MEMORANDUM

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DATE: April 15, 2016

SUBJECT: **Reuse Permit M-020-05, USFS Sam Owen Campground, Staff Analysis Supporting Reuse Permit Issuance**

Executive Summary

The United States Forest Service (USFS) Sam Owen Campground is served by a municipal wastewater treatment and recycled water irrigation system. The recycled water system is classified as a Class D system. The irrigation site consists of six (6) acres of native forest which has historically been lightly loaded both hydraulically and with nutrients (nitrogen and phosphorous). There are no major changes to the facility's operations since last permit was issued that need to be addressed. Irrigation will continue to only be permitted during the growing season. There are no impacts or nuisance conditions that will need to be addressed with the new permit. The most recent inspection (2015) and annual report reviews conducted by the Idaho Department of Environmental Quality (DEQ) have indicated that the USFS is operating the system in substantial compliance with the reuse permit.

The draft permit discussed in this Staff Analysis is similar to the current permit with the exception of a different method of calculating the "irrigation water requirements" for the native forest vegetation. Staff recommends that the new permit, M-020-05, be issued for the USFS Sam Owen Campground with a ten (10) year permit duration.

1 Introduction

The purpose of this memorandum is to satisfy the requirements of IDAPA 58.01.17.400 for issuing recycled water reuse permits. It briefly states the principal facts and significant questions considered in preparing the draft permit and provides a summary of the basis for the draft permit conditions.

The following is a summary of the reuse permit application process to-date:

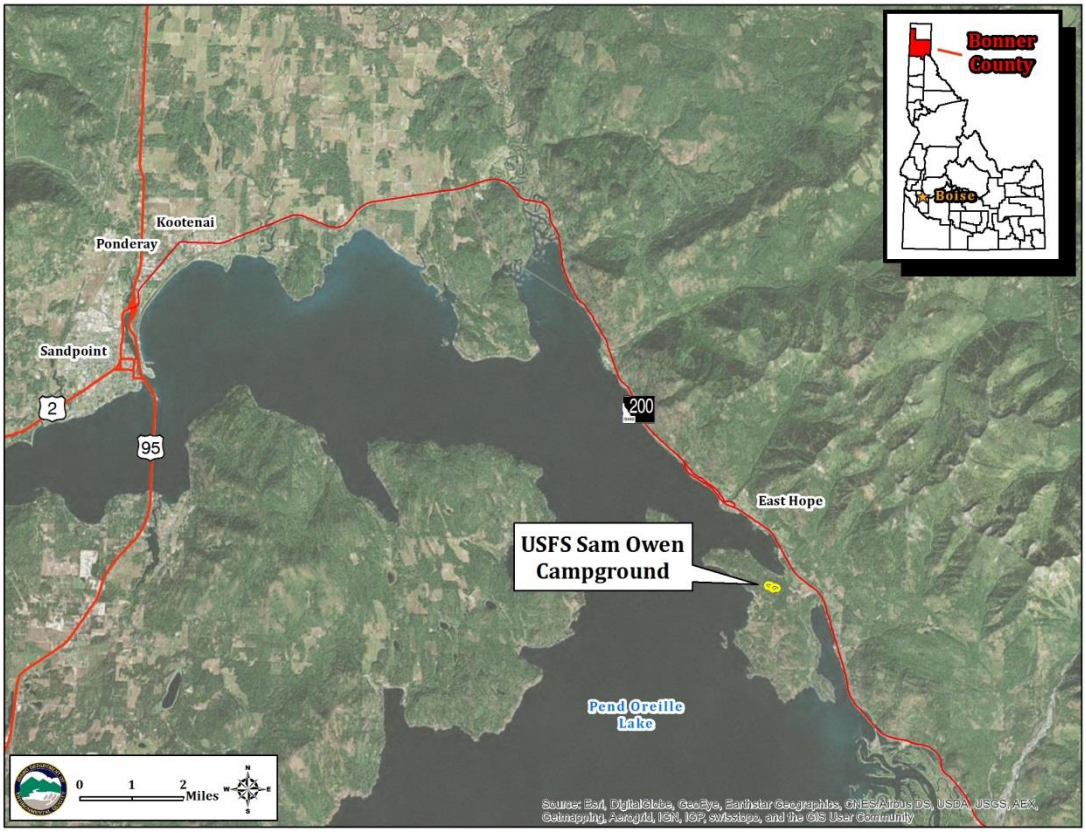
- The first reuse permit (LA-0000020-01) was issued by DEQ to the USFS for the Campground in 1993. Permit 02 was issued in 1999 and Permit 03 was issued in 2004.

- The current permit, LA-000020-04, was issued on May 9, 2011 and expires May 9, 2016.
- Permit application (Technical Report which included the 2014 Operation and Maintenance Manual for the wastewater facility) received – September 2, 2015. Prepared by Debbie Johnston, P.E., of Morrison-Maierle, Inc., Missoula, Montana.
- DEQ's "Completeness Determination" letter and effective date of application – January 6, 2016.
- DEQ's preliminary decision to prepare draft reuse permit – January 6, 2016.

2 Site Location and Ownership

The USFS Sam Owen Campground (Campground) is located on the Hope Peninsula of Lake Pend Oreille in Bonner County, Idaho. The township, range and section description is as follows: T56N, R01E, Sections 11& 12. The Campground is located approximately 13 miles east, southeast of Sandpoint, Idaho and two (2) miles south, southeast from East Hope, Idaho (see Figure 1). The Campground lies in the Kaniksu National Forest which is part of the Idaho Panhandle National Forests.

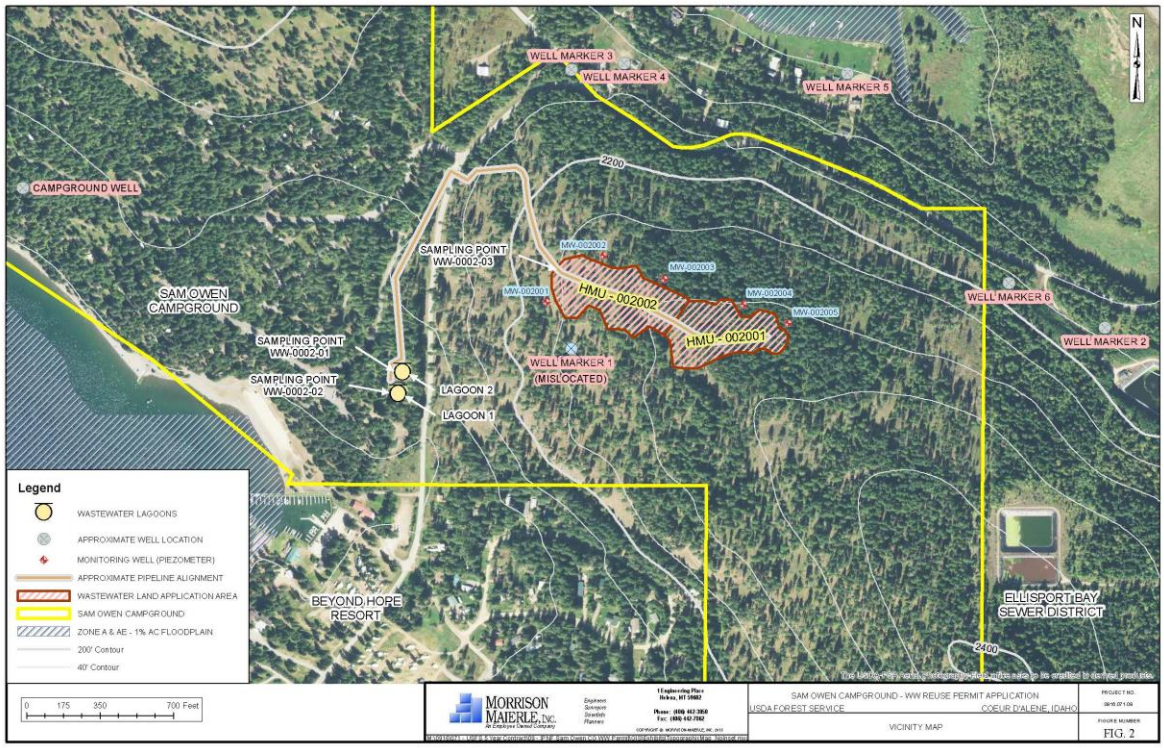
Figure 1. Vicinity Map



The recycled water facility for the Campground is located on the Campground property. The Campground is approximately 303 acres with 80 campsites. As shown on the map in Figure 2, the northern boundary of the six (6) acre irrigation site is located approximately 1,300 feet from Lake Pend Oreille and 1,500 feet on the south boundary from the lake. The elevation of the

irrigation site varies between 2220 to 2300 feet and the Lake Pend Oreille summer pool elevation is 2050 feet. The 100-year floodplain elevation is 2074 feet (Johnston, 2015).

Figure 2. Site Map



The Campground and recycled water treatment facilities are owned by the United States Department of Agriculture Forest Service. For operation and maintenance of the Sam Owen Campground, including the wastewater treatment facilities, the USFS contracts with American Land & Leisure (AL&L). AL&L contracts with Water System Management, Inc. (WSM) who provides the Idaho licensed operators to oversee the operation of the facilities. The 2014 agreement for these services is included in the Technical Report (Johnston, 2015) and is automatically renewed each year unless one of the parties provides a 30 day notification that they want to void the contract.

The Campground is surrounded by private property on the Hope Peninsula (see Figure 3). In Figure 3, the shaded green area is the 303 acre Campground property owned by the Forest Service and all other property around it is privately owned. The closest private property to the irrigation sites is approximately 700 feet to the north and the closest dwelling is approximately 800 feet to the north.

Figure 3. Site Map and Surrounding Land Ownership

3 Process Description

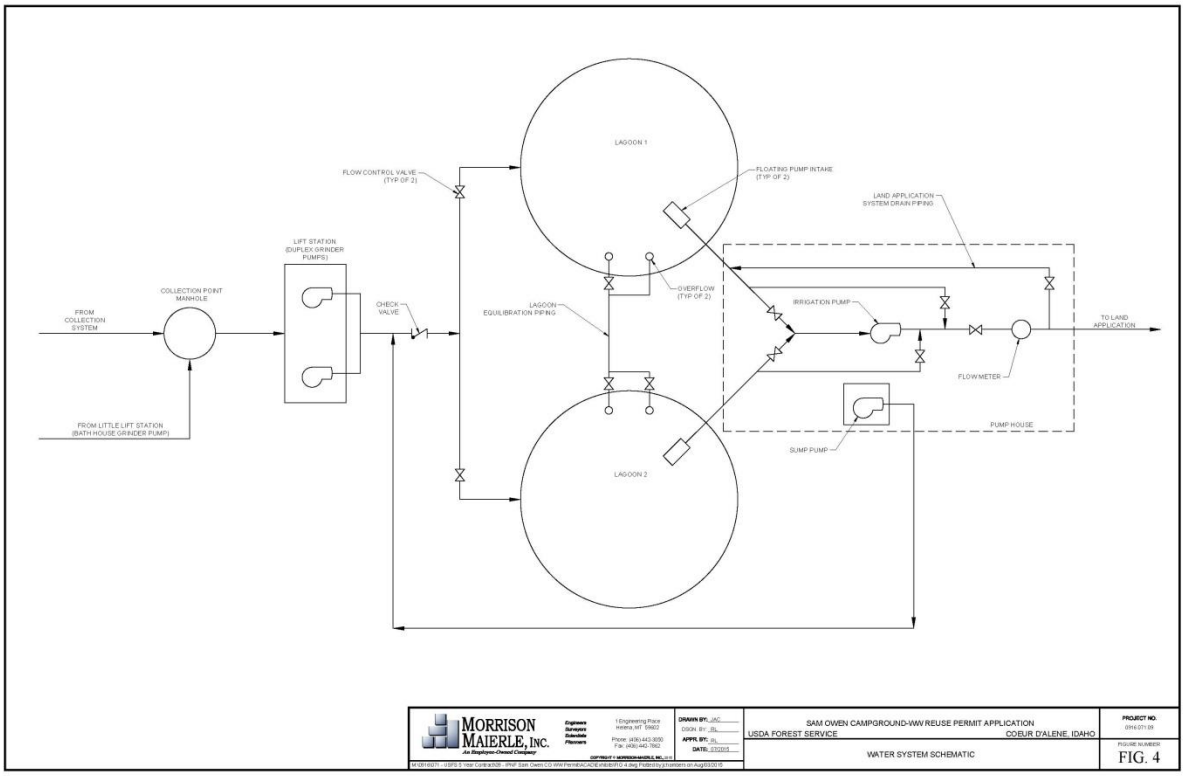
The Campground wastewater collection system consists of three (3) separate wastewater collection areas within the Campground. The nine (9) campground bathrooms are connected to a gravity collection system of 4-inch and 6-inch pipe with manholes and cleanouts. The raw sewage from the bathrooms flows to the main duplex, grinder pump lift station. There also is a RV dump station that is connected via gravity to the main lift station. The dump station includes a septic tank for solids settling and septic effluent is conveyed to the lift station. The Beach House bathroom is served by a simplex grinder pump station which pumps wastewater to a manhole upstream of the main lift station.

The Campground also serves potable drinking water and is regulated by DEQ (PWS #ID1090167). Undisinfected ground water from a single well provides water for the Campground bathrooms and water spigots serving the campsites (see Figure 2 for the location of the well). In the event of any sewage release from the wastewater collection system, it is important for the operators to take the appropriate measures to protect the water supply and drinking water distribution system.

The main lift station pumps the wastewater to the two (2) above-ground, circular, open-topped, concrete aerated treatment/storage tanks. Each tank has a diameter of 85 feet and is 16 feet deep. The working volume of each tank is about 611,000 gallons up the overflow pipe depth of 14.4 feet. Each tank is equipped with a 5-hp surface aerator to provide mixing and add oxygen. Piping and valving allows the influent wastewater pumped from the main lift station to enter either of the tanks or be split between the two (2) tanks. The tanks were tested for leakage in

2012 (south tank) and 2014 (north tank) in accordance with the Idaho Wastewater Rules (IDAPA 58.01.16) lagoon seepage testing procedures. Both tanks were found to have leakage rates less than the maximum allowable rate of 0.25 inches per day (see Section 5.3). See Figure 4 for a schematic of the wastewater system.

Figure 4. Wastewater System Schematic



The collection and treatment systems serving the Campground are typically only operational between May and September each year. When the Campground is closed in September, the potable water supply is shut down and collection system pumps are shut off. Precipitation does enter the treatment/storage tanks and accumulates because they are not covered. Typically from October to April there is about 24 inches of precipitation or about 85,000 gallons in each tank. The liquid level in the tanks is drawn down to accommodate the precipitation and leave adequate space for recycled water storage during the first couple months of the next camping season.

The most current Operation and Maintenance (O&M) Manual is dated March 2014 (Johnston, 2015). The O&M Manual describes how the tanks should be operated. Each tank should be isolated and aerated a minimum of 20 days before starting to irrigate from that tank. While one tank is isolated, the other is receiving the influent flow from the main lift station. The O&M Manual also recommends that at least 12 hours prior to irrigating from a tank, the aerator should be turned off to allow for settling of solids.

Following aeration and settling in the tanks, the recycled water is chlorinated prior to being irrigated. The chlorination system consists of a chemical feed pump that injects 12.5% liquid sodium hypochlorite solution into the irrigation pump discharge pipe. The calculated chlorine contact time through the 3-inch and 4-inch discharge pipe varies from 13 to 16 minutes

depending on the irrigation pump flow rates (Johnston, 2015). Sampling for total coliform concentration and free chlorine residual concentration occurs at the sample tap located on the irrigation pump discharge pipe just upstream from the first irrigation sprinkler head. Based on past total coliform concentration results reported in the 2015 and 2014 annual reports, the combination of pretreatment provided in the tanks, initial chlorine concentration at the point of injection and contact time appears to adequately disinfect the recycled water to typically meet the permit disinfection requirements for this Class D system (Hansen, 2015 and 2014).

The irrigation pump is a single, 15-hp, vertical centrifugal pump installed in a pump house. When seasonally irrigating the native forest site (current permit allows from August 25 to October 7), recycled water is pumped to one (1) of the two (2), three (3) acre irrigation fields (see Figure 2). There are 22 impact sprinklers in each field installed on 2-foot tall riser pipes. According to the 2014 O&M Manual, the pumping rate to the lower field (western) is about 98 gallons per minute (gpm) and 87 gpm to the upper field (eastern) (Johnston, 2015). The fields are alternatively irrigated and not irrigated any more than three (3) times per week. The current permit also limits the daily volume that can be irrigated to 40,781 gallons or about 0.5 inches which equates to a maximum run time for the lower field of about 7 hours and 8 hours for the upper field.

Biosolids will accumulate in the tanks. Reportedly biosolids have never been pumped out of the tanks (Johnston, 2015). Disposal of the biosolids will need to be done in accordance with the applicable state and federal requirements. These biosolids cannot be land applied with septage unless authorized by DEQ.

4 Site Characteristics

4.1 Site Management History

The Campground received the first DEQ issued reuse permit in 1993 (LA-000020-01). Native forest has been the “crop” irrigated since the first permit was issued. The same two (2) hydraulic management units (MUs) have been used for 23 years.

A silvicultural plan was submitted to DEQ in 1995 and updated in 2008 (Johnston, 2015). The 2008 plan has recommendations for improving the vitality of the native forest being irrigated. The USFS has not implemented any of the recommendations from the 2008 report or performed any active management of the native forest irrigation site since the site was first used for irrigation of recycled water (Johnston, 2015). The draft permit will include a compliance activity to update the silvicultural plan and include implementation updates in the annual reports.

Based on the review of recent annual reports, the irrigation site is being managed in accordance with the current permit limits and conditions for hydraulic loading rates.

4.2 Climatic Characteristics

The climatic characteristics for the region are described in detail in Section 3.2 of the technical report (Johnston, 2015). The data is taken from the National Climate Data Center for the North Idaho Panhandle region which includes the Campground area.
The Campground is located approximately 13 miles east, southeast of Sandpoint, Idaho. Western Regional Climate Center (WRCC) temperature data at the Sandpoint Experimental Station (#108137) indicates that the average temperatures during the permitted growing season (April through October) varies from 45.5^{o}F to 65.2 ^{o}F. (*http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?idsand*). The gross average monthly precipitation during the growing season from the Sandpoint weather station (Sandpoint KSPT Station #108137, ET Idaho 2012, *http://data.kimberly.uidaho.edu/ETIdaho/stcvrstats.py?station=108137&cover=-2&stats=Special*) is shown in Table 1. Annual average gross precipitation is 33.66 inches for the Sandpoint area and 6.69 inches during the proposed irrigation season (June 1 through September 30).

Table 1. Growing season average precipitation for Sandpoint, Idaho Station #108137 (ET Idaho 2012, 1973-2007).

Month	Average Precipitation (inches)
June	2.46
July	1.31
August	1.43
September	1.49
Total Growing Season Precipitation	**6.69**

Crop evapotranspiration for this location was taken from the ET_{Idaho} 2012 website (*http://data.kimberly.uidaho.edu/ETIdaho/*) using the Coeur d'Alene 1E Weather Station located at latitude 47° 41' North, longitude 116° 45' West at an elevation of 2,160 feet and 42 miles southwest from the Campground. This weather station is used for estimating the precipitation deficit for the native forested site because it is the closest and most representative "irrigated" station (crop evapotranspiration data is calculated based on irrigation occurring). The Sandpoint Weather Station is closer but a "non-irrigated" station and evapotranspiration data is calculated based on only precipitation providing water for plant growth. The Bonner Ferry Weather Station (#101079) is located 33 miles north of the Campground and is an "irrigated" station. It was not used for estimating the crop evapotranspiration at the Campground because it has slightly less average precipitation during from June to September (4.67 inches) than Coeur d'Alene (4.97 inches). The average minimum and maximum temperatures from June to September are similar for all three (3) stations.

The precipitation deficit (net irrigation water requirement) for the proposed permitted irrigation season (June 1 to September 30) is discussed in Sections 4.6.2 and 6.7 and is as follows:

- Native conifer forest: 22.6 inches

4.3 Soils

The Natural Resources Conservation Service (NRCS) Web Soil Survey shows two (2) predominant map unit delineations for the recycled water irrigation sites, as follows: Pend Oreille-Rock outcrop complex; and Treble-Rock outcrop association. Rock outcrops range from 25% to 30%. The typical profiles in the top 60 inches of soil profile for these units include ashy silt loam, gravelly loam, gravelly sandy loam, very cobbly sandy loam, very gravelly coarse sandy loam and very gravelly loamy coarse sand. Bedrock or restrictive features are typically at depths of about 40-60 inches. The soils are described as well-drained with a moderately high capacity to transmit water, while soil water storage is moderate to low with about 6 inches for the Pend Oreille-Rock outcrop complex and 4 inches for the Treble-Rock outcrop complex. Detailed descriptions of the soil types as provided on the NRCS Web Soil Survey website are included in Attachment D of the Technical Report (Johnston, 2015).

The irrigation site slopes are estimated at about 6% from southeast to northwest (Johnston, 2015). Using the rating criteria given in the rating table in the DEQ reuse guidance document (Table 2-5, p. 2-23), the site scores a 29, which places the site in the high suitability category for land application (Johnston, 2015).

Soil monitoring has not been a requirement in the current permit and there is no soil data to evaluate. The past nutrient and hydraulic loading rates have been relatively low in comparison to theoretical uptake rates for a native conifer forest so there would be limited value in monitoring this media.

4.4 Surface Water

There are no streams, ditches, springs or other surface water bodies within 100 feet of the irrigation sites. The closest surface water body is Lake Pend Oreille. As shown on the map in Figure 2, northern boundary of the six (6) acre irrigation site is located approximately 1,300 feet from Lake Pend Oreille and 1,500 feet on the south boundary from the lake. The elevation of the irrigation site varies between 2220 to 2300 feet and the Lake Pend Oreille summer pool elevation is 2050 feet. The 100-year floodplain elevation is 2074 feet (Johnston, 2015). In 2002, the U.S. Environmental Protection Agency (EPA) approved a Total Maximum Daily Load (TMDL) for Lake Pend Oreille to control phosphorus (the nutrient of concern) in order to protect and maintain water quality standards in the nearshore waters of the lake (DEQ, 2004). The irrigation of recycled water at the Campground's irrigation site in accordance with the permit conditions should not result in phosphorous entering the lake and impacting the nearshore phosphorous concentrations.

4.5 Ground Water Hydrogeology

Seasonal high ground water near the irrigation site has been a concern addressed in the past permits with requirements to monitor the depth to ground water in five (5) piezometers around the irrigation site. The depths of the piezometers range from four (4) to eight (8) feet deep. The soil depth, as discussed in Section 4.3, extends to 60 inches below ground surface. Beneath this

soil can be bedrock, which serves as an aquiclude limiting recharge of nearby surface water into the ground water. As a result, it is common to have pockets of seasonally perched water on top of the bedrock in areas where lateral drainage is restricted. Normally these areas develop in the spring and subside by the end of the summer (Plaisted, 2011). Past annual reports submitted by the Campground indicate that when irrigating in August and September, the piezometers have consistently shown that the depths to ground water from the ground surface were greater than three (3) feet. No ground water quality monitoring has been required in past permits.

The Campground's public well is the closest public well and is located about 2,500 feet west of the irrigation site (see Figure 2). The Campground water system is regulated by DEQ (PWS #ID1090167). The well was drilled in 1941 to a depth of 158 feet and production is estimated to be about 20 gallons per minute. The depth to water was estimated at 20 feet below the ground surface (DEQ, 2015). A 2005 "Ground Water Under Direct Influence of Surface Water" (GWUDI) evaluation indicated that there is not a direct connection between the surface water (Lake Pend Oreille which is about 200 feet from the well) and the ground water that supplies the well (DEQ, 2015). No chronic contamination problems have been reported with the water system and as of the latest drinking water survey done in 2015, the system was in compliance with the Idaho Rules for Public Drinking Water Systems.

A review of well logs filed with the Idaho Department of Water Resources (IDWR) shows that ground water is found at two (2) distinct levels: 20 to 50 feet and 200 to 300 feet below the ground surface (Johnston, 2015). There are private wells drilled to serve homes in the area. None of the wells appear to be closer than 500 feet from the irrigation site (Johnston, 2015).

Considering the historically low hydraulic loading rate the Campground is able to successfully operate with and only irrigating in August and September, the risk of impacting the shallow ground water under the irrigation site appears to be low.

4.6 Recycled Water Characterization and Loading Rates

The current permit limits include maximum growing-season hydraulic rates for each management unit. The Campground has generally been in compliance with these permit limits.

4.6.1 Recycled Water Characterization

Recycled water annual average constituent concentrations for the years 2011 to 2015 are shown in Table 2. Data in Table 3 were taken from 2010 – 2014 annual reports.

Table 2. Annual average effluent quality

Year	Total N (mg/L)	Total P (mg/L)
2011	44.5	10.9
2012	22.8	8
2013	12.8	5.6
2014	44.8	11.7
2015	24.5	11.2
Average	29.9	9.5

The average annual volume effluent used for land application is shown in Table 3.

Table 3. Average annual recycled water irrigated

Year	Irrigated Water (million gallons)
2011	0.819
2012	0.783
2013	1.046
2014	0.586
2015	0.342
Average	0.715

The current permit includes a total coliform limit of a Class D system (maximum of 230 organisms/100 ml. as the median value of the last five (5) results and a maximum single sample concentration of 2300 organisms/100 ml.). As shown in Table 4, the Campground has been in compliance with these disinfection permit limits throughout the current permit period.

Table 4. Summary of annual total coliform monitoring data for the last permitting cycle

Year	Total # of Total Coliform Samples	Total # of Samples that Exceeded 230 CFU/100 mL	Total # of Samples that Exceeded 2300 CFU/100 mL	% of Samples Resulting in Non-compliance Events
2011	3	1	0	0%
2012	4	0	0	0%
2013	6	0	0	0%
2014	4	0	0	0%
2015	2	0	0	0%

4.6.2 Hydraulic Loading Rates

The historical hydraulic loading rates for each of the reuse fields are shown in Table 5.

Table 5. Average hydraulic loading rates, 2011 to 2015

Year	Annual Average		Weekly Average		Daily Average	
	MU-020-01 (inches/acre)	MU-020-02 (inches/acre)	MU-020-01 (inches/acre)	MU-020-02 (inches/acre)	MU-020-01 (inches/acre)	MU-020-02 (inches/acre)
2011	5.45	4.60	No data	No data	No data	No data
2012	4.76	4.85	1.59	1.62	0.44	0.35
2013	6.54	6.31	1.31	1.26	0.36	0.37
2014	4.46	2.73	1.49	0.91	0.29	0.19
2015	1.81	2.38	0.91	1.19	0.36	0.40
Average	4.60	4.17	1.33	1.25	0.36	0.33

The current permit includes maximum annual (6 inches and 1 million gallons), weekly (1.5 inches) and daily (0.5 inches) hydraulic loading rates with the intention being to avoid overloading the irrigation sites. With the exception of exceeding the maximum weekly loading rates a few times in 2012 and 2014, the Campground complied with the hydraulic loading rate permit conditions. In addition, the current permit limited the irrigation season each year to August 25 to October 7 and the Campground was able to comply with this requirement except in 2013.

The annual hydraulic loading rate permit limit of 6 inches was recognized by the DEQ permit writers as being low compared to the estimated annual irrigation water requirement of 26 inches for a native conifer forest site (Plaisted, 2011). The permit also reflected the Campground's historical operating strategy of typically irrigating the entire volume of wastewater generated for the camping season in August and September.

The Campground has requested that the irrigation season be increased to also allow irrigation in June and July. This will give the operator additional flexibility to irrigate when evapotranspiration rates are high in July which should reduce the risk of hydraulically overloading the irrigation sites and creating runoff. There are no proposed changes to the campground in the near future that would significantly change the volume of wastewater generated or the hydraulic/nutrient loading rates to the irrigation site. The factors that most impact the annual wastewater volume generated are the amount of precipitation collecting in the storage tanks and infiltration/inflow (I/I) problems in the wastewater collection system. Staff supports the Campground's request to increase the irrigation season from June 1 to September 30.

Staff recommends that the new permit require the Campground to irrigate "at or below" the estimated monthly irrigation water requirements (IWR) during the permitted growing season from June 1 to September 30. The IWR for a native conifer forest site is estimated using data from ETIdaho 2012 to calculate the monthly precipitation deficit. DEQ has prepared a guidance document that covers the procedure for using weather related data from nearby weather stations in ETIdaho with some site specific assumptions about tree canopy coverage and understory coverage (DEQ, 2012). The estimated monthly IWRs using an irrigation season from June to September are shown in Table 6. Irrigation outside of those months will not be permitted. A more detailed discussion of the methodology used to calculate the IWRs is included in Section 6.7 of this Staff Analysis.

Table 6. Calculated IWR for MU-020-01 & 02 (each 3 acres) Using 80% Exceedance Precipitation Deficit Data

Month	Forest Pdef[1]	Understory Pdef[2]	Weighted Pdef[3]	IWR[4]	IWR[5]
	(inches)	(inches)	(inches)	(inches)	(Million Gallons)
June	2.74	1.06	3.80	5.07	0.83
July	4.35	1.85	6.20	8.27	1.35
August	3.23	1.29	4.52	6.03	0.98
September	1.70	0.71	2.41	3.21	0.52
Total	**12.02**	**4.91**	**16.93**	**22.58**	**3.68**

1. Represented by ETIdaho data for "Orchard-no ground cover" using 80% exceedance values for Pdef
2. Represented by ETIdaho data for "Grass Pasture-high maintenance" using 80% exceedance values for Pdef
3. Weighted assuming 70% Forest Canopy Density and 30% Ground cover
4. Calculated using Pdef/E, where E is the irrigation efficiency estimated to be 75%
5. Calculated using IWR in inches * 6 acres

The Campground irrigated an annual average of 0.715 million gallons (MG) from 2011 to 2015 (see Table 3). The Campground's irrigation site acreage and annual recycled water volume appear to work with the estimated IWR shown in Table 6. The storage volumes of the two (2) concrete storage tanks (611,000 gallons each) have been adequate in the past to allow the operator enough storage capacity so irrigation did not have to start until at the earliest July. All other years except 2013, the storage capacities were adequate to not require irrigation until the end of August, as stipulated in the current permit.

4.6.3 Constituent Loading Rates

Nitrogen and Phosphorus

Annual nitrogen and phosphorous loading rates from irrigated recycled water for the years 2011 to 2015 are shown in Table 7.

Table 7. Irrigated recycled water nitrogen and phosphorous loading rates (2011 to 2015)

Year	Total N (lbs./acre)		Total P (lbs./acre)	
	MU-020-01 (lbs./acre)	MU-020-02 (lbs./acre)	MU-020-01 (lbs./acre)	MU-020-02 (lbs./acre)
2011	54.9	46.4	13.5	11.4
2012	24.6	25.1	8.6	8.8
2013	19.0	18.3	8.3	8.0
2014	45.3	27.7	11.8	7.2
2015	10.1	13.2	4.6	6.0
Average	30.8	26.1	9.4	8.3

The current permit does not include any permit limits for nitrogen and phosphorous. The rationale for this decision was that with the permitted hydraulic loadings and historical total nitrogen and phosphorous concentrations, the loading rates would be below the estimated nutrient uptake rates for a native conifer forest of 100 lbs./acre for nitrogen and 25 lbs./acre for

phosphorous (Plaisted, 2011). As shown in Table 7, the annual nutrient loading rates have been below the estimated uptake rates. There are no proposed changes to the Campground in the near future that are anticipated to significantly change nutrient loading rates.

In the draft permit, the nitrogen loading rates will be calculated based on the DEQ recycled water forest guidance (DEQ, 2012). Section 6.7 of this Staff Analysis includes a more detailed discussion of how these loading rates were calculated. The assumptions used to calculate these rates include that the predominant tree species are 80-year old Douglas fir (Johnston, 2015), 70% of the irrigation sites are covered by the tree canopy and 30% are covered with herbaceous understory. Younger trees have higher nitrogen uptake capacities than older trees (DEQ, 2012). Staff recommends that the draft permit include a maximum nitrogen loading rate of 63 lbs./acre. Comparing this proposed permit limit with the historical loading rates in Table 7, it appears that the Campground can comply with this limit.

A recommended phosphorous loading rate is 20 lbs./acre/year for non-grazed, privately owned woodlands (NRCS, 1998). Since 2011, the average total phosphorous loading rate has been about 9 lbs./acre (see Table 7). Therefore, the phosphorous loading rates from the irrigated recycled water should be less than the estimated phosphorous uptake rate of the native conifer forest sites.

Staff recommends that no phosphorous loading rate limits be included in the draft permit but continue monitoring phosphorous concentration in the irrigated recycled water to determine annual loading rates.

<u>Total Coliform</u>

The current permit includes Class D disinfection permit limits requiring that prior to irrigation of the recycled water, the wastewater be oxidized and disinfected. Disinfection through the injection of liquid sodium hypochlorite and contact time occurs after treatment/storage in the concrete storage tanks and prior to the first sprinkler head. Daily sampling for free chlorine residual and weekly sampling for total coliform is required in the current permit. The total coliform concentration limits for Class D are the following:

"The median number of total coliforms organisms can be no more than 230 organisms per 100 milliliters (organisms/100mL), as determined from the results of the last three (3) days for which analyses have been completed and no total coliform samples shall exceed 2300 organisms/100mL in any confirmed sample."

As shown in Table 4, the Campground was able to comply with these permit limits continuously throughout the permit period. The DEQ recommended buffer zone distances for Class D sprinkler irrigated recycled water will continue to be maintained (see Section 5.1 of this Staff Analysis).

Staff recommends the draft permit include when irrigating daily sampling for total chlorine residual and weekly sampling for total coliform.

Chemical Oxygen Demand (COD) DEQ guidance recommends COD loading rate limit of 50 lbs./acre-day during the growing season (DEQ, 2007). Currently data does not exist for the COD concentration of the irrigated recycled water at this facility. Typical COD concentration in raw municipal wastewater is about 400 mg/L (Metcalf, 1979). The Campground COD concentration may be higher than typical raw wastewater because there is a higher proportion of black water to gray water in the waste stream from public toilets. Assuming a COD concentration of 600 mg/L in the irrigated recycled water (following treatment and storage), 20 days of irrigation and a total of one (1) million gallons irrigated for the season, the estimated loading is 42 lbs. COD/acre-day. In addition, high COD loading to an irrigation site can sometimes lead to nuisance odor problems. There have not been any documented odor complaints registered with DEQ related to the irrigation of recycled water at these irrigation sites.

Staff recommends that no COD loading limit be included in the draft permit and no monitoring is recommended for this constituent.

Non-volatile Dissolved Solids (NVDS)

NVDS monitoring of the irrigated recycled water during the growing season is sometimes required in reuse permits. Typical concentration of NVDS in raw municipal wastewater is 300 mg/L and a strong concentration is 525 mg/L (Metcalf, 1979). The Campground NVDS concentration may be higher than typical raw wastewater because there is a higher proportion of black water to gray water in the waste stream from public toilets. Assuming a NVDS concentration of 600 mg/L in the irrigated recycled water (following treatment and storage) and a total of one (1) million gallons irrigated for the season, the estimated loading is 834 lbs. NVDS/acre.

For a native forest, there is not information on the estimated annual ash (NVDS) uptake. Excess NVDS loading can lead to salt leaching into the ground water and/or build-up of salts in the soils that could be detrimental to the health of the forest.

Irrigation of the recycled water for the Campground typically has been completed in less than 20 days from July through September. The highest annual hydraulic loading rate during the last permit period was about 7 inches/acre (see Table 5) and the average annual precipitation is 34 inches/acre (see Section 4.2). Leaching of salts from the recycled water irrigation will occur during the non-irrigation periods and likely prevent any harmful salt buildups in the soil. The risk appears to be low of the salt leaching causing an impact to the ground water due to the dilution provided by the precipitation. The secondary constituent standard for total dissolved solids in the Idaho Ground Water Quality Rule (IDAPA 58.01.11) is 500 mg/L.

Staff recommends that no NVDS loading limit or monitoring in the irrigated recycled water for this constituent be included in the draft permit. In addition, no monitoring of electrical conductivity in the soil is recommended.

5 Site Management

5.1 Buffer Zones

Buffer zones for protection of surface water, ground water, drinking water supplies and the public are required by the Idaho Recycled Water Rules (IDAPA 58.01.17.604). DEQ has prepared guidance on recommended buffer distances for various reuse scenarios (DEQ, 2015). For the current and proposed draft permits, the following scenario was used in determining buffer distances: Class D municipal recycled water, sprinkler irrigated and rural area. A summary of buffer zones is shown in Table 8.

Table 8. Buffer zones for Class D municipal recycled water, sprinkler irrigated, rural area

	Current Permit Buffer Requirements[1]	Guidance Buffer Zone Requirements[2]	Actual Irrigation Sites
Nearest Inhabited Residence	500 feet	500 feet	800 feet (north, northeast of MU-0020-02)
Nearest Public Water System (Sam Owen Campground)	1,000 feet	1,000 feet	2,500 feet (west of MU-0020-02)
Nearest Private Water Supply	500 feet	500 feet	700 feet (north, northeast of MU-0020-02 at nearest residence)
Nearest Drinking Water Reservoir	500 feet	500 feet	None in area
Areas Accessible to the Public	300 feet	300 feet	550 feet (Peninsula Road) 700 feet (Campsites)
Nearest Surface Water (Lake Pend Oreille)	100 feet	100 feet	1,300 feet (north, northeast of MU-0020-02)
Nearest Irrigation Ditches/Canals	None	50 feet	None in area
Fencing	Not required but is fenced	Three (3) wire pasture fence	Three (3) wire pasture fence
Posting	On the perimeter fencing	Every 500 feet and each corner of the outer perimeter of the buffer zone of the site	Along the fence which is around the perimeter of the irrigation sites.

1. Current buffer zone requirements in Reuse Permit LA-000020-04.
2. The DEQ "Municipal Reuse System Buffer Zone Guidance" (DEQ, 2015) provides recommended buffer distances for various reuse scenarios. For this permit, the following scenario was used for determining buffer distances: municipal, Class D, rural location, sprinkler application.

As shown in Table 8, all the existing buffer zones satisfy the DEQ guidance buffer requirements. The guidance buffer zones requirements will be specified in the new permit.

Fencing and signage are required for this reuse scenario. Fencing is currently provided (3-wire barbed wire) and none was specified in the previous permit. The fence, with warning signs attached to it, is around the perimeter of the irrigation sites and not around the perimeter of the 300-foot recommended buffer zone from the irrigation sites. People camping could hike from the campsites into the area near the irrigation sites. There is a dirt path from the campground off Peninsula Road to the irrigation site used by the operators during the irrigation season. This path could be used by the public as access for hiking near the irrigation site. The trees are effective in reducing the amount of aerosol drift that can move outside the fenced perimeter. The fencing of the irrigation site is adequate.

Staff recommends that the draft permit require additional signage be installed around the buffer zone perimeter (a minimum of 300 feet from the perimeter of the 6-acre irrigation site) and along the access dirt path. As part of the updated Plan of Operation (O&M Manual), a Buffer Zone Plan will be required which will address how the signage is to be installed.

5.2 Runoff

Runoff of recycled water from the irrigation sites has never been an observed or reported problem. Irrigation of the entire annual volume of recycled water generated can normally be completed in 3 to 4 weeks which provides flexibility for the operator to not irrigate when there are rain events.

Staff recommends in the draft permit to require that a Runoff Management Plan be prepared and included in the updated Plan of Operation.

5.3 Seepage Rate Testing

The two (2) 611,000 gallon concrete storage tanks are viewed by DEQ as “lagoons” and required seepage testing per the Idaho Wastewater Rules (IDAPA 58.01.16.493.02).

Table 9 contains a summary of seepage rate testing for the lagoons associated with this reuse permit. The south tank requires retesting no later than 2022 and the north tank in 2024.

Table 9. Lagoon Seepage Rate Testing

Lagoon	Test Date Completion	Date of DEQ approval of test report	Seepage rate (inches/day)	Allowable rate (inches/day)	Date next seepage rate test is due
LG-020-01 (North)	08/26/14	09/30/14	0.049	0.25	08/26/24
LG-053-02 (South)	08/08/12	09/30/14	0.006	0.25	08/08/22

The diameter of each concrete tank is 85 feet. The calculated seepage rate for the north tank is 173 gallons/day and the south tank is 21 gallons/day when the tanks are full. During the 2015

DEQ inspection of the Campground, no obvious signs of seepage from the tanks were observed by the DEQ inspector (Borrenpohl, 2015).

The draft permit duration is proposed to be ten (10) years with the permit expiration in 2026. The tanks will require retesting prior to the permit expiration date. A Compliance Activity will be included in the draft permit for this task.

5.4 Waste Solids, Biosolids, Sludge, and Solid Waste

A waste solids management plan for the Campground has never been submitted to DEQ. The concrete storage tanks will act as storage for biosolids from the raw wastewater that is pumped to the tanks for treatment and storage. No information was provided in the technical report about the amount of biosolids that have accumulated in the tanks and no biosolids have ever been pumped from the tanks (Johnston, 2015). The RV dump station uses a septic tank to provide solids removal and primary treatment prior to pumping the septic tank effluent to the tanks. Sludge is periodically pumped from the two (2) lift station wet wells (see Section 3) (Johnston, 2015).

A waste solids management plan will need to be prepared by the Campground to cover the disposal of all the waste solids, biosolids and septage in accordance with the state and federal regulations. The plan will become part of the updated Plan of Operation.

5.5 Nuisance Odors

Nuisance odors from the Campground lift stations, concrete storage tanks or recycled water irrigation site have not been reported to DEQ or discussed as being an issue in any of the recent annual reports. A nuisance odor management plan will not need to be submitted as part of the updated Plan of Operation. If nuisance odors start to become a problem, the Campground will need to develop strategies for controlling the odors and consult with DEQ.

5.6 Cropping Plan

A cropping plan for the Campground is not necessary because the crops are native conifer trees and native understory vegetation. The 2008 silvicultural plan will need to be updated to provide short and long-term management strategies for the conifer forest.

5.7 Grazing

The Campground has not requested that grazing be permitted and no grazing will be permitted within the irrigation site.

5.8 Salts

As discussed in Section 4.6.3 (see NVDS), excess salt loading of the soil or impacts to ground water are not anticipated to be a problem.

5.9 Silvicultural Plan

A Silvicultural Plan was prepared by James Grubb, USFS Environmental Engineer in 2007. Appendix H of the technical report also includes a silviculture report prepared by Albert Helgenberg, Forester/Certified Silviculturist with the Sandpoint USFS but it is not dated (Johnston, 2015). The report recommends that a complete silvicultural diagnosis be completed within 10-20 years. The only short-term recommendation for the site is monitoring for insect (particularly Douglas-fir bark beetle) and disease (particularly root disease). The report also notes that 80 year old Douglas-fir trees cover approximately 85% of the site and Douglas-fir reach maturity at 100 years old.

Staff recommends that an updated silvicultural plan be prepared and submitted to DEQ five (5) years after permit issuance. The updated plan should provide a description of the vegetation found on the site and recommendations on how the Campground should manage the irrigation site to optimize the nutrient and hydraulic uptake by the vegetation. The Silvicultural Plan will become part of the updated Plan of Operation. The Campground will be required to follow the recommendations listed in the Silvicultural Plan and provide annual updates in the annual reports.

6 Monitoring

6.1 Recycled Water Monitoring

Reporting of the influent wastewater flows pumped from the main lift station to the storage tanks (see Figure 4), is not a requirement in the current permit. All monitoring is focused on the quantity and quality of the irrigated recycled water. Staff recommends a similar approach in the draft permit. Below is the recommended monitoring of the recycled water:

Volumes irrigated on each management unit – *daily, weekly and monthly when irrigating*

Total chlorine residual – *daily when irrigating*

Nitrate and nitrite-N – *monthly when irrigating with a minimum of two (2) samples collected per year*

Total Kjeldahl Nitrogen (TKN) – *monthly when irrigating with a minimum of two (2) samples collected per year*

Total phosphorous – *monthly when irrigating with a minimum of two (2) samples collected per year*

Total coliforms – *weekly when irrigating*

Recycled water flow monitoring will occur at the irrigation pump flow meter (FM-020-01) and the water quality sampling at the sample tap located on the first irrigation sprinkler riser pipe in MU-020-02 (WW-020-01). The sample tap is located after disinfection chlorine contact time in the irrigation pump discharge line and prior to the first sprinkler head.

Sections 4.6.2 and 4.6.3 discusses the importance of monitoring for these constituents and how the draft permit limits will be set.

6.2 Soil Monitoring

The current permit does not include any soil monitoring. Considering the historically low hydraulic and nutrient loading rates relative to the estimated uptake rates of the forest vegetation, there appears to be minimal value in monitoring soil. A build-up of nutrients or salts in soils can sometimes be an indicator that over loading is occurring which could impact ground water quality or the health of the forest vegetation. Staff recommends that no soil monitoring be required in the draft permit.

6.3 Ground Water Monitoring

Section 4.5 of this Staff Analysis discusses the ground water conditions at and near the irrigation site. The current permit does not require ground water quality monitoring but does require that during the irrigation season the depth to ground water from the ground surface be greater than 36 inches as measured in five (5) shallow piezometers located around the irrigation site (see Figure 2). The Campground has been able to comply with this requirement during the current permit term.

Hydraulic and nutrient loading on the irrigation site will continue to be low in the future relative to the estimated uptake rates of the forest vegetation. There are no changes proposed to the campground or wastewater/recycled water facilities. There is a low risk of negative impacts to ground water quality or public health from the Campground's irrigation of recycled water if done in accordance with permit requirements.

Staff recommends that monitoring the depth to ground water prior to starting irrigation should continue to be included in the draft permit. The depth must be greater than 36 inches in all five (5) piezometers and the recommended monitoring frequency will be weekly until two (2) consecutive weekly results show that the depth to ground water is greater than 36 inches. No ground water quality monitoring is recommended.

6.4 Meteorological Monitoring

Staff does not recommend that the draft permit require meteorological monitoring. Determination of the appropriate irrigation water requirement (IWR) for the forested site in a particular year (see Section 4.6.2) does depend on the precipitation and temperature. Monitoring of the temperature and precipitation at the irrigation site could help the operator make decisions about irrigation timing and quantity.

6.5 Calculation Methodologies

6.5.1 Irrigation Water Requirement (IWR) for MU-020-01 & 02

Limited data exists on irrigation requirements of native conifer forests and DEQ has developed guidance (DEQ, 2012) for estimating the irrigation water requirements (IWR) of native forested sites. The native forest does not require irrigation to grow like a field crop. Irrigation of native forests has been shown to accelerate the growth of trees in Spirit Lake, Idaho based on a comparison of growth ring spacing (Wheeler, 2010).

The draft permit will not include hydraulic loading limits, but rather will require that the hydraulic loading be substantially at or below the IWR. The permittee will need to include in each annual report, a demonstration of compliance with the hydraulic loading limits. The method DEQ uses for estimating the IWR for a forested site is described below. DEQ will allow alternative methods for determining the IWR provided sufficient justification for the alternative approach.

Using the method suggested in the DEQ guidance (DEQ, 2012), the IWR for forested sites is estimated using the best available plant evapotranspiration rate data from the closest "irrigated" ETIdaho weather station (Coeur d'Alene in this case which is 42 miles southwest from the Campground) with the most similar weather conditions. The Bonners Ferry weather station is 33 miles north of the Campground and also is an "irrigated" weather station. In comparing the precipitation and temperature data for the Sandpoint weather station ("non-irrigated") with Bonners Ferry and Coeur d'Alene, the Coeur d'Alene station appears to slightly more similar than the Bonners Ferry to the Campground (see Section 4.2).

The crops listed in the ETIdaho database that have been determined to be the most similar to evapotranspiration from a native conifer forest are *Orchard-no cover* and *Grass Pasture-high maintenance*. The orchard data represents the treed portion of the site and the grass pasture data represents the understory vegetation of the forested site. A forest canopy density (as percentage) is estimated which attempts to adjust the evapotranspiration rates from the trees and understory depending on how dense or sparse the tree canopies are. MU-020-01 and 02 are estimated to have 70% canopy coverage and 30% understory based on the latest DEQ inspection of the Campground (Borrenpohl, 2015).

DEQ Guidance (DEQ, 2007) recommends a range of 60-85% efficiency for solid-set impact sprinkler systems like the system installed for the Campground irrigation site. An irrigation efficiency of 75% was used in the IWR calculations for the sprinkler systems in both of the management units.

The method of calculation for the forested sites IWR is shown in Equation 1. For forested sites, the P_{def} values used to calculate the IWR are weighted by the estimated percentages of the forest canopy density and understory (DEQ, 2012). In addition, DEQ recommends that for planning purposes, the P_{def} be calculated using the 80% exceedance values. The 80% exceedance estimates represent the amount of water that can be added to the ground surface that has an 80% chance of completely evaporating or transpiring, with no net flux below the root zone. This conservative approach means that statistically only 20% of the time will the P_{def} be less than these values. Since a native conifer forest does not require irrigation but does benefit from irrigation, this conservative approach to estimating the IWR reduces the risk of hydraulically overloading the forested sites except during unusually wet growing seasons. Table 10 shows the calculated IWRs for the two (2) management units using the 80% exceedance values for P_{def} and other assumptions listed above.

Equation 1. Irrigation Water Requirement

$$IWR = P_{def} \div E$$

Where:

IWR = Irrigation Water Requirement (inches/acre)

P_{def} = Monthly Precipitation Deficit for the crops from ETIdaho 2012. It is the amount of additional precipitation needed to fully support the evaporation potential of a given crop in a particular location.

E = Irrigation Efficiency of Sprinkler Equipment (0.75 for solid-set sprinklers)

Table 10. Calculated IWR for MU-020-01 & 02 (each 3 acres) Using 80% Exceedance Precipitation Deficit Data

Month	Forest Pdef[1]	Understory Pdef[2]	Weighted Pdef[3]	IWR[4]	IWR[5]
	(inches)	(inches)	(inches)	(inches)	(million gallons)
June	2.74	1.06	3.80	5.07	0.83
July	4.35	1.85	6.20	8.27	1.35
August	3.23	1.29	4.52	6.03	0.98
September	1.70	0.71	2.41	3.21	0.52
Total	**12.02**	**4.91**	**16.93**	**22.58**	**3.68**

1. Represented by ETIdaho data for "Orchard-no ground cover" using 80% exceedance values for Pdef
2. Represented by ETIdaho data for "Grass Pasture-high maintenance" using 80% exceedance values for Pdef
3. Weighted assuming 70% Forest Canopy Density and 30% Ground cover
4. Calculated using Pdef/E, where E is the irrigation efficiency estimated to be 75%
5. Calculated using IWR in inches * 6 acres

Staff recommends that the Campground consider irrigating at or below the IWR shown in Table 10. The updated Plan of Operation will need to discuss how the operator will schedule irrigation. If an alternative method for scheduling irrigation is proposed, DEQ will need to review and approve the method.

6.5.2 Nitrogen and Phosphorous Loading Rates for MU-020-01 & 02

Nitrogen

The DEQ forest guidance (DEQ, 2012) presents a methodology for estimating the nitrogen requirement of a native forest based on the ages of the trees, the type of trees, tree canopy coverage, understory type and understory coverage. Table 11 lists the assumptions used for canopy and understory density (discussed in Section 6.5.1 for calculating the IWRs) and the estimated tree ages. The estimated tree ages for MU-020-01 & 02 are taken from the technical report (Johnston, 2015).

Table 11. Native Conifer Forest Properties for MU-020-01 &02

	Tree Canopy Coverage	Understory Type/Density	Tree Age
MU-020-01 & 02	70%	Herbaceous Vegetation/30%	Douglas fir > 40 years old

Equation 2 and Tables 12 and 13 show the how the estimated nitrogen uptake rates were calculated.

Calculation of the net N requirement for the native conifer forest (DEQ, 2012);

Equation 2

$$N_{rate} = \frac{(N_{uptake} - N_{cr})}{(1 - N_{loss})} = \frac{N_{req}}{(e_f)}$$

where:

N_{rate} = Nitrogen (N) loading rate

N_{loss} = N losses from denitrification and volatilization

e_f = uptake efficiency factor (1 - N_{loss})

N_{uptake} = N net uptake

N_{cr} = N credits

N_{req} = N_{uptake} - N_{cr} = N net requirement

$$N_{rate} = \frac{(N_{uptake} - N_{cr})}{(1 - N_{loss})}$$

Table 12, Nitrogen Uptake Variables and Values

Variables	**Variable Values** (DEQ, 2012)
Assume forested sites are similar to Douglas-fir juvenile plantation > 40 years old:	
MU-020-01 & 02 - Forest canopy covers 70% of the site	25 lbs./acre N uptake
Understory**:**	
MU-020-01 & 02 - 30% herbaceous coverage	22 lbs./acre N uptake
Denitrification/volatilization rate	25%
Assume no appreciable change in soil storage from initial time of recycled water application to the end of permit cycle **(N_{cr} = 0)**.	0 lbs. N/acre credit

The values are then substituted into Equation 2 to calculate the estimated nitrogen loading rate as shown in Table 13.

Table 13, Calculated Nitrogen Uptake Rates

MU-020-01 & 02	$N_{rate} = \frac{[(25 + 22) - 0]}{(1 - 0.25)} =$ **63 lbs. N/acre/year**

Comparing the estimated nitrogen loading rate of 63 lbs.N/acre/year with the historical loading rates in Table 7, the Campground loading rates are less than the estimated uptake rate of the forest site. Younger trees have higher nitrogen uptake capacities than older trees which is part of the reason the estimated nitrogen loading rate is low (DEQ, 2012).

Staff recommends that the draft permit include a maximum nitrogen loading rate of 63 lbs./acre.

A recommended phosphorous loading rate is 20 lbs./acre/year for non-grazed, privately owned woodlands (NRCS, 1998). Since 2011, the average total phosphorous loading rate has been about 9 lbs./acre (see Table 7). Therefore, the phosphorous loading rates from the irrigated recycled water should be less than the estimated phosphorous uptake rate of the native conifer forest sites.

Staff recommends that no phosphorous loading rate limits be included in the draft permit but continue monitoring phosphorous concentration in the irrigated recycled water to determine annual loading rates.

7 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) is a written document outlining the procedures used by the permitee to ensure the data collected and analyzed meets the requirements of the permit.

In support of the agency mission, DEQ is dedicated to using and providing objective, correct, reliable, and understandable information. Decisions made by DEQ are subject to public review and may at times, be subject to rigorous scrutiny. Therefore, DEQ's goal is to ensure that all decisions are based on data of known and acceptable quality.

The QAPP is a permit requirement and must be submitted to DEQ as a stand-alone document for review and acceptance. The QAPP is used to assist the permittee in planning for the collection, analysis, and reporting of all monitoring data in support of the reuse permit and explaining data anomalies when they occur.

DEQ does not approve QAPPs, but reviews them to determine if the minimum EPA guideline requirements are met and that the reuse permit requirements are satisfied. The reason DEQ does not approve QAPPs is that the responsibility for validation of the facility sampling data lies with the permittee's quality assurance officer and not with DEQ.

The format of the QAPP should adhere to the recommendations and references in 1) the Assurance and Data Processing sections of the DEQ Guidance and 2) EPA QAPP guidance

documents. EPA QAPP guidance documents are available at the following website: *http://www.epa.gov/quality/qapps.html*

DEQ also has a template that can be used for preparing a QAPP.

Currently, the Campground does not have a DEQ-approved QAPP. Staff recommends that the draft permit include compliance activity CA-020-02 to prepare a QAPP within six (6) months after permit issuance.

8 Site Operation and Maintenance

The Sam Owen Campground wastewater collection, treatment and recycled water irrigation systems are owned by the U.S. Forest Service (USFS). The land that the systems are constructed on is also owned by the USFS. Operation and maintenance of the Sam Owen Campground, including the wastewater collection, treatment and recycled water irrigation systems treatment facilities, is contracted out by the USFS to American Land & Leisure (AL&L). AL&L contracts with Water System Management, Inc. (WSM) who provides the Idaho licensed operators to oversee the operation of the facilities. The 2014 agreement for these services is included in the technical report (Johnston, 2015) and is automatically renewed each year unless one of the parties provides a 30 day notification that they want to void the contract.

The Campground is a municipal system classified in the State of Idaho public wastewater classification system as a Class I for both the collection and wastewater treatment systems. The responsible charge operators for the system are required to have Idaho wastewater licenses of at least Class I in both collections and treatment and a land application license. WSM lists Mr. Robert Hansen as the responsible charge operator for the collection, wastewater treatment and reuse (land application) facilities. Mr. Hansen holds the following current licenses:

- Wastewater Collection Operator – Class 2 License #WWC2-13710
- Wastewater Treatment Operator – Class 2 License #WWT2-15575
- Wastewater Treatment Operator – Lagoon License #WWTL-10693
- Wastewater Treatment Operator – Land Application License #WWTLA-14275

WSM lists Mr. Claire Hansen as the substitute responsible charge operator the collection, wastewater treatment and reuse (land application) facilities. Mr. Hansen holds the following current licenses:

- Wastewater Collection Operator – Class 2 License #WWC2-13888
- Wastewater Treatment Operator – Class 2 License #WWT2-17552
- Wastewater Treatment Operator – Lagoon License #WWTL-12983
- Wastewater Treatment Operator – Land Application License #WWTLA-14668

9 Compliance Activities

9.1 Status of Compliance Activities in Current Permit

1. CA-020-01. Discussions between the USFS and Ellisport Bay Sewer District (EBSD) about connecting the Sam Owen Campground wastewater collection system to the EBSD wastewater treatment and recycled water irrigation system located on the on the Hope Peninsula.
    a. As reported in the annual reports, USFS staff met with the EBSD Board in 2013 and 2014 to discuss the connection (Johnston, 2015). No agreement could be reached on how this could be accomplished. One issue is that EBSD does not have capacity to serve the Campground because capacity has been reserved for the users in the cities of Hope and East Hope who financed the construction of the EBSD system. Expansion of the EBSD system has proved to be difficult.
2. CA-020-02. Prior to January 1, 2012, update the Plan of Operation.
    a. Submitted March 13, 2014 with 2013 Annual Report.

9.2 Compliance Activities Required in New Permit

Staff recommends that the following compliance activities be included in in the draft permit:

1. **CA-020-01**: **Within one (1) year of permit issuance. Submit a revised Plan of Operation (O&M Manual) that incorporates the requirements of the new permit.**
    a. Discussion: The current O&M Manual (included in Appendix C of the technical report) will need to be revised to cover the new permit requirements.
2. **CA-020-02: Within one (1) year of permit issuance. Submit a Quality Assurance Project Plan.**
    a. Discussion: A complete QAPP has not been prepared. See Section 7 of this Staff Analysis.
3. **CA-020-03: Within five (5) years of permit issuance. Submit an updated Silvicultural Plan.**
    a. Discussion: The 2007 Silvicultural Plan and a silviculture report included in Appendix H of the technical report both will need to be updated in five (5) years. This will allow time for the USFS to plan for timber harvesting of the irrigation site. The updated plan should provide a description of the vegetation found on the irrigation site (trees and understory) and provide recommendations on how to manage the irrigation site to optimize the nutrient and hydraulic uptake by the vegetation.
4. **CA-020-04: Submit lagoon seepage rate test proposed schedules and procedures at least 42 days prior to the planned seepage tests. Complete the seepage tests before August 8, 2022 (South Tank) and August 26, 2024 (North Tank). Submit the seepage test reports within 90 days after completion of the seepage tests.**
    a. Discussion: The concrete storage tanks were seepage tested in 2012 (South Tank and 2014 (North Tank). Testing is required every 10 years (see Section 5.3 of this Staff Analysis).
5. **CA-020-05: 12 months prior to the permit expiration date. Schedule a Pre-Application Workshop with DEQ**

a. Discussion: A pre-application meeting between the permittee and DEQ is recommended as listed in the Idaho Recycled Water Rules (IDAPA 58.01.17.300.01). The purpose of this meeting is to discuss the permit renewal application content requirements and potential permit-specific conditions.

6. **CA-020-06: 6 months prior to expiration of the existing permit. Submit a permit renewal application**
   a. Discussion: Permit renewal applications must be submitted to DEQ at least 180 days prior to permit expiration as required in the Idaho Recycled Water Rules (IDAPA 58.01.17.400.01).

10 Recommendations

Staff recommends the draft reuse permit be issued. The permit specifies hydraulic and constituent loading limits and establishes monitoring and reporting requirements to evaluate system performance, environmental impacts, and permit compliance.

11 References

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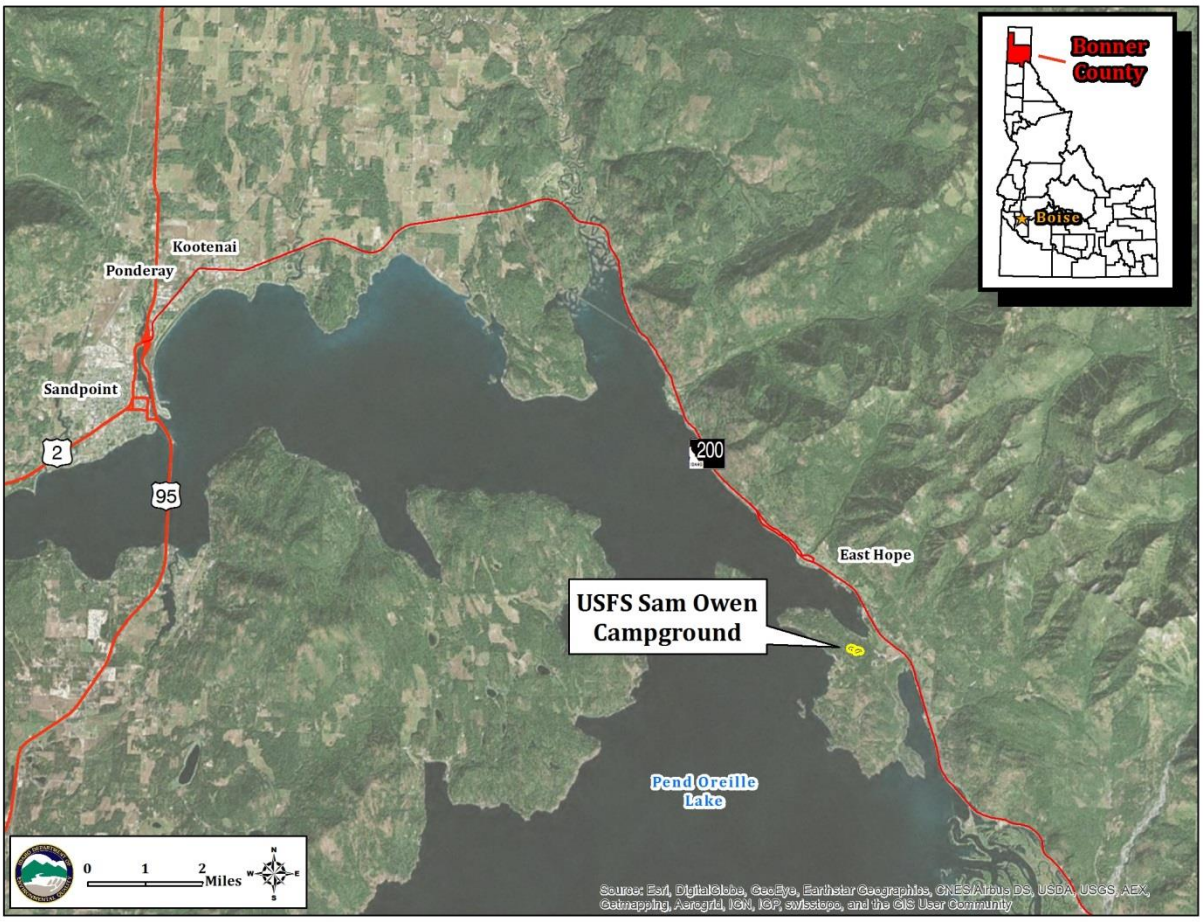
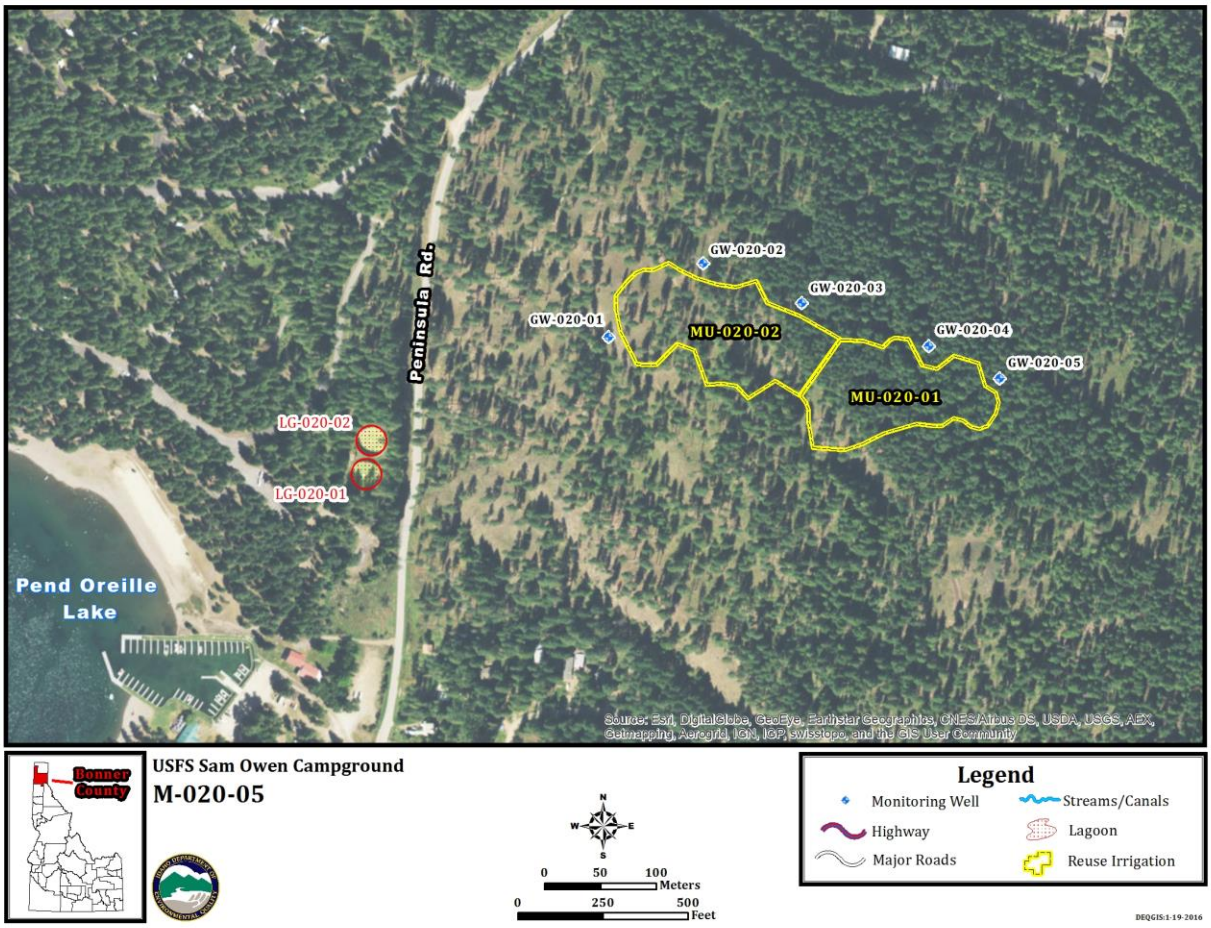
Appendix A. Site Maps

Regional Map



Facility Map