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MINERAL LAKE YMCA CAMP

WASTEWATER MEMORANDUM

Mineral Lake, Washington

Prepared For:
YMCA of Seattle

Prepared By:
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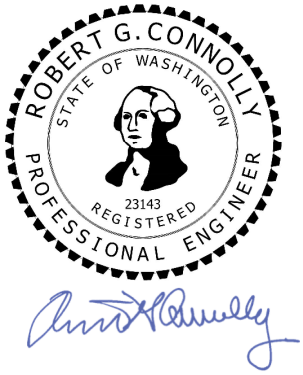

March 25, 2021

SCJ ALLIANCE
CONSULTING SERVICES

Wastewater Management Memorandum

Project Information

Project:	Mineral Lake YMCA Camp
Prepared for:	YMCA of Seattle 14230 Bel-Red Road Bellevue, WA 98007 Contact: Josh Sutton Seattle Y Facilities Executive jsutton@seattleymca.org 206.658.3331
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Contact:	Robert G. Connolly, PE
Project Reference:	SCJ # 3375.01

Purpose of Memorandum

This memorandum is in response to a specific comment received in letter dated February 11, 2021 from Brianna Uly, Associate Planner Lewis County Community Development. Comment number 2 is related to wastewater management and how the design of the on-site sewage system will or will not affect Mineral Lake as a fish and wildlife habitat conservation area and any wetlands on the subject parcel.

1 Introduction

The YMCA of Greater Seattle proposes to amend the Lewis County Comprehensive Plan map to add a Master Plan Resort Overlay to parcels along the north shore of Mineral Lake. The property is currently in Forest Resource Land and has historically been used for timber production/harvesting. The map Overlay would allow the YMCA to then pursue a Binding Site Plan with the County to detail the phased development to establish a youth camp on the property over the next 20 years. At full build out the camp will accommodate up to 400 campers and 100 staff members.

2 Project Background

The proposed phases are:

- Phase 1 – Visitor Center (northwest of Mineral Lake, near Mineral Hill Road site entrance)
- Phase 2 – Camp A (northwest of Mineral Lake)
- Phase 3 – Camp B (eastern project area, between Mineral Lake and Mineral Creek)

Phase 1 and 2 would be scheduled for build out in the near future and Phase 3 would be delayed until a later date.

The +/- 2,118-acre site is presently undeveloped, and some areas have been logged in recent years. There are several narrow logging roads on the site as well as an access onto Mineral Hill Road. The anticipated camp site improvement area will cover about 100 acres in total for all three phases. As the project is in the early phases of conceptual planning and design, specific type, size and location of on-site sewage and stormwater systems is not available. Type, size and location details of these systems will be determined at a later date in accordance with Lewis County and other appropriate regulatory agencies.

This memorandum focuses on the site civil related development items for wastewater collection, conveyance, treatment, and disposal system needed for the development and use of the camp sites. Schematic layouts are based on drawings prepared by Mithun Architects and provided by Client to SCJ Alliance. These drawings are the basis of the exhibits prepared by SCJ and are included herein.

The site's projected population during peak summer days for each phase is as follows :

- Phase 1 – Visitor Center – 25 Staff and visitors
- Phase 2 – Camp A – 500 Youth Campers, staff, and support personnel
- Phase 3 – Camp B – remains 500 Youth Campers, staff, and support personnel

The Visitor Center will be located close to site entrance off Mineral Hill Road, the Family Camp will be located west of Mineral Lake and the Youth Camp will be located east of the lake. A fire lane/access road will connect the two camps. Parking lots will be included in each of the phases. The two camp areas will have overnight housing, lodges, dining halls and activity buildings. Most of these camp areas will be off limits to motor vehicles, except for maintenance and emergency vehicles. New fire lanes will be placed throughout the camp areas as required by Lewis County Fire Marshal.

3 Wastewater Management

The sewer service for each of the three phases of the Camp project are recommended to be designed as standalone systems due to upfront cost of building one large facility. The wastewater flows for Phase 1 Visitor Center are expected to be relatively small compared to the expected flows for Phases 2 and 3. It is recommended that Phase 1 would be a standard pressure distribution/mound system with the drainfield and reserve drainfield located in the previously logged area where Phase 2 Camp will be located. In addition, our opinion is that when Phase 2 Camp is built that the septic drainfield for Phase 1 be abandoned and that flows for Phase 1 and 2 be combined for treatment in one system.

The septic system for Phase 1 Visitor Center is assumed to have a maximum daily flow of 1,500gpd. This design, along with an application, will be required to be submitted, reviewed, and approved by the Lewis County Health Department per State and County guidelines and requirements.

The future wastewater systems for the YMCA Camp project Phases 2 and 3 will need to be permitted through WSDOH as a LOSS (Large On-site Septic System) due to the expected daily flows. For each of these two new systems a "Sewer System Plan" is required to be submitted for review and approval by WSDOH. A copy of the DOH's LOSS New Project Review & Approval Process Flowchart is included in the Appendix 1 of this memorandum.

Each of the Wastewater Systems would be comprised of:

A. Collection & Conveyance
B. Wastewater Treatment
C. Subsurface Soil Absorption System (SSAS)
D. Annual Operating Permit (for phases 2 and 3)

Each of these will be discussed in this section of the report. See Exhibit 'A' Sewer Schematic for proposed general location of wastewater system components.

Background information and design parameters:

- Large On-site Sewage Systems (LOSS) shall collect, convey, treat, and provide subsurface soil treatment and disposal of domestic sewage. The design flow for a LOSS is between 3,500 to 100,000 gallons per day. These systems are reviewed and permitted by WSDOH. Systems with flows under 3,500 are reviewed and permitted by Lewis County Health Department. The LOSS rule is Chapter 246-272B WAC, developed under authority of Chapter 70.118B RCW. Sewer systems for Phase 2 Camp and Phase 3 Camp will be required to be processed as LOSS.

- In general, as part of the approval process a Pre-design Report , Hydrogeological Report, Final Plans and Design Report are required to be prepared, submitted along with application, and approved by WSDOH.
- Design water use per person in attendance at each of the proposed two camps was assumed to be 45gpd/p (gallons per day per person). This was based on review of water usage at two other YMCA Camps (Camp Orkila at average of 47gpd/p and Camp Colman at estimated use at 27gpd/p), and from USEPA Wastewater Treatment Systems Manual Table 4-9 Typical wastewater flow rates from recreational facilities which lists a range of 35 – 50 gpd/p for Children Camps, it also lists 45 gpd/p as a typical flow.
- Assumed wastewater flows per day for the combined three phase of the project varies throughout the year from zero to 49,500 gpd. This would amount to 22,500gpd for Phase 2 - Camp and 27,000gpd for the Phase 3 Camp. See "Anticipated Water Use" Chart in Appendix 1 of this report for possible varying flows during the year for the full build out of the Mineral Lake YMCA Camp.
- Soil logs and corresponding design application rates for effluent subsurface disposal were determined by Client's consultant, GeoEngineers, Inc., the report outlining soil information is not included herein.
- It is assumed that proposed sewer lines will be PVC pipe (local industry standard).

The following is a detailed discussion of each of the wastewater system components:

A. Wastewater Collection

Phase I Visitor center should have a gravity sewer flowing from new visitor building to a nearby two stage 4,500gallon septic tank based on the assumed 1,500gpd wastewater flow. The soils report indicates that a type 6 soil can be expected in the proposed temporary disposal field planned for the area south of the roadway connecting Camps A and B. This area is the area where the Phase 3 Camp is expected to be located. A pressure distribution or mound system can be expected to be required by the Lewis County Health Department due to soil type and possible high ground water. This drainfield will need to be abandoned when Phase 2 Camp is built-out and sewer flows from the visitor center will need to be connected to the new LOSS for Phase 2.

For the collection system for Phases 2 and 3 there are two basic ways for collection of wastewater. The first is to have gravity sewer pipes flow from each building to an individually sized two stage, septic tank. The other method is to have one or more larger centrally located two stage septic tanks for both Phase 2 and 3 that would collect wastewater via gravity sewer pipes flowing from each building to the larger common tanks. Final design will determine which system would be best suited for the project based on final layout of each camp site.

Exact locations of tanks and gravity lines to tanks have not been determined, final design shall show locations.

B. Conveyance

From the septic tank pump chamber(s) low flow, high pressure effluent pump systems should be used to transport effluent to the proposed advanced treatment systems. Final design shall determine final pipe sizing, and locations of advanced treatment systems. The pressure pipe sizes and locations for conveyance of effluent from the Advanced Treatment Systems to the proposed subsurface soil absorption system areas have not been determined and will be per final design. Note that collection and transport piping will follow WSDOE's most recent edition of "Criteria for Sewage Works Design".

C. Wastewater Treatment

For a LOSS, advanced treatment of wastewater effluent will be required by WSDOH. Advanced treatment systems will be per DOH guidelines and Washington State approved systems. It is expected that there will be one dedicated system for Phase 2 and one for Phase 3. The exact system to be used has not been determined but a SBR (Sequencing Batch Reactor) system may be one of the alternatives studied for use at time of final design. Other approved applicable systems will be reviewed also for possible use.

D. Subsurface Soil Absorption System (SSAS)

This component of the wastewater system may well be the most critical and will take added soil testing and detailed design for siting and approval. In general, the limited soils testing by GeoEngineers Inc. had identified one area for a large SSAS that had soil types 2, 3, 5, and 6. This area is located east of Phase 3 Camp and west of Mineral Creek as shown on Exhibit A. More detailed locations of test pits and soil typing can be found in GeoEngineers soils report. Additional, soil testing and drainfield sizing will be required for final design.

Other SSAS areas closer to Phase 2 than the easterly noted area on the exhibit may be adequate also. One such promising area is shown on attached Exhibit A and is the recently clear cut hillside area between test pits TP-1.03, TP-1.06, TP-1.07 and TP-1-08. See GeoEngineers soils report for exact locations and for soil classification. Additional soil test holes and analysis in this area will need to be provided prior to final design of either a standard pressurized bed or trench drainfields or shallow "drip system" SSAS fields.

The aforementioned area located east of the Phase 3 Camp site appears to be suitable for SSAS for Phase 3. This area is also large enough for Phase 2 SSAS also but an area closer to Phase 2 would be preferred.

Per WSDOH guidelines the SSAS system should have the new constructed drainfield beds or trenches for 100% of the primary and 50% of the reserve drainfield area, with a 50% reserve area unconstructed. The other alternative is for a drip system to be constructed to have 100% of both the primary and reserve system.

Final layout of the SSAS will need to be designed and approved for each phase of the project. Final design will look into possible addition of storage tanks near the drainfields for dosing and possible aeration. Pumps and controls would be necessary for this.

E. Annual Operating Permit

All existing LOSS's are required to obtain and renew annual operating permits from the Department of Health.

The LOSS operator is responsible for ensuring the LOSS consistently and reliably treats sewage to meet the operating permit conditions. Depending on the type of LOSS, the operator may need to hold a Department of Ecology wastewater certification, be approved by a local health jurisdiction, or be qualified to operate a LOSS using proprietary technology.

The locations of the project's advanced wastewater treatment facility and SSAS will be outside of any site environmental sensitive areas and buffers. The design and construction of the wastewater facilities for the project will strictly follow Lewis County, State, DOH, and DOE guidelines and requirements for wastewater collection, transport, treatment and disposal created to minimize any impacts to the local environment.

EXHIBIT ‘A’

N

0 300 600

SCALE IN FEET

POSSIBLE AREA FOR ADVANCE WASTEWATER TREATMENT

PHASE 2
POSSIBLE DRAINFIELD AREA, ADDITIONAL SOIL TEST HOLES NEEDED

PHASE 1

PHASE 2

PHASE 3

PHASE 3 DRAINFIELD AREA

POSSIBLE AREA FOR ADVANCE WASTEWATER TREATMENT

Mineral Lake

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HORIZONTAL SCALE:	1"=300'
DATE:	MARCH, 2021
JOB No.:	3375.01
DRAWING FILE No.:	3375.01 SWR-EXBT.dwg

EXHIBIT A

SEWER SCHEMATIC

EXHIBIT No:	SS-01
SHEET No:	2

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Appendix

MINERAL LAKE YMCA
ANTICIPATED WATER USE
29-Mar-21
PREPARED BY: SCJ Alliance, Robert Connolly, PE

CAMP A AND B (PHASE 1 AND 2 BUILDOUT)

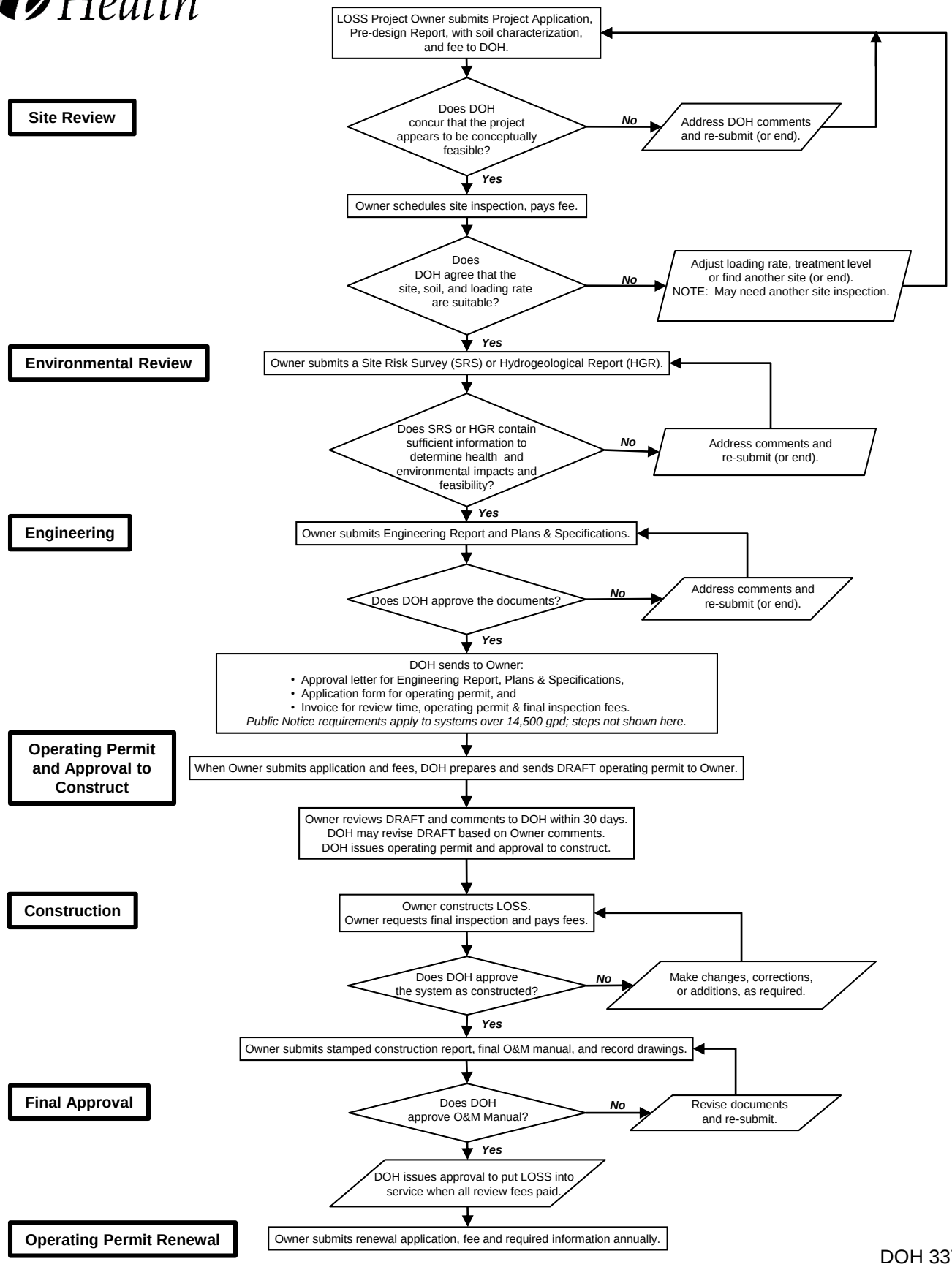
Month	Days	People/Day	% Capacity	Water Use GPD	Water Use Gal/Month	
Jan	31	Closed				
Feb	28	Closed				
March	31	30	*5	1350	16200	
April	30	30	*5	1350	16200	
May	31	300	*50	13500	162000	
June	30	600	100	27000	324000	
July	31	600	100	27000	324000	
Aug	31	600	100	27000	324000	
Sept	30	300	*50	13500	162000	
Oct	31	30	*5	1350	16200	
Nov	30	30	*5	1350	16200	
Dec	31	Closed				
				TOTAL	1360800	Gallons/Year
				or:	4.18	Acre Ft./Year

* - 12 days per month

Assumes 45 gpd per person water use

Washington State Department of Health

Large On-site Sewage System (LOSS)
New Project Review & Approval Process Flowchart



DOH 337-047
REVISED August 2020