

WATER SYSTEMS MGT., INC.

WSM, Inc.
67 Wild Horse Trail
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Water System Management/Operation
Wastewater System Management/Operation
Backflow Prevention Assembly Testing
Cross Connection Control Inspection
Consulting

January 24, 2020

Matt Plaisted
State of Idaho – DEQ
2110 Ironwood Parkway
Coeur d’Alene, ID 83814-2648
Matthew.Plaisted@deq.idaho.gov

RE: ANNUAL REPORT, Bayview Water and Sewer District, WASTEWATER REUSE PERMIT, M-105-04 – Including Minor Permit Modifications No. 1 & No. 2

Dear Mr. Plaisted:

The following is a summary of activities at Bayview Water and Sewer District (District) municipal wastewater facilities for the period of November 1, 2018 through October 31, 2019.

The current permit, #M-105-04, was issued on July 1, 2015 and expires on July 1, 2025.

American Land & Leisure contracted with Water System Management, Inc. (WSM) Bob Hansen to operate the wastewater systems starting on July 1, 2014 and a new contract was issued by Scenic Canyons Recreational Services on April 22, 2019. WSM does provide appropriately licensed personnel to fulfill requirements for responsible-charge and substitute responsible-charge operation of the District collection, treatment and land application activities.

During this reporting period, November 1st through October 31st the District’s collection, treatment and land application systems have been operated in substantial compliance with the current Department issued Permit. WSM continues to be retained as the District contract operating firm providing appropriately licensed operating personnel. With a total permitted average land application reuse volume of approximately 18.284 MG and a total of 2.215 MG applied during the 2019 growing season, the District is operating at approximately 12% of currently developed land application area capacity, with a reserve capacity of approximately 88%. The District remains in a pro active posture in reviewing potential system upgrades and addressing aging infrastructure.

Sometime over the 2018/19 winter season, an irrigation area land application valve actuator was stolen from inside of the fenced and locked treatment area. As a result of this and a later than normal snow melt, irrigation was not started until July. The total reuse land application volume during the 2019 irrigation season was approximately 0.665 MG less than for the same period during the previous year and substantially below the average and calculated IWR.

6. Reporting Requirements

6.1.1 Due Date

The Annual Report covering the previous reporting period is being submitted as require, no later than January 31.

6.1.2 Required Contents

The Annual Report shall include the following: Status -

1. A brief interpretive discussion of all required monitoring data.
 - a. Data quality objectives are to insure public health and the environment are protected.
 - b. Validation of data collected is a continuing process of calibrating on site constituent testing equipment and measuring devices.
 - c. Verification is a continuing process of redundant testing through an Idaho Certified Laboratory (Accurate Testing Labs, LLC) and daily on site monitoring when the reuse system is in operation.
 - d. Permit compliance is continually being monitored with required constituent monitoring being submitted to an Idaho Certified Laboratory and on site testing and measuring being conducted as required and noted above and throughout this reporting period during times of reuse operation. Operation of the reuse system during the 2019 growing season has been in substantial compliance with permit conditions, with detailed compliance reporting included with this Annual Report for the period of November 1, 2018 through October 31, 2019.
 - e. There were no environmental impacts noted during this reporting period.
2. Results of the required monitoring as described in section 5 of this permit can be found in the **WASTEWATER REUSE LAND APPLICATION LOGS FOR JULY 2019 THROUGH SEPTEMBER 2019**, attached. Detailed constituent loading, described in Section 5 of this permit can be found in the following organized data summary tables:

5.1.1 Constituent Monitoring

Monitoring Point Serial Number and Location	Sample Description	Sample Type and Frequency	Constituents (Units in mg/L Unless Otherwise Specified)	STATUS
WW-105-01 Recycled water from lagoon LG-10501	Recycled water to MU-10501, MU-10502 and MU-10503	Grab/monthly (during periods of use)	-Total Kjeldahl nitrogen, as N -Nitrite + nitrate-nitrogen, as N	See attached monthly land application logs & Accurate Testing Labs Certificate of Analysis
WW-105-01 Recycled water from lagoon LG-10501	Recycled water to MU-10501, MU-10502 and MU-10503	Grab/weekly (during periods of use)	-Total coliform (total coliform organisms/100mL)	See attached monthly land application logs & Accurate Testing Labs Certificate of Analysis

Total Kjeldahl nitrogen, as N and Nitrite + Nitrate nitrogen, as N – Required monitoring was performed monthly, when land applying, and a grab sample was pulled from the Discharge Point of Wastewater to Land Application and submitted to an Idaho licensed lab for analysis. All samples were tested at a state licensed lab. All monitoring lab analysis reports are attached. Sample results are also listed on the attached Bayview Water & Sewer District Wastewater Land Application Log reports for July through September (2019 active irrigation season).

Total Coliform Bacteria (organisms/mL) – Coliform bacteria sampling was performed weekly (when land applying), grab samples were pulled from the discharge point of wastewater to land application and submitted to an Idaho licensed lab for analysis. The median value of the last five (5) results did NOT exceed 23/100ml and did NOT exceed a single sample value of 230/100ml. All coliform bacteria samples tested ND for this reporting period. Sample results are listed on the attached Bayview Water & Sewer District, Wastewater Land Application Log reports for July through September (2019 active irrigation season).

PLEASE SEE NOTROGEN LOADING TABLE BELOW

Pounds/acre-year – See the table below for calculated nitrogen loading rates from wastewater irrigation, to the Hydraulic Management Units MU-10501, MU-10502 & MU-10503, applied during the irrigations season.

NITROGEN LOADING

MONTH	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL	TOTAL
	Nitrogen	Gallons	Nitrogen	Gallons	Nitrogen	Gallons	Nitrogen
	Concentration	Area	lbs./acre	Area	lbs./acre	Area	lbs./acre
	mg/L	MU-10501	MU-10501	MU-10502	MU-10502	MU-10503	MU-10503
April	N/A	N/A	N/A	N/A	N/A	N/A	N/A
May	N/A	N/A	N/A	N/A	N/A	N/A	N/A
June	N/A	N/A	N/A	N/A	N/A	N/A	N/A
July	52.49	0.297	18.63	0.144	12.71	0.251	12.69
August	49.37	0.579	34.15	0.221	18.35	0.466	22.16
September	49.75	0.172	10.22	0.000	0.00	0.085	4.07
October	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTALS		1.05	63.01	0.37	31.06	0.80	38.92

Note: ALL NITROGEN (lb./acre) LOADING IS SUBSTANTIALLY BELOW PERMIT LOADING LIMITS OF 144 lbs/acre. All monthly and cumulative loading rates can also be found on the attached land application log reports. Where Lab results were ND, 50% of the PQL has been added to the total.

5.1.2 Management Unit and Other Flow Monitoring

Management Unit or Flow Measurement Serial Number and Location	Sample Description	Sample Type and Frequency	Measured Parameters, each MU	STATUS
MU-10501, MU910502, and MU-10503 Effluent flow meter	Recycled water flow from LG-10501	-Daily meter reading -Monthly compilation of data	-Volume (MG/month) -Application depth (inches/month)	Complete – See attached land application log reports for: July through September.

Flow of wastewater to the irrigation system was measured daily when irrigating. Volume (million gallons and acre-inches) to each hydraulic management unit (HMU), were recorded daily and compiled monthly. Additionally, as requested by Chris Westerman, DEQ, in the Bayview Water and Sewer District M-105-04 – 2018 Annual Report Review, the acreage within each MU has been broken down into each loading zone within that unit. Reference attached, Bayview Water & Sewer District, Wastewater Land Application Log reports for July through September (2019 active irrigation season).

5.2 Ground Water Monitoring

5.2.1 Ground Water Monitoring Point Descriptions

Monitoring Point Serial Number	Common Designation	Well Type	Gradient Location	STATUS
GW-10501	PZ 1	Piezometer	MU-10501	Active – in use
GW-10502	PZ 2	Piezometer	MU-10502	Active – in use
GW-10503	PZ 3	Piezometer	MU-10503	Active – in use

5.2.2 Ground Water Monitoring, Sampling and Analyses

Monitoring Point Serial Number	Sampling Point Description	Sample Type and Frequency	Constituents (Units in mg/L Unless Otherwise Specified)	STATUS
GW-10501 through GW-10503	Piezometers	Monthly (during periods of use)	Depth to groundwater in feet (ft.) or inches (in.)	See attached land application log reports for: July through September.

Note: ALL DEPTH TO GROUNDWATER, IN INCHES, WAS GREATER THAN THE PERMIT 36" MINIMUM.

5.3 Soil Monitoring

5.3.1 Soil Monitoring Unit Descriptions

Monitoring Point Serial Number	Description	Associated Hydraulic Management Unit	STATUS
SU-10501	Area 1	MU-10501	Active – in use
SU-10502	Area 2	MU-10502	Active – in use
SU-10503	Area 3	MU-10503	Active – in use

5.3.2 Soil Monitoring, Sampling, and Analyses

Monitoring Point Serial Number	Sample Type	Sample Frequency	Constituents (Units in mg/kg Soil Unless Otherwise Specified)	STATUS
SU-10501 SU-10502 SU-10503	Composite Samples ^a	Annually, October	-Nitrate-nitrogen -Ammonium nitrogen	Done for SU-10501, SU-10502 & SU-10503 completed at the end of the irrigation season. See attached Accurate Testing Labs Certificate of Analysis #2019110178 and the following summary table.

Soil Monitoring Constituent Summary

CONSTITUENT	Monitoring Point	2019								
		SU-10501			SU-50102			SU-50103		
		0-12"	12-24"	24-36"	0-12"	12-24"	24-36"	0-12"	12-24"	24-36"
Nitrate-nitrogen	SU-10501, 02 & 03	1.14	0.05	0.05	0.705	1.181	0.808	2.52	0.956	0.404
Ammonium nitrogen		0.828	0.731	0.660	0.157	0.460	0.927	1.61	3.03	1.05

Note: As noted by Chris Westerman, DEQ, in the Bayview Water and Sewer District M-105-04 – 2018 Annual Report Review soil monitoring procedures have been corrected. All soil samples were collected and composited from each monitoring unit from each soil depth in accordance with Bayview Water and Sewer District M-105-04 – Minor Permit Modification No. 1.

3. Status of all work described in section 3 of this permit.

3. Compliance Schedule for Required Activities - STATUS

Compliance Activity (CA) Number and Completion Due Date	Compliance Activity Description
CA-105-01 Within 6 months of permit issuance	<p>Plan of Operation (PO): The permittee shall submit for review and approval a Plan of Operation that reflects current operations and incorporates the requirements of this permit. The PO shall comply with the applicable requirements stated in IDAPA 58.01.17.300.05 and shall address applicable items in the Plan of Operation Checklist in the DEQ Guidance.</p> <p>The PO shall include the following site management plans or the permittee may submit the site management plans individually:</p> <ol style="list-style-type: none"> 1. Buffer zone plan; 2. Emergency operating plan; 3. Irrigation management and scheduling plan; 4. Runoff management plan <p>The PO shall be undated as needed to reflect current operations. The permittee shall notify DEQ of material changes to the PO and copies shall be kept on site and made available to DEQ upon request.</p>
<p>STATUS: COMPLETE - As reported in the 2016 Annual Report the Plan of Operation (PO) was submitted to DEQ by T-O Engineers and approved.</p>	

Compliance Activity (CA) Number and Completion Due Date	Compliance Activity Description
CA-105-02 Within 6 months of permit issuance	<p>Quality Assurance Project Plan (QAPP): The permittee shall prepare and implement a QAPP that incorporates all monitoring and reporting required by this permit. A copy of the QAPP along with written notice that the permittee has implemented the QAPP shall be provided to DEQ.</p> <p>The QAPP shall be designed to assist in planning for the collection, analysis, and reporting of all monitoring in support of this permit and in explaining data anomalies when they occur. At a minimum, the QAPP must include the following:</p> <ol style="list-style-type: none"> 1. Details on the number of measurements, number of samples, type of sample containers, preservation of samples, holding times, analytical methods, analytical detection, and quantitation limits for each target compound, type and number of quality assurance field samples, precision and accuracy requirements, sample preparation requirements, sample shipping methods, and laboratory data delivery requirements. 2. Maps indicating the location of each monitoring, and sampling point. 3. Qualification and training of personnel. 4. Names, addresses, and telephone numbers of the laboratories used by or proposed to be used by the permittee 5. Example formats and tables that will be used by the permittee to summarize and present all data in the annual report. <p>The format and content of the QAPP should adhere to the recommendations and references in the Quality Assurance and Data Processing sections of the DEQ Guidance.</p> <p>The permittee shall amend the QAPP whenever there is a modification in sample collection, sample analysis, or other procedure addressed by the QAPP. The permittee shall notify DEQ of material changes to the QAPP and copies shall be kept on site and made available to DEQ upon request.</p>
<p>STATUS: <u>COMPLETE</u> - As reported in the 2016 Annual Report the Quality Assurance Project Plan (QAPP) was submitted to DEQ by T-O Engineers and approved.</p>	

Compliance Activity (CA) Number and Completion Due Date	Compliance Activity Description				
CA-105-03 As specified	<p>Seepage Testing: The following table shows the date by which the permittee shall complete seepage testing on the specified lagoons;</p> <table border="1" data-bbox="505 464 1269 531"> <tr> <td>Lagoon:</td> <td>Seepage Test Due Date:</td> </tr> <tr> <td>Storage Lagoon</td> <td>June 30, 2019</td> </tr> </table> <p>Submit to DEQ for review and approval a proposed schedule and procedure for performing the required seepage tests at least 42 days prior to the planned seepage test. Guidance for developing seepage test procedures are available at: http://www.deq.idaho.gov/water-quality/wastewater/lagoon-deepage-testing.aspx</p> <p>The seepage test procedures shall be sealed by the Idaho licensed professional engineer or professional geologist in responsible charge for the test.</p> <p>Seepage tests shall be completed in accordance with the procedures approved by DEQ. The seepage test report shall be sealed by the person in responsible charge and submitted within 90 days after completion of the seepage test.</p> <p>For municipal lagoons, the leakage rate for lagoons constructed after April 15, 2007 shall be no more than zero point one hundred twenty-five (0.125) inches (1/8 inch) per day. The leakage rate for existing lagoons constructed prior to April 15, 2007 shall be no more than zero point twenty-five (0.25) inches (1/4 inch) per day. See IDAPA58.01.16.493.03. Requirements for lagoons leaking above the allowable amount are outlined in IDAPA 58.01.16.493.04.</p>	Lagoon:	Seepage Test Due Date:	Storage Lagoon	June 30, 2019
Lagoon:	Seepage Test Due Date:				
Storage Lagoon	June 30, 2019				
	<p>STATUS: Seepage Testing, in accordance with the DEQ approved plan was initialed and the lagoon was found to be leaking in excess of allowable limits. Testing was halted and DEQ, Mr. Chis Westerman was notified on June 3, 2019 by Mr. Brett Converse, JUB Engineering. In an effort to identify the leak, the lagoon was filled to the top, all valves were closed, and the lagoon was allowed to leak until the level stabilized – this level was marked on the lagoon liner and the lagoon will be inspected in the Spring at the approximate stabilized level. When identified, the leak will be repaired and seepage testing will be re-initiated.</p>				
CA-105-04 By December 31, 2019	<p>Silvicultural Plan: An updated silvicultural plan for the reuse site prepared by a professional silviculturist shall be submitted to DEQ. This plan shall include the dominant vegetation species occupying the application site, estimated percentage of the application site occupied by each of the dominant species, land management activities that will maximize ET and nutrient uptake, harvesting schedules, and nutrient uptake estimates with literature references for the dominant species present.. Once completed the silvicultural plan shall be implemented and included in the updated plan of operation.</p>				
	<p>STATUS: The District has contacted a qualified silviculturalist who was unable to complete the survey and report to DEQ by December 31, 2019. It is anticipated the work will be completed during the summer of 2020 and the report will be submitted to DEQ during the 2020 reporting period.</p>				

Compliance Activity (CA) Number and Completion Due Date	Compliance Activity Description
CA-105-05 1 year prior to permit expiration	Pre-Application Workshop: If the permittee intends to continue operating the reuse facility beyond the expiration date of this permit, the permittee shall contact DEQ and schedule a pre-application workshop to discuss the compliance status of the facility and the content required for the reuse permit application package.
STATUS: The permittee will contact DEQ, 1 year prior to permit expiration, and schedule a pre-application workshop to discuss the compliance status of the facility and the content required for the reuse permit application package.	
CA-105-06 6 months prior to permit expiration	Renewal Permit Application: The permittee shall submit to DEQ a complete permit renewal application package, which fulfills the requirements specified at the pre-application workshop identified in CA-105-05.
STATUS: The permittee will submit to DEQ, 6 months prior to permit expiration, a complete permit renewal application package which fulfills the requirements specified at the pre-application workshop identified in CA-003-05.	

4. Results of all backflow testing, repairs, and replacements required by Section 9.1.1 of this permit.
 - a. *There are no backflow prevention assemblies at the reuse land application site.*

5. Discussion of major maintenance activities such as major equipment replacement, lagoon liner maintenance, and wastewater treatment and reuse facility maintenance.
 - a. *As reported above, sometime over the 2018/19 winter season, an irrigation area land application valve actuator was stolen from inside of the fenced and locked treatment area. R.C. Worst & Co. was called in to make repairs.*
 - b. *As reported above in section CA-105-03, initial attempts at seepage testing failed. Prior to testing the outlet structure at the bottom of the lagoon was re-sealed. After further inspection and repair, seepage testing will be initialed again in the spring or summer of 2020.*
 - c. *As new items requiring attention are identified, they are being addressed.*

6. A summary of all noncompliance events that occurred during the reporting year. Examples of noncompliance events that must be discussed include, but are not limited to: exceedance of permit limits, complaints, missed monitoring events, incorrect monitoring dates or frequencies, dry monitoring wells, uncontained spills causing runoff, construction without DEQ engineering plan approval, construction without engineering inspection, and reporting incorrect acreage.
 - a. *As reported above, no Total Coliform bacteria test exceeded permit limits. See section 5.1.1, above.*
 - b. *No complaints were received during this reporting period.*
 - c. *Missed monitoring events – Due to seepage testing failure, the Seepage Test was not completed by: June 30, 2019 – See section CA-105-03 above for status. Due to scheduling problems, the Silvicultural Plan was not completed by: December 31, 2019 – See section CA-105-04 above for status.*
 - d. *Incorrect Monitoring dates or frequencies – All monitoring was completed as required.*

- e. Dry monitoring wells (Piezometer) – All depth to ground water is listed on the monthly Bayview Wastewater Land Application logs, attached.
 - f. There were no uncontained spills causing runoff during this reporting period.
 - g. No construction took place without DEQ engineering plan approval.
 - h. No construction took place during this reporting period without engineering inspection.
 - i. No reporting of incorrect acreage took place during this reporting period.
7. Submittal of the calculations and observations for hydraulic management units specified in the table below.
 See, Reporting Requirement Number 2, Section 5.1.1 Constituent Monitoring, table (NITROGEN LOADING) and Section 5.1.2 Management Unit and Other Flow monitoring and IWR table below.

Monitoring Point Serial Number	Parameter (Calculate for each MU)	Units	STATUS
MU-10501 MU-10502 MU-10503	Recycled water loading rate	Million gallons/month Inches/month	See attached WASTEWATER REUSE LAND APPLICATION LOGS for July through September 2019, for MU-10501, 10502, & MU-10503. Also see irrigation table below.
	Irrigation water requirement (IWR) for each crop grown	Inches/month Inches/GS	See attached WASTEWATER REUSE LAND APPLICATION LOGS for July through September 2019, for MU-10501, 10502, & MU-10503. Also see irrigation table below.
	Recycled water nitrogen loading rates	Pounds N/acre-year	See Nitrogen Loading table, Section 5.1.1 above.

Irrigation water requirement (IWR) Gallons & Inches/month & year

Month	Average IWR in/month	Average IWR MG/mo.	MU-10501		MU-10502		MU-10503	
			ACTUAL		ACTUAL		ACTUAL	
			IRRIGATION		IRRIGATION		IRRIGATION	
			in/month	MG/mo.	in/month	MG/mo.	in/month	MG/mo.
April	1.620	0.905	0	0	0	0	0	0
May	4.330	2.420	0	0	0	0	0	0
June	5.830	3.259	0	0	0	0	0	0
July	8.720	4.878	1.570	0.297	1.070	0.144	1.070	0.251
August	7.300	4.083	3.050	0.579	1.640	0.221	1.980	0.466
September	4.040	2.259	0.910	0.172	0.000	0.000	0.360	0.085
October	0.880	0.480	0	0	0	0	0	0
TOTALS	32.720	18.284	5.530	1.048	2.710	0.365	3.410	0.802

8. Laboratory analytical reports for monitoring specified in Section 5 of the permit. Chain of custody forms, supporting information for laboratory analytical reports and quality assurance documentation shall be available for review upon request by DEQ.
All required testing was performed by Accurate Testing Labs, LLC, an Idaho Licensed laboratory and all associated paperwork is available for review upon request by the Department. All laboratory analysis reports are attached.
9. The parameters in the following table:
See item number 7, above.

6.1.3 Submittals

This annual report is being submitted in accordance with:

2. Annual reports and other information required by this permit is being signed by the a duly Authorized Representative of the Responsible Official in accordance with:
 - a. The authorization is made in writing by the responsible official;
 - b. The authorization specified an individual or position having responsibility for the overall operation of the regulated facility.
 - c. The written authorization is submitted to DEQ.

As always, if you have any questions please feel free to contact me at any time.

"I certify that the information provided in this submittal was prepared in conformance with the Quality Assurance Project Plan required by permit M-105-04, and is to the best of my knowledge, true, accurate and complete and I acknowledge that knowing submission of false or incomplete information may result in permit revocation as provided for in IDAPA-58.01.17.920.01 or other enforcement action as provided for under Idaho law."

Sincerely,



Bob Hansen
Bayview RCO

c: BWSO Board, bwsd637@gmail.com
Scott McNee, P.E., T-O Engineers, smcnee@to-engineers.com
Brett Converse, JUB Engineering, bconverse@jub.com

Attachments: Bayview Water & Sewer District, Land Application Logs (July-September)
Certificates of Analysis, Accurate Testing Labs
Seepage Test letter to Chris Westerman, DEQ Coeur d'Alene regional office, dated June 3, 2019.

BAYVIEW WATER AND SEWER DISTRICT - WASTEWATER LAND APPLICATION LOG - July 2019

PERMIT MAX		1,652,985			1,174,614		2,050,838		N/A		23/100mL	AVG.	3 FEET (36")				
DATE	LA-METER READING	Land Ap TOTAL VOLUME	MU-10501-AREA 1-6.98 Acres			MU-10502-Area 2-4.96		MU-10503-Area 3-8.66		CHLORINE		WEEKLY	0.94	MONTHLY			
	4252000		VOLUME TO ZONE			VOLUME TO ZONE		VOLUME TO ZONE		TOTAL		PRESIP	GrndwtrDepth(in.)				
	4252000	#1 (2.33)	#2 (2.33)	#3 (2.32)	#4 (2.48)	#5 (2.48)	#6(4.33)	#7 (4.33)	FREE	TOT	Bac-T	in.	501	502	503		
1	4252000	0															
2	4252000	0															
3	4252000	0															
4	4252000	0															
5	4252000	0															
6	4252000	0															
7	4252000	0															
8	4252000	0															
9	4252000	0															
10	4252000	0															
11	4252000	0															
12	4252000	0															
13	4252000	0															
14	4252000	0															
15	4252000	0															
16	4271000	19,000	19,000							1.5	10			72"	73"	74"	
17	4303000	32,000		32,000						1.4	16	ND					
18	4341000	38,000			38,000					0.7	7	0.10					
19	4396000	55,000				55,000				1.1	5						
20	4448000	52,000						52,000		2.1	7						
21	4511000	63,000							63,000	4.2	4						
22	4544000	33,000		33,000						2.5	13	ND					
23	4594000	50,000	50,000							6.1	14						
24	4629000	35,000			35,000					5.1	14	0.30					
25	4684000	55,000				55,000				1.6	7						
26	4718000	34,000					34,000			1.1	5						
27	4795000	77,000						77,000		1.1	5						
28	4798000	3,000						3,000		1.1	5						
29	4854000	56,000							56,000	1.5	14						
30	4917000	63,000	63,000							6.3	15						
31	4944000	27,000		27,000						3.7	15	ND					
TOTAL (ZONE) GALLONS			132,000	92,000	73,000	110,000	34,000	132,000	119,000								
TOTAL (ZONE) ACRE INCHES			2.09	1.45	1.16	1.63	0.50	1.12	1.01								
TOTAL (MU) GALLONS			297,000			144,000		251,000		TOTAL PRECIP.		0.40					
TOTAL (MU) ACRE INCHES			1.57			1.07		1.07		Precip.Adjustment		0.54					
TOTAL NITROGEN - LBS/ACRE MONTH			18.63			12.71		12.69		TOTAL NITROGEN LAST MO.							
TOTAL NITROGEN - LBS/ACRE CUM. YR			18.63			12.71		12.69		#1	#2	#3					

NOTE: 50% of the Practical Quantitation Limits (PQL) for all ND Lab results have been added for these calculations

IRW BASED ON PRECIPITATION ADJUSTMENT	
MU-10501 Calculated Adjusted IRW	1,755,328
MU-10502 Calculated Adjusted IRW	1,247,339
MU-10503 Calculated Adjusted IRW	2,177,813

Total Kjeldahl nitrogen, as N-PQL = 0.09 (0.045 @ 50%)	0.24	MONTHLY
Nitrite+Nitrate-nitrogen, as N-PQL=0.1/ea (0.05@50%)	52.25	

Accurate Testing Labs, LLC

7950 Meadowlark Way
Coeur d'Alene, ID 83815
Phone (208) 762 8378 Fax (208) 762 9082
www.accuratetesting.com
info@accuratetesting.com

Certificate of Analysis

Order No.: **2019070392**

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Water & Sewer

Date Received: 07/17/2019 13:45

Sample: **1** Matrix: Waste Water
Location: Land App Tap D/T Collected: 07/17/2019 12:35
Sample Type: Grabs Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	07/19/19	GM
Temperature (Sample Received)	9.5	deg. C	Infrared		07/17/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 07/19/19

Accurate Testing Labs, LLC

7950 Meadowlark Way
Coeur d'Alene, ID 83815
Phone (208) 762 8378 Fax (208) 762 9082
www.accuratetesting.com
info@accuratetesting.com

Certificate of Analysis

Order No.: **2019070473**

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Water & Sewer

Date Received: 07/22/2019 15:05

Sample: **1** Matrix: Waste Water
Location: Land App Tap D/T Collected: 07/22/2019 14:10
Sample Type: Grabs Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	07/24/19	GM
Temperature (Sample Received)	8.0	deg. C	Infrared		07/22/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 07/25/19

Accurate Testing Labs, LLC

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Order No.: **2019070677**

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Water & Sewer

Date Received: 07/31/2019 14:05

Sample: **1** Matrix: Waste Water
Location: Land App Tap D/T Collected: 07/31/2019 13:00
Sample Type: Grabs Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	08/03/19	WM
Temperature (Sample Received)	4.9	deg. C	Infrared		07/31/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 08/05/19

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Order No.: **2019070393**

Page: 1 of 1

Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Water & Sewer

Date Received: 07/17/2019 13:45

Sample: **1**
Location: Land App Tap
Sample Type: Grabs

Matrix: Waste Water
D/T Collected: 07/17/2019 12:35
Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrite-N	ND	mg/L	EPA 300.0	0.1	07/18/19	WM
Nitrate-N	52.2	mg/L	EPA 300.0	0.1	07/19/19	WM
Total Kjeldahl Nitrogen (N)	0.240	mg/L	SM 4500NORG B	0.09	07/19/19	JD

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 07/22/19

BAYVIEW WATER AND SEWER DISTRICT - WASTEWATER LAND APPLICATION LOG - AUGUST 2019

PERMIT MAX		1,383,511			983,126		1,716,505		N/A		23/100mL	AVG.	3 FEET (36")			
DATE	LA-METER READING	Land Ap	MU-10501-AREA 1-6.98 Acres			MU-10502-Area 2-4.96		MU-10503-Area 3-8.66		CHLORINE		WEEKLY	1.02	MONTHLY		
	4944000	TOTAL VOLUME	VOLUME TO ZONE			VOLUME TO ZONE		VOLUME TO ZONE		FREE	TOT	TOTAL	PRESIP	GrndwtrDepth(in.)		
			#1 (2.33)	#2 (2.33)	#3 (2.32)	#4 (2.48)	#5 (2.48)	#6 (4.33)	#7 (4.33)			Bac-T	in.	501	502	503
1	5012000	68,000			68,000					6.3	20					
2	5057000	45,000				45,000				6.6	27					
3	5078000	21,000					21,000			4.4	35					
4	5128000	50,000						50,000		4.6	22					
5	5178000	50,000							50,000	4.6	31	ND		72"	73"	74"
6	5228000	50,000	50,000							6.1	28					
7	5256000	28,000		28,000						5.1	27					
8	5315000	59,000			59,000					7.9	27					
9	5363000	48,000				48,000				11.5	33		0.10			
10	5387000	24,000					24,000			1.3	30					
11	5387000	0								N/A	N/A		0.70			
12	5387000	0								N/A	N/A					
13	5387000	0								N/A	N/A					
14	5454000	67,000						67,000		5.3	12	ND				
15	5513000	59,000							59,000	0.7	5					
16	5546000	33,000	33,000							2.1	8					
17	5618000	72,000		72,000						2.8	26		0.10			
18	5650000	32,000			32,000					4.1	31					
19	5691000	41,000					41,000			3.7	37					
20	5762000	71,000						71,000		6.7	31					
21	5791000	29,000							29,000	6.0	31	ND				
22	5839000	48,000	48,000							4.5	36		0.20			
23	5867000	28,000		28,000						6.3	28					
24	5899000	32,000			32,000					5.9	25					
25	5941000	42,000					42,000			5.5	31					
26	5987000	46,000						46,000		5.0	30	ND				
27	6039000	52,000							52,000	4.1	29					
28	6085000	46,000	46,000							3.9	28					
29	6113000	28,000		28,000						5.6	34					
30	6168000	55,000			55,000					4.3	23		0.40			
31	6210000	42,000						42,000		3.9	33					
TOTAL (ZONE) GALLONS			177,000	156,000	246,000	93,000	128,000	276,000	190,000							
TOTAL (ZONE) ACRE INCHES			2.80	2.47	3.91	1.38	1.90	2.35	1.62							
TOTAL (MU) GALLONS			579,000			221,000		466,000		TOTAL PRECIP.		1.50				
TOTAL (MU) ACRE INCHES			3.06			1.64		1.98		Precip.Adjustment		-0.48				
TOTAL NITROGEN - LBS/ACRE MONTH			34.15			18.35		22.16		TOTAL NITROGEN LAST MO.						
TOTAL NITROGEN - LBS/ACRE CUM. YR			52.78			31.06		34.85		#1	#2	#3				

NOTE: 50% of the Practical Quantitation Limits (PQL) for all ND Lab results have been added for these calculations

18.63	12.71	12.69
-------	-------	-------

IRW BASED ON PRECIPITATION ADJUSTMENT

MU-10501 Calculated Adjusted IRW	1,292,540
MU-10502 Calculated Adjusted IRW	918,482
MU-10503 Calculated Adjusted IRW	1,603,638

Total Kjeldahl nitrogen, as N-PQL = 0.09 (0.045 @ 50%)	4.82	MONTHLY
Nitrite+Nitrate-nitrogen, as N-PQL=0.1/ea (0.05@50%)	44.55	

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Page: 1 of 1

Bayview Water & Sewer Distr.
P.O. Box 637
Bayview , ID 83803

Project: Bayview Water & Sewer

Date Received: 08/05/2019 15:10


Sample: 1
Location: Land App Tap
Sample Type: Grabs

Matrix: Waste Water
D/T Collected: 08/05/2019 13:00
Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	08/07/19	GM
Temperature (Sample Received)	6.1	deg. C	Infrared		08/05/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 08/08/19

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Order No.: 2019080334

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Sewer

Date Received: 08/14/2019 09:30

Sample: 1 Matrix: Waste Water
Location: Land App Tap D/T Collected: 08/14/2019 08:15
Sample Type: Grabs Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	08/16/19	GM
Temperature (Sample Received)	2.6	deg. C	Infrared		08/14/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 08/19/19

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview , ID 83803

Project: Bayview Water & Sewer

Date Received: 08/21/2019 15:10

Sample: **1**
Location: Land App Tap
Sample Type: Grabs

Matrix: Waste Water
D/T Collected: 08/21/2019 13:30
Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	08/23/19	GM
Temperature (Sample Received)	7.6	deg. C	Infrared		08/21/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 08/26/19

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Water & Sewer

Date Received: 08/26/2019 15:10

Sample: 1
Location: Land App Tap
Sample Type: Grabs

Matrix: Waste Water
D/T Collected: 08/26/2019 11:50
Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	08/28/19	GM
Temperature (Sample Received)	3.4	deg. C	Infrared		08/26/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 08/29/19

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Order No.: **2019080066**

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview , ID 83803

Project: Bayview Water & Sewer

Date Received: 08/05/2019 15:10


Sample: **1**
Location: Land Application Tap
Sample Type: Grabs

Matrix: Waste Water
D/T Collected: 08/05/2019 13:10
Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrite-N	ND	mg/L	EPA 300.0	0.1	08/06/19	WM
Nitrate-N	44.5	mg/L	EPA 300.0	0.1	08/06/19	WM
Total Kjeldahl Nitrogen (N)	4.82	mg/L	SM 4500NORG B	0.09	01/01/70	JD

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 08/09/19

BAYVIEW WATER AND SEWER DISTRICT - WASTEWATER LAND APPLICATION LOG - SEPTEMBER 2019

PERMIT MAX		765,275	543,806	949,468	N/A	23/100mL	AVG.	3 FEET (36")								
DATE	LA-METER READING	Land Ap	MU-10501-AREA 1-6.98 Acres			MU-10502-Area 2-4.96		MU-10503-Area 3-8.66		CHLORINE		WEEKLY	1.18	MONTHLY		
	6210000	TOTAL VOLUME	VOLUME TO ZONE			VOLUME TO ZONE		VOLUME TO ZONE		FREE	TOT	TOTAL	PRESIP	GrndwtrDepth(in.)		
			#1 (2.33)	#2 (2.33)	#3 (2.32)	#4 (2.48)	#5 (2.48)	#6(4.33)	#7 (4.33)			Bac-T	in.	501	502	503
1	6233000	23,000						23,000		3.4	28					
2	6295000	62,000							62,000	4.4	24			72"	72"	74"
3	6354000	59,000	59,000							2.5	22					
4	6390000	36,000		36,000						2.0	19	ND				
5	6467000	77,000			77,000					3.6	20					
6		0														
7		0											0.50			
8		0														
9		0														
10		0														
11		0														
12		0														
13		0														
14		0														
15		0														
16		0														
17		0														
18		0											0.20			
19		0														
20		0														
21		0														
22		0											0.50			
23		0														
24		0														
25		0														
26		0														
27		0														
28		0														
29		0														
30		0											1.50			
31		0														

TOTAL (ZONE) GALLONS	59,000	36,000	77,000	0	0	23,000	62,000									
TOTAL (ZONE) ACRE INCHES	0.93	0.57	1.22	0.00	0.00	0.20	0.53									
TOTAL (MU) GALLONS	172,000			0		85,000		TOTAL PRECIP.	2.70							
TOTAL (MU) ACRE INCHES	0.91			0.00		0.36		Precip.Adjustment	-1.52							
TOTAL NITROGEN - LBS/ACRE MONTH	10.43			0.00		4.15		TOTAL NITROGEN LAST MO.								
TOTAL NITROGEN - LBS/ACRE CUM. YR	63.21			31.06		39.00		#1	#2	#3						

NOTE: 50% of the Practical Quantitation Limits (PQL) for all ND Lab results have been added for these calculations

52.78	31.06	34.85
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IRW BASED ON PRECIPITATION ADJUSTMENT

MU-10501 Calculated Adjusted IRW	477,199
MU-10502 Calculated Adjusted IRW	339,099
MU-10503 Calculated Adjusted IRW	592,056

Total Kjeldahl nitrogen, as N-PQL = 0.09 (0.045 @ 50%)	35.400	MONTHLY
Nitrite+Nitrate-nitrogen, as N-PQL=0.1/ea (0.05@50%)	15.349	

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Water & Sewer

Date Received: 09/04/2019 13:45

Sample: 1
Location: Land App Tap
Sample Type: Grabs

Matrix: Waste Water
D/T Collected: 09/04/2019 12:25
Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Total Coliform Bacteria	ND	MPN/100mL	SM 9221B	1.8	09/06/19	GM
Temperature (Sample Received)	6.1	deg. C	Infrared		09/04/19	JM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 09/06/19

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Order No.: 2019090071

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Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Bayview Water & Sewer

Date Received: 09/04/2019 13:45

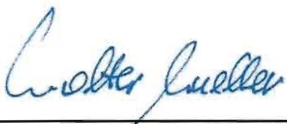
Sample: 1
Location: Land Application Tap
Sample Type: Grabs

Matrix: Waste Water
D/T Collected: 09/04/2019 12:25
Collected by: Bob Kuchenski

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrite-N	0.249	mg/L	EPA 300.0	0.1	09/04/19	WM
Nitrate-N	15.1	mg/L	EPA 300.0	0.1	09/04/19	WM
Total Kjeldahl Nitrogen (N)	35.4	mg/L	SM 4500NORG B	0.09	09/06/19	JD

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 09/06/19

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Page: 1 of 3

Bayview Water & Sewer Distr.
P.O. Box 637
Bayview, ID 83803

Project: Soil - Land Application

Date Received: 11/12/2019 12:25

Sample: 1 Matrix: Soil
Location: Soil, SU-10501 0"-12" D/T Collected: 11/12/2019 10:30
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Ammonia-N (KCl Extract)	0.828	mg/Kg	S-3.50	0.1	11/19/19	JD
Nitrate-N (KCl Extract)	1.14	mg/Kg	S-3.10	0.1	11/18/19	WM
Total Solids	79.12	%	SM 2540G		11/20/19	GM

Sample: 2 Matrix: Soil
Location: Soil, SU-10501 12"-24" D/T Collected: 11/12/2019 10:30
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	ND	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	0.731	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	79.97	%	SM 2540G		11/20/19	GM

Sample: 3 Matrix: Soil
Location: Soil, SU-10501 24"-36" D/T Collected: 11/12/2019 10:30
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	ND	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	0.660	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	82.54	%	SM 2540G		11/20/19	GM

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 11/21/19

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Order No.: 2019110178

Page: 2 of 3

Sample: **4** Matrix: Soil
Location: Soil, SU-10502 0"-12" D/T Collected: 11/12/2019 11:30
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	0.705	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	0.157	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	85.78	%	SM 2540G		11/20/19	GM

Sample: **5** Matrix: Soil
Location: Soil, SU-10502 12"-24" D/T Collected: 11/12/2019 11:30
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	1.81	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	0.460	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	78.21	%	SM 2540G		11/20/19	GM

Sample: **6** Matrix: Soil
Location: Soil, SU-10502 24"-36" D/T Collected: 11/12/2019 11:30
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	0.808	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	0.927	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	79.82	%	SM 2540G		11/20/19	GM

Sample: **7** Matrix: Soil
Location: Soil, SU-10503 0"-12" D/T Collected: 11/12/2019 09:15
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	2.52	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	1.61	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	73.51	%	SM 2540G		11/20/19	GM

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 11/21/19

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Page: 3 of 3

Sample: **8** Matrix: Soil
Location: Soil, SU-10503 12"-24" D/T Collected: 11/12/2019 09:15
Sample Type: Composites Collected by: Claire Hansen


Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	0.956	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	3.03	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	78.97	%	SM 2540G		11/21/19	GM

Sample: **9** Matrix: Soil
Location: Soil, SU-10503 24"-36" D/T Collected: 11/12/2019 09:15
Sample Type: Composites Collected by: Claire Hansen

Analyte	Result	Unit	Method	PQL	Analysis Date	Analyst
Nitrate-N (KCl Extract)	0.404	mg/Kg	S-3.10	0.1	11/18/19	WM
Ammonia-N (KCl Extract)	1.05	mg/Kg	S-3.50	0.1	11/19/19	JD
Total Solids	84.19	%	SM 2540G		11/20/19	GM

If the RESULT is 'ND' (Not Detected) or 'Absent', that means the concentration is less than the PQL (Practical Quantitation Limit for this method).

Comments:



Laboratory Supervisor, Digitally signed by: Walter Mueller Date: 11/21/19



J-U-B ENGINEERS, INC.

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THE
LANGDON
GROUP



GATEWAY
MAPPING
INC.

June 3, 2019

Mr. Chris Westerman
2110 Ironwood Parkway
Coeur d'Alene, ID 83814

By email: Chris.Westerman@deq.idaho.gov

Dear Chris:

J-U-B ENGINEERS, Inc. (JUB) performed seepage testing on Bayview's wet well lagoon per the Lagoon Seepage Testing Procedure approved by DEQ on April 5, 2019. The lagoon was tested between May 13th, 2019 at 10:16 a.m. and May 15th, 2019 at 9:24 a.m. The lagoon was tested to satisfy the Idaho Department of Environmental Quality (DEQ) Rules (IDAPA 58.01.16) that require all lagoons be tested at least every 10 years. The lagoon was tested to determine if the average seepage rate is less than 0.25 in/day, the maximum seepage rate allowed for lagoons built before April 15, 2007. The seepage rate measured during this test is estimated to be approximately 1.48 inches per day. The estimated seepage rate exceeds the allowable rate. Therefore, the lagoon liner must be repaired and retested to be brought into compliance.

The wet well lagoon is only used during the irrigating season and does not store wastewater during the non-growing season; therefore, working on the lagoon during the non-growing season is a practical approach to repairing the leak. At this point, when the lagoon is off-line in the Fall of 2019, the District plans to carefully inspect all the liner area, penetrations and piping, repair any leaks discovered, and retest in the spring of 2020 before the lagoon is active for the irrigation season.

The District carefully inspected the lagoon liner prior to the test and did not see any damage to the liner or anything that would suggest the liner would leak. District operators suspect piping under the lagoon may be leaking and will endeavor to inspect and ascertain if system piping is leaking. A project will be planned to repair the system.

The lagoon was visually observed to be leaking at an excessive rate after about 24 hours during the daily check and again the next day after about 46 hours of testing; therefore, the lagoon seepage test was suspended. Insufficient data were collected for a statistical analysis; however, the District is confident the lagoon is leaking at a rate greater than 0.25 inches per day based on visual observation. Two averaging periods were available from the data and shown in Table 1 along with an estimated seepage rate calculation following Table 1.

Table 1 – Two Averaging Periods from the Available Data

	Lagoon Level, inches	Pan Level, inches	Median Air Temp, °F
5/13/19 13:32	14.76	14.95	67.42
5/14/19 13:32	13.18	14.82	57.27
Difference	1.58	0.13	

Estimated seepage rate calculation:

$$1.58 - (0.13 * 0.749) = 1.48 \text{ inches/day}$$

Where 0.749 is the pan coefficient at a median air temperature of 57.27 °F

Please contact me or District Operator Robert Hansen with any questions you may have regarding the seepage testing and plan for future actions by the District.

Sincerely

J-U-B ENGINEERS, Inc.



Brett C. Converse PE., Ph.D.

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