New Industrial Facility Permit

Select the type of industrial operation:
- ○ Commercial
- ○ Drinking Water (Private)
- ○ Drinking Water (Public)
- ○ Manufacturing
- ○ Mining
- ○ Silvicultural
- ◉ Other agricultural drainage

I. Outfall Locations

Identify the outfall number, latitude, longitude, and the receiving water in the table below. Click the location link to identify the outfall location on the map, which will auto-populate the latitude and longitude in decimal degrees. Follow this link to DEQ's Interactive Map for help identifying the receiving water: https://mapcase.deq.idaho.gov/wq2012/.

Outfall Number	Latitude: Decimal Degrees (N)	Longitude: Decimal Degrees (W)	Receiving Water
001	43.68637	-116.64144	Mason Slough

II. Discharge Date

The date you expect to begin discharging:
04/01/2021

III. Flows, Sources of Pollution, and Treatment Technologies

A. Attach a line drawing showing the water flow through the facility. Indicate sources of intake water, operations, contributing wastewater to the effluent, and treatment units labeled to correspond to the more detailed descriptions in Part III.B.Construct a water balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a water balance cannot be determined (e.g., for certain mining activities), provide a pictorial description of the nature and amount of any sources of water and any collection or treatment measures.

List of Uploaded Documents	Size (MB)
Mason Creek Wetland Demo Summary.pdf	0.11
Mason Creek Demo Flow Diagram.pdf	0.06

B. For each outfall, provide a description of all operations contributing wastewater to the effluent, including process wastewater, sanitary wastewater, cooling water, and storm water runoff (Operation and Average Flow) and the treatment received by the wastewater (Description and List Codes from Table 1).
Outfall Number: 001

		Treatment
Operations Contributing Flows	**Average Flow**	**Description Treatment Codes**
irrigation diversion water	3.877901 mgd	sedimentation ponds 1-U biochar soil substrate 2-A substrates coated with poly-Aluminum Chloride3 or MgCl3 2-C zeolite soil substrate 2-J wetlands cells with plants 3-G discharge from wetland to creek 4-A removal and land application of spent substrates 5-G

C. Except for storm water runoff, leaks, or spills, are any of the discharges intermittent or seasonal? ○ Yes ◉ No

IV. Production

Does a production-based effluent limit guideline (ELG) or new source performance standards (NSPS) apply to the facility? ○ Yes ◉ No

V. Effluent Characteristics

Are you a small business with gross annual sales for the most recent three years averaging less than $287,300 per year in 2014 dollars (see IDAPA 105.07.n)?
◉ Yes ○ No

Upload sales data for those years instead of conducting analysis for organic pollutants.

List of Uploaded Documents	Size (MB)
IWWQG Sales.docx	0.01

If yes, upload sales data for those years instead of conducting analysis for GC/MS fractions.

If No, complete the Primary Industry Table. Identify your primary industry. The required pollutant categories in the table will autopopulate with an X.

Primary Industry Table

Industry Category	Is Primary Industry	Volatile	Acid	Base/Neutral	Pesticide
Adhesives and sealants	○				
Aluminum forming	○				

Industry Category	Is Primary Industry	Volatile	Acid	Base/Neutral	Pesticide
Auto and other laundries					
Battery manufacturing					
Coal mining					
Coil coating					
Copper forming					
Electrical and electronic components					
Electroplating					
Explosives manufacturing					
Foundries					
Gum and wood chemicals manufacturing					
Inorganic chemicals manufacturing					
Iron and steel manufacturing					
Leather tanning and finishing					
Mechanical products manufacturing					
Nonferrous metals forming					
Ore mining					
Organic chemicals manufacturing					
Paint and ink formulation					
Pesticide chemicals					
Petroleum refining					
Pharmaceutical manufacturing					
Photographic equipment and supplies					
Plastic and synthetic materials manufacturing					
Plastic processing					
Porcelain enameling					
Printing and publishing					
Rubber manufacturing					
Soap and detergent manufacturing					
Steam electric power generating					
Textile mills					

Industry Category	Is Primary Industry	Volatile	Acid	Base/Neutral	Pesticide
Timber products processing					

Groups A. and B. Report the concentration and mass of the pollutants to be discharged from each outfall (for new sources or discharges this is the expected concentration and mass). Complete each group of this section according to the specific instructions.

Outfall Number: 001

Report estimated amounts (both concentration and mass) of the pollutants to be discharged from each of your outfalls. Each part of the Effluent Characteristics section should be completed in accordance with the specific instructions for that part.
Categories of Pollutants: Group A

Group A. Pollutants and Parameters

Provide estimated daily maximum values and average daily values for the following pollutants for each outfall, unless waived by the permitting authority.

Parameter	Maximum Daily Value	Average Daily Value	Source of Estimate
Flow	3.877901 mgd	3.877901 mgd	Other (describe) 6 cfs planned
pH, maximum	9	8	Best professional estimates mason creek
pH, minimum	7	8	Best professional estimates
Temperature , Summer	22	19	Best professional estimates
Temperature , Winter	16	13	Best professional estimates

Pollutant	Concentration Unit	Mass Unit	Maximum Daily Value		Average Daily Value		Source of Estimate
			Concentration	Mass	Concentration	Mass	
Ammonia, total as N	mg/L	Not Available/Applicable	< 0.04	0	< 0.04	0	Other (describe) mason creek data
Biochemical Oxygen Demand (BOD5)	mg/L	Not Available/Applicable	< 3	0	< 3	0	Other (describe) mason creek data
Chemical Oxygen Demand (COD)	mg/L	Not Available/Applicable	< 20	0	< 20	0	Other (describe) mason creek data
Total Organic Carbon (TOC)	Not Available/Applicable	Not Available/Applicable	= 0	0	0	0	Other (describe) not known
Total Suspended Solids	mg/L	lbs	= 80.4	= 70656	= 80.4	= 70656	Other (describe) DEQ TMDL

Group B. Pollutants

For all outfalls, data for pollutants in Group B should be reported only for pollutants that you believe will be present or are limited directly by an effluent limit guideline or NSPS or indirectly through limits on an indicator pollutant.

Pollutant	Believed Absent	Concentration Unit	Mass Unit	Maximum Daily Value		Average Daily Value		Source of Information
				Concentration	Mass	Concentration	Mass	
Alpha Radiation (Gross alpha radiation)	☑							
Aluminum, total [as Al]	☐	mg/L	Not Available/Applicable	= 4.28	0	= 4.28	0	Other (describe) mason creek data
Barium, total [as Ba]	☑							
Boron, total [as B]	☑							
Bromide [as Br]	☑							
Chlorine, total residual	☑							
Cobalt	☐	mg/L	Not Available/Applicable	< 0.02	0	< 0.02	0	Other (describe) mason creek data
Color	☑							
E. coli	☐	MPN/100 mL		= 460		= 460		Other (describe) mason creek data
Fluoride	☑							
Iron	☐	mg/L	Not Available/Applicable	= 2.53	0	= 2.53	0	Other (describe) mason creek data
Magnesium	☐	mg/L	Not Available/Applicable	= 10.2	0	= 10.2	0	Other (describe) mason creek data
Manganese, total	☐	mg/L	Not Available/Applicable	= 0.069	0	= 0.069	0	Other (describe) mason creek data
Molybdenum	☑							
Nitrite + Nitrate total [as N]	☐	mg/L	Not Available/Applicable	= 6.3	0	= 6.3	0	Other (describe) mason creek data
Nitrogen, organic, dissolved [as N]	☐	Not Available/Applicable	Not Available/Applicable	0	0	0	0	Other (describe) not measured
Oil & Grease	☐	mg/L	Not Available/Applicable	< 5	0	< 5	0	Other (describe) mason creek data

Pollutant	Believed Absent	Concentration Unit	Mass Unit	Maximum Daily Value		Average Daily Value		Source of Information
				Concentration	Mass	Concentration	Mass	
Phosphorus, Total	☐	mg/L	Not Available/Applicable	= 0.32	= 173	= 0.32	= 173	Other (describe) DEQ TP TMDL Table 10
Radiation, gross beta	☑							
Radium	☑							
Radium, total	☑							
Sulfate, total [as SO4]	☐	mg/L	Not Available/Applicable	= 20	0	= 20	0	Other (describe) mason Creek data
Sulfide, total [as S]	☐	mg/L	Not Available/Applicable	< 0.05	0	< 0.05	0	Other (describe) mason creek data
Sulfite [as SO3]	☐	ppm	Not Available/Applicable	< 3	0	< 3	0	Other (describe) mason creek data
Surfactants	☑							
Tin, total [as Sn]	☑							
Titanium, total [as Ti]	☑							

Group C

Metals, Cyanide, Phenol, and Dioxin

Pollutant	Believed Absent	Concentration Unit	Mass Unit	Maximum Daily Value		Average Daily Value		Source of Information
				Concentration	Mass	Concentration	Mass	
2,3,7,8-TCDD (dioxin) (tetrachloro-dibenzo-p-dioxin) 2,3,7,8-TCDD (dioxin)(tetrachloro-dibenzo-p-dioxin)	☑							
Antimony Antimony	☑							
Arsenic Arsenic	☐	mg/L	Not Available/Applicable	= 0.0051	0	= 0.0051	0	Other (describe) mason creek data
Beryllium Beryllium	☑							

Pollutant	Believed Absent	Concentration Unit	Mass Unit	Maximum Daily Value		Average Daily Value		Source of Information
				Concentration	Mass	Concentration	Mass	
Cadmium Cadmium	☐	mg/L	Not Available/Applicable	< 0.0005	0	< 0.0005	0	Other (describe) mason creek data
Chromium Chromium	☐	mg/L	Not Available/Applicable	= 0.003	0	= 0.003	0	Other (describe) mason creek data
Copper Copper	☐	mg/L	Not Available/Applicable	< 0.01	0	< 0.01	0	Other (describe) mason creek data
Cyanide Cyanide	☑							
Hardness, total [as CaCO3] Hardness, total [as CaCO3]	☐	Milligram per liter as CaCO3	Not Available/Applicable	= 220	0	= 160	0	Other (describe) USGS gage 1970
Lead Lead	☐	mg/L	Not Available/Applicable	< 0.005	0	< 0.005	0	Other (describe) mason creek data
Mercury Mercury	☐	mg/L	Not Available/Applicable	< 0.0002	0	< 0.0002	0	Other (describe) mason creek data
Nickel Nickel	☐	mg/L	Not Available/Applicable	< 0.02	0	< 0.02	0	Other (describe) mason creek data
Selenium Selenium	☐	mg/L	Not Available/Applicable	< 0.005	0	< 0.005	0	Other (describe) mason creek data
Silver Silver	☑							
Thallium Thallium	☑							
Total phenols Total phenols	☑							
Zinc Zinc	☐	mg/L	Not Available/Applicable	= 0.01	0	= 0.01	0	Other (describe) mason creek data

Group D. Toxic Pollutants and Hazardous Substances

1. Do you know or have reason to believe pollutants from Table 3 are discharged or may be discharged from any outfall? ○ Yes ◉ No

2. Exemption Request for Hazardous Substances

VI. Engineering Report on Wastewater Treatment

A. Are there technical evaluations on the wastewater treatment, including engineering reports or pilot plant studies? (•) Yes ( ) No

B. Are there existing pilot projects or production facilities resembling your facility? Provide the name and location of any existing facilities that, to the best of your knowledge, resemble this production facility with respect to production processes, wastewater constituents, or wastewater treatments. ( ) Yes (•) No

VII. Requests and Other Information

A. Do you intend to request one or more of the variances authorized under IDAPA or the Code of Federal Regulations? ( ) Yes (•) No

B. Do you intend to request a mixing zone? (•) Yes ( ) No

Other Information

C. Use the space below to expand upon any of the previous questions or to alert the reviewer of any other additional information that should be considered in establishing permit limits for the facility (e.g., intake credits, mixing zone requests, and waivers).
We have sampled for various analytes in Mason Creek water, the source water for our facility. Those test results are provided in an attached file. We expect the analytes detected to either pass through our treatment system or become entrapped and removed. We have also sampled for various analytes that may leach from our substrate materials, zeolite and biochar in a closed system leach test (i.e. sitting in deionized water for 5 days). Those test results are provided in attached files. We do not know if any of the detected analytes will discharge from the facility or will become entrained and removed. We do expect detected analytes to become diluted under the 6 cfs flow of the facility, thus leach test concentrations are not applicable. We are also including a spreadsheet of our ongoing Mason Creek and Mason Slough water quality sampling (phosphorus, nitrogen and TSS). Mason Slough is not involved in the facility plan. The demonstration project is depicted as drawings, the secondary meander pools and second outfall have been excluded from the project plans. Substrate materials biochar and zeolite will also be treated with poly-aluminum chloride to enhance their attractiveness to phosphate. Small amounts of PAC will be sprayed on substrate materials in a tumbler mill to lightly coat the surface of the material. Mixed hardwood/softwood wood chips will also be used as substrate material.

D. Attach Additional Information

List of Uploaded Documents	Size (MB)
Mason Creek analytes 2020.pdf	0.05
Biochar supreme analytes.pdf	0.03
StCloud zeolite analytes.pdf	0.04
DI water blank.pdf	0.03
Mason Creek field sampling.xlsx	0.03
StCloud Zeolite MSDS.pdf	5.98
MSDS-Polyaluminium-Chloride_rev002.pdf	0.12
D 200904 Mason_Pilot 50% Set 119063.pdf	0.75

July 26, 2020

To Whom It May Concern,

Idaho Wildlife and Water Quality Group, LLC (IWWQG) has a business plan to build activated constructed wetlands for the purpose of removing pollutants from agricultural irrigation return flows, agricultural wastewaters, and domestic wastewaters where applicable. IWWQG intends to remove tradeable pollutants from non-point and point source waters and to sell water quality credits to point sources so they may offset the high costs of point source treatment technologies. As of this writing, no activated wetlands have been built and no credits have been sold.

Mark L. Shumar
Chief Technical Officer
Idaho Wildlife and Water Quality Group, LLC

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515
http://www.analyticallaboratories.com

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

Email: markshumar@gmail.com

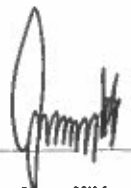
Laboratory Analysis Report

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

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

Email: markshumar@gmail.com



James Hibbs

Thank you for choosing Analytical Laboratories for your testing needs.
If you have any questions concerning this report,
please contact your client manager:

Analytical Laboratories, Inc.

1804 N. 33rd Street
Boise, Idaho 83703
Phone (208) 342-5515

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These test results relate only to the items tested.

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:
Field Temp:
Lab pH:
Temp Rcvd in Lab:

PWS#:
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

MCL = Maximum Contamination Level
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UR = Unregulated

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If you have any questions about this report, or any future analytical needs, please contact your client manager:

James Hibbs

Analytical Laboratories, Inc.

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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:
Field Temp:
Temp Rcvd in Lab:

PWS#:
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

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

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James Hibbs

Analytical Laboratories, Inc.

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Boise, Idaho 83703
Phone (208) 342-5515

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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

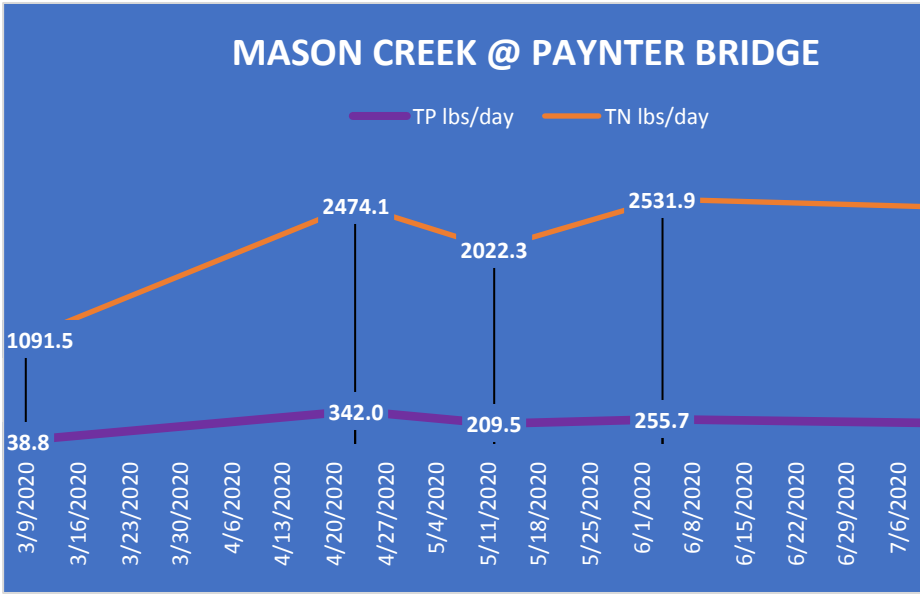
MCL = Maximum Contamination Level
MDL = Method/Minimum Detection Limit
UR = Unregulated

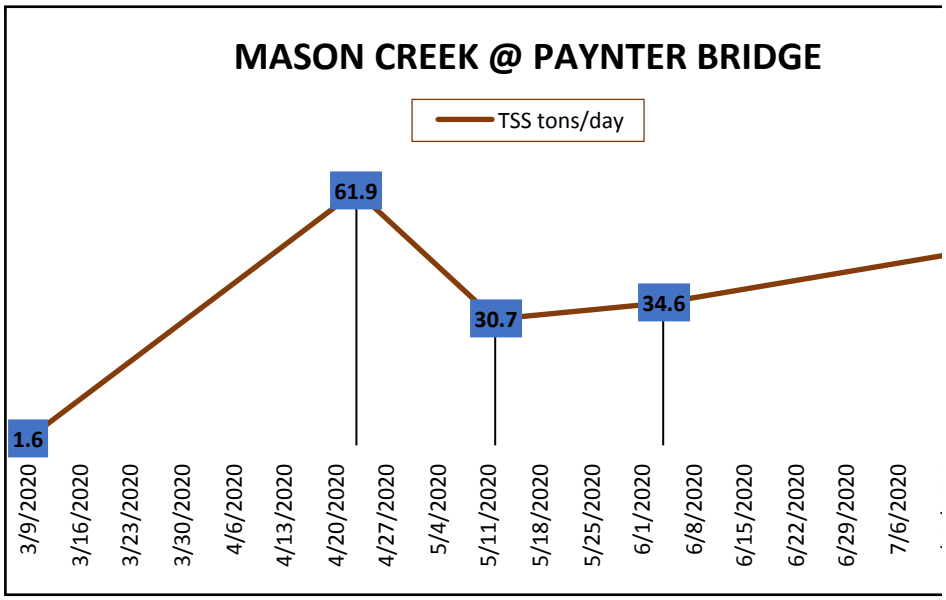
Thank you for choosing Analytical Laboratories for your testing needs.

If you have any questions about this report, or any future analytical needs, please contact your client manager:

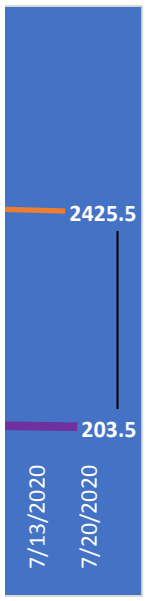
James Hibbs

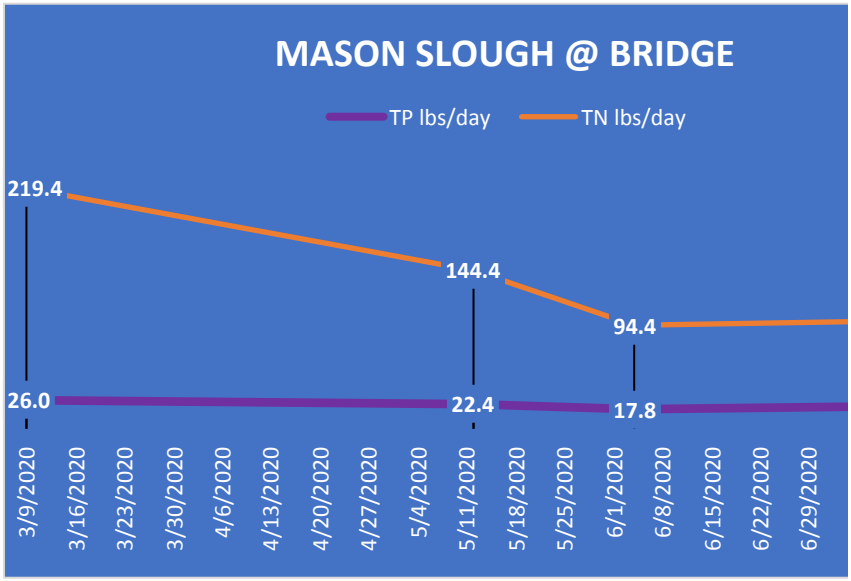
Location	Date	Flow cfs	USGS cfs	TP mg/l	OrthoP mg/l	Ortho %
Mason Creek @ Painter Xing	3/9/2020	64	42.3	0.17	0.146	85.9
Mason Slough @ confluence	3/9/2020	23		0.21	0.076	36.2
Mason Creek @ Painter Xing	4/23/2020	135	128	0.47	0.236	50.2
Mason Creek @ Painter Xing	5/12/2020		134	0.29	0.172	59.3
Mason Slough @ confluence	5/12/2020	13.4		0.31	0.222	71.6
Mason Creek @ Painter Xing	6/4/2020		153	0.31	0.2	64.5
Mason Slough @ confluence	6/4/2020	10.3		0.32	0.219	68.4
Mason Creek @ Painter Xing	7/24/2020		151	0.25	0.24	96.0
Mason Slough @ confluence	7/24/2020	10.8		0.37	0.42	113.5
Mason Creek @ Painter Xing	7/29/2020		139	0.23		

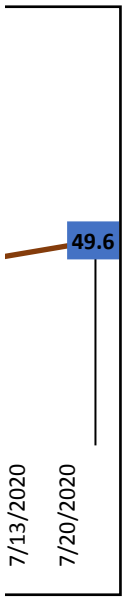


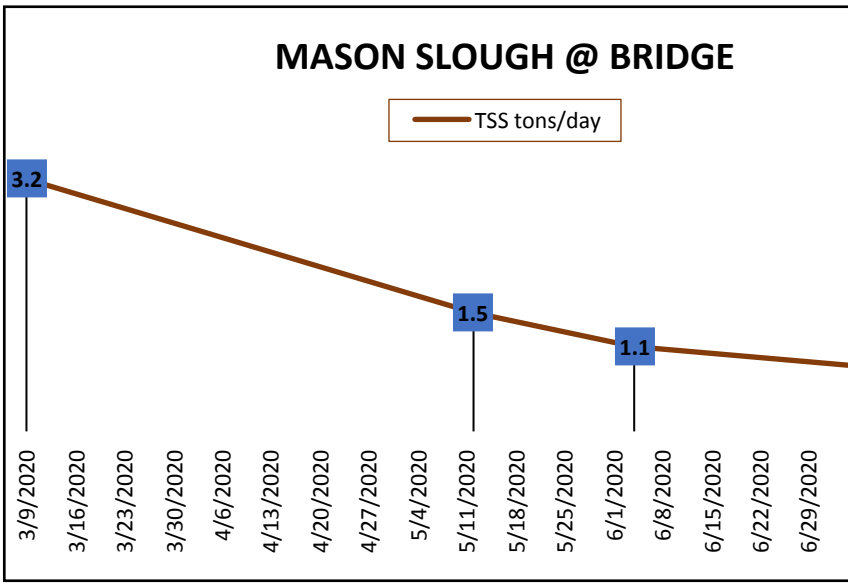


TKN mg/l	NO2+NO3 mg/l	TN (TKN + Nox)	TSS mg/l	Flow MGD	TP lbs/day
0.487	4.3	4.787	14	27.3	38.8
1	0.77	1.77	52	14.9	26.0
1.4	2	3.4	170	87.3	342.0
0.8	2	2.8	85	86.6	209.5
1	1	2	42	8.7	22.4
0.77	2.3	3.07	84	98.9	255.7
0.83	0.87	1.7	39	6.7	17.8
0.52	2.46	2.98	122	97.6	203.5
0.78	0.94	1.72	24	6.9	21.4
0.48	24.6	25.08	77	89.8	172.3

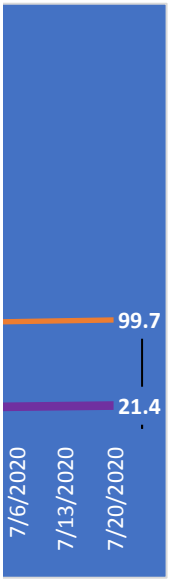


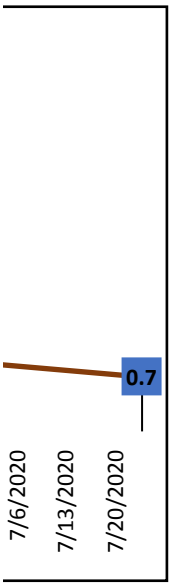






O-P lbs/day	TKN lbs/day	Nox lbs/day	TN lbs/day	TSS lbs/day	TSS tons/day
33.3	111.0	980.4	1091.5	3192.1	1.6
9.4	124.0	95.5	219.4	6446.8	3.2
171.7	1018.8	1455.4	2474.1	123707.0	61.9
124.2	577.8	1444.5	2022.3	61390.7	30.7
16.0	72.2	72.2	144.4	3033.4	1.5
164.9	635.0	1896.8	2531.9	69275.9	34.6
12.2	46.1	48.3	94.4	2165.3	1.1
195.3	423.2	2002.3	2425.5	99299.8	49.6
24.3	45.2	54.5	99.7	1390.7	0.7
	359.6	18431.5	18791.2	57692.2	28.8





Comments

sampling followed overnight rain event

beaver dam construction at sampling location

dam construction stopped

analyte sampling

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

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)

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

(Cont'd. from page 1)

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)

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)

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)

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)

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 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)

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 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)

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 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)

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 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

MATERIAL SAFETY DATA SHEET

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

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

Formula: $[Al_2(OH)nCl_6\text{-}n]m$

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	$[Al_2(OH)nC_{l6}\text{-}n]m$
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

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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

Mason Creek Activated Wetlands Demonstration Project

Project Description:

The Lower Boise River extends from the Lucky Peak Dam east of Boise, Idaho to the confluence with the Snake River near the Idaho/Oregon border. The Idaho Department of Environmental Quality (DEQ) completed a watershed clean-up plan (TMDL) for the Lower Boise River valley including Mason Creek to address sediment and bacteria loads in 2015 (DEQ, 2015a). Suspended solids concentrations (SSC), a measure of water column sediment, averaged 80.4 mg/L or about 35 tons/day during the irrigation season in Mason Creek. The lower Boise River total phosphorus TMDL was completed in 2016 (DEQ, 2015b). The document contains considerable data on phosphorus concentrations and loads in the Boise River and its tributaries. Mason Creek, which has no point source discharges, has an average TP load of 322.1 lbs/day, the second highest tributary load in Table 17 of the TMDL. Data from the TMDL assessments showed seasonal mean TP concentrations in Mason Creek varied from 0.25 mg/L during the non-irrigation season to 0.41 mg/L during the irrigation season.

A major constructed wetland project (The Mason Creek Activated Wetlands Complex) is being designed to fit approximately 200+ acres of existing farm ground at the mouth of Mason Creek and adjacent to the Boise River. The site borders Lincoln Road to the south, the City of Caldwell to the west, and the Boise River to the north. This project is designed to remove total phosphorus and sediment from Mason Creek and produce tradable phosphorus and temperature credits for water quality trading with point source dischargers in the valley.

IPDES Permit Application:

The subject of the IPDES permit application is the Mason Creek Activated Wetlands Demonstration Project, the first phase of the much larger $29 million, 20 year operation and maintenance Mason Creek Activated Wetlands Complex project to remove most of the phosphorus and sediment from Mason Creek, a tributary to the lower Boise River. The demonstration project will be a small version of the overall project and will include sedimentation basins and activated wetland areas. The discharge permit application identifies the demonstration project as a new industrial process which will include a 17 acre pilot study site on a parcel nearest to Lincoln Road that will include sedimentation basins and wetland test cells, a downsized version of the overall wetland master plan. The pilot study will be used to identify and perfect activated substrates and hydraulic operation to be used in the master project. The pilot study is expected to last one to two years before it is removed to make way for the master project.

Activated (Constructed) Wetlands:

Wetlands, natural or constructed, have three basic components: water, substrate (soil), and vegetation. The process of water flowing slowly through a soil or some growth medium that allows aquatic plants, rooted or free floating, to grow provides the starting blocks for lots of other biological activity to get started. This activity includes the growth of a host of microbes (bacteria, algae, zooplankton, etc.), and the introduction of invertebrate and vertebrate life. These organisms in turn live, die, decompose, regenerate and in general use up a lot of nutrients and other constituents in the water. The biological activity provides the basis for removing pollutants from the water flowing into the wetland. Additionally, the substrate itself will absorb, entrain and retain additional levels of pollutants; the amount of which depends on the nature and type of substrate in the wetland. Modern day constructed wetlands for the

treatment of wastewaters has been generally recognized as beginning with research in Germany in the 1950s (Sengupta et al., 2015; Almuktar et al., 2018). Currently, constructed wetlands are used to treat various kinds of wastewater (agricultural, industrial, domestic) all over the world. In a review of wetland systems, Almuktar et al. (2018) indicate the attractiveness of constructed wetlands for treatment purposes stems from their relatively low cost and low maintenance. They also recognized that wetland behavior and efficiency is linked to plant composition, substrate, hydrology, surface loading rate, influent feeding mode, microorganism availability, and temperature. Ballantine & Tanner (2010) indicate that constructed wetlands in general are good at removing nitrogen from wastewaters, but that phosphorus removal is more difficult and variable and usually requires some enhancement of the system to increase phosphorus adsorption. This has led to a variety of research on various ways to remove phosphorus via wetland systems. Many research articles address the three main ways of enhancing phosphorus removal which are filtration, chemical precipitation, and biological assimilation. Biological assimilation by wetland plants (macrophytes to algae) and other microorganisms has generally been the primary focus of traditional constructed wetlands. Filtration and chemical precipitation have been the focus of enhancing phosphorus removal. Chemical precipitation results from the addition of cations such as Ca (lime), Fe (ferric sulfate) and Al (alum) to bind with phosphate anions and precipitate out of the aqueous solution (Leader et al., 2005; Ballantine & Tanner, 2010). Filtration may involve inert materials such as sands, or substrates that can adsorb or bind with phosphate due to matrix composition. Many substrate materials have and continue to be investigated including blast furnace slags (Sakadevan & Bavor, 1998), natural and manmade, enhanced zeolites (Sakadevan & Bavor, 1998; Mohamed et al., 2015; Cheng et al., 2017), biochars (Brothers, 2014), and a variety of soils and soil amendments (Sakadevan & Bavor, 1998; Ballantine & Tanner, 2010; Ozengin & Elmaci, 2016).

IWWQG will use Activated Wetlands^{TM}; basic properties of constructed wetlands with substrate enhancements to remove pollutants, specifically nitrogen and phosphorus from agricultural return water, drains, creeks, and waste waters. Our intent is to provide a constructed wetland on the landscape that will have sediment deposition ponds for sediment and attached phosphorous, natural substrate materials for phosphorus adsorption and soils, which will efficiently absorb dissolved phosphorus from the water, and in turn feed wetland plant growth for harvesting and removal of phosphorus from the water systems. IWWQG will use a combination of substrates (e.g. natural zeolite, tree wood chips, enhanced biochar or activated carbon) specifically designed to absorb and retain anions such as phosphates. Each wetland cell will contain these activated substrate materials such that water will flow through and be filtered year-round (both irrigation and non-irrigation seasons). Phosphate loaded substrate material can be periodically removed and replaced. Substrate materials are organic and can be utilized as fertilizer/soil amendment after removal.

In addition to our primary goal of removing phosphorus, we anticipate the removal of other pollutants that might adhere to substrate or be taken up by vegetation including nitrogen, heavy metals, herbicides, pesticides, and potentially other organic and inorganic pollutants. Our constructed wetlands will also provide substantial environmental benefits to the landscape and watershed including wildlife habitat, pollinator habitat (we intend to plant lots of wildflowers), hydrologic retention, shade and other thermal reductions, aesthetics and recreation, and potential educational opportunities (K – 12 and beyond).

Water Quality Trading:

Water quality trading is a mechanism for funding non-point sources of pollution by allowing municipal and industrial dischargers to offset their costs of treatment in trade for funding more pollution control elsewhere in the watershed. For example, it may cost a municipality many tens (perhaps hundreds) of millions of dollars to build a mechanical treatment system to reduce phosphorus discharges down to expected limits. If a municipality can save millions of dollars by treating 80% of their needed reductions in plant, and then spend some of that money on more non-point source reductions elsewhere in the watershed, then the municipality can save taxpayer money and still remove more phosphorus from the river system than would happen in plant alone. This creates a win-win for the environment and the economy of the region. More phosphorus is removed from the river system and the municipality did not need to spend as much money on treatment works (including operation/maintenance, parts replacement, chemical costs, etc.). The lower Boise River and its tributaries carry a substantial load of total phosphorus, on the order of one or two pounds/day per cubic foot/second flow. Municipal and industrial dischargers of phosphorus are responsible for a substantial portion of the phosphorus in streams and the river and must reduce their discharge of phosphorus to help clean these waterways. The costs for each discharger to treat and reduce phosphorus will be tremendous and will impact the public with increased rates granted through the mechanism of approved municipal revenue bonds. Phosphorus, a major component of plant fertilizers, also comes from runoff from farm field and other lands. Agricultural sources of phosphorus are generally not regulated the same as are point source dischargers. Efforts that are put forth to reduce landscape-based sources, also known as nonpoint sources, are typically voluntary. One method to help boost reductions from these non- regulated sources and to help the burden of cost born by regulated sources is to allow the two entities to trade phosphorus reduction credits. In this scenario, phosphorus reduction can occur at the end of an agricultural drain or tributary like Mason Creek because of treatment through a constructed wetland. That reduction produces credits some of which could be traded to a discharger who pays for the credit in lieu of expensive treatment at the dischargers plant and helps defray the costs of building and maintaining the wetland. Water pollution control agencies within states have begun in recent years to see the value of water quality trading, especially since grants for non-point source controls have reduced over the years. Recently, the Idaho Department of Environmental Quality (DEQ) has updated and revised its guidance on water quality trading to indicate support for such a mechanism to reduce pollution in river systems. Activated Wetlands^{TM} is one of the mechanisms uniquely qualified for removing pollutants from urban and agricultural drainage.

The major project is expected to process over 100 cfs of Mason Creek flow when completed. Since the average flow during the irrigation season is about 150 cfs, project flow should carry 2/3 of the total loads of phosphorus and sediment or 215 lbs/day and 23 tons/day, respectively. NRCS has indicated that a normal constructed wetland built to code is 60-70% efficient at removing sediment. We believe that the additional steps and processes (initial basin, meander pools, stilling/substrate basin, shallow vegetated wetland cells) we are creating will give us higher rates (80-90%) of sediment removal or 18-21 tons/day.

This efficacy will be demonstrated in the demonstration project. The demo project is expected to process 6 cfs or 4% of the average irrigation season flow. Therefore, we anticipate removing 4% of 18-21 tons/day or 0.72-0.84 ton/day. Estimating phosphorus removal is more tricky, first the ratio of dissolved phosphorus to attached phosphorus varies throughout the season. The TMDL and our own sampling at

Mason Creek has shown that dissolved (ortho) phosphorus is as low as 50% in the spring as canals open up and lots of sediment is on the move, to as high as 95% in the winter when base flows are primarily ground water. If we assume that attached phosphorus equals 2 lbs TP per ton of sediment, then we anticipate removing 36-42 lbs/day of the 46 lbs TP in sediment. Of the 169 lbs/day TP that is dissolved (80% of total), we hope to retain in our activated wetland about 25% or another 42 lbs/day. Again, the demo pilot study should identify actual efficacy, 4% of 42 lbs/day is 1.68 lbs/day. During the non-irrigation season Mason Creek flows decrease to an average of about 60 cfs and carry very little sediment and mostly dissolved phosphorus. We anticipate running the demonstration project throughout the winter to investigate how much of this phosphorus can be absorbed into the activated wetlands of the demonstration project.

We also added information on possible temperature reductions in degrees Fahrenheit based on modeling conducted for us where our wetland design is anticipated to reduce temperature 0.066 degrees F per cfs flow or 6.6F at 100 cfs, 0.396F at 6 cfs.

Total phosphorus and temperature will be monitored for the purposes of creating water quality trading credits. As such, a DEQ approved monitoring and Qa/QC document will be prepared. The sampling strategy is relatively straight forward. Water leaving Mason Creek and entering the project will be monitored weekly for flow, TP, dissolved (ortho) P, TKN, nitrate + nitrite, TSS or SSC, and any other pollutants of interest or concern. These same constituents will be monitored in water leaving the project and entering Mason Creek or Boise River depending on outfall location. The various loads of material that is retained in the wetland complex will be determined through time from these data. Water balance will also be determined from flow data. Any water lost or gained from the complex in excess of evapotranspiration will be assumed lost or gained from ground water. Local ground water TP concentrations will be determined from peizometer monitoring and will be included in the mass balance determination.

Temperature will be monitored with continuous recording devices in the inflow and outflow waters to determine temperature reduction through the project area.

Prior to construction, we will follow all State and local codes and ordinances related to public information and education including, but not limited to the Canyon County Planning and Zoning public hearing guidelines to inform area residents and businesses of construction activities. Additionally, we have and will continue to present the project plans to local governments, business leaders, state legislators, and various state and federal agencies. Post construction and ongoing during operation we will provide a wide variety of educational opportunities including invitations to K-12 classes and programs throughout the valley to tour the wetland complex and receive education from our staff. Additionally, we will provide opportunities for college level instruction including sponsoring graduate level research opportunities.

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Cheng, Q., H. Li, Y. Xu, S. Chen, Y. Liao, F. Deng, & J. Li. 2017. Study on the adsorption of nitrogen and phosphorus from biogas slurry by NaCl-modified zeolite. PLOS ONE 12 (5): 12p.

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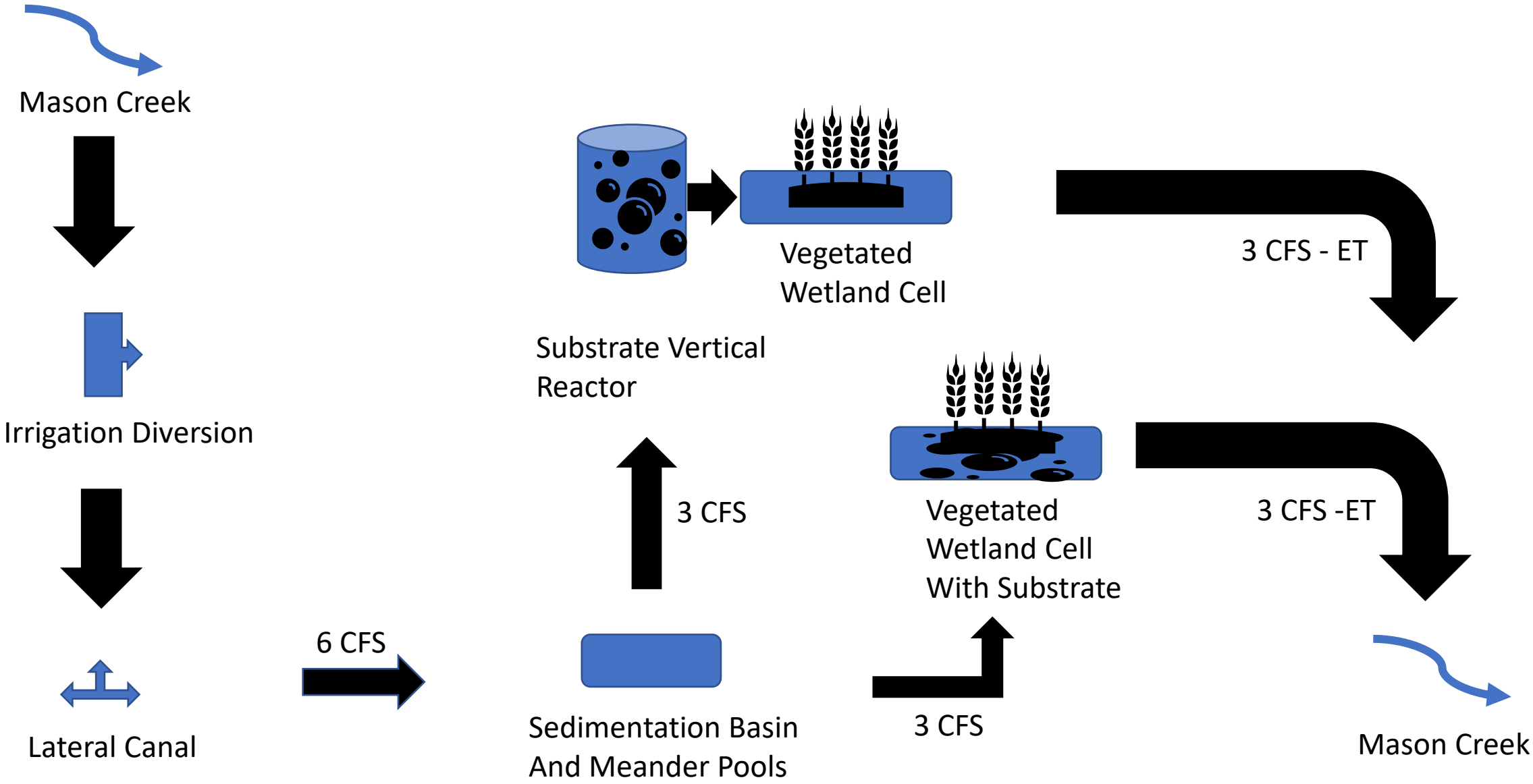
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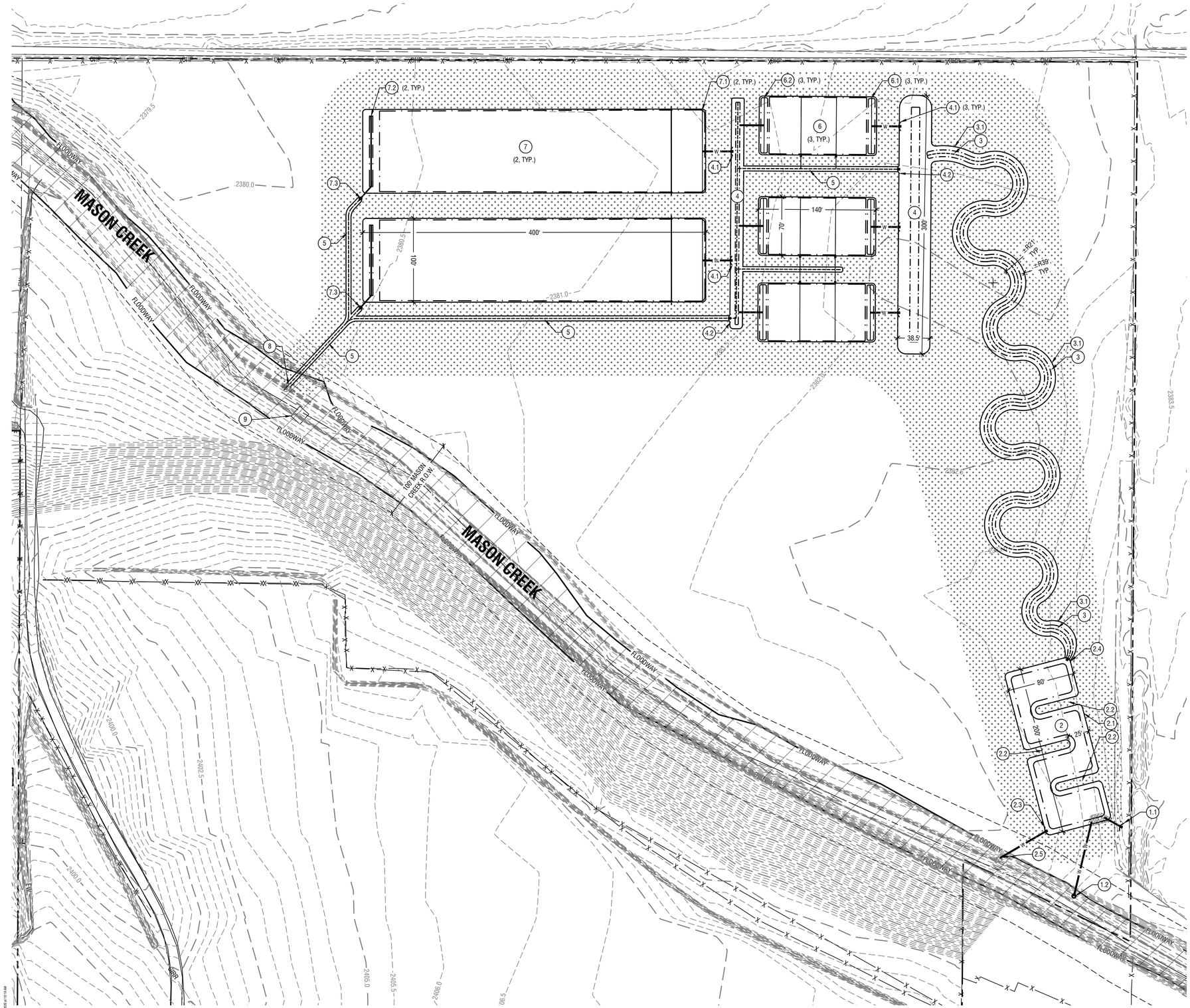
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Sengupta, S., T. Nawaz & J. Beaudry. 2015. Nitrogen and phosphorus recovery from wastewater. Current Pollution Reports 1 (3): 155-166.

Mason Creek Activated Wetland Demonstration Project





Material Legend:

APPROX. LIMITS OF REVEGETATION - NON-IRRIGATED GRASS & FORBS BLEND.

RIP RAP.

CONVEYANCE PIPE.

CHANNEL FLOW LINE

CHANNEL OR BASIN BOTTOM

Keynotes:

(#) CALLOUT NUMBERS COORDINATED TO NUMBERED NOTES BELOW.

1. WATER DELIVERY STRUCTURE, APPROX. 6 CFS FLOW, TYPICAL.
   - 1.1. HEADGATE IN EXISTING PAYNTER PARCEL LATERAL TO BE USED FOR SUMMER DELIVERY DURING IRRIGATION SEASON.
   - 1.2. PUMP IN MASON CREEK TO BE USED FOR WINTER DELIVERY OUTSIDE OF IRRIGATION SEASON.
2. INITIAL SEDIMENTATION BASIN, APPROX 3' WATER DEPTH WITH MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 2.1. EDGE OF WATER.
   - 2.2. BASIN DIKE.
   - 2.3. OVERFLOW SPILLWAY. HEADGATE CONTROLLED DISCHARGE TO MASON CREEK.
   - 2.4. OUTLET HEADGATE.
   - 2.5. DISCHARGE INVERT ELEVATION 2376.0'.
3. SEDIMENTATION MEANDER CHAIN, APPROX. 2' WATER DEPTH AT 1,080 LINEAR FEET WITH MIN. 1' FREEBOARD ON CHANNEL EARTHWORK.
   - 3.1. EDGE OF WATER.
4. DEEPWATER STILLING BASIN, APPROX. 4'-DEPTH WITH MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 4.1. OUTLET HEADGATE.
   - 4.2. BYPASS OUTLET. HEADGATE CONTROLLED DISCHARGE TO CONVEYANCE CHANNEL.
5. CONVEYANCE CHANNEL.
6. ACTIVATED SUBSTRATE WETLAND CELL, 2'-DEPTH WATER COLUMN AND 2'-DEPTH OF SUBSTRATE FOR TOTAL BASIN DEPTH OF 4'. MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 6.1. FLOW DISTRIBUTION MANIFOLD.
   - 6.2. FLOW COLLECTION MANIFOLD.
7. ACTIVATED POLISHING WETLAND CELL, APPROX. 6"-18" WATER COLUMN OVER 6"-12" SUBSTRATE BLEND. MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 7.1. FLOW DISTRIBUTION MANIFOLD.
   - 7.2. FLOW COLLECTION MANIFOLD.
   - 7.3. FLOW CONTROL GATE VALVE.
8. MASON CREEK DISCHARGE, ELEVATION 2376.0'.
9. EXISTING SERVICE ROAD BRIDGE.

THE LAND GROUP

BICANDI ACTIVATED WETLAND PROJECT
The Idaho Water Trust, Inc

PAYNTER PARCEL (R34792000000) | LINCOLN ROAD
Canyon County, Idaho

Revisions
1.

Project No.: 119063
Date of Issuance: 09.03.2020
Project Milestone: AGENCY REVIEW

Pilot Project Site Plan

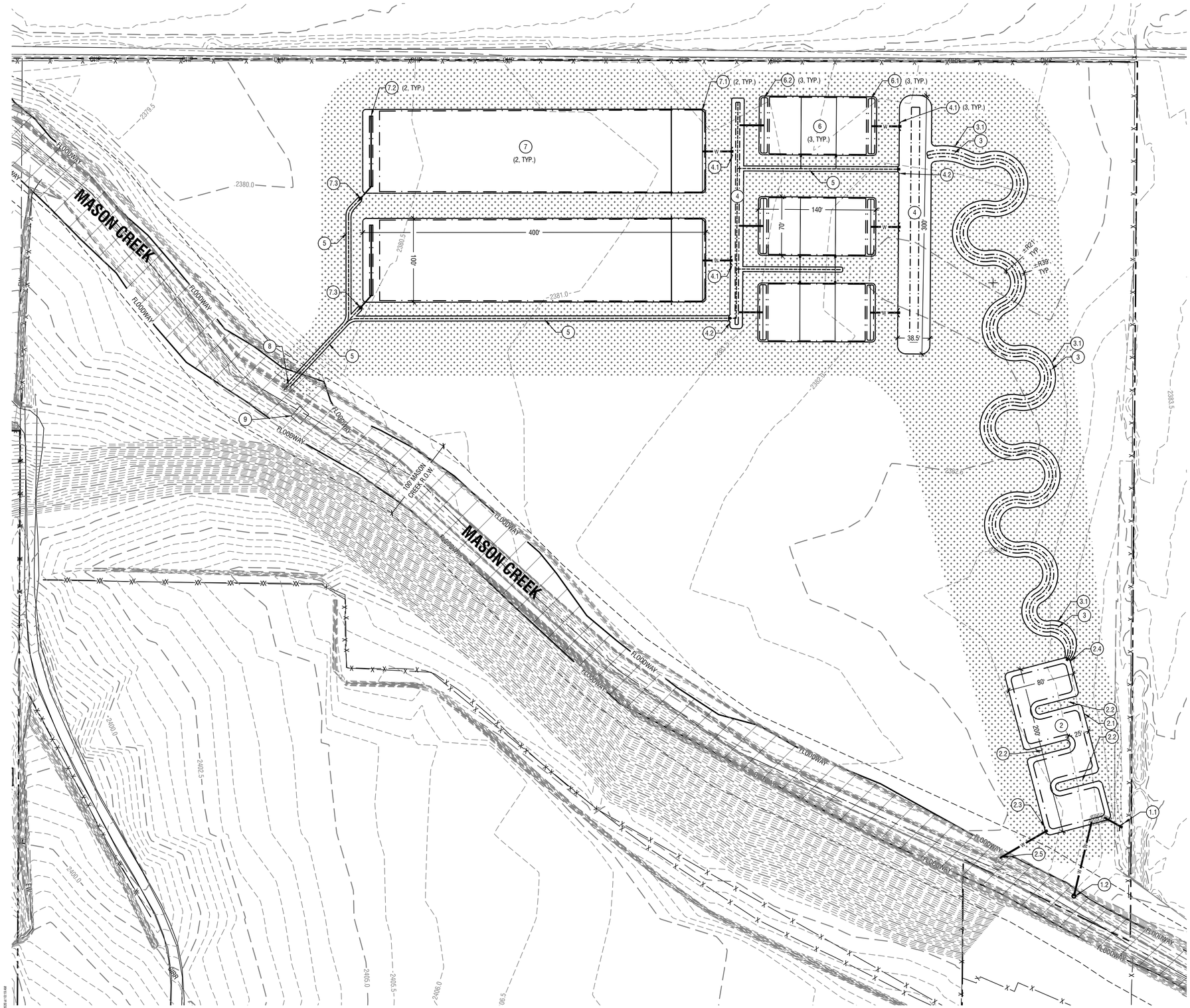
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Pilot Project-Site Plan

Horizontal Scale: 1" = 60'

0 60' 120'

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Last Edited By: Jeremy Hoffman
Date Plotted: Thursday, September 3 2020 at 10:19 AM



Material Legend:

APPROX. LIMITS OF REVEGETATION - NON-IRRIGATED GRASS & FORBS BLEND.

RIP RAP.

CONVEYANCE PIPE.

CHANNEL FLOW LINE

CHANNEL OR BASIN BOTTOM

Keynotes:

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   - 1.1. HEADGATE IN EXISTING PAYNTER PARCEL LATERAL TO BE USED FOR SUMMER DELIVERY DURING IRRIGATION SEASON.
   - 1.2. PUMP IN MASON CREEK TO BE USED FOR WINTER DELIVERY OUTSIDE OF IRRIGATION SEASON.
2. INITIAL SEDIMENTATION BASIN, APPROX 3' WATER DEPTH WITH MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 2.1. EDGE OF WATER.
   - 2.2. BASIN DIKE.
   - 2.3. OVERFLOW SPILLWAY. HEADGATE CONTROLLED DISCHARGE TO MASON CREEK.
   - 2.4. OUTLET HEADGATE.
   - 2.5. DISCHARGE INVERT ELEVATION 2376.0'.
3. SEDIMENTATION MEANDER CHAIN, APPROX. 2' WATER DEPTH AT 1,080 LINEAR FEET WITH MIN. 1' FREEBOARD ON CHANNEL EARTHWORK.
   - 3.1. EDGE OF WATER.
4. DEEPWATER STILLING BASIN, APPROX. 4'-DEPTH WITH MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 4.1. OUTLET HEADGATE.
   - 4.2. BYPASS OUTLET. HEADGATE CONTROLLED DISCHARGE TO CONVEYANCE CHANNEL.
5. CONVEYANCE CHANNEL.
6. ACTIVATED SUBSTRATE WETLAND CELL, 2'-DEPTH WATER COLUMN AND 2'-DEPTH OF SUBSTRATE FOR TOTAL BASIN DEPTH OF 4'. MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 6.1. FLOW DISTRIBUTION MANIFOLD.
   - 6.2. FLOW COLLECTION MANIFOLD.
7. ACTIVATED POLISHING WETLAND CELL, APPROX. 6"-18" WATER COLUMN OVER 6"-12" SUBSTRATE BLEND. MIN. 1' FREEBOARD ON BASIN EARTHWORK.
   - 7.1. FLOW DISTRIBUTION MANIFOLD.
   - 7.2. FLOW COLLECTION MANIFOLD.
   - 7.3. FLOW CONTROL GATE VALVE.
8. MASON CREEK DISCHARGE, ELEVATION 2376.0'.
9. EXISTING SERVICE ROAD BRIDGE.

THE LAND GROUP

BICANDI ACTIVATED WETLAND PROJECT
The Idaho Water Trust, Inc

PAYNTER PARCEL (R34792000000) | LINCOLN ROAD
Canyon County, Idaho

Revisions
1.

Project No.: 119063
Date of Issuance: 09.03.2020
Project Milestone: AGENCY REVIEW

Pilot Project Site Plan

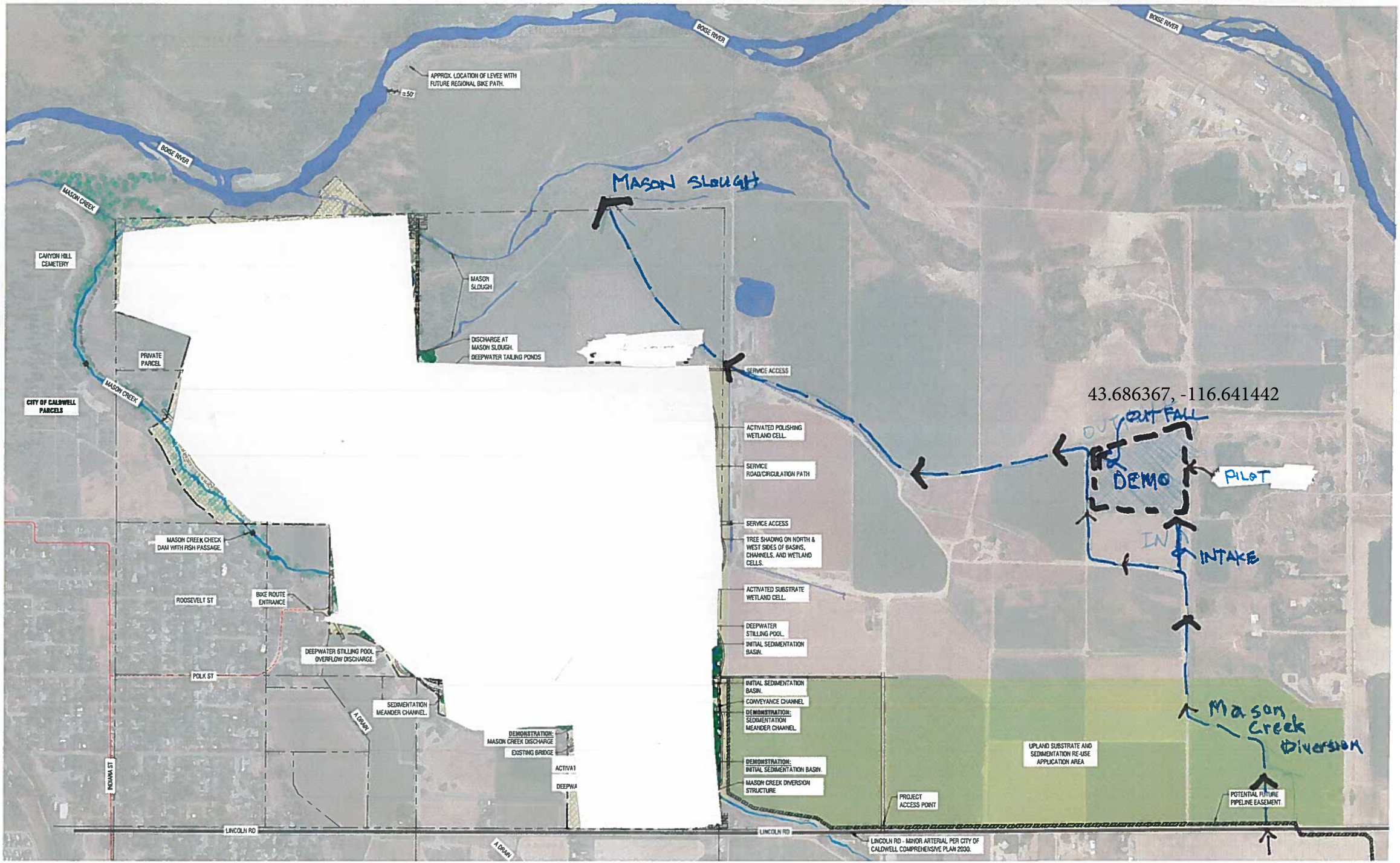
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Pilot Project-Site Plan

Horizontal Scale: 1" = 60'

0 60' 120'

File Location: g:\2019\119063\cad_bim\ cadd\1119063_c2000-site-plan.dwg
Last Edited By: Jeremy Hoffman
Date Plotted: Thursday, September 3 2020 at 10:19 AM



Conceptual Master Plan

Horizontal Scale: 1" = 400'

0 400 800

THE LAND GROUP

Idaho Wildlife and Water Quality Group, llc

Bicandi Activated WetlandS Project
The Idaho Water Trust, Inc.

LINCOLN RD
Canyon, Idaho

Revisions	
1.	

Project No.:	119063
Date of Issuance:	09.09.2020
Project Milestone:	Master Plan Review

Conceptual Master Plan

C1.00

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

☑ Check to certify you have read the above language and abide by the language and terms

Name: Mark Shumar

Signature Date: 11/16/2020 1:05:41 PM