DISCOVERY CLEAN WATER ALLIANCE

Engineering Report for Phase 5B Package 1—Odor Control/Existing Facilities Improvements Project

Phase 5B Project—Salmon Creek Treatment Plant Improvements, Phase 5 Expansion Program

An Alliance Capital Project delivered by Clark Regional Wastewater District as Administrative Lead for the Discovery Clean Water Alliance

Prepared for

Washington State Department of Ecology

July 19, 2019

JACOBS

2020 SW Fourth Avenue, 3rd Floor
Portland, Oregon 97201

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Acronyms and Abbreviations

$\mu g/m^3$	micrograms per cubic meter
ACH	air changes per hour
ADMM	average-day maximum month
ASIL	Acceptable Source Impact Level
AWS	American Welding Society
BFP	belt filter press
cfm	cubic feet per minute
CMU	concrete masonry unit
DMDS	dimethyl disulfide
D/T	dilutions to threshold
EPA	U.S. Environmental Protection Agency
fpm	feet per minute
FRP	fiberglass reinforced plastic
GBT	gravity belt thickener
gpm	gallons per minute
H_2S	hydrogen sulfide
HVAC	heating, ventilation, and air conditioning
MLSS	mixed liquor suspended solids
NA	not applicable
NFPA	National Fire Protection Association
O&M	operations and maintenance
OA	odorous air
ORS	organic reduced sulfur
PE	primary effluent
ppbV	parts per billion by volume
ppmV	parts per million by volume
RAS	return activated sludge
RCW	Revised Code of Washington
SCADA	supervisory control and data acquisition
SCTP	Salmon Creek Treatment Plant
SEPA	State Environmental Policy Act
SVI	sludge volume index
SWCAA	Southwest Washington Clean Air Agency
TM	Technical Memorandum
TWAS	thickened waste activated sludge
WAS	waste activated sludge

WAC	Washington Administrative Code
wc	water column

1. Introduction

The Discovery Clean Water Alliance (Alliance) is proposing a project at the Salmon Creek Treatment Plant (SCTP) to upgrade the wastewater facilities currently operating onsite. This project is called SCTP Phase 5B Project: Package 1—Odor Control/Existing Facilities Improvements. The improvements will provide enhanced operational flexibility, reliability, and increased odor treatment at the facility. The Package 1 project improvements are not intended to change the overall wastewater treatment capacity of the facility. A separate project, SCTP Phase 5B Project: Package 2—Capacity Increase, is planned to follow Package 1 to address capacity related elements. A separate engineering report will be submitted for the Package 2 project at a later date.

1.1 Owner and Authorized Representative

The Owner of the SCTP is the Alliance. The Clark Regional Wastewater District (District) is responsible for engineering and capital planning, as well as the overall financial and administrative functions of the Alliance. The Owner's authorized representative for this facility is Dale Lough. His contact information is as follows:

Dale W. Lough, P.E.
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Clark Regional Wastewater District (Administrative Lead for Discovery Clean Water Alliance)
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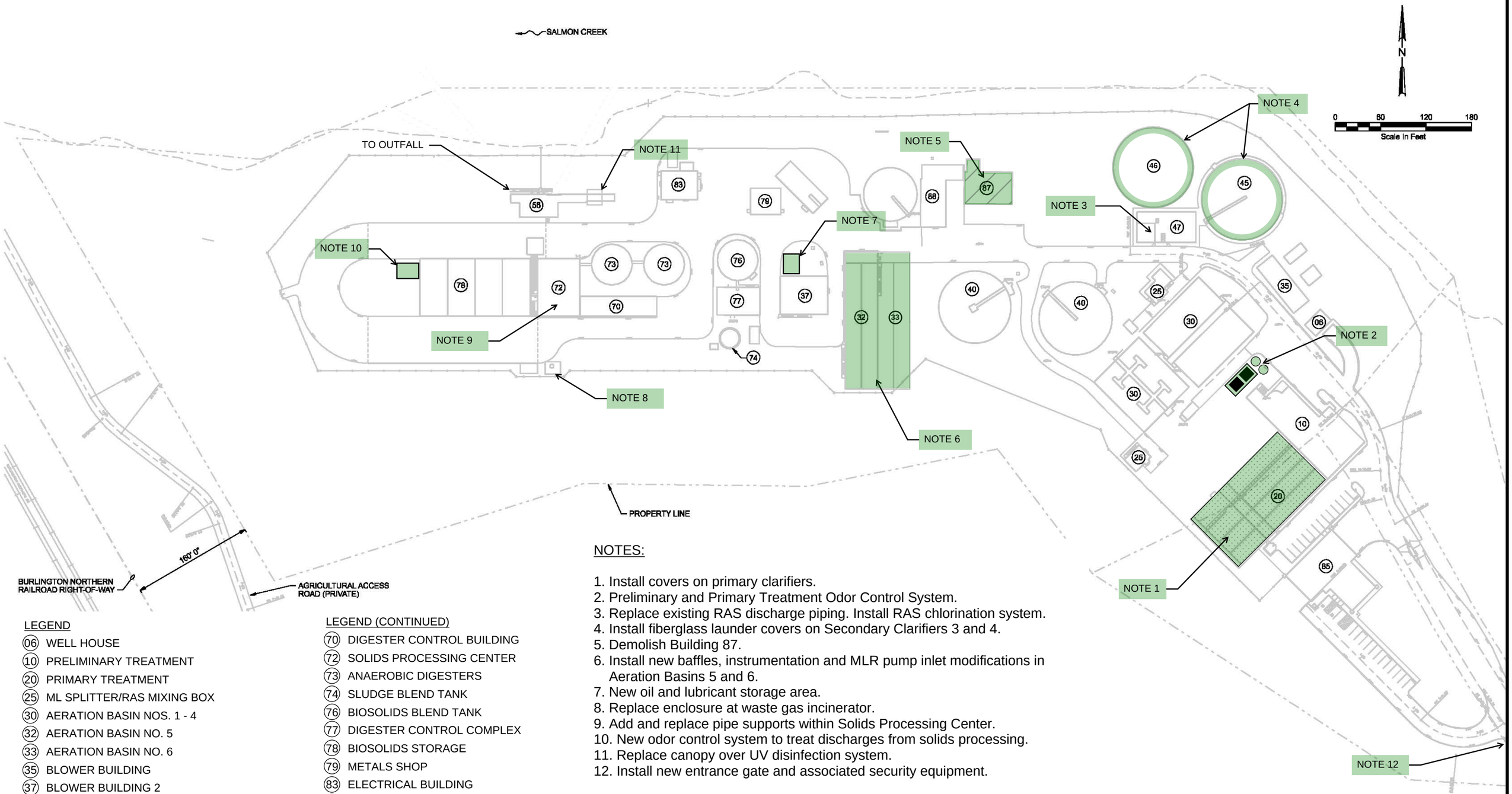
1.2 Project Description and Location

The Alliance is proposing a number of improvements at the SCTP for this Package 1 project. A summary of the improvements is as follows:

- Odor control systems for the preliminary/primary treatment facilities
- Odor control systems for the solids processing facilities
- Existing Aeration Basin 5 and 6 improvements including:
  - Additional anoxic and aerobic zone baffles
  - Mixed liquor recycle pump hydraulic modifications
  - Additional aeration basin instrumentation
- Fiberglass covers on existing secondary clarifier effluent launders
- RAS chlorination system
- Improved return activated sludge (RAS) discharge piping
- New and replacement pipe supports in the solids processing center
- Demolition of the abandoned Control Building
- Construction of new oil and lubricant storage building
- Replacement canopy structure at disinfection facility
- Replacement enclosure at existing waste gas incinerator controls
- New automated entrance gate

These improvements are depicted in Figure 1-1 and most will be made within existing structures. All proposed improvements are within the existing footprint of the developed wastewater treatment plant.

SCTP is located at 15100 Northwest McCann Road, Vancouver, Washington 98685.



LEGEND

- 06 WELL HOUSE
- 10 PRELIMINARY TREATMENT
- 20 PRIMARY TREATMENT
- 25 ML SPLITTER/RAS MIXING BOX
- 30 AERATION BASIN NOS. 1 - 4
- 32 AERATION BASIN NO. 5
- 33 AERATION BASIN NO. 6
- 35 BLOWER BUILDING
- 37 BLOWER BUILDING 2
- 40 SECONDARY CLARIFIER NOS. 1 AND 2
- 45 SECONDARY CLARIFIER NO. 3
- 46 SECONDARY CLARIFIER NO. 4
- 47 RAS/WAS PUMP STATION
- 55 EFFLUENT PUMP STATION/UV DISINFECTION

LEGEND (CONTINUED)

- 70 DIGESTER CONTROL BUILDING
- 72 SOLIDS PROCESSING CENTER
- 73 ANAEROBIC DIGESTERS
- 74 SLUDGE BLEND TANK
- 76 BIOSOLIDS BLEND TANK
- 77 DIGESTER CONTROL COMPLEX
- 78 BIOSOLIDS STORAGE
- 79 METALS SHOP
- 83 ELECTRICAL BUILDING
- 85 OPERATIONS CENTER
- 87 ORIGINAL PLANT CONTROL BUILDING
- 88 MAINTENANCE/STORAGE BUILDING

NOTES:

1. Install covers on primary clarifiers.
2. Preliminary and Primary Treatment Odor Control System.
3. Replace existing RAS discharge piping. Install RAS chlorination system.
4. Install fiberglass launder covers on Secondary Clarifiers 3 and 4.
5. Demolish Building 87.
6. Install new baffles, instrumentation and MLR pump inlet modifications in Aeration Basins 5 and 6.
7. New oil and lubricant storage area.
8. Replace enclosure at waste gas incinerator.
9. Add and replace pipe supports within Solids Processing Center.
10. New odor control system to treat discharges from solids processing.
11. Replace canopy over UV disinfection system.
12. Install new entrance gate and associated security equipment.

FIGURE 1-1
SALMON CREEK TREATMENT PLANT
PHASE 5B IMPROVEMENTS PROJECT
PACKAGE 1 - EXISTING FACILITIES/ODOR CONTROL IMPROVEMENTS

2. Future Conditions

This SCTP Phase 5B Project: Package 1—Odor Control/Existing Facilities Improvements is consistent with long-term plans for SCTP. The project proposes to optimize current treatment processes and provide a higher level of odor treatment to benefit the surrounding area. Proposed odor control systems will be sized to treat odorous air (OA) through buildout of SCTP as defined in the 2004 Facilities Plan and the 2013 Facilities Plan Update. The Package 1 project improvements do not result in a change to the overall wastewater treatment capacity of the facility.

A separate project, SCTP Phase 5B Project: Package 2—Capacity Increase, is planned to follow Package 1 to address capacity related elements. A separate engineering report will be submitted for the Package 2 project at a later date.

3. Analysis and Recommended Alternatives

3.1 Odor Control

3.1.1 Regulatory Requirements for Air Emissions and Odor Control

The SCTP treats wastewater from a regional sewer collection system and as part of the treatment processes may emit odor and other emissions. These emissions are regulated by state and local authorities. Southwest Clean Air Agency (SWCAA) is the local air emissions authority for Clark County.

3.1.1.1 Nuisance Odors

Hydrogen sulfide (H_2S) is easily detected by people, and therefore it is commonly regulated as a nuisance odor. The SWCAA Regulations (SWCAA 400) contain a “nuisance odor” clause. This clause indicates that procedures be put in place to mitigate odors so that they are not “unreasonable” or a nuisance. Odors are typically quantified using a dilutions to threshold (D/T) method. However, limiting values are not specifically defined by the SWCAA, so target thresholds were selected based on experience to meet these qualitative nuisance odor requirements.

3.1.1.2 Toxic Air Pollutants

Regulations have been implemented for H_2S at the state level but have not yet been adopted at the local level. At the state level, the Washington Administrative Code, Title 173, Chapter 460, Section 150 (WAC 173-460-150) describes an updated Acceptable Source Impact Level (ASIL) for H_2S as 2.0 micrograms per cubic meter ($\mu g/m^3$) over a 24-hour period. The previous value was 0.9 $\mu g/m^3$ over a 24-hour period. At the local level, which is regulated by SWCAA, the new regulated value has not been adopted and the ASIL for H_2S is 0.9 $\mu g/m^3$ over a 24-hour period. To be in compliance with both state and local agency requirements, the value 0.9 $\mu g/m^3$ over a 24-hour period shall be used as the required criteria.

3.1.1.3 Odor Criteria Requirements

Based on the conclusions above, toxic air pollution requirements and odor criteria requirements include the following:

- H_2S—For toxic air pollution control, H_2S must not exceed a 24-hour average of 0.9 $\mu g/m^3$ (0.6 parts per billion by volume [ppbV]) at the property boundary per year.
- H_2S—For nuisance odor control, H_2S must not exceed a 1-hour average of 10 $\mu g/m^3$ (6.5 ppbV) at any receptor (residence) per year.
- D/T—For nuisance odor control, operators of treatment facilities may use discretion in selection of treatment performance. The concentration in air at which odors from wastewater plants typically cause nuisance odor complaints is approximately 10 D/T. A more stringent recommended industry practice for odor control performance is that dilutions to threshold (D/T) must not exceed a 1-hour average of 5 D/T at any receptor with 99 percent compliance. The odor control systems constructed in this project are designed to meet this more stringent performance of D/T not exceeding 1-hour average of 5 D/T at any receptor with 99 percent compliance.

3.1.2 Preliminary and Primary Treatment Odor Control

3.1.2.1 Odor Source Identification and Sampling

Air sampling showed that preliminary treatment and primary clarifiers have the highest concentrations of odorous compounds and therefore the highest potential to create offsite odors that can impact offsite sensitive receptors. Currently, SCTP treats odors from the 117th Street Pump Station Force Main and the raw sludge blend tank. The odor control system for the raw sludge blend tank will remain. The current

odor control system for the 117th Street Pump Station Force Main will be demolished and odorous air from the force main will be routed to the new preliminary and primary treatment odor control system.

Based on odor sampling results, as well as anticipated dissolved sulfide levels from the 117th Street Pump Station Force Main, both average and peak odor levels can be estimated for design purposes. These are summarized in Table 3-1.

Table 3-1. Estimated Odor Concentrations for Process Areas

Process Area	Hydrogen Sulfide		Organic Reduced Sulfur Compounds[a]	
	Average (ppmV)	Peak (ppmV)	Average (ppbV)	Peak (ppbV)
Headworks	2	10	50	200
Primary Clarifiers	1	5	100	500
PE/RAS Mixing Box[b]	1	5	100	500
117th Street Pump Station Force Main	2	25[c]	0	0

[a] Organic reduced sulfur compounds include methyl mercaptans, dimethyl disulfides, etc.

[b] Concentrations estimated to be similar to primary clarifiers.

[c] Peak is based on an uncontrolled dissolved sulfide level of 6 milligrams per liter resulting from a failure of the liquid-phase odor control system at 117th Street Pump Station.

PE = primary effluent
ppbV = parts per billion by volume
ppmV = parts per million by volume

By way of flow mixing, the combined odor levels from the three processes and the 117th Street Pump Station Force Main can be computed. The overall estimated inlet odor concentrations for the preliminary/primary odor control system are summarized as follows:

- H_2S: 2 ppmV (average); 10 ppmV (peak)
- Organic Reduced Sulfur Compounds: 75 ppbV (average); 300 ppbV (peak)

Future expansion at SCTP will construct additional primary clarifiers. The associated air flow and projected concentration of odorous compounds of future primary clarifiers has been accommodated in the design of the odor control system.

3.1.2.2 Ventilation Requirements

Recommended ventilation rates for sizing odor control systems should conform to National Fire Protection Association (NFPA) 820 and Jacobs engineering design practice for similar type facilities. In general, ventilation rates should meet the following objectives:

- Provide adequate ventilation to protect maintenance personnel within occupied spaces per NFPA 820, *Standard for Fire Protection in Wastewater Treatment and Collection Facilities*, 2016 Edition.
- Maintain a minimum negative pressure of 0.1-inch water column (wc) within headspace of wastewater holding tanks and raw wastewater sewers to contain odors under the following conditions:
  - Dynamic liquid level changes
  - Estimated crack openings in storage tank covers treated as sharp-edged orifices
- Sufficient velocities across the opening to prevent fugitive odors when a single access cover is removed.
- Adequate turnover rate and air scavenging within tanks to reduce corrosion resulting from H_2S pockets.

Table 3-2 summarizes flow rates and sizing criteria for each odor source area.

Table 3-2. Odorous Air Flow Rates and Sizing Criteria Summary

Location	Air Flow (cfm)	Air (ACH)	Sizing Criteria Summary
Preliminary Treatment Facility			
Dumpster Room	1,000	7.2	Existing OA exhaust flow rate adequate to prevent buildup of interior odors by introducing sufficient dilution air.
Screen Channel	500	NA	Existing OA ventilation flow rate from the screen channel.
Screen Room	11,100	15.5	Existing OA ventilation flow rate to provide (1) cooling in summer months due to heat generation, (2) exceedance of NFPA 820 ventilation criteria of 12 ACH, and (3) prevention of buildup of interior odors by introducing sufficient dilution air.
Primary Treatment			
Primary Clarifiers PE/RAS Mixing Box	4,000[a] 150	6 6	Flow rate necessary to (1) maintain a negative 0.1-inch wc under clarifier covers under normal operating conditions assuming typical cover tightness (crack opening of 0.02% of total area), (2) maintain high capture velocity of > 50 fpm across open hatches, and (3) prevent pockets of corrosive H_2S from accumulating by creating adequate scavenging velocities (approximately 25 fpm through cross section of headspace.)
117th Street Pump Station Force Main			
42-inch Sewer Line Upstream of Plant	2,000	NA	Existing OA ventilation flow rate to overcome pressurization within force main discharge (gravity sewer) line due to frictional drag forces.
Total	**18,750 (21,750)[b]**		

[a] Based on current plant design with four primary clarifiers. Odor control system designed for future capacity based on seven clarifiers.

[b] Capacity required at future buildout.

ACH = air changes per hour
cfm = cubic feet per minute
fpm = feet per minute
NA = not applicable

3.1.2.3 Dispersion Modeling

U.S. Environmental Protection Agency (EPA)-approved AERMOD dispersion model has been used to validate alternative performance. These results are shown below. All odor sources on the liquids side of the plant are modelled, including the preliminary treatment facility stack, Primary Clarifiers 1 through 4, Aeration Basins 1 through 6, primary effluent splitter box, mixed liquor splitter box, secondary clarifiers, and the exhaust from the 117th Street Pump Station Force Main discharge structure.

The Phase 5B project odor control improvements will treat the major odor sources to significantly reduce the odor impact and meet the odor goal. Figure 3-1 shows the predicted odor dispersion when the major sources are treated.

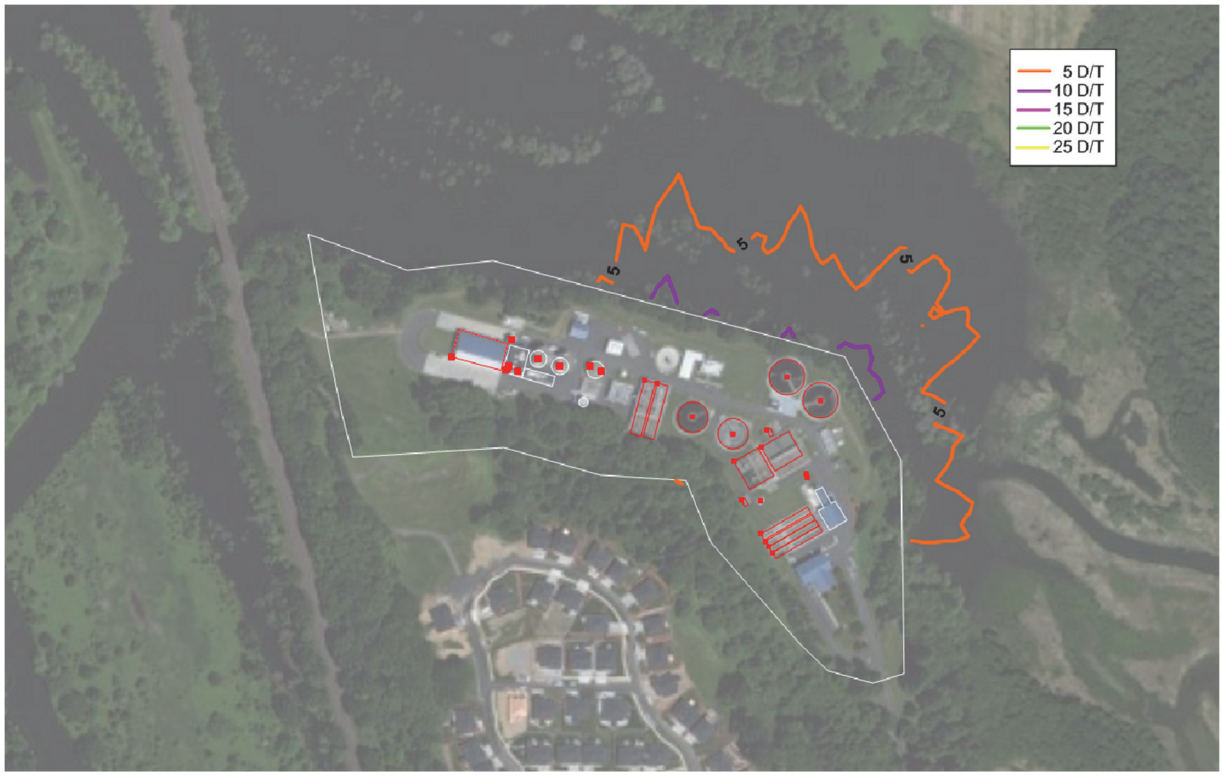


Figure 3-1. 1-Hour Annual Average Isopleths Showing Lines of Constant Odor Concentration in D/T—All Liquids Odor Sources with Odor Control as Proposed in Phase 5B Improvements

With odor control treatment of the major odor sources, the odor goal of 5 D/T at 99 percent compliance is met. The isopleth shows the odor dispersion and predicts a maximum odor level of 13.6 D/T at the fence line. The exceedances over 5 D/T do not occur at sensitive receptors (residences) south of the plant. The model predicts a total of 129 hours over the course of 5 years, or 0.3 percent of the time, for that receptor to experience an odor level up to 7.6 D/T. This provides compliance of 99.7 percent to the odor goal of 5 D/T at the nearest receptor thus achieving the odor criteria requirement established in Section 3.1.1.3.

H_2S emissions were modeled as 1-hour averaging period and 24-hour averaging period. The 1-hour predicted impacts were compared to the odor nuisance threshold of 10 µg/m^3. The 24-hour predicted impacts were compared to the toxic air pollution control threshold of 0.9 µg/m^3. Table 3-3 displays the maximum predicted impacts for H_2S emissions. As seen in Table 3-3, all maximum predicted impacts are below both the odor nuisance threshold and the air toxic threshold.

Table 3-3. H_2S Dispersion Modeling Results for Liquids Odor Sources

	Scenario	Maximum Predicted Impact H_2S 1-hour (µg/m^3)	Above the 10 µg/m^3 Odor Nuisance Threshold?	Maximum Predicted Impact H_2S 24-hour (µg/m^3)	Above the 0.9 µg/m^3 Toxic Air Pollutant Threshold?
1	Bio-trickling Filter 1 Stack[a]	1.05	No	0.41	No
2	Bio-trickling Filter 2 Stack[a]	1.17	No	0.41	No
3	Aeration Basins[b]	0.95	No	0.12	No
4	Secondary Clarifiers[c]	0.26	No	0.04	No
5	Mixed Liquor Splitter Box	0.21	No	0.02	No

[a] The odor sources treated by the bio-trickling filters are the preliminary treatment exhaust, primary clarifiers, PE/RAS mixing box, and 117th Street Pump Station Force Main discharge.

[b] Values in table are average of all six basins, with no individual basin exceeding the limits.

[c] Values in table are average of all four clarifiers, with no individual clarifier exceeding the limits.

3.1.2.4 Technology Screening

Four technologies were evaluated. These included packed chemical towers, mineral biofilters and organic biofilters, bio-trickling filters, and engineered media biofilters.

3.1.2.4.1 Packed Chemical Towers

Packed chemical towers are a common form of wet scrubbers used for odor control in municipal wastewater treatment plants. They are a proven technology and have been the technology of choice for many wastewater treatment facilities. Odor constituents including H_2S, ammonia, and various organic reduced sulfur (ORS) compounds may be reduced to very low levels using multistage packed towers. These systems are extremely effective in situations with high odor concentrations and large airflows. However, when compared to other technologies such as bio-trickling filters as described herein, these systems can be costlier and pose more safety concerns due to storage and handling of chemicals. These systems also exhibit greater complexity regarding operation due to additional equipment and instrumentation when compared to other technologies. For these reasons, this technology was not selected for further evaluation.

3.1.2.4.2 Mineral Biofilters and Organic Biofilters

In an organic biofilter, organic material such as wood chips and compost are used as a medium to grow sulfur-consuming bacteria. Foul air is forced into the bottom of the biofilter bed and treated air is released from the surface. The bacteria also use other odor compounds as a food source, including ammonia, amines, and various ORS compounds.

The concept and components of a mineral (or sand) biofilter are the same as for an organic biofilter, but a different medium (proprietary sandy loam) is used to host the microbial population.

Both of these types of biofilters require large footprints and the organic media requires more frequent media replacement than a bio-trickling filter or chemical packed tower. The land needed based on the estimated required airflow made these systems less favorable than the bio-trickling filter system in the evaluation. For these reasons, these technologies were not selected for further evaluation.

3.1.2.5 Technology Evaluation

Two odor control technologies were evaluated for implementation: (1) bio-trickling filter and (2) engineered media biofilter. These are described separately below.

3.1.2.5.1 Bio-Trickling Filter

In bio-trickling filter technology, OA is blown into the bottom of the tower and flows up through the media material, exiting through an exhaust stack. The media may be a synthetic material or a natural material such as lava rock. The bacteria also use other odor compounds as a food source, including ammonia and various ORS compounds. A schematic diagram of a typical bio-trickling filter is shown in Figure 3-2.

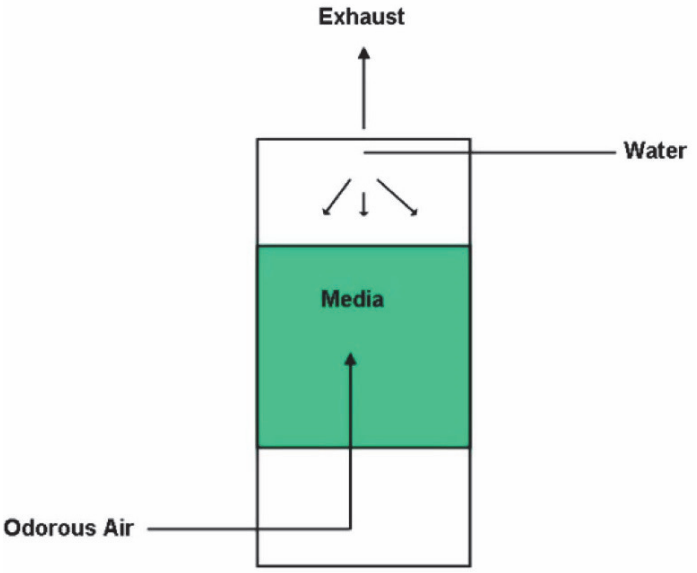


Figure 3-2. Simplified Schematic Diagram of a Bio-Trickling Filter System

Earlier design bed velocities for bio-trickling filters were 50 fpm maximum. However, advances in this technology have gradually shifted acceptable bed velocities to as high as 100 to 200 fpm; although 100 fpm is a high-end value that can be achieved by multiple suppliers.

The required empty bed gas residence time ranges from 10 to 14 seconds, depending on odor loading rate. The design head loss through the media bed can range from 0.2 to 0.5-inch wc per foot of bed depth, depending on bed velocity selected. The required footprint for this technology is generally smaller than for biofilters. For some bio-trickling filter systems, a scrubbant recirculation pump is required to keep the media moist and maintain some biomass in solution. Several suppliers including BioAir, Azzuro, and EcoVerde use a once-through arrangement by which makeup water is sprayed over the top of the media and drained out the bottom without recirculation. The advantage to this type of arrangement is that a pH gradient is maintained within the media that supports both low pH bacteria (autotrophic thiobacillus—specifically targets H_2S) and neutral pH bacteria (heterotrophic bacteria—target ORS compounds). Nutrients are generally added for maintaining biomass health because of the synthetic nature of the media. However, supplemental nutrients are not required if secondary effluent is available and meets specific water quality requirements.

3.1.2.5.2 Engineered Media Biofilter

Engineered media biofilters are biofilter systems that utilize a proprietary media that performs under much higher loading rates than organic, soil, or mineral biofilters. Engineered media biofilters also exhibit similar or better performance characteristics than organic mediums. These types of systems also have longer lasting media; however, the media is generally more expensive because it is a unique proprietary composition. Multiple vendors offer engineered media suitable for use in this application.

Design flow rates for engineered media biofilters range from 5.0 to 11.0 cubic feet per minute per square foot. Media life is normally guaranteed for 10 to 20 years. The appropriate empty bed gas residence time for engineered media is dependent upon the target odor and respective loading rate but will typically range from 30 to 60 seconds.

Generally, engineered biofilter media do not require a nutrient source because they have a nutrient constituent built into the media recipe. The advantages of engineered media biofilters include the following:

- A wide range of odorous constituents may be removed.
- The system operations and maintenance (O&M) is relatively simple.

- Chemical storage and delivery is not required.
- High rate proprietary media requires less frequent change-out (generally guaranteed for 10 to 20 years).
- The control systems are either manually operated or are relatively simple.
- The collected leachate is typically not odorous, as with compost biofilters.

However, engineered media biofilters have the following disadvantages:

- Media costs can be high.
- The system can handle gradual cyclic loadings but cannot accommodate rapid load spikes effectively because bacterial populations provide the removal mechanism.
- Require a larger footprint than tower-type odor control technologies.

3.1.2.6 Capital and Life-Cycle Cost Evaluations

A conceptual level cost estimate has been developed for each evaluated technology. The cost estimates are considered study- or feasibility-level, Class 4 estimates as defined by the Association for the Advancement of Cost Engineering International. These estimates are considered accurate from +20 to +50 percent on the high side to -15 to -30 percent on the low side, based on a preliminary design, level of information available, and estimating techniques used.

Capital costs for all odor control technology alternatives include site work, odor control equipment, mechanical, electrical, instrumentation and control, piping, and ductwork. Site work includes excavation for equipment pads and biofilter vessels. Odor control equipment costs include the odor control fans, media, and vessels. The ductwork costs include an estimated 550 feet of collection duct from the headworks and primary clarifiers. Also included are aluminum covers for the primary clarifiers as well as a $100,000 place holder for modifying the headworks heating, ventilation, and air conditioning (HVAC) system. Capital costs are estimated using the following approach:

- Equipment costs are based on recent equipment supplier cost quotes received.
- Percentage markups applied for unknown costs such as site work, instrumentation, electrical, and yard piping.

Additional project costs were developed by escalating the equipment sub-cost by the markups illustrated below.

Markups applied to equipment costs were as follows:

- Equipment installation: 10%
- Field painting/finishes: 1%
- Mechanical: 8%
- Electrical: 8%
- Instrumentation: 5%

Contractor markups applied to equipment subtotal + project costs were as follows:

- General conditions: 7%
- Overhead: 5%
- Profit: 5%
- Bonds/insurance: 2.5%
- Contingency: 20%
- Escalation (3% per year): 6% (construction completed end of 2018)

Non-construction cost markups applied to construction cost after contractor markups and escalation were as follows:

- Permitting: 3%
- Engineering: 10%
- Services during construction: 5%
- Commissioning/startup: 5%
- Sales tax: 8.4% (Sales tax in Washington)

O&M and life-cycle costs were developed using the following inputs:

- Electricity costs: $0.06/ kilowatt-hour
- Operator labor costs: $40/hour
- Financing costs: 20-year life, 6 percent discount rate
- Nutrient costs: $10/gallon

Table 3-4 summarizes the cost estimate for evaluated odor control technologies.

Table 3-4. Cost Estimate Summary of Technologies

Item	Bio-Trickling Filter (x$1,000)	Engineered Media Biofilter (x$1,000)
Capital Equipment Costs:		
Odor Control Equipment	$794	$372
Biofilter Aluminum Cover	$0	$91
Primaries Aluminum Cover	$239	$239
HVAC For Headworks	$100	$100
Ducting and Stack	$234	$243
Site Work	$18	$279
Subtotal- Equipment Costs	$1,386	$1,324
Capital Mark-Up Costs:		
Allowance Costs	$460	$440
Contractor Markups	$360	$344
Contingency (20%)	$441	$422
Escalation (3% per year)	$238	$228
Non-Construction Capital Costs:		
Engineering	$289	$276
Permitting	$87	$83
Services During Construction	$144	$138
Commissioning and Start-Up	$144	$138
Sales Tax	$242	$232
Annual Costs:		
Electrical Power	$10.94	$11.06
Maintenance	$25.87	$36.79
Nutrients	$19.16	$0.00

Table 3-4. Cost Estimate Summary of Technologies

Item	Bio-Trickling Filter (x$1,000)	Engineered Media Biofilter (x$1,000)
Removal and Replacement Costs	$7.70	$12.59
Water	$5.37	$5.37
Subtotal – Annual Costs	$70.00	$66.00
Present Worth Annual Costs	$873	$823
Total Capital Cost	$3,794	$3,623
Total Project Present Worth	$4,667	$4,446

The cost evaluation shows that the total project present worth cost for either technology is similar given the level of comparison (Class 4 estimates). However, the larger footprint required for the engineered media biofilter combined with site constraints made this option infeasible. Several locations were evaluated but each would have placed the biofilter too close to residences or required relocation of existing facilities.

3.1.2.7 Recommended Technologies

The results of the evaluation determined that bio-trickling filter odor control technology using a structured media and once-through irrigation would provide adequate removal of H_2S and removal of ORS compounds. Although the engineered media biofilter has a similar overall cost, the bio-trickling filter technology was selected based on its high qualitative rating, smaller footprint, and consistent technology approach to the existing sludge blend tank bio-trickling filter system currently operated at the SCTP.

3.1.2.8 Design Criteria

The new Preliminary and Primary Treatment Odor Control System is designed to treat the odorous air (OA) from the sources described. The design criteria for bio-trickling filter towers are summarized in Table 3-5. Two towers are needed for the quantity of air to be treated and are sized for treatment of additional OA when the future Primary Clarifiers 5, 6, and 7 are installed and 117th Avenue Pump Station is expanded. The incremental additional cost to add capacity for the future condition is estimated to be less than 15 percent and will be much less expensive than adding a tower in the future to handle additional loads. Therefore, additional capacity is recommended to be provided as part of this initial phase of construction.

Table 3-5. Bio-Trickling Filter Tower Odor Control System Design Criteria

Description	Criteria
Tower Type	Once through—counterflow
Media Type	Synthetic
Air flow capacity	18,750 cfm initial, (21,750 cfm future)
Predicted Inlet Concentrations	Hydrogen Sulfide: 2 ppmV (average); 10 ppmV (peak) ORS Compounds: 75 to 300 ppbV
Minimum H_2S Removal Rate	For inlet concentrations > 10 ppm, 99% removal For inlet concentrations < 10 ppm, outlet concentration < 500 ppb
Minimum Odor Removal Rate, D/T	For inlet odor > 3000 D/T 90% removal For inlet odor < 3000, outlet ≤ 500 D/T

Table 3-5. Bio-Trickling Filter Tower Odor Control System Design Criteria

Description	Criteria
Tower Vessel	Two at 12-foot-diameter and 30 feet high
Contact Time (based on future)	14 seconds (minimum)
Irrigation Water	Plant water
Maximum Instantaneous Rate (at pressure)	45 gpm (at 75 pounds per square inch)
Estimated Water Usage	3,500 gallons per day
Fans	Type: FRP centrifugal (1 duty, 1 standby) Capacity: 22,000 cfm at 7-inches wc Motor: 40 horsepower
Facility Footprint	Approximately 1,800 square feet

FRP = fiberglass reinforced plastic
gpm = gallon(s) per minute

3.1.2.9 System Configuration

The existing primary treatment facility includes four open basin primary clarifiers. All four clarifiers and the associated influent and effluent channels will be covered with new premanufactured flat aluminum or FRP covers and ventilated to the new Preliminary and Primary Treatment Odor Control System. Refer to Sheets 1 and 2 in Appendix A for drawings of the primary clarifier modifications.

The Preliminary and Primary Treatment Odor Control System itself will consist of ductwork and dampers to convey OA to fans (one duty, one standby) which move air through the odor control bio-trickling filters. The bio-trickling filters are towers filled with synthetic media. Secondary effluent is fed to the top of the filter and trickles down through the media. Filtrate is collected and returned to the preliminary treatment process via the plant drain. OA passes through the media and odorous compounds (primarily H_2S and other reduced sulfur compounds) are removed from the air stream via microbes residing in the biofilm attached to the media. Treated air exits the system through a stack that provides dispersion of any residual odors. Figure 3-3 shows the configuration of the bio-trickling filter system. Refer to Sheets 3 and 4 in Appendix A for drawings of the Preliminary and Primary Treatment Odor Control System.

Control of the system will be automated. Fans and valves will be connected to the SCTP supervisory control and data acquisition (SCADA) system where operators will have remote control. Power requirements are minimal as each odor control exhaust fan is 40 horsepower (hp).

The bio-trickling filters are set up to operate in parallel, meaning both are duty with each treating 50 percent of the air. This allows maintenance activities to be performed on one filter while the other remains in operation. During maintenance activities, the active bio-trickling filter will treat half the odorous air while the remaining air exhausts through a bypass stack. Operation of odor control systems in series (that is, with exhaust from the first vessel being routed to the intake of the second vessel) is not required for system performance, and it adds pressure drop, which would require larger motors on the fans and would increase the overall power consumption. Reactors in series are more common in industrial vapor phase treatment systems that are seeking to recover solvents from an industrial process.

Minimal maintenance is required for the bio-trickling filter towers, which are designed to operate continually. The media does not normally require replacement and is guaranteed by the supplier for 10 years.

A maintenance platform is provided for operators to observe the spray nozzle and maintenance is only necessary if the nozzle is not providing an adequate spray pattern. Maintenance on the other system components does not require the system to be shut down. Other maintenance includes lubrication of fan bearings and periodic inspection of the fan wheel. The water source for the spray system is treated secondary effluent, which is expected to have sufficient nutrients to maintain a healthy biomass. A stand-

alone nutrient feed system is provided to supply supplemental nutrients to the biomass if required, and this feature is a standard component of such bio-trickling filter systems.

The biological process results in an accumulated “blowdown” water that becomes acidic. This acidic blowdown water must be pumped out of the bio-trickling filter regularly and will be discharged to the plant drain system, which is then pumped back to the primary treatment process. Approximately 3,000 gallons per day of blowdown water is expected. This flow stream will be drained by gravity and diluted with plant water at the point of discharge into the plant drain system to avoid potential damage from acidic exposure to piping materials.

Sound attenuating enclosures will be provided around the fans and are designed with removable panels to facilitate fan maintenance. Notably, the bio-trickling filter fans provide the required ventilation that allows for one large exhaust fan at the Preliminary Treatment Building, with limited sound attenuation, to be removed from service.

An existing carbon adsorber odor control system currently treats OA from the 42-inch-diameter gravity sewer conveying the 117th Street Pump Station Force Main flow into the plant. That odor control system was installed as a temporary measure to reduce odors until a new comprehensive odor control system could be installed. The carbon adsorber system will be demolished and the existing duct will be connected to the new Preliminary and Primary Treatment Odor Control System for continued treatment of this odor source.

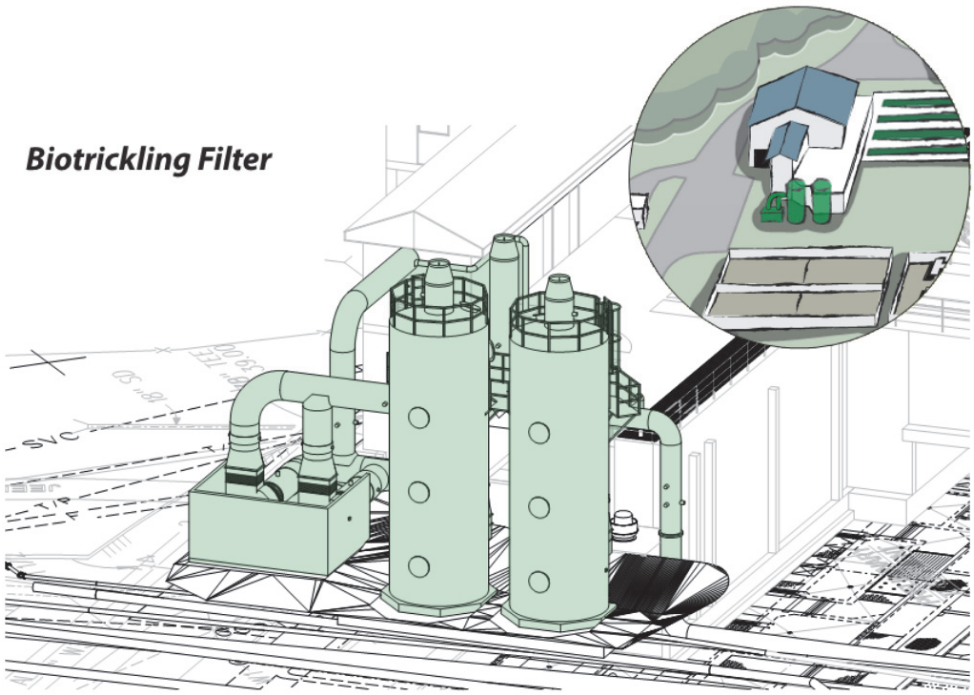


Figure 3-3. Preliminary and Primary Treatment Odor Control System

3.1.3 Solids Processing Odor Control

The Solids Processing Center includes unit processes that handle sludge pre-digestion and biosolids post-digestion. Waste activated sludge (WAS) is thickened, then pumped to a sludge blend tank where it is combined with primary sludge from the primary clarifiers. This blended sludge is then fed to the digesters. Following digestion, the digested sludge, or biosolids, flows to a biosolids holding tank, which serves as a wide spot prior to dewatering. Dewatering currently occurs 24 hours per day, 7 days per week, although the system is designed with capacity for a shorter daily operation.

The sludge blend tank is served by an existing bio-trickling filter to treat OA from the headspace of the tank. No other odor control is currently provided within the Solids Processing Center.

3.1.3.1 Odor Source Identification and Sampling

The Solids Processing Center was identified as a potential source of nuisance complex odors, characteristic of solids handling, and noted to be different from odors characteristic of the preliminary/primary treatment processes. Odor sources were identified, and air samples were collected and analyzed to identify the odor and H_2S levels at each source. Odors were quantified using a D/T method as determined by a third-party laboratory. H_2S concentrations in the air were measured using a portable detector and reported as ppmV or ppbV. Odor and H_2S dispersion modelling was then performed based on the most current data and EPA-recommended modelling protocol. The modelling confirmed the solids process as major or minor sources that impact the offsite receptor odor goal.

Process areas within the Solids Processing Center were surveyed and air samples were collected and analyzed. These areas are shown in Figure 3-4.

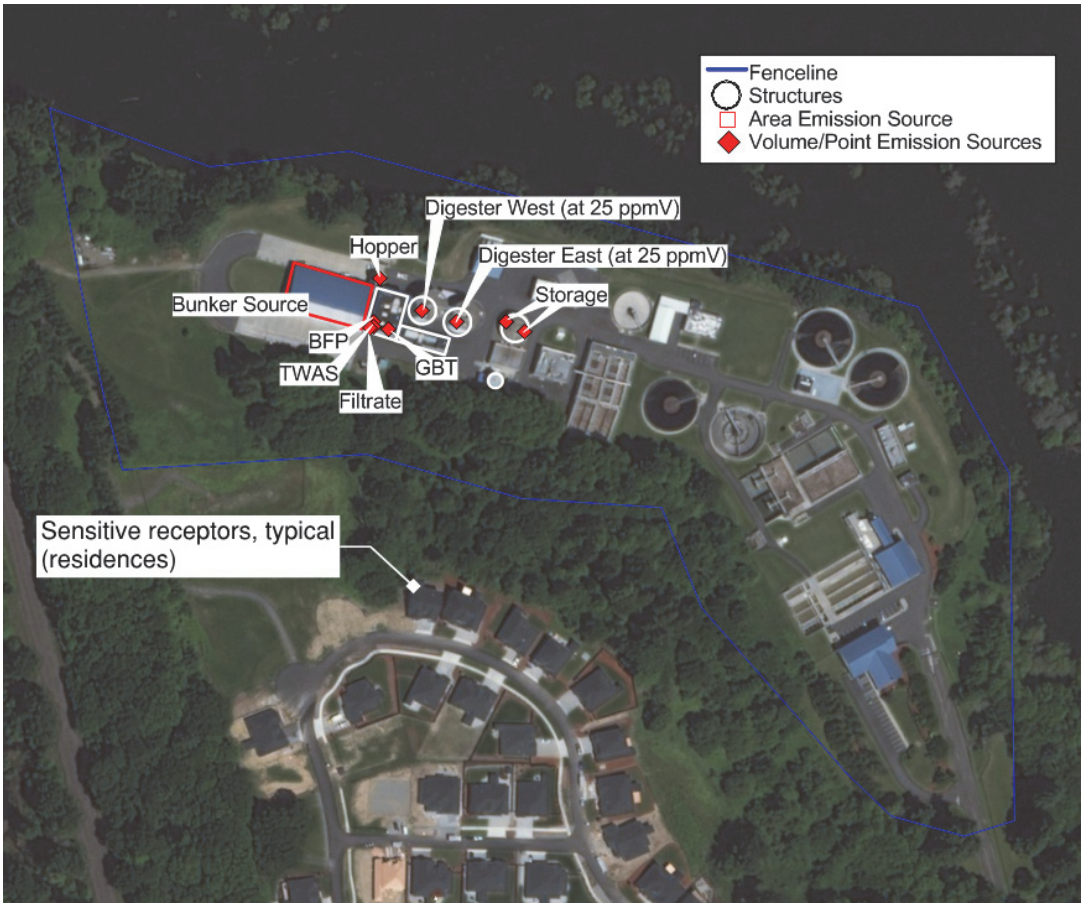


Figure 3-4. Solids Processing Center Odor Sources
Aerial Imagery © Google Earth. Annotation © 2018 Jacobs.

Table 3-6 summarizes the recommendations for the odor sources that were examined.

Table 3-6. Solids Processing Center Odor Sources Summary

Location		Air Flow (cfm)	Summary
1	Thickening – Gravity Belt Thickeners Room Exhaust	30,000	HVAC roof exhaust from ductwork located above each GBT and room. The H_2S and odor levels are very low and do not impact the property boundary. This source does not require treatment.
2	TWAS Wet Wells	660	The wet wells are ventilated to the outdoors untreated. The OA is discharged by the exhaust fan (72-EF-3) on the roof. These wet wells are ventilated at approximately 15 ACH. This odor source will be directed to the new odor control system.
3	Filtrate Wet Well	300	The filtrate recycle wet well has a 12-inch-diameter passive vent at the roof. The ventilation rate is based on 6 ACH (empty). Although the odor levels are low, this odor source will be directed to the new odor control system to reduce corrosion.
4	Biosolids Dewatering – BFP Stack	14,000	The BFP room exhausts the OA from above BFP units to the outdoors untreated. H_2S and ammonia have been measured in the stack exhaust. This is a major source of odor for the Solids Processing Center and will be directed to the new odor control system.
5	Biosolids Conveyors	150	Conveyers are covered and minimize risk for odors. A new conveyer is planned for 2019 that will be provided with OA connections for the new odor control system.
6	Biosolids Hopper	Estimated 200	The biosolids hopper has a passive vent and odors do not impact the property boundary. The hopper should be ventilated for odor containment and the discharge air treated at the new odor control system.
7	Biosolids Storage Day Tank	5,600	The biosolids storage day tank can be ventilated by an existing supply fan 77-SF-1; however, the odor levels are low for both passive (fan off) and active ventilation (fan running) and do not affect the property boundary.
8	Cake Storage Bunkers	NA	Bunkers are not actively ventilated. This source does not require treatment.

3.1.3.2 Air Sample Results

This section describes the major processes and how they contribute as sources of odor. Data from air sampling and analysis from the odor sources are included.

3.1.3.2.1 Thickening – Gravity Belt Thickeners Room Exhaust

The solids handling process includes WAS thickening using gravity belt thickeners (GBTs) before digestion. The GBTs are on the ground level of the Solids Processing Center and are not enclosed or covered. The room is ventilated to the outdoors untreated by HVAC through exhaust fan 72-EF-2 on the roof. Air samples taken from the exhaust were found to contain 0.2 ppmV H_2S and an odor level of 820 D/T. It was observed that this room does not exhibit high odors and further testing of the stack exhaust indicated that this is not a major source that results in exceeding the odor goals at the offsite receptors.

3.1.3.2.2 TWAS Wet Wells

The TWAS wet wells have been identified as a potential odor source and contain a distinct odor. There are two separate wells, each 15-feet, 6-inches long by 8-feet wide and 11-feet deep. Each well is ventilated to the outdoors untreated. The OA is discharged by exhaust fan 72-EF-3 on the roof. The total air flow rate from both wells is 660 cfm and is dispersed upward without a stack. Air samples have been analyzed from this source and found to contain 0.33 ppmV H_2S and an odor level of 2,000 D/T.

3.1.3.2.3 Filtrate Wet Well

The filtrate wet well is in the lower level of the Solids Processing Center. The wet well is 37-feet, 6-inches long by 8-feet wide and 11-feet deep. There are two 3-foot-square access hatches on each end of the

well and a 12-inch-diameter vent that extends to the roof. This passive vent allows OA to exit with minimal dispersion. The vent pipe can be connected to an odor control exhaust fan to produce a negative pressure in the well and contain odors, then treat the air to remove odorous compounds. Providing active ventilation will be beneficial to reduce corrosion that is noticeable on the underside of the wet well cover. Air samples taken from the vent pipe during normal operation have been analyzed and found to contain 0.65 ppmV H_2S and an odor level of 4,700 D/T.

3.1.3.2.4 Biosolids Dewatering – BFP Stack

BFPs are used to remove excess water from digested biosolids. Hoods are installed directly above the BFPs to capture odors emitted by the biosolids as they move through the BFP. Exhaust fans 72-EF-1-1 and 72-EF-1-2 on the roof draw the air through the hoods and discharge 14,040 cfm outdoors, untreated, through a short stack. The dewatering process operates 24 hours per day, 7 days per week, which creates a continuous exhaust (although the system, like thickening, is sized large enough to operate only during a typical single 8-hour daytime working shift). During certain meteorological conditions (for example, nocturnal inversion layers), the odor plume may accumulate and migrate beyond the fence line and reach sensitive receptors with minimum mixing or dilution. Air samples have been analyzed from this source and found to contain 0.5 to 1.0 ppmV H_2S, up to 2 ppmV ammonia and an odor level of 4,400 D/T. Additional analysis of odor plume resulted in non-detectable levels of organic reduced sulfides commonly found in this process. The minimum detectable limit (that is, method reporting limit) is 5 ppbV. These compounds may still be present at low levels because distinct odors have been observed. Many of these compounds have odor thresholds (typically 0.1 ppbV) much lower than the detectable limit.

3.1.3.2.5 Biosolids Conveyer

Dewatered biosolids are conveyed from the BFPs by horizontal screw conveyors to an inclined screw conveyor to the biosolids hopper. The screw conveyor is covered, which helps contain odors. The screw conveyor is planned to be replaced in 2019 and the new screw conveyor will also be covered. The new auger cover will be provided with an OA connection so that it can be ducted to the new odor control system.

3.1.3.2.6 Biosolids Hopper

When the hopper is full, the biosolids are automatically directed by the horizontal conveyer that extends to the first biosolids bunker for storage. The full hopper is emptied into a truck and either hauled away or transferred to one of the additional biosolids bunkers. The hopper is passively vented to the outdoors through a small gooseneck vent and has been identified as a potential source of odor. Air samples taken from the access hatch have been analyzed and found to contain 0.16 ppmV H_2S and an odor level of 580 D/T.

3.1.3.2.7 Biosolids Storage Day Tank

Biosolids are stored in the biosolids storage day tank prior to being sent to the BFPs for dewatering. The tank can be passively or actively ventilated and has been identified as a potential source of odor. Air samples taken from the tank have been analyzed and found to contain 0.55 ppmV H_2S and an odor level of 1,000 D/T.

3.1.3.2.8 Cake Storage Bunkers

When the biosolids hopper is full, dewatered biosolids are transferred to one of four cake storage bunkers. There is a roof over the bunkers to prevent rain from infiltrating the dewatered biosolids, but the bunkers are otherwise open to the surrounding environment and are not actively ventilated. Air samples taken from the bunkers have been analyzed and found to contain 0.014 ppmV H_2S and an odor level of 220 D/T.

3.1.3.3 Ventilation Requirements

Recommended ventilation rates for sizing odor control systems should comply with NFPA 820 and Jacobs design practice for similar facilities. In general, ventilation rates should meet the following objectives:

- Provide adequate ventilation to protect maintenance personnel within occupied spaces per NFPA 820, *Fire Protection in Wastewater Treatment and Collection Facilities*, 2016 Edition.
- Maintain a minimum negative pressure of 0.1-inch wc within wastewater holding tanks and raw wastewater sewers to contain odors under the following conditions:
  - Dynamic liquid level changes
  - Estimated crack openings in storage tank covers treated as sharp-edged orifices
- Maintain sufficient velocities across the opening to prevent fugitive odors when a single access cover is removed.
- Provide adequate turnover rate and air scavenging within tanks to reduce corrosion resulting from H_2S pockets.

3.1.3.4 Dispersion Modeling

Odor and H_2S dispersion modelling using the AERMOD model was performed using the analytical data. The results show which odor sources impact the sensitive receptors outside of the plant boundary.

H_2S emissions were modeled as 1-hour averaging period and 24-hour averaging period. The 1-hour predicted impacts were compared to the odor nuisance threshold of 10 µg/m^3. The 24-hour predicted impacts were compared to the toxic air pollution control threshold of 0.9 µg/m^3. Table 3-7 summarizes the maximum predicted impacts for H_2S emissions. As seen in Table 3-7, all maximum predicted impacts are below both the odor nuisance threshold and the air toxic threshold.

Table 3-7. H_2S Dispersion Modeling Results for Solids Odor Sources

Scenario		Maximum Predicted Impact H_2S 1-hour (µg/m^3)	Above the 10 µg/m^3 Odor Nuisance Threshold?	Maximum Predicted Impact H_2S 24-hour (µg/m^3)	Above the 0.9 µg/m^3 Toxic Air Pollutant Threshold?
1	GBT stack only	2.69	No	0.63	No
2	New solids odor control stack*	3.04	No	0.68	No
3a	Storage tank (passive vent)	6.69E-05	No	1.40E-05	No
3b	Storage tank (active exhaust)	3.03	No	0.28	No
4	Bunkers only	0.14	No	2.09E-02	No
5	Digester hatch	1.98E-02	No	4.94E-03	No

*The odor sources treated by the new solids odor control system are the BFP stack, TWAS wet well vent, filtrate wet well vent, and hopper.

The odor sources that impact the offsite sensitive receptors (residences) include the BFP stack discharge, TWAS wet well vent, filtrate wet well vent, and hopper. Figure 3-5 shows the dispersion model results for maximum offsite D/T concentrations when these sources are treated.

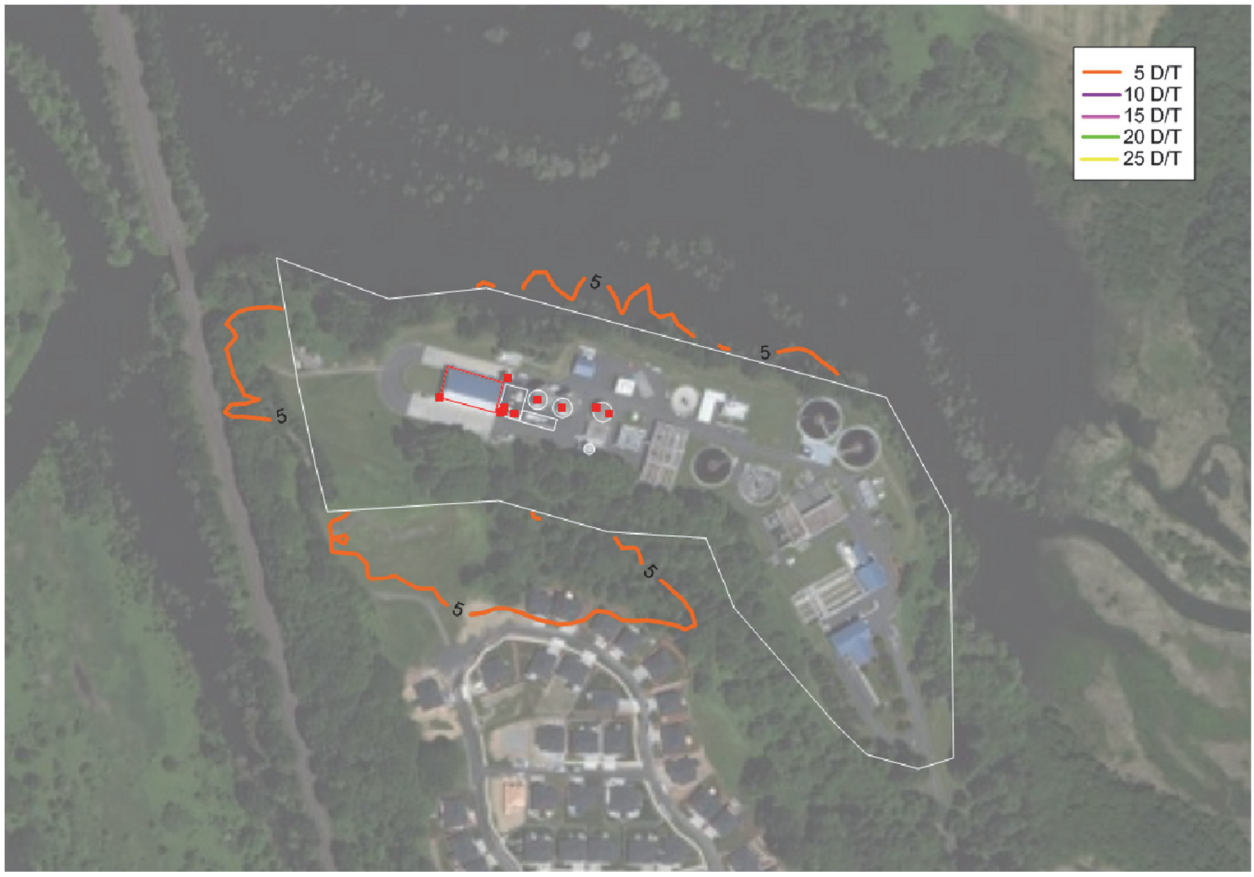


Figure 3-5. 1-Hour Annual Average Isopleths Showing Lines of Constant Odor Concentration in D/T—Overall Solids Area with Major Odor Sources Treated
Aerial Imagery © Google Earth. Annotation © 2018 Jacobs.

Figure 3-5 shows the isopleth for 5 D/T and the areas outside of the property boundary. The area inside the orange line illustrates locations that will experience an odor level higher than 5 D/T. It should be noted that the number of exceedances over 5 D/T occur less than 1 percent of the time over 5 years. The dispersion model predicts that the D/T will not exceed a 1-hour average of 5 D/T at any receptor with 99 percent compliance thus achieving the odor criteria requirement established in Section 3.1.1.3.

3.1.3.5 Technology Screening

The odor sources can be contained and treated by a new odor control system. Each odor source has specific odor characteristics, and therefore the applicability of various odor treatment technologies varies by odor source. Considering the relatively small size of this system, and the specific odor characteristics, it is most appropriate to combine all the OA flow streams and treat them in a single system that addresses site boundary odor criteria.

The major sources of odor from solids process areas are the TWAS wet well, filtrate wet well, BFP stack, and biosolids hopper. These sources are exhausted by active ventilation to the outdoors. The treatment strategy considers combining the major odor sources and treating them in a single odor control system with 16,000 actual cfm capacity. The most appropriate technologies for these types of complex odors in the low concentrations being addressed are as follows:

- Photoionization
- Carbon adsorber with blended media

Either of these technologies will result in a low level of odor in the exhaust (< 200 D/T) that will result in meeting the odor criteria described.

Biofilter technology is not applicable because there will not be adequate loading to support the bacteria. Chemical scrubbing requires a more complex system with increased maintenance and uses harsh and unsafe chemicals, which is not a preferred technology and therefore not recommended.

3.1.3.6 Technology Evaluation

3.1.3.6.1 Photoionization

Photoionization is a process by which special lamps produce ultraviolet (UV) energy that reacts with the odorous compounds. The UV light creates oxidizing agents, such as OH^- and O_3, which neutralize the odors. A catalyst (carbon media) filter is used to polish any remaining free radicals and odors. The equipment requires replacing the lamps every 1 to 2 years and the filters and catalyst annually.

The photoionization units are typically provided with a stainless steel enclosure, double-walled and insulated, with an integral fan to pull the OA through a dust filter, past the UV lamps, then through a carbon bed that acts as a catalyst. The carbon bed acts to hold the reacted odor compounds for enough time to allow total and complete oxidation before discharge. The air then exits the stack.

Figure 3-6 shows a smaller unit (90 cfm) treating a wastewater treatment plant in Orem, Utah.

Figure 3-6. Photoionization Unit (90 cfm) Orem Utah

The advantages of this technology include the following:

- Requires a small footprint
- Relatively low weight
- Variations in loading are handled well
- Temperature and relative humidity do not affect the performance
- Effectively treats low levels of odors, in particular reduced sulfide species
- Can meet odor levels of 500 D/T or lower
- Odors are removed immediately upon startup
- Low pressure drop
- Can operate at reduced capacity to extend bulb life during periods of low loading
- No chemicals or water required

The disadvantages of this technology include the following:

- Requires replacing lamps every 1 to 2 years
- Lamps have high power consumption
- Catalyst filter (carbon media) needs regular maintenance
- Potential to release ozone if the catalyst is not maintained
- Limited installations in USA (many in Canada and Europe)

3.1.3.6.2 Carbon Adsorber

Activated carbon is commonly used for removing odors in airstreams. Several types of activated carbon media are available. The most commonly used when higher levels of H_2S are present include impregnated activated carbon, catalytically activated carbon, and high-rate activated carbon. For airstreams containing low odor levels (as in this situation) a virgin carbon is typically used. The carbon is installed in an FRP vessel and a typical system includes a pre-filter, fan, ducting, stack, and control panel.

For vertical adsorbers with horizontal carbon beds, a single- or dual-bed configuration are common. The adsorbers can be designed with multiple beds in the same vessel using a horizontal adsorber with vertical carbon beds. Figure 3-7 shows a typical dual-bed carbon adsorber system.

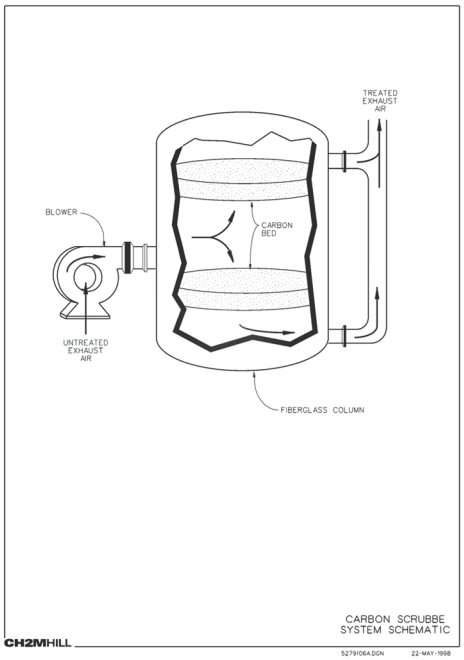


Figure 3-7. Dual Bed Carbon Vessel

3.1.3.6.3 Virgin Activated Carbon

Virgin activated carbon comes in several forms, including coconut shell carbon and coal-based carbon. In addition, pelletized media or granular media are both available. Coal-based carbon exhibits a broader distribution of pores and exhibits relatively better settling of the media, which allows more media to be placed in a specified volume, than the coconut shell carbon. The coconut shell carbon exhibits higher surface area per unit volume and adsorbs organics better than coal-based carbon. The pelletized carbon is better than granular coal for settling and has a lower pressure drop. Because of its relatively low adsorption capability for H_2S, virgin media is generally not recommended for systems handling H_2S levels greater than 1 to 2 ppmV. In this case, for lower levels of H_2S and where additional ORS compounds common in solids handling are present in the air stream, a virgin media provides good adsorption.

A blended media consisting of activated carbon and potassium permanganate pellets is used to provide additional capacity of some compounds that are not adsorbed well on carbon. Permanganate is a strong oxidizing agent and reacts well with vapor phase odorous compounds. A porous, inert compound such as zeolite or activated alumina provides the substrate for either sodium or potassium permanganate, which can contain varying amounts of this active ingredient. The mechanisms for capturing and reacting with odorous compounds include absorption, adsorption, and chemical oxidation. The media is a bright purple color when new and slowly turns to a brownish color when it is spent. A 50:50 mixture with carbon is commonly used for increased removal of complex odorous compounds.

With moist air, catalytic conversion of methyl mercaptan to dimethyl disulfide (DMDS) occurs within the carbon bed. The DMDS adsorbs on the carbon; however, it tends to break through quickly due to its low adsorption capacity. It is not uncommon to observe a different odor exiting the carbon bed than entering, due to this phenomenon. The use of a blended media reduces this issue because the DMDS is more fully oxidized.

Advantages of carbon adsorption are as follows:

- Simplicity of system and operation
- Requires a relatively small footprint
- Works on day one (no acclimation requirement)
- Various odor constituents in addition to H_2S can be removed, although not at as high an efficiency

Disadvantages of carbon adsorption are as follows:

- At high loadings, the carbon must be replaced often.
- Pressure drops through the carbon bed can be high.
- Breakthrough of odor may occur if the media is not replaced once it is saturated.
- A grease filter/mist eliminator is needed upstream to avoid any blinding of the carbon bed. This adds cost, pressure drop, and additional maintenance.

3.1.3.7 Capital and Life-Cycle Cost Evaluations

A conceptual level cost estimate has been developed for each evaluated technology. The cost estimates are considered a study- or feasibility-level, Class 4 estimate as defined by the Association for the Advancement of Cost Engineering International. These estimates are considered accurate from +20 to +50 percent on the high side to -15 to -30 percent on the low side, based on a preliminary design, level of information available, and estimating techniques used.

Capital costs for all odor control technology alternatives include site work, odor control equipment, mechanical, electrical, instrumentation and control, piping, and ductwork. Site work includes excavation for equipment pads. Odor control equipment costs include the odor control fans, media, and vessels. The ductwork costs include collection duct, dampers, and supports from the Solids Processing Center odor sources. Capital costs are estimated using the following approach:

- Equipment costs are based on recent equipment supplier cost quotes received.
- Percentage markups are applied for unknown costs such as site work, instrumentation, electrical, and yard piping.

Additional project costs were developed by escalating the equipment sub-cost by the markups shown below.

Markups applied to equipment costs were as follows:

- Equipment Installation: 10%
- Field Painting/Finishes: 1%
- Mechanical: 8%
- Electrical: 8%
- Instrumentation: 5%

Contractor markups applied to equipment subtotal and project costs were as follows:

- General Conditions: 7%
- Overhead: 5%
- Profit: 5%
- Bonds/Insurance: 2.5%
- Contingency: 20%
- Escalation (3% per year): 4.5% (Mid-point of construction, August 2020)

Non-construction cost markups applied to construction cost after contractor markups and escalation were as follows:

- Permitting 3%
- Engineering 10%
- Services during Construction: 5%
- Commissioning/Startup: 5%
- Sales Tax: 8.4% (Sales tax in Clark County, Washington)

Operation and maintenance and life-cycle costs were developed using the following inputs:

- Electricity Costs: $0.06/ kilowatt-hour

- Operator Labor Costs: $40/hour
- Financing Costs: 20-year life, 6 percent discount rate
- Carbon Media Costs: $2.25/pound
- Other consumables: Per vendor quote

Table 3-8 summarizes the cost estimate for evaluated odor control technologies.

Table 3-8. Cost Estimate Summary of Technologies

Item	Photoionization (x$1,000)	Carbon Adsorber (x$1,000)
Capital Equipment Costs		
Odor Control Equipment	$459	$320
Ducting and Stack	$100	$100
Site Work	$10	$10
Subtotal- Equipment Costs	$569	$430
Capital Mark-up Costs		
Allowance Costs	$181	$138
Contractor Markups	$146	$110
Contingency (20%)	$179	$136
Escalation (3% per year)	$48	$37
Non-construction Capital Costs		
Engineering	$112	$85
Permitting	$34	$26
Services During Construction	$56	$43
Commissioning and Start-up	$56	$43
Sales Tax	$94	$72
Annual Costs		
Electrical Power	$11.7	$8.9
Maintenance	$3.5	$0.8
Media/Other Consumables	$40	$18
Subtotal – Annual Costs	$56	$28
Present Worth Annual Costs	**$643**	**$322**
Total Capital Cost	**$1,477**	**$1,120**
Total Project Present Worth	**$2,120**	**$1,442**

The cost evaluation shows that the total project present worth cost for the photoionization technology is almost 50 percent higher than the carbon adsorber technology. This is because the photoionization equipment cost is 32 percent higher than the carbon adsorber equipment and the annual costs are twice as much. The annual cost for carbon adsorbers is based on replacing the media every 4 years. The annual cost for photoionization includes replacing the lamps and catalyst.

3.1.3.8 Recommended Technology

The results of the evaluation determined that carbon adsorber technology would provide adequate removal of odorous compounds with a lower capital cost. Plant staff also contacted several facilities with installations of photoionization and were not fully comfortable with the newer technology and maintenance requirements at this time. Carbon adsorption is an established technology with less maintenance required and is the recommended technology for solids processing odor control.

3.1.3.9 Design Criteria

Table 3-9 describes the specific design criteria for the selected carbon adsorber system.

Table 3-9. Odor Control System Design Criteria for Carbon Adsorbers

Description	Criteria
Technology	Virgin Activated Carbon adsorbers (blended media)
Air flow	16,000 cfm
Unit footprint	12 feet diameter
Height	8 feet
Required performance	200 D/T at exhaust
Number of units	2
Overall footprint required	30 feet by 15 feet
Operating weight (total)	40,000 pounds
Supply voltage	3 phase/460 volts alternating current (fan motors)
Power usage (total)	16 kilowatts
Fans	Type: FRP centrifugal (1 duty, 1 standby) Capacity: 16,000 cfm at 7-inches wc Motor: 25 horsepower
Location	Near biosolids bunkers

3.1.3.10 System Configuration

Major odor sources from the Solids Processing Center will be connected to the new activated carbon odor control system. All existing exhaust fans will be removed, and balancing dampers will be added to each source. Two fans arranged in a duty and standby will provide redundancy in the system. The location for the treatment system is west of the bunkers. This location is selected because ample space is available, there are no below-ground utilities to relocate, and there are no future plans for expansion of the bunkers. The OA duct and power/control raceways will be routed through the bunkers headspace and use the existing structure for support. Figure 3-8 below shows the system configuration of the carbon adsorption system. Refer to Sheets 5 and 6 in Appendix A for drawings of the solids processing odor control System.

Control of the system will be automated. The exhaust fans will be connected to the facility SCADA system where operators will have remote control. Power requirements are minimal as each odor control exhaust fan is 25 hp.

The carbon adsorbers are set up to operate in parallel, meaning both are duty with each treating 50 percent of the air. Two single bed adsorbers were chosen instead of one dual bed adsorber. This eases maintenance by allowing the media to be changed from a single bed without requiring the entire system to be shut down. When changing the media, one adsorber will be shut down at a time. The remaining active adsorber can treat half the odorous air while the remaining air exhausts through a bypass stack. During media changeout, which can be completed within 1 or 2 days, a single adsorber will be in operation thereby reducing the amount of solids process air being treated by 50 percent.

SCTP staff will be able to sample the carbon media at different depths of the media bed with sample ports spaced every 9 inches along the 36-inch bed depth. The media samples can be analyzed to determine remaining capacity and these data can be used to schedule a changeout before odors break through. After some period of time, staff will have enough experience to forecast and schedule the media changeout frequency (currently estimated at 3 to 5 years).

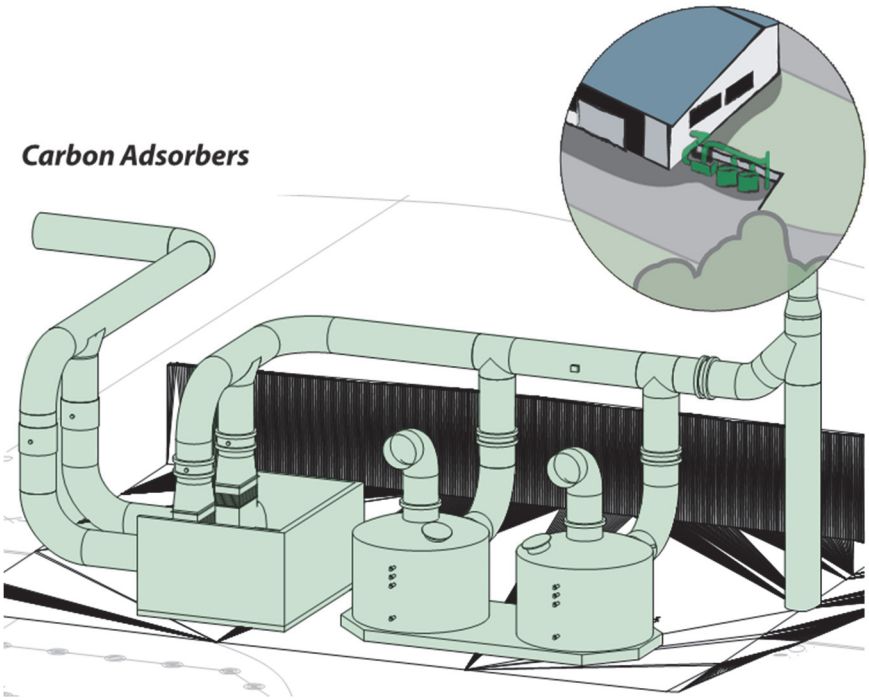


Figure 3-8. Solids Processing Odor Control System

3.2 Secondary Treatment

3.2.1 Existing Aeration Basin Upgrades

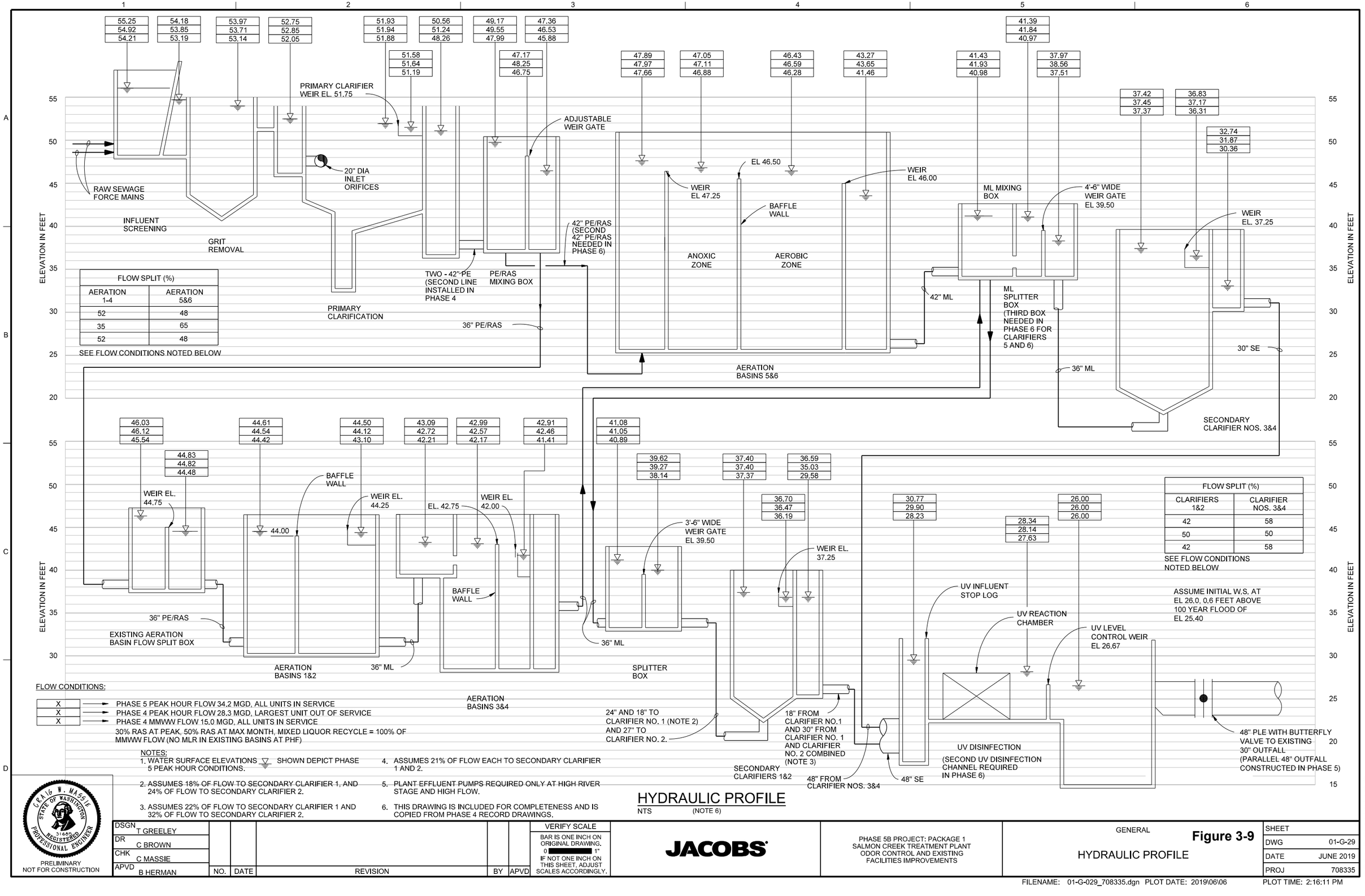
3.2.1.1 Baffles

3.2.1.1.1 Proposed Improvements

Hydraulic currents within aeration basins can cause short circuiting, reduced mixing and reduced effective hydraulic detention time, resulting in reduced treatment efficiencies. Existing Aeration Basins 5 and 6 were designed to industry standards at the time of their construction (1996 and 2006, respectively). While they currently perform well, there are process improvements that can optimize their performance to provide an incrementally improved level of treatment. Baffle walls can be used to minimize short circuiting in the anoxic zone by impeding currents and improving mixing. The impact of baffles on hydraulics and the conveyance of scum have been considered as part of this project and each new baffle is sized to produce less than 1-inch of hydraulic loss at peak flow. Refer to Figure 3-9 for the proposed hydraulic profile with the addition of the baffles.

New baffles will be added to Aeration Basins 5 and 6. These new baffles are anticipated to incrementally improve aeration basin performance by trending the basin configuration toward “reactor in series,” which is known to exhibit improved performance over “plug flow” conditions. The new baffles will be placed as follows:

- Between the first and second anoxic mixer to improve mixing of basin influent and the mixed liquor recycle flows, as well as disrupt currents from the aeration basin inlet gates.
- Between the third anoxic mixer and the swing zone to improve plug flow characteristics and prevent backflow of bubbles during swing aeration.
- Between the second and third aerobic zones to limit short circuiting.



FLOW CONDITIONS:

X	PHASE 5 PEAK HOUR FLOW 34.2 MGD, ALL UNITS IN SERVICE
X	PHASE 4 PEAK HOUR FLOW 28.3 MGD, LARGEST UNIT OUT OF SERVICE
X	PHASE 4 MMWW FLOW 15.0 MGD, ALL UNITS IN SERVICE

30% RAS AT PEAK, 50% RAS AT MAX MONTH, MIXED LIQUOR RECYCLE = 100% OF MMWW FLOW (NO MLR IN EXISTING BASINS AT PHF)

NOTES:
1. WATER SURFACE ELEVATIONS ▽ SHOWN DEPICT PHASE 5 PEAK HOUR CONDITIONS.
2. ASSUMES 18% OF FLOW TO SECONDARY CLARIFIER 1, AND 24% OF FLOW TO SECONDARY CLARIFIER 2.
3. ASSUMES 22% OF FLOW TO SECONDARY CLARIFIER 1 AND 32% OF FLOW TO SECONDARY CLARIFIER 2.
4. ASSUMES 21% OF FLOW EACH TO SECONDARY CLARIFIER 1 AND 2.
5. PLANT EFFLUENT PUMPS REQUIRED ONLY AT HIGH RIVER STAGE AND HIGH FLOW.
6. THIS DRAWING IS INCLUDED FOR COMPLETENESS AND IS COPIED FROM PHASE 4 RECORD DRAWINGS.

HYDRAULIC PROFILE

NTS (NOTE 6)

CRAIG W. MASSIE STATE OF WASHINGTON 31668 REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY NOT FOR CONSTRUCTION

DSGN	T GREELEY
DR	C BROWN
CHK	C MASSIE
APVD	B HERMAN

NO.	DATE	REVISION	BY	APVD

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

JACOBS

PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

GENERAL

Figure 3-9

HYDRAULIC PROFILE

SHEET	
DWG	01-G-29
DATE	JUNE 2019
PROJ	708335

60% DRAWINGS

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FILENAME: 01-G-029_708335.dgn PLOT DATE: 2019\06\06 PLOT TIME: 2:16:11 PM

3.2.1.1.2 Design Criteria

Baffle walls may be constructed in a variety of materials with varying durability, cost, and flexibility for future modifications. Baffle designs, regardless of material, redirect all mixed liquor flow through a few openings in each wall, or over the top of the baffle. Reinforced concrete is a common material used in new construction but is often not used for baffle wall construction in existing basins due to complication of construction. Coated steel framing with panels or marine grade plywood, treated or untreated timbers, or FRP planks or panels are frequently used in wastewater applications. Aeration Basins 1 through 4 at SCTP have had timber baffles installed for over 20 years and have performed well and still have remaining service life.

Reinforced concrete may generally have a higher capital cost, but is also more durable than FRP, which, in turn, is more durable than wood-based panels. FRP or timber-based systems are potentially quicker to install in an out-of-service existing basin than concrete and are also simpler to modify if required to optimize performance. For the Phase 5B Package 1 Project, FRP or timber baffles for Aeration Basins 5 and 6 are favored for future flexibility and to avoid impacting the existing diffuser arrangement.

3.2.1.1.3 System Configuration

Figure 3-10 below shows the location of the new baffle walls within the existing aeration basins. Refer to Sheets 7 – 10 in Appendix A for detailed drawings of the Aeration Basin 5 improvements. Refer to Sheets 11 – 14 in Appendix A for detailed drawings of the Aeration Basin 6 improvements.

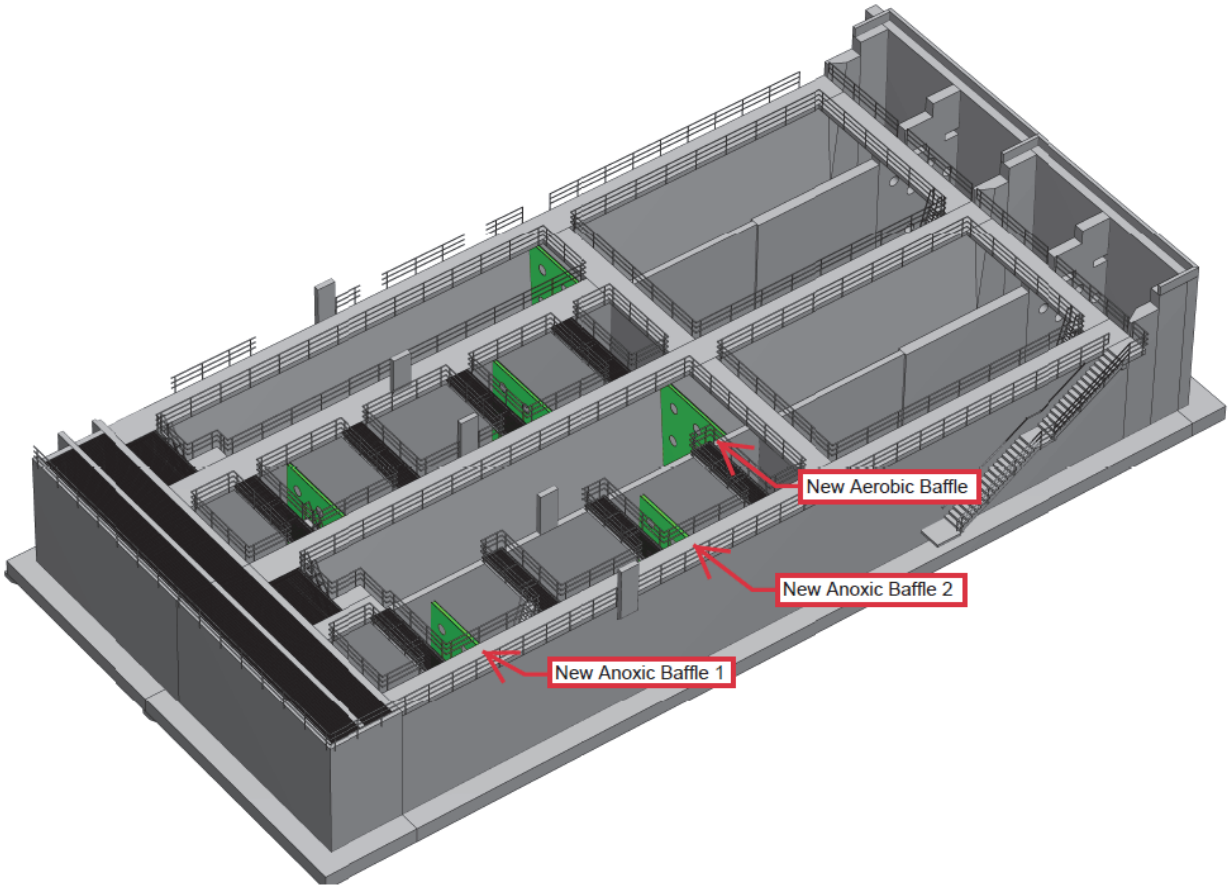

Figure 3-10. Aeration Basin Baffle Walls

3.2.1.2 Mixed Liquor Recycle Pumps

3.2.1.2.1 Proposed Improvements

The existing mixed liquor recycle pumps at Aeration Basins 5 and 6 are vertical turbine pumps powered by variable frequency drives. They are typically operated at full speed due to intermittent difficulty with air binding when operating at reduced flow rates that are normally acceptable to achieve performance requirements. The pumps draw from the aerobic zone, include flow measurement at the deck level, and discharge through an open v-port ball valve to the anoxic zone.

To address the difficulty with air binding, a sump-style baffle will be placed around the pump inlets to minimize entrainment of air bubbles in the mixed liquor that enters the pump suction. MOP 8[1] recommends a baffle designed so that bubble rise velocity is greater than the down-flow rate in the baffle

3.2.1.2.2 Design Criteria

Based on MOP 8 guidance, the design bubble rise velocity will be 0.8 foot/second. Design downward velocity will be 0.4 foot/second.

3.2.1.2.3 System Configuration

Figure 3-11 shows the proposed baffle configuration for the MLR pumps in Aeration Basins 5 and 6. A 4-foot by 4-foot baffle box will be constructed around the suction of each MLR pump. Each box will be centered on the pump and include a drain with a check valve. Refer to Sheets 13 and 14 in Appendix A for detailed drawings of MLR pump baffles.

[1] Water Environment Federation (WEF). 2010. *Design of Municipal Wastewater Treatment Plants, 5th Edition – Manual of Practice No. 8.* Water Environment Federation, Alexandria, Virginia.

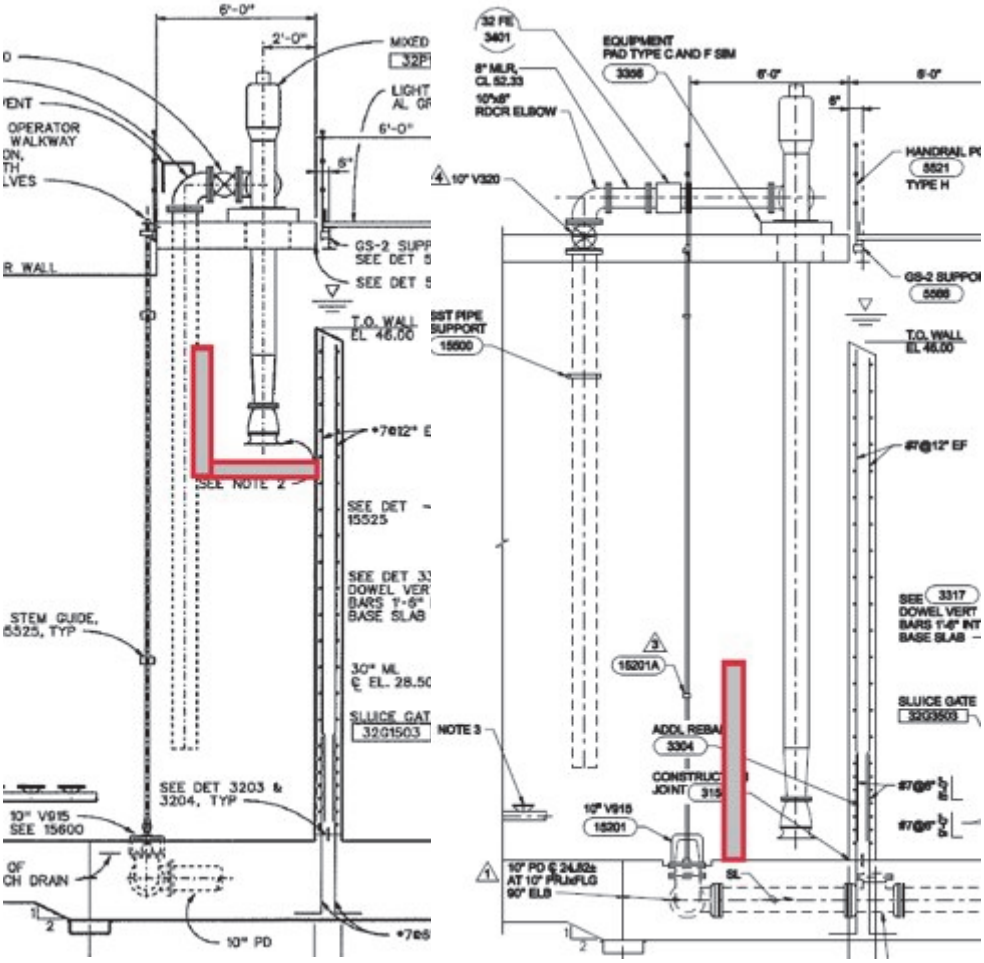

Figure 3-11. MLR Pump Baffles in Aeration Basins 5 and 6

3.2.1.3 Instrumentation

3.2.1.3.1 Proposed Improvements

New instruments will be added to Aeration Basins 5 and 6 to enhance monitoring capabilities of the aeration basin performance. An ammonia probe will be added in each of the aerobic zones of Aeration Basins 5 and 6 to gather and trend ammonia data and allow SCTP staff to further refine the aeration rate, which also allows optimization of electrical energy while still achieving full treatment performance. An oxidation-reduction potential meter will be installed in the anoxic zone of Aeration Basins 5 and 6 to monitor and allow optimization of the anoxic environment by operator adjustments to the mixed liquor recycle rates.

3.2.1.3.2 Design Criteria/System Configuration

The design criteria are as follows:

- Ammonia probes will be installed in each of the three aerobic zones. The automated process control will continue to use dissolved oxygen levels. Ammonia probes will be utilized to gather and trend ammonia data and further understand how diurnal flow and loading variables influence basin performance.
- Oxidation reduction potential probes will be installed at the end of the anoxic zone to confirm the presence of nitrate and absence of dissolved oxygen.

Refer to Sheets 7 and 8 in Appendix A for locations of additional instrumentation in Aeration Basin 5. Refer to Sheets 10 and 11 in Appendix A for locations of additional instrumentation in Aeration Basin 6.

3.2.2 Secondary Clarifier Launder Covers

3.2.2.1 Proposed Improvements

Algae growth within the clarifier, launder, weir, and scum baffle is a maintenance challenge. Such algae growth results in biological particulates that detach, are conveyed in secondary effluent, and can impair disinfection performance. Plant staff currently must clean the existing secondary clarifier weirs multiple times per week to address this issue. To mitigate this issue, full-width FRP covers will be installed on existing Secondary Clarifiers 3 and 4. These covers will cover the launder as well as the weir. Covers are not proposed on existing Secondary Clarifiers 1 or 2 as this is not considered to be cost effective. Secondary Clarifier 1 is infrequently used, and Secondary Clarifier 2 is anticipated to be demolished to make way for future Aeration Basin 7 in a subsequent expansion project within the next several years. This improvement is anticipated to substantially reduce operator labor requirements for weir cleaning.

3.2.2.2 Design Criteria/System Configuration

Secondary clarifier launder covers are intended to be constructed from corrosion resistant materials (FRP with stainless steel hardware). The launder cover will cover the entire launder from the inside of the perimeter wall and extend over the scum baffle and effluent weir. Figure 3-12 shows a similar launder cover. Refer to Sheets 15 – 18 in Appendix A for drawings of secondary clarifier launder covers.

Figure 3-12. Launder Cover

3.2.3 RAS Chlorination System

3.2.3.1 Proposed Improvements

The selector zones in the aeration basins are the primary form of filament control. In 2017–2019, one incident of the sludge volume index (SVI) exceeding 180 milliliters per gram has occurred. This period of high SVI (April 2017) was not a function of selector design. The SCTP operators were allowing growth of filamentous bacteria in an effort to trap and settle pin-floc. RAS chlorination is a tool available to operators to address infrequent process upsets and is not a core process control function.

The proposed RAS chlorination system will allow operators a permanently installed method to dose sodium hypochlorite solution into the RAS, when required to address infrequent periods of poor settleability of the mixed liquor. Liquid sodium hypochlorite will be used to create the chlorine solution because it is a common commercially available source of chlorine, avoids gaseous chlorine and attendant health and safety hazards, and is readily available from chemical distributers. Chemical totes are the preferred storage method because they can be obtained with integrated chemical containment, minimizing the need for additional infrastructure.

3.2.3.2 Design Criteria

RAS chlorination design criteria are summarized in Table 3-10.

Table 3-10. Return Activated Sludge Chlorination Design Criteria

Parameter	Units	Value
Hypochlorite Dose	Pounds-chlorine/1,000 pound-MLSS*day*	2 – 8*
Maximum Duration of Injection	Days	5
Biomass Inventory, maximum month	Pounds	106,000
Hypochlorite Solution		12.5%
Hypochlorite Solution Required, at maximum month	Gallons per day	200 to 800
Number of Totes		2
Dilution Water	Gallons per minute	25

*Design hypochlorite dose for equipment sizing is per industry recommendations (M&E) and designer experience at 2 to 8 pounds-chlorine/1,000 pound-MLSS*day, and this is conservative, considering good dose response has been achieved at a lower dose 0.25 to 0.50 pounds-chlorine/1,000 pound-MLSS. This entire dose range is expected to be able to be provided by a single system due to inherent turn-down capability of the dosing pumps.

MLSS = mixed liquor suspended solids

3.2.3.3 System Configuration

The RAS chlorination system will consist of a small chemical metering pump system located in the southeast corner of the existing RAS Pump Station. Liquid sodium hypochlorite totes will be stored within a contained area located near grade level on the roof of the below grade RAS Pump Station. Make-up water for the chlorine solution will come from the existing W2 piping in the RAS Pump Station. A rotameter assembly will be used to meter the makeup water. SCTP staff will utilize metering pumps as needed to inject hypochlorite solution into the RAS discharge piping.

The hypochlorite injection point will be located within the RAS/WAS Pump Station downstream of RAS collection from all four secondary clarifiers. An injection quill will be installed at this location for improved introduction of chlorine solution.

Figure 3-13 shows the proposed chemical metering pump system. Refer to Sheets 19 in Appendix A for proposed chlorine tote location. Refer to Sheets 20 and 21 in Appendix A for chlorine metering pump location.

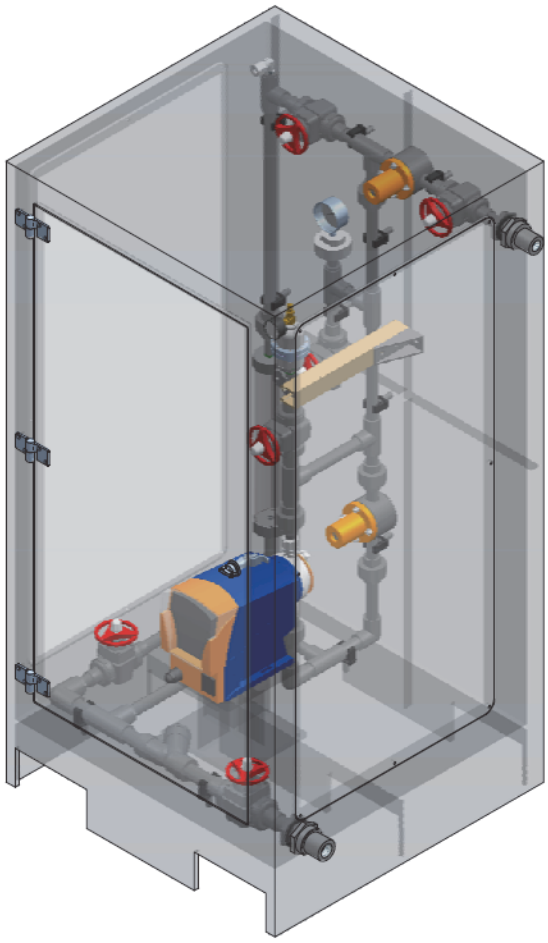

Figure 3-13. Skid-mounted Hypochlorite Pump System from ProMinent Fluid Controls LTD

3.2.4 RAS Pump Discharge Upgrades

3.2.4.1 Proposed Improvements

The existing RAS Pump Station has operated as configured since the Phase 4 expansion and the plant meets current NPDES permit requirements. Minor improvements are proposed to optimize the RAS pumping system and position the existing RAS system to accommodate future improvements with limited disruptions. Replacement of existing RAS piping with larger piping near the pumps will be required in the future and installing larger RAS piping at this time will provide incremental additional 10-15% capacity and thereby improve existing treatment reliability and performance.

3.2.4.2 Design Criteria

The 8-inch-diameter discharge pipes and fittings associated with each existing RAS pump will be replaced with larger 12-inch-diameter pipes and fittings. These piping improvements are also expected be compatible with replacement of the RAS pumps in future plant expansions.

3.2.4.3 System Configuration

Refer to Sheets 20 and 21 in Appendix A for drawings of the proposed RAS piping improvements.

3.3 Solids Processing

3.3.1 Solids Processing Center Pipe Supports

3.3.1.1 Proposed Improvements

A few of the existing piping supports inside the Solids Processing Center were added by SCTP staff to support new piping modifications made by plant staff. These pipe supports are understood to have been installed and operational but did not undergo the appropriate design, permitting, or inspection processes. These supports will be analyzed, designed, and upgraded to meet current building code requirements to reduce the likelihood of damage from a seismic event. This evaluation and pipe support retrofit includes the 6-inch-diameter polyvinyl chloride pipe that was added to convey dewatering filtrate to the GBT as well as other larger piping systems.

3.3.1.2 Design Criteria

The design criteria are as follows:

- Structural steel wide flange shapes conform to ASTM A992. Steel plates, angles, and channels conform to ASTM A36 unless shown otherwise on the drawings. Square or rectangular steel tubing conform to ASTM A500, Grade B, and steel pipe conform to ASTM A53, Grade B.
- All connection bolts are high-strength bolts conforming to ASTM A325N or slip-critical. Unless otherwise shown on the drawings, bolts indicated as machine bolts or anchor bolts conform to ASTM A307 for carbon steel, A193 for stainless steel, and A153 for galvanized steel.
- All welds will be performed by American Welding Society (AWS)-certified welders and will conform to AWS D1.1, latest edition.
- Stainless steel, Type 316, is used for bolts, fasteners, etc., where corrosion concerns dictate. This will be indicated on the drawings.

3.3.1.2.1 Seismic Loads

Seismic loads are as follows:

- Site Class:.....D
- Risk Category: III
- S_S: 0.91g
- S_1:.....0.33g
- S_{DS}:.....0.69g
- S_{D1}:.....0.38g
- I_E: 1.25
- Seismic Design Category: ...D

3.3.1.3 System Configuration

Refer to Sheets 22 and 23 in Appendix A for drawings of proposed piping support improvements.

3.4 Other Improvements

3.4.1 Demolition of Abandoned Control Building and Construction of New Oil Storage Building

3.4.1.1 Proposed Improvements

The former Control Building (Facility 87) was part of the original facility construction in the mid-1970s and is primarily used today for conditioned spare parts and supplies storage. Some hazardous materials are

stored in one room within Facility 87 that is permitted and inspected by the Fire Department. Functions currently served by space within Facility 87 will be relocated and consolidated in spaces in other locations on the project site in order to support the future addition of a Secondary Clarifier. District/County staff will manage the relocation of stored parts and materials in this facility. The Phase 5B Package 1 Project will include construction of a new facility for storage of the oil and hazardous materials. These improvements are support functions for the SCTP maintenance program and do not directly affect the wastewater treatment process facilities. The improvements are described in this report in order to create a complete record of the intended work at the facility.

Although it is technically not in service as a control building, the space inside Facility 87 serves the following functions:

- The former shop/electrical room area houses conditioned storage that is used for moisture or temperature sensitive shelf spares and electrical components required for normal maintenance by the operations staff.
- The primary electrical feed into Facility 88 is distributed from the electrical room panels in Facility 87.
- The air compressor housed in the back room of Facility 87 supplies tool air for Facility 88.
- Storage of spare variable-frequency drives.
- The storage room on the southwest corner of Facility 87 is used for storage of oil and hazardous materials.

The design team has evaluated the functions served by Facility 87 and has developed recommendations for finding repurposed space for these functions as follows:

- Conditioned Storage: Space inside Facilities 37, 77, and 88 will be repurposed to replace this function. This work will be completed by County staff prior to start of construction.
- Primary Power Feed to Facility 88: The main power feed to Facility 88 will be rerouted prior to demolition of Facility 87 by the Contractor as part of the 5B Package 1 project.
- Air Compressor: The air compressor in Facility 87 will be relocated into repurposed space within Facility 88 by the Contractor as part of the 5B Package 1 project.
- Oil and Hazardous Materials Storage: These materials will need to be relocated to allow demolition of Facility 87. A new Oil Storage Building (Facility 89) will be constructed north of the existing Blower Building (Facility 37). This facility will be designed to house the oil and hazardous materials in a code-compliant (quantity and methods) manner. Amounts of materials to be moved by Contractor as part of the Phase 5B Package 1 Project will be coordinated after District/County staff has completed development of itemized list of materials stored and their quantities.

3.4.1.2 Design Criteria

The building will store a variety of hazardous materials including gasoline, lubricants, motor oil, and paint products. Additional hazardous materials may be identified during the 30 percent design phase. The International Fire Code Table 5003.1.1.(1) lists the allowable amounts of hazardous materials for a given material classification. Class IB and IIIB products have been identified for storage in the building and are as follows:

- Class IB materials include gasoline, acrylic urethane paint, paint thinner, and epoxy.
  - The maximum allowable amount for all Class IB products combined is 120 gallons.
  - The maximum allowable amount can be doubled when materials are stored in approved storage cabinets that are approved by the local authority having jurisdiction.
  - The maximum allowable amount can be doubled when an approved sprinkler system is installed.
- Class IIIB materials include lubricants and motor oil.
  - The maximum allowable amount for all Class IIIB products combined is 13,200 gallons.

- The maximum allowable amount can be doubled when materials are stored in approved storage cabinets that are approved by the local authority having jurisdiction.
- The maximum allowable amount can be doubled when an approved sprinkler system is installed.

3.4.1.3 System Configuration

The new Oil Storage Building will be constructed adjacent to and north of the existing Facility 37. It will be an insulated concrete masonry unit (CMU) structure with split-faced CMU exterior wall surfaces matching the existing Facility 37. The roofing material will consist of an EPDM single-ply membrane.

Refer to Sheet 24 in Appendix A for drawings of the demolition of the abandoned control building. Refer to Sheets 25 and 26 in Appendix A for drawings of the new oil storage building.

3.4.2 Canopy at Ultraviolet Disinfection

3.4.2.1 Proposed Improvements

A new canopy will be constructed to replace the existing wood canopy over the UV disinfection channels to provide additional covered area and to meet current building code. Steel columns, beams, and framing members will support a mono-slope roof with standing seam metal roofing panels. Metal gutters and downspouts will direct water away from the structure. Consideration will be given for the flexibility to replace the canopy for a future expansion of the UV system. This canopy is anticipated to remain in service until the UV system is replaced in Phase 6 expansion and a new building/enclosure is provided around the UV disinfection equipment and effluent pump station.

The existing basin walls are intended to serve as the foundation support of the canopy. Additional concrete foundation work is not anticipated but may be required based on the final layout of the canopy.

3.4.2.2 Design Criteria

The design criteria are as follows:

- Structural steel wide flange shapes conform to ASTM A992. Steel plates, angles, and channels conform to ASTM A36 unless shown otherwise on the drawings. Square or rectangular steel tubing conform to ASTM A500, Grade B, and steel pipe conform to ASTM A53, Grade B.
- All connection bolts are high-strength bolts conforming to ASTM A325N or slip-critical. Unless otherwise shown on the drawings, bolts indicated as machine bolts or anchor bolts conform to ASTM A307 for carbon steel, A193 for stainless steel, and A153 for galvanized steel.
- All welds will be performed by AWS-certified welders and will conform to AWS D1.1, latest edition.
- Stainless steel, Type 316, is used for bolts, fasteners, etc., where corrosion concerns dictate. This will be indicated on the drawings.

3.4.2.3 System Configuration

Refer to Sheets 27 and 28 in Appendix A for drawings of the canopy over the UV disinfection system.

3.4.3 Waste Gas Incinerator Enclosure

3.4.3.1 Proposed Improvements

The existing metal framed enclosure around the waste gas incinerator controls will be removed and replaced to provide appropriate occupancy and building code compliant structure. A new steel-frame enclosure will be constructed to replace the existing. The exterior wall surfaces will consist of insulated metal wall panels supported on metal wind girts. The enclosure will have a mono-sloped roof of insulated metal roof panels over metal purlins. The enclosure materials and colors will be selected to coordinate

with the existing plant aesthetics. All components of the design such as lights and power will follow in accordance with the resulting Class 1, Division 1, Group D electrical classification. Supplemental safety provisions will include the required combustible gas detection, space alarming, and entry alarming.

The existing concrete equipment pad will be incorporated into the foundation of the new structure. Additional concrete foundation work may be required and would be integrated with the existing equipment pad concrete.

3.4.3.2 Design Criteria

Table 3-11 describes the code-related criteria for the new waste gas incinerator enclosure.

Table 3-11. Waste Gas Incinerator Equipment Enclosure

Item	Criteria
Occupancy Group:	Occupancy Group F-2
Construction Type:	Construction Type VB
Allowable Area:	Type VB non-sprinklered = 23,000 square feet (actual area = 196 square feet).
Building Elements Fire Resistance; Table 601:	Type VB, Fire Resistance Rating 0 Hours
Fire Resistance based on Separation; Table 602:	Separation distance of exterior walls 10 < x < 30 0 Hours for Type VB

3.4.3.3 System Configuration

Refer to Sheet 29 in Appendix A for a drawing of the new waste gas incinerator enclosure.

3.4.4 New Automated Entrance Gate

3.4.4.1 Proposed Improvements

The existing manual gate at the plant entrance is proposed to be fitted with an actuator, and card-reader based security access system. These improvements are proposed to improve site security and prevent unauthorized access into the parking area adjacent to the operations center. The existing electric actuated chain link gate that isolates vehicle access past the operations building will remain unchanged.

3.4.4.2 Design Criteria

Design criteria are as follows:

- Automated gate: Motorized entry gate at the top of the plant access road, complete with card reader access, an intercom station dialing to the Control Room (with mobile phone answering capability), video cameras viewing the driver and front of vehicle. A buried magnetic detection loop located on the plant side of the gate will be positioned to allow automatic gate actuation for vehicles that approach the gate and will be located to help large biosolids trucks avoid need for stop/start on the steepest portions of the incline of the plant access road.

3.4.4.3 System Configuration

Refer to Sheets 30 and 31 in Appendix A for drawings of the automated entrance gate location.

4. Financial Considerations, Staffing, and Schedule

4.1 Preliminary Cost Estimate

Table 4-1 provides a preliminary estimate of the total project costs for the proposed project based on the recommendations contained herein.

The cost estimate is considered to be consistent with Class 2 estimates, as defined by the estimate classification system of the Association for the Advancement of Cost Engineering International (formerly known as the American Association of Cost Engineers). The estimate was developed with engineering data based on a 60 percent design definition. Class 2 estimates are normally expected to be accurate within minus 15 percent to plus 20 percent. This range implies that there is a high probability that the final project cost will fall within the range.

Table 4-1. Project Cost

Item	Cost Estimate
Preliminary and Primary Treatment Odor Control	$2,800,000
Solids Processing Odor Control	$1,600,000
Aeration Basin Upgrades	$600,000
Secondary Clarifier Launder Covers	$230,000
RAS Chlorination System	$30,000
RAS Pump Discharge Upgrades	$300,000
Oil Storage Building 89	$150,000
Demolition of Building 87	$230,000
Solids Processing Center Pipe Supports	$30,000
Canopy at Ultraviolet Disinfection	$50,000
Waste Gas Incinerator Enclosure	$40,000
Entrance Gate, and Misc. Site Work	$400,000
Washington State Tax (8.4%)	$540,000
Subtotal Construction Baseline	**$7,000,000**
Class 2 Contingency (15%)	$1,000,000
Total Construction Cost	**$8,000,000**
Project Delivery Costs	$3,420,000
Total Project Cost	**$11,420,000**

4.2 Project Funding

The capital expenditures portion of the proposed project will be funded as an Alliance Capital Project. The Alliance Capital Program work is funded by a combination of Regional Service Charges and debt proceeds to fund larger capital projects. The Alliance costs are allocated to the Alliance Member Agencies, based on the amount of capacity allocation purchased with the project. In this case, the resulting Alliance charges have been communicated to the City of Battle Ground and the District as Member Agencies with capacity allocations. The City and the District, in turn, have included the Alliance costs in their respective financial planning and rate modeling efforts to ensure that retail rates and charges are adequate to fund this project. The allocation of costs for the project is summarized as follows:

• City of Battle Ground	19.2% of project cost	$2,200,000
• Clark Regional Wastewater District	80.8% of project cost	$9,220,000
• Total	100% of project cost	$11,420,000

The O&M costs associated with power and general maintenance for the proposed odor control system will be incorporated into the annual operating costs for SCTP. The current annual O&M budget for SCTP is approximately $4 million per year. The additional costs for this work will be included in the future budgets associated with the construction period and commencement of operations. Similar to the framework for capital costs, operating costs for SCTP are shared between the City and the District based on the relative contribution of flow from each agency.

4.3 Staffing Requirements

The overall degree of operator attention required for the proposed facility is similar to that required for the current facility. The new primary clarifier covers will reduce maintenance access space and visual observation into the primary clarifiers, but access can be accommodated during regular maintenance activities that require manned entry into the primary clarifier tanks.

The new preliminary/primary treatment odor control bio-trickling filter will run continually, and require similar daily operations monitoring as the existing bio-trickling filter that treats air off the headspace of the sludge blend tank. The instrumentation and equipment associated with the new bio-trickling filter are similar to others onsite.

The new solids process odor control carbon adsorber will run continually, and require similar daily operations monitoring as the existing carbon adsorber that treats air off the 117th Street Pump Station Force Main and gravity sewer. This existing carbon adsorber will be demolished, thereby reducing maintenance. The instrumentation and equipment associated with the new carbon adsorber are similar to others onsite.

By providing covers over the primary clarifier and secondary clarifier launders, the algae growth and debris accumulation is anticipated to be dramatically reduced. This, in turn, is anticipated to provide a substantial reduction in labor hours required by operations staff. This labor reduction will provide the staff capacity to operate and maintain the new equipment provided by the project with the same overall staffing currently present at the facility. Design will provide opportunities to further automate processes where possible.

4.4 Project Schedule

A preliminary project schedule was developed that shows a total project duration of approximately 3 years. The preliminary project schedule, included as Figure 4-1, shows design development and permitting occurring in 2018, final design and permitting in 2019, and construction in 2020–2021. This schedule will deliver the proposed odor control improvements by the end of calendar year 2020.

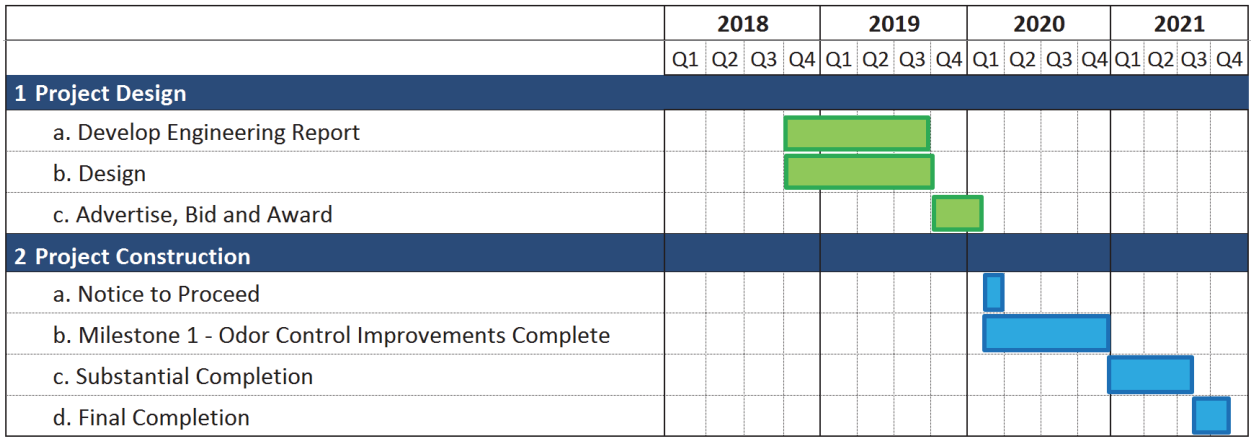

Figure 4-1. Project Schedule

5. Permitting and Regulatory Requirements

5.1 Permitting and Regulations

In accordance with Revised Code of Washington (RCW) 90.48.110, all engineering reports, plans, and specifications for new construction or improvements to existing sewage treatment systems shall be submitted to and approved by the Washington Department of Ecology (Ecology) before construction may begin. RCW 90.48.110 also allows delegation of this authority to local authorities that meet Ecology's criteria. The District meets Ecology's criteria and has entered into a formal delegation agreement with Ecology. As a result, the District will perform as the delegated authority for certain review and approval responsibilities, as indicated below. The Alliance will serve as State Environmental Policy Act (SEPA) lead agency under its adopted SEPA rules.

For the proposed project, the Alliance will obtain or perform the following permits and approvals (except where noted):

1. Review and approval of the Engineering Report per WAC 173-240-060 by Ecology.
2. Review and approval of final Plans and Specifications per WAC 173-240-020(11) and WAC 173-240-070 by the District.
3. Review and approval of Construction Quality Assurance Plan per WAC 173-240-020(2) and WAC 173-240-075 by the District.
4. Modification of Minor Source Air Discharge Permit from SWCAA.
5. Site Plan Review or exemption by Clark County.
6. Shoreline Substantial Development Permit (SSDP), Conditional Use Permit (SCUP), or exemption by Clark County.
7. Review and concurrence of archaeological survey by Department of Archaeology and Historic Preservation (DAHP Project Tracking Code #2017-12-08780).

The Alliance issued SEPA determination of non-significance (DNS) #DNS 001-2018 for the overall Phase 5B Project on September 14, 2018. The issued SEPA did not cover some of the minor site improvements currently proposed. Therefore, an addendum has been prepared by the Alliance in July 2019, per WAC 197-11-625, noting that no new significant adverse impact will occur and that no further SEPA review is necessary. SEPA documentation is included as Appendix B.

The Phase 5B Project does not have a federal nexus and will not utilize the Clean Water Act State Revolving Fund loan program. Therefore, neither compliance with the National Environmental Policy Act nor the State Environmental Review Process will be required.

5.2 Air Quality and Odor Control

The air discharges from SCTP are regulated by the SWCAA to limit criteria pollutant emissions, toxic air pollution and nuisance odors. Individual odor-causing compounds are quantified as a concentration (mass per volume). Of these compounds, H_2S is a regulated toxic pollutant and the SWCAA has established a limiting concentration for H_2S toxicity. Key regulatory requirements pertaining to required limits of SCTP air emissions are described in more detail in Section 3.1.1.

5.3 Environmental Impacts

Development of this Engineering Report requires the Alliance to consider environmental values under SEPA. Consequently, the Alliance conducted a SEPA environmental review as lead agency per SEPA rules adopted under WAC 197-11. The Alliance prepared a SEPA checklist and DNS, taking into account all direct and indirect environmental impacts of the proposed project. Following a SEPA public notice

period and response to public comments, SEPA DNS #001-2018 was completed and adopted. The Alliance is preparing a SEPA addendum, per WAC 197-11-625, to cover minor site improvements added to the project description during final design. The addendum is being prepared by the Alliance in April 2019, noting that no new significant adverse impact will occur and that no further SEPA review is necessary. The SEPA DNS, checklist, and addendum are included as Appendix B.

All physical improvements, and the direct environmental effects, would occur within the existing plant site. The site is within the public facilities (PF) zone and the northern portion of the site is located within the Clark County shoreline master program (SMP) Urban Conservancy shoreline designation. Utilities located above ground are permitted in both the PF zone and the Urban Conservancy shoreline designation. There are no known or expected Endangered Species Act-listed species or critical habitats, or Washington Department of Fish and Wildlife priority species or habitats at the project site.

The SCTP lies within an area of moderately-high or high archaeological probability for which an Archaeological Site Buffer is designated and sits on a documented cultural property. Munsell (1974) documented pre-contact site 45CL98 during the preliminary archaeological evaluation prior to construction of the SCTP. There is no map available showing the extent of the 1974 survey area. A subsequent survey by Blukis Onat and Starkey (1979) did not relocate the resource, which may have been destroyed by prior development; the significance or extent of the site was never determined. The proposed physical improvements are not expected to encounter or disturb cultural properties; however, the Alliance conducted a professional cultural survey of intact native soil that might be disturbed by construction and findings were negative for presence of eligible cultural properties.

The SEPA DNS public notice included tribes with treaty rights to the Columbia River where plant effluent will be discharged. Several Native American Tribes have an active presence in Clark County. Under established treaty rights, federally recognized Tribes have rights to the annual salmon harvests within the Columbia River and tributary streams. Tribes with usual and accustomed territory within Clark County include:

- Cowlitz Indian Tribe, Washington – Area throughout Clark County is usual and accustomed territory
- Confederated Tribes and Bands of the Yakama Nation, Washington – South-central Washington
- Chinook Tribe – Not currently federally recognized

Tribes with usual and accustomed territory on shorelines adjacent to Clark County and/or within the upstream Columbia River Basin, downstream of the Bonneville Dam, include:

- Confederated Tribes of the Grand Ronde Community of Oregon – Usual and accustomed territory extending throughout the Grand Ronde area of Oregon
- Confederated Tribes of the Siletz Reservation, Oregon – Usual and accustomed territory in Western Oregon

During construction, a variety of equipment would be used for material delivery, grading, lifting, and clean up; and may include flat-bed trucks, dump trucks, cement trucks, loader, trackhoe/excavator, scissor lift, crane, jackhammer, impact wrenches, pumps, and compressors. Construction would be limited to daytime hours, and operation of construction equipment would meet Clark County noise ordinance requirements. The closest residence is about 400 feet away.

Minimal earthwork is required for the odor control improvements. Ground disturbance will include a concrete foundation pad for the 1,300-square-foot bio-trickling filter odor control system and replacement of an existing stairs at the Preliminary Treatment Building. Prior to constructing the foundation, existing utility piping to a depth of about 6 feet under the bio-trickling filter system site will be relocated to avoid conflicts with the structures. The carbon system removal area will be about 230 square feet. The Solids Processing Center will be connected to the new carbon adsorber odor control system.

No earthwork will be associated with RAS chlorination improvements or RAS piping modifications. The Control Building demolition will reduce 401 square feet of impervious area from the shoreline environment.

It is possible that toxic or hazardous chemicals may be encountered during demolition of existing structures. In addition to asbestos or lead-based paint, the structures might contain potentially dangerous or hazardous materials, such as polychlorinated-biphenyl-containing lamp ballasts, caulking, or paint; fluorescent lamps; treated wood; and wall thermostats containing mercury. Consequently, the Alliance would perform surveys for asbestos-containing material/lead-based paint, and other dangerous and hazardous materials and wastes, at structures proposed for demolition; and prepare and implement a hazardous materials handling plan, as appropriate. Dangerous and hazardous materials and wastes will be removed and appropriately managed prior to structure demolition, if possible.

Fuel used in construction equipment would not be stored onsite. Construction equipment would produce emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and PM_{10}[2] (dust) during construction, but these amounts would be minor and temporary. The project would be constructed in accordance with applicable state and local health and safety regulations. Temporary erosion and sediment control is entirely manageable within the plant site. After construction, the ground would be stabilized by seeding for lawn or pavement.

RAS chlorination facilities would improve treatment performance reliability under filamentous sludge bulking conditions and reduce risk of these filamentous bacteria causing activated sludge process upsets that result in discharge of suspended solids to the Columbia River. Biosolids removed from the plant are regularly applied to farmlands near Woodland or Goldendale.

No changes to plant lighting are proposed, and no protected views would be altered or obstructed in the immediate project vicinity. The RAS chlorination system, bio-trickling filter odor control system and virgin carbon adsorber odor control system would be electrically powered and create additional energy demands, but these would be small percentage increases over the energy use by SCTP operation.

The RAS chlorination equipment requires liquid sodium hypochlorite. The package system includes chemical storage and containment. Hypochlorite has a limited shelf life and is readily available. It would be ordered and delivered to the SCTP (likely in totes) when needed, so onsite storage would be minimal to none during periods of system non-use. The plant operates under a rigorous spill prevention, containment, and countermeasures plan.

Odors originating from the preliminary and primary treatment process would be captured and treated and dispersed. Odor control would limit H_2S concentration below the SWCAA's ASIL (i.e., 0.9 µg/m^3) in the airshed within the SCTP property boundary. Existing operational noise at the SCTP includes normal plant O&M activities, including service vehicle operation, and would not be measurably different after the project. Although noise from the existing primary clarifiers is negligible, the proposed covers and associated ductwork would reduce the noise.

[2] PM_{10} describes inhalable particles (particulate matter) with diameters generally 10 micrometers and smaller.

6. Engineering Report Requirements Checklist

For the reviewer's convenience, Table G1-1 Requirements for Engineering Reports, taken from *Criteria for Sewage Works Design*, is included as Table 6-1. The table provides a comprehensive list of the information required for engineering reports and facilities plans and the location where the information is provided. Additional supporting information regarding the SCTP service area and treatment facility can be found in the Facilities Plan (CH2M, 2013).

Table 6-1. Requirements for Engineering Reports

Element	Requirement	Location or Reference
Site Description and Map	Well documented	A layout of the proposed improvements is shown in Figure 1-1.
Problem Identification	Well documented	Refer to Section 1 of the Engineering Report.
Description of Discharge Standards	Well documented	The improvements in this project do not affect the discharge from SCTP. Description of Discharge Standards information can be found in the *Salmon Creek Wastewater Management System Wastewater Facilities Plan/General Sewer Plan* Amendment (Facilities Plan) (CH2M, 2013).
Background Information	Existing Environment: • Water, air, sensitive areas • Floodplains • Shorelines • Wetlands • Endangered species • Public health Demographics and Land Use: • Current Population • Present wastewater treatment • Advanced wastewater treatment need evaluated • Infiltration and inflow studies • Combined sewer overflows • Sanitary surveys for unsewered areas	Refer to Section 1 of the Engineering Report and the SEPA checklist/addendum referenced in Section 5 of the Engineering Report. Further information can be found in the *Salmon Creek Wastewater Management System Wastewater Facilities Plan/General Sewer Plan* Amendment (Facilities Plan) (CH2M, 2013).
Future Conditions	Demographics and Land Use: • Projected population levels • Appropriateness of population data source, zoning changes • Future domestic and industrial flows, and flow reduction options • Future flows and coding • Reserved capacity • Future environment without project	Refer to summary in Section 2 of the Engineering Report. Further information can be found in the *Salmon Creek Wastewater Management System Wastewater Facilities Plan/General Sewer Plan* Amendment (Facilities Plan) (CH2M, 2013).

Table 6-1. Requirements for Engineering Reports

Element	Requirement	Location or Reference
Alternatives	• List specific alternative categories, including no action • Collection system alternatives • Sludge management/use alternatives • Flow reduction • Costs • Environmental impacts • Public acceptability • Rank order • Recommended alternative	Refer to Section 3 of the Engineering Report.
Final Recommended Alternative	• Site layout • Flow diagram • Sizing • Environmental impacts • Design life • Sludge management • Ability to expand • O&M/staffing needs • Design parameters • Feasibility of implementation	• Refer to Figure 3-1 of the Engineering Report. • NA • Refer to Section 3 of the Engineering Report. • Refer to Section 5 of the Engineering Report. • Refer to Section 3 of the Engineering Report. • Refer to Section 3 of the Engineering Report. • Refer to Section 3 of the Engineering Report. • Refer to Section 4 of the Engineering Report. • Refer to Section 3 of the Engineering Report. • Refer to Section 3 of the Engineering Report.
Financial Analysis	• Costs • User charges • Financial capability • Capital financing plan • Implementation plan	Refer to Section 4 of the Engineering Report.
Other	• Water quality management plan • SEPA approval • List required permits	Refer to Section 5 and Appendix B of the Engineering Report for information regarding SEPA approval and permitting. For information regarding a Water Quality Management Plan, refer to the 2004 Facilities Plan (CH2M, 2004), as updated by the Facilities Plan (CH2M, 2013).

Appendix A
60 Percent Drawings
Phase 5B Project: Package 1 Salmon Creek Treatment Plant Odor Control/Existing Facilities Improvements

NOTES:

1. INSTALL COVERS FOR PRIMARY CLARIFIERS 1, 2, 3, AND 4.
2. REPLACE EXISTING CHANNEL GRATING WITH ALUMINUM CHECKER PLATE AT PRELIMINARY TREATMENT.
3. REPLACE EXISTING GRATING WITH ALUMINUM CHECKER PLATE AS SHOWN. SEE (0554-001)
4. PROVIDE SAFETY MESH BELOW EACH ACCESS HATCH FOR FALL PROTECTION.

30" OA (BURIED) FOR CONTINUATION SEE DWG 05-CY-104

B 20-SM-301

A 20-SM-301

6" W3

1 20-SM-401

ACCESS HATCH, TYP

ALUMINUM OR FRP COVER WITH SUPPORT BEAMS/FRAMING, TYP

ACCESS HATCH, TYP NOTE 4

20" OA FROM 117TH ST PUMP STATION FM

30" OA

4" SAMPLE DISCHARGE LINE

25M0601

PRIMARY EFFLUENT REFRIGERATED COMPOSITE SAMPLER

2" W3 SPRAY HEADER TYP

20FV 0604A

20FV 0604B

PRIMARY CLARIFIER NO. 4

20G0301

PRIMARY INFLUENT CHANNEL

20G0302

STOP LOG GUIDES,TYP

STOP LOG GUIDES, TYP

24" OA

8" W4

PRIMARY EFFLUENT CHANNEL, TYP

EFFLUENT LAUNDER TYP, 3 PER TANK

SCUM COLLECTION BOX

NOTE 1

20LCP0003

20M1003

20G0103B

20G0103A

PRIMARY CLARIFIER NO. 3

PRIMARY INFLUENT BYPASS CHANNEL

AGITATION AIR DIFFUSERS ON 3" ALP HEADER (BELOW)

1 1/2 " W3 CL 53.0

20FV 0603B

20FV 0603A

20LCP0002

20M1002

20G0102B

20G0102A

PRIMARY CLARIFIER NO. 2

NOTE 2

18" OA

20FV 0602B

20FV 0602A

NOTE 1, TYP.

6" MUD VALVE (EXISTING)

20LCP0001

20M1001

20G0101B

20G0101A

PRIMARY CLARIFIER NO. 1

14" OA

14" OA (1000 CFM) CONNECT TO COVER WITH BUTTERFLY DAMPER & EXP JT, TYP

NOTE 3

20PCV060

20FV 0601B

20FV 0601A

1 1/2 W3 CL EL 52.50

1 1/2" W3

8" W4 CL EL 49.50

6" W3 CL EL 52.75

1 1/2" - V300 ISOLATION VALVE, TYP

12"x12" GRATING AIR INTAKE, TYP

A 20-SM-301

MATCHLINE SEE 10-SM-211

INTERMEDIATE LEVEL PLAN

1/8"=1'-0"

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CHK	S COWDEN
APVD	B HERMAN

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

PRIMARY TREATMENT

STRUCTURAL/MECHANICAL INTERMEDIATE LEVEL PLAN

Appendix A
Sheet 1

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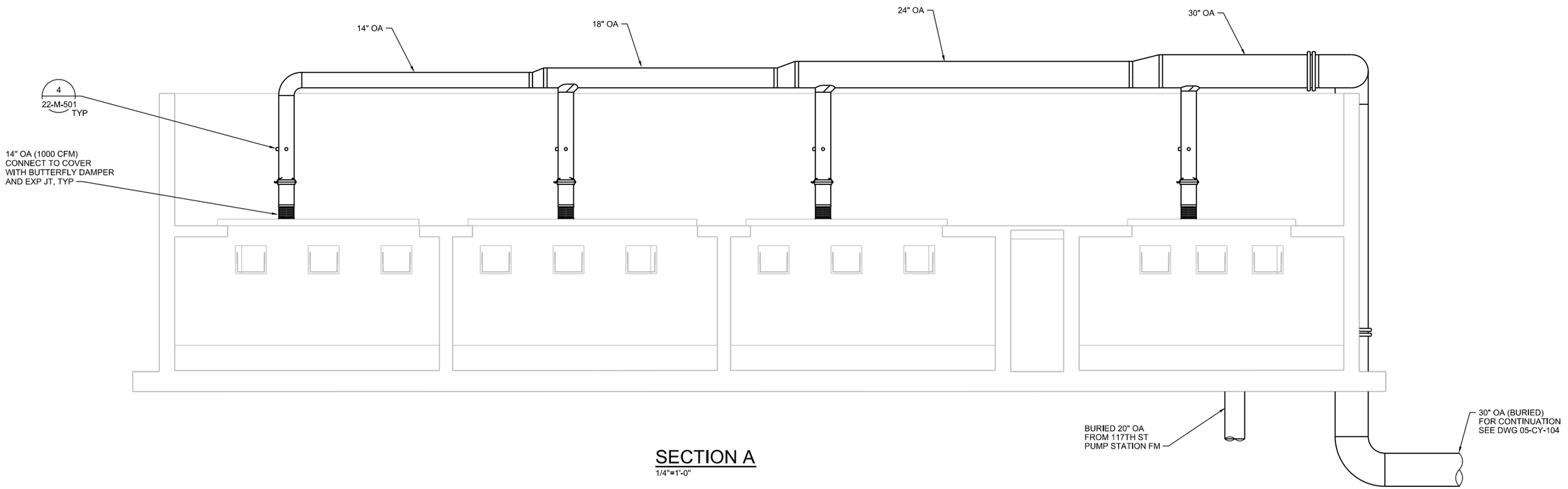

SECTION A
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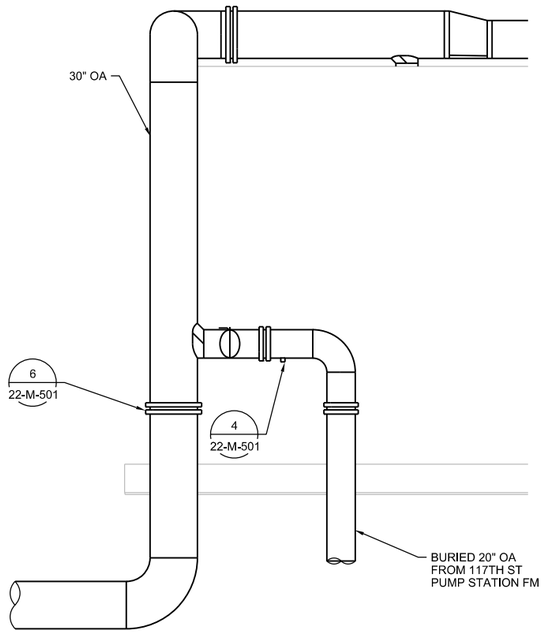

SECTION B
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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

PRIMARY TREATMENT
STRUCTURAL/MECHANICAL
SECTIONS

Appendix A
Sheet 2

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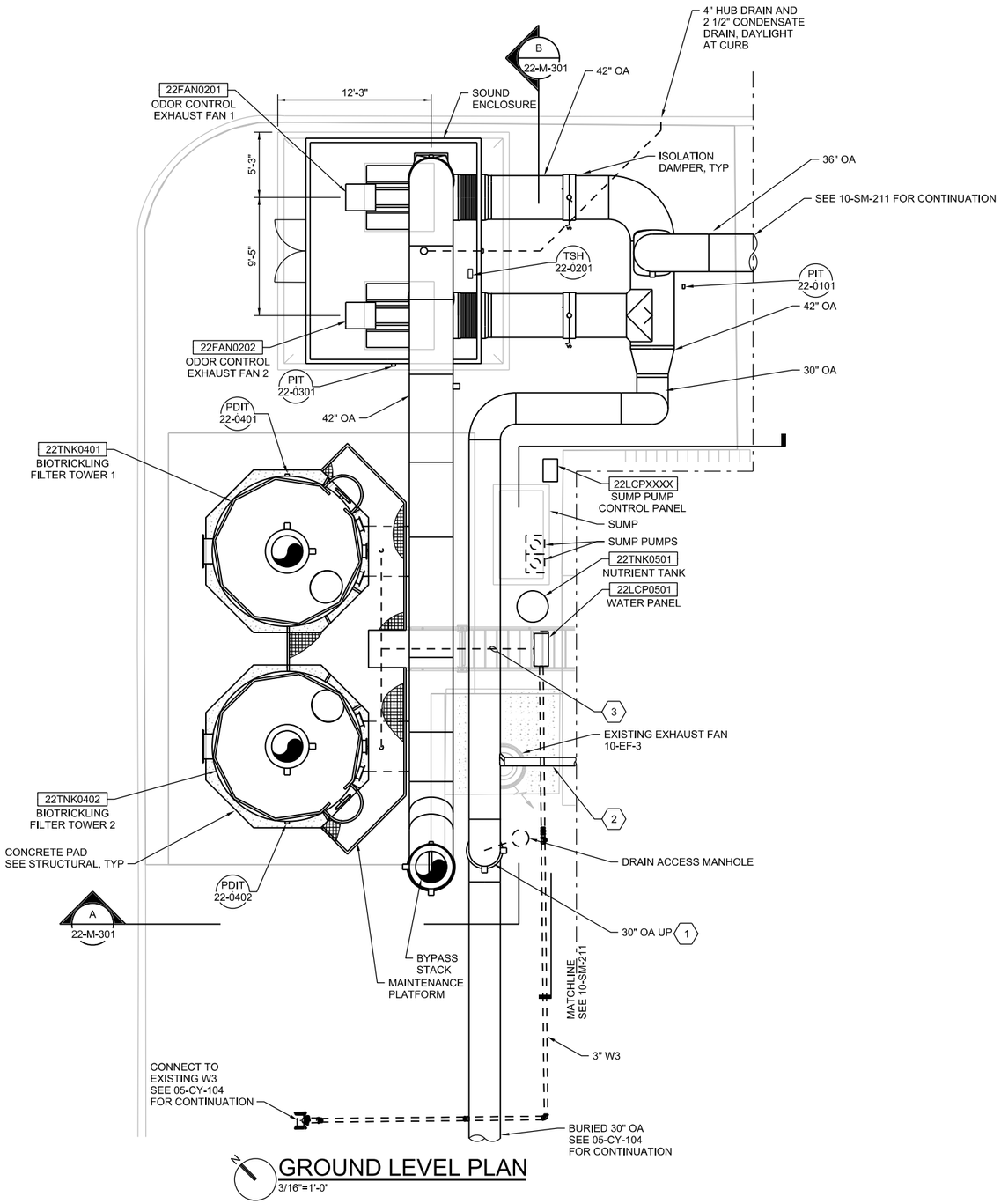

GROUND LEVEL PLAN

3/16"=1'-0"

NOTES:

1. PROVIDE LOW POINT CONDENSATE DRAIN CONNECTION AT BOTTOM OF 30" OA ELBOW. ROUTE DRAIN PIPE TO MANHOLE AS SHOWN IN DETAIL.
2. 8" OA FROM PRIMARY INFLUENT CHANNEL. CONNECT TO NEW COVER WITH BUTTERFLY DAMPER AND EXPANSION JOINT.
3. 2" ARD ROUTE PIPE FROM WATER PANEL TO EACH BIOTRICKLING FILTER. HEAT TRACE AND INSULATE.

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

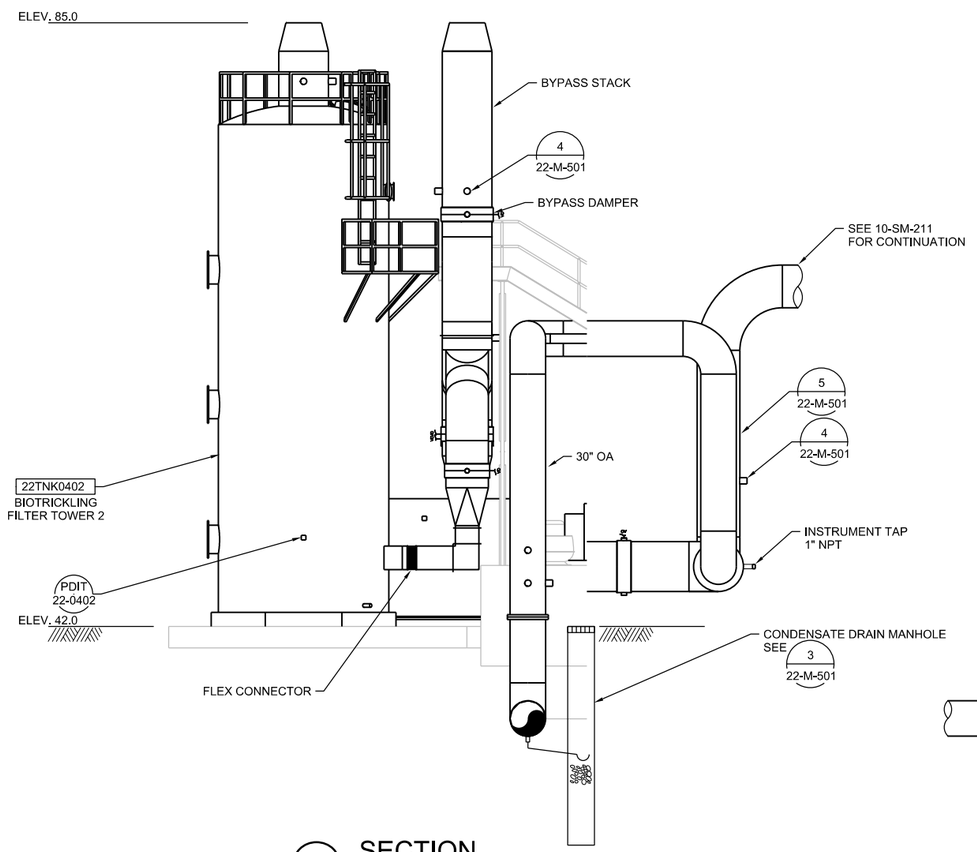
ODOR CONTROL
MECHANICAL
GROUND LEVEL PLAN

Appendix A
Sheet 3

FILENAME: 22-M-130_708335.dgn PLOT DATE: 2019\06\06 PLOT TIME: 10:41:48 AM

NOTES:

1. CONTRACTOR TO COORDINATE PLATFORM ELEVATION WITH TOWER MANUFACTURER. ADJUST HEIGHT OF STAIRS TO ACCOMODATE A FLAT SURFACE BETWEEN LANDINGS.
2. COORDINATE SIZE WITH TOWER MANUFACTURER. SLOPE TOWARDS TOWER INLET.



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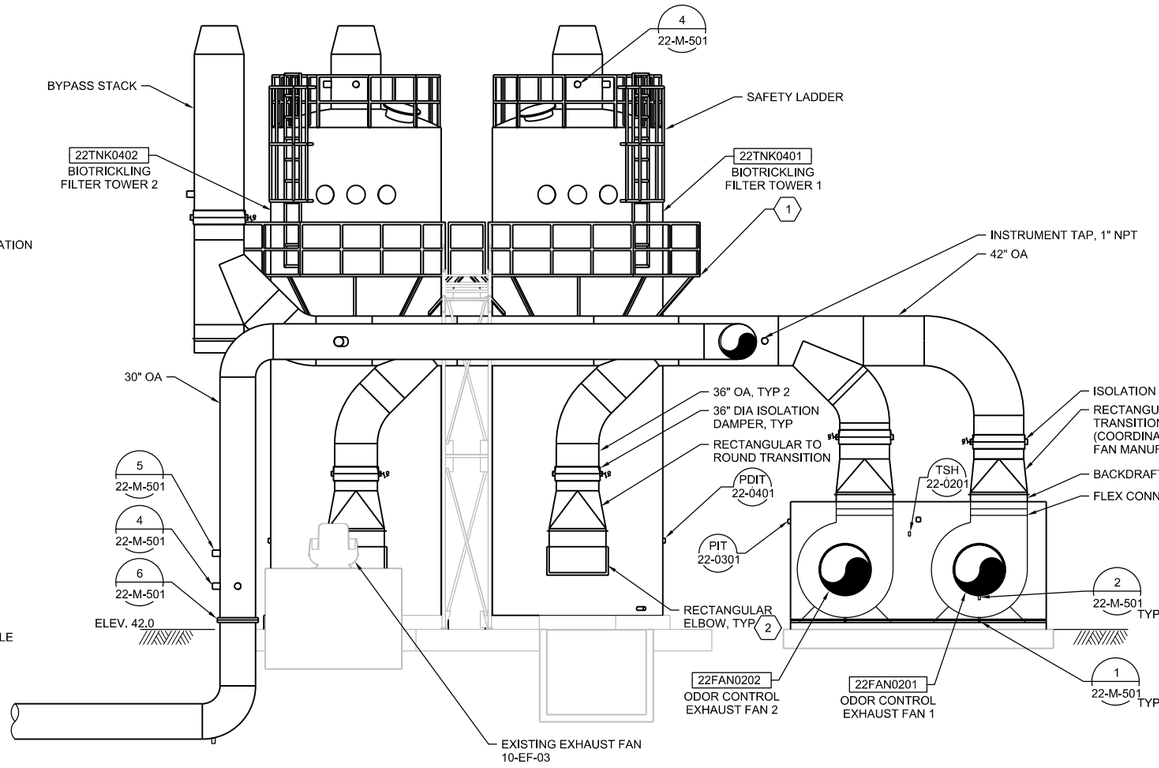
22-M-130



B SECTION
3/16"=1'-0"
22-M-130

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

ODOR CONTROL
MECHANICAL
SECTIONS

Appendix A
Sheet 4

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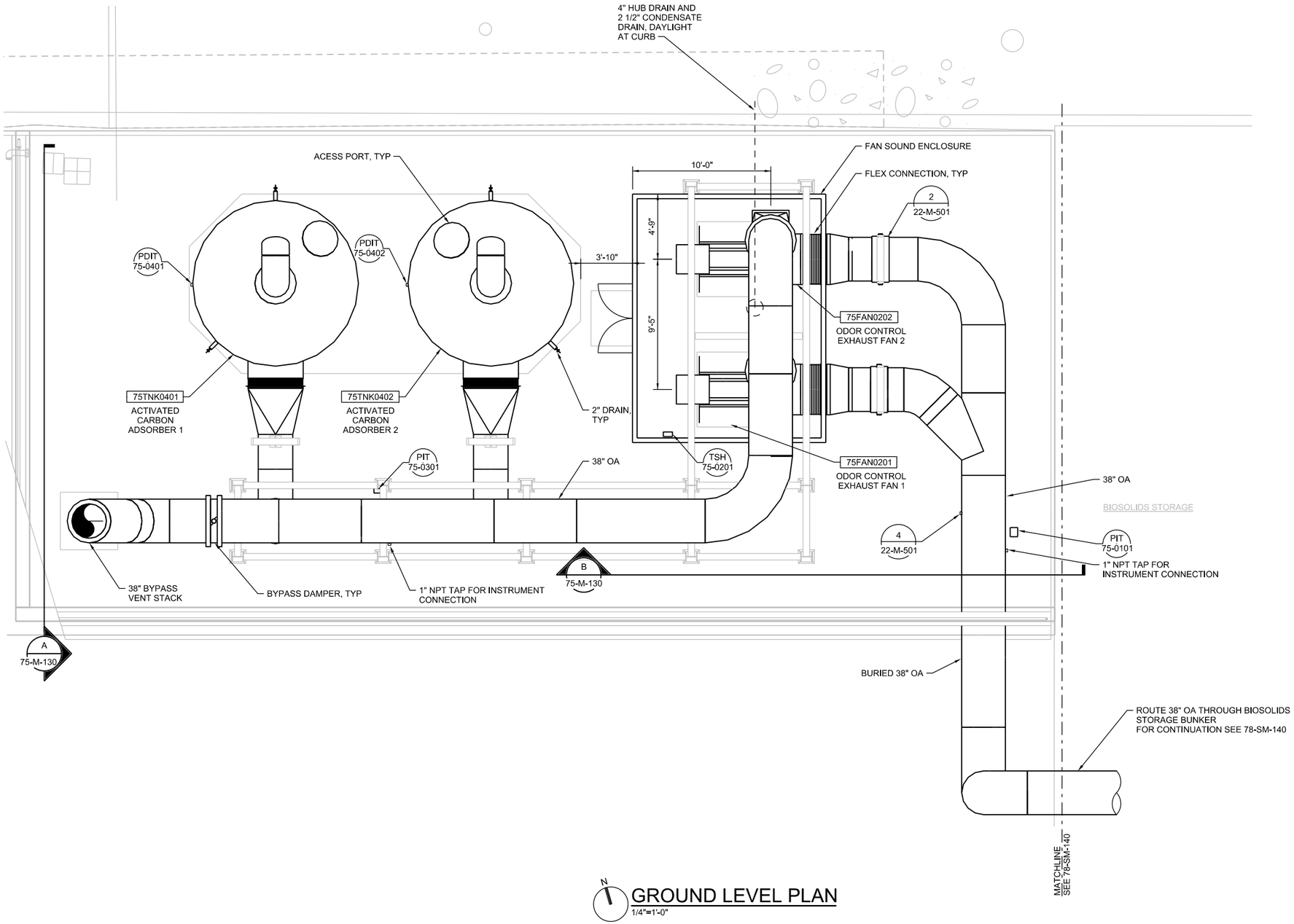

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GROUND LEVEL PLAN

1/4"=1'-0"

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SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SOLIDS ODOR CONTROL
MECHANICAL
GROUND LEVEL PLAN

Appendix A
Sheet 5

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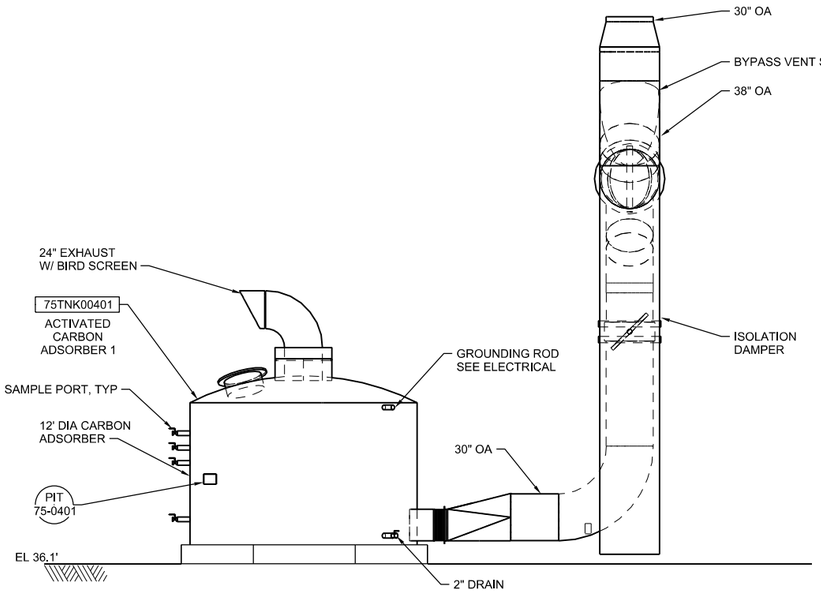

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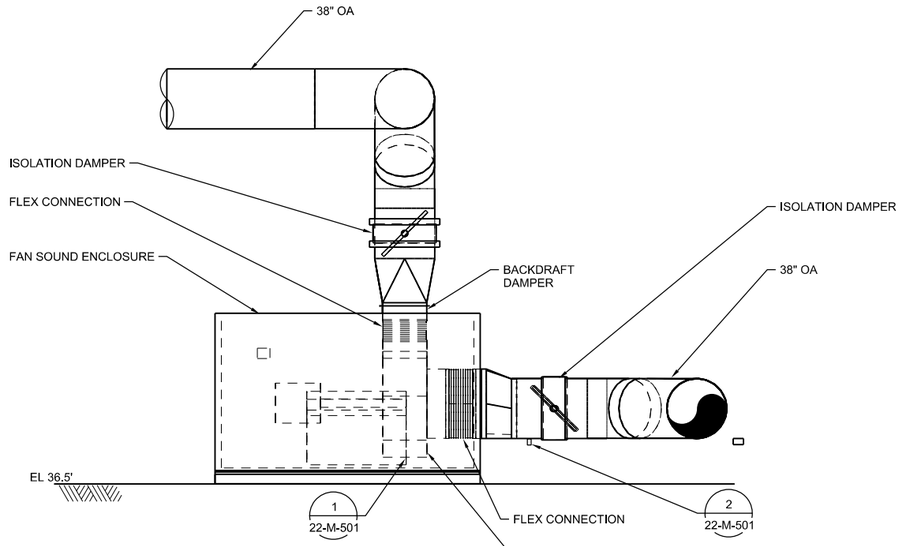
75-M-130



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CHK	S COWDEN						
APVD	B HERMAN	NO.	DATE	REVISION	BY	APVD	

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SOLIDS ODOR CONTROL
MECHANICAL
SECTIONS

Appendix A
Sheet 6

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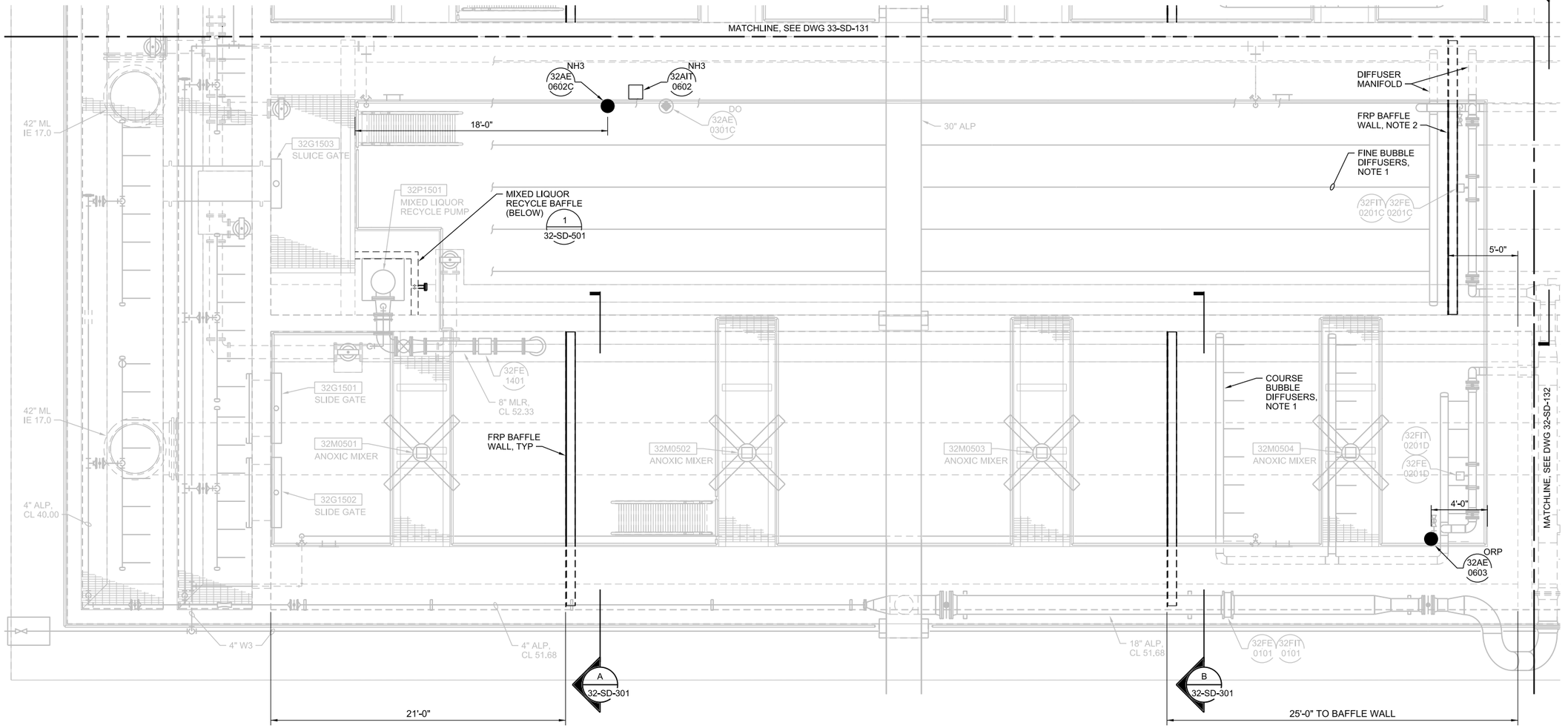

NOTES:

1. REMOVE EXISTING DIFFUSER SYSTEMS WITHIN 10' DURING BAFFLE WALL INSTALLATION. REINSTALL DIFFUSER SYSTEM AND TEST IN ACCORDANCE WITH EQUIPMENT OPERATIONS AND MAINTENANCE MANUAL.
2. LOCATE FRP BAFFLE WALL BETWEEN DIFFUSER MANIFOLD,

N

NORTH END PLAN

1/4"=1'-0"

CRAIG W. MASSIE
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31602
REGISTERED
PROFESSIONAL ENGINEER
PRELIMINARY
NOT FOR CONSTRUCTION

DSGN	T GREELEY/L SCOGGINS					
DR	C BROWN					
CHK	C MASSIE					
APVD	B HERMAN	NO.	DATE	REVISION	BY	APVD

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

AERATION BASIN NO. 5
STRUCTURAL/PROCESS
NORTH END PLAN

Appendix A
Sheet 7

FILENAME: 32-SD-131_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:46:14 AM

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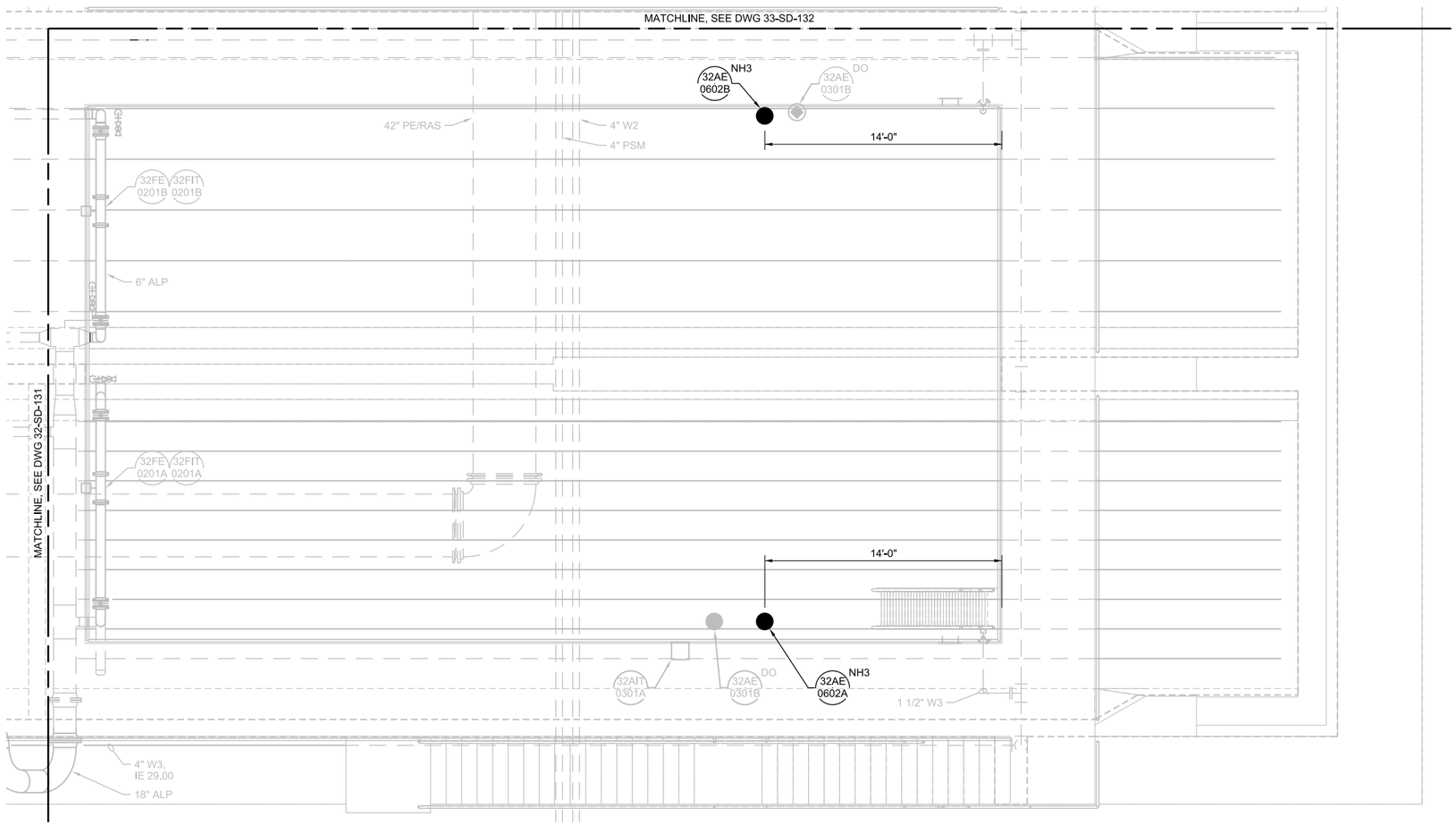

N

SOUTH END PLAN

1/4"=1'-0"

CRAIG W. MASSIE
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31668
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PROFESSIONAL ENGINEER
PRELIMINARY
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DR	C BROWN
CHK	C MASSIE
APVD	B HERMAN

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

AERATION BASIN NO. 5

STRUCTURAL/PROCESS
SOUTH END PLAN

Appendix A
Sheet 8

FILENAME: 32-SD-132_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:36:50 AM

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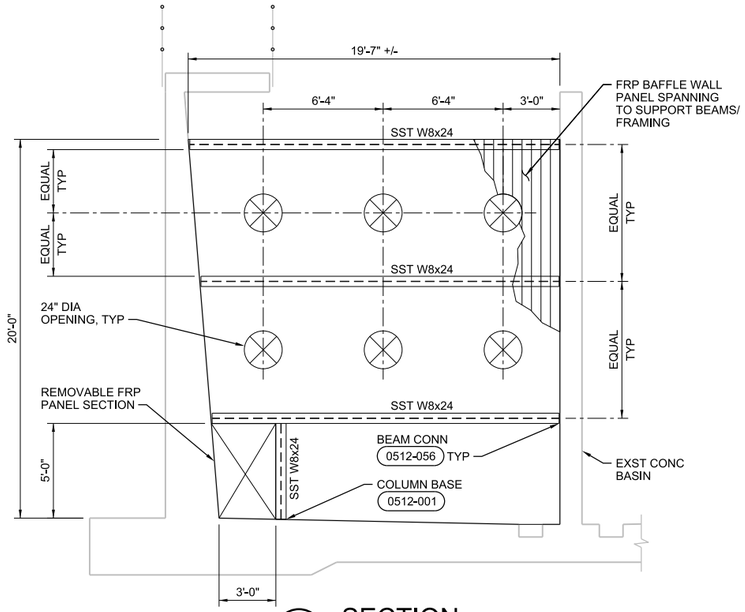
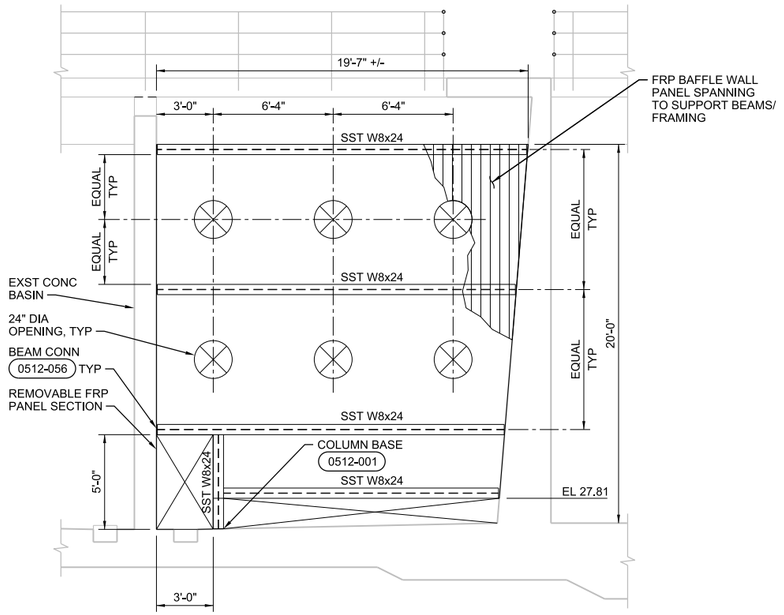


A SECTION
1/4"=1'-0"
32-S-131



C SECTION
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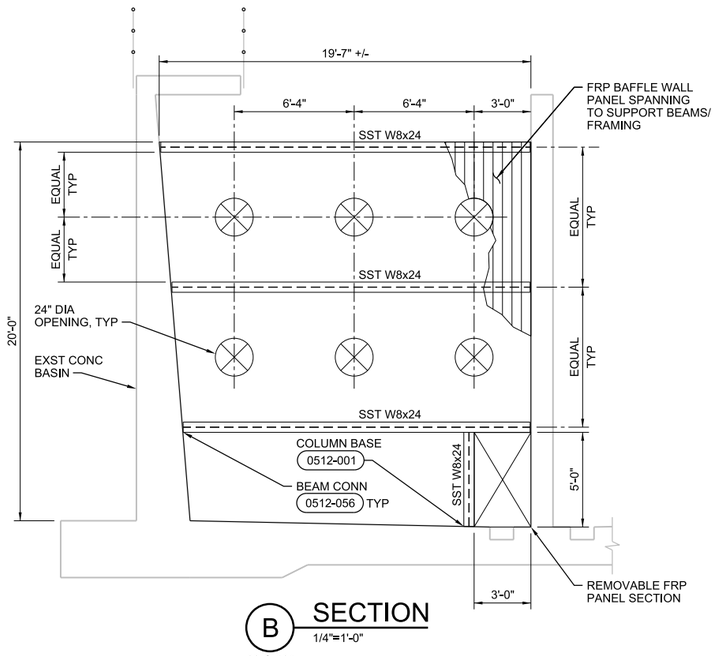
32-S-131



B SECTION
1/4"=1'-0"
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CHK	R FORREST
APVD	B HERMAN

NO.	DATE	REVISION	BY	APVD

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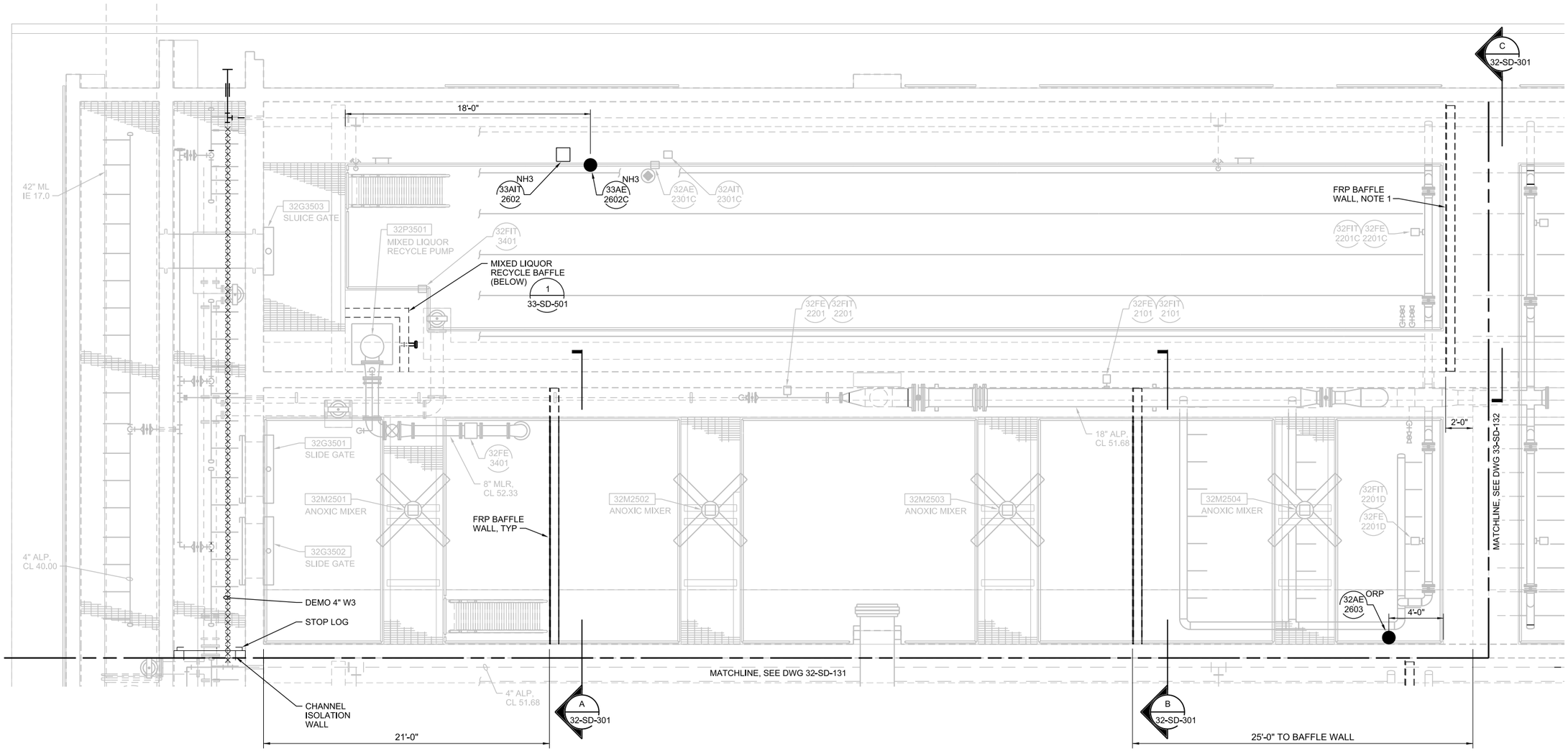
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

AERATION BASIN NO. 5
STRUCTURAL/PROCESS SECTIONS

Appendix A
Sheet 9

FILENAME: 32-SD-301_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:36:55 AM



NOTES:

1. LOCATE FRP BAFFLE WALL BETWEEN DIFFUSER MANIFOLD,

N

NORTH END PLAN

1/4"=1'-0"

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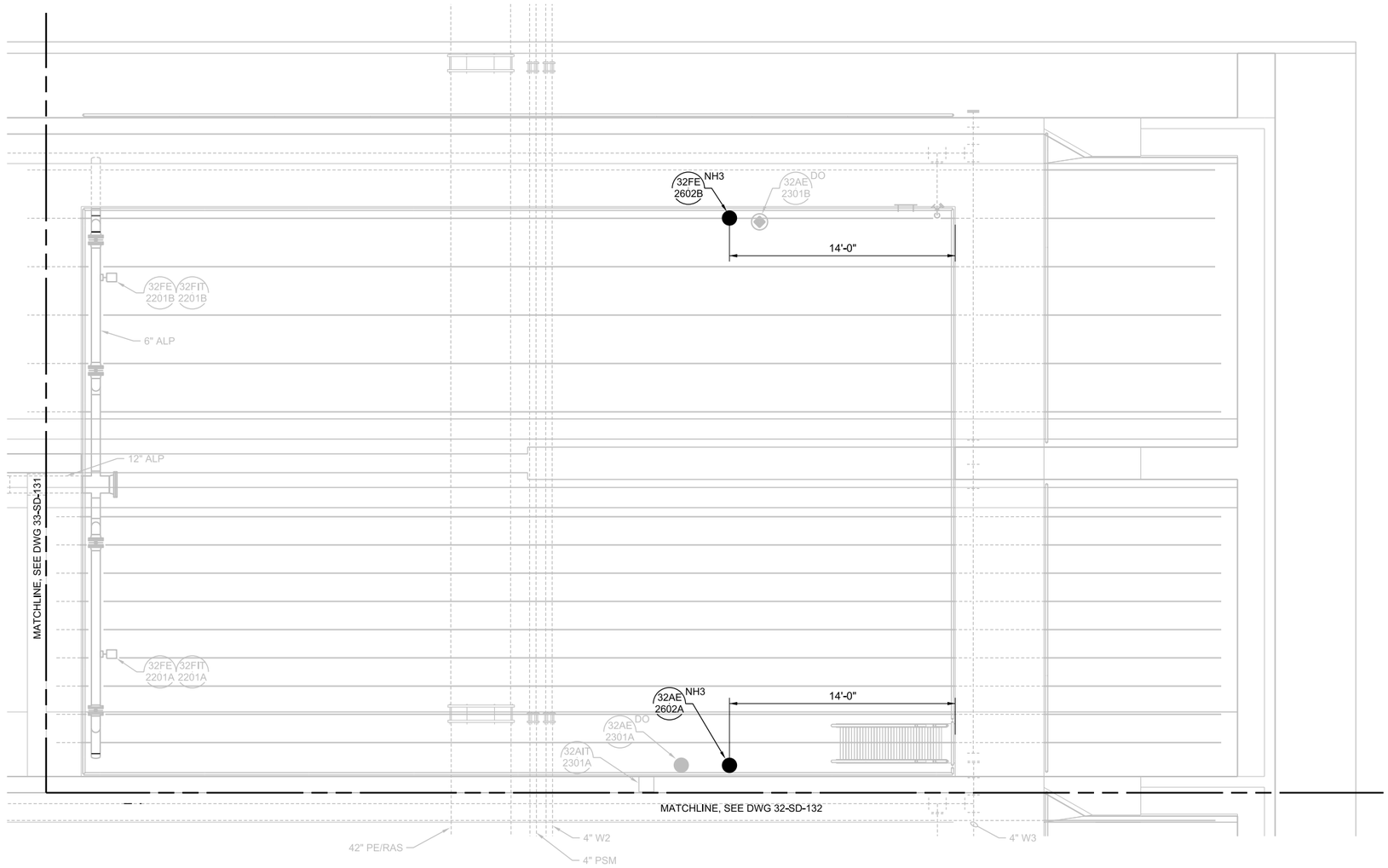
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

AERATION BASIN NO. 6
STRUCTURAL/PROCESS
NORTH END PLAN

Appendix A
Sheet 10

FILENAME: 33-SD-131_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:36:49 AM



N

SOUTH END PLAN

1/4"=1'-0"

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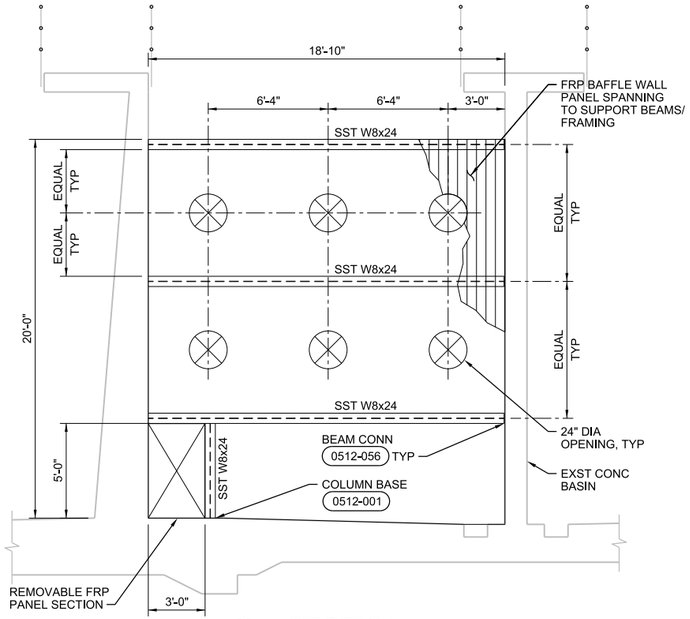
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

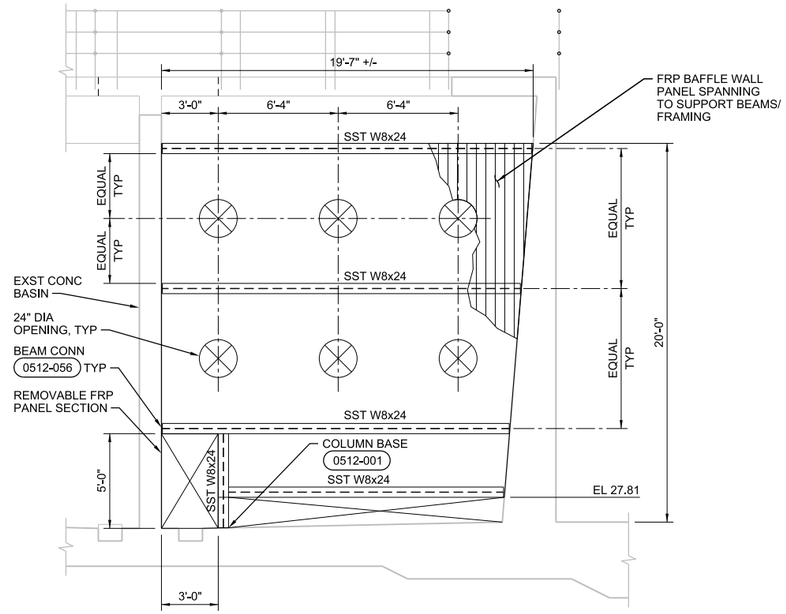
AERATION BASIN NO. 6
STRUCTURAL/PROCESS
SOUTH END PLAN

Appendix A
Sheet 11

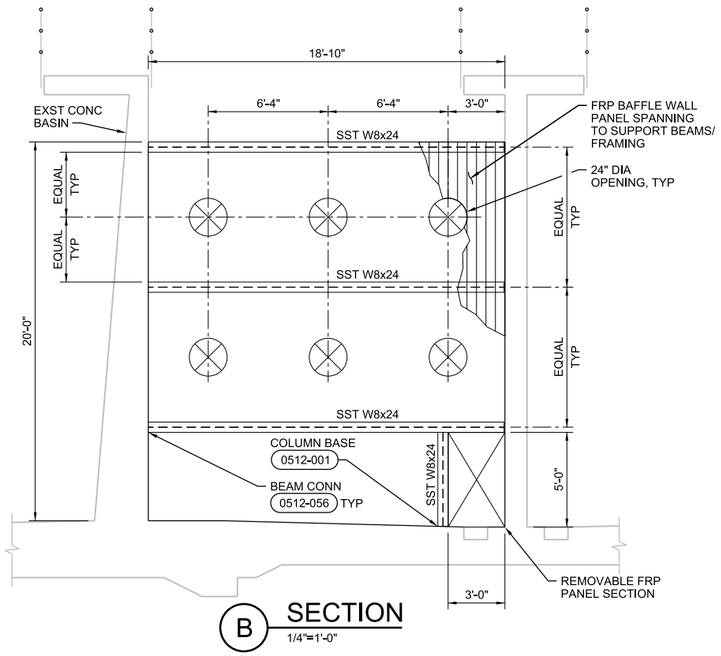
FILENAME: 33-SD-132_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:36:50 AM



A SECTION
1/4"=1'-0"
32-S-131



C SECTION
1/4"=1'-0"
32-S-131



B SECTION
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APVD	B HERMAN	NO.	DATE	REVISION	BY	APVD	

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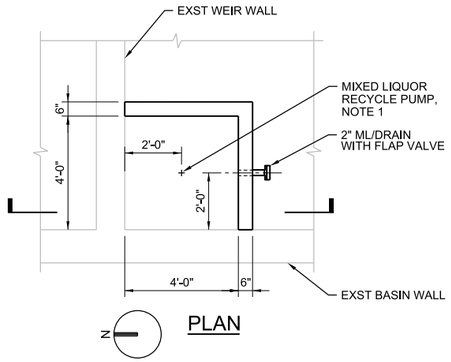
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

AERATION BASIN NO. 6

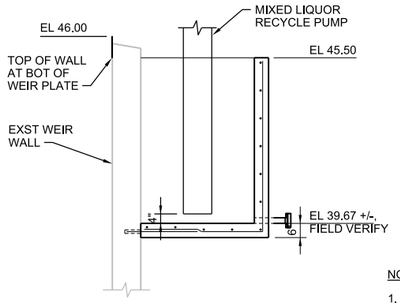
STRUCTURAL/PROCESS SECTIONS

Appendix A
Sheet 12

FILENAME: 33-SD-301_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:36:58 AM



PLAN



SECTION

NOTES:

1. FIELD VERIFY CENTERLINE OF PUMP. IF DIMENSIONS ARE NOT AS SHOWN NOTIFY ENGINEER PRIOR TO PLACEMENT.

1 MLR PUMP BAFFLE DETAIL

3/8"=1'-0"

33-SD-131

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APVD	B HERMAN

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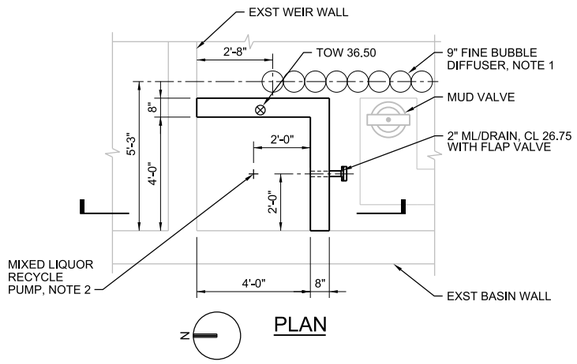
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

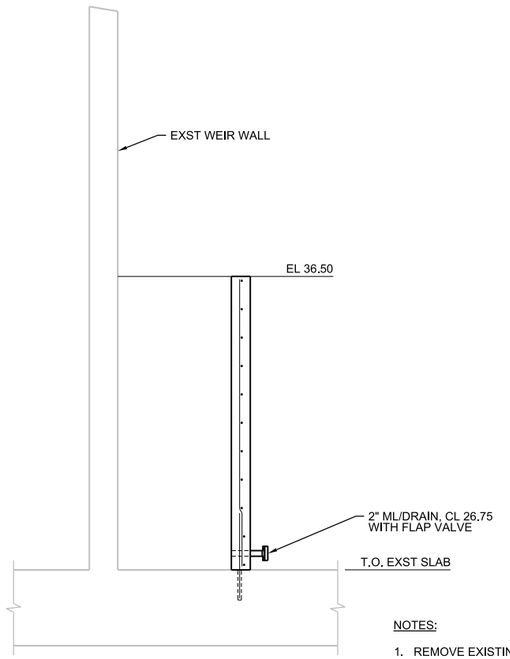
AERATION BASIN NO. 5
STRUCTURAL/PROCESS DETAILS

Appendix A
Sheet 13

FILENAME: 32-SD-501_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:36:54 AM



PLAN



SECTION

NOTES:

1. REMOVE EXISTING DIFFUSER SYSTEM WITHIN 10' DURING BAFFLE WALL INSTALLATION. REINSTALL DIFFUSER SYSTEM AND TEST IN ACCORDANCE WITH EQUIPMENT OPERATIONS AND MAINTENANCE MANUAL.
2. FIELD VERIFY CENTERLINE OF PUMP. IF DIMENSIONS ARE NOT AS SHOWN, NOTIFY ENGINEER PRIOR TO WALL PLACEMENT.

1 MLR PUMP BAFFLE DETAIL

3/8"=1'-0"

32-SD-131

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STATE OF WASHINGTON
48008
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PROFESSIONAL ENGINEER

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SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

AERATION BASIN NO. 6

STRUCTURAL/PROCESS DETAILS

Appendix A
Sheet 14

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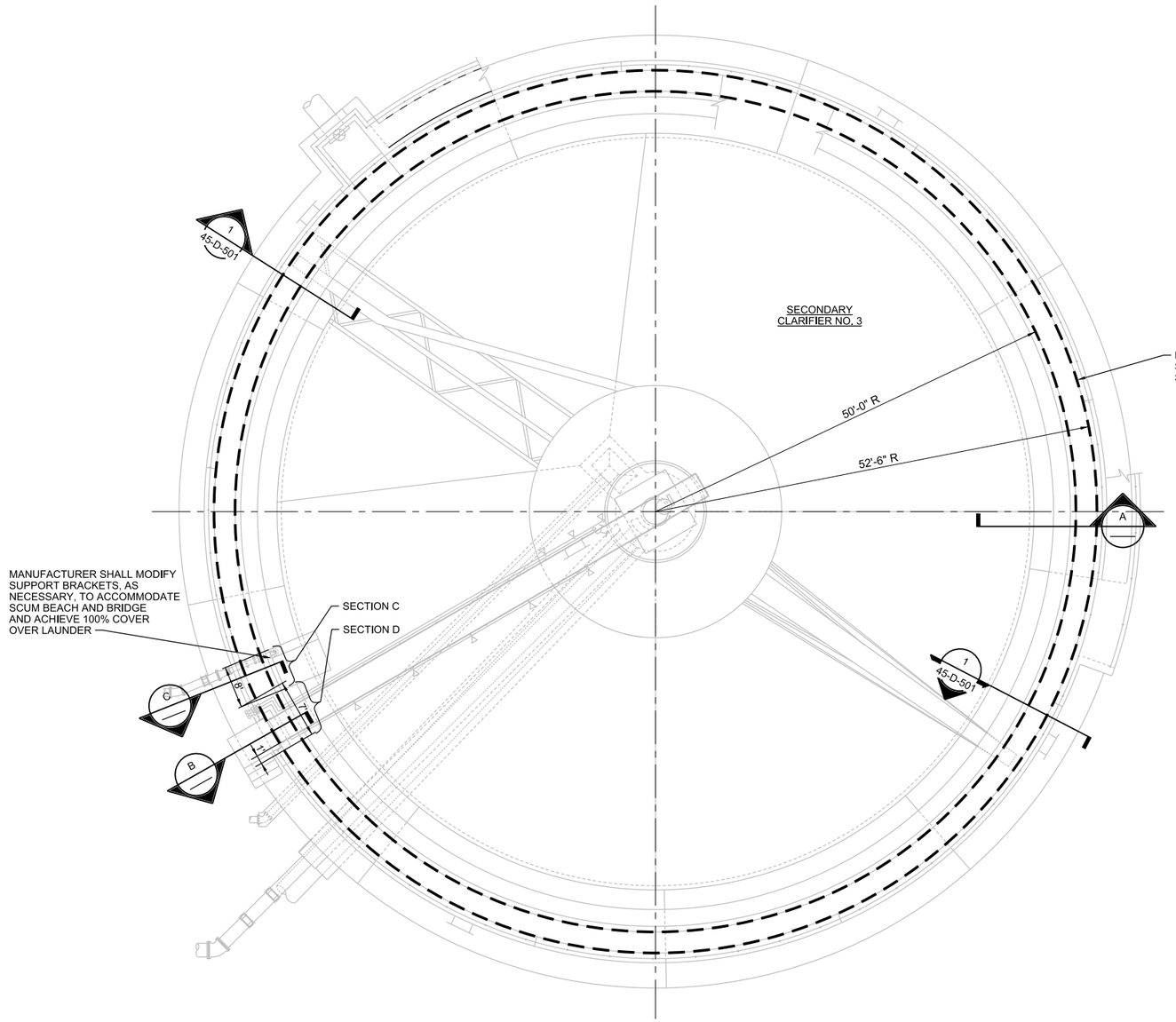
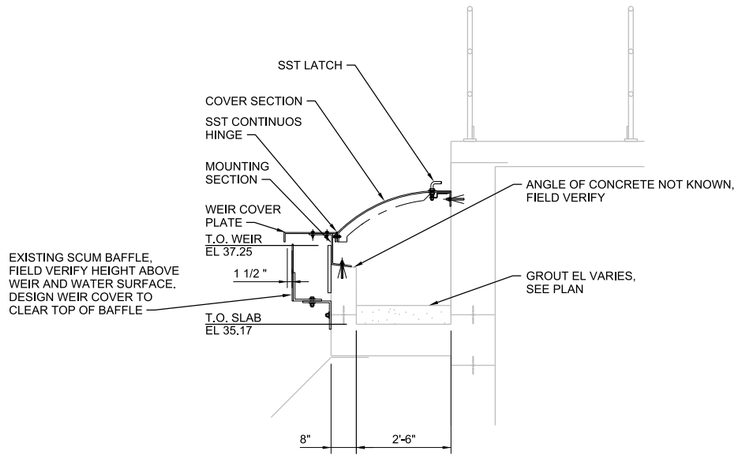


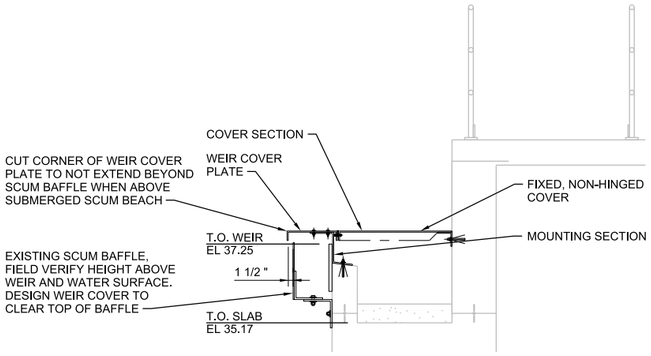
SECONDARY CLARIFIER NO. 3 PLAN

1/8"=1'-0"



A SECTION

NTS



B SECTION

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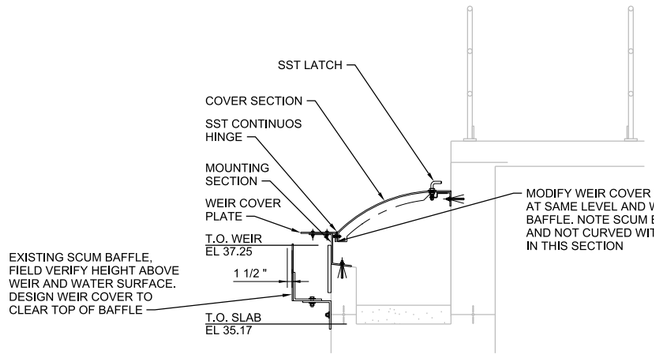

C SECTION

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SECONDARY CLARIFIER NO. 3

PROCESS
PLAN

Appendix A
Sheet 15

FILENAME: 45-D-130_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:54:53 AM

1 DETAIL
NTS
45-D-130

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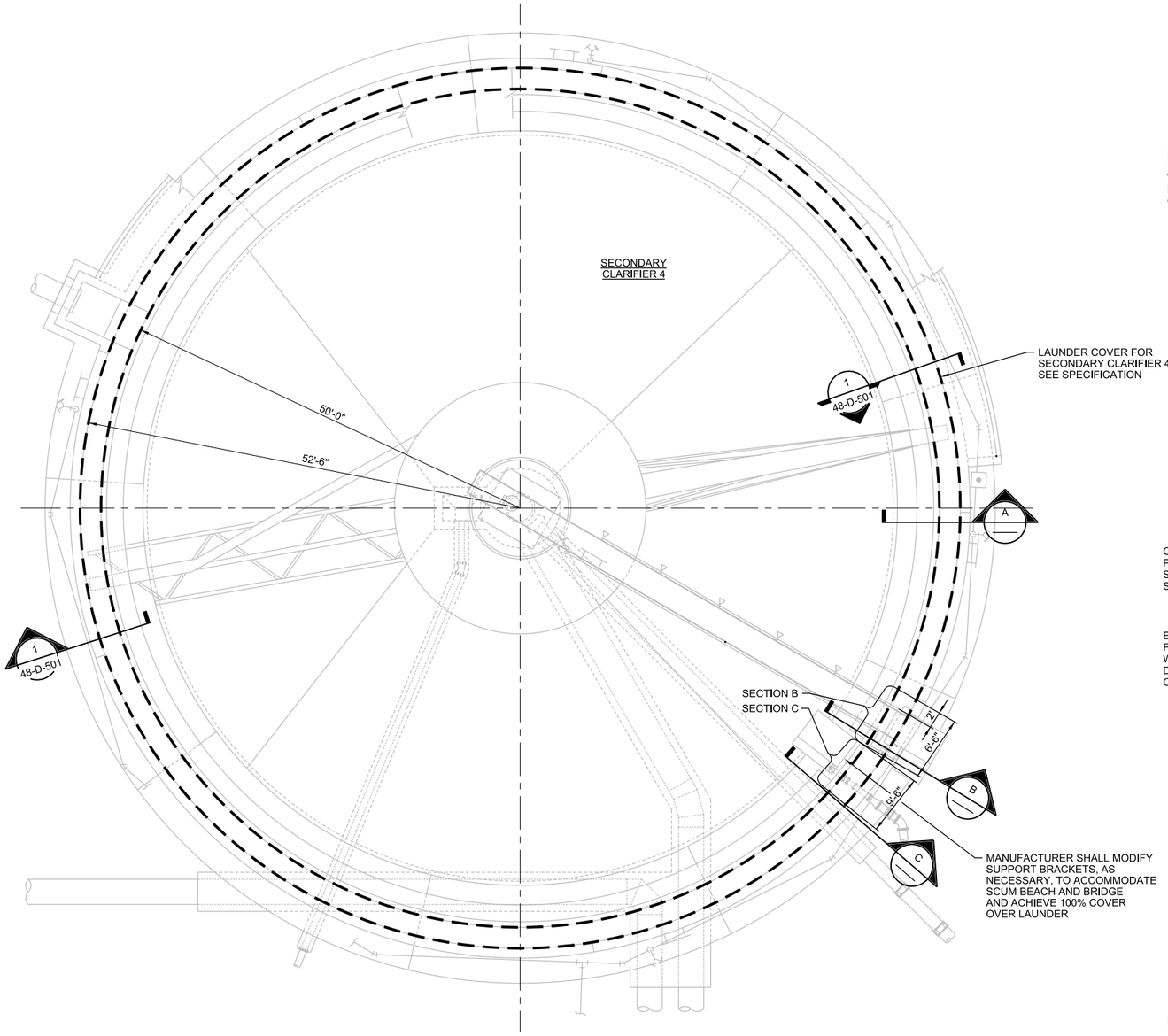
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

SECONDARY CLARIFIER NO. 3
PROCESS DETAIL

Appendix A
Sheet 16

FILENAME: 45-D-501_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:54:42 AM



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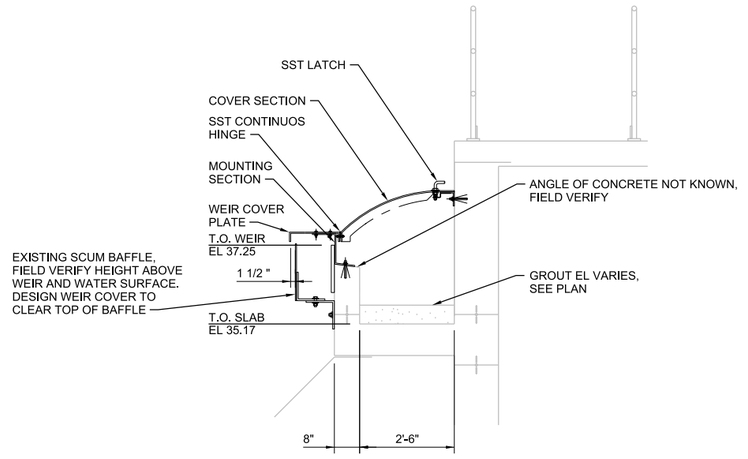
SECONDARY CLARIFIER NO. 4 PLAN

1/8"=1'-0"



A SECTION
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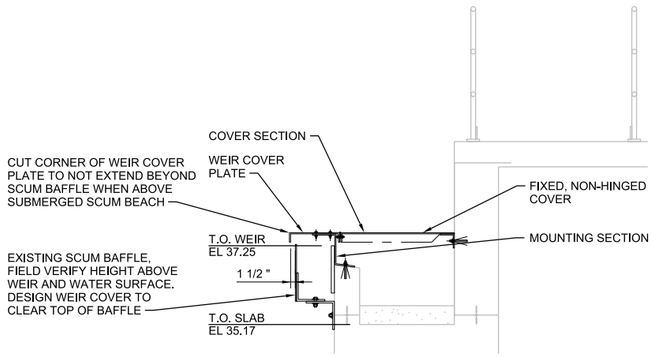

B SECTION
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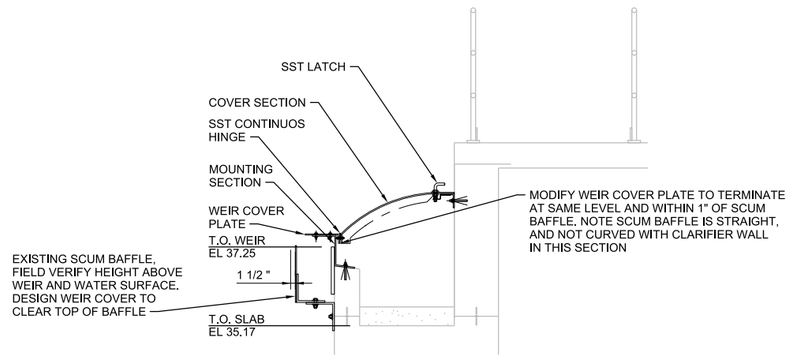

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SECONDARY CLARIFIER NO. 4

PROCESS
PLAN

Appendix A
Sheet 17

FILENAME: 46-D-130_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:56:07 AM

1 DETAIL
NTS
46-D-130

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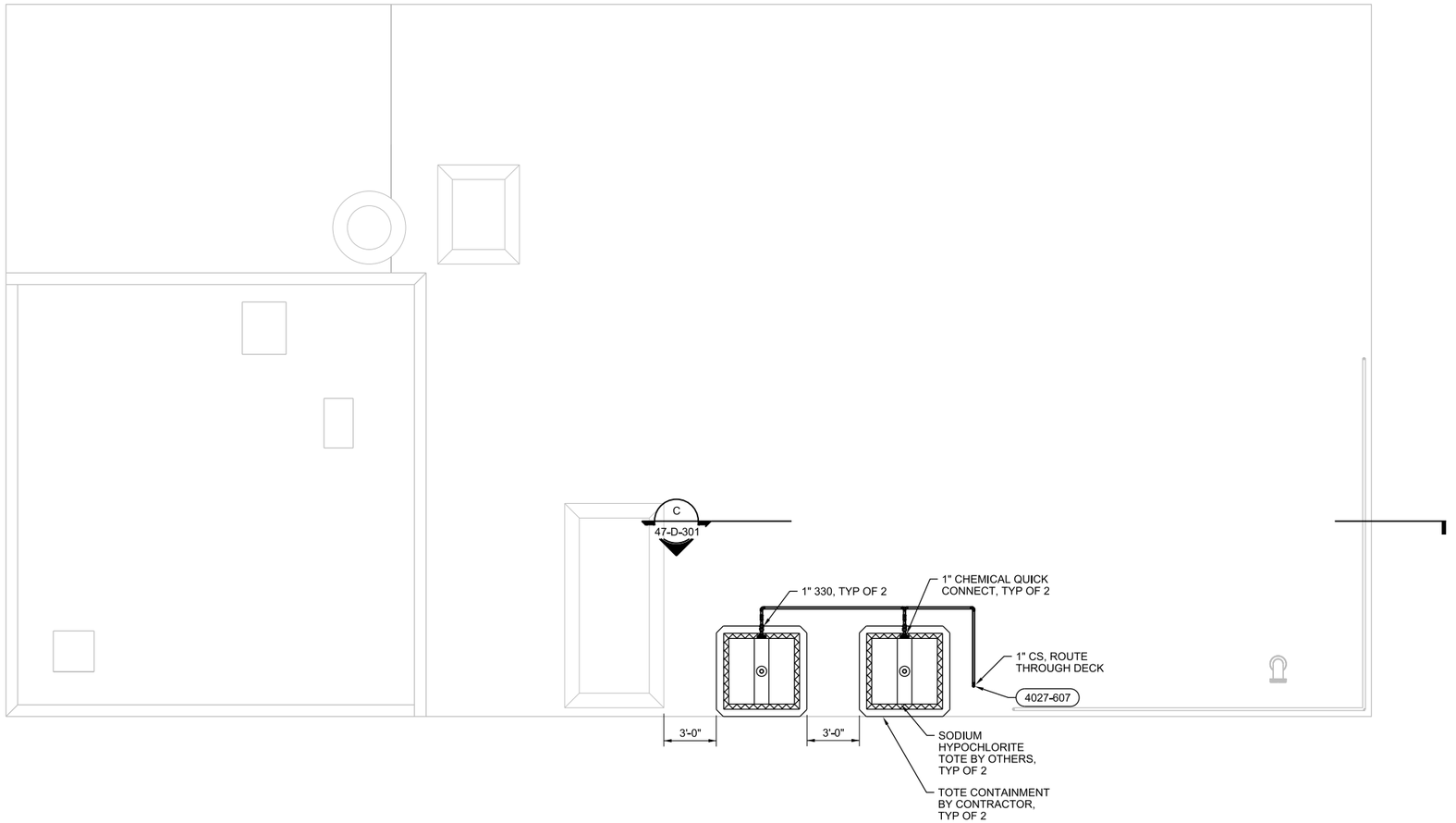
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SECONDARY CLARIFIER NO. 4
PROCESS
DETAIL

Appendix A
Sheet 18

FILENAME: 46-D-501_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:55:56 AM



N

GROUND LEVEL PLAN

1/4"=1'-0"

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APVD	B HERMAN

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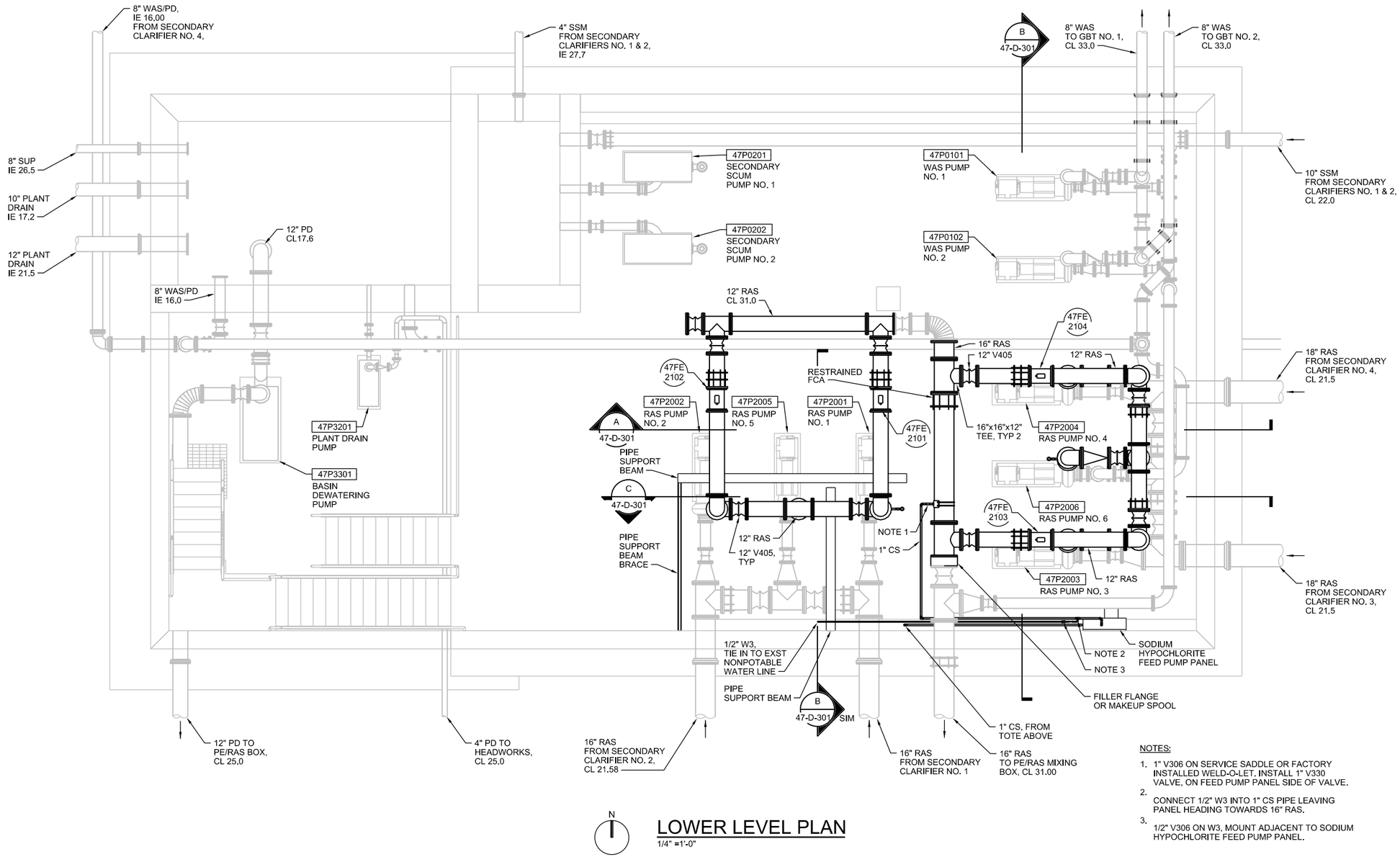
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

RAS / WAS PUMP STATION

PROCESS
GROUND LEVEL PLAN

Appendix A
Sheet 19

FILENAME: 47-D-130_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 9:57:37 AM



N

LOWER LEVEL PLAN

1/4" =1'-0"

NOTES:

1. 1" V306 ON SERVICE SADDLE OR FACTORY INSTALLED WELD-O-LET. INSTALL 1" V330 VALVE, ON FEED PUMP PANEL SIDE OF VALVE.
2. CONNECT 1/2" W3 INTO 1" CS PIPE LEAVING PANEL HEADING TOWARDS 16" RAS.
3. 1/2" V306 ON W3, MOUNT ADJACENT TO SODIUM HYPOCHLORITE FEED PUMP PANEL.

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APVD	B HERMAN

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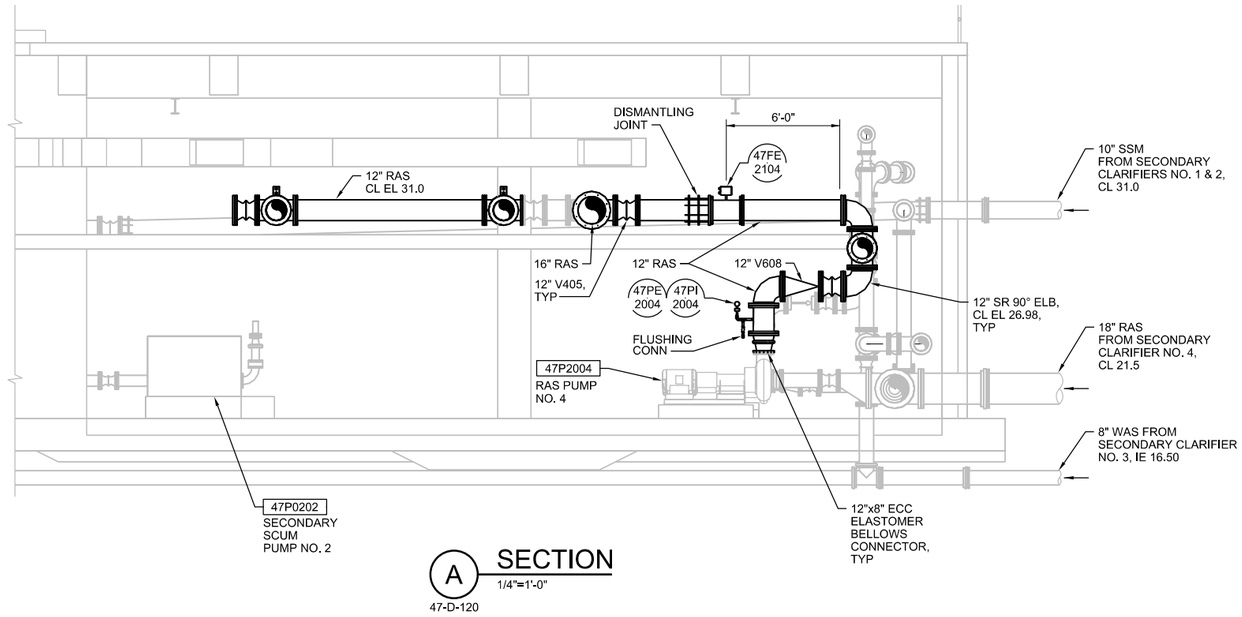
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

RAS / WAS PUMP STATION
PROCESS
LOWER LEVEL PLAN

Appendix A
Sheet 20

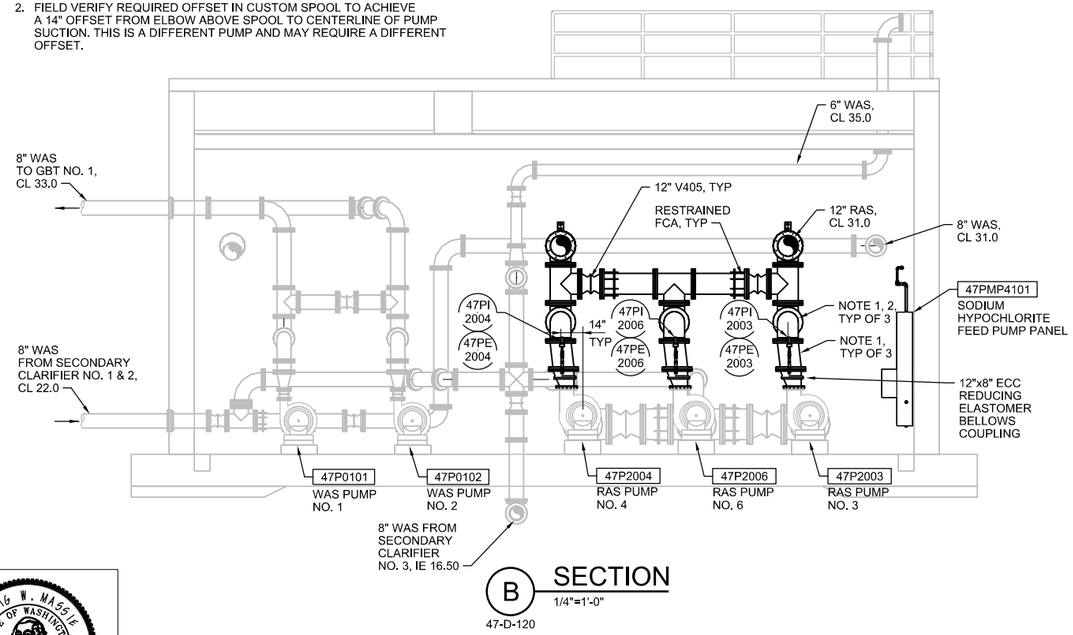
FILENAME: 47-D-120_708335.dgn PLOT DATE: 2019\06\06 PLOT TIME: 6:11:54 AM



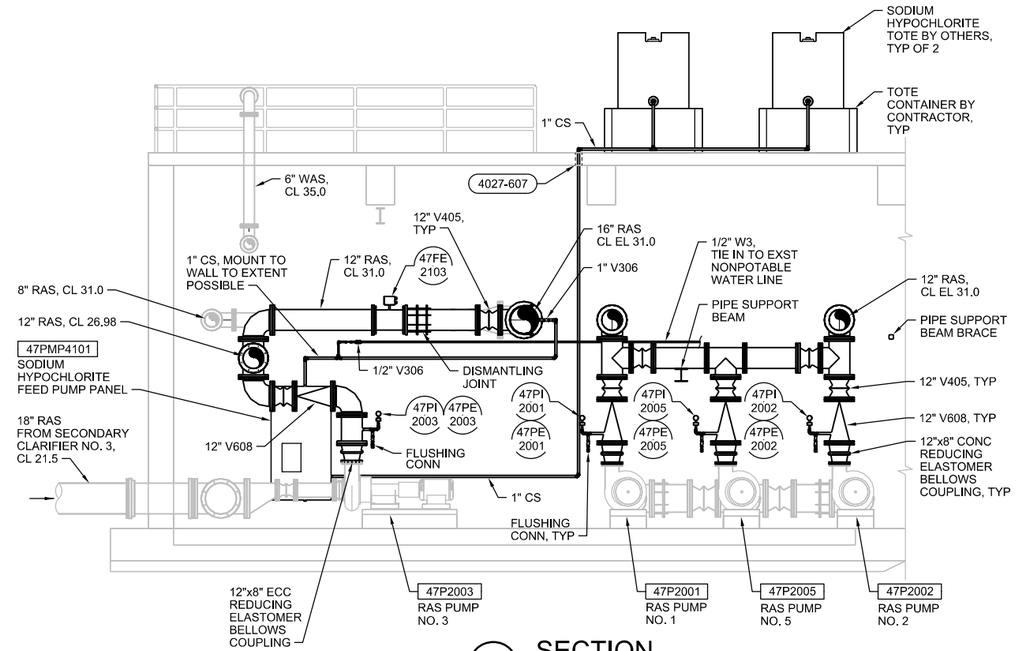
A SECTION
1/4"=1'-0"
47-D-120

NOTES:

1. PROVIDE 316L SST CUSTOM FABRICATED SPOOL IN ACCORDANCE WITH 40 27 00.08. WELD TWO BENDS IN CENTER SECTION OF SPOOL TO GIVE HORIZONTAL OFFSET OF 1 3/16" BETWEEN CENTERLINE OF FLANGES. ROTATE WELDED FLANGES SO VERTICAL PLANE CONTAINING CENTERLINES OF VERTICAL PIPE AS WELL AS DIAGONAL PORTIONS OF PIPE EQUALLY SPLITS THE BOLT PATTERN ON FLANGES. SUBMIT FABRICATION DRAWING TO ENGINEER FOR REVIEW PRIOR TO FABRICATION.
2. FIELD VERIFY REQUIRED OFFSET IN CUSTOM SPOOL TO ACHIEVE A 14" OFFSET FROM ELBOW ABOVE SPOOL TO CENTERLINE OF PUMP SUCTION. THIS IS A DIFFERENT PUMP AND MAY REQUIRE A DIFFERENT OFFSET.



B SECTION
1/4"=1'-0"
47-D-120



C SECTION
1/4"=1'-0"
47-D-120
47-D-130

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CHK	C MASSIE
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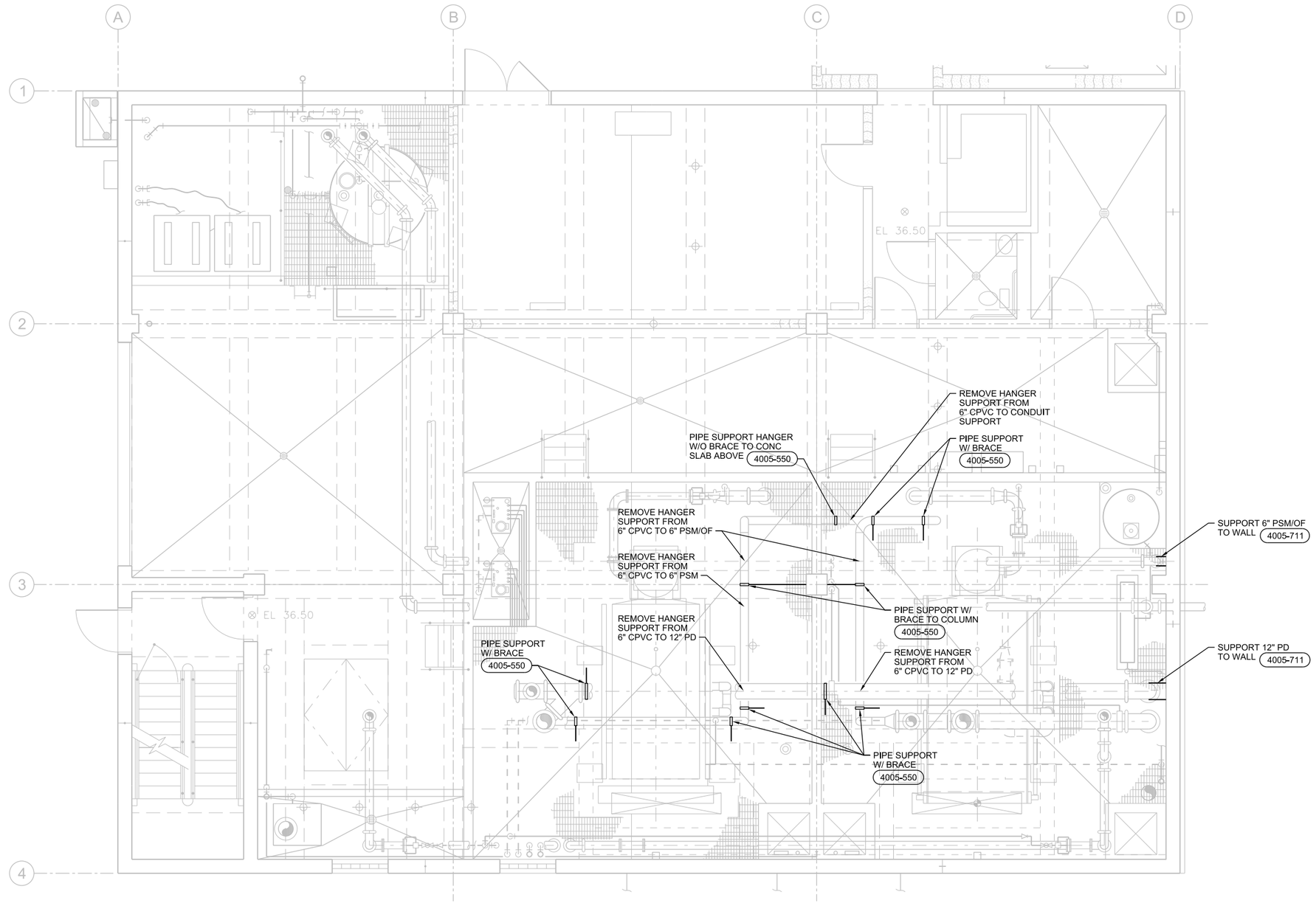
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

RAS / WAS PUMP STATION
PROCESS SECTIONS

Appendix A
Sheet 21

FILENAME: 47-D-301_708335.dgn PLOT DATE: 2019\06\06 PLOT TIME: 6:14:49 AM



GROUND LEVEL PLAN

1/4"=1'-0"

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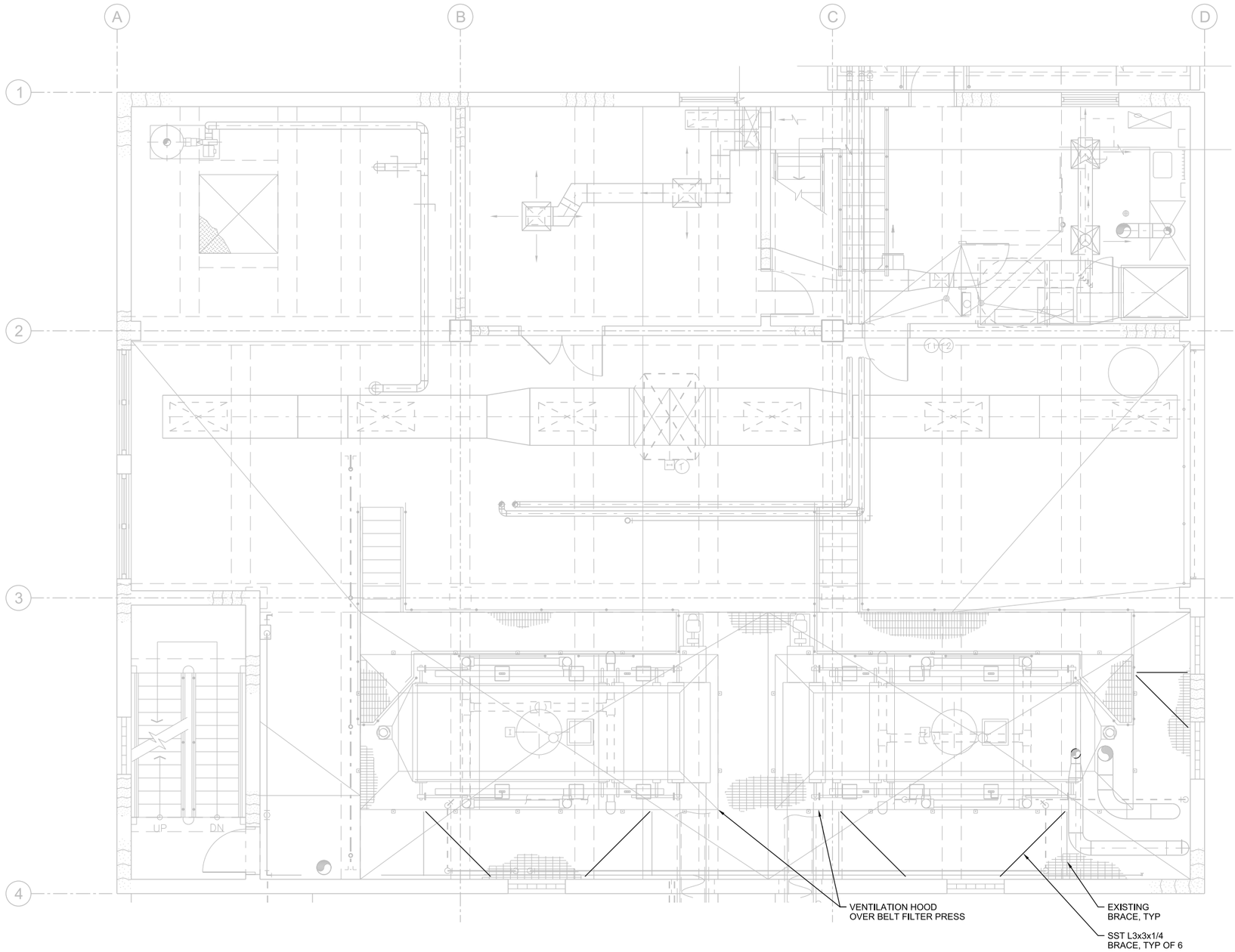
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SOLIDS PROCESSING CENTER
STRUCTURAL
GROUND LEVEL PLAN

Appendix A
Sheet 22

FILENAME: 72-S-130_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 3:06:40 PM



N

UPPER LEVEL PLAN

1/4"=1'-0"

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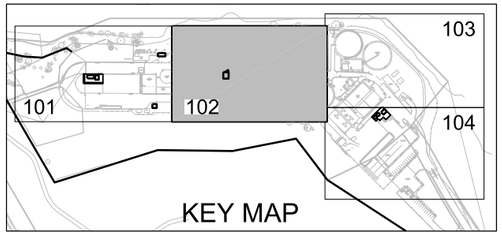
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SOLIDS PROCESSING CENTER

STRUCTURAL
UPPER LEVEL PLAN

Appendix A
Sheet 23

FILENAME: 72-S-140_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 3:06:48 PM



NOTES:

1. CAP ENDS OF ABANDONED PIPES AT LIMITS OF REMOVAL.
2. SEE YARD PIPING DRAWINGS FOR CONNECTIONS TO EXISTING PIPING.

PLUG AND ABANDON PIPING BEYOND LIMITS OF DEMOLITION OF FACILITY 87

DEMOLISH 1/2" A, 4" WAS, 4" SSM, 4" DS, 2" W1 AS NECESSARY FOR THE DEMOLITON OF FACILITY 87

DEMOLITION LIMITS FOR CONTROL BUILDING, SEE REFERENCE DRAWINGS - FACILITY 87 RECORD DRAWINGS

DEMOLISH ABANDONED 6" WAS AND 6" SC

DEMOLISH ABANDONED 2" W1 AND 3" W1

DEMOLISH EXST SIDEWALK

DEMOLISH ENCLOSURE, SEE 6 / 05-CX-501

SAWCUT AND REMOVE PAVEMENT

DEMOLISH 2" W1 AND 3" W1 AS NECESSARY FOR CONSTRUCTION

DEMOLISH 4" SSM AS NECESSARY FOR CONSTRUCTION

DEMOLISH 3" W3 AND 6" W3 AS NECESSARY FOR CONSTRUCTION

DEMOLISH ABANDONED 6" PWS

DEMOLISH 3" PD AS NECESSARY FOR CONSTRUCTION

MATCH LINE, SEE DWG 05-CX-101

MATCH LINE, SEE DWG 05-CX-103

MATCH LINE, SEE DWG 05-CX-104

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DANIEL J. PETERSON STATE OF WASHINGTON 24376 REGISTERED PROFESSIONAL ENGINEER

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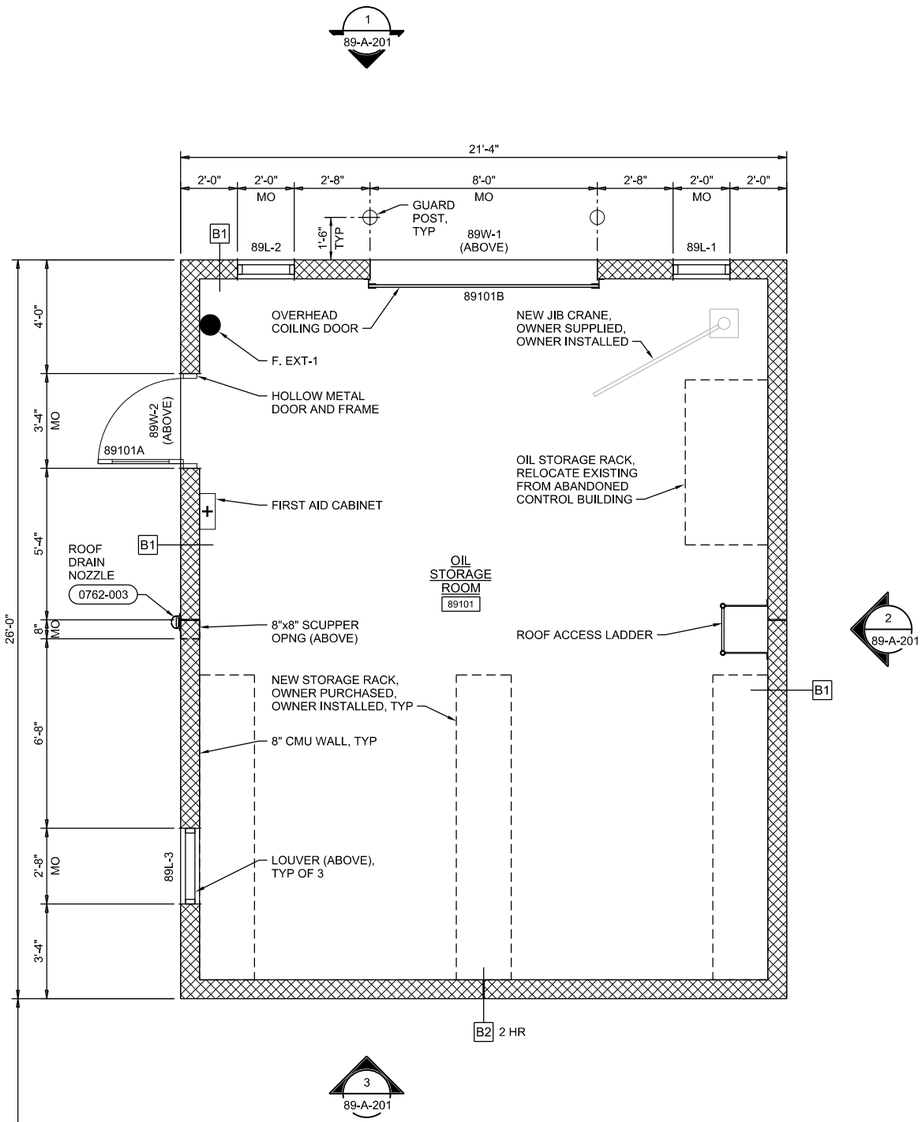
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

SITE DEVELOPMENT

CIVIL DEMOLITION PLAN AREA 102

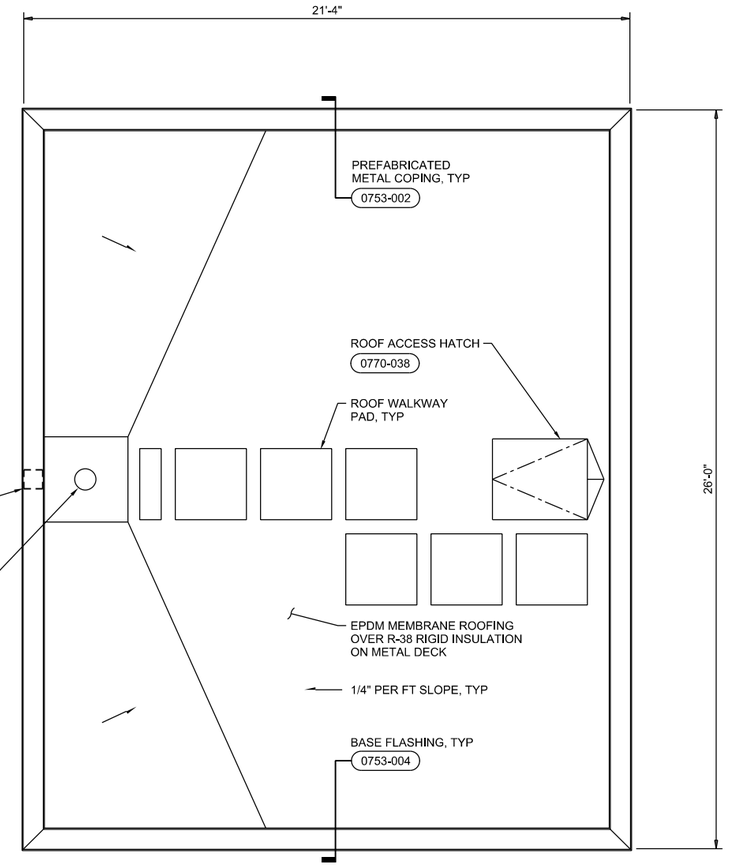
Appendix A
Sheet 24

FILENAME: 05-CX-102_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 1:21:42 PM



GROUND LEVEL FLOOR PLAN

3/8"=1'-0"



ROOF PLAN

3/8"=1'-0"

FACE OF EXISTING BLOWER BLDG, TYP

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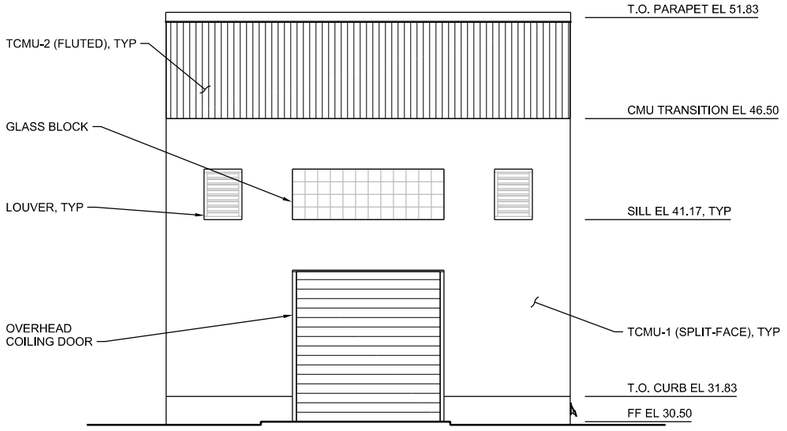
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

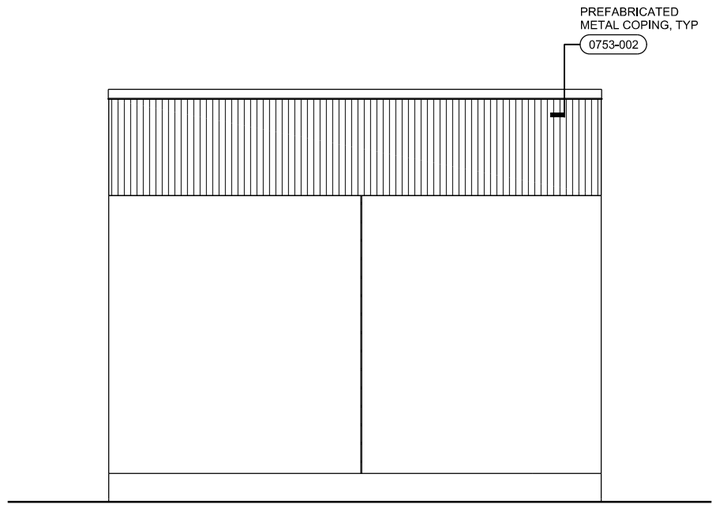
OIL STORAGE BUILDING
ARCHITECTURAL
FLOOR PLAN AND ROOF PLAN

Appendix A
Sheet 25

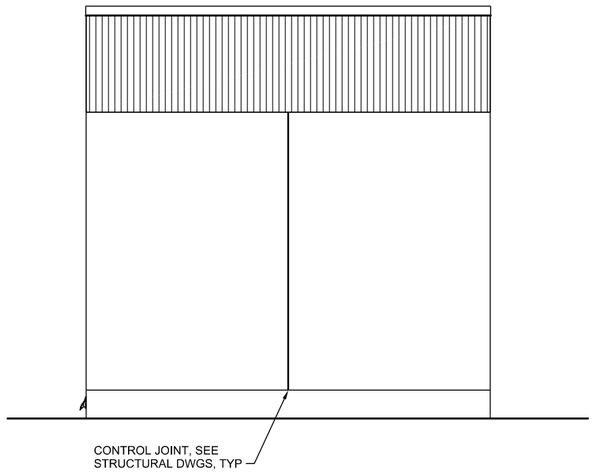
FILENAME: 89-A-130_708335.dgn PLOT DATE: 2019\06\04 PLOT TIME: 11:32:26 AM



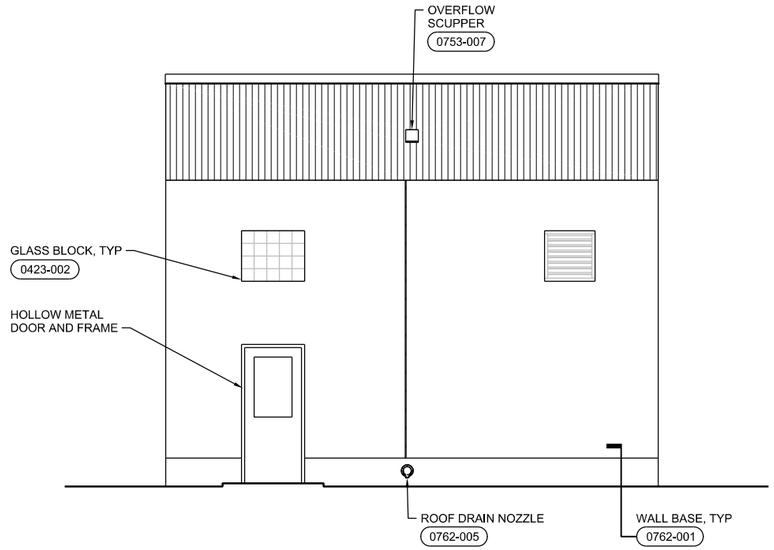
1 NORTH ELEVATION
1/4"=1'-0"
89-A-130



2 EAST ELEVATION
1/4"=1'-0"
89-A-130



3 SOUTH ELEVATION
1/4"=1'-0"
89-A-130



4 WEST ELEVATION
1/4"=1'-0"
89-A-130

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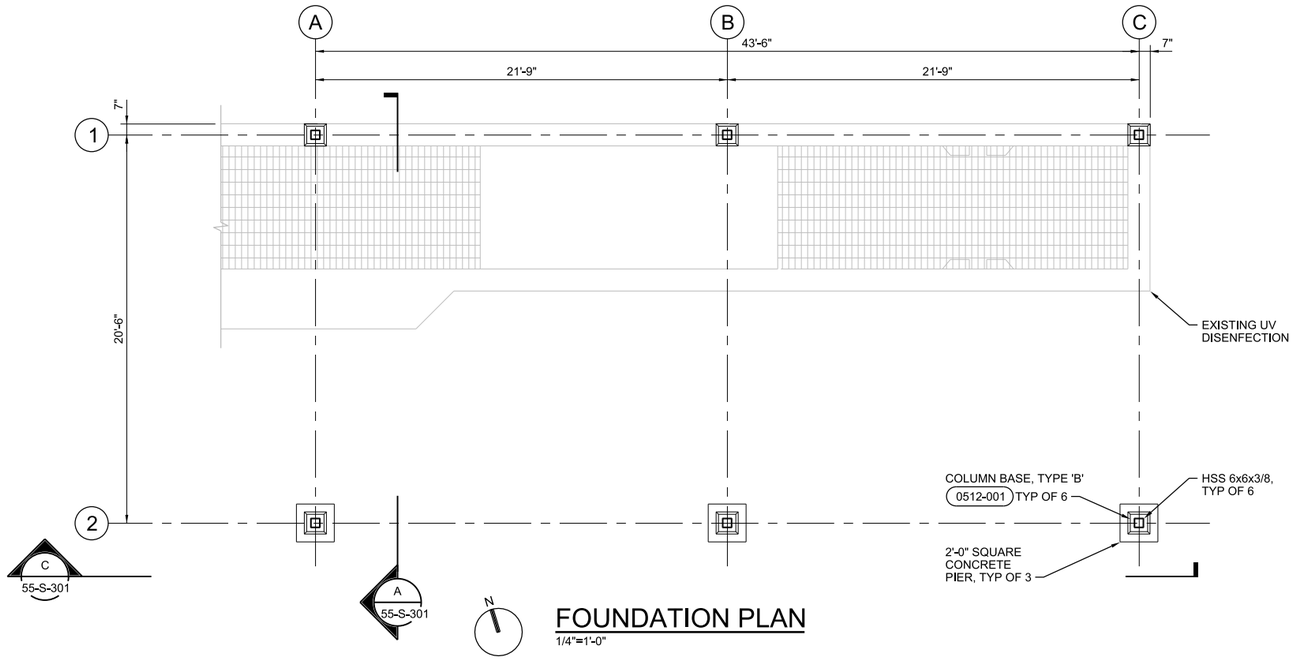
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

OIL STORAGE BUILDING
ARCHITECTURAL
ELEVATIONS

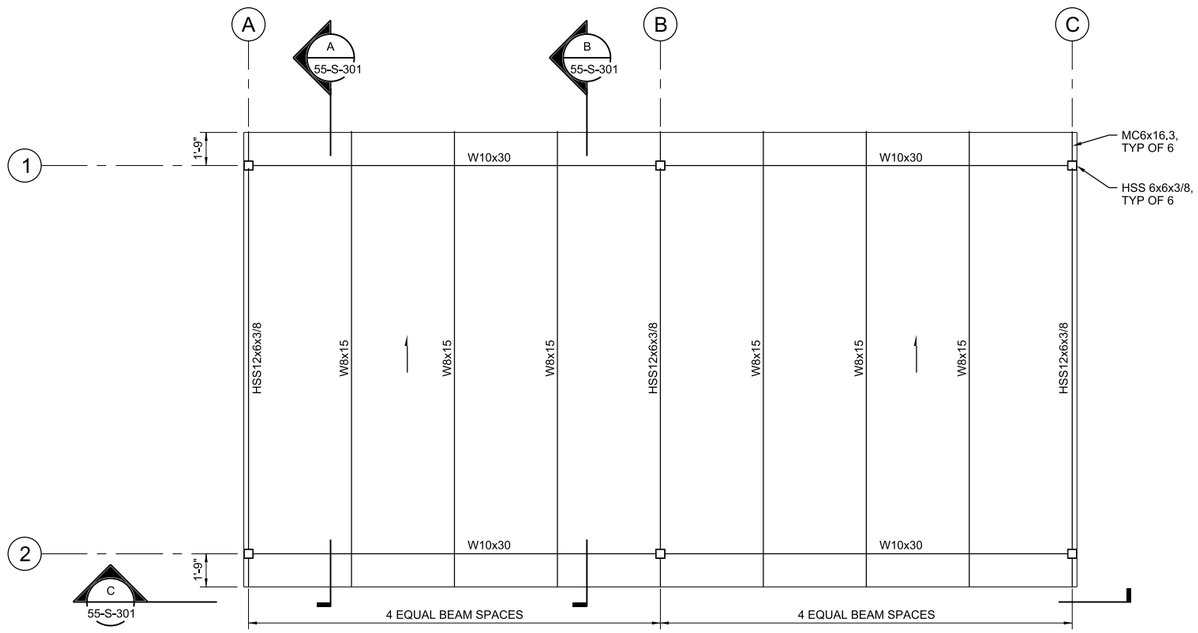
Appendix A
Sheet 26

FILENAME: 89-A-201_708335.dgn PLOT DATE: 2019\06\03 PLOT TIME: 3:08:34 PM



FOUNDATION PLAN

1/4"=1'-0"



ROOF FRAMING PLAN

1/4"=1'-0"

FACILITY NOTES:

1. FOR STRUCTURAL GENERAL NOTES SEE DRAWINGS 01-G-010 THROUGH 01-G-011.
2. SEISMIC DESIGN DATA:
   - A. MAIN LATERAL FORCE RESISTING SYSTEM: STEEL ORDINARY MOMENT FRAME
   - B. RESPONSE MODIFICATION COEFFICIENT, R: 3 1/2
   - C. RESPONSE COEFFICIENT, Cs: 0.246
   - D. BASE SHEAR: 5.5 KIPS

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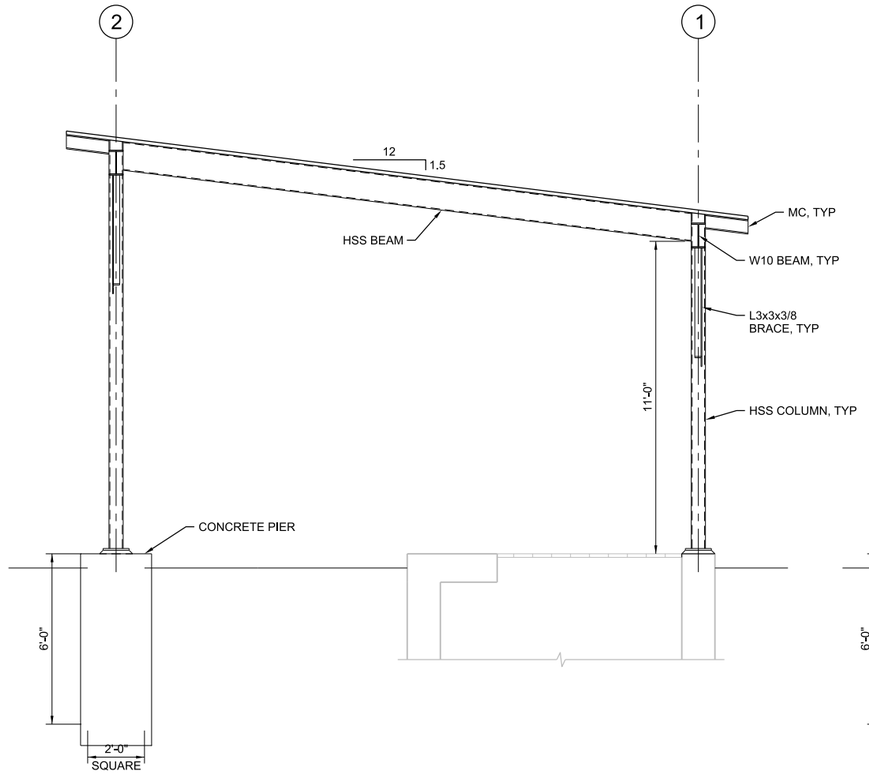
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

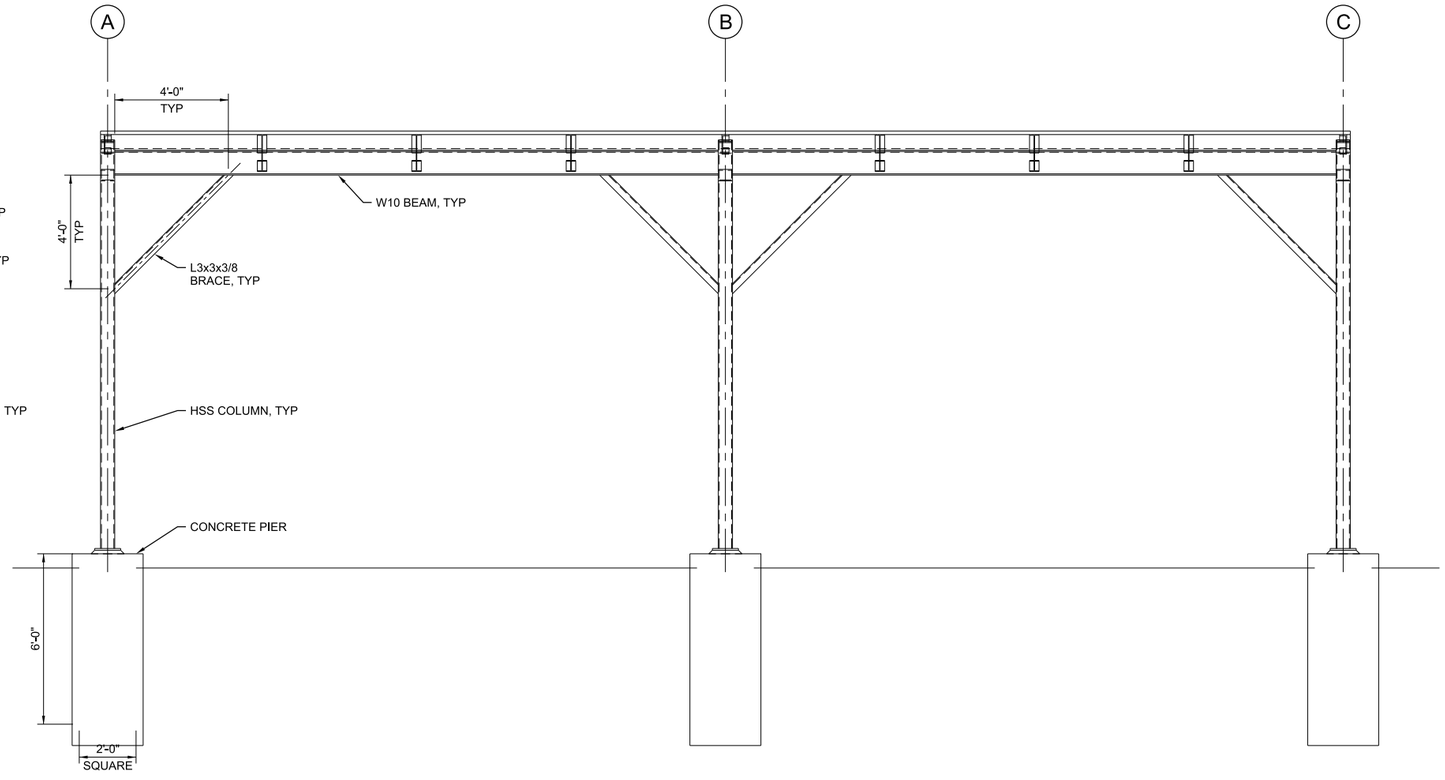
EFFLUENT PUMP STATION/UV DISINFECTION
STRUCTURAL
UV EQUIPMENT CANOPY
FOUNDATION & ROOF FRAMING PLANS

Appendix A
Sheet 27

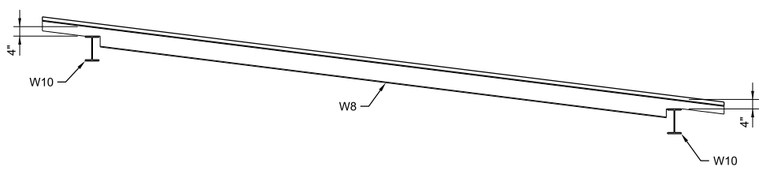
FILENAME: 55-S-130_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 3:06:16 PM



A SECTION
3/8"=1'-0"
55-S-130



C SECTION
3/8"=1'-0"
55-S-130



B SECTION
3/8"=1'-0"
55-S-130

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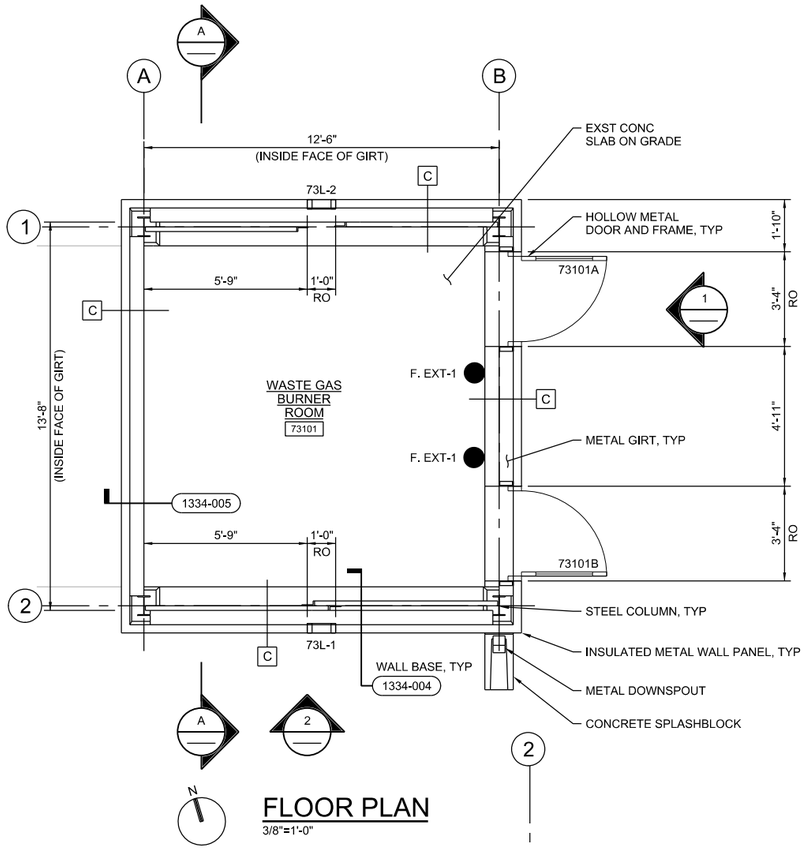
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

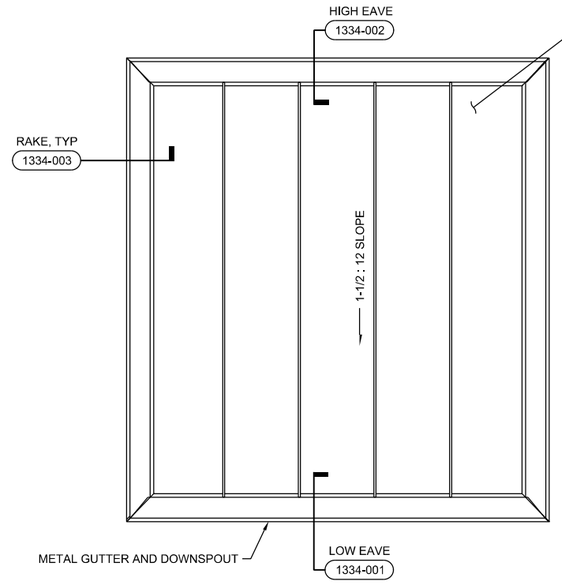
EFFLUENT PUMP STATION/UV DISINFECTION
STRUCTURAL
UV EQUIPMENT CANOPY
SECTIONS

Appendix A
Sheet 28

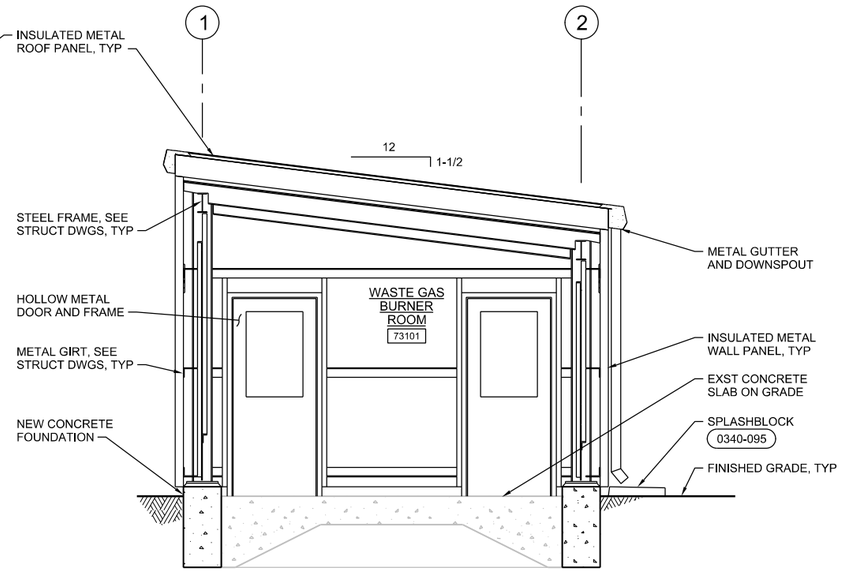
FILENAME: 55-S-301_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 3:05:40 PM



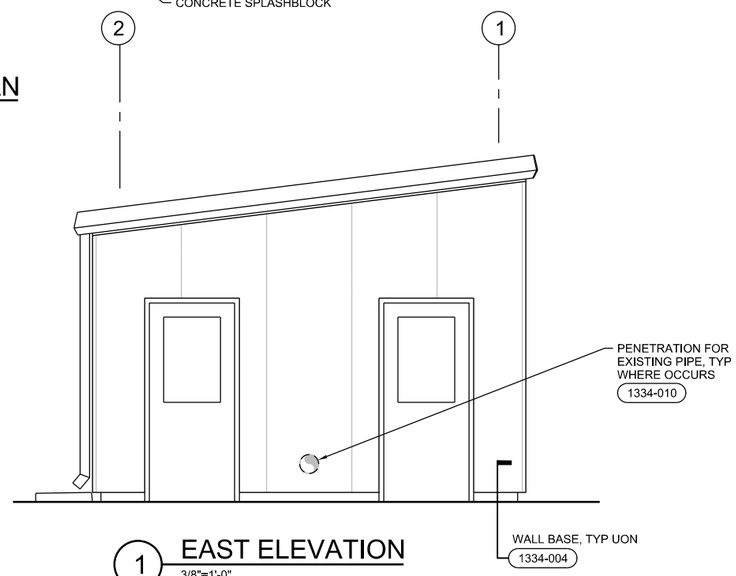
FLOOR PLAN
3/8"=1'-0"



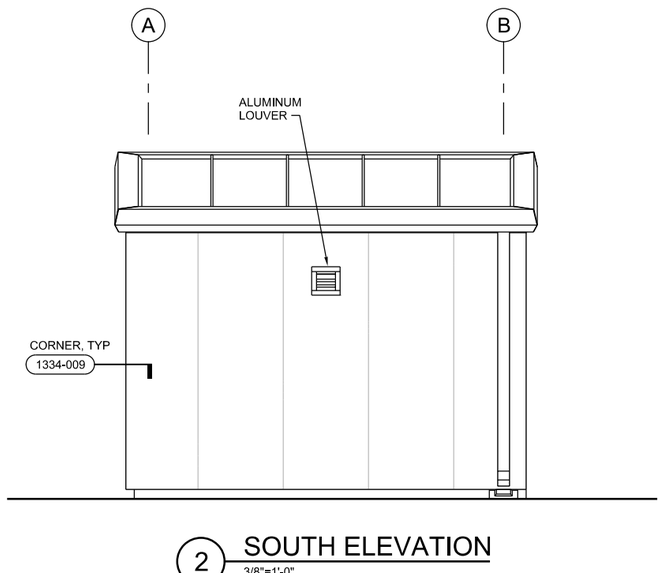
ROOF PLAN
3/8"=1'-0"



A SECTION
3/8"=1'-0"



1 EAST ELEVATION
3/8"=1'-0"



2 SOUTH ELEVATION
3/8"=1'-0"

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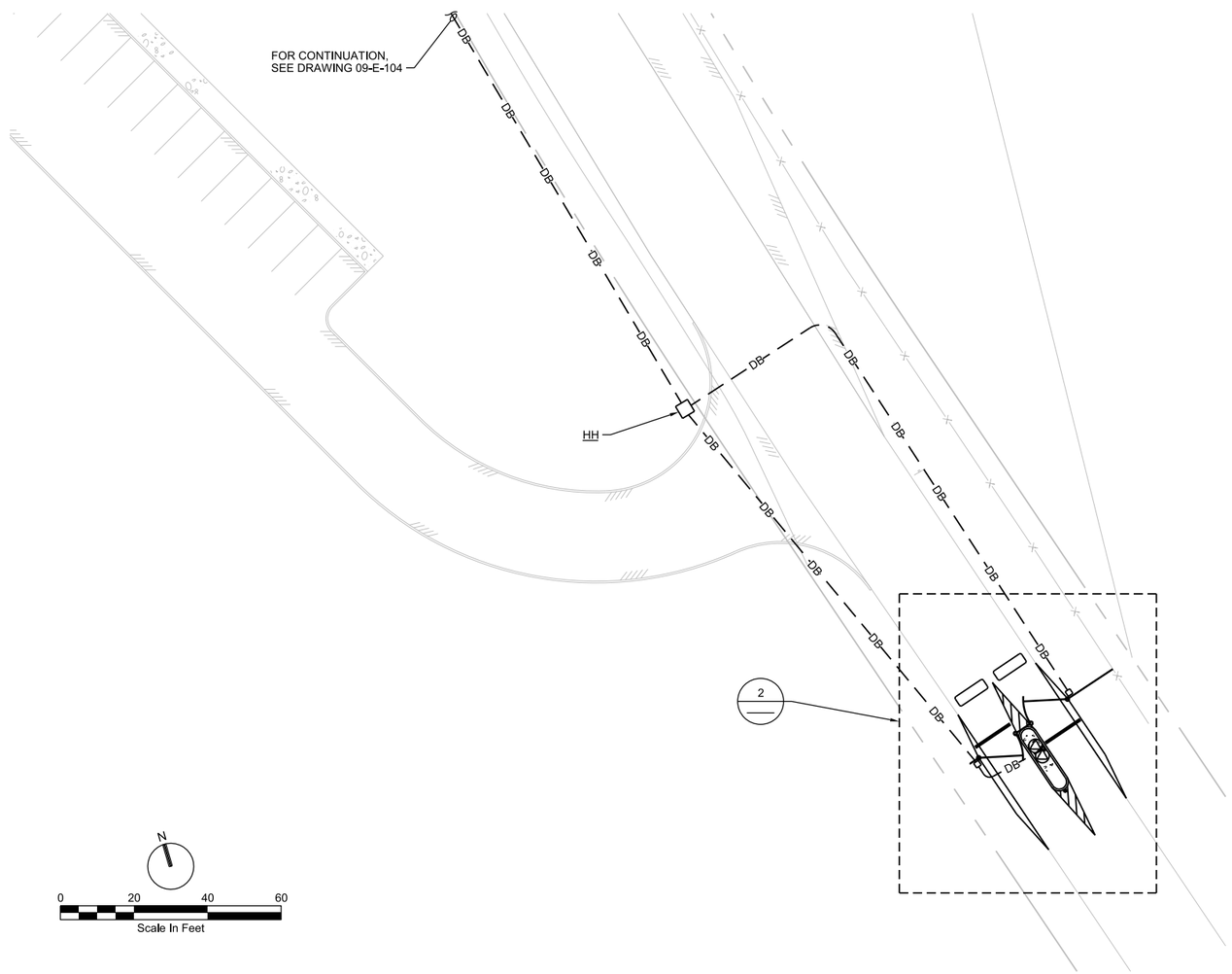
PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

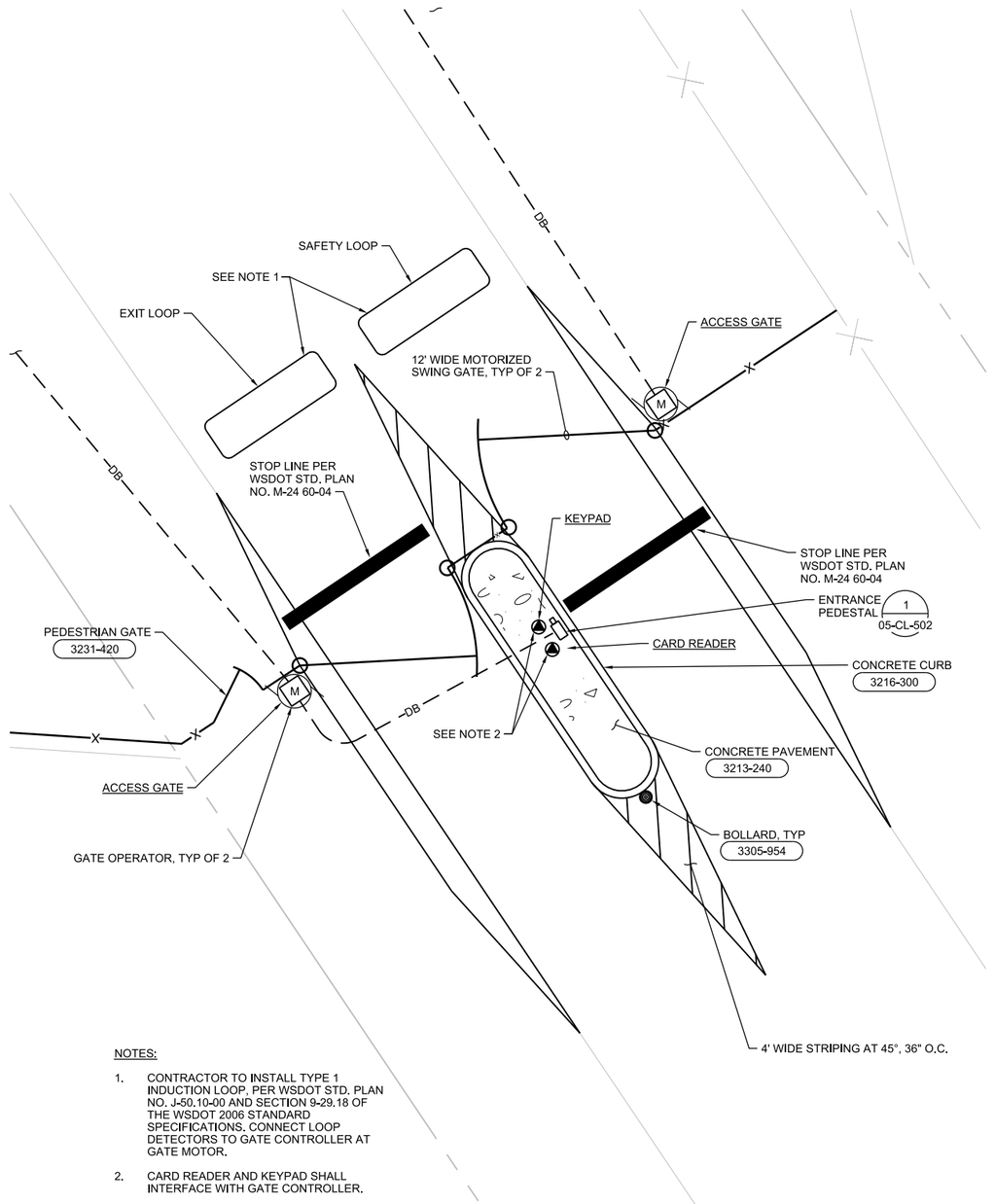
WASTE GAS BURNER BUILDING
ARCHITECTURAL
FLOOR PLAN, ROOF PLAN
ELEVATIONS AND SECTION

Appendix A
Sheet 29

FILENAME: 73-A-130_708335.dgn PLOT DATE: 2019\06\03 PLOT TIME: 2:44:27 PM



1 ENLARGED PLAN
1"=20'
05-CL-100



NOTES:

1. CONTRACTOR TO INSTALL TYPE 1 INDUCTION LOOP, PER WSDOT STD. PLAN NO. J-50.10-00 AND SECTION 9-29.18 OF THE WSDOT 2006 STANDARD SPECIFICATIONS. CONNECT LOOP DETECTORS TO GATE CONTROLLER AT GATE MOTOR.
2. CARD READER AND KEYPAD SHALL INTERFACE WITH GATE CONTROLLER.

2 MOTORIZED SWING GATE
1"=5'
05-CL-100

N

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25574
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DR	S REDDELL
CHK	D PETERSON
APVD	B HERMAN

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PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING
FACILITIES IMPROVEMENTS

SITE DEVELOPMENT

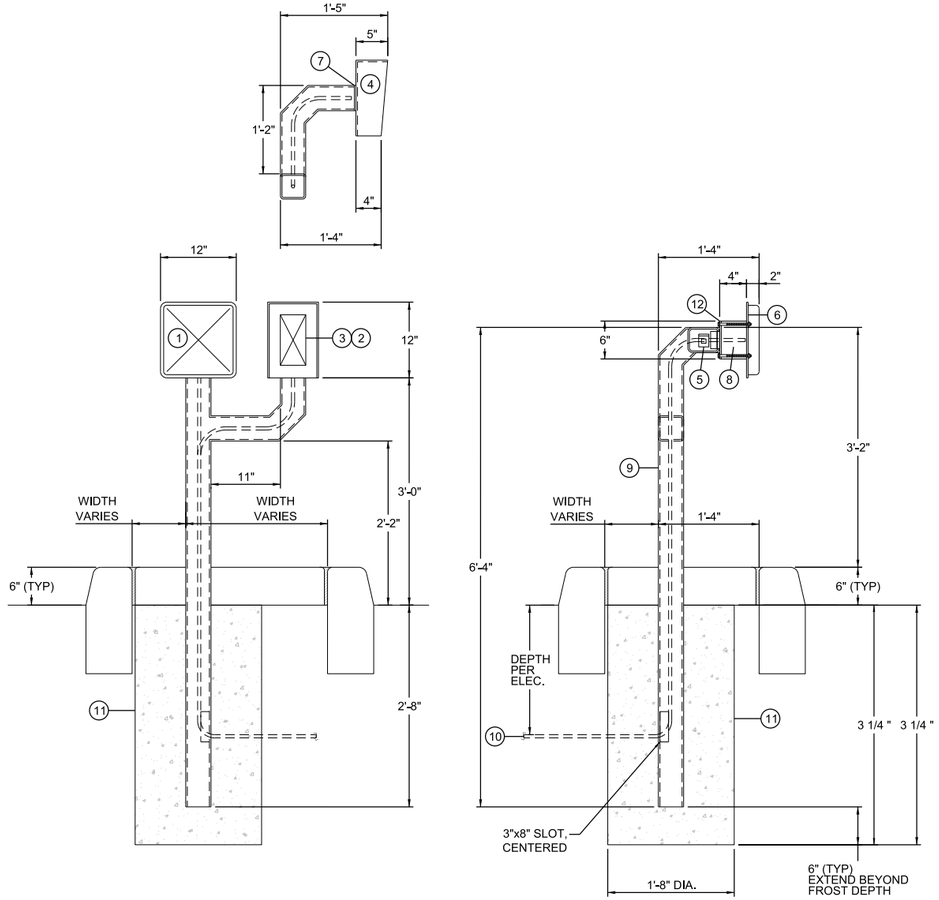
CIVIL DETAILS

Appendix A
Sheet 30

FILENAME: 05-CL-501_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 1:58:51 PM

KEYED NOTES:

1. LONG RANGE CARD READER
2. INTERCOM SIGN
3. CAR INTERCOM
4. 3/16" STL PLATE FRAME, CONT. WELD AND WELD FRAME TO CLOSURE PLATE. PROVIDE 1 1/2" DIA. OPENING FOR CONDUIT/WIRING
5. ATTACH KNOX BOX TO PEDESTAL WITH 3/8" GRADE 5 OR GRADE 8 FASTENERS. ALLOW ROOM FOR REQUIRED CONDUIT/WIRING.
6. 12"x12"x 3/16" BLACK ACRYLIC PROVIDE 1 1/2" DIA. OPENING FOR CONDUIT/WIRING
7. 3/16" STL CLOSURE PLATE, CONT. WELD, GROUND FLUSH. PROVIDE 1 1/2" DIA. OPENING FOR CONDUIT/WIRING
8. 6"x6"x 4" BLACK ACRYLIC SPACER w/4 BLACK NYLON THRU BOLTS
9. TUBULAR STEEL 4"x4"x3/16" (TYP)
10. ELECTRICAL CONDUIT, SEE 1 / 05-CL-501
11. SEE STRUCTURAL GENERAL NOTES FOR CONCRETE REQUIREMENTS.
12. 6"x6"x 3/16" CLOSURE PLATE CENTERED ON TS WITH 1 1/2" DIA. OPENING FOR CONDUIT/WIRING. DRILL 4 HOLES FOR NYLON THROUGH BOLTS. VERIFY SIZE WITH CONTRACTOR



1 ENTRANCE PEDESTAL
NTS
05-CL-501

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APVD	B HERMAN

NO.	DATE	REVISION	BY	APVD

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

JACOBS

PHASE 5B PROJECT: PACKAGE 1
SALMON CREEK TREATMENT PLANT
ODOR CONTROL AND EXISTING FACILITIES IMPROVEMENTS

SITE DEVELOPMENT
CIVIL DETAILS

Appendix A
Sheet 31

FILENAME: 05-CL-502_708335.dgn PLOT DATE: 6/5/2019 PLOT TIME: 1:20:04 PM

Appendix B
SEPA Documentation
Phase 5B Project - Salmon Creek Treatment Plant Improvements (Revised)

File: Phase 5B Project—Salmon Creek Treatment Plant Improvements
DNS 001-2017

Date Published: December 1, 2017

NOTICE OF DETERMINATION OF NON-SIGNIFICANCE (DNS)

PROJECT:
Phase 5B Project: Salmon Creek Treatment Plant Improvements
#2015-Alliance-01

Please find enclosed an environmental Determination of Non-Significance (DNS) issued pursuant to State Environmental Policy Act (SEPA) Rules (Chapter 197-11, Washington Administrative Code), and Discovery Clean Water Alliance Resolution No. 2013–10. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency, Discovery Clean Water Alliance, as required by WAC 197-11-330(1)(a)(i).

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received. Comments must be submitted by December 15, 2017.

Please address all correspondence to: **Discovery Clean Water Alliance**
c/o Clark Regional Wastewater District
Administrative Lead
PO Box 8979
Vancouver, WA 98668-8979
Attn: John M. Peterson, PE

DISTRIBUTION LIST

FEDERAL AGENCIES

- National Marine Fisheries Service
- US Environmental Protection Agency
- US Fish and Wildlife Service – Ridgefield Refuge
- US Fish and Wildlife Service – Lacey WA Office

NATIVE AMERICAN INTERESTS

- Chinook Indian Nation
- Confederated Tribes and Bands of the Yakama Nation
- Confederated Tribes of the Grand Ronde
- Confederated Tribes of the Siletz Reservation
- Cowlitz Indian Tribe

STATE AGENCIES

- Department of Archaeology and Historic Preservation
- Department of Commerce
- Department of Community Development
- Department of Ecology – SEPA Review Section
- Department of Fish and Wildlife
- Department of Health
- Department of Natural Resources – SEPA Center
- Department of Transportation

REGIONAL AGENCIES

- Camas Public Library
- Fort Vancouver Regional Library
- Fort Vancouver Regional Library – Battle Ground Branch
- Fort Vancouver Regional Library – Three Creeks Branch
- Fort Vancouver Regional Library – Woodland Branch
- Southwest Clean Air Agency
- Southwest Washington Health District
- Southwest Washington Regional Transportation Council

LOCAL AGENCIES

Cities

- City of Battle Ground
- City of Camas
- City of La Center
- City of Ridgefield
- City of Vancouver – Administration
- City of Vancouver – Community & Economic Development
- City of Vancouver – Public Works
- City of Washougal
- City of Woodland

Counties

- Clark County – Board of County Councilors
- Clark County – Central Files
- Clark County – Community Planning (Economic Development)
- Clark County – Public Health
- Clark County Community Development – Building Division
- Clark County Prosecuting Attorney's Office
- Clark County Public Works – Administration
- Clark County Public Works – Clean Water
- Clark County Sheriff's Office
- Cowlitz County Health & Human Services

Non-Governmental Agencies

- Building Industry Association
- Clark County Association of Realtors
- Clark County Natural Resources Council
- Columbia River Economic Council
- Columbia Riverkeeper
- Friends of Clark County
- Futurewise
- Greater Vancouver Chamber of Commerce
- Lower Columbia Fish Recovery Board
- Partners in Careers
- Salmon Creek Watershed Council
- Sierra Club – Loo Wit
- Trout Unlimited
- Vancouver Audubon Society
- Vancouver Housing Authority

SPECIAL PURPOSE AGENCIES/DISTRICTS

- Battle Ground School District
- Camas School District
- Evergreen School District
- Hockinson School District
- C-Tran
- Clark Conservation District
- Clark County Fire District No. 5
- Clark County Fire District No. 6
- Clark County Fire District No. 9
- Clark Public Utilities – Electrical
- Clark Public Utilities – Water
- Clark Regional Wastewater District
- CREDC
- CRESA
- Port of Camas-Washougal
- Port of Ridgefield
- Port of Vancouver
- Port of Woodland
- Vancouver School District
- Vancouver-Clark Parks & Recreation

INTEREST GROUPS

Homeowners Associations

- Neighborhood Associations Council of Clark County
- Andresen/St Johns Neighborhood Assoc.
- East Fork Frontier Neighborhood Assoc.

- East Fork Hills Rural Assoc.
- East Minnehaha Neighborhood Assoc.
- Enterprise/Paradise Point Neighborhood Assoc.
- Fairground Neighborhood Assoc.
- Felida Neighborhood Assoc.
- Greater Brush Prairie Neighborhood Assoc.
- Green Meadows Neighborhood Assoc.
- Heritage Neighborhood Assoc.
- Meadow Glade Neighborhood Assoc.
- NE Hazel Dell Neighborhood Assoc.
- North Salmon Creek Neighborhood Assoc.
- Pleasant Highlands Neighborhood Assoc.
- Ridgefield Junction Neighborhood Assoc.
- Roads End Neighborhood Assoc.
- Sherwood Hills Neighborhood Assoc.
- Sifton Neighborhood Assoc.
- Sunnyside Neighborhood Assoc.
- Truman Neighborhood Assoc.
- Washougal River Neighborhood Assoc.
- West Hazel Dell Neighborhood Assoc.

Media

- Camas Washougal Post-Record
- The Columbian
- The Reflector

WAC 197-11-970

NOTICE OF DETERMINATION OF NONSIGNIFICANCE (DNS)

NOTICE IS HEREBY GIVEN that the following proposal had been determined to have no probable significant adverse impacts on the environment, and that an environmental impact statement is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. The DNS is available online at: https://www.discoverycwa.org/SCTP_Imprvmts_Project.html. Written comments on the following DNS may be submitted to the Responsible Official by December 15, 2017.

LOCATION OF PROPOSAL: Salmon Creek Treatment Plant, 15100 Northwest McCann Road, Vancouver, Washington 98685 (Clark County).

DESCRIPTION: The Phase 5B Project – Salmon Creek Treatment Plant Improvements addresses facility wastewater loading and treatment capacity with an updated process analysis using current data and design guidance, and updated hydraulic analysis for projected flows. Also, the project includes minor facility improvements unrelated to treatment capacity analysis. Specifically, the project includes:

1. Re-rating the capacity of the Salmon Creek Treatment Plant to accommodate an incremental BOD_5/TSS capacity increase and a corresponding inflow increase from 14.95 to 17.00 million gallons per day (mgd).
2. New liquid chlorine system to improve settleability during sludge bulking events and improve the associated performance of the secondary clarifiers, and to control filamentous organisms in the activated sludge system.
3. Odor control improvements at the preliminary treatment and primary treatment facilities.
4. Digested biosolids dewatering improvements at the anaerobic digester tanks.

Re-Rating Process. The Washington Department of Ecology requires that Salmon Creek Treatment Plant (SCTP) capacity improvements for each planned expansion begin once influent flows reach 85% of the rated capacity identified in the National Pollutant Discharge Elimination System (NPDES) permit's facility loading design criteria for flow, biochemical oxygen demand (BOD) load, or total suspended solids (TSS) load). The 2013 SCTP Facilities Plan Amendment conservatively rated plant influent capacity as 14.95 mgd average day maximum month (ADMM) and 28.3 mgd peak hour effluent flow. Analysis of plant data from January 2011 to June 2017 determined that existing unit processes at the SCTP can treat up to 17 mgd ADMM and 32.2 mgd peak hour influent flow without any physical modifications, and without affecting the plant's ability to reliably and consistently comply with wastewater permit terms and conditions. However, an interim operational adjustment at the existing effluent pump station will be required to incrementally increase hydraulic capacity from a firm rating of 28.3 to 29.6 mgd. The SCTP's effluent system normally operates with flow conveyed by gravity to the Columbia River, but under conditions when the river level and/or effluent flow is high, effluent pumping is required to convey effluent flows. Therefore, the project will achieve this increase by over-speeding existing pumps at 108 percent to meet the projected peak hour flows. Over-speeding the pumps increases the pump horsepower demand and speed required to convey the additional flow, increases wear on mechanical parts, and slightly reduces efficiency. However, 108 percent over-speeding falls within the range of the motor service factor and will not overload the existing pump motors during the rare and relatively short peak hour operating condition.

Plant capacity re-rating to 17 mgd ADMM will not involve physical modifications to the SCTP's liquids and solids treatment process, and phased physical plant capacity improvements can be deferred. Re-rating the facility will not impact the operation and maintenance of the plant, require additional process controls or monitoring, or require any additional levels of operator certification or staffing. The Washington Department of Ecology must reissue the SCTP's NPDES Permit No. WA0023639 to permit the increase in effluent flows. Process re-rating has independent utility in that no other planned plant improvements or modifications are interdependent on re-rating the plant's capacity.

Return Activated Sludge Chlorination System. The project will install a new liquid sodium hypochlorite system. The return activated sludge (RAS) chlorination equipment will reduce the risk of losing sludge inventory from high or overflowing sludge blanket levels in the secondary clarifiers. The liquid sodium hypochlorite system and appurtenances, which include chemical storage and containment, will dilute the hypochlorite and measure flow, minimizing the need for additional infrastructure and operator involvement during filamentous process upsets. Hypochlorite has a limited shelf life and is readily available. On site storage will be minimal because the liquid will be ordered and delivered when needed. To accommodate the RAS

chlorination system, the RAS injection point within the RAS/WAS Pump Station will be relocated downstream of all four secondary clarifiers, and an injection quill for improved introduction of chlorine solution will be added.

Odor Control Improvements. Based on updated air dispersion model results, additional odor control measures are needed to satisfy the 0.9 milligram per cubic meter (mg/m^3) requirement for toxic air pollution control at the SCTP, and achieve odor and hydrogen sulfide (H_2S) target thresholds for existing and new sensitive receptors outside the SCTP boundary. Therefore, odor control improvements will be implemented to reduce discharges of materials and odors to the atmosphere. The grating over the existing preliminary treatment facility (headworks) will be replaced with checkered plate, and the existing primary treatment facility (primary clarifiers) will be covered and fitted with air intake louvers. The preliminary treatment facility and primary clarifiers will be ventilated to a vapor phase biotrickling filter odor control system installed adjacent to the primary clarifiers. The odor control system will consist of two filter vessels, duty and standby fan enclosures, and piping occupying a 1,300-square-foot concrete foundation pad. Prior to constructing the foundation, existing utility piping under the biotrickling filter system site will be relocated to avoid conflicts. Also, the existing stairs will be replaced. The new odor control biotrickling filter will run continually, and require daily operations monitoring like that performed at the existing biofilter that treats air off the headspace of the existing sludge blend tank. The instrumentation and equipment associated with the new biotrickling filter will be similar to other instrumentation and equipment on site. Operations and maintenance staff can accommodate the operations and maintenance within the existing staffing framework. The existing carbon system at the SCTP, located immediately east of the existing PE/RAS Mixing Box, is no longer needed for plant operations and will be removed from the plant site.

Digested Biosolids Dewatering Improvements. The project will optimize the biosolids dewatering process to improve dewatered cake concentration and overall dewatering performance without replacing the existing equipment. Improved dewatering and thickening will be performed by conditioning the sludge prior to thickening to flocculate the biomass. The process will remove bound water through the injection of pressurized air. Air diffused into the sludge aids flocculation, which yields denser floc and facilitates the dewatering process. This pretreatment process can increase the dewatered cake solids concentration from anaerobically digested biosolids by 3 to 5 percent. Other benefits of the process are 20 to 30 percent lower polymer consumption and extremely clear filtrate. The aeration equipment will have a footprint of only 4 feet by 6 feet.

PROPONENT: Discovery Clean Water Alliance, 8000 NE 52nd Court, PO Box 8979, Vancouver, WA 98668-8979.

☐ There is no comment period for this DNS.
☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.
■ This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by December 15, 2017.

Lead agency: Discovery Clean Water Alliance

Responsible official: John M. Peterson, PE, General Manager Clark Regional Wastewater District, Administrative Lead for the Discovery Clean Water Alliance

Address: 8000 NE 52nd Court, P.O. Box 8979, Vancouver, WA 98668-8979

Phone: 360-993-8819

Date: December 1, 2017 Signature: _____

■ You may appeal this determination to Shane Bowman, Chair of the Alliance Board of Directors
at 8000 NE 52nd Court, P.O. Box 8979, Vancouver, WA 98668
no later than January 5, 2018
by U.S. mail

You should be prepared to make specific factual objections based on how you or your property is adversely affected by the proposal, any new facts that would be important to and affect the determination, and the reasons why the determination was incorrect. The notice of appeal shall be accompanied by a filing fee of $50.00. Consult Discovery Clean Water Alliance Resolution No. 2013–10 for the procedures for SEPA appeals.

☐ There is no agency appeal.

SEPA ENVIRONMENTAL CHECKLIST

A. Background

1. Name of proposed project, if applicable:

   Phase 5B Project—Salmon Creek Treatment Plant Improvements

2. Name of applicant:

   Discovery Clean Water Alliance

3. Address and phone number of applicant and contact person:

   8000 NE 52nd Court, P.O. Box 8979, Vancouver, Washington 98668 (360-993-8819);
   Attn: R. Brady Fuller, PE, Project Lead for Discovery Clean Water Alliance

4. Date checklist prepared:

   November 22, 2017

5. Agency requesting checklist:

   Discovery Clean Water Alliance (Alliance)

6. Proposed timing or schedule (including phasing, if applicable):

   2018-2020

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

   No

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

   BergerABAM. 2015. Wetland and Stream Delineation and Assessment, Columbia River Outfall and Effluent Pipeline Project. BergerABAM, Vancouver, Washington.

   CH2M HILL. 1995. Salmon Creek Wastewater Treatment Plant Expansion Program Final Environmental Impact Statement. CH2M HILL, Portland, Oregon. October.

   CH2M HILL. 2004. Salmon Creek Wastewater Management System Wastewater Facilities Plan/General Sewer Plan. CH2M HILL, Portland, Oregon. July.

   CH2M HILL. 2009. Salmon Creek Wastewater Treatment Plant Rerating Study. CH2M HILL, Portland, Oregon. January.

   CH2M HILL. 2013. Salmon Creek Wastewater Management System Wastewater Facilities Plan/General Sewer Plan Amendment. CH2M HILL, Portland, Oregon. August.

CH2M HILL. 2017. Engineering Report for the Phase 5B Project—Salmon Creek Treatment Plant Improvements, Phase 5 Expansion Program. CH2M HILL, Portland, Oregon. October.

Demith, Alex. 2017. Salmon Creek Treatment Plant Phase 4 Odor Control Update. Technical Memorandum. CH2M HILL, Boise, Idaho. July 28, 2017.

Hotze, Karla and Eva Hulse. 2016. Cultural Resource Survey for the Columbia River Outfall and Effluent Pipeline Project, Clark County, Washington. Archaeological Investigations Northwest, Inc., Portland, Oregon. Report No. 3785.

Thatcher, Erin and Brady Fuller. 2017. Water Quality and Tier II Antidegradation Evaluation. Technical Memorandum. CH2M HILL, Bellevue, Washington. August 11, 2017.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No

10. List any government approvals or permits that will be needed for your proposal, if known.

Review and approval of Engineering Report per WAC 173-240-060 (Department of Ecology)

NPDES Permit No. WA0023639 (Department of Ecology)

Minor Source Air Discharge Permit (Southwest Clean Air Agency)

Shoreline Management Act Shoreline Conditional Use Permit (Clark County; including Fire Marshall)

Building Permit (Clark County; including Fire Marshall)

Grading and Drainage Permit (Clark County)

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The Phase 5B Project – the Salmon Creek Treatment Plant Improvements addresses facility wastewater loading and treatment capacity with an updated process analysis using current data and design guidance, and updated hydraulic analysis for projected flows. Also, the project includes minor facility improvements unrelated to treatment capacity analysis. Specifically, the project includes:

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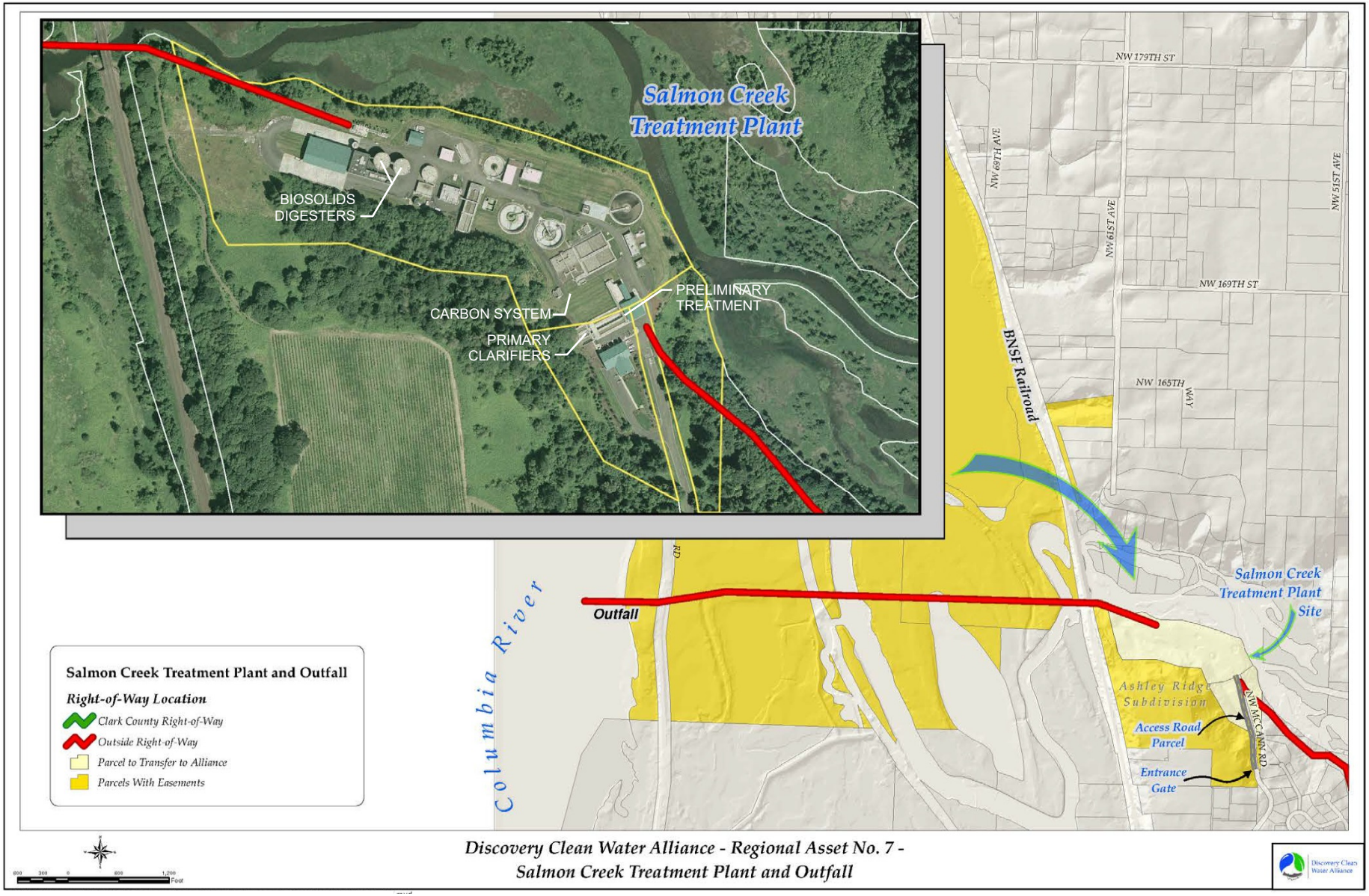
12. Location of the proposal.

Salmon Creek Treatment Plant, 15100 Northwest McCann Road, Vancouver, Washington 98685 (Clark County). Township 3N, Range 1E, Section 19 NE ¼ and NW ¼. Property ID: 183515-000 and 183508-000. See also the site plan, vicinity map, topographic map, and Salmon Creek Treatment Plant Improvements plan.



SITE PLAN

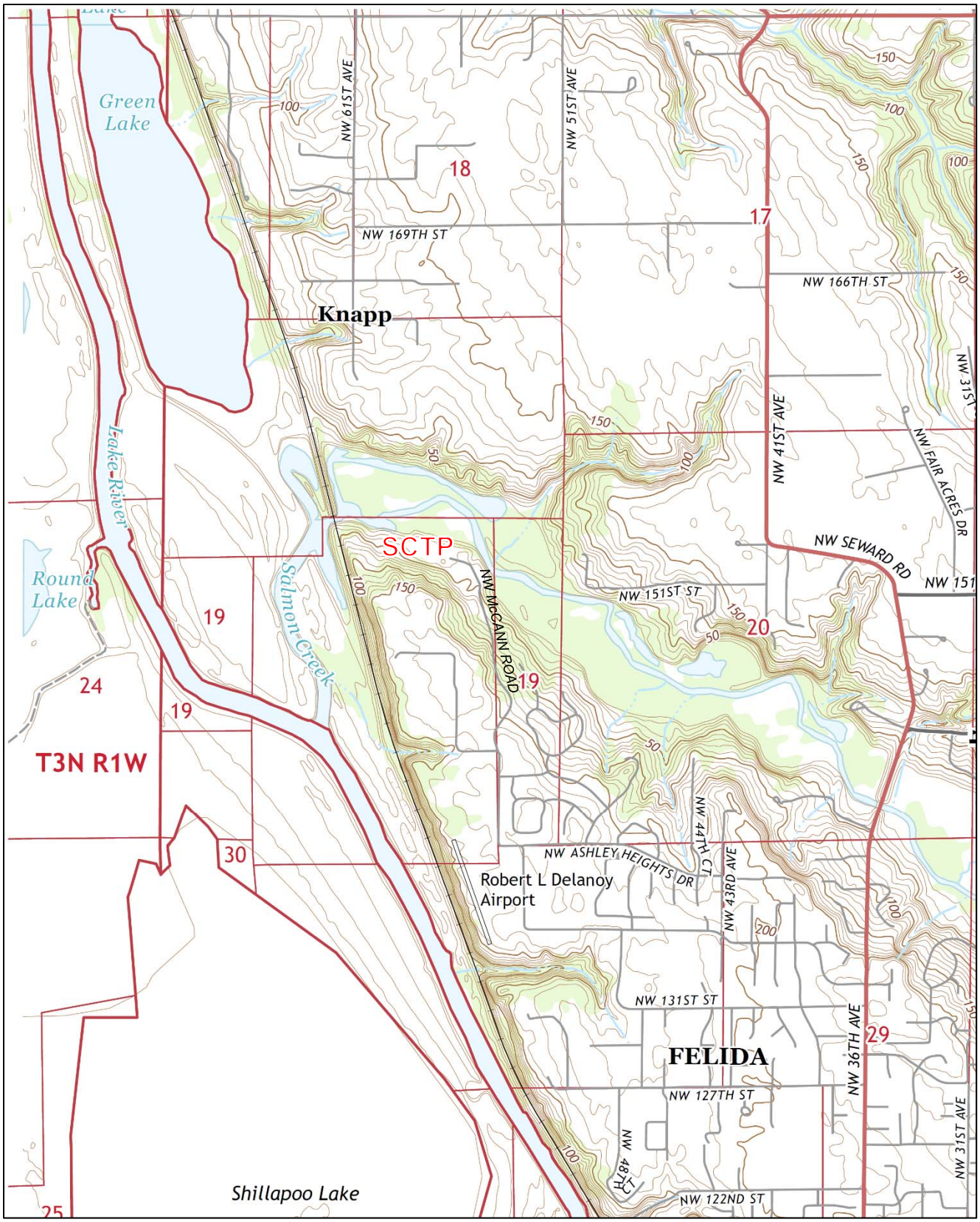
Phase 5B Project–

Salmon Creek Treatment Plant Improvements

VICINITY MAP

Phase 5B Project–

Salmon Creek Treatment Plant Improvements

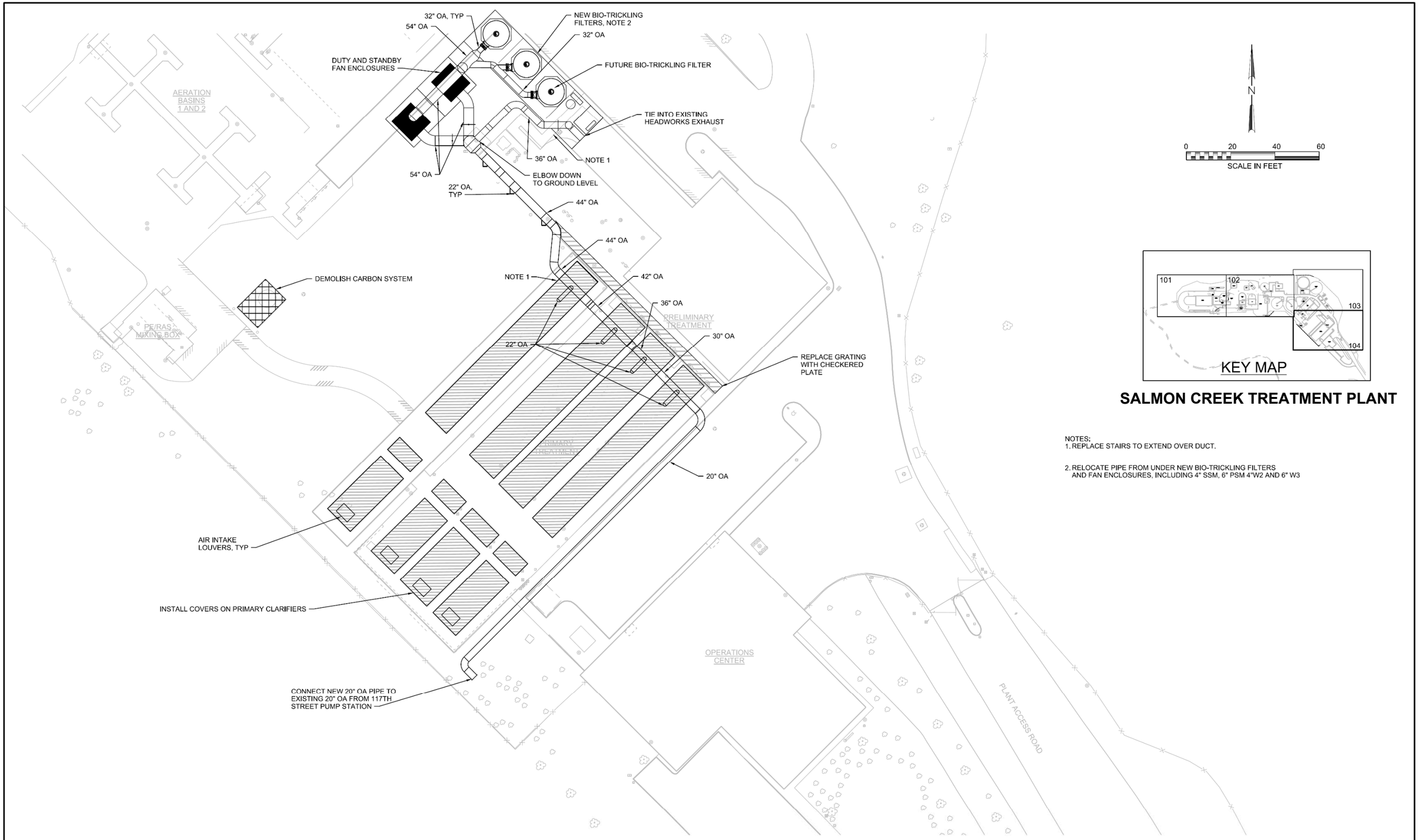


TOPOGRAPHIC MAP

Source: USGS (2014) Vancouver, WA-OR 7.5' quadrangle map

Phase 5B Project–

Salmon Creek Treatment Plant Improvements



SALMON CREEK TREATMENT PLANT

NOTES:
1. REPLACE STAIRS TO EXTEND OVER DUCT.

2. RELOCATE PIPE FROM UNDER NEW BIO-TRICKLING FILTERS AND FAN ENCLOSURES, INCLUDING 4" SSM, 6" PSM 4"W2 AND 6" W3

SALMON CREEK TREATMENT PLANT IMPROVEMENTS PLAN

Phase 5B Project–

Salmon Creek Treatment Plant Improvements

688766

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:
(circle one): Flat, rolling, hilly, steep slopes, mountainous, other terrace on lower hillside slope

b. What is the steepest slope on the site (approximate percent slope)?

Approximately 20 percent within the developed site, and about 33 percent outside the developed site.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Hillsboro silt loam. No agricultural land is present.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No. The site is not designated as Landslide Hazard Area or Severe Erosion Hazard.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

Filling, excavation, and grading will be minimal and limited to construction of the concrete foundation pad for the 1,300-square-foot biotrickling filter odor control system and replacement of the existing stairs. Prior to constructing the foundation, existing utility piping under the biotrickling filter system site will be relocated to avoid conflicts. The carbon system removal area will be about 230 square feet.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The existing ground surface is paved or managed turf grass. Potential erosion during construction will be minor because the disturbance area will be only 1,300 square feet, the work site is nearly level and previously developed, and the SCTP site is completely contained.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The RAS Chlorination System will be skid mounted and located indoors, so no new impervious surfaces will be constructed. The odor control covers will be placed on the existing preliminary treatment facility and primary clarifiers, so no new impervious surfaces will be constructed. The 0.03-acre biotrickling filter odor control system will be about 0.1 percent of the 27.37-acre SCTP site, and installed on existing surfaces that are effectively impervious.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Trucks and equipment will use existing paved surfaces for access. Site stormwater is completely contained. Sediment controls will include inlet filters, biobags, straw wattles, or similar devices, as needed. Pollution controls are available on site in the event of an accidental spill.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

SCTP operates under Air Discharge Permit 07-2726 issued by the Southwest Clean Air Agency (SWCAA). The SCTP is a secondary treatment plant comprised of common unit processes that, in addition to treating wastewater, generates odors as a byproduct of the physical and biological treatment processes. The odors are primarily hydrogen sulfide (H_2S) and smaller amounts of other organic reduced sulfur compounds (methyl mercaptans, dimethyl disulfide, etc.), all traditionally associated with secondary treatment plants.

These odors can drift across plant property lines and affect nearby residents. By re-rating the SCTP capacity, the plant will be able treat about 14 percent more influent flow. Therefore, it is reasonable to estimate that the SCTP will generate about 14 percent more biogas under re-rating.

A major project purpose is to control odor and H_2S pollution within the SCTP site, and at existing and new sensitive receptors outside the SCTP boundary, during plant operations and maintenance. The proposed odor control system will reduce air emissions from the plant such that H_2S emissions will not exceed a 24-hour average of 0.9 $\mu g/m^3$ at the plant boundary. Furthermore, nuisance odors at receptors will be controlled within SWCAA nuisance odor requirements. The bio-trickling filter system will be nearly 79 percent efficient and may provide as much as 94 percent odor removal at the most sensitive receptor.

There are National Ambient Air Quality Standards (NAAQS) for six common air pollutants: particulate matter (also called $PM_{2.5}$ and PM_{10}, or particle pollution), ground-level ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen oxides (NO_2), and lead (Pb). The Clark County airshed, as all of Washington, does not have any areas designated as nonattainment for exceeding pollution limits of NAAQS (Ecology 2016).

A minor amount of dust may be produced during the construction period. Construction equipment will produce emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and PM_{10} (dust) during construction, but these amounts will be minor and temporary.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Air emissions during construction will be within regulatory limits.

A major project purpose is to control odor and H_2S pollution within the SCTP site, and at existing and new sensitive receptors outside the SCTP boundary.

3. **Water**

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The SCTP lies along Salmon Creek at river mile 00.60. Salmon Creek is a Type S water (i.e., shoreline of the state). It is perennial and classified on the National Wetlands Inventory as R2UBH (riverine, lower perennial, unconsolidated bottom, permanently flooded), with associated PEM1C (palustrine, emergent, persistent, seasonally flooded) wetlands.

The Clark County Property Information identifies PEMT, PSSC, and R1UBV wetlands within the tax lot.

The wetland delineation performed by BergerABAM (2015) determined that no wetlands occur along Salmon Creek above the ordinary high water elevation, which is 16.4 feet (NAVD88).

The SCTP's effluent pipeline discharges treated wastewater to the Columbia River.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No work will occur over or in waters. However, covering of the preliminary treatment facility and primary clarifiers, and installation of the biotrickling filters, will occur within 200 feet of Salmon Creek wetlands.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill and dredge material will be placed in or removed from surface water or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No, the project will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No, the project will not lie within a 100-year floodplain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The SCTP discharges treated wastewater to the Columbia River. Under re-rating, treated effluent from the plant will continue to discharge into the Columbia River. This treated effluent is a permitted discharge under NPDES Permit No. WA0023639, and meets all State of Washington regulatory requirements for water quality. Re-rating allows the existing facility to be operated at a higher influent capacity (i.e., 17 mgd ADMM versus 14.95 mgd ADMM flow) without physical changes to the plant. The existing unit processes at the SCTP will treat about 14 percent more inflow without affecting the ability of the SCTP to reliably and consistently comply with reissued wastewater permit terms and conditions. CH2M prepared a *Water Quality and Tier II Antidegradation Evaluation Technical Memorandum* (August 11, 2017) for the Phase 5B Project–Salmon Creek Treatment Plant Improvements with regard to water quality in the Columbia River and Washington water quality standards (Washington Administrative Code [WAC] 173-201A). The evaluation found that the project is not expected to cause or contribute to a violation of acute and chronic toxicity criteria because the projected Phase 5B Project–Salmon Creek Treatment Plant Improvements discharge is not expected to result in an increase in pollutant concentrations. Furthermore, the Technical Memorandum's antidegradation analysis found that the discharge will not cause a measurable change in the river water quality.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The potable water supply to SCTP is derived from an on site well. Therefore, the project will withdraw groundwater from a well. However, the quantity of applied water will be minor. Groundwater may be applied during construction for dust mitigation, washing, or mixing small amounts of cement or grout. However, the amount will depend on site conditions and weather.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged into the ground. Onsite portable toilets will be used during construction activities. No septic systems will be installed.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The RAS chlorination system will be inside an existing building, so no runoff will be generated. Runoff from the preliminary treatment facility and primary clarifiers, and biotrickling filter odor control system, will be collected in the existing SCTP storm drain system. The SCTP storm drain system is approximately 24 acres and drains to Salmon Creek. The onsite drainage system is a combination of belowground pipeline systems fed by catch basins, open channels, and an erosion/sedimentation basin. Treatment is performed by vegetated ditches, grassy swale, and a detention/water quality pond. The SCTP's storm water pollution prevention plan (SWPPP) complies with stormwater NPDES permitting requirements for industrial sites, as required by the State of Washington. The SWPPP will be updated for the Phase 5B Project–Salmon Creek Treatment Plant Improvements to ensure protection of surface and ground waters and to conform to Clark County's Stormwater Control Ordinance.

2) Could waste materials enter ground or surface waters? If so, generally describe.

All materials stored at the SCTP will either be located indoors or have secondary containment (or both) to prevent entrance into ground or surface waters. Further, the SCTP maintains an industrial NPDES permit that requires a SWPPP to be in place. Therefore, waste materials will not enter ground or surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No, drainage patterns in the vicinity of the site will not be altered or affected.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

The existing SCTP storm drain system will manage stormwater runoff. Erosion and sediment control measures will be implemented at the biotrickling filter odor control system and carbon system removal sites, as necessary, during construction.

4. **Plants**

a. Check the types of vegetation found on the site:

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
X___grass
____pasture
____crop or grain
____orchards, vineyards or other permanent crops.
____wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Managed turf grass.

c. List threatened and endangered species known to be on or near the site.

No threatened or endangered plant species are known to be on or near the site (BergerABAM 2015).

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

The project will not involve pervious areas suitable for landscaping.

e. List all noxious weeds and invasive species known to be on or near the site.

No noxious weeds and invasive species are known to be on or near the site.

5. **Animals**

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

No birds or other animals have been observed or are known to occur at the proposed RAS chlorination system site, the preliminary treatment facility and primary clarifiers, or the proposed biotrickling filter odor control system site. Screening and netting have been installed at isolated areas within the plant to prevent nesting and roosting. The following species occur near the project site (CH2M HILL 1995; BergerABAM 2015):

Common Name	Scientific Name
American coot	*Fulica americana*
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
American wigeon	*Anas americana*
Belted kingfisher	*Ceryle alcyon*
Black-capped chickadee	*Parus atricapillus*
Brown creeper	*Certhis americana*
Canada goose	*Branta canadensis*
Chestnut-backed chickadee	*Parus rufescens*
Common raven	*Corvus corax*
Dark-eyed junco	*Junco hyemalis*
Double crested cormorants	*Phalacrocorax auritus*
Dusky Canada goose	*Branta canadensis occidentalis*
European starling	*Sturnus vulgaris*
Gadwalls	*Anas strepera*
Golden-crowned kinglet	*Regulus satrapa*
Great blue heron	*Ardea herodias*
Green-winged teal	*Anas crecca*
Gull	*Larus* sp.
MacGillavray' s warbler	*Oporornis tolmiei*
Mallards	*Anas platyrhynchos*
Mourning dove	*Zenaida macroura*
Northern flicker	*Colaptes auratus*
Rock dove	*Columba livia*
Sandhill crane	*Grus canadensis*
Scrub jay	*Aphelocoma coerulescens*
Tundra swan	*Cygnus columbianus*
White fronted goose	*Anser albifrons*
Wood duck	*Aix sponsa*
Beaver	*Castor canadensis*
Coyote	*Canis latrans*
Deer	*Odocoileus hemionus*
Muskrat	*Ondatra zibethica*

Coho salmon, steelhead, cutthroat trout, largemouth bass, and numerous non-game fish species are found in Salmon Creek.

b. List any threatened and endangered species known to be on or near the site.

No threatened and endangered species are known to occur at the project site. Animal species listed under the federal Endangered Species Act that may occur in the project vicinity, including the Columbia River, are (BergerABAM 2015):

Common Name	Scientific Name
Streaked horned lark	*Eremophila alpestris strigata*
Yellow-billed cuckoo	*Coccyzus americanus*
Bull trout	*Salvelinus confluentus*
Chinook salmon	*Oncorhynchus tshawytscha*
Chum salmon	*Oncorhynchus keta*
Coho salmon	*Oncorhynchus kisutch*
Sockeye salmon	*Oncorhynchus nerka*
Steelhead	*Oncorhynchus mykiss*
Pacific eulachon	*Thaleichthys pacificus*
North American green sturgeon	*Acipenser medirostris*

c. Is the site part of a migration route? If so, explain.

The SCTP falls within the Pacific Flyway, which is a general route for migratory birds. The project site is not on a terrestrial wildlife migration route, and the SCTP is fenced to exclude wildlife.

d. Proposed measures to preserve or enhance wildlife, if any:

The project does not propose measures to preserve or enhance wildlife because it will have virtually no adverse effects on wildlife. The primary clarifier covers will prevent birds from contacting the process liquids.

e. List any invasive animal species known to be on or near the site.

No invasive animal species are known to be on or near the project site.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

By re-rating the SCTP capacity, the plant will be able treat about 14 percent more influent flow. Therefore, it is reasonable to estimate that the SCTP will consume about 14 percent more electrical energy under re-rating.

The incremental increase in effluent flow from 28.3 to 29.6 mgd will be achieved by over-speeding existing electrical pumps at 108 percent to meet the projected peak hour flows. Over-speeding the pumps increases the pump horsepower demand and speed required to convey the additional flow and slightly reduces efficiency.

The RAS chlorination system and biotrickling filter odor control system will be electrically powered and create additional energy demands, but these will be small percentage increases over the energy use by SCTP operation.

The existing power supply and delivery systems at the SCTP can accommodate the additional electrical demand.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No, the project will not affect the potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

By overspeeding the existing effluent pumps, the SCTP will avoid a potential throw away pump investment that could become obsolete when the SCTP Phase 5A Project comes on line.

The RAS chlorination system and biotrickling filter odor control system are sized to meet the Phase 5 plant needs, but can be expanded to meet changed future needs.

7. **Environmental Health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

The SCTP is not known to be contaminated from present or past uses. Infrequent solid or liquid process overflows are contained and cleaned up to sanitary standards.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are no hazardous chemicals/conditions that might affect project development and design.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

The RAS chlorination equipment requires liquid sodium hypochlorite. The package system includes chemical storage and containment. Hypochlorite has a limited shelf life and is readily available. It will be ordered and delivered to the SCTP when needed, so on site storage will be minimal.

Biosolids are generated from solids collected during the main treatment process. By re-rating the SCTP capacity, the plant will be able treat about 14 percent more influent flow. Therefore, the SCTP will generate about 14 percent more biosolids under re-rating. However, the proposed digested biosolids dewatering improvements are expected to increase the dewatered cake solids concentration from anaerobically digested biosolids by 3 to 5 percent, reducing the volume of generated biosolids by a similar amount.

Biosolids are a nutrient-rich fertilizer that reduces soil erosion, and provides micronutrients and nitrogen to the soil. Biosolids are regularly removed from the plant and applied to nearby farmlands. During the second week of August through mid-September, biosolids are taken to farms near Woodland. During the remainder of the year, biosolids are hauled to farms near Goldendale.

The project will be constructed in accordance with applicable state and local health and safety regulations. Fuel used in construction equipment will not be stored on site.

4) Describe special emergency services that might be required.

No special emergency services would be required.

5) Proposed measures to reduce or control environmental health hazards, if any:

The plant operates under a rigorous spill prevention, containment, and countermeasures plan. Standard construction safety measures will be implemented to reduce or control environmental hazards and accidents.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

The project will not be affected by noise in the SCTP area.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

During construction, a variety of equipment will be used for material delivery, grading, lifting, and clean up; and may include flat beds, loader, backhoe, scissor lift, crane, jackhammer, impact wrenches, and compressors.

Existing noise at the SCTP includes normal plant operations and maintenance, including a variety of service vehicles, and will not be measurably different after the project. Although noise from the existing clarifiers is negligible, the proposed covers will reduce the noise.

3) Proposed measures to reduce or control noise impacts, if any:

Construction will be limited to daytime hours, and operation of construction equipment will meet Clark County noise ordinance requirements. There are no residences within 200 feet of the proposed Phase 5B Project–Salmon Creek Treatment Plant Improvements.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The SCTP is an existing public utility use. Immediately north and east of the SCTP is the Salmon Creek floodway and floodplain. The area immediately south and east of the SCTP is a forested, undeveloped hillslope forming the Salmon Creek ravine. The area immediately west of the SCTP is a common property access to Salmon Creek, the BNSF Railway, the Salmon Creek floodway and floodplain, and pasture land. South of the SCTP is undeveloped forested hillside and the developing Ashley Ridge residential neighborhood. The nearest residence to the plant is approximately 360 feet to the south.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The project site does not contain working farmlands or working forest lands, and none will be converted.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

The project site will not be affected by working farm or forest land business operations.

c. Describe any structures on the site.

The SCTP contains facilities associated with wastewater treatment, including the process control building, preliminary treatment facility, primary clarifiers, effluent pump station, and other process facilities.

d. Will any structures be demolished? If so, what?

The existing carbon system structure will be demolished. The headworks stairs will be replaced, and the utility conduits at the biotrickling filter site will be relocated.

e. What is the current zoning classification of the site?

The current zoning classification of the site is PF (Public Facility).

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation of the site is PF (Public Facility).

g. If applicable, what is the current shoreline master program designation of the site?

The current shoreline master program designation of the site is Aquatic/Urban Conservancy.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The project site lies within designated Priority Species Buffer and Priority Habitat and Species Area (i.e., Riparian Habitat Conservation Area). The project site does not contain Wetlands, nor does it contain Floodway, Floodway Fringe, or 500 Year Flood Area. The project site is outside Priority Habitat Buffer.

i. Approximately how many people would reside or work in the completed project?

No people reside at the project site. The SCTP employs about 14 personnel.

j. Approximately how many people would the completed project displace?

The project will not displace people.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project will obtain a Shoreline Conditional Use Permit from Clark County.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Not applicable.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low income housing.

No housing will be provided by the project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing will be eliminated by the project.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable.

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The primary clarifiers will be covered by aluminum sheathing supported by an integral frame. The sheathing will not materially change the heights of the primary clarifiers.

The biotrickling filter odor control system will be primarily composed of two vertical painted filter vessels, duty and standby fan enclosures, and piping. The filter chambers will stand about 25 feet tall.

The RAS chlorination system will be portable, skid-mounted, unsheathed mechanical equipment that will be stored in the old control building. The pump skid and tote will be placed in the old chlorine storage room when unused.

b. What views in the immediate vicinity would be altered or obstructed?

No protected views would be altered or obstructed in the immediate project vicinity.

c. Proposed measures to reduce or control aesthetic impacts, if any:

The aluminum sheathing over the primary clarifiers will have low reflectivity. Otherwise, no measures to reduce or control aesthetic impacts are proposed because no impacts are expected.

11. **Light and Glare**

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Low-level night lighting has been installed at the SCTP to ensure public safety, and no changes to lighting are proposed. Security night lighting is internally focused using sodium vapor illumination. No new sources of glare will be created.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No new sources of light or glare are proposed.

c. What existing off-site sources of light or glare may affect your proposal?

The project will not be affected by existing off-site sources of light or glare.

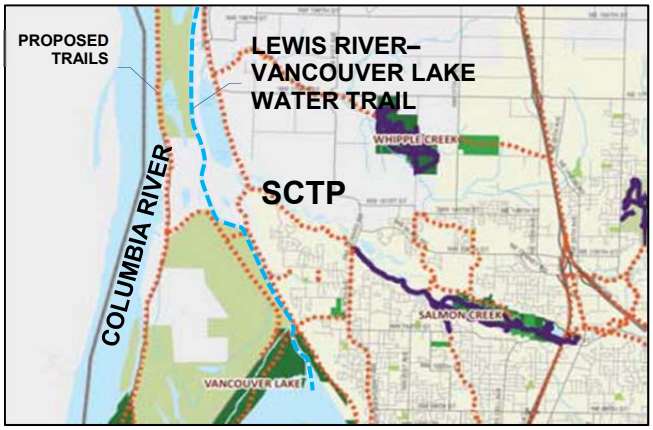
d. Proposed measures to reduce or control light and glare impacts, if any:

No measures to reduce or control light and glare impacts are proposed because no impacts are expected.

12. **Recreation**

a. What designated and informal recreational opportunities are in the immediate vicinity?

The SCTP property is publicly owned, but public entry is prohibited. The area around the SCTP is privately owned and without developed recreation uses. Tax parcel #986038501, owned by the Ashley Ridge Homeowner Association, currently is developing and will provide recreational access to Salmon Creek.



The Clark County Regional Trails map shows a proposed pedestrian trail running along the SCTP and connecting to the regional trail network (Clark County 2015).

The Columbia River, Lake River, and Salmon Creek are state-owned aquatic lands and utilized as a public resource for recreation such as fishing, boating, and bird watching. The Lewis River–Vancouver Lake Water Trail is an existing designated 32-mile-long water trail that follows Lake River between Lewis River and Vancouver Lake (Vancouver-Clark Parks and Recreation 2013).

b. Would the proposed project displace any existing recreational uses? If so, describe.

The project will not displace existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No measures to reduce or control recreation impacts are proposed because no impacts are expected.

13. **Historic and Cultural Preservation**

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

The SCTP was originally constructed in 1974, and has undergone several improvements and expansions. None of the buildings or structures are over 45 years old.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of

cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Cultural resources in the vicinity include several recorded pre-contact materials and campsites (DAHP 2010). Native Americans used the entire Clark County area, including areas around Salmon Creek. The Columbia Valley lowlands, which extend east into the Vancouver Lake lowlands, supported Chinookan-speaking peoples. Salish-speaking and Sahptin-speaking Cowlitz Tribes lived nearby to the north, including the Taitnapam and Upper Lewis Taitnapam or Klickitat (Hajda 1990). Native American archaeological resources are recorded along the Columbia River shoreline, with additional significant numbers in the lowlands extending from the Columbia River around Vancouver Lake. The Cathalpolte site located on the Ridgefield National Wildlife Refuge is an example of an archaeological site that existed during the prehistoric, protohistoric, and historic archaeological periods. At the time of Euro-American contact in the early 1800s, the village population was estimated at 900.

Cultural resources within the Columbia Valley lowlands include numerous recorded pre-contact materials, village sites, and camp sites. Recorded materials include fishing structures and weights, lithic material, charcoal deposits, and calcined bones (DAHP 2010). Prehistoric Native American occupation of the Columbia River area within Clark County, as well as the surrounding region, probably began about 12,000 years ago, although direct evidence for ancient occupation of this area has not been found. Rising Holocene sea levels and river and stream flooding events throughout the county have combined to erase or deeply bury low elevations. However, a history of Native American people living in Clark County has been demonstrated by archaeological research dating back 9,000 to 10,000 years (Ames 1994).

Cultural resource investigations in the Clark County area, summarized by Pettigrew in the 1970s and 1980s, have documented a cultural history of Native peoples over the last 2,500 years (Pettigrew 1977; 1981). The location of this early research was focused on the area around the Willamette River near its confluence with the Columbia River, primarily on Sauvie Island. Subsequent research by Ames and others identified that significant populations were focused on the shoreline areas of the Columbia River within Clark County, extending through the lowland area surrounding Vancouver Lake.

Not all areas of the Columbia Valley lowlands were used by Chinookan-speaking groups on a regular basis, but all areas are a part of their usual and accustomed grounds. Early Euro-American contact is recorded by Lewis and Clark (Moulton 1990). Chinookan-speaking groups lived along the Columbia River from the Sandy River in Oregon, downstream to the Kalama River (Silverstein 1990). In 1805-1806, Lewis and Clark reported between 15 to 20 villages or village clusters throughout this area, with a total population of about 4,000 to 5,000 people. Amongst these locations is a documented village site along the Columbia River, generally west of and between the Ridgefield and Vancouver areas (Ames and Maschner 1999). Populations of Native peoples doubled during the spring seasons as area Native groups moved into the Columbia Valley lowlands to share in the abundant fish (Boyd and Hajda 1987).

Archaeological Investigations Northwest, Inc. (AINW) conducted archaeological investigations for effluent pipeline replacement. Previously recorded archaeological sites 45CL98, 45CL99, 45CL435, 45CL100, and 45CL21 are known in the vicinity of the project. Of these, 45CL98 is located at the SCTP.

Several Native American Tribes have an active presence in Clark County. Under established treaty rights, federally recognized Tribes have rights to the annual salmon harvests within the Columbia River and tributary streams. Salmon runs rely on habitat within the Clark County jurisdiction shorelines and watersheds. Tribes with usual and accustomed territory within Clark County include:

- Cowlitz Indian Tribe, Washington – Area throughout Clark County is usual and accustomed territory
- Confederated Tribes and Bands of the Yakama Nation, Washington – South-central Washington
- Chinook Tribe – Not currently federally recognized

Tribes with usual and accustomed territory on shorelines adjacent to Clark County and/or within the upstream Columbia River Basin downstream of the Bonneville Dam include:

- Confederated Tribes of the Grand Ronde Community of Oregon – Usual and accustomed territory extending throughout the Grand Ronde area of Oregon
- Confederated Tribes of the Siletz Reservation, Oregon – Usual and accustomed territory in Western Oregon

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Karla Hotze and Eva Hulse of AINW prepared the Cultural Resource Survey for the Columbia River Outfall and Effluent Pipeline Project, Clark County, Washington on December 30, 2016. This report covers the SCTP, and reports that archaeological site 45CL98, which was lithic scatter, had been previously destroyed during construction of the wastewater treatment plant. The location, significance, or extent of the site was never determined, and archaeological deposits matching the description and location of 45CL98 were not identified within the project APE.

The Corps issued NWS-2017-25 on August 1, 2017 to permit geotechnical investigation in the project vicinity. The Corps conducted consultation with tribes, but no significant comments were received. However, the field work must comply with NWP General Condition 21, *Discovery of Previously Unknown Remains and Artifacts*.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

The project will not perform deep excavation of the existing site such that native substrate would be disturbed or exposed. The project will implement an archaeological discovery plan in the event of unforeseen discoveries.

14. **Transportation**

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The SCTP is not open to the public. The project site is accessed via McCann Road. The closest principal arterial is NW 36th Avenue. No new street access is proposed.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No, the site is not served by public transit.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

The proposed project will not add or eliminate parking spaces.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The proposed project will not add or improve roads, streets, pedestrian, bicycle or state transportation facilities.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project will not use water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The project will not generate any additional employee vehicular trips per day. The facility improvements will be operated by existing personnel. From the second week of August through mid-September, when about half of the biosolids are taken to farms near Woodland, the number of daily truck trips may increase by 2-3 trips. During the remainder of the year, biosolids hauling to farms near Goldendale may increase by about 10 percent.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The project will not interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area.

h. Proposed measures to reduce or control transportation impacts, if any:

No measures to reduce or control transportation impacts are proposed because impacts are expected to be minor.

15. **Public Services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No increase in the need for public services will occur because of the project.

b. Proposed measures to reduce or control direct impacts on public services, if any.

No measures to reduce or control public services impacts are proposed because no impacts are expected.

16. **Utilities**

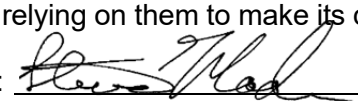
a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other_____

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No new utilities are needed for the proposed project, which will rely on existing electrical and other services.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

Name of signee: Steve Mader

Position and Agency/Organization: Environmental Manager at CH2M HILL, Inc.

Date Submitted: November 22, 2017

TELEPHONE CONVERSATION RECORD

PHONE NO.:	(360) 407-7273	DATE:	December 11, 2017
CALL FROM:	Rebecca Rothwell/Ecology	TIME:	4:15 pm
MESSAGE TAKEN BY:	Steve Mader/CH2M		
SUBJECT:	Phase 5B Project SEPA DNS and checklist		

I returned the call received by Tammy Lecomte/Discovery Clean Water Alliance on December 8, 2017. Rebecca Rothwell (email: rebs461@ECY.WA.GOV) is Wetlands/Shorelands Specialist in Ecology's Shorelands and Environmental Assistance Program based in the Southwest Regional Office. In this capacity, she is the Shoreline Permit Reviewer and responded to the Alliance's public notice for the Phase 5B Project SEPA DNS and checklist.

Rebecca asked clarifying questions about the project. She said she had difficulty discerning between existing and proposed facilities in the site plans, and asked whether the facility footprints would be expanding. I replied that there will be small additions of package systems. She asked about moving the existing stairs to make space for the bio-tricking filter, and I replied the stairs would only be moved a short distance. She asked about the aluminum covers/louvers for odor control, and I replied that they will sit atop the existing facilities without changing their footprints.

Rebecca asked about the Clark County conditional use permit. I responded that we do not know with certainty that a conditional use permit will be needed, and that we will learn about Clark County permitting requirements after we conduct a pre-application meeting. She asked if the pre-application meeting has been scheduled, and I said no. Rebecca offered her assistance to the Alliance if conditional use permitting will be required.

Rebecca has not been in contact with others at Ecology who will be involved in the Engineering Report review.

--End--

Allyson Brooks Ph.D., Director
State Historic Preservation Officer

December 13, 2017

Mr. John Peterson
Clark Regional Wastewater District
PO Box 8979
Vancouver, WA 98668-8979

In future correspondence please refer to:
Project Tracking Code: 2017-12-08780
Property: Notice of DNS for Phase 5B: Salmon Creek Treatment Plant Improvements DNS 001-2017
Re: Archaeology – Professional Archaeological Monitor and Monitoring Plan Requested

Dear Mr. Peterson:

Thank you for contacting the Washington State Historic Preservation Officer (SHPO) and Department of Archaeology and Historic Preservation (DAHP) and providing documentation regarding the above referenced project. As a result of our review, our professional opinion is that the project area has a high potential to contain archaeological resources. The project area is approximately 150 feet from a precontact archaeological site 45 CL98 and approximately 300 feet from another precontact archaeological site as well as approximately 300 feet from National Register of Historic Places (NRHP)-eligible Vancouver Lake and Shoto Villages Archaeological District 45DT101. Please be aware that archaeological sites are protected from knowing disturbance on both public and private lands in Washington States. Both RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from our Department before excavating, removing, or altering Native American human remains or archaeological resources in Washington. Failure to obtain a permit is punishable by civil fines and other penalties under RCW 27.53.095, and by criminal prosecution under RCW 27.53.090.

Chapter 27.53.095 RCW allows the Department of Archaeology and Historic Preservation to issue civil penalties for the violation of this statute in an amount up to five thousand dollars, in addition to site restoration costs and investigative costs. Also, these remedies do not prevent concerned tribes from undertaking civil action in state or federal court, or law enforcement agencies from undertaking criminal investigation or prosecution. Chapter 27.44.050 RCW allows the affected Indian Tribe to undertake civil action apart from any criminal prosecution if burials are disturbed.

Identification of archaeological resources during construction is not a recommended detection method because inadvertent discoveries often result in costly construction delays and damage to the resource**. We request a professional archaeological survey of the project area be conducted prior to ground disturbing activities. The completed survey should be submitted to DAHP and the interested Tribes prior to ground disturbance.** We also recommend consultation with the concerned Tribes' cultural committees and staff regarding cultural resource issues.

If any federal funds or permits are associated with this proposal, Section 106 of the National Historic Preservation Act, as amended, and its implementing regulations, 36 CFR 800, must be followed. This is a separate process from both the NEPA and SEPA environmental review processes and requires formal

government-to-government consultation with the affected Tribes and the SHPO. Also, we appreciate receiving any correspondence or comments from concerned tribes or other parties concerning cultural resource issues that you receive.

Thank you for the opportunity to comment on this project and we look forward to receiving the survey report. Should you have any questions, please feel free to contact me.

Sincerely,

Gretchen Kaehler
Assistant State Archaeologist, Local Governments
(360) 586-3088
gretchen.kaehler@dahp.wa.gov

cc. Nathan Reynolds, Cultural Resources, Cowlitz Tribe
James Gordon, Cultural Resources, Cowlitz Tribe
Dave Harrelson, THPO, Grand Ronde Tribes
Robert Brunoe, THPO, Warm Springs Tribes
Johnson Meninick, Cultural Resources, Yakama Nation
Tony Johnson, Cultural Resources, Chinook Tribe
Dan Penn, Cultural Resources, Chehalis Tribe

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

December 15, 2017

John Peterson, General Manager
c/o Clark Regional Wastewater District
Discovery Clean Water Alliance
Administrative Lead
PO Box 8979
Vancouver, WA 98668-8979

Dear Mr. Peterson:

Thank you for the opportunity to comment on the determination of nonsignificance for the The Phase 5B Project – Salmon Creek Treatment Plant Improvements Project (2015-Alliance-01) located at 15100 Northwest McCann Road in Vancouver as proposed by Brady Fuller, Discovery Clean Water Alliance. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

WASTE 2 RESOURCES: Beth Gill (360) 407-6380

The applicant proposes to demolish an existing structure(s). In addition to any required asbestos abatement procedures, the applicant should ensure that any other potentially dangerous or hazardous materials present, such as PCB-containing lamp ballasts, fluorescent lamps, and wall thermostats containing mercury, are removed prior to demolition. Also, be aware that PCBs are increasingly being found in caulking and paint. It is important that these materials and wastes are removed and appropriately managed prior to demolition. It is equally important that demolition debris is also safely managed, especially if it contains painted wood or concrete, treated wood, or other possibly dangerous materials. Please review the "Dangerous Waste Rules for Demolition, Construction, and Renovation Wastes," on Ecology's website at: www.ecy.wa.gov/programs/hwtr/dangermat/demo_debris_constr_materials.html.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(MLD:201706262)

cc: Beth Gill, W2R
Brady Fuller, Discovery Clean Water Alliance (Proponent)

MEMORANDUM

SEPA DNS 001-2017
Phase 5B Project – Salmon Creek Treatment Plant Improvements; Discovery Clean Water Alliance

PREPARED FOR:	Administrative Record for SEPA DNS 001-2017
COPY TO:	Tammy Lecomte/Alliance Brady Fuller/CH2M
PREPARED BY:	John M. Peterson, P.E.
DATE:	July 22, 2019
PROJECT NUMBER:	#2015-Alliance-01

The Discovery Clean Water Alliance (Alliance) published their SEPA DNS, and distributed our checklist/DNS for the Phase 5B Project – Salmon Creek Treatment Plant Improvements (Project) on December 1, 2017. They advertised that they would accept SEPA comments through December 15, 2017.

The Project addresses facility wastewater loading and treatment capacity with an updated process analysis using current data and design guidance, and updated hydraulic analysis for projected flows. Also, the Project includes minor facility improvements unrelated to treatment capacity analysis. Specifically, the project includes:

1. Re-rating the capacity of the Salmon Creek Treatment Plant to accommodate an incremental BOD_5/TSS capacity increase and a corresponding inflow increase from 14.95 to 17.00 million gallons per day (mgd).
2. New liquid chlorine system to improve settleability during sludge bulking events and improve the associated performance of the secondary clarifiers, and to control filamentous organisms in the activated sludge system.
3. Odor control improvements at the preliminary treatment and primary treatment facilities.
4. Digested biosolids dewatering improvements at the anaerobic digester tanks.

Through December 22, 2017, we received the following comments:

Date	Commenter	Agency	Subject
Dec. 11, 2017	Rebecca Rothwell	Ecology, Shorelands & Environmental Assistance	Shoreline Management Act
Dec. 13, 2017	Gretchen Kaehler	Department of Archaeology & Historic Preservation	Archaeological resources
Dec. 15, 2017	Beth Gill	Ecology, Waste 2 Resources	Potentially dangerous or hazardous materials

The commenters did not identify significant adverse environmental impacts, pertinent new information, misrepresentation or lack of material disclosure, or recommend mitigation to reduce impacts. However, the comments we received are valuable and will be addressed during final design to ensure that the project will avoid significant adverse environmental impacts. We will coordinate with Rebecca Rothwell/Ecology if Clark County determines that a conditional use permit will be required through Shoreline Management Act permitting. A professional archaeologist will conduct a survey of archaeological resources that will be submitted to DAHP and interested Tribes prior to construction. Finally, we will ensure that procedures are in place for handling and disposal if potentially dangerous or hazardous materials will be encountered during demolition of structures.

Therefore, the Alliance has decided to retain the DNS and implement the proposed action, pending negative findings from archaeological resources survey. Consequently, no further SEPA review is needed.

File: Revised Phase 5B Project—Salmon Creek Treatment Plant Improvements DNS 001-2018

Date Published: **September 14, 2018**

NOTICE OF DETERMINATION OF NON-SIGNIFICANCE (DNS)

PROJECT:
Phase 5B Project: Salmon Creek Treatment Plant Improvements
(revised)
#2015-Alliance-01

Please find enclosed an environmental Determination of Non-Significance (DNS) issued pursuant to State Environmental Policy Act (SEPA) Rules (Chapter 197-11, Washington Administrative Code), and Discovery Clean Water Alliance Resolution No. 2013–10. The enclosed review comments reflect evaluation of the environmental checklist by the lead agency, Discovery Clean Water Alliance, as required by WAC 197-11-330(1)(a)(i).

Written comments may be submitted on this determination within fourteen (14) days of its issuance, after which the DNS will be reconsidered in light of the comments received. Comments must be submitted by **September 28, 2018**.

Please address all correspondence to: **Discovery Clean Water Alliance**
c/o Clark Regional Wastewater District
Administrative Lead
PO Box 8979
Vancouver, WA 98668-8979
Attn: John M. Peterson, PE
JPeterson@crwwd.com

DISTRIBUTION LIST

FEDERAL AGENCIES

1. National Marine Fisheries Service
2. US Environmental Protection Agency
3. US Fish and Wildlife Service – Ridgefield Refuge
4. US Fish and Wildlife Service – Lacey WA Office

NATIVE AMERICAN INTERESTS

5. Chinook Indian Nation
6. Confederated Tribes and Bands of the Yakama Nation
7. Confederated Tribes of the Grand Ronde
8. Confederated Tribes of the Siletz Reservation
9. Cowlitz Indian Tribe

STATE AGENCIES

10. Department of Archaeology and Historic Preservation
11. Department of Commerce
12. Department of Community Development
13. Department of Ecology – SEPA Review Section
14. Department of Fish and Wildlife
15. Department of Health
16. Department of Natural Resources – SEPA Center
17. Department of Transportation

REGIONAL AGENCIES

18. Camas Public Library
19. Fort Vancouver Regional Library
20. Fort Vancouver Regional Library – Battle Ground Branch
21. Fort Vancouver Regional Library – Three Creeks Branch
22. Fort Vancouver Regional Library – Woodland Branch
23. Southwest Clean Air Agency
24. Southwest Washington Health District
25. Southwest Washington Regional Transportation Council

LOCAL AGENCIES

Cities

26. City of Battle Ground
27. City of Camas
28. City of La Center
29. City of Ridgefield
30. City of Vancouver – Administration
31. City of Vancouver – Community & Economic Development
32. City of Vancouver – Public Works
33. City of Washougal
34. City of Woodland

Counties

35. Clark County – Board of County Councilors
36. Clark County – Central Files
37. Clark County – Community Planning (Economic Development)
38. Clark County – Public Health
39. Clark County Community Development – Building Division
40. Clark County Prosecuting Attorney's Office
41. Clark County Public Works – Administration
42. Clark County Public Works – Clean Water
43. Clark County Sheriff's Office
44. Cowlitz County Health & Human Services

Non-Governmental Agencies

45. Building Industry Association
46. Clark County Association of Realtors
47. Clark County Natural Resources Council
48. Columbia Riverkeeper
49. Friends of Clark County
50. Futurewise
51. Greater Vancouver Chamber of Commerce
52. Lower Columbia Fish Recovery Board
53. Partners in Careers
54. Salmon Creek Watershed Council
55. Sierra Club – Loo Wit
56. Trout Unlimited
57. Vancouver Audubon Society
58. Vancouver Housing Authority

SPECIAL PURPOSE AGENCIES/DISTRICTS

59. Battle Ground School District
60. Camas School District
61. Evergreen School District
62. Hockinson School District
63. Vancouver School District
64. C-Tran
65. Clark Conservation District
66. Clark County Fire District No. 5
67. Clark County Fire District No. 6
68. East County Fire and Rescue
69. Clark Public Utilities – Electrical
70. Clark Public Utilities – Water
71. Clark Regional Emergency Services Agency (CRESA)
72. Clark Regional Wastewater District
73. Columbia River Economic Development Council (CREDC)
74. Port of Camas-Washougal
75. Port of Ridgefield
76. Port of Vancouver
77. Port of Woodland
78. Vancouver-Clark Parks & Recreation

INTEREST GROUPS

Neighborhood Associations

79. Neighborhood Associations Council of Clark County
80. Andresen/St Johns Neighborhood Assoc.
81. East Fork Frontier Neighborhood Assoc.
82. East Fork Hills Rural Assoc.
83. East Minnehaha Neighborhood Assoc.
84. Enterprise/Paradise Point Neighborhood Assoc.

85. Fairground Neighborhood Assoc.
86. Felida Neighborhood Assoc.
87. Greater Brush Prairie Neighborhood Assoc.
88. Green Meadows Neighborhood Assoc.
89. Heritage Neighborhood Assoc.
90. Meadow Glade Neighborhood Assoc.
91. NE Hazel Dell Neighborhood Assoc.
92. North Salmon Creek Neighborhood Assoc.
93. Pleasant Highlands Neighborhood Assoc.
94. Ridgefield Junction Neighborhood Assoc.
95. Roads End Neighborhood Assoc.
96. Sherwood Hills Neighborhood Assoc.
97. Sifton Neighborhood Assoc.
98. Sunnyside Neighborhood Assoc.
99. Truman Neighborhood Assoc.
100. Washougal River Neighborhood Assoc.
101. West Hazel Dell Neighborhood Assoc.

Media

102. Camas Washougal Post-Record
103. The Columbian
104. The Reflector

WAC 197-11-970

NOTICE OF DETERMINATION OF NONSIGNIFICANCE (DNS)

NOTICE IS HEREBY GIVEN that the following proposal had been determined to have no probable significant adverse impacts on the environment, and that an environmental impact statement is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. The DNS is available online at: https://www.discoverycwa.org/SCTP_Imprvmts_Project.html. Written comments on the following DNS may be submitted to the Responsible Official by **September 28, 2018**.

PROPOSED PROJECT: Phase 5B Project—Salmon Creek Treatment Plant Improvements (revised) #2015-Alliance-01.

LOCATION OF PROPOSAL: Salmon Creek Treatment Plant (SCTP), 15100 Northwest McCann Road, Vancouver, Washington 98685 (Clark County).

The current zoning classification of the project site is PF (Public Facility). The shoreline master program designation of the site is Aquatic/Urban Conservancy. The site lies within designated Priority Species Buffer and Priority Habitat and Species Area (i.e., Riparian Habitat Conservation Area). The project site does not contain Wetlands, nor does it contain Floodway, Floodway Fringe, or 500 Year Flood Area. The project site is outside Priority Habitat Buffer.

DESCRIPTION: The Discovery Clean Water Alliance (Alliance), a regional wastewater partnership, proposes the Phase 5B Project – Salmon Creek Treatment Plant Improvements (revised) at the SCTP, 15100 Northwest McCann Road, Vancouver, Washington 98685. The original and revised project proposal address facility wastewater loading and treatment capacity, and minor facility improvements unrelated to treatment capacity. The proposed project has been planned since 1995 when Clark County prepared a State Environmental Policy Act (SEPA) Final Environmental Impact Statement for the SCTP Expansion Program and determined the proposed project to be a phase of the expansion program and preferred action. The project will accommodate incremental growth, and associated flow increases, envisioned by the Clark County 20-year Comprehensive Growth Management Plan.

The Alliance issued SEPA DNS #001-2017 for the original project proposal in December 2017. The original project addressed:

1. Re-rating the capacity of the SCTP to accommodate an incremental biochemical oxygen demand (BOD_5)/total suspended solids (TSS) capacity increase and a corresponding inflow increase from 14.95 to 17.00 million gallons per day (mgd).
2. New liquid chlorine system to improve settleability during sludge bulking events and improve the associated performance of the secondary clarifiers, and to control filamentous organisms in the activated sludge system.
3. Odor control improvements at the preliminary treatment and primary treatment facilities.
4. Digested biosolids dewatering improvements at the anaerobic digester tanks.

The revised proposal addresses comments received from Washington Department of Ecology (Ecology) and incorporates additional improvements to unit wastewater treatment processes. The Alliance has provided the revised engineering report, including revised engineering plans for all proposed improvements, to Ecology for concurrent review and approval.[1] All proposed improvements will occur within the existing SCTP site. The revised project's major elements include the following:

[1] CH2M. Engineering Report for the Phase 5B Project – Salmon Creek Treatment Plant Improvements. August 2018.

1. Increase the capacity of the SCTP to accommodate an incremental BOD_5/TSS capacity increase and an inflow increase from 14.95 to 17.50 mgd.
2. Add Return Activated Sludge (RAS) chlorination.
3. Odor control improvements at the preliminary treatment and primary treatment facilities.
4. Improve solids dewatering.
5. Construct Aeration Basin #7.
6. Add blower system.
7. Demolish Secondary Clarifier #2.
8. Construct Secondary Clarifier #5.
9. Demolish former Control Building (Building 87).
10. Add and replace RAS Pumps.
11. Modify Effluent Pump Station.
12. Construct and relocate Yard Piping.

Increase Wastewater Treatment Capacity. Ecology requires SCTP to schedule capacity improvements when actual influent flow or waste load reaches 85 percent of the rated capacity or the design capacity will be reached within 5 years, as relates to the facility loading design criteria for flow, BOD_5 load, or TSS load, specified in the in the facility's National Pollutant Discharge Elimination System (NPDES) permit. Increasing the facility's treatment capacity requires modified unit processes, process controls, and monitoring for the operation and maintenance of the plant, but will not require any additional levels of operator certification or staffing. Ecology must reissue the SCTP's NPDES Permit No. WA0023639, and the Southwest Clean Air Agency must modify Minor Source Air Discharge Permit No. 07-2726, to allow the 17 percent increase in effluent flows.

Add Return Activated Sludge (RAS) Chlorination System. Install a new liquid chlorine (sodium hypochlorite) system to improve settleability during sludge bulking events and improve the associated performance of the secondary clarifiers, and to control filamentous organisms in the activated sludge system. All work will occur in the existing RAS/WAS Pump Station without ground disturbance. The improved return activated sludge (RAS) chlorination equipment will reduce the risk of losing sludge inventory from high or overflowing sludge blanket levels in the secondary clarifiers. The liquid sodium hypochlorite system and appurtenances, which include chemical storage and containment, will dilute the hypochlorite and measure flow, minimizing the need for additional infrastructure and operator involvement during filamentous process upsets. Hypochlorite has a limited shelf life and is readily available. On site storage will be minimal because the liquid will be ordered and delivered when needed. To accommodate the RAS chlorination system, the RAS injection point within the RAS/WAS Pump Station will be relocated downstream of all secondary clarifiers, and an injection quill for improved introduction of chlorine solution will be added.

Odor Control Improvements. Based on updated air dispersion model results, additional odor control measures are needed to satisfy the 0.9 milligram per cubic meter requirement for toxic air pollution control at the SCTP, and achieve odor and hydrogen sulfide (H_2S) target thresholds for existing and new sensitive receptors outside the SCTP boundary. Therefore, odor control improvements will be implemented to reduce discharges of materials and odors to the atmosphere. The grating over the existing preliminary treatment facility (headworks) will be replaced with checkered plate, and the existing primary treatment facility (primary clarifiers) will be covered and fitted with air intake louvers. The preliminary treatment facility and primary clarifiers will be ventilated to a vapor phase biotrickling filter odor control system installed adjacent to the primary clarifiers. The odor control system will consist of two filter vessels, duty and standby fan enclosures, and piping occupying a 1,300-square-foot concrete foundation pad. Prior to constructing the foundation, existing utility piping under the biotrickling filter system site will be relocated to avoid conflicts. Also, the existing stairs will be replaced. The new odor control biotrickling filter will run continually, and require daily operations monitoring like that performed at the existing biofilter that treats air off the headspace of the existing sludge blend tank. The instrumentation and equipment associated with the new biotrickling filter will be like other instrumentation and equipment on site. Operations and maintenance staff can accommodate the operations and maintenance within

the existing staffing framework. The existing carbon system at the SCTP, located immediately east of the existing PE/RAS Mixing Box, is no longer needed for plant operations and will be removed from the plant site.

Improve Solids Dewatering. The project will optimize the biosolids dewatering process at the anaerobic digester tanks to improve dewatered cake concentration and overall dewatering performance without replacing the existing equipment. Improved dewatering and thickening will be performed by conditioning the sludge prior to thickening to flocculate the biomass. The process will remove bound water through the injection of pressurized air. Air diffused into the sludge aids flocculation, which yields denser floc and facilitates the dewatering process. This pretreatment process can increase the dewatered cake solids concentration from anaerobically digested biosolids by 3 to 5 percent. Other benefits of the process are 20 to 30 percent lower polymer consumption and extremely clear filtrate. The aeration equipment will be installed in the existing Solids Processing Center without ground disturbance, and have a footprint of only 4 feet by 6 feet.

Construct Aeration Basin #7. Construct new 180-foot x 40-foot concrete Aeration Basin #7. The structure will be aligned adjacent to existing aeration basins, and extend about 18 feet below the existing ground surface. The southern end will be supported by a concrete retaining wall.

Add Blower System. Add a new 4,500 standard cubic feet per minute (SCFM) blower system to the existing Blower Building, without ground disturbance. The blower system will enhance air delivery to the aeration basins.

Demolish Secondary Clarifier #2. Remove 90-foot-diameter Secondary Clarifier #2 to make space for the new Aeration Basin #7.

Construct Secondary Clarifier #5. Construct new 120-foot-diameter concrete Secondary Clarifier #5. The structure will be adjacent to existing Secondary Clarifier #4, and extend about 15 feet below the existing ground surface.

Demolish Former Control Building. Remove the former Control Building, presently used for storage, to make space for the new Secondary Clarifier #5.

Add and Replace RAS Pumps. Replace RAS Pumps 1, 3, 4, 5, and 6; remove RAS Pump 2; and install new RAS Pumps 7 and 8. All work will occur in the existing RAS/WAS Pump Station without ground disturbance. Replacement of existing RAS pumps with larger pumps will give SCTP the ability to remove more RAS from the secondary clarifiers.

Modify Effluent Pump Station. Perform an interim operational adjustment at the existing effluent pump station to incrementally increase hydraulic capacity of the existing 30-inch-diameter effluent pipeline from a firm rating (peak-hour influent flow) of 28.3 mgd to 33.1 mgd. Peak-hour effluent flow will be about 30.4 mgd due to an 8 percent attenuation of peak influent flow across the plant. The project will achieve this increase by replacing two existing effluent pumps with larger pumps. All work will occur in the existing Effluent Pump Station without ground disturbance. The SCTP's effluent system normally operates with flow conveyed by gravity to the Columbia River, but under conditions when the river level and/or effluent flow is high, effluent pumping is required to convey effluent flows.

Construct and Relocate Yard Piping. Where existing utilities and conduits lie belowground, below the existing Secondary Clarifier #2, they will be relocated to a new alignment that avoids conflict with existing or future structures.

REQUIRED PERMITS, APPROVALS, AND APPLICABLE REGULATIONS:

The applicant will obtain and comply with the terms and conditions of applicable local, state, and federal permits and approvals and comply with regulations, as follows:

- Review and approval of Engineering Report per WAC 173-240-060 (Ecology)
- Modification of NPDES Permit No. WA0023639 (Ecology)
- Review and concurrence of archaeological survey by Department of Archaeology and Historic Preservation (DAHP Project Tracking Code #2017-12-08780)

- Modification of Minor Source Air Discharge Permit (Southwest Clean Air Agency)
- Shoreline Management Act Shoreline Permit (Clark County; including Fire Marshall)
- Building Permit (Clark County; including Fire Marshall)
- Grading and Drainage Permit (Clark County)

PROPONENT: Discovery Clean Water Alliance, 8000 NE 52nd Court, PO Box 8979, Vancouver, WA 98668-8979.

☐ There is no comment period for this DNS.
☐ This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.
■ This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by **September 28, 2018**.

Lead agency: Discovery Clean Water Alliance

Responsible official: John M. Peterson, PE, General Manager Clark Regional Wastewater District, Administrative Lead for the Discovery Clean Water Alliance

Address: 8000 NE 52nd Court, P.O. Box 8979, Vancouver, WA 98668-8979

Phone: 360-993-8819

Date Issued: **September 14, 2018** Signature: 

■ You may appeal this determination to Ron Oslow, Chair of the Alliance Board of Directors
at 8000 NE 52nd Court, P.O. Box 8979, Vancouver, WA 98668
no later than **October 19, 2018**
by U.S. mail.

You should be prepared to make specific factual objections based on how you or your property is adversely affected by the proposal, any new facts that would be important to and affect the determination, and the reasons why the determination was incorrect. The notice of appeal shall be accompanied by a filing fee of $50.00. Consult Discovery Clean Water Alliance Resolution No. 2013–10 for the procedures for SEPA appeals.

☐ There is no agency appeal.

SEPA ENVIRONMENTAL CHECKLIST

A. Background

1. Name of proposed project, if applicable:

   Phase 5B Project—Salmon Creek Treatment Plant Improvements (revised)

2. Name of applicant:

   Discovery Clean Water Alliance

3. Address and phone number of applicant and contact person:

   8000 NE 52nd Court, P.O. Box 8979, Vancouver, Washington 98668 (360-993-8856);

   Attn: Dale W. Lough, PE, Project Lead for Discovery Clean Water Alliance

4. Date checklist prepared:

   September 6, 2018

5. Agency requesting checklist:

   Discovery Clean Water Alliance (Alliance)

6. Proposed timing or schedule (including phasing, if applicable):

   The Alliance anticipates that project design will occur in 2018-2019, with project construction occurring in 2020-2022.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

   The Phase 5B Project—Salmon Creek Treatment Plant Improvements (revised) is one of several incrementally planned projects of the Salmon Creek Treatment Plant Expansion Program.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

   BergerABAM. 2017. *Wetland and Stream Delineation and Assessment, Columbia River Outfall and Effluent Pipeline Project*. BergerABAM, Vancouver, Washington. November.

   BHC Consultants. 2017. *Clark Regional Wastewater District Comprehensive General Sewer Plan (Draft)*. BHC Consultants, Seattle, Washington. December.

   CH2M HILL. 2013. *Salmon Creek Wastewater Management System Wastewater Facilities Plan/General Sewer Plan Amendment*. CH2M HILL, Portland, Oregon. August.

   CH2M HILL. 2004. *Salmon Creek Wastewater Management System Wastewater Facilities Plan/General Sewer Plan*. CH2M HILL, Portland, Oregon. July.

   CH2M HILL. 1995. *Salmon Creek Wastewater Treatment Plant Expansion Program Final Environmental Impact Statement*. CH2M HILL, Portland, Oregon. October.

Demith, Alex. 2017. *Salmon Creek Treatment Plant Phase 4 Odor Control Update*. Technical Memorandum. CH2M HILL, Boise, Idaho. July.

Hotze, Karla and Eva Hulse. 2018. *Cultural Resource Survey for the Columbia River Outfall and Effluent Pipeline Project, Clark County, Washington*. Archaeological Investigations Northwest, Inc., Portland, Oregon. Report No. 3957.

Jacobs Engineering. 2018. *Final Draft Engineering Report for the Phase 5B Project—Salmon Creek Treatment Plant Improvements, Phase 5 Expansion Program*. Jacobs Engineering, Portland, Oregon. August 2018.

Wilson, David, Erin Thatcher, and Brady Fuller. 2018. *Water Quality Compliance Evaluation for the Phase 5B Project - Salmon Creek Treatment Plant Improvements*. Technical Memorandum. CH2M-Jacobs, Bellevue, Washington. August.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

Washington State Department of Ecology (Ecology) is reviewing an engineering report for the Alliance's Phase 5A Project—Columbia River Outfall and Effluent Pipeline, which proposes a replacement outfall diffuser that improves mixing and dilution of treated effluent in the Columbia River.

10. List any government approvals or permits that will be needed for your proposal, if known.

Review and approval of Engineering Report per WAC 173-240-060 (Ecology)

Modification of NPDES Permit No. WA0023639 (Ecology)

Review and concurrence of archaeological survey by Department of Archaeology and Historic Preservation (DAHP Project Tracking Code #2017-12-08780)

Modification of Minor Source Air Discharge Permit SWCAA 07-2726 (Southwest Clean Air Agency)

Shoreline Management Act Shoreline Permit (Clark County; including Fire Marshall)

Building Permit (Clark County; including Fire Marshall)

Grading and Drainage Permit (Clark County)

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The Phase 5B Project – Salmon Creek Treatment Plant Improvements (revised) addresses facility wastewater loading and treatment capacity. Also, the project includes minor facility improvements unrelated to treatment capacity analysis. Specifically, the project includes:

1. Increase the capacity of the Salmon Creek Treatment Plant to accommodate an incremental BOD_5/TSS capacity increase and an inflow increase from 14.95 to 17.50 million gallons per day (mgd).
2. Retrofit odor control improvements at the preliminary treatment and primary treatment facilities.
3. Construct Aeration Basin #7.
4. Add blower system.
5. Demolish Secondary Clarifier #2.
6. Construct Secondary Clarifier #5.
7. Demolish Former Control Building (Building 87).
8. Add Return Activated Sludge (RAS) Chlorination.
9. Add and replace RAS Pumps.
10. Modify Effluent Pump Station.
11. Improve Solids Dewatering.
12. Construct and relocate Yard Piping.

Increase Wastewater Treatment Capacity. Ecology requires that Salmon Creek Treatment Plant (SCTP) schedule capacity improvements when actual influent flow or waste load reaches 85% of the rated capacity or the design capacity will be reached within 5 years, as relates to the facility loading design criteria for flow, biochemical oxygen demand (BOD) load, or total suspended solids (TSS) load, specified in the in the facility's National Pollutant Discharge Elimination System (NPDES) permit. Increasing the facility's treatment capacity requires modified unit processes, process controls, and monitoring for the operation and maintenance of the plant, but will not require any additional levels of operator certification or staffing. Ecology must reissue the SCTP's NPDES Permit No. WA0023639 to allow the 17 percent increase in effluent flows.

Odor Control Improvements. Based on updated air dispersion model results, additional odor control measures are needed to satisfy the 0.9 milligram per cubic meter (mg/m^3) requirement for toxic air pollution control at the SCTP, and achieve odor and hydrogen sulfide (H_2S) target thresholds for existing and new sensitive receptors outside the SCTP boundary. Therefore, odor control improvements will be implemented to reduce discharges of materials and odors to the atmosphere. The grating over the existing preliminary treatment facility (headworks) will be replaced with checkered plate, and the existing primary treatment facility (primary clarifiers) will be covered and fitted with air intake louvers. The preliminary treatment facility and primary clarifiers will be ventilated to a vapor phase biotrickling filter odor control system installed adjacent to the primary clarifiers. The odor control system will consist of two filter vessels, duty and standby fan enclosures, and piping occupying a 1,300-square-foot concrete foundation pad. Prior to constructing the foundation, existing utility piping under the biotrickling filter system site will be relocated to avoid conflicts. Also, the existing stairs will be replaced. The new odor control biotrickling filter will run continually, and require daily operations monitoring like that performed at the existing biofilter that treats air off the headspace of the existing sludge blend tank. The instrumentation and equipment associated with the new biotrickling filter will be like other instrumentation and equipment on site. Operations and maintenance staff can accommodate the operations and maintenance within the existing staffing framework. The existing carbon system at the SCTP, located immediately east of the existing PE/RAS Mixing Box, is no longer needed for plant operations and will be removed from the plant site.

Construct Aeration Basin #7. Construct new 180-foot x 40-foot concrete Aeration Basin #7. The structure will be aligned adjacent to existing aeration basins, and extend about 18 feet below the existing ground surface. The southern end will be supported by a concrete retaining wall.

Add Blower System. Add a new 4,500 standard cubic feet per minute (SCFM) blower system to the existing Blower Building, without ground disturbance. The blower system will enhance air delivery to the aeration basins.

Demolish Secondary Clarifier #2. Remove 90-foot-diameter Secondary Clarifier #2 to make space for the new Aeration Basin #7.

Construct Secondary Clarifier #5. Construct new 120-foot-diameter concrete Secondary Clarifier #5. The structure will be adjacent to existing Secondary Clarifier #4, and extend about 15 feet below the existing ground surface.

Demolish Former Control Building. Remove the former Control Building, presently used for storage, to make space for the new Secondary Clarifier #5.

Add Return Activated Sludge (RAS) Chlorination System. Install a new liquid chlorine (sodium hypochlorite) system to improve settleability during sludge bulking events and improve the associated performance of the secondary clarifiers, and to control filamentous organisms in the activated sludge system. All work will occur in the existing RAS/WAS Pump Station without ground disturbance. The improved return activated sludge (RAS) chlorination equipment will reduce the risk of losing sludge inventory from high or overflowing sludge blanket levels in the secondary clarifiers. The liquid sodium hypochlorite system and appurtenances, which include chemical storage and containment, will dilute the hypochlorite and measure flow, minimizing the need for additional infrastructure and operator involvement during filamentous process upsets. Hypochlorite has a limited shelf life and is readily available. On site storage will be minimal because the liquid will be ordered and delivered when needed. To accommodate the RAS chlorination system, the RAS injection point within the RAS/WAS Pump Station will be relocated downstream of all secondary clarifiers, and an injection quill for improved introduction of chlorine solution will be added.

Add and Replace RAS Pumps. Replace RAS Pumps 1, 3, 4, 5, and 6; remove RAS Pump 2; and install new RAS Pumps 7 and 8. All work will occur in the existing RAS/WAS Pump Station without ground disturbance. Replacement of existing RAS pumps with larger pumps will give SCTP the ability to remove more RAS from the secondary clarifiers.

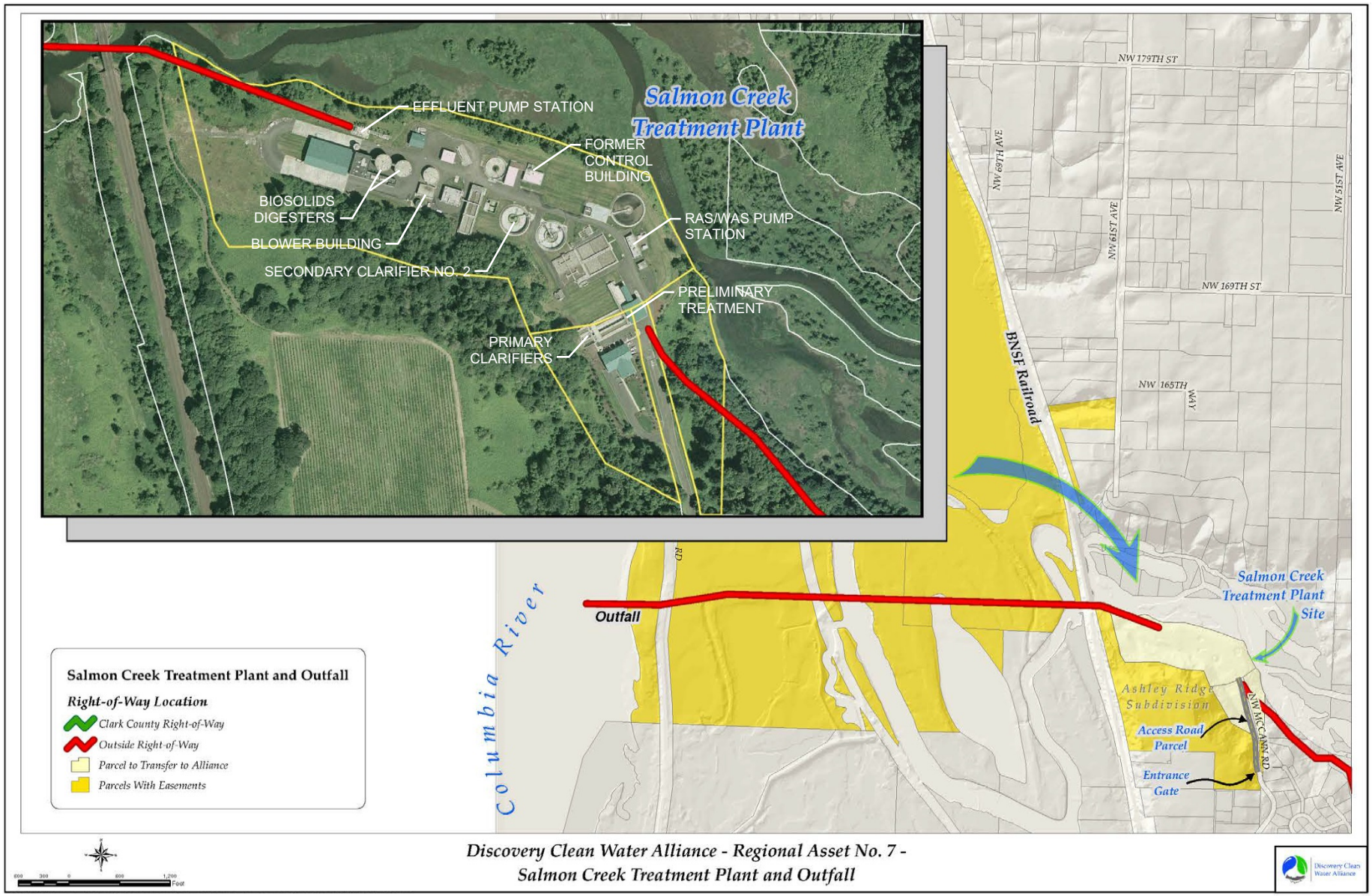
Modify Effluent Pump Station. Perform an interim operational adjustment at the existing effluent pump station to incrementally increase hydraulic capacity of the existing 30-inch-diameter effluent pipeline from a firm rating (peak-hour influent flow) of 28.3 mgd to 33.1 mgd. Peak-hour effluent flow will be about 30.4 mgd due to an 8 percent attenuation of peak influent flow across the plant. The project will achieve this increase by replacing two existing effluent pumps with larger pumps. All work will occur in the existing Effluent Pump Station without ground disturbance. The SCTP's effluent system normally operates with flow conveyed by gravity to the Columbia River, but under conditions when the river level and/or effluent flow is high, effluent pumping is required to convey effluent flows.

Improve Solids Dewatering. The project will optimize the biosolids dewatering process at the anaerobic digester tanks to improve dewatered cake concentration and overall dewatering performance without replacing the existing equipment. Improved dewatering and thickening will be performed by conditioning the sludge prior to thickening to flocculate the biomass. The process will remove bound water through the injection of pressurized air. Air diffused into the sludge aids flocculation, which yields denser floc and facilitates the dewatering process. This pretreatment process can increase the dewatered cake solids concentration from anaerobically digested biosolids by 3 to 5 percent. Other benefits of the process are 20 to 30 percent lower polymer consumption and extremely clear filtrate. The aeration equipment will be installed in the existing Solids Processing Center without ground disturbance, and have a footprint of only 4 feet by 6 feet.

Construct and Relocate Yard Piping. Where existing utilities and conduits lie belowground, below the existing Secondary Clarifier #2, they will be relocated to a new alignment that avoids conflict with existing or future structures.

12. Location of the proposal.

Salmon Creek Treatment Plant, 15100 Northwest McCann Road, Vancouver, Washington 98685 (Clark County). Township 3N, Range 1E, Section 19 NE ¼ and NW ¼. Property ID: 183515-000 and 183508-000. See also the site plan, vicinity map, topographic map, and Salmon Creek Treatment Plant Improvements plan.



SITE PLAN

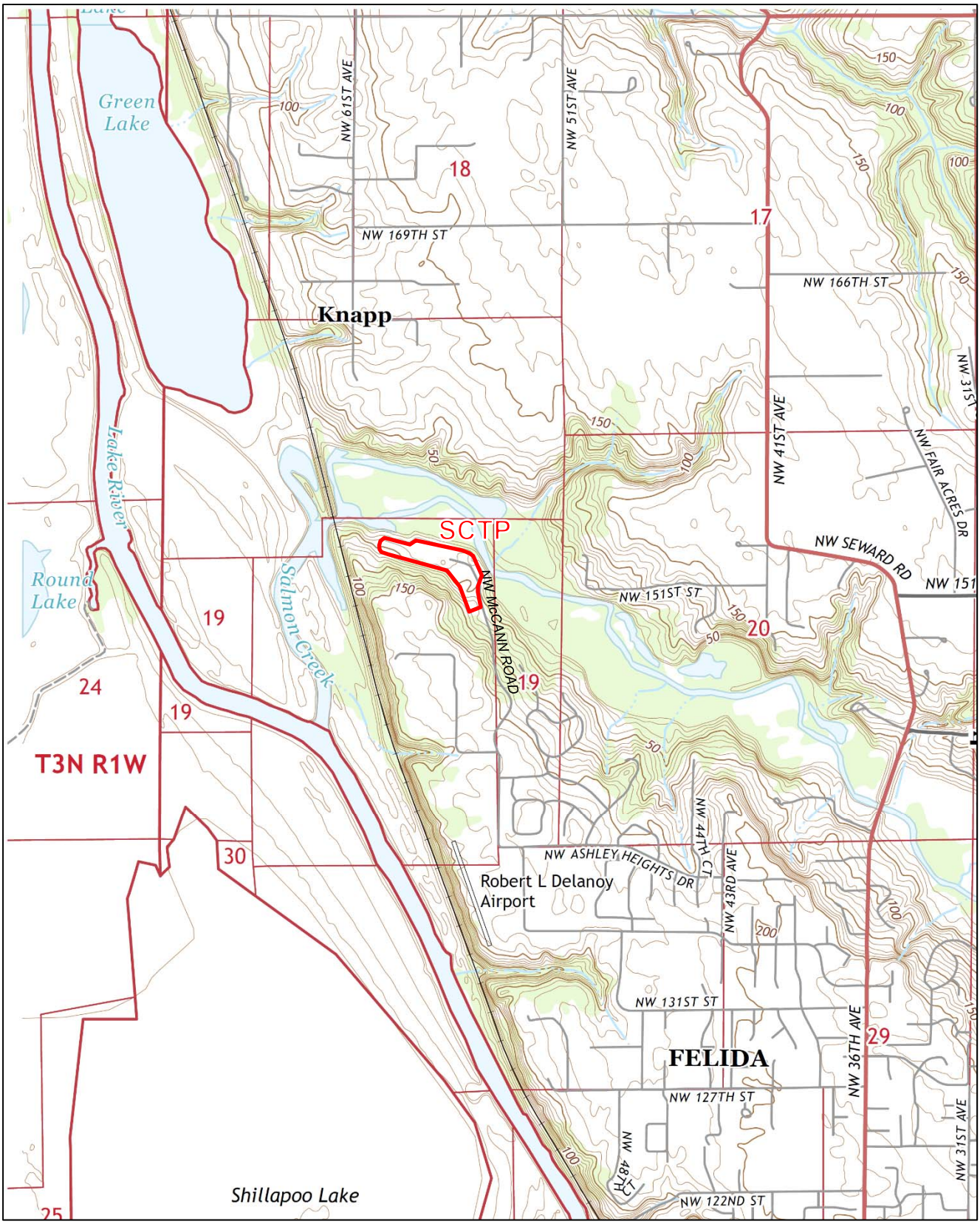
Phase 5B Project–

Salmon Creek Treatment Plant Improvements (revised)

VICINITY MAP

Phase 5B Project–

Salmon Creek Treatment Plant Improvements (revised)

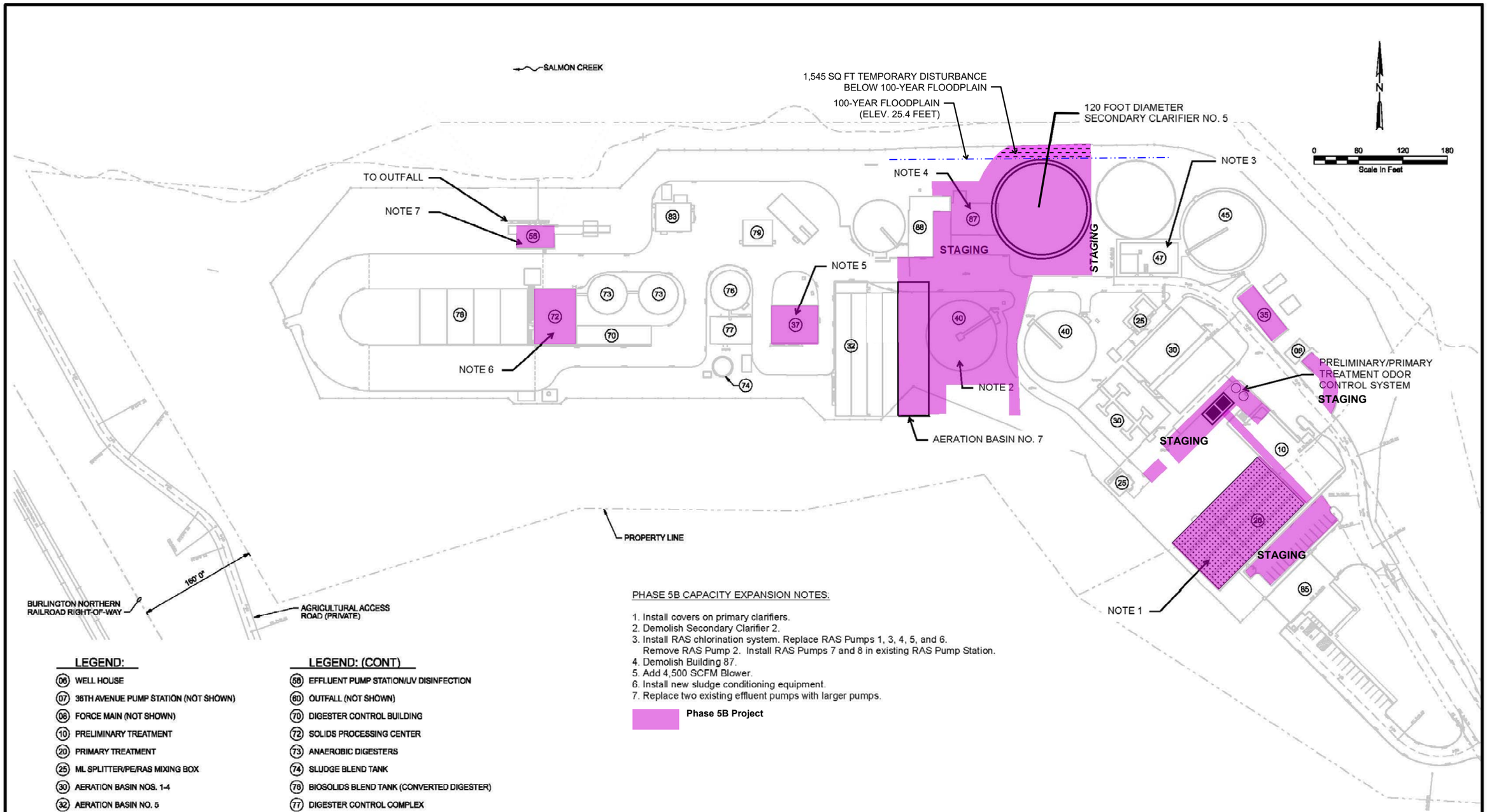


TOPOGRAPHIC MAP

Source: USGS (2014) Vancouver, WA-OR 7.5' quadrangle map

Phase 5B Project–

Salmon Creek Treatment Plant Improvements (revised)



LEGEND:

- (06) WELL HOUSE
- (07) 36TH AVENUE PUMP STATION (NOT SHOWN)
- (08) FORCE MAIN (NOT SHOWN)
- (10) PRELIMINARY TREATMENT
- (20) PRIMARY TREATMENT
- (25) ML SPLITTER/PE/RAS MIXING BOX
- (30) AERATION BASIN NOS. 1-4
- (32) AERATION BASIN NO. 5
- (35) BLOWER BUILDING
- (37) BLOWER BUILDING (CONVERTED THICKENING BUILDING)
- (40) SECONDARY CLARIFIER NOS. 1 AND 2
- (45) SECONDARY CLARIFIER NO. 3
- (47) RAS/WAS PUMP STATION
- (50) ABANDONED CHLORINE CONTACT/ ABANDONED EFFLUENT PUMP STATION

LEGEND: (CONT)

- (58) EFFLUENT PUMP STATION/UV DISINFECTION
- (60) OUTFALL (NOT SHOWN)
- (70) DIGESTER CONTROL BUILDING
- (72) SOLIDS PROCESSING CENTER
- (73) ANAEROBIC DIGESTERS
- (74) SLUDGE BLEND TANK
- (76) BIOSOLIDS BLEND TANK (CONVERTED DIGESTER)
- (77) DIGESTER CONTROL COMPLEX
- (78) BIOSOLIDS STORAGE
- (79) TRUCK LOADING FACILITY
- (83) ELECTRICAL BUILDING
- (85) OPERATIONS CENTER
- (87) ABANDONED CONTROL BUILDING
- (88) ABANDONED MAINTENANCE BUILDING

PHASE 5B CAPACITY EXPANSION NOTES:

1. Install covers on primary clarifiers.
2. Demolish Secondary Clarifier 2.
3. Install RAS chlorination system. Replace RAS Pumps 1, 3, 4, 5, and 6. Remove RAS Pump 2. Install RAS Pumps 7 and 8 in existing RAS Pump Station.
4. Demolish Building 87.
5. Add 4,500 SCFM Blower.
6. Install new sludge conditioning equipment.
7. Replace two existing effluent pumps with larger pumps.

Phase 5B Project

SALMON CREEK TREATMENT PLANT
PHASE 5B IMPROVEMENTS

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site:
(circle one): Flat, rolling, hilly, steep slopes, mountainous, other terrace on lower hillside slope

b. What is the steepest slope on the site (approximate percent slope)?

Approximately 20 percent within the developed site, and about 33 percent outside the developed site.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

Hillsboro silt loam and fill. No agricultural land is present.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No. The site is not designated as Landslide Hazard Area or Severe Erosion Hazard.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The total area of ground disturbance will be about 68,502 ft^2 (1.6 acres). Filling, excavation, and grading primarily will focus on construction of the Aeration Basin #7 (7,200 ft^2) and Secondary Clarifier #5 (11,310 ft^2), and installation and relocation of Yard Piping (4,259 ft^2). Relatively minor amounts of filling, excavation, and grading will be associated with demolition of Secondary Clarifier #2 (8,659 ft^2) and the former Control Building (3,104 ft^2).

The excavation depths for new Aeration Basin #7 and Secondary Clarifier #5 will be about 18 and 15 feet, respectively. The fill depth for Secondary Clarifier #2 will be about 12 feet. The fill depth for the Control Building will be about 2 feet. Attempts will be made to balance the excavation volumes for Aeration Basin #7 (4,800 yd^3) and Secondary Clarifier #5 (6,283 yd^3) with fill volumes for removing Secondary Clarifier #2 (3,848 yd^3) and the former Control Building (230 yd^3). Cement, gravel, asphalt, and other building materials will be imported from commercial sources.

Minimal earthwork is required for the odor control improvements. Ground disturbance will include a concrete foundation pad for the 1,300-square-foot biotrickling filter odor control system and replacement of an existing stairs at the Preliminary Treatment Building. Prior to constructing the foundation, existing utility piping to a depth of about 6 feet under the biotrickling filter system site will be relocated to avoid conflicts with the structures. The carbon system removal area will be about 230 square feet.

No earthwork will be associated with the RAS Chlorination system, RAS Pumps, adding the blower system, modifying the Effluent Pump Station, and improving Solids Dewatering.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

The existing ground surface is covered by structure, paved, or managed turf grass. Potential erosion during construction will be minor because an erosion and sediment control plan will be prepared and implemented, the disturbance area will be only 1.6 acres, the work site is nearly level and previously developed, and the SCTP site is completely contained.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The SCTP site covers about 27.37 acres. New Aeration Basin #7 and Secondary Clarifier #5 will be open-aired and filled with processed wastewater; they will not generate runoff, except from a non-pollution-generating sidewalk around the clarifier. Secondary Clarifier #2, the 3,104-ft^2 former Control Building, and old 230-ft^2 carbon system will be removed and the ground covered with pervious soil and lawn or riprap, except where the footprints overlap with new structures.

Odor control covers will be placed on the existing, impervious preliminary treatment facility and primary clarifiers, and will not increase the impervious surface area. The new 1,300-ft^2 biotrickling filter odor control system will be about 0.1 percent of the SCTP site, but installed on existing landscaped surfaces that are effectively impervious.

The RAS Chlorination System will be skid mounted and will be in the existing RAS/WAS Pump Station with the RAS pumps, so no new impervious surfaces will be constructed. The additional blower system, Effluent Pump Station modifications, and Solids Dewatering improvements also will be in existing structures, so these, too, will not add new impervious surfaces. Furthermore, no new roads or parking will be constructed.

Therefore, the site will have a net reduction in impervious surface area.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Trucks and equipment will use existing paved surfaces for access. Site stormwater is completely contained in the existing stormwater system. An erosion and sediment control plan will be prepared and implemented; control measures will include seeding, mulching, sediment fence, inlet filters, biobags, straw wattles, or similar devices, as needed. Pollution controls are available on site in the event of an accidental spill.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

SCTP operates under Air Discharge Permit 07-2726 issued by the Southwest Clean Air Agency (SWCAA). The SCTP is a secondary treatment plant comprised of common unit processes, including headworks, clarifiers, aeration tanks, boilers, digester waste gas incinerator, scum concentrator, sludge blend tank, and generator engines. In addition to treating wastewater, the processes generate fugitive emissions and odors as a byproduct of the physical and biological treatment processes. Volatile organic compounds (VOC) and toxic air pollutants (TAP) are volatilized from unenclosed primary and secondary clarifiers, aeration tanks, and the headworks building. The SCTP unit processes incorporate several types of emissions control equipment, which include low-NO_x burners, low-NO_x design, carbon canister, biological packed tower, and ultra-low sulfur diesel fuel. The facility is not a major source of hazardous air pollutants.

There are National Ambient Air Quality Standards (NAAQS) for six common air pollutants, four of which are generated at SCTP: particulate matter (also called $PM_{2.5}$ and PM_{10}, or particle pollution), carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen oxides (NO_2). The SCTP's Air Discharge Permit assures compliance with the NAAQS for these potential air pollutants. The Clark County airshed, as all of Washington, does not have any areas designated as nonattainment for exceeding pollution limits of NAAQS (Ecology 2016).

SCTP produces toxic air pollutant emissions, such as chloroform, formaldehyde and polycyclic aromatic hydrocarbons (PAH). However, toxic air pollutant emissions are expected to be below applicable Small Quantity Emission Rate (SQER) levels listed in WAC 173-460, or the Acceptable Source Impact Levels for each compound, and presumed by SWCAA to be not significant.

The odors are primarily hydrogen sulfide (H_2S) and smaller amounts of other organic reduced sulfur compounds (e.g., methyl mercaptans and dimethyl disulfide), all traditionally associated with secondary treatment plants. These odors can drift across plant property lines and affect nearby residents.

By implementing the Phase 5B Project, the plant will be able to treat about 17 percent more influent wastewater flow. Therefore, it is reasonable to estimate that the SCTP will generate up to about 17 percent more biogas from the existing and new unit processes at project completion. However, the SCTP's incinerators have the capacity to handle this increase in biogas production. No new air pollutants will be emitted. Continued compliance with the SWCAA Air Discharge Permit, as amended, would ensure that effects on air resources would not be significant.

A minor amount of dust may be produced during the construction period, which is controllable. Construction equipment will produce emissions of nitrogen oxides (NO_x), carbon monoxide (CO), and PM_{10} (dust) during construction, but these amounts will be minor and temporary.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The Air Discharge Permit will be modified by SWCAA, as necessary, to address proposed Salmon Creek Treatment Plant improvements. Adherence to the permit terms, as amended, ensures SCTP operations within the limits of applicable emission standards, and in conformance with the NAAQS and requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants," WAC 173-470 "Ambient Air Quality Standards for Particulate Matter," WAC 173-474 "Ambient Air Quality Standards for Sulfur Oxides," and WAC 173-475 "Ambient Air Quality Standards for Carbon Monoxide, Ozone, and Nitrogen Dioxide."

A major project purpose is to control odor and H_2S emissions at the headworks and primary clarifiers, to avoid adverse effects at existing and new sensitive receptors outside the SCTP boundary during plant operations and maintenance. The proposed odor control system will reduce air emissions from the plant such that H_2S emissions will not exceed a 24-hour average of 0.9 $\mu g/m^3$ at the plant boundary. Furthermore, nuisance odors at receptors will be controlled within SWCAA nuisance odor requirements. The bio-trickling filter system will be nearly 79 percent efficient and may provide as much as 94 percent odor removal at the most sensitive receptor.

The SCTP's Air Discharge Permit requires the operator to evaluate odors originating from the plant at the fence line. If odors are identified, the operator will investigate the cause of the odor and determine whether all relevant odor control and wastewater processing equipment are operating properly; and promptly correct, if necessary, any improperly operating equipment. The results of each odor evaluation and necessary corrective action shall be recorded.

Air emissions during construction will be within regulatory limits, using fugitive dust abatement measures, as needed.

3. **Water**

a. Surface Water:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

The SCTP lies along Salmon Creek at river mile 0.70. Salmon Creek is a Type S water (i.e., shoreline of the state). It is perennial and classified on the National Wetlands Inventory as R2UBH (riverine, lower perennial, unconsolidated bottom, permanently flooded), with associated PEM1C (palustrine, emergent, persistent, seasonally flooded) wetlands.

The Clark County Property Information identifies PEMT, PSSC, and R1UBV wetlands within the tax lot.

The wetland delineation performed by BergerABAM (2017) determined that no wetlands occur along Salmon Creek above the ordinary high water elevation (OHWE), which is about 16.4 feet (NAVD88).

The SCTP's effluent pipeline discharges treated wastewater to the Columbia River.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No work will occur over or in waters. However, ground disturbance to construct Secondary Clarifier #5 will occur as close as 15 feet of OHWE. Removal of Secondary Clarifier #2 involves ground disturbance as close as 15 feet of OHWE and removal of the former Control Building involves ground disturbance as close as 50 feet of OHWE. Covering of the preliminary treatment facility and primary clarifiers, and installation of the biotrickling filters, will occur within 200 feet of Salmon Creek wetlands.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill and dredge material will be placed in or removed from surface water or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No, the project will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

The 100-year floodplain elevation is 25.4 feet (NGVD29). Its limits lie north and northeast of SCTP, outside the fenced SCTP site but crisscrossing the Alliance's property line. All proposed aboveground structures will be sited outside the 100-year floodplain, including Secondary Clarifier No. 5 which will be adjacent to the floodplain at the northern side of the plant site. Clarifier construction will temporarily disturb sloped ground at the northern side of Secondary Clarifier No. 5 to install erosion and sediment controls (wattles and sediment fence), match grades, and place Class II riprap stabilization. About 1,545 square feet of ground within the 100-year floodplain and within the fenced plant site will be disturbed and then restored to pre-construction contours.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

The SCTP discharges treated wastewater to the Columbia River. Under the proposal, treated effluent from the plant will continue to discharge into the Columbia River. This treated effluent is a permitted discharge under NPDES Permit No. WA0023639, and meets all State of Washington regulatory requirements for water quality. At project completion, the existing facility can be operated at a higher influent capacity (i.e., 17.5 mgd ADMM versus 14.95 mgd ADMM flow). The unit processes at the SCTP will treat about 17 percent more inflow without affecting the ability of the SCTP to reliably and consistently comply with reissued wastewater permit terms and conditions. CH2M prepared a *Water Quality and Tier II Antidegradation Evaluation Technical Memorandum* (July 18, 2018) for the Phase 5B Project–Salmon Creek Treatment Plant Improvements (revised) with regard to water quality in the Columbia River and Washington water quality standards (Washington Administrative Code [WAC] 173-201A). The evaluation found that the project is not expected to cause or contribute to a violation of acute and chronic toxicity criteria. Furthermore, the Technical Memorandum's antidegradation analysis found that the discharge will not cause a measurable change in the river water quality. Notably regarding the current 303(d) listing, the plant is anticipated to provide exceptional performance during the most critical time of year (July through September) for dissolved oxygen impairment because facilities will provide reliable removal of oxygen demanding substances year-round. The treatment processes will treat up to a maximum monthly flow of 17.5 mgd without affecting SCTP's ability to reliably and consistently produce high-quality effluent with very low oxygen-depleting substance concentrations.

b. Ground Water:

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The potable water supply to SCTP is derived from an on-site well. Therefore, the project will withdraw groundwater from an existing well. However, the quantity of applied water will be minor. Groundwater may be applied during construction for dust mitigation, washing, or mixing small amounts of cement or grout. However, the amount will depend on site conditions and weather.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals...; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

No waste material will be discharged into the ground. On-site portable toilets will be used during construction activities. No septic systems will be installed.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

All ground disturbances will occur within the previously developed 27.37-acre SCTP site. During construction, groundwater dewatering required to construct the 15-foot-deep secondary clarifier and 18-foot-deep aeration basin. Water generated by dewatering will be detained and filtered by Baker tanks, dirt bags, and/or a vegetated filter strip prior to discharge to Salmon Creek, detained and stilled in unused secondary clarifiers, or the water will be hauled and discharged at an approved off-site location.

If the relocated yard piping needs to be pressure tested prior to operation, the small amount of process water will be routed to the wastewater treatment process stream at the head of the plant.

If the relocated yard piping needs to be chlorinated prior to operation (i.e., for a potable water line), the process water will be either dechlorinated through a standard media diffuser at a hydrant or routed to the wastewater treatment process stream at the head of the plant.

New Aeration Basin #7 and Secondary Clarifier #5 will be open-air and filled with processed wastewater, so they will not generate runoff. Secondary Clarifier #2, the former Control Building, and old carbon system will be removed and the ground covered with pervious soil and lawn or riprap, except where the footprints overlap with new structures. Pipe and ditch connections will be established to the existing SCTP storm drain system.

Odor control covers will be placed on the existing preliminary treatment facility and primary clarifiers, so they will not increase the impervious surface area. The new biotrickling filter odor control system will be installed on existing previously developed landscaped surfaces. Runoff from the preliminary treatment facility and primary clarifiers, and biotrickling filter odor control system, will be collected in the existing SCTP storm drain system.

The RAS Chlorination System will be skid mounted; it will be in the existing RAS/WAS Pump Station with the RAS pumps, so no new impervious surfaces will be constructed. The additional blower system, Effluent Pump Station modifications, and Solids Dewatering improvements also will be in existing structures, so these, too, will not add new impervious surfaces. No new roads or parking will be constructed. Therefore, the site will have a net reduction in impervious surface area.

The existing storm drain system covers approximately 24 acres and drains to Salmon Creek. The on-site drainage system is a combination of belowground pipeline systems fed by catch basins, open channels, and an erosion/sedimentation basin. Treatment is performed by vegetated ditches, grassy swale, and a detention/water quality pond. The SCTP's storm water pollution prevention plan (SWPPP) complies with stormwater NPDES permitting requirements for industrial sites, as required by the State of Washington. The SWPPP will be updated for the Phase 5B Project–Salmon Creek Treatment Plant Improvements (revised) to ensure protection of surface and ground waters and to conform to Clark County's Stormwater Control Ordinance.

2) Could waste materials enter ground or surface waters? If so, generally describe.

All materials stored at the SCTP will either be located indoors or have secondary containment (or both) to prevent entrance into ground or surface waters. Further, the SCTP maintains an industrial NPDES permit that requires a SWPPP to be in place. Therefore, waste materials will not enter ground or surface waters.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The existing storm drain system at SCTP will remain intact. Minor drainage connections will be reestablished.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

The existing SCTP storm drain system will manage stormwater runoff. There will not be a net increase in impervious surface area. Erosion and sediment control measures will be implemented at disturbed soil areas, existing catch basins, and site perimeter, as necessary, during construction.

The Alliance is undertaking water quality monitoring (including dissolved oxygen, temperature, and pH) in the Columbia River (RM 95 to 110) during July-September 2018 and 2019 to provide Ecology with current measurements for water quality assessment and classification of the Columbia River.

4. **Plants**

a. Check the types of vegetation found on the site:

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
____shrubs
X___grass
____pasture
____crop or grain
____orchards, vineyards or other permanent crops.
____wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Managed turf grass.

c. List threatened and endangered species known to be on or near the site.

No threatened or endangered plant species are known to be on or near the site (BergerABAM 2017).

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Managed lawn will be re-established where surfaces are not covered by structures or pavement.

e. List all noxious weeds and invasive species known to be on or near the site.

Noxious weeds do not occur on or near the site. Invasive species, such as reed canarygrass and Himalayan blackberry, occur near and below the OHWE of Salmon Creek. However, invasive species generally will not be disturbed by the proposed project.

5. **Animals**

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

No birds or other animals have been observed or are known to occur at SCTP. Screening and netting have been installed at isolated areas within the plant to prevent nesting and roosting. The following species occur near the project site (CH2M HILL 1995; BergerABAM 2017):

Common Name	Scientific Name
American coot	*Fulica americana*
American crow	*Corvus brachyrhynchos*
American robin	*Turdus migratorius*
American wigeon	*Anas americana*
Belted kingfisher	*Ceryle alcyon*
Black-capped chickadee	*Parus atricapillus*
Brown creeper	*Certhis americana*
Canada goose	*Branta canadensis*
Chestnut-backed chickadee	*Parus rufescens*
Common raven	*Corvus corax*
Dark-eyed junco	*Junco hyemalis*
Double crested cormorants	*Phalacrocorax auritus*
Dusky Canada goose	*Branta canadensis occidentalis*
European starling	*Sturnus vulgaris*
Gadwalls	*Anas strepera*
Golden-crowned kinglet	*Regulus satrapa*
Great blue heron	*Ardea herodias*
Green-winged teal	*Anas crecca*
Gull	*Larus* sp.
MacGillavray' s warbler	*Oporornis tolmiei*
Mallards	*Anas platyrhynchos*
Mourning dove	*Zenaida macroura*
Northern flicker	*Colaptes auratus*
Rock dove	*Columba livia*
Sandhill crane	*Grus canadensis*
Scrub jay	*Aphelocoma coerulescens*
Tundra swan	*Cygnus columbianus*
White fronted goose	*Anser albifrons*
Wood duck	*Aix sponsa*
Beaver	*Castor canadensis*
Coyote	*Canis latrans*
Deer	*Odocoileus hemionus*
Muskrat	*Ondatra zibethica*

Coho salmon, Chinook salmon, steelhead, cutthroat trout, largemouth bass, and numerous non-game fish species rear or migrate in Salmon Creek.

b. List any threatened and endangered species known to be on or near the site.

No threatened and endangered animal species are known to occur at the project site. Animal species listed under the federal Endangered Species Act that may occur in the project vicinity, including the Columbia River, are (BergerABAM 2017):

Common Name	Scientific Name
Streaked horned lark	*Eremophila alpestris strigata*
Yellow-billed cuckoo	*Coccyzus americanus*
Bull trout	*Salvelinus confluentus*
Chinook salmon	*Oncorhynchus tshawytscha*
Chum salmon	*Oncorhynchus keta*
Coho salmon	*Oncorhynchus kisutch*
Sockeye salmon	*Oncorhynchus nerka*
Steelhead	*Oncorhynchus mykiss*
Pacific eulachon	*Thaleichthys pacificus*
North American green sturgeon	*Acipenser medirostris*

c. Is the site part of a migration route? If so, explain.

The SCTP falls within the Pacific Flyway, which is a migratory route for birds. The project site is not on a terrestrial wildlife migration route, and the SCTP is fenced to exclude wildlife.

d. Proposed measures to preserve or enhance wildlife, if any:

The project does not propose measures to preserve or enhance wildlife because it will have virtually no adverse effects on wildlife. The primary clarifier covers will prevent birds from contacting the process liquids.

e. List any invasive animal species known to be on or near the site.

No invasive animal species are known to be on or near the project site.

6. **Energy and Natural Resources**

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

The Phase 5B Project will increase the hydraulic capacity of the SCTP by about 17 percent. Therefore, it is reasonable to estimate that the SCTP will consume about 17 percent more electrical energy after the proposed project.

The incremental increase in effluent flow from 28.3 to 33.1 mgd (30.4 mgd attenuated) will be achieved by increasing process capacity of aeration basins and secondary clarifiers, and the Effluent Pump Station, which will increase the pump horsepower demand.

The RAS chlorination system and biotrickling filter odor control system will be electrically powered and create additional energy demands, but these will be small percentage increases over the energy use by SCTP operation.

The existing power supply and delivery systems at the SCTP can accommodate the additional electrical demand.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No, the project will not affect the potential use of solar energy by adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The upsized effluent pumps will be sufficient for the Phase 5 expansion period, but their motors and impellers can be exchanged to accommodate a larger, 48-inch-diameter effluent pipeline when the SCTP Phase 5A Project comes on line, or replaced for future expansion phases, to avoid potential throw away pump investments that could become obsolete.

The RAS chlorination system and biotrickling filter odor control system are sized to meet the Phase 5 plant needs, but can be expanded to meet changed future needs.

7. **Environmental Health**

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.

The SCTP is not known to be contaminated from present or past uses. Infrequent solid or liquid process overflows are contained and cleaned up to sanitary standards.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are no hazardous chemicals/conditions that might affect project development and design.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

It is possible that toxic or hazardous chemicals may have been used in the construction of structures proposed for demolition. In addition to asbestos or lead-based paint, the structures might contain potentially dangerous or hazardous materials, such as PCB-containing lamp ballasts, caulking, or paint; fluorescent lamps; treated wood; and wall thermostats containing mercury.

The RAS chlorination equipment requires liquid sodium hypochlorite. The package system includes chemical storage and containment. Hypochlorite has a limited shelf life and is readily available. It will be ordered and delivered to the SCTP when needed, so on site storage will be minimal.

Biosolids are generated from solids collected during the main treatment process. By upsizing the SCTP capacity, the plant will be able treat about 17 percent more influent flow. Therefore, the SCTP will generate about 17 percent more biosolids at project completion. However, the proposed digested biosolids dewatering improvements are expected to increase the dewatered cake solids concentration from anaerobically digested biosolids by 3 to 5 percent, reducing the volume of generated biosolids by a similar amount.

Biosolids are a nutrient-rich fertilizer that reduces soil erosion, and provides micronutrients and nitrogen to the soil. Biosolids are regularly removed from the plant and applied to nearby farmlands. During the second week of August through mid-September, biosolids are taken to farms near Woodland. During the remainder of the year, biosolids are hauled to farms near Goldendale.

The project will be constructed in accordance with applicable state and local health and safety regulations. Fuel used in construction equipment will not be stored on site.

4) Describe special emergency services that might be required.

No special emergency services would be required.

5) Proposed measures to reduce or control environmental health hazards, if any:

The Alliance will perform surveys for asbestos-containing material/lead-based paint (ACM/LBP), and other dangerous and hazardous materials and wastes, at structures proposed for demolition; and prepare and implement a hazardous materials handling plan, as appropriate. Dangerous and hazardous materials and wastes will be removed and appropriately managed prior to structure demolition.

The plant operates under a rigorous spill prevention, containment, and countermeasures plan. Standard construction safety measures will be implemented to reduce or control environmental hazards and accidents.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

The project will not be affected by noise in the SCTP area.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

During construction, a variety of equipment will be used for material delivery, grading, lifting, and clean up; and may include flat beds, dump trucks, cement trucks, loader, trackhoe/excavator, scissor lift, crane, jackhammer, impact wrenches, pumps, and compressors.

Existing noise at the SCTP includes normal plant operations and maintenance, including a variety of service vehicles, and will not be measurably different after the project. Although noise from the existing clarifiers is negligible, the proposed covers will reduce the noise.

3) Proposed measures to reduce or control noise impacts, if any:

Construction will be limited to daytime hours, and operation of construction equipment will meet Clark County noise ordinance requirements. There are no residences within 200 feet of the proposed Phase 5B Project–Salmon Creek Treatment Plant Improvements (revised).

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The SCTP is an existing public utility use. Immediately north and east of the SCTP is the Salmon Creek floodway and floodplain. The area immediately east of the SCTP is a forested, undeveloped hillslope forming the Salmon Creek ravine. The area immediately west of the SCTP is a common property access to Salmon Creek, the BNSF Railway, the Salmon Creek floodway and floodplain, and pasture land. South of the SCTP is undeveloped forested hillside and the developing Ashley Ridge residential neighborhood. The nearest residence to the plant is approximately 360 feet to the south.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

The project site does not contain working farmlands or working forest lands, and none will be converted.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

The project site will not be affected by working farm or forest land business operations.

c. Describe any structures on the site.

The SCTP contains facilities associated with wastewater treatment, including the process control buildings, preliminary treatment and primary treatment facilities, secondary clarifiers, aeration basins, blower building, RAS/WAS pump station, effluent pump station, anaerobic digesters, and other process facilities.

d. Will any structures be demolished? If so, what?

Secondary Clarifier #2 and the former Control Building (Building 87) will be demolished.

The headworks stairs will be replaced, and the utility conduits at the Biotrickling Filter site will be relocated. The existing carbon system structure will be demolished.

e. What is the current zoning classification of the site?

The current zoning classification of the site is PF (Public Facility).

f. What is the current comprehensive plan designation of the site?

The current comprehensive plan designation of the site is PF (Public Facility).

g. If applicable, what is the current shoreline master program designation of the site?

The current shoreline master program designation of the site is Aquatic/Urban Conservancy.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

The project site lies within designated Priority Species Buffer and Priority Habitat and Species Area (i.e., Riparian Habitat Conservation Area). The project site does not contain Wetlands, nor does it contain Floodway, Floodway Fringe, or 500 Year Flood Area. The project site is outside Priority Habitat Buffer.

i. Approximately how many people would reside or work in the completed project?

No people reside at the project site. The SCTP employs about 14 personnel.

j. Approximately how many people would the completed project displace?

The project will not displace people.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project will obtain a Shoreline permit from Clark County. The county will determine the type of Shoreline permit required.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

Not applicable.

9. **Housing**

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low income housing.

No housing will be provided by the project.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

No housing will be eliminated by the project.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable.

10. **Aesthetics**

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The new concrete secondary clarifier and aeration basin will be similar in form, appearance, and height to existing structures at SCTP.

The primary clarifiers will be covered by aluminum sheathing supported by an integral frame. The sheathing will not materially change the heights of the primary clarifiers.

The biotrickling filter odor control system will be primarily composed of two vertical painted filter vessels, duty and standby fan enclosures, and piping. The filter chambers will stand about 25 feet tall.

The RAS chlorination system will be portable, skid-mounted, unsheathed mechanical equipment that will be stored in the old control building. The pump skid and tote will be placed in the old chlorine storage room when unused.

The additional blower system, Effluent Pump Station, modifications, and Solids Dewatering improvements will be installed in existing structures and not visible.

b. What views in the immediate vicinity would be altered or obstructed?

No protected views would be altered or obstructed in the immediate project vicinity.

c. Proposed measures to reduce or control aesthetic impacts, if any:

The aluminum sheathing over the primary clarifiers will have low reflectivity. Otherwise, no measures to reduce or control aesthetic impacts are proposed because no impacts are expected.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Low-level night lighting has been installed at the SCTP to ensure public safety, and no changes to lighting are proposed. Security night lighting is internally focused using sodium vapor illumination. No new sources of glare will be created.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No new sources of light or glare are proposed.

c. What existing off-site sources of light or glare may affect your proposal?

The project will not be affected by existing off-site sources of light or glare.

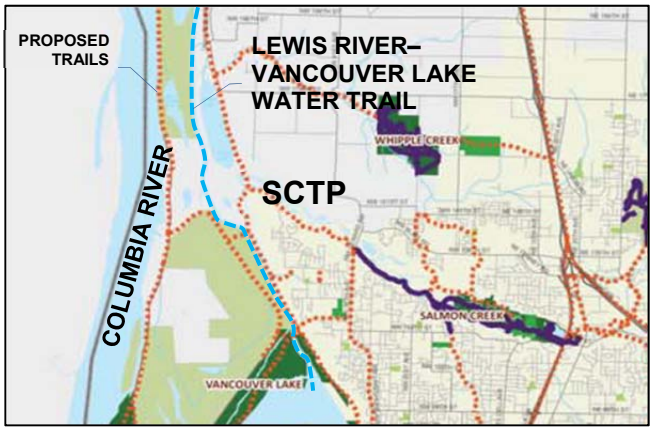
d. Proposed measures to reduce or control light and glare impacts, if any:

No measures to reduce or control light and glare impacts are proposed because no impacts are expected.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

The SCTP property is publicly owned, but public entry is prohibited. The area around the SCTP is privately owned and without developed recreation uses. Tax parcel #986038501, owned by the Ashley Ridge Homeowner Association, currently is developing and will provide recreational access to Salmon Creek.



The Clark County Regional Trails map shows a proposed pedestrian trail running along the SCTP and connecting to the regional trail network (Clark County 2015).

The Columbia River, Lake River, and Salmon Creek are state-owned aquatic lands and utilized as a public resource for recreation such as fishing, boating, and bird watching. The Lewis River–Vancouver Lake Water Trail is an existing designated 32-mile-long water trail that follows Lake River between Lewis River and Vancouver Lake (Vancouver-Clark Parks and Recreation 2013).

b. Would the proposed project displace any existing recreational uses? If so, describe.

The project will not displace existing recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No measures to reduce or control recreation impacts are proposed because no impacts are expected.

13. Historic and Cultural Preservation

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.

The SCTP was originally constructed during 1974-76, and has undergone several improvements and expansions. None of the buildings or structures are over 45 years old.

The BNSF Railway, Northwest Division, Seattle Subdivision, Line Segment 52, recommended for listing in the National Register of Historic Places (NRHP), lies outside the proposed project's Area of Potential Effect (APE).

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Archaeological Investigations Northwest, Inc. (AINW) conducted a cultural resource survey of the APE for the Alliance. A preliminary survey report was submitted to the USACE in 2017.

Pre-contact site 45CL98 was documented during the preliminary archaeological evaluation prior to construction of the SCTP (Munsell 1974). There is no map available showing the extent of the 1974 project area. A subsequent survey by Blukis Onat and Starkey (1979) did not relocate the resource, which may have been destroyed; the significance or extent of the site was never determined.

Pre-contact site 45CL99 (was 45CL99/45CL435) lies outside the proposed project's APE. Also, the NRHP-listed Vancouver Lakes Archaeological District lies outside the project APE.

Several Native American Tribes have an active presence in Clark County. Under established treaty rights, federally recognized Tribes have rights to the annual salmon harvests within the Columbia River and tributary streams. Salmon runs rely on habitat within the Clark County jurisdiction shorelines and watersheds. Tribes with usual and accustomed territory within Clark County include:

- Cowlitz Indian Tribe, Washington – Area throughout Clark County is usual and accustomed territory
- Confederated Tribes and Bands of the Yakama Nation, Washington – South-central Washington
- Chinook Tribe – Not currently federally recognized

Tribes with usual and accustomed territory on shorelines adjacent to Clark County and/or within the upstream Columbia River Basin downstream of the Bonneville Dam include:

- Confederated Tribes of the Grand Ronde Community of Oregon – Usual and accustomed territory extending throughout the Grand Ronde area of Oregon
- Confederated Tribes of the Siletz Reservation, Oregon – Usual and accustomed territory in Western Oregon

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Karla Hotze and Eva Hulse of AINW prepared the Cultural Resource Survey for the Columbia River Outfall and Effluent Pipeline Project, Clark County, Washington on December 30, 2016. Their report covers the SCTP, and reports that archaeological site 45CL98, which was lithic scatter, had been previously destroyed during construction of the wastewater treatment plant. The location, significance, or extent of the site was never determined, and archaeological deposits matching the description and location of 45CL98 were not identified within the project APE.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

The project will perform deep excavation of the existing site for construction of Secondary Clarifier #5 and Aeration Basin #7, such that native substrate would be disturbed or exposed.

Alliance will perform a professional archaeological survey of the APE prior to ground-disturbing activities. RCW 27.44 and RCW 27.53.060 require that a person obtain a permit from the DAHP before excavating, removing,

or altering Native American human remains or archaeological resources in Washington. The completed survey will be submitted to the Department of Archaeological and Historic Preservation (DAHP) and the interested Tribes prior to ground disturbance. Concerned Tribes' cultural committees and staff will be consulted regarding cultural resource issues.

The Alliance will prepare a site protection plan to address measures being taken to avoid impacts to archaeological sites, and an inadvertent discovery plan to outline procedures to be followed if there is an archaeological discovery during construction.

14. **Transportation**

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The SCTP is not open to the public. The project site is accessed via McCann Road. The closest principal arterial is NW 36th Avenue. No new street access is proposed.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No, the site is not served by public transit.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

The proposed project will not add or eliminate parking spaces.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

The proposed project will not add or improve roads, streets, pedestrian, bicycle or state transportation facilities.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project will not use water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

The project will not generate any additional employee vehicular trips per day. The facility improvements will be operated by existing personnel. From the second week of August through mid-September, when about half of the biosolids are taken to farms near Woodland, the number of daily truck trips may increase by 2-3 trips. During the remainder of the year, biosolids hauling to farms near Goldendale may increase by about 10 percent.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The project will not interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area.

h. Proposed measures to reduce or control transportation impacts, if any:

No measures to reduce or control transportation impacts are proposed because impacts are expected to be minor.

15. **Public Services**

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

No increase in the need for public services will occur because of the project.

b. Proposed measures to reduce or control direct impacts on public services, if any.

No measures to reduce or control public services impacts are proposed because no impacts are expected.

16. **Utilities**

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other_____

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No new utilities are needed for the proposed project, which will rely on existing electrical and other services.

C. Signature

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: 

Name of signee: Steve Mader

Position and Agency/Organization: Environmental Manager at Jacobs Engineering.

Date Submitted: September 6, 2018

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • (360) 407-6300
711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

September 28, 2018

John M. Peterson, PE
Discovery Clean Water Alliance
c/o Clark Regional Wastewater District
Administrative Lead
PO Box 8979
Vancouver, WA 98668-8979

Dear Mr. Peterson:

Thank you for the opportunity to comment on the revised determination of nonsignificance for the Phase 5B Project – Salmon Creek Treatment Plant Improvements Project (2015-Alliance-01) located at 15100 Northwest McCann Road in Vancouver. The Department of Ecology (Ecology) reviewed the environmental checklist and has the following comment(s):

AIR QUALITY/GREENHOUSE GASES: Gail Sandlin (360) 407-6800

It is unclear from the information provided what impact, if any, the wastewater treatment plant improvements would have on greenhouse gas emissions. For questions or technical assistance, contact Gail Sandlin at the number provided above.

Ecology's comments are based upon information provided by the lead agency. As such, they may not constitute an exhaustive list of the various authorizations that must be obtained or legal requirements that must be fulfilled in order to carry out the proposed action.

If you have any questions or would like to respond to these comments, please contact the appropriate reviewing staff listed above.

Department of Ecology
Southwest Regional Office

(MLD:201805115)

cc: Gail Sandlin, AQP/GHG

Discovery Clean
Water Alliance

8000 NE 52nd Court
Vancouver, WA 98665
360.993.8823
www.DiscoveryCWA.org

November 16, 2018

Gail Sandlin, AQP/GHG
Southwest Regional Office
Washington Department of Ecology
PO Box 47775
Olympia, Washington 98504-7775

Subject: SEPA DNS 002-2018
Phase 5B Project – Salmon Creek Treatment Plant Improvements (revised)
Discovery Clean Water Alliance

The Discovery Clean Water Alliance (Alliance) appreciates your review of our State Environmental Policy Act (SEPA) checklist and Determination of Nonsignificance (DNS) for the Phase 5B Project – Salmon Creek Treatment Plant Improvements (revised). Following the close of the SEPA comment period on September 14th, 2018, the Alliance decided to retain the DNS and implement the proposed action.

The project proponent is now completing the Engineering Report for Ecology per WAC 173-240-060. As design development proceeds, the project will further consider potential impacts of proposed wastewater treatment plant improvements on greenhouse gas emissions. The Salmon Creek Treatment Plant (SCTP) operates under SWCAA Minor Source Air Discharge Permit No. 07-2726. Emissions-generating equipment includes boilers; digester waste gas burner; headworks, clarifiers, and aeration tanks (fugitive emissions); scum concentrator; sludge blend tank; and emergency generators. The permit stipulates emissions limits for nitrogen oxides, carbon monoxide, and sulfur dioxide.

We expect the greenhouse gas (GHG) emissions to increase with the proposed increase in the plant's wastewater treatment capacity, which will be about 17 percent. The increase will be due to treatment of the wastewater as well as increased combustion of methane digester gas at the existing SCTP digester waste gas burner. Existing emissions controls – low-NOx burners, low-NOx designs, carbon canisters, biological packed tower, diesel engines meeting EPA relevant Tier emission standards and operated only for maintenance checks, and readiness testing for emergencies – will continue to provide reductions in GHG emissions. In addition, proposed measures to capture and treat existing fugitive emissions will further reduce GHG emissions.

The Alliance will perform air emissions modeling and quantify the emissions for the proposed SCTP capacity increase, which SWCAA requested to modify the Alliance's air discharge permit. However, no modeling of greenhouse gases is anticipated for air discharge permitting because no thresholds will be triggered.

Thank you for your comments on operational greenhouse gas emissions, as we enter the next phase of project planning.

Sincerely,

Dale Lough, P.E.
Alliance Capital Program Manager
Clark Regional Wastewater District

Administrative Lead
Discovery Clean Water Alliance

Copy: John Peterson, P.E./Clark Regional Wastewater District
Jamie Dooley, P.E./Jacobs

WAC 197-11-600

SEPA ADDENDUM TO DETERMINATION OF NONSIGNFICANCE PHASE 5B PROJECT— SALMON CREEK TREATMENT PLANT IMPROVEMENTS (REVISED)

Ecology SEPA No. 201805115

Alliance SEPA DNS 001-2018

Purpose of Addendum:

This is an addendum to the Determination of Non-Significance (Ecology SEPA No. 201805115) for the Phase 5B Project—Salmon Creek Treatment Plant Improvements (Revised). This addendum addresses additions to the original project description relating to repairs, relocations, and upgrades to existing facilities and processes at Salmon Creek Treatment Plant (SCTP).

The addendum is prepared under State Environmental Policy Act (SEPA) provisions for amending or modifying an existing environmental document (WAC 197-11-600) and addresses additional information or analysis that does not substantially change the analysis of significant impacts and alternatives in the existing environmental document (WAC 197-11-706). The Discovery Clean Water Alliance adopted agency SEPA procedures by Resolution No. 2013–10.

Name of Project:

Phase 5B Project—Salmon Creek Treatment Plant Improvements (Revised)

Project Location:

15100 Northwest McCann Road, Vancouver, Washington 98685

Proponent and Lead Agency:

Discovery Clean Water Alliance, 8000 NE 52nd Court, P.O. Box 8979, Vancouver, WA 98668-8979

Contact Person, Telephone, E-Mail:

Brady Fuller, P.E., Consultant Project Manager, Jacobs, (541) 318-4716, Brady.Fuller@jacobs.com

Type of the Environmental Document Originally Prepared:

- SEPA Environmental Checklist issued September 6, 2018
- SEPA Determination of Non-Significance issued September 14, 2018

Action Originally Proposed:

The Phase 5B Project – Salmon Creek Treatment Plant Improvements (revised) addresses facility wastewater loading and treatment capacity. Also, the project includes minor facility improvements unrelated to treatment capacity analysis. Specifically, the project includes:

1. Increase the capacity of the Salmon Creek Treatment Plant to accommodate an incremental BOD_5/TSS capacity increase and an inflow increase from 14.95 to 17.50 million gallons per day (mgd).
2. Retrofit odor control improvements at the preliminary treatment and primary treatment facilities.
3. Construct Aeration Basin #7.
4. Add blower system.
5. Demolish Secondary Clarifier #2.
6. Construct Secondary Clarifier #5.
7. Demolish former Control Building (Building 87).
8. Add Return Activated Sludge (RAS) Chlorination.
9. Add and replace RAS Pumps.
10. Modify Effluent Pump Station.
11. Improve Solids Dewatering.
12. Construct and relocate Yard Piping.

Increase Wastewater Treatment Capacity. Ecology requires that Salmon Creek Treatment Plant (SCTP) schedule capacity improvements when actual influent flow or waste load reaches 85% of the rated capacity or the design capacity will be reached within 5 years, as relates to the facility loading design criteria for flow, biochemical oxygen demand (BOD) load, or total suspended solids (TSS) load, specified in the in the facility's National Pollutant Discharge Elimination System (NPDES) permit. Increasing the facility's treatment capacity requires modified unit processes, process controls, and monitoring for the operation and maintenance of the plant, but will not require any additional levels of operator certification or staffing. Ecology must reissue the SCTP's NPDES Permit No. WA0023639 to allow the 17 percent increase in effluent flows.

Odor Control Improvements. Based on updated air dispersion model results, additional odor control measures are needed to satisfy the 0.9 milligram per cubic meter (mg/m^3) requirement for toxic air pollution control at the SCTP, and achieve odor and hydrogen sulfide (H_2S) target thresholds for existing and new sensitive receptors outside the SCTP boundary. Therefore, odor control improvements will be implemented to reduce discharges of materials and odors to the atmosphere. The grating over the existing preliminary treatment facility (headworks) will be replaced with checkered plate, and the existing primary treatment facility (primary clarifiers) will be covered and fitted with air intake louvers. The preliminary treatment facility and primary clarifiers will be ventilated to a vapor phase biotrickling filter odor control system installed adjacent to the primary clarifiers. The odor control system will consist of two filter vessels, duty and standby fan enclosures, and piping occupying a 1,300-square-foot concrete foundation pad. Prior to constructing the foundation, existing utility piping under the biotrickling filter system site will be relocated to avoid conflicts. Also, new existing stairs will be provided to the odor control system. The new odor control biotrickling filter will run continually, and require daily operational monitoring like that performed at the existing biofilter that treats air off the headspace of the existing sludge blend tank. The instrumentation and equipment associated with the new biotrickling filter will be like other instrumentation and equipment on site. Operations and maintenance staff can accommodate the operations and maintenance within the existing staffing framework. The existing carbon system at the SCTP, located immediately east of the existing PE/RAS Mixing Box, is no longer needed for plant operations and will be removed from the plant site.

Construct Aeration Basin #7. Construct new 180-foot x 40-foot concrete Aeration Basin #7. The structure will be aligned adjacent to existing aeration basins, and extend about 18 feet below the existing ground surface. The southern end will be supported by a concrete retaining wall.

Add Blower System. Add a new 4,500 standard cubic feet per minute (SCFM) blower system to the existing Blower Building, without ground disturbance. The blower system will enhance air delivery to the aeration basins.

Demolish Secondary Clarifier #2. Remove 90-foot-diameter Secondary Clarifier #2 to make space for the new Aeration Basin #7.

Construct Secondary Clarifier #5. Construct new 120-foot-diameter concrete Secondary Clarifier #5. The structure will be adjacent to existing Secondary Clarifier #4, and extend about 15 feet below the existing ground surface.

Demolish Former Control Building. Remove the former Control Building, presently used for storage, to make space for the new Secondary Clarifier #5.

Add Return Activated Sludge (RAS) Chlorination System. Install a new liquid chlorine (sodium hypochlorite) system to improve settleability during sludge bulking events and improve the associated performance of the secondary clarifiers, and to control filamentous organisms in the activated sludge system. All work will occur in the existing RAS/WAS Pump Station without ground disturbance. The improved return activated sludge (RAS) chlorination equipment will reduce the risk of losing sludge inventory from high or overflowing sludge blanket levels in the secondary clarifiers. The liquid sodium hypochlorite system and appurtenances, which include chemical storage and containment, will dilute the hypochlorite and measure flow, minimizing the need for additional infrastructure and operator involvement during filamentous process upsets. Hypochlorite has a limited shelf life and is readily available. On site storage will be minimal because the liquid will be ordered and delivered when needed. To accommodate the RAS chlorination system, the RAS injection point within the RAS/WAS Pump Station will be relocated

downstream of all secondary clarifiers, and an injection quill for improved introduction of chlorine solution will be added.

Add and Replace RAS Pumps. Replace RAS Pumps 1, 3, 4, 5, and 6; remove RAS Pump 2; and install new RAS Pumps 7 and 8. All work will occur in the existing RAS/WAS Pump Station without ground disturbance. Replacement of existing RAS pumps with larger pumps will give SCTP the ability to remove more RAS from the secondary clarifiers.

Modify Effluent Pump Station. Perform an interim operational adjustment at the existing effluent pump station to incrementally increase hydraulic capacity of the existing 30-inch-diameter effluent pipeline from a firm rating (peak-hour influent flow) of 28.3 mgd to 33.1 mgd. Peak-hour effluent flow will be about 30.4 mgd due to an 8 percent attenuation of peak influent flow across the plant. The project will achieve this increase by replacing two existing effluent pumps with larger pumps. All work will occur in the existing Effluent Pump Station without ground disturbance. The SCTP's effluent system normally operates with flow conveyed by gravity to the Columbia River, but under conditions when the river level and/or effluent flow is high, effluent pumping is required to convey effluent flows.

Improve Solids Dewatering. The project will optimize the biosolids dewatering process at the anaerobic digester tanks to improve dewatered cake concentration and overall dewatering performance without replacing the existing equipment. Improved dewatering and thickening will be performed by conditioning the sludge prior to thickening to flocculate the biomass. The process will remove bound water through the injection of pressurized air. Air diffused into the sludge aids flocculation, which yields denser floc and facilitates the dewatering process. This pretreatment process can increase the dewatered cake solids concentration from anaerobically digested biosolids by 3 to 5 percent. Other benefits of the process are 20 to 30 percent lower polymer consumption and extremely clear filtrate. The aeration equipment will be installed in the existing Solids Processing Center without ground disturbance, and have a footprint of only 4 feet by 6 feet.

Construct and Relocate Yard Piping. Where existing utilities and conduits lie belowground, below the existing Secondary Clarifier #2, they will be relocated to a new alignment that avoids conflict with existing or future structures.

Project Refinement:

The Alliance has continued to refine the Project in response to comments received from Ecology during review of the draft Engineering Report and work scheduling constraints. All project elements evaluated under the Phase 5B Project DNS (Ecology SEPA No. 201805115) remain proposed without change. Project changes that have arisen through refinement include the following additional improvements at the Salmon Creek Treatment Plant:

1. Perform upgrades to existing Aeration Basins 5 and 6
2. Install Secondary Clarifier launder covers
3. Implement Solids Processing Center odor control improvements
4. Replace and add pipe supports in the Solids Processing Center
5. Replace the canopy at the Disinfection Facility
6. Replace enclosure at existing Waste Gas Incinerator controls
7. Construct Oil and Lubricant Storage Building
8. Complete perimeter security fence

The current Project description, shown as two design packages, is shown in Figures 1 and 2.

Perform Upgrades to Existing Aeration Basins 5 and 6. Baffles will be added to Aeration Basins 5 and 6 to improve mixing and to minimize short circuiting in the basins. Also, a sump-style baffle will be placed around the mixed liquor recycle pump inlets to minimize entrainment of air bubbles in mixed liquor that enters the pump suction and caused the pumps to be operated intermittently at full speed due to difficulty with air binding. An ammonia probe will be added in each of the aerobic zones to allow SCTP staff to control the aeration rate based on ammonia levels and optimize electrical energy. An oxidation-reduction potential meter will be installed in the anoxic zones to monitor and optimize the anoxic environment.

Install Secondary Clarifier Launder Covers. The Alliance will install full-width corrosion-resistant fiberglass-reinforced plastic covers over the launders, scum baffles, and effluent weirs in existing Secondary Clarifiers 3 and 4 to impede algae growth.

Implement Solids Processing Odor Control Improvements. Major odor sources from the Solids Processing Center will be connected to a new carbon adsorber odor control system. The 480 ft^2 treatment system will be west of the biosolids storage bunkers and address regulatory requirements for air discharges. Existing exhaust fans will be removed, and balancing dampers will be added to each source. Two fans arranged in a duty and standby arrangement will be designed so that adequate redundancy is provided. The odorous air duct will be routed through the bunkers and use the existing structure for support. The ground disturbance area will be about 1,940 ft^2.

Replace and Add Pipe Supports in the Solids Processing Center. New and replacement lateral pipe and conduit support bracing will be added to the existing Solids Processing Center because a few existing interior supports do not meet current seismic bracing requirements of the building code.

Replace the Canopy at the Disinfection Facility. The existing ~350 ft^2 wooden canopy over the ultraviolet (UV) disinfection channels will be replaced with a new canopy with a mono-slope roof, standing seam metal roofing panels, and metal gutters and downspouts over steel columns, beams, and framing members. The existing basin walls will serve as foundation support for the new canopy, with minor additional concrete foundation work, as required.

Replace Enclosure at Existing Waste Gas Incinerator Controls. The Alliance will replace the existing ~196 ft^2, 14-foot-tall metal-framed enclosure around the waste gas incinerator controls to provide an occupancy- and building-code-compliant structure. The enclosure will have insulated metal exterior wall panels on metal wind girts, with a mono-sloped roof of insulated metal roof panels over metal purlins. The existing concrete equipment pad will be incorporated into the foundation of the new structure, but minor additional concrete foundation work may be required. The colors will be coordinate with other existing plant structures. The light and power design will follow the Class 1, Division 1, Group D electrical classification. Supplemental safety provisions will include combustible gas detection, space alarming, and entry alarming.

Construct Oil and Lubricant Storage Building. A new dedicated 546 ft^2 facility for storage of the oil and lubricant (Facility 89) will be constructed north of the existing blower building (Facility 37). This facility will replace existing oil and lubricant storage inside Facility 87 (former Control Building). Facility 89 will be designed to house the oil and hazardous materials in compliance with International Fire Code Table 5003.1.1(1), which specifies quantities and methods. It will be an insulated concrete masonry unit structure with split-faced exterior wall surfaces matching the existing Blower Building and with EPDM single-ply membrane roofing material. The building will store hazardous materials, including gasoline, lubricants, motor oil and paint products.

Add Perimeter Security Fence. Construct about 2,600 linear feet of perimeter security fence at portions of the southern, western, and northern property line.

Analysis of Environmental Effects:

All proposed repairs, replacements and process improvements covered by this SEPA addendum to the DNS are within the existing SCTP, which is within the Clark County public facilities (PF) zone. Most of the work will be performed within existing structures. The repairs, replacements and improvements will be state-of-the-art and bring existing facility operations up to code. The improvements will not exceed Clark County height, location, or size thresholds. None of the repairs, replacements or improvements covered by this addendum will increase the capacity of the Salmon Creek Treatment Plant to treat wastewater or increase effluent discharges.

The addendum improvements will not increase the overall SCTP site. Most of the plant site is underlain by structural fill. Ground surface disturbances will be about 10,400 ft^2, not including treatment plant surfaces that will be used for temporary construction access, equipment staging, vehicle parking, and equipment laydown. Additionally, about 2,600 linear feet of perimeter security fence will be installed along the previously filled and capped portion of the western property line, the undeveloped portion of the

southern property line immediately south of an existing unpaved east-west access road, and adjacent sections without apparent pre-development, with up to 12,590 ft^2 of temporary ground disturbance.

The addendum work will not contribute to additional air emissions. However, odor control improvements at the Solids Processing Center will address regulatory requirements for air discharges.

No addendum work will occur over or in waters, wetlands, or 100-year floodplain. Addendum disturbances will be above the ordinary high water line of Salmon Creek, and at locations posing no hazard to water quality.

No new functionally impervious surfaces will be created. Although minor adjustments in erosion and sediment control measures will be needed for the additional work, the entire plant site is within a contained collection system that facilitates stormwater conveyance and capture. The Oil and Lubricant Storage Building will not contain hazardous materials that are not currently stored on site at the former Control Building, but the new storage building will be farther from Salmon Creek and comply with the compliance with International Fire Code.

No special status plants or animals or priority habitats are known to occur within the treatment plant, and none will be affected.

The carbon adsorber odor control system and balancing dampers/fans at the Solids Processing Center will be electrically powered and create additional energy demands, but these will be small percentage increases over the energy use by SCTP operation and at least partially offset by removal of existing ventilation fans and electrical energy optimization from the aeration basin upgrades.

No additional environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste have been identified. However, the Alliance will perform surveys for asbestos-containing material/lead-based paint (ACM/LBP), and other dangerous and hazardous materials and wastes, at structures proposed for demolition; and prepare and implement a hazardous material handling plan, as appropriate. Dangerous and hazardous materials and wastes will be removed and appropriately managed prior to structure demolition.

Existing noise at the SCTP includes normal plant operations and maintenance, including a variety of service vehicles, and will not be measurably different after the addendum improvements. Construction will be limited to daytime hours, and operation of construction equipment will meet Clark County noise ordinance requirements. Additional construction noise from addendum activities will be negligible.

The additional proposed improvements within the Urban Conservancy shoreline environment are limited to the carbon adsorber odor control system at the Solids Processing Center and the canopy replacement at the Disinfection Facility, both within the existing plant site, and a section of the perimeter security fence. Per WAC 173-27-040(2)(b), routine repair includes replacements of similar size, shape, and configuration that do not adversely affect shoreline environments. As the carbon adsorber odor control system and canopy replacement improvements in the shoreline environment will be internal to the existing plant and within the existing built footprint, the shoreline environment will not be impacted. These improvements appear to be consistent with the Clark County Normal Maintenance and Repair exemption and, therefore, the need for a shoreline permit is not expected.

The section of the perimeter security fence will be in the Salmon Creek Shoreline environment. The Clark County Code (CCC) protects Salmon Creek (a Type S fish-bearing stream) by establishing a habitat conservation zone (riparian area) that extends 250 feet from the ordinary high water line. The trees and woody vegetation within the riparian areas provide forage, nesting, and cover opportunities for resident wildlife, as well as nutrient cycling. The Clark County Shoreline Management Plan views native tree and woody vegetation removal from a functional perspective, with any impacts to function needing to be replaced. However, no trees greater than 20 feet tall will be felled and temporary impacts to riparian areas from clearing vegetation will be restored by establishing a permanent native herbaceous cover and planting low-growing native shrubs within the fence line corridor. Long-term temporary impacts will be nil or discountable because loss of riparian functions will be restored within growing season. Permanent impacts will be discountable because they will be limited to concrete post bases at 10-foot spacing, which will not impede ecological functions.

No housing will be eliminated or provided by the addendum activities.

New and reconstructed structures will blend within the existing SCTP facilities. No protected views will be altered or obstructed in the vicinity of addendum improvements.

No new sources of light or glare are proposed.

The addendum activities will not displace recreational uses because there is no public access to the SCTP site, and no work will occur below the ordinary high water elevation of Salmon Creek.

There are no buildings, structures, or sites on or near the addendum work that are potentially eligible for listing in national, state, or local preservation registers. Karla Hotze and Eva Hulse of AINW prepared an *Archaeological Survey for the Salmon Creek Treatment Plant Phase 5B Project* (AINW Report No. 4149, July 2019) that covers the addendum work at SCTP. The report states that archaeological site 45CL98, reported as lithic scatter, had been previously destroyed during construction of the wastewater treatment plant. The location, significance, or extent of the site was never determined, and archaeological deposits matching the description and location of 45CL98 were not identified within the addendum APE. Multi-component archaeological site 45CL99, much of which was previously capped with fill, was expanded and updated. The significance and integrity of the newly expanded portion of site 45CL99 are unevaluated. Also, one pre-contact archaeological site (18/2750-1) was newly identified, but the significance and integrity of the site remain unevaluated. A DAHP permit will be needed if fence construction cannot avoid sites 45CL99 or 18/2750-1, and if unavoidable, a monitoring and site protection plan and an inadvertent discovery plan with procedures for screening the excavated native soils, and collecting and analyzing recovered artifacts.

The addendum work will not generate additional employee vehicular trips per day. Transportation impacts from proposed addendum activities during construction are expected to be minor.

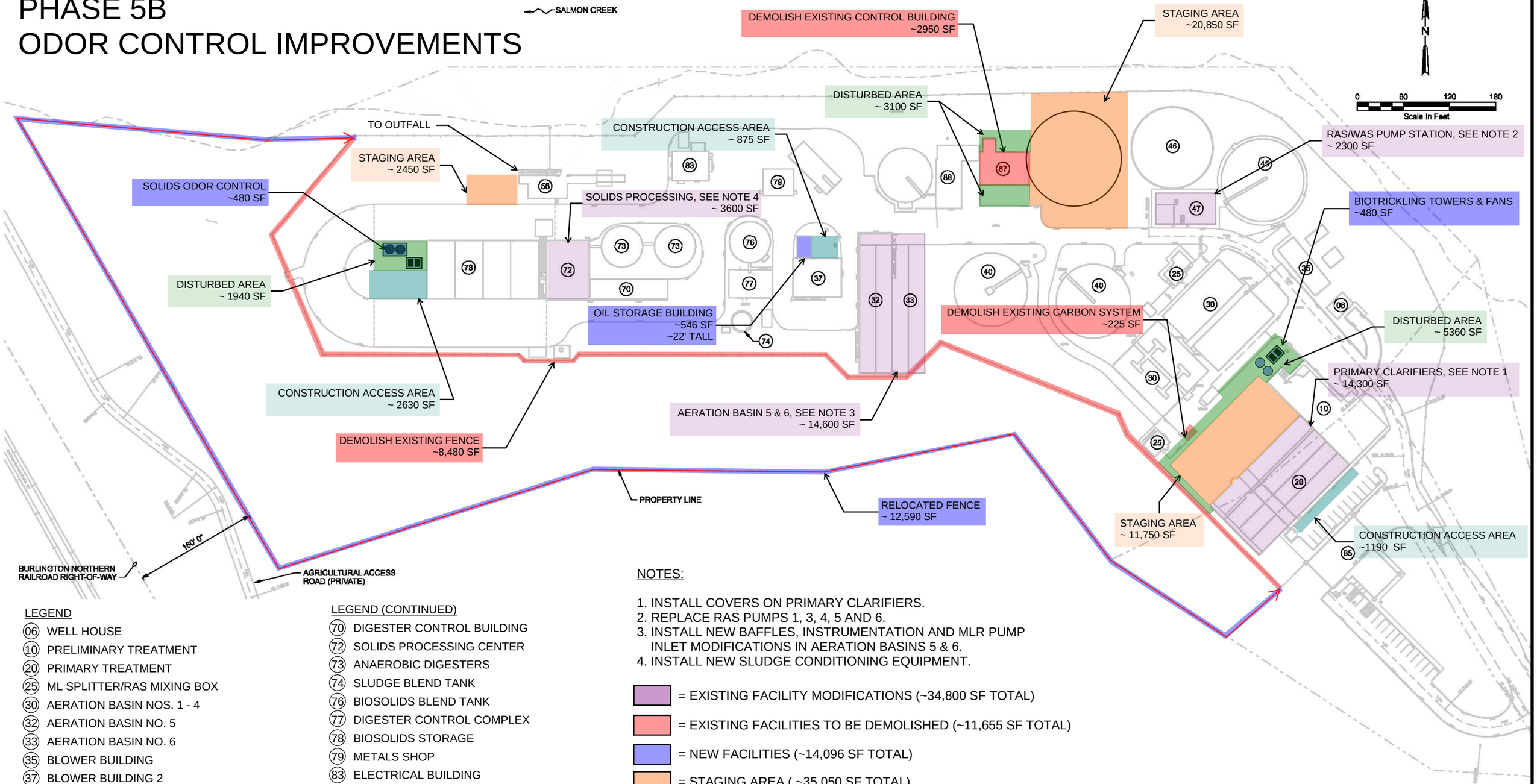
The additional plant improvements will not increase the need for public services. No additional SCTP staff will be needed to operate the addendum facilities.

No new utilities are needed for the proposed additional improvements, which will rely on existing electrical and other services.

Determination:

The additional facility and process repairs, relocations, and upgrades at Salmon Creek Treatment Plant proposed under this addendum to the original Phase 5B Project's SEPA DNS pose no new significant adverse impacts, either directly, indirectly, or cumulatively. Consequently, no further SEPA review is necessary.

FIGURE 1.
PHASE 5B
ODOR CONTROL IMPROVEMENTS



LEGEND

- 06 WELL HOUSE
- 10 PRELIMINARY TREATMENT
- 20 PRIMARY TREATMENT
- 25 ML SPLITTER/RAS MIXING BOX
- 30 AERATION BASIN NOS. 1 - 4
- 32 AERATION BASIN NO. 5
- 33 AERATION BASIN NO. 6
- 35 BLOWER BUILDING
- 37 BLOWER BUILDING 2
- 40 SECONDARY CLARIFIER NOS. 1 AND 2
- 45 SECONDARY CLARIFIER NO. 3
- 46 SECONDARY CLARIFIER NO. 4
- 47 RAS/WAS PUMP STATION
- 55 EFFLUENT PUMP STATION/UV DISINFECTION

LEGEND (CONTINUED)

- 70 DIGESTER CONTROL BUILDING
- 72 SOLIDS PROCESSING CENTER
- 73 ANAEROBIC DIGESTERS
- 74 SLUDGE BLEND TANK
- 76 BIOSOLIDS BLEND TANK
- 77 DIGESTER CONTROL COMPLEX
- 78 BIOSOLIDS STORAGE
- 79 METALS SHOP
- 83 ELECTRICAL BUILDING
- 85 OPERATIONS CENTER
- 87 ORIGINAL PLANT CONTROL BUILDING
- 88 MAINTENANCE/STORAGE BUILDING

NOTES:

1. INSTALL COVERS ON PRIMARY CLARIFIERS.
2. REPLACE RAS PUMPS 1, 3, 4, 5 AND 6.
3. INSTALL NEW BAFFLES, INSTRUMENTATION AND MLR PUMP INLET MODIFICATIONS IN AERATION BASINS 5 & 6.
4. INSTALL NEW SLUDGE CONDITIONING EQUIPMENT.

= EXISTING FACILITY MODIFICATIONS (~34,800 SF TOTAL)

= EXISTING FACILITIES TO BE DEMOLISHED (~11,655 SF TOTAL)

= NEW FACILITIES (~14,096 SF TOTAL)

= STAGING AREA (~35,050 SF TOTAL)

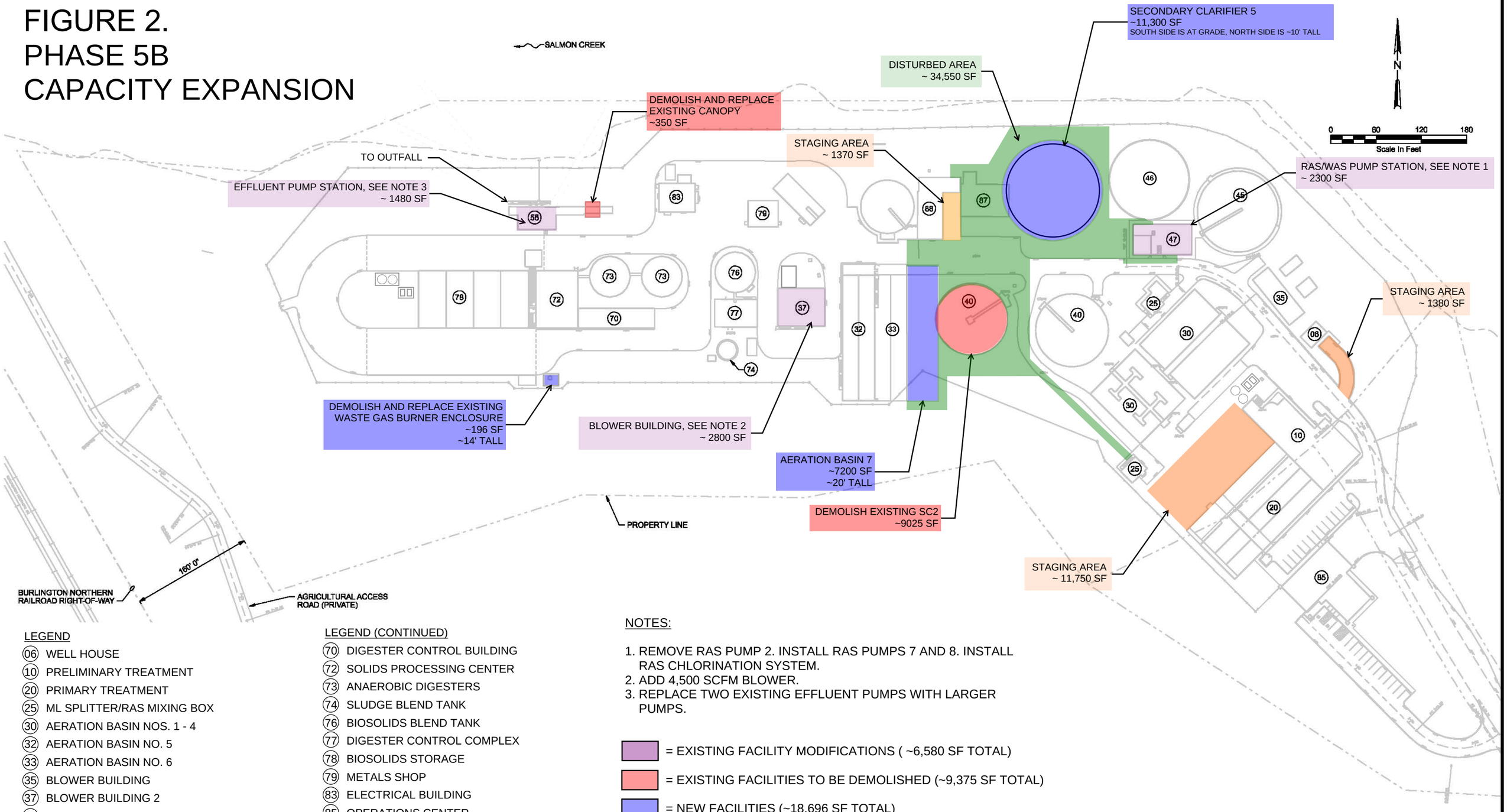
= CONSTRUCTION ACCESS AREA (~4,695 SF TOTAL)
OUTSIDE OF DISTURBED AREAS

= DISTURBED AREAS (~10,400 SF TOTAL)
INCLUDES EXCAVATION FOR NEW CONSTRUCTION, PIPE TRENCHING, NEW PAVING OUTSIDE THE FOOTPRINTS OF NEW AND EXISTING FACILITIES

SALMON CREEK TREATMENT PLANT
PHASE 5B IMPROVEMENTS PROJECT

UPDATED: 2/5/2019

FIGURE 2.
PHASE 5B
CAPACITY EXPANSION



LEGEND

- 06 WELL HOUSE
- 10 PRELIMINARY TREATMENT
- 20 PRIMARY TREATMENT
- 25 ML SPLITTER/RAS MIXING BOX
- 30 AERATION BASIN NOS. 1 - 4
- 32 AERATION BASIN NO. 5
- 33 AERATION BASIN NO. 6
- 35 BLOWER BUILDING
- 37 BLOWER BUILDING 2
- 40 SECONDARY CLARIFIER NOS. 1 AND 2
- 45 SECONDARY CLARIFIER NO. 3
- 46 SECONDARY CLARIFIER NO. 4
- 47 RAS/WAS PUMP STATION
- 55 EFFLUENT PUMP STATION/UV DISINFECTION

LEGEND (CONTINUED)

- 70 DIGESTER CONTROL BUILDING
- 72 SOLIDS PROCESSING CENTER
- 73 ANAEROBIC DIGESTERS
- 74 SLUDGE BLEND TANK
- 76 BIOSOLIDS BLEND TANK
- 77 DIGESTER CONTROL COMPLEX
- 78 BIOSOLIDS STORAGE
- 79 METALS SHOP
- 83 ELECTRICAL BUILDING
- 85 OPERATIONS CENTER
- 87 ORIGINAL PLANT CONTROL BUILDING
- 88 MAINTENANCE/STORAGE BUILDING

NOTES:

1. REMOVE RAS PUMP 2. INSTALL RAS PUMPS 7 AND 8. INSTALL RAS CHLORINATION SYSTEM.
2. ADD 4,500 SCFM BLOWER.
3. REPLACE TWO EXISTING EFFLUENT PUMPS WITH LARGER PUMPS.

= EXISTING FACILITY MODIFICATIONS (~6,580 SF TOTAL)

= EXISTING FACILITIES TO BE DEMOLISHED (~9,375 SF TOTAL)

= NEW FACILITIES (~18,696 SF TOTAL)

= STAGING AREA (~14,500 SF TOTAL)

= DISTURBED AREAS (~34,550 SF TOTAL)
INCLUDES EXCAVATION FOR NEW CONSTRUCTION, PIPE TRENCHING, NEW PAVING OUTSIDE THE FOOTPRINTS OF NEW AND EXISTING FACILITIES

SALMON CREEK TREATMENT PLANT
PHASE 5B IMPROVEMENTS PROJECT

UPDATED: 2/5/2019

- ■ There is no comment period for this DNS Addendum.
- ☐ This DNS Addendum is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.
- ☐ This DNS Addendum is issued under WAC 197-11-625; the lead agency will not act on this proposal for 14 days from the date below. Comments must be submitted by _____.

Lead agency: Discovery Clean Water Alliance

Responsible official: John M. Peterson, PE, General Manager Clark Regional Wastewater District, Administrative Lead for the Discovery Clean Water Alliance

Address: 8000 NE 52nd Court, P.O. Box 8979, Vancouver, WA 98668-8979

Phone: 360-993-8819

Date Issued: **July 8, 2019** Signature: _____

- ☐ You may appeal this determination to _____
  at _____
  no later than _____
  by _____

  You should be prepared to make specific factual objections based on how you or your property is adversely affected by the proposal, any new facts that would be important to and affect the determination, and the reasons why the determination was incorrect. The notice of appeal shall be accompanied by a filing fee of $50.00. Consult Discovery Clean Water Alliance Resolution No. 2013–10 for the procedures for SEPA appeals.
- ■ There is no agency appeal.