Montana Department of Environmental Quality

Water Protection Bureau
P.O. Box 200901
Helena, MT 59620-0901

PERMIT FACT SHEET

MONTANA GROUND WATER POLLUTION CONTROL SYSTEM (MGWPCS)

Permittee:	Jefferson Local Development Corporation
Permit Number:	MTX000192
Permit Type:	Domestic wastewater
Application Type:	Renewal
Facility Name:	Sunlight Business Park
Facility Location:	Section 31 and 32, Township 2 North, Range 3 West, Jefferson County Latitude: 45.87844 Longitude:-112.01012
Facility Address:	PO Box 1079 Whitehall MT 59759-1079
Facility Contact:	Tom Harrington
Treatment Type:	Level 2, Advantex
Receiving Water:	Class III Ground Water
Number of Outfalls:	1
Outfall / Type:	001 / pressure dose drain field
Effluent Type:	Domestic strength wastewater
Mixing Zone:	Standard
Effluent Limit Type:	WQBEL
Effluent Limits:	Total nitrogen: 4.0 lbs/day
Flow Rate:	Design maximum: 31,800 gpd Design average: 31,800 gpd
Effluent sampling:	Quarterly, Dose Tank prior to discharge
Ground water sampling:	MW1, North of Outfall 001
Fact Sheet Date:	November, 2019
Prepared By:	Rich Morse

1.0 PERMIT INFORMATION

DEQ issues MGWPCS permits for a period of five years. The permit may be reissued at the end of the period, subject to reevaluation of the receiving water quality and permit limitations. This fact sheet provides the basis for DEQ's decision to renew a MGWPCS wastewater discharge permit Jefferson Local Development Corporation (applicant) for the Sunlight Business Park wastewater treatment system.

1.1 APPLICATION

DEQ received an application for renewal of the permit on November 1, 2019. Renewal fees accompanied the application. DEQ reviewed the submittal and issued a completeness letter on November 8, 2019.

1.2 PERMIT HISTORY

This permit was originally issued in 2008. The facility is being developed in phases. Currently Phase I of 4 phases is being developed. The permit is sized for the final buildout with a capacity of 31,800 gallons per day. In 2019 there has to date been no discharge for this system. The permit was renewed in 2013.

1.3 CHANGES TO THIS PERMIT

There are no changes to this permit. The Effluent limits will be adjusted for current ambient nitrogen concentrations.

2.0 FACILITY INFORMATION

2.1 LOCATION

The Sunlight Business Park Phase I wastewater treatment system is located in the western portion of the Business Park Development that is leased to Jefferson Local Development Corporation from the Golden Sunlight mine. The property is north of Interstate 90 one mile east of Whitehall, Jefferson County Montana (**Figure 1**). The property is adjacent to the Golden Sunlight gold mine.

Figure 1. Location of the Sunlight Business Park

Figure 2. Sunlight Business Park

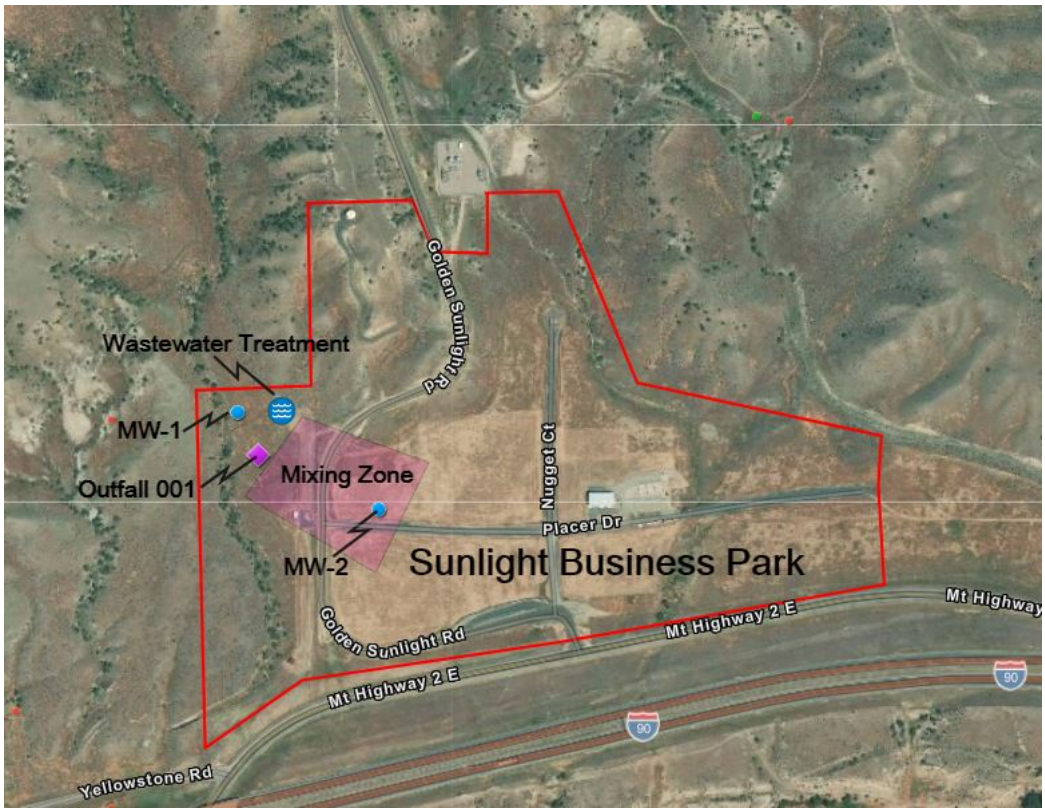


Figure 3. Wastewater Treatment Location.

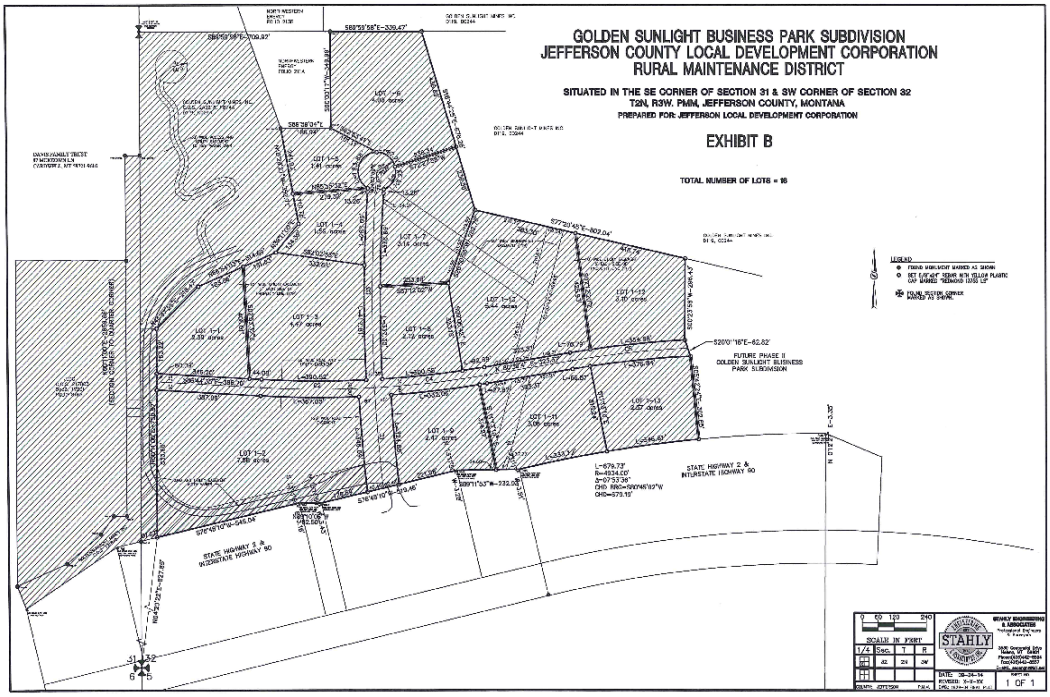


Figure 4. Phase I Plat, Sunlight Business Park

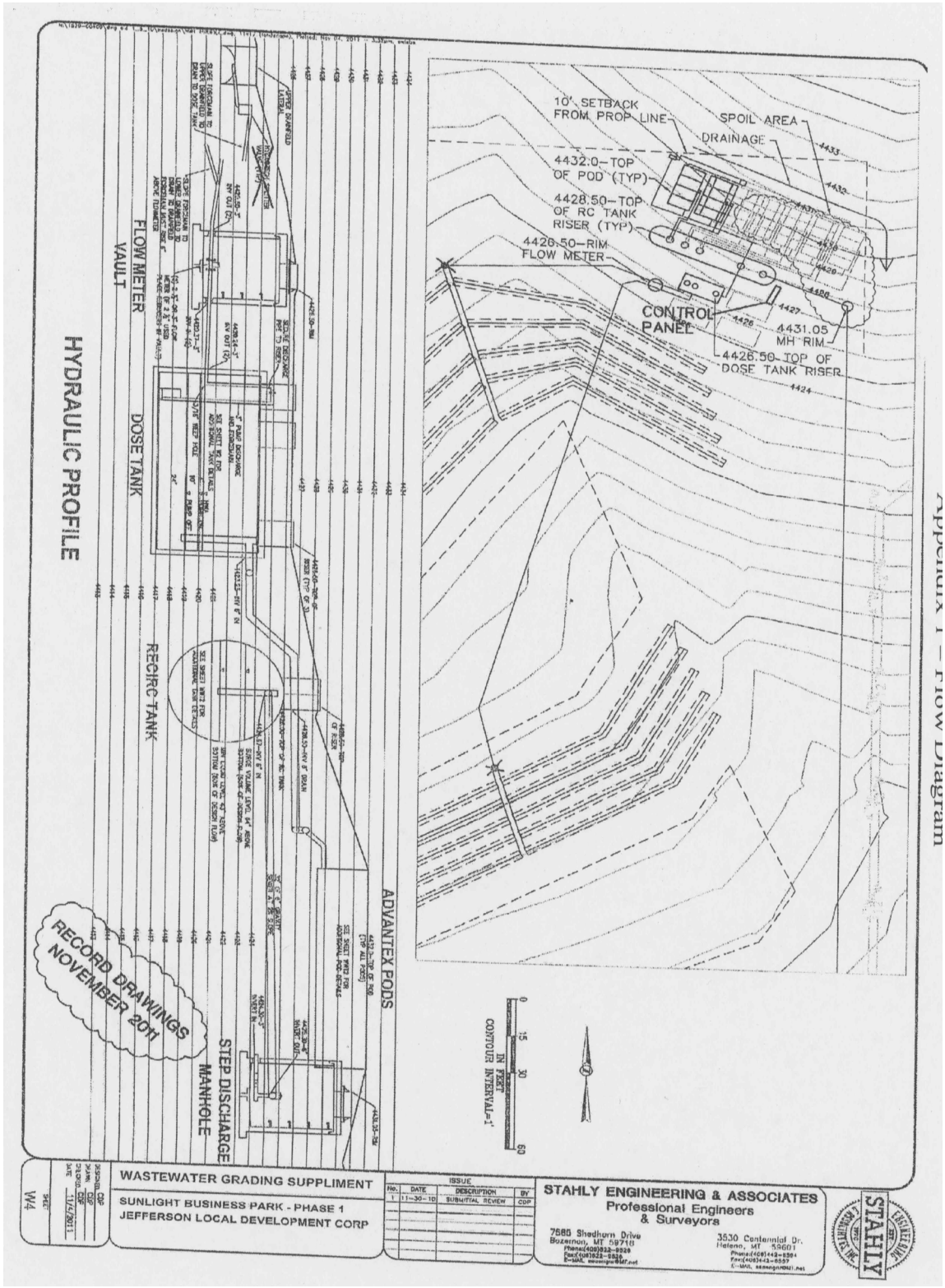
This wastewater facility will eventually serve 53 commercial businesses of 53 commercial lots. The currently installed treatment system serves only phase one of the project which consists of 13 commercial lots.

2.2 OPERATIONS

System operations are summarized below in **Table 1**.

Table 1. Collection, Treatment, and Disposal Summary

Collection	
Contributing sources:	53 commercial facilities (non-industrial)
Standard industrial code(s) of sources:	1541, 4225, 8773
Collection method:	Individual Septic tanks to Gravity-driven sewer lines and STEP tank and low-pressure sewer main.
Flow volume:	Average daily design flow: 31,800 gallons per day Maximum daily design flow: 31,800 gallons per day
Treatment	
Treatment level:	Level 2, Septic, Advantex AX100 recirculating, six pods
Treatment technology:	Advantex recirculating system to pressure dose subsurface drainfield
Treatment location:	Latitude: 45.879453, Longitude: -112.013606
Disposal	
Method of disposal:	Infiltration to ground water
Disposal structure:	Subsurface drainfield (Outfall 001)
Outfall location:	Latitude: 45.879013, Longitude: -112.013939



Appendix F – Flow Diagram

Figure 5. Facility location

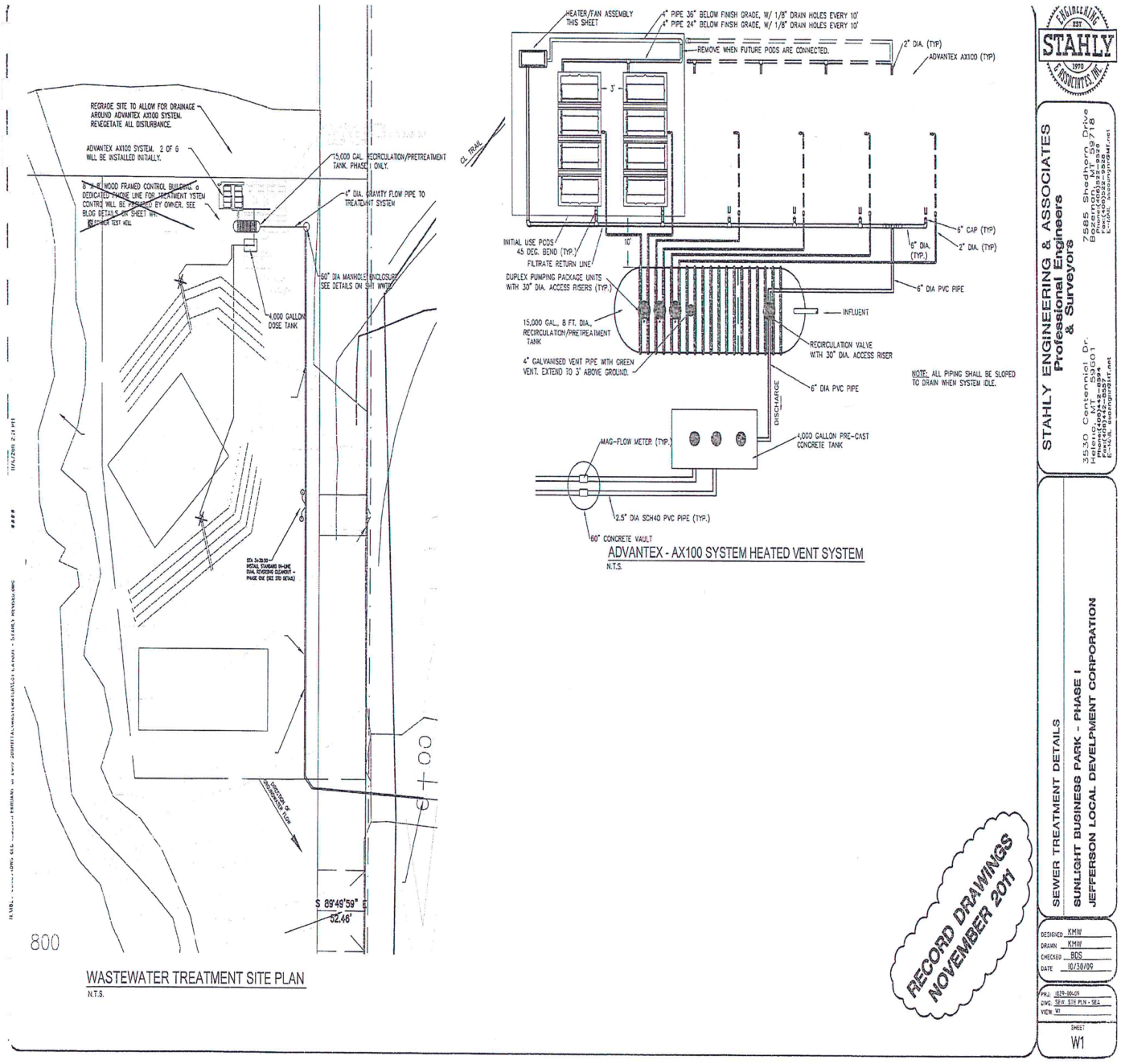


Figure 6. Wastewater Treatment System Line Diagram.

2.3 EFFLUENT CHARACTERISTICS

DEQ requires a permit applicant to disclose the quality of the effluent so that DEQ may evaluate the potential for pollution of state water. At the time of this permit renewal, there has been no discharge from this facility. The applicant has provided estimated effluent quality based on best professional judgement and effluent characteristics from equivalent facilities. These data are summarized below in **Table 2**. The majority of the concentrations are reported in units of milligrams per liter (mg/L), which is equivalent to one part per million.

Table 2. Estimated effluent characteristics from similar facility. The Sunlight Business Park facility has had no discharge.

Parameter	Units	Maximum	Average
Nitrogen, nitrate+nitrite	mg/L	20	16
Nitrogen, total Kjeldahl	mg/L	12	8
Nitrogen, total*	mg/L	32	24
Phosphorus, total	mg/L	10	7
Total suspended solids	mg/L	930.0	30.9

2.4 GEOLOGY

The facility is located in the Jefferson River Valley, a north-northeast trending intermontane basin bounded by Bull Mountain to the north, the London Hills to the northeast, the Tobacco Root Mountains to the east, arbitrarily at the confluence of the Big Hole and Beaverhead Rivers to the south, the Highland Mountains to the west, and the Continental Divide to the northwest. The Jefferson River Valley was formed by Cenozoic faulting and by the emplacement of the Boulder Batholith. Faults bound the eastern and western sides of the basin as well as cross-cutting the basin in several places (Kendy and Tresch, 1996).

The facility lies at the southern end of Bull Mountain (an offshoot of the Continental Divide) within an of area southwestern Montana where a number of geologic provinces intersect to create an extremely complex and complicated geologic history. The facility is located above the alluvial floodplain of Jefferson River in Quaternary alluvial fan deposits with Tertiary deposits (Bozeman Group, Renova Formation, Climbing Arrow Member) north of and upgradient from the facility; Quaternary alluvial deposits of the Jefferson River and Jefferson Slough are downgradient from the facility (McDonald *et al*., 2012).

2.5 HYDROGEOLOGY

Outside of the Jefferson River and Jefferson Slough, the water resources near the facility are associated with the Jefferson River Valley aquifer system. This system is an unconfined valley-fill aquifer that serves as the domestic water supply for the residents of the Jefferson Valley. The Jefferson Valley aquifer system is comprised of unconsolidated Quaternary alluvial deposits whose depth estimates range from 4,900 to 11,000 feet bgs (Kendy and Tresch, 1996). Wells completed in the Tertiary deposits generally do not yield large quantities of ground water due to the amount of fine-grained materials found in the Renova Formation. The ground water contained

within the Tertiary aquifers is generally either unconfined or semi-confined by laterally discontinuous layers of fine-grained material.

The hydrogeologic characteristics of the Jefferson River Valley aquifer system are described as follows: recharge occurs through the infiltration from tributary streams, leakage from irrigation canals, the infiltration of excess irrigation water, the infiltration of precipitation and snowmelt, subsurface flow from surrounding bedrock, and subsurface flow from the Beaverhead Valley (Kendy and Tresch, 1996). Discharge is through evapotranspiration, withdrawal of water for domestic and industrial usage from wells, and seepage and/or leakage into springs, seeps, irrigation drains, and stream channels (Kendy and Tresch, 1996). Ground water flow in the Jefferson River Valley generally flows from the uplands toward the flood plain and then parallels the Jefferson River.

The hydraulic conductivity, hydraulic gradient, and ground water flow direction for the facility were determined using an on-site investigation outlined in the previous fact sheet (DEQ, 2008) and updated in the current MGPWCS application materials (Jefferson Local Development Corporation, 2013). The current permit application indicates a hydraulic conductivity (K) of 15 ft/day, a hydraulic gradient (I) of 0.045 ft/ft, and a ground water flow direction of S42°E (Jefferson Local Development Corporation, 2013).

The nearest surface water to the facility listed in the application materials (Form GW-1, Section L) is the Jefferson Slough, a part of the Jefferson River. The Jefferson Slough, at its closest linear distance, is about 2,000 feet south of the facility. The closest surface water to the facility, based on the ground water flow direction, is also the Jefferson Slough at about 3,000 feet downgradient from and southeast of the facility.

Important hydrogeologic characteristics are summarized below in **Table 3**.

Table 3. Hydrogeologic Summary

Average depth to ground water	200 feet
General ground water flow direction	S 42°E
Hydraulic conductivity	15 feet per day
Hydraulic gradient	0.045 feet/feet
Nearest downgradient surface water	Jefferson Slough 2,500 feet

2.6 GROUND WATER MONITORING WELLS

There are 2 monitoring wells associated with this permit: MW-1 and MW-2. Both of these wells are plotted on **Figure 3 and Figure 5**. Monitoring well construction details are provided below in **Table 4**. MW1 is an upgradient monitoring well installed since the last permit. MW2 is a downgradient monitoring well that was used as an ambient source in the last permit cycle (there was no discharge). Driller's logs for each monitoring well are attached as **Appendix A**.

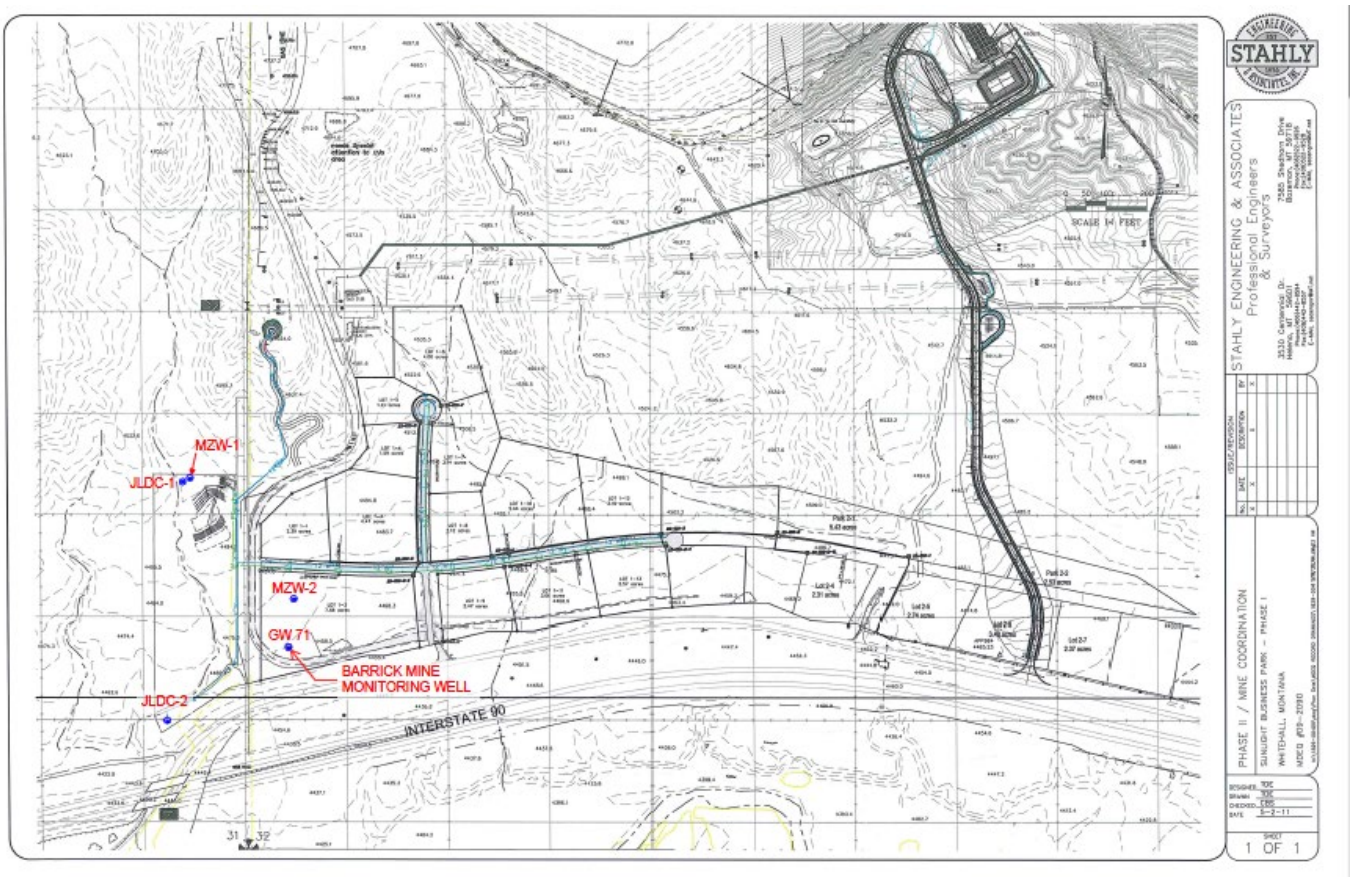


Figure 5. Monitoring Well Location. Note that MZW-1 and MZW-2 are referred to as MW1 and MW2 in this fact sheet and permit renewal. Monitoring and sampling requirements are further discussed in **Section 6**.

Table 4. Monitoring Well Summary

Monitoring Well MW1	
MBMG GWIC ID:	NR
Location- latitude/longitude:	Latitude: 45.879422° Longitude: -112.014251°
Location- narrative:	WNW of Advantex pods, See photo, Appendix A
Rationale:	Ambient receiving water quality
Depth; screened interval:	TD=80 ft. SWL=60 ft.
Notes:	Placed as special condition, 2014 permit
Monitoring Well MW2	
MBMG GWIC ID:	NR
Location- latitude/longitude:	Latitude: 45.878018° Longitude: -112.012331°
Location- narrative:	South and east of intersection of Golden Sunlight and Placer Dr., South of Placer Drive
Rationale:	Down gradient well, end of MZ
Depth; screened interval:	TD=100 ft. SWL= 88ft
Notes:	Used for ambient before any discharge from Outfall 001

If a DEQ-approved monitoring well is abandoned, destroyed or decommissioned, or is no longer able to be sampled due to fluctuations in the ground water table, the permittee must install or designate a new well to replace the abandoned, destroyed, decommissioned, or non-viable well.

2.7 GROUND WATER QUALITY CHARACTERISTICS

Ambient water sampling results from MW-1 are provided below in **Table 5**. Based on the 3482 microsiemens per centimeter (µS/cm) specific conductance, the receiving water is Class III ground water. Class III ground water is not a High Quality Water and therefore not subject to non degradation concerns. Data reported in the table is taken from ambient sampling provided by applicant.

Table 5. Ambient Water Quality Reported From Monitoring Well MW-1

MW-1 represents shallow ground water 150 feet upgradient of Outfall 001						
Parameter	**Units**	**Reported values**			**Reporting Limit**	**# of Samples**
		Minimum	**Maximum**	**Average**		
Escherichia coli bacteria	CFU/100mL	<1	<2	<1	1	10
Nitrogen, nitrate+nitrite (as N)	mg/L	3.79	5.6	4.7	0.1	14
Nitrogen, total Kjeldahl (as N)	mg/L	.5	.5	.5	0.5	5
Specific conductivity (@25°C)	µS/cm	370	3810	3482	1	14
Static water level	Feet below ground surface	87.9	90.07	89.6	0.1	14
Footnotes CF =Conlon Forming Units µS/cmU= Siemens per cm Total Nitrogen = Nitrate + Nitrite + Total Kjeldahl Nitrogen (as N)						

Total nitrogen was not reported; however it may be calculated as the sum of nitrate + nitrite (4.7 mg/L) and total Kjeldahl nitrogen (0.5 mg/L). **The calculated total nitrogen concentration in the receiving water is 5.2 mg/L.**

3.0 WATER QUALITY STANDARDS AND NONDEGRADATION

Part of DEQ's mission is to protect, sustain, and improve the quality of state waters. Water quality standards provide the basis for effluent limits that DEQ applies to discharge permits (**Section 5**). These standards include three components: designated uses, water quality criteria, and nondegradation policy. DEQ protects all designated uses of state water by basing effluent limits on the most restrictive water quality limitations, intended to protect the most sensitive uses.

3.1 DESIGNATED USES

With a specific conductivity of 3482 µS/cm (**Table 5** above), the receiving water is Class III ground water and therefore not a high-quality water of the State. Class III ground waters must be maintained suitable for the following uses with little or no treatment:

- Irrigation of some salt tolerant crops;
- Some commercial and industrial purposes;
- Drinking water for some livestock and wildlife; and
- Drinking, culinary and food processing purposes where the specific conductance is less than 7,000 microsiemens./cm at 25 degrees centigrade.

DEQ protects all the assigned beneficial uses by protecting the most sensitive. Drinking water is the most sensitive use of this receiving water.

3.2 WATER QUALITY CRITERIA

Montana has water quality standards for both surface water and ground water. The numeric criteria for each are different because they must support different uses. DEQ writes permits to protect the most sensitive, thereby protecting all uses. DEQ's ground water standard for nitrate is 10.0 mg/L, as is the standard for nitrate + nitrite (as nitrogen). Class III ground water must be meet the corresponding human health standard of 10.0 mg/L total nitrogen. These water quality standards may not be exceeded outside a designated mixing zone (**Section 4**).

3.3 NONDEGRADATION

Montana's nondegradation policy is intended to preserve the existing condition of high-quality state waters. Any water whose existing condition is better than the water quality standards must be maintained in that high quality. Nondegradation policy allows discharges to cause only nonsignificant changes in water quality. Nondegradation policy does not apply to Class III groundwater.

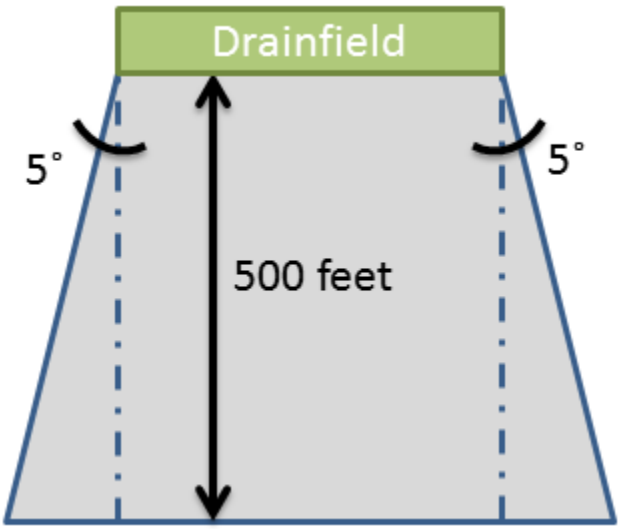
3.4 NONSIGNIFICANCE

The receiving ground water is Class III and is therefore not a high quality water of the state. Nondegradation policy does not apply to Class III ground water, and therefore DEQ does not determine the significance of changes in the receiving water.

4.0 MIXING ZONE

DEQ authorizes a standard mixing zone for total nitrogen discharged from Outfall 001. A mixing zone is a specifically defined area of the receiving water where water quality standards may be exceeded. DEQ evaluates the suitability according to criteria established in the Administrative Rules of Montana. The mixing zone is then defined in the permit. The applicant requested a standard mixing zone for this discharge, consistent with previous permit cycles.

A standard mixing zone extends 500 feet downgradient from the source. The upgradient boundary is equal to the width of the source (measured perpendicular to the of ground water flow direction). The mixing zone widens in the downgradient direction by 5° on either side. The width of the downgradient boundary is calculated by adding the increased width for each side (the tangent of 5° (0.0875) times the mixing zone length) to the width of the upgradient boundary. Standard mixing zones extend 15 feet below the ground water table.



The volume of ground water (Q_{GW}) available to mix with the effluent is calculated using Darcy's Equation: $Q_{GW} = KIA$

Where:
Q_{GW} = ground water flow volume (feet^3/day)
K = hydraulic conductivity (feet/day)
I = hydraulic gradient (feet/feet)
A = cross-sectional area (feet^2) at the downgradient boundary of the mixing zone.

Table 6 summarizes the variables used in Darcy's equation and the resulting volume of ground water available to mix at Outfall 001. These values are drawn from the previous fact sheet, recent investigation, permit application.

Table 6. Standard Mixing Zone for Total Nitrogen Discharged from Outfall 001

Parameter	Units	Value
Receiving water nitrogen concentration	5.2	mg/L
Ground water flow direction	S42°E	Bearing
Length of mixing zone	500	Feet
Thickness/depth of mixing zone	15	Feet
Upgradient width of mixing zone	364	Feet
Downgradient width of mixing zone	452	Feet
Cross-sectional area of mixing zone (A)	6,780	Square feet
Hydraulic conductivity (K)	15	Feet per day
Hydraulic gradient (I)	0.045	Feet per feet
Volume of ground water available for mixing (Q_{GW})	4,577	Cubic feet per day

In order to determine whether a mixing zone is allowable, DEQ calculates a predicted concentration at the downgradient end of the mixing zone. This mixing calculation follows the following procedure:

- Volume of ground water times the concentration of the parameter = existing load;
- Volume of discharge times the concentration of the parameter = waste load; and
- (Existing load + waste load) / total volume = predicted concentration.

Because the predicted concentration must satisfy the human health standard (**Section 3**), DEQ can calculate water quality based effluent limits (WQBELs) by rearranging the equation and solving for the effluent concentration (**Section 5**).

5.0 Permit Conditions

Discharge permits include conditions that ensure compliance with the Montana Water Quality Act and the regulations used to implement it. These conditions include effluent limits as well as any special conditions that DEQ deems necessary to protect the quality of the receiving water.

Montana's numeric water quality standards are published in Circular DEQ-7. Water quality criteria applicable to this permit are summarized below in **Table 7**. The permit establishes effluent limits that will meet water quality standards and nondegradation criteria, thereby protecting beneficial uses and existing high quality waters. The most restrictive criteria in **Table 7** provide the basis for the effluent limits.

Table 7. Applicable Standards

Parameter	Human Health Standard	Beneficial Use Support
Nitrate plus nitrite (as Nitrogen[N])	10 mg/L	
Total Nitrogen	-	10 mg/L
Total Phosphorus	-	> 50 year breakthrough

This discharge permit includes numeric WQBELs that restrict the strength and volume of the discharge. The ground water nonsignificance criteria (**Section 3.4.1**) provide the basis for the limits. DEQ calculates WQBELs by rearranging the mixing zone equation (**Section 4**) and solving for the effluent concentration that satisfies the water quality criteria. DEQ evaluates and recalculates the limits using updated water quality data as part of every permit renewal cycle. In this way, DEQ protects the receiving water quality by continually assessing cumulative impacts to the receiving water.

DEQ calculated the effluent limits using the same method used for the previous permit. DEQ uses updated ambient ground water quality data to re-evaluate the receiving water quality and the assimilative capacity for dilution.

5.1 TOTAL NITROGEN EFFLUENT LIMIT

DEQ established the final WQBEL for this discharge by back-calculating the effluent concentration that results in 10.0 mg/L at the end of the mixing zone, given the available dilution. Available dilution is determined by recent ground water quality sampling of the receiving water. Ambient total nitrogen averaged 5.2 mg/L (**Section 2**). DEQ calculates an effluent limit that protects receiving water quality and beneficial uses according to the following equation:

$$\text{Equation 1: } C_{lmt} = C_{std} + D(C_{std} - C_{gw})$$

Where:

C_{lmt} = effluent limitation concentration
C_{std} = limiting water quality criterion
C_{gw} = ambient receiving ground water concentration
D = dilution ratio (Q_{gw} / Q_{eff})
Q_{gw} =ground water flux at the end of the mixing zone
Q_{eff} = average maximum daily discharge

Using the values provided above in **Table6**, the result for C_{lmt} is 15.17 mg/L. This is the final WQBEL expressed as a concentration. Load limits are more appropriate for discharges to ground water since the long-term loading is the greater concern in absence of aquatic life considerations. Additionally, load limits inherently control both the strength and volume of the discharge. A discharge of 31,800 gallons per day containing 15.17 mg/L total nitrogen is equivalent to 4.0 pounds per day. The limit calculations are provided in detail in **Appendix B**.

5.2 TOTAL PHOSPHORUS EFFLUENT LIMIT

Effluent limits for phosphorous are based on the nondegradation rules of ARM 17.30.701-718 and the water quality standards of DEQ-7. As the nondegradation rules do not apply to the receiving water (as is discussed in Section 3.4. of this Fact Sheet) and there is no water quality standard for phosphorous, the Department will not develop a permit limit for phosphorous.

Based on the information and analyses presented above, DEQ proposes the following numerical effluent limitations in **Table 8** below.

Table 8. Total Nitrogen Limit

Proposed Final Effluent Limits – Outfall 001		
Parameter	**Units**	**Daily Maximum(1)**
Nitrogen, Total (as N)	lbs/day	4.0
Footnotes: Beneficial Uses: ARM 17.30.1006		
(1) See definition in Part V of permit.		

6.0 MONITORING AND REPORTING REQUIREMENTS

DEQ requires effluent and ground water monitoring to assure compliance with the effluent limitations and therefore water quality standards. Effluent monitoring and ground water monitoring is required as a condition of this permit. All monitoring and sampling required by this permit must be representative; therefore the permit identifies specific monitoring locations. Monitoring requirements and rationale are summarized below.

6.1 EFFLUENT MONITORING

This permit includes numeric effluent limitations with specific magnitudes and durations to ensure the discharge will not cause or contribute to an exceedance of an applicable water quality standard (see **Section 3**). Accordingly, the permittee is required to monitor and report at a specified frequency in order to demonstrate compliance with these limitations.

Effluent samples and discharge flow measurements must be representative of the nature and volume of the effluent. The effluent sample location (EFF-001) is at the dose tank prior to discharge as shown in **Figure 5**. The permittee is required to install, maintain and report flow measurements using a flow-measuring device capable of measurements that are within 10 percent of the actual flow. The flow measuring device (FM-001) is located flow meter vault after dose tank (**Figure 5**). The flow measuring device must be installed and in operating condition prior to discharge.

Effluent monitoring and reporting requirements are summarized in **Table 9** below. All analytical methods must be in accordance with the Code of Federal Regulations, 40 CFR Part 136 for each monitored parameter.

Table 9 – Effluent Monitoring Requirements

Effluent Monitoring and Reporting Requirements – Outfall 001 Sunlight Business Park						
Analyte/Measurement/ Method	**Monitor Location**	**Units**	**Sample Type[1]**	**Minimum Sample Frequency**	**Reporting Requirements[1][2][3]**	**Report Freq**
Count of Daily Samples Collected During Reporting Period	EFF-001	-	-	-	Count	Quarterly
Flow Rate, Effluent[4]	FM-001	gpd	Grab	Contin-uous	Daily Maximum Quarterly Average	Quarterly
Nitrogen, Nitrite+Nitrate (as N)	EFF-001	mg/L	Grab	1/Quarter	Daily Maximum Quarterly Average	Quarterly
Nitrogen, Total Ammonia (as N)	EFF-001	mg/L	Grab	1/Quarter	Daily Maximum Quarterly Average	Quarterly
Nitrogen, Total Kjeldahl (TKN)(as N)	EFF-001	mg/L	Grab	1/Quarter	Daily Maximum Quarterly Average	Quarterly
Nitrogen, Total (as N)[5]	EFF-001	mg/L	Calculate	1/Quarter	Daily Maximum Quarterly Average	Quarterly
		lbs/day[6]	Calculate	1/Quarter	Daily Maximum[7] Quarterly Average[8]	Quarterly
Phosphorus, Total (as P)	EFF-001	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly

Footnotes:

CFU = Colony Forming Units

EFF-001: Top of dose tank lid, description provided in Figure 5.

FM-001: Metering vault, description provided in Figure 5.

If no discharge occurs through out the reporting period, "no discharge" shall be recorded on the effluent Discharge Monitoring Report (DMR) report forms.

Grab sample will represent concentration for a 24 hour period.

Parameter analytical methods shall be in accordance with the Code of Federal Regulations, 40 CFR Part 136, unless specified above.

(1) See definitions in Part V of the permit.

(2) Daily Maximum: Report highest measured daily value for the reporting period on Discharge Monitoring Report (DMR) form.

(3) The geometric mean must be reported if multiple samples are taken during a reporting period.

(4) Requires recording device or totalizing meter, must be capable of recording daily effluent volume.

(5) Total Nitrogen is the sum of Nitrate + Nitrite and Total Kjeldahl Nitrogen.

(6) Load calculation: lbs/day = (mg/L) x flow (gpd) x [8.34×10^{-6}].

(7) Daily Maximum Load calculation: lbs/day = the maximum of all calculated individual daily average loads (lbs/day) recorded during the reporting period.

(8) Quarterly Average Load calculation: lbs/day = the average of all calculated individual daily average loads (lbs/day) recorded during the reporting period.

6.2 GROUND WATER MONITORING

As a condition, this permit requires ground water monitoring to provide long term ambient and downgradient characterization of the aquifer. Ground water monitoring will be required at monitoring well MW-1. Data collected via ground water monitoring will be used for mixing zone evaluation and aquifer characterization in future permit renewals. Ground water monitoring and reporting requirements are summarized in the table below. Sampling and reporting requirements shall commence upon the effective date of the permit.

The quarterly ground water monitoring established in previous permits will continue with some changes in parameters and reporting descriptions.

Ground water monitoring and reporting requirements are summarized in **Table 10** below. All analytical methods must be in accordance with the Code of Federal Regulations, 40 CFR Part 136 for each monitored parameter.

Table 10 – Ground Water Monitoring Requirements

Ground Water Monitoring and Reporting Requirements, Sunlight Business Park, MW1 and MW2						
Analyte/Measurement	**Monitor Location(1)**	**Units**	**Sample Type(2)**	**Minimum Sampling Frequency**	**Reporting(2)(3) Requirements**	**Reporting Frequency**
Chloride (as Cl)	MW1 MW2	mg/L	Grab	1/Quarter	Quarterly Average	Quarterly
Count of Daily Samples Collected During Reporting Period	MW1 MW2	-	-	-	Count	Quarterly
Escherichia coli Bacteria	MW1 MW2	CFU/100ml	Grab	1/Quarter	Daily Maximum Quarterly Average(4)	Quarterly
Nitrogen, Nitrate + Nitrite (as N)	MW1 MW2	mg/L	Grab	1/Quarter	Daily Maximum Quarterly Average	Quarterly
Total Nitrogen, Calculated	MW1 MW2	mg/L	Grab	1/Quarter	Daily Maximum Quarterly Average	Quarterly
Nitrogen, Total Ammonia (as N)	MW1 MW2	mg/L	Grab	1/Quarter	Daily Maximum Quarterly Average	Quarterly
Nitrogen, Total Kjeldahl (TKN)(as N)	MW1 MW2	mg/L	Grab	1/Quarter	Daily Maximum Quarterly Average	Quarterly
Specific Conductivity @ 25°C	MW1 MW2	µS/cm	Grab	1/Quarter	Minimum Quarterly Average Maximum	Quarterly
Temperature	MW1 MW2	°C	Instant-aneous	1/Quarter	Minimum Quarterly Average Maximum	Quarterly
Static Water Level (SWL)(5)	MW1 MW2	ft-bmp	Instant-aneous	1/Quarter	Minimum Quarterly Average Maximum	Quarterly
Well Depth	MW1 MW2	ft-bmp	Instant-aneous	1/Quarter	Minimum Quarterly Average Maximum	Quarterly

Footnotes:

CFU = Colony Forming Units

ft-bmp = feet below measuring point

At no time shall the permittee mark or state "no discharge" on any monitoring well DMR form.

Each monitor well to be individually sampled and analyzed for each respective parameter listed above.

If any monitoring well(s) are abandoned, destroyed or decommissioned, or are no longer able to be sampled due to fluctuations in the ground water table; the permittee shall install a new well to replace the abandoned, destroyed, decommissioned, or non-viable well(s).

Parameter analytical methods shall be in accordance with the Code of Federal Regulations, 40 CFR Part 136, unless specified above.
Submittal of discharge monitoring report forms (DMRs) will be required, regardless of the operational status of the facility or of each individual monitoring well.

(1) Refer to Section 2.6, Table 4 of the Fact Sheet for the location of the monitoring wells.

(2) See definitions in Part V of the permit.

(3) Daily Maximum: Report highest measured daily value for the reporting period on Discharge Monitoring Report (DMR).

(4) The geometric mean must be reported if more than one sample is taken during a reporting period.

(5) Measuring point (point of reference) for SWL measurements shall be from top of casing and measured to within 1/100th of one foot.

PUBLIC NOTICE

Legal notice information for water quality discharge permits are listed at the following website: http://deq.mt.gov/Public/notices/wqnotices. Public comments on this proposal are invited any time prior to close of business on **January 2, 2020**. Comments may be directed to:

DEQWPBPublicComments@mt.gov

or to:

Montana Department of Environmental Quality
Water Protection Bureau
PO Box 200901
Helena, MT 59620

All comments received or postmarked prior to the close of the public comment period will be considered in the formulation of the final permit. DEQ will respond to all substantive comments pertinent to this permitting action and may issue a final decision within thirty days of the close of the public comment period.

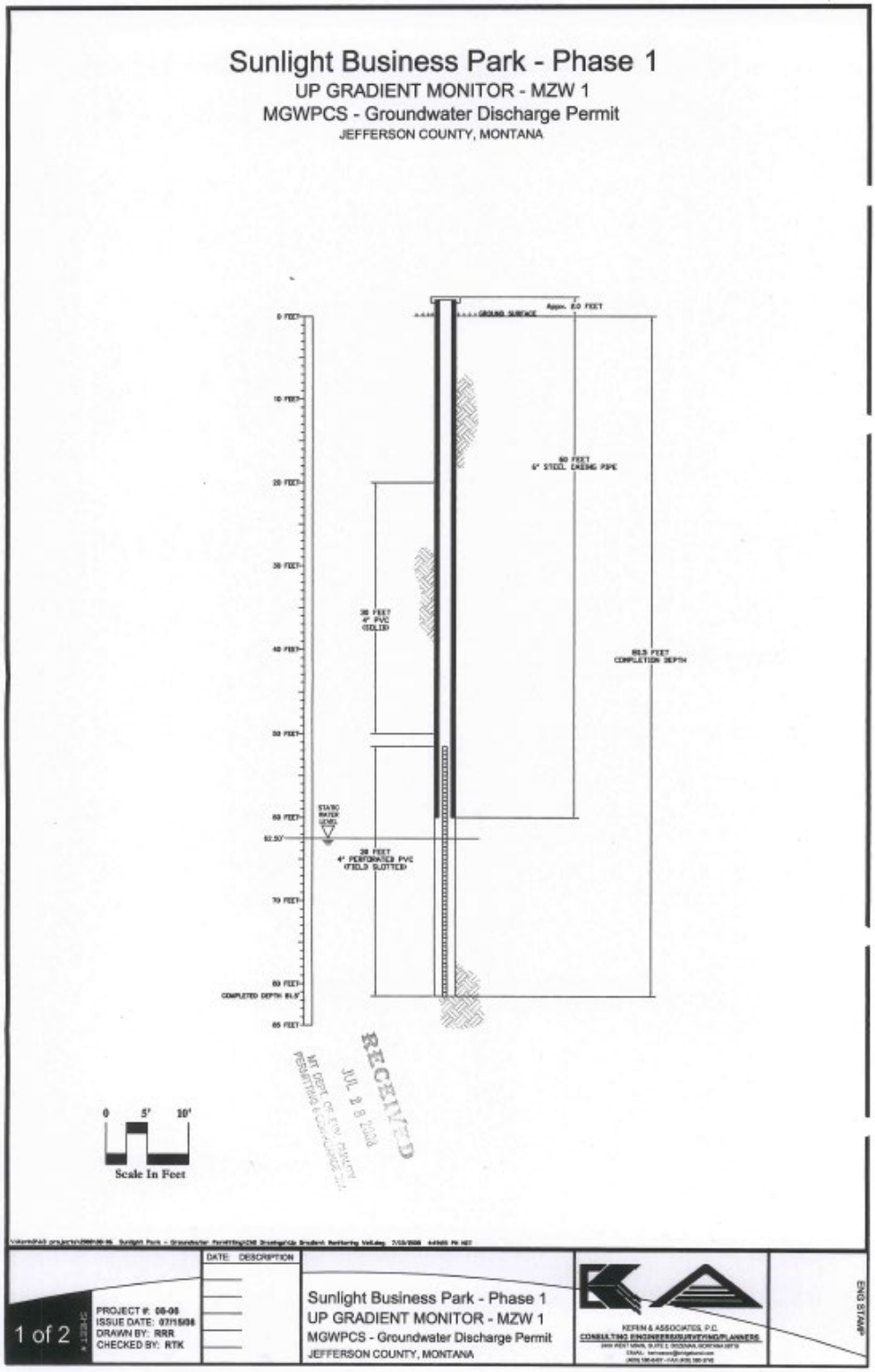
All persons, including the applicant, who believe any condition of the draft permit is inappropriate, or that DEQ's tentative decision to deny an application, terminate a permit, or prepare a draft permit is inappropriate, shall raise all reasonably ascertainable issues and submit all reasonably available arguments supporting their position by the close of the public comment period (including any public hearing). All public comments received for this draft permit will be included in the administrative record and will be available for public viewing during normal business hours.

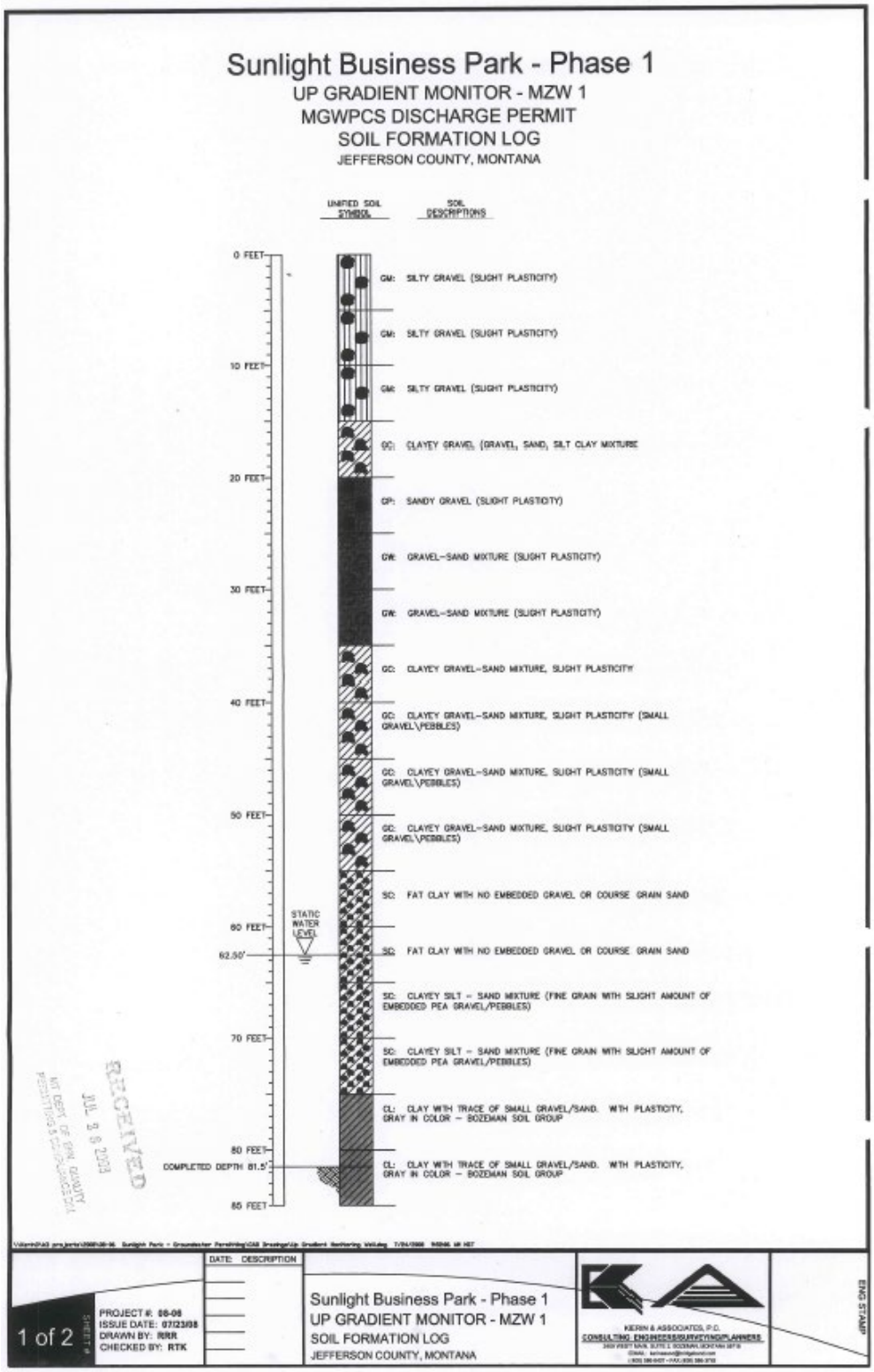
Copies of the public notice are mailed to the applicant, state and federal agencies, and interested persons who have expressed interest in being notified of permit actions. A copy of the distribution list is available in the administrative record for this draft permit. Electronic copies of the public notice, draft permit, fact sheet, and draft environmental assessment are available at the following website: http://deq.mt.gov/Public/notices/wqnotices.

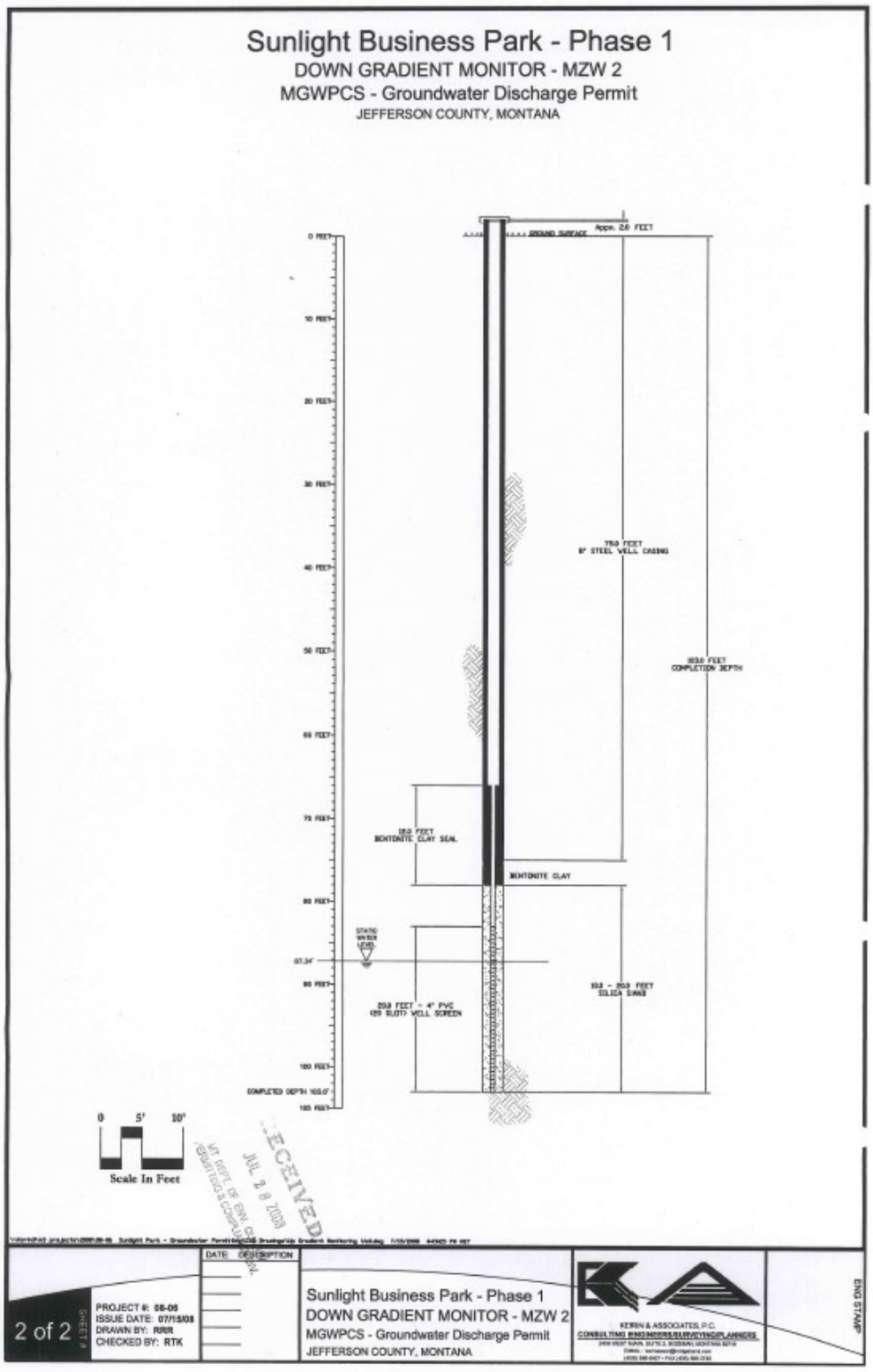
Any person interested in being placed on the mailing list for information regarding this permit may contact the DEQ Water Protection Bureau at (406) 444-5546 or email DEQWPBPublicComments@mt.gov. All inquiries will need to reference the permit number (MTX000192), and include the following information: name, address, and phone number.

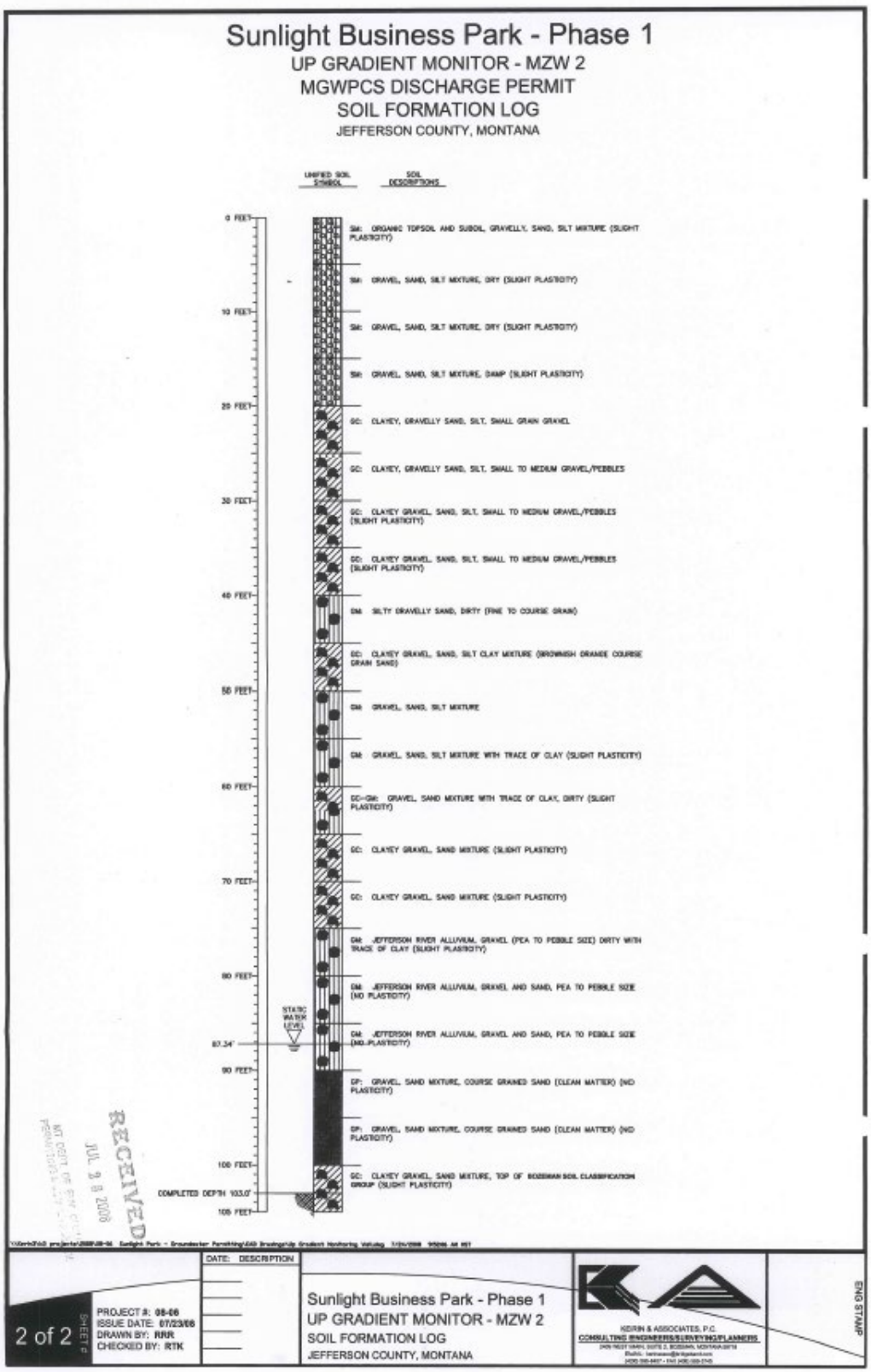
During the public comment period provided by the notice, DEQ will accept requests for a public hearing. A request for a public hearing must be in writing and must state the nature of the issue proposed to be raised in the hearing.

APPENDIX A – MONITORING WELL LOGS




Sunlight Business Park - Phase 1
UP GRADIENT MONITOR - MZW 1
MGWPCS DISCHARGE PERMIT
SOIL FORMATION LOG
JEFFERSON COUNTY, MONTANA
UNIFIED SOIL SYMBOL
SOIL DESCRIPTIONS
0 FEET
10 FEET
20 FEET
30 FEET
40 FEET
50 FEET
60 FEET
70 FEET
80 FEET
85 FEET
STATIC WATER LEVEL
62.50'
COMPLETED DEPTH 81.5'
GM: SILTY GRAVEL (SLIGHT PLASTICITY)
GM: SILTY GRAVEL (SLIGHT PLASTICITY)
GM: SILTY GRAVEL (SLIGHT PLASTICITY)
GC: CLAYEY GRAVEL (GRAVEL, SAND, SILT CLAY MIXTURE
GP: SANDY GRAVEL (SLIGHT PLASTICITY)
GW: GRAVEL-SAND MIXTURE (SLIGHT PLASTICITY)
GW: GRAVEL-SAND MIXTURE (SLIGHT PLASTICITY)
GC: CLAYEY GRAVEL-SAND MIXTURE, SLIGHT PLASTICITY
GC: CLAYEY GRAVEL-SAND MIXTURE, SLIGHT PLASTICITY (SMALL GRAVEL\PEBBLES)
GC: CLAYEY GRAVEL-SAND MIXTURE, SLIGHT PLASTICITY (SMALL GRAVEL\PEBBLES)
GC: CLAYEY GRAVEL-SAND MIXTURE, SLIGHT PLASTICITY (SMALL GRAVEL\PEBBLES)
SC: FAT CLAY WITH NO EMBEDDED GRAVEL OR COURSE GRAIN SAND
SC: FAT CLAY WITH NO EMBEDDED GRAVEL OR COURSE GRAIN SAND
SC: CLAYEY SILT - SAND MIXTURE (FINE GRAIN WITH SLIGHT AMOUNT OF EMBEDDED PEA GRAVEL/PEBBLES)
SC: CLAYEY SILT - SAND MIXTURE (FINE GRAIN WITH SLIGHT AMOUNT OF EMBEDDED PEA GRAVEL/PEBBLES)
CL: CLAY WITH TRACE OF SMALL GRAVEL/SAND. WITH PLASTICITY, GRAY IN COLOR - BOZEMAN SOIL GROUP
CL: CLAY WITH TRACE OF SMALL GRAVEL/SAND. WITH PLASTICITY, GRAY IN COLOR - BOZEMAN SOIL GROUP
RECEIVED
JUL 2 9 2019
MT DEPT OF ENV QUALITY
PERMITTING & COMPLIANCE
DATE: DESCRIPTION
1 of 2
SHEET #
PROJECT #: 08-08
ISSUE DATE: 07/23/08
DRAWN BY: RRR
CHECKED BY: RTK
Sunlight Business Park - Phase 1
UP GRADIENT MONITOR - MZW 1
SOIL FORMATION LOG
JEFFERSON COUNTY, MONTANA
KIERIN & ASSOCIATES, P.C.
CONSULTING ENGINEERS/SURVEYING/PLANNERS
END STAMP


Sunlight Business Park - Phase 1
DOWN GRADIENT MONITOR - MZW 2
MGWPCS - Groundwater Discharge Permit
JEFFERSON COUNTY, MONTANA
GROUND SURFACE
Appx. 2.0 FEET
75.0 FEET
8" STEEL WELL CASING
203.0 FEET
COMPLETION DEPTH
12.0 FEET
BENTONITE CLAY SEAL
BENTONITE CLAY
STATIC WATER LEVEL
97.34'
10.0 - 203.0 FEET
SILICA SAND
203.0 FEET - 4" PVC
.020 SLOT) WELL SCREEN
COMPLETED DEPTH 103.0'
0
5'
10'
Scale In Feet
RECEIVED
JUL 2 8 2008
2 of 2
PROJECT #: 08-06
ISSUE DATE: 07/15/08
DRAWN BY: RRR
CHECKED BY: RTK
DATE
DESCRIPTION
Sunlight Business Park - Phase 1
DOWN GRADIENT MONITOR - MZW 2
MGWPCS - Groundwater Discharge Permit
JEFFERSON COUNTY, MONTANA
KERN & ASSOCIATES, P.C.
ENG STAMP


Sunlight Business Park - Phase 1
UP GRADIENT MONITOR - MZW 2
MGWPCS DISCHARGE PERMIT
SOIL FORMATION LOG
JEFFERSON COUNTY, MONTANA
UNIFIED SOIL SYMBOL
SOIL DESCRIPTIONS
0 FEET
10 FEET
20 FEET
30 FEET
40 FEET
50 FEET
60 FEET
70 FEET
80 FEET
90 FEET
100 FEET
110 FEET
SM: ORGANIC TOPSOIL AND SUBSOIL, GRAVELLY, SAND, SILT MIXTURE (SLIGHT PLASTICITY)
SM: GRAVEL, SAND, SILT MIXTURE, DRY (SLIGHT PLASTICITY)
SM: GRAVEL, SAND, SILT MIXTURE, DRY (SLIGHT PLASTICITY)
SM: GRAVEL, SAND, SILT MIXTURE, DAMP (SLIGHT PLASTICITY)
GC: CLAYEY, GRAVELLY SAND, SILT, SMALL GRAIN GRAVEL
GC: CLAYEY, GRAVELLY SAND, SILT, SMALL TO MEDIUM GRAVEL/PEBBLES
GC: CLAYEY GRAVEL, SAND, SILT, SMALL TO MEDIUM GRAVEL/PEBBLES (SLIGHT PLASTICITY)
GC: CLAYEY GRAVEL, SAND, SILT, SMALL TO MEDIUM GRAVEL/PEBBLES (SLIGHT PLASTICITY)
SM: SILTY GRAVELLY SAND, DIRTY (FINE TO COURSE GRAIN)
GC: CLAYEY GRAVEL, SAND, SILT CLAY MIXTURE (BROWNISH ORANGE COURSE GRAIN SAND)
GM: GRAVEL, SAND, SILT MIXTURE
GM: GRAVEL, SAND, SILT MIXTURE WITH TRACE OF CLAY (SLIGHT PLASTICITY)
GC-GM: GRAVEL, SAND MIXTURE WITH TRACE OF CLAY, DIRTY (SLIGHT PLASTICITY)
GC: CLAYEY GRAVEL, SAND MIXTURE (SLIGHT PLASTICITY)
GC: CLAYEY GRAVEL, SAND MIXTURE (SLIGHT PLASTICITY)
GM: JEFFERSON RIVER ALLUVIUM, GRAVEL (PEA TO PEBBLE SIZE) DIRTY WITH TRACE OF CLAY (SLIGHT PLASTICITY)
GM: JEFFERSON RIVER ALLUVIUM, GRAVEL AND SAND, PEA TO PEBBLE SIZE (NO PLASTICITY)
STATIC WATER LEVEL
87.34'
GM: JEFFERSON RIVER ALLUVIUM, GRAVEL AND SAND, PEA TO PEBBLE SIZE (NO PLASTICITY)
GP: GRAVEL, SAND MIXTURE, COURSE GRAINED SAND (CLEAN MATTER) (NO PLASTICITY)
GP: GRAVEL, SAND MIXTURE, COURSE GRAINED SAND (CLEAN MATTER) (NO PLASTICITY)
GC: CLAYEY GRAVEL, SAND MIXTURE, TOP OF BOZEMAN SOIL CLASSIFICATION GROUP (SLIGHT PLASTICITY)
COMPLETED DEPTH 103.0'
RECEIVED
JUL 2 8 2008
DATE: DESCRIPTION
2 of 2
SHEET #
PROJECT #: 08-06
ISSUE DATE: 07/23/08
DRAWN BY: RNR
CHECKED BY: RTK
Sunlight Business Park - Phase 1
UP GRADIENT MONITOR - MZW 2
SOIL FORMATION LOG
JEFFERSON COUNTY, MONTANA
KEIRN & ASSOCIATES, P.C.
CONSULTING ENGINEERS/SURVEYING/PLANNERS
ENG STAMP

MONITORING WELL MW1 (ON RIGHT)

APPENDIX B – EFFLUENT LIMIT CALCULATIONS

The system consists of Advantex Level 2 system.

To protect beneficial uses [ARM 17.30.1006(1)(b)(ii)], there shall be no increase of a parameter to a level that renders the waters harmful, detrimental, or injurious to the beneficial uses. Therefore, no wastes may be discharged such that the waste either alone or in combination with other wastes will violate or can reasonably be expected to violate any standard. DEQ establishes the effluent limitations for nitrogen based on the projection that the entire nitrogen load in the wastewater stream may ultimately be converted to nitrate (USEPA, 2002a).

The allowable discharge concentrations are derived from a mass-balance equation (ARM 17.30.517) which is a simple steady-state model, used to determine concentration after accounting for other sources of pollution in the receiving water and any dilution as provided by a mixing zone. The mass-balance equation (Equation 1) derived for ground water is as follows:

Equation 1:

$$Q_{gw}C_{gw} + Q_{eff}C_{eff} = Q_{comb}C_{proj}$$

Where:

Q_{gw}	=	ground water available for mixing
C_{gw}	=	ambient receiving ground water concentration
Q_{eff}	=	maximum design capacity of wastewater system
C_{eff}	=	effluent pollutant concentration
Q_{comb}	=	combined ground water and effluent ($Q_{comb} = Q_{gw} + Q_{eff}$)
C_{proj}	=	projected pollutant concentration (after available mixing)

The mass-balance equation has been arranged to calculate effluent limits so that the discharge does not cause or contribute to an exceedance of the most restrictive water quality standard. This equation can be applied to any effluent and receiving water where the applicable dilution ratio is known. This equation will only be used for nitrogen which has been authorized a mixing zone (Section 4).

Equation 2:

$$C_{lmt} = C_{std} + D(C_{std} - C_{gw})$$

Where:
C_{lmt} = effluent limitation concentration
C_{std} = water quality standard concentration = 10 mg/L
C_{gw} = ambient receiving ground water concentration = 5.2 mg/L D = dilution ratio (Q_{gw} / Q_{eff}) = 4577 / 4251

C_{lmt} =10 + (4577/4251)(10 – 5.2) **= 15.17 mg/L**

A mass-balance approach is used to calculate the effluent quality of the discharge that meets the most restrictive water quality standard at the end of the mixing zone. Numeric effluent limitations are expressed as loads since this type of limitation inherently regulates both volume and strength of the effluent as prescribed by 75-5-402(3), MCA. Load limits ensure compliance with the ground water standards at the end of the mixing zone. Based on the proposed design capacity, the respective load effluent limitation is:

4.0 lbs/day
[(8.34*10-6)* 15.7 mg/L*31,800 gpd]
as based on the following equation:

Equation 3:

Llmt =CON * Ceff *

DCeff Where:
Llmt = effluent limitation-load
Ceff = allowable effluent concentration
DCeff = design capacity of wastewater treatment system
(gpd) CON = conversion factor [$8.34*10^{-6}$]

The Final Effluent Limits are summarized in Table 8 for Outfall 001.