its permitting and the sale of credits.

Response 4: Section 4.1.2 of the permit outlines the IPDES requirements of an Operation and Maintenance (O&M) Manual that will be kept on site and made available to DEQ upon request. The permittee may include additional details in the O&M Manual, but it is not required for this IPDES permit.

Changes to draft permit: None.

Appendix F. Permit Rating Worksheet

IPDES Permit Rating Worksheet

NPDES/IPDES No.: ID0030031

- ○ Regular Addition
- ○ Discretionary addition
- ○ Score change, but no status change
- ○ Deletion

Facility Name: Mason Creek Activated W City: BOISE

Receiving Water: Mason Slough Assessment Unit: ID17050114SW006_02

Is this facility a steam electric power plant (SIC = 4911) with one or more of the following characteristics? ○ Yes; score is 600 **(stop here)** ◉ No (continue)

1. Power output 500 MW or greater (not using a cooling pond/lake)
2. A nuclear power plant
3. Cooling water discharge greater than 25% of the receiving stream's 7Q10 flow rate

Is this permit for a municipal separate storm sewer serving a population greater than 100,000? ○ Yes; score is 700 **(stop here)** ◉ No (continue)

Factor 1: Toxic Pollutant Potential

Primary SIC Code: 8399 Other SIC Codes: 8699

Industrial Subcategory Code: 000 (Code 000 if no subcategory)

Determine the toxicity potential from https://www.naics.com/sic-codes-counts-division/?div=D. (Be sure to use the TOTAL toxicity potential column and check one.

Toxicity Group	Code	Points	Toxicity Group	Code	Points	Toxicity Group	Code	Points
○ No process waste streams	0	0	○ 3	3	15	○ 7	7	35
◉ 1	1	5	○ 4	4	20	○ 8	8	40
○ 2	2	10	○ 5	5	25	○ 9	9	45
			○ 6	6	30	○ 10	10	50

Code: 1

Total Points Factor 1: 5

Factor 2: Flow/Streamflow Volume (Complete either Section A or Section B; check only one.)

Section A - Wastewater Flow Only Considered

Wastewater Type (see instructions)			Code	Points
Type I:	Flow < 5 MGD	○	11	0
	Flow 5-10 MGD	○	12	10
	Flow >10 to 50 MGD	○	13	20
	Flow >50 MGD	○	14	30
Type II:	Flow < 1 MGD	◉	21	10
	Flow 1-5 MGD	○	22	20
	Flow >5 to 10 MGD	○	23	30
	Flow >10 MGD	○	24	50
Type III:	Flow < 1 MGD	○	31	0
	Flow 1-5 MGD	○	32	10
	Flow >5 to 10 MGD	○	33	20
	Flow >10 MGD	○	34	30

Section B - Wastewater and Streamflow Considered

Wastewater Type (see instructions)	% of Instream Wastewater Concentration at Receiving Stream Low Flow		Code	Points
Type I/III:	< 10%	○	41	0
	≥ 10% to < 50%	○	42	10
	≥ 50%	○	43	20
Type II:	< 10%	○	51	0
	≥ 10% to < 50%	○	52	20
	≥ 50%	○	53	30

Code: 21

Total Points Factor 2: 10

Factor 3: Conventional Pollutants (only when limited by the permit)

Are conventional pollutants limited by the permit? ○ Yes ◉ No

Factor 4: Public Health Impact

Is there a public drinking water supply located within 50 miles downstream of the effluent discharge (this includes any body of water to which the receiving water is a tributary)? A public drinking water supply may include infiltration galleries, or other methods of conveyance that ultimately get water from the above referenced supply. ○ Yes (if yes, check **toxicity potential number below**) ◉ No (if no, go to **Factor 5**)

Factor 5: Water Quality Factors

A. Is (or will) one or more of the effluent discharge limits based on water quality factors of the receiving stream (rather than technologybased federal effluent guidelines, or technology-based state effluent guidelines), or has a wasteload allocation been assigned to the discharge?

	Code	Points
◉ Yes	1	10
○ No	2	0

B. Is the receiving water in compliance with applicable water quality standards for pollutants that are water quality limited in the permit?

	Code	Points
○ Yes	1	0
◉ No	2	5

C. Does the effluent discharged from this facility exhibit the reasonable potential to violate water quality standards due to whole effluent toxicity?

	Code	Points
○ Yes	1	10
◉ No	2	0

Codes A. 1 B. 2 C. 2

Total Points Factor 5: A. 10 + B. 5 + C. 0 = 15

Score Summary

Factor and Description	Total Points
1. Toxic Pollutant Potential	5
2. Flow/Streamflow Volume	10
3. Conventional Pollutants	0
4. Public Health Impacts	0
5. Water Quality Factors	15
Total (Factors 1-5)	30

S1. Is the total score equal to or greater than 80? ○ Yes (facility is a major) ◉ No

S2. If the answer to the above question is no, would you like this facility to be discretionary major? ○ Yes (add 500 points to the above score and provide reason below) ◉ No

Reason

New Score: 30 Old Score: N/A

DEQ\rpope

Permit Reviewer's Name

(208) 373-0599

Phone Number

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