SWCAA
Southwest Clean Air Agency

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Vancouver, WA 98682
(360) 574-3058
www.swcleanair.org

January 14, 2020

Mr. Travis Capson
Clark County Public Works
15100 NW McCann Road
Vancouver, Washington 98685

Subject: Final Approval for Phase 5B Package 1 (Odor Control Improvements)

Dear Mr. Capson:

A final determination to issue Air Discharge Permit 20-3379 has been completed for Air Discharge Permit Application CL-3105 pursuant to Section 400-110(4) of the General Regulations for Air Pollution Sources of the Southwest Clean Air Agency (SWCAA). Public notice for Air Discharge Permit Application CL-3105 was published on SWCAA's internet website October 18, 2019. SWCAA did not receive a request for a public comment period in response to the public notice and has concluded that significant public interest does not exist for this determination. Therefore, a public comment period will not be provided for this permitting action. Electronic copies of Air Discharge Permit 20-3379 and the associated Technical Support Document are available for public review in the permit section of SWCAA's internet website (http://www.swcleanair.org/permits/adpfinal.asp). Original copies are enclosed for your files.

This Air Discharge Permit may be appealed directly to the Pollution Control Hearings Board (PCHB) at P.O. Box 40903, Olympia, Washington 98504-0903 within 30 days of receipt as provided in RCW 43.21B.

If you have any comments, or desire additional information, please contact me or Clint Lamoreaux at (360) 574-3058, extension 131.

Sincerely,

Uri Papish
Executive Director

UP: cl
Enclosures

SOUTHWEST CLEAN AIR AGENCY

AIR DISCHARGE PERMIT
SWCAA 20-3379

Issued: January 14, 2020

Facility Name:	Salmon Creek Wastewater Management System
Physical Location:	Main Plant at 15100 NW McCann Road Vancouver, Washington 98685
SWCAA ID:	1834

REVIEWED BY: _____
Paul T. Mairose, Chief Engineer

APPROVED BY: _____
Uri Papish, Executive Director

TABLE OF CONTENTS

1. Equipment/Activity Identification

ID No.	Generating Equipment/Activity	# of Units	Control Measure/Equipment	# of Units
1	4.226 MMBtu/hr Boiler	1	Low-NO_X burners	1
2	5.231 MMBtu/hr Boiler	1	Low-NO_X burners	1
3	Fulton Pulse Boiler	1	None	0
4	Old Digester Waste Gas Incinerator	1	Low-NO_X design	N/A
5	New Digester Waste Gas Burner	1	Low-NO_X design	N/A
6	Caterpillar Emergency Generator Engine	1	Ultra-low sulfur diesel	N/A
7	36th Avenue Pump Station Generator Engine	1	Ultra-low sulfur diesel	N/A
8	Cat Emergency Generator Engine #1	1	Tier 2 engine design, ultra-low sulfur diesel	N/A
9	Flow Augmentation Pump Engine #1	1	Tier 3 engine design, ultra-low sulfur diesel	N/A
10	Flow Augmentation Pump Engine #2	1	Tier 3 engine design, ultra-low sulfur diesel	N/A
11	117th Street Pump Station Emergency Generator Engine	1	Tier 2 engine design, ultra-low sulfur diesel	N/A
12	117th Street Pump Station Ventilation	1	Carbon adsorber system, liquid sulfide control system	1
13	36th Avenue Pump Station Ventilation	1	Biofilter	1
14	Sludge Blend Tank	1	Biotrickling filter	1
15	Preliminary / Primary Treatment (headworks, primary clarifiers, primary effluent / RAS mixing box, force main vent)	1	Biotrickling Filters	2
16	Solids Handling (thickened waste activated sludge wet well fan, belt filter presses, filtrate wet well, hopper vent, biosolids conveyor)	1	Carbon Adsorbers	2
17	Fugitive Emissions (Including six aeration basins, four secondary clarifiers, UV filtration, and effluent pump station)	1	None	0

2. Permit Terms and Conditions

The following tables detail the specific terms and conditions of this permit. In addition to the requirements listed below, equipment at this facility may be subject to additional federal, state, and local regulations. The permit term or requirement number is identified in the left hand column. The permit term or requirement is contained in

the middle column. The emission unit, equipment, or activity (by identification No.) to which the permit term or condition applies is identified in the right hand column.

Air Discharge Permit 07-2726 and the approval for Small Unit Notification SUN-055 are superseded in their entirety by this Air Discharge Permit.

Emission Limits

No.	Emission Limits	Equipment/ Activity
1.	Facilitywide emissions of sulfur dioxide must not exceed 8.94 tons per year.	Facilitywide
2.	Emissions from the 4.226 MMBtu/hr Boiler must not exceed any of the following: Pollutant / Emission Concentration (1-hour average, each) / Annual Emissions Nitrogen oxides / 30 ppmvd @ 3% O_2 / 0.70 tons per year Carbon monoxide / 50 ppmvd @ 3% O_2 / 0.71 tons per year Sulfur dioxide / 0.50 lb/MMBtu / 8.90 tons per year Annual emissions must be calculated using the most recent source emissions test results and the amount of each fuel burned. If source emission testing has not been conducted for a specific fuel, annual emissions for that fuel must be calculated using the emission factors presented in the Technical Support Document for this Air Discharge Permit.	1
3.	Emissions from the 5.231 MMBtu/hr Boiler must not exceed any of the following: Pollutant / Emission Concentration (1-hour average, each) / Annual Emissions Nitrogen oxides / 30 ppmvd @ 3% O_2 / 0.83 tons per year Carbon monoxide / 50 ppmvd @ 3% O_2 / 0.85 tons per year Sulfur dioxide / 0.50 lb/MMBtu / 8.90 tons per year Annual emissions must be calculated using the most recent source emissions test results and the amount of each fuel burned. If source emission testing has not been conducted for a specific fuel, annual emissions for that fuel must be calculated using the emission factors presented in the Technical Support Document for this Air Discharge Permit.	2
4.	Emissions from the old digester waste gas incinerator must not exceed any of the following: Pollutant / Emission Concentration (1-hour average) / Annual Emissions Nitrogen oxides / 0.06 lb/MMBtu / 1.07 tons per year Carbon monoxide / 0.30 lb/MMBtu / 5.35 tons per year Sulfur dioxide / 0.50 lb/MMBtu / 8.90 tons per year Annual emissions must be calculated using the most recent source emissions test results and the amount of gas burned. If source emission testing has not been conducted, annual emissions must be calculated using the emission factors presented in the Technical Support Document for this Air Discharge Permit.	4

<table>
<tr><th>No.</th><th>Emission Limits</th><th>Equipment/ Activity</th></tr>
<tr><td>5.</td><td>Emissions from the new digester waste gas burner must not exceed any of the following:

<table>
<tr><th>Pollutant</th><th>Emission Concentration (1-hour average)</th><th>Annual Emissions</th></tr>
<tr><td>Nitrogen oxides</td><td>0.06 lb/MMBtu</td><td>1.07 tons per year</td></tr>
<tr><td>Carbon monoxide</td><td>0.30 lb/MMBtu</td><td>5.35 tons per year</td></tr>
<tr><td>Sulfur dioxide</td><td>0.50 lb/MMBtu</td><td>8.90 tons per year</td></tr>
</table>

Annual emissions must be calculated using the most recent source emissions test results and the amount of gas burned. If source emission testing has not been conducted, annual emissions must be calculated using the emission factors presented in the Technical Support Document for this Air Discharge Permit.</td><td>5</td></tr>
<tr><td>6.</td><td>Emissions of hydrogen sulfide must not exceed the following:

<table>
<tr><th>Source</th><th>Emission Concentration (1-hour average)</th><th>Annual Emissions</th></tr>
<tr><td>Fugitive Emissions</td><td>N/A</td><td>146 pounds</td></tr>
<tr><td>Preliminary/Primary Treatment (Biotrickling Filter System)</td><td>0.5 ppmv or 99% control</td><td>518 pounds</td></tr>
<tr><td>Solids Handling (Carbon Adsorption System)</td><td>0.1 ppmv or 99% control</td><td>74 pounds</td></tr>
<tr><td>117th Street Pump Station Ventilation</td><td>0.15 ppmv</td><td>34 pounds</td></tr>
</table>

Hydrogen sulfide emissions volatilized from wastewater must be calculated using the Bay Area Sewage Toxics Emissions (BASTE) program. If a new BASTE model run is not conducted for a specific calendar year, the emission factor from the most current BASTE model run must be utilized (which may be the emission factor cited in Section 6 of the Technical Support Document for this Permit). Hydrogen sulfide emissions from the 117th Street Pump Station must be calculated using the emission factors cited in Section 6 of the Technical Support Document for this Permit unless more recent source emission sampling data has been collected. Hydrogen sulfide emissions from Preliminary/Primary Treatment and Solids Handling must be calculated using the most recent sampling results.</td><td>12, 15, 16, 17</td></tr>
<tr><td>7.</td><td>Emissions from Flow Augmentation Pump Engine #1 must not exceed any of the following:

<table>
<tr><th>Pollutant</th><th>Annual Emissions</th></tr>
<tr><td>Nitrogen oxides</td><td>712 pounds per year</td></tr>
<tr><td>Carbon monoxide</td><td>130 pounds per year</td></tr>
</table>

Annual emissions must be calculated using the emission factors presented in the Technical Support Document for this Air Discharge Permit unless unit specific source test data is collected.</td><td>9</td></tr>
</table>

No.	Emission Limits	Equipment/ Activity
8.	Emissions from Flow Augmentation Pump Engine #2 must not exceed any of the following: Pollutant — Annual Emissions Nitrogen oxides — 712 pounds per year Carbon monoxide — 130 pounds per year Annual emissions must be calculated using the emission factors presented in the Technical Support Document for this Air Discharge Permit unless unit specific source test data is collected.	10
9.	Visible emissions from all points of discharge except the diesel engines must not exceed zero percent opacity for more than 3 minutes in any one hour period as determined in accordance with SWCAA Method 9 (See Appendix A of SWCAA 400).	1 – 5, 12 – 17
10.	Visible emissions from the Cat Emergency Generator Engine #1, the 117th Street Pump Station Emergency Generator Engine, Flow Augmentation Pump Engine #1, and Flow Augmentation pump Engine #2 must not exceed five percent opacity for more than 3 minutes in any one hour period as determined in accordance with SWCAA Method 9 (See Appendix A of SWCAA 400) except during startup. For the purposes of this requirement, the startup period ends when the earlier of the following operating events occurs: (a) The engine has reached normal operating temperature; or (b) The engine has been operating for 15 minutes.	8 - 11
11.	Operations which cause or contribute to odors which unreasonably interfere with any other property owner's use and enjoyment of their property must use recognized good practice and procedures to reduce these odors to a reasonable minimum.	Facilitywide

Operating Limits and Requirements

No.	Operating Limits and Requirements	Equipment/ Activity
12.	The equipment specified in ADP Application CL-3105 and this Permit must be maintained and operated in total and continuous conformity with the emission levels identified in this Permit. SWCAA reserves the right to take any and all appropriate action to maintain the conditions of this Permit, including directing the facility to cease operations until corrective action can be completed.	Facilitywide
13.	Exhaust from all emission units must be discharged vertically. If the emission unit is within a structure, the exhaust must be discharged vertically above the structure in which the unit is housed. Any rain cap or device that interferes with vertical dispersion is prohibited.	Facilitywide
14.	All digester gas must be burned. No digester gas may be released to the ambient air.	Facilitywide
15.	All odor or other air quality complaints received by the permittee or SWCAA must be investigated by the Permittee no later than one workday after receipt. The permittee must investigate the validity of each complaint, the cause of any emissions that may have prompted the complaint, and promptly initiate corrective action, if necessary, in response to the complaint. All complaint investigations must be documented and the documentation maintained in a readily retrievable format for a minimum of three years.	Facilitywide

No.	Operating Limits and Requirements	Equipment/ Activity
16.	The 4.226 MMBtu/hr Boiler, the 5.231 MMBtu/hr Boiler, the Old Digester Waste Gas Incinerator, and the New Digester Waste Gas Burner must fire only digester gas and/or natural gas.	1, 2, 4, 5
17.	The Old Digester Waste Gas Incinerator exhaust temperature must be maintained at 1,323 degrees Fahrenheit or greater (1 hour average).	4
18.	The temperature of the New Digester Waste Gas Burner must be maintained at 1,400 degrees Fahrenheit or greater (1-hour average) unless compliance with all applicable emission limitations can be maintained at a lower temperature as demonstrated by a source test.	5
19.	The diesel-fired engines must only be fired on #2 diesel or better. The sulfur content of the fuel fired in the generator engines must not exceed 0.0015% by weight. The permittee must maintain a fuel certification from the fuel supplier or equivalent documentation as a means of demonstrating compliance with this requirement.	6 - 11
20.	Operation of the emergency service engines for maintenance checks and readiness testing must not exceed 100 hours per year each. Emergency operation of the emergency service engines is not limited. A nonresettable time totalizer must be installed and used to measure the number of hours each engine operates.	6 - 11
21.	Operation of the emergency generator engines must be limited to testing, maintenance, and as necessary to provide emergency power or pumping.	6 - 11
22.	The 117th Street Pump Station Odor Control Unit, 36th Avenue Pump station biofilter, Sludge Blend Tank biotrickling filter, Preliminary/Primary Treatment biotrickling filters, and Solids Handling carbon adsorbers must be operated properly and maintained in working order. All equipment malfunctions or improper operations of the above equipment must be corrected promptly after identification.	12 - 16

Monitoring and Recordkeeping Requirements

No.	Monitoring and Recordkeeping Requirements	Equipment/ Activity
23.	The 117th Street Pump Station Odor Control Unit, 36th Avenue Pump station biofilter, Sludge Blend Tank biotrickling filter, Preliminary/Primary Treatment biotrickling filters, Solids Handling carbon adsorbers and chemical injection system must be inspected weekly for signs of equipment malfunctions or improper operation. The differential pressure across each system must be recorded during each inspection. For the purposes of this requirement, improper operation or equipment malfunction is presumed if the unit is emitting excessive odor. All equipment malfunctions or improper operations must be corrected promptly.	12 - 16

No.	Monitoring and Recordkeeping Requirements	Equipment/ Activity
24.	The permittee must walk the facility fence line of the wastewater treatment plant monthly to evaluate odors originating from the wastewater treatment plant. If odors from the wastewater treatment plant are identified at the fence line, the permittee must investigate the cause of the odor, and determine if all relevant odor control equipment and wastewater processing equipment is operating properly. The permittee must promptly institute corrective action if necessary to correct improperly operating equipment. The results of each odor evaluation and necessary corrective action must be recorded.	Facilitywide
25.	The following information must be collected, recorded at the intervals specified below, and readily retrievable on-site for inspection: (a) The temperature of the Old Digester Waste Gas Incinerator and the New Digester Waste Gas Burner must be recorded continuously when in operation. For the purposes of this Permit, "recorded continuously" means that the temperature must be recorded at least once every 15 minutes of operation with a minimum data availability of 95% on an annual basis; (b) Maintenance activities that may affect emissions must be recorded for each occurrence; (c) Upset conditions that cause excess emissions must be recorded for each occurrence; (d) The quantity of natural gas and digester gas consumed by each boiler, the New Digester Waste Gas Burner, and the Old Digester Waste Gas Incinerator must be determined and recorded monthly; (e) The number of hours each diesel-fired engine is operated must be recorded for each calendar year; (f) Diesel fuel sulfur content must be documented for each diesel fuel delivery. (g) The results of boiler performance monitoring and digester waste gas incinerator/burner source test activities must be recorded for each occurrence; (h) The results of weekly inspections of the Sludge Blend Tank biotrickling filter and 36th Avenue Pump Station biofilter, Preliminary/Primary Treatment biotrickling filters, Solids Handling carbon adsorbers, and chemical injection systems must be recorded for each occurrence; (i) The results of the monthly wastewater treatment plant fence line walks must be recorded for each occurrence; (j) The results of hydrogen sulfide monitoring of the exhaust from the 117th Street Pump Station Odor Control Unit, Preliminary/Primary Treatment biotrickling filters, and Solids Handling carbon adsorbers must be recorded for each occurrence; (k) The permittee must maintain a record of each air quality complaint received and the results of the permittee's investigation of each complaint; and (l) Corrective action in response to a permit deviation or odor problem must be recorded for each occurrence.	Facilitywide
26.	Each record required by this Permit must include the date and the name of the person making the record entry.	Facilitywide
27.	All records required by this Permit must be maintained in a readily retrievable format for a minimum of three years.	Facilitywide

Emission Monitoring and Testing Requirements

No.	Emission Monitoring and Testing Requirements	Equipment/ Activity
28.	The hydrogen sulfide content of the exhaust from the 117th Street Pump Station Odor Control Unit, the Preliminary/Primary Treatment biotrickling filters, and the Solids Handling carbon adsorbers must be measured each calendar month using a colorimetric detector tube or other method per-approved by SWCAA. If an emission concentration greater than 0.5 ppmv is measured at the exhaust of the Preliminary/Primary Treatment biotrickling filters, the inlet concentration must also be measured to demonstrate compliance with the alternative 99% reduction requirement. If an emission concentration greater than 0.1 ppmv is measured at the exhaust of the Solids Handing carbon adsorbers, the inlet concentration must also be measured to demonstrate compliance with the alternative 99% reduction requirement.	12, 15, 16
29.	The hydrogen sulfide content of the digester gas must be measured monthly with a colorimetric detector tube or other method approved by SWCAA. If the results of six consecutive monthly samples indicate that hydrogen sulfide concentrations in the digester gas do not exceed 1,500 ppmv, then the sampling frequency may be reduced to once every three calendar months. If any subsequent sample indicates that the hydrogen sulfide concentration in the digester gas exceeds 1,500 ppmv, then the sampling frequency must return to once per month until six consecutive monthly hydrogen sulfide samples again indicate that hydrogen sulfide concentrations in the digester gas do not exceed 1,500 ppmv.	Facilitywide
30.	Source emissions testing of the 5.231 MMBtu/hr Boiler must be conducted no later than the end of December 2029 and no later than the end of December every 10 years thereafter. Tests conducted more than three months before the required due date will not satisfy the periodic source emission testing requirement without prior approval from SWCAA. All required testing must be conducted in accordance with Appendix B of this Permit.	2
31.	Source emissions testing of the Old Digester Waste Gas Incinerator must be performed in accordance with the requirements in Appendix A of this Permit at least once every 60 calendar months, or 10,000,000 cubic feet of digester gas combusted, whichever is least frequent. For the purposes of this requirement the February 2002 source test shall serve as the initial source test.	4
32.	Source emissions testing of the New Digester Waste Gas Burner must be conducted no later than the end of October 2023 and no later than the end of October every 5 years thereafter. Tests conducted more than three months before the required due date will not satisfy the periodic source emission testing requirement without prior approval from SWCAA. All required testing must be conducted in accordance with Appendix A of this Permit.	5
33.	Performance monitoring of the 4.226 MMBtu/hr Boiler and the 5.231 MMBtu/hr Boiler must be conducted at least once each year, no later than the end of December, as described in Appendix C of this Permit.	1, 2

Reporting Requirements

No.	Reporting Requirements	Equipment/ Activity
34.	The permittee must notify SWCAA in writing within ten (10) days after completing initial installation of new equipment. This will allow proper inspections and observations to be conducted for the new equipment.	15, 16
35.	Excess emissions must be reported to SWCAA as follows: (a) As soon as possible, but no later than 12 hours after discovery for emissions that represent a potential threat to human health or safety; (b) As soon as possible, but no later than 48 hours after discovery for emissions which the permittee wishes to claim as unavoidable pursuant to SWCAA 400-107; and (c) No later than 30 days after the end of the month of discovery for all other excess emissions.	Facilitywide
36.	Deviations from permit conditions must be reported no later than 30 days after the end of the month during which the deviation is discovered.	Facilitywide
37.	The following records must be reported to SWCAA as indicated below: (a) The results of source emissions testing conducted in accordance with Appendices A and B must be reported to SWCAA within 45 days of test completion; (b) The results of performance monitoring conducted in accordance with Appendix C must be reported to SWCAA within 15 days of test completion; (c) The result of initial performance testing of the Preliminary/Primary Treatment biotrickling filters and the Solids Handling carbon adsorbers must be submitted within 15 days of report receipt by the permittee; and (d) All air quality complaints shall be reported to SWCAA within three days of receipt. Complaint reports shall include the date and time of the complaint, the name of the complainant, and the nature of the complaint.	Facilitywide
38.	The following emission-related information must be reported to SWCAA by March 15th for the previous calendar year: (a) The quantity of natural gas and digester gas consumed by each boiler, the New Digester Waste Gas Burner and the Old Digester Waste Gas Incinerator; (b) The number of hours each diesel engine is operated; (c) The total amount of wastewater treated; (d) The results of hydrogen sulfide monitoring of the 117th Street Pump Station Odor Control Unit, Preliminary/Primary Treatment biotrickling filters, Solids Handling carbon adsorbers, and digester gas; and (e) Air emissions of criteria air pollutants, volatile organic compounds, toxic air pollutants (TAPs), and hazardous air pollutants (HAPs).	Facilitywide

3. General Provisions

No.	General Provisions
A.	The equipment specified in this Permit must be maintained and operated in total and continuous conformity with the conditions identified in this Permit. SWCAA reserves the right to take any and all appropriate action to maintain the conditions of this Permit, including directing the facility to cease operations until corrective action can be completed.
B.	For the purpose of ensuring compliance with this Permit, duly authorized representatives of the Southwest Clean Air Agency must be permitted access to the permittee's premises and the facilities being constructed, owned, operated and/or maintained by the permittee for the purpose of inspecting said facilities. These inspections are required to determine the status of compliance with this Permit and applicable regulations and to perform or require such tests as may be deemed necessary.
C.	The provisions, terms and conditions of this Permit shall be deemed to bind the permittee, its officers, directors, agents, servants, employees, successors and assigns, and all persons, firms, and corporations acting under or for the permittee.
D.	The requirements of this Permit shall survive any transfer of ownership of the source or any portion thereof.
E.	This Permit must be posted conspicuously at or be readily available near the source.
F.	Approval to construct, install, or modify specific pollution generating equipment becomes invalid if construction or installation is not commenced within eighteen months after the date of issuance of this Permit, if construction or installation is discontinued for a period of eighteen months or more, or if construction or installation is not completed within a reasonable time.
G.	This Permit does not supersede requirements of other Agencies with jurisdiction and further, this Permit does not relieve the permittee of any requirements of any other governmental Agency. In addition to this Permit, the permittee may be required to obtain permits or approvals from other agencies with jurisdiction.
H.	Compliance with the terms of this Permit does not relieve the permittee from the responsibility of compliance with SWCAA General Regulations for Air Pollution Sources, previously issued Regulatory Orders, RCW 70.94, Title 173 WAC or any other applicable emission control requirements, nor from the resulting liabilities and/or legal remedies for failure to comply.
I.	If any provision of this Permit is held to be invalid, all unaffected provisions of the Permit shall remain in effect and be enforceable.
J.	No change in this Permit shall be made or be effective except as may be specifically set forth by written order of the Southwest Clean Air Agency upon written application by the permittee for the relief sought.
K.	The Southwest Clean Air Agency may, in accordance with RCW 70.94 impose such conditions as are reasonably necessary to assure the maintenance of compliance with the terms of this Permit, the Washington Clean Air Act, and the applicable rules and regulations adopted under the Washington Clean Air Act.

Appendix A
Emission Testing Requirements
New Digester Waste Gas Burner and Old Digester Waste Gas Incinerator

1. Introduction:

a. The purpose of these testing requirements is to quantify emissions from the New Digester Waste Gas Burner and the Old Digester Waste Gas Incinerator and to demonstrate compliance with the requirements of this Air Discharge Permit.

2. Testing Requirements:

a. Source emissions testing of the New Digester Waste Gas Burner and the Old Digester Waste Gas Incinerator must be conduced in accordance wit the schedule in the following table. Subsequent source tests must be conducted no later than the end of the calendar month identified in the "Next Test Due" column every 5 years except as noted in the table. Tests conducted more than three months before the required due date will not satisfy the periodic testing requirement without prior approval from SWCAA. The use of an alternative test schedule must be pre-approved by SWCAA in writing.

Source	Next Test Due	Subsequent Test Frequency
New Digester Waste Gas Burner	October 31, 2023	Every 5 years
Old Digester Waste Gas Incinerator	60 days after burning 10,000,000 cubic feet of digester gas beginning March 2002.	Every 5 years or 60 days after 10,000,000 cubic feet of digester gas combusted since the last source emissions test, whichever is less frequent.

b. Special Considerations – New Digester Waste Gas Burner. The new digester waste gas burner exhaust stack must be sized to provide a sampling location meeting the requirements of EPA Method 1. The sampling location shall be at least two stack diameters upstream and at least one-half stack diameter downstream from any flow disturbance such as a bend, expansion or contraction in the stack, or from a visible flame.

The number of traverse points must be determined using EPA Method 1 and following the procedure provided for determining the number of traverse points for a particulate matter emissions test. If continuous sampling is conducted, the mass emission rate of each pollutant sampled must be determined for each section of stack area represented by one of the traverse points located according to Method 1. For example, if 24 traverse points are required by Method 1, then the stack gas flow rate, pollutant concentrations, and emission rates must be determined for each of the 24 areas represented by the 24 traverse points. Total mass emissions must be determined by summing the mass emission rates for all representative areas. Grab samples may only be collected if the sample is integrated over all traverse points in proportion to the stack gas flow rate measured at that point.

Appendix A
Emission Testing Requirements
New Digester Waste Gas Burner and Old Digester Waste Gas Incinerator

Three sampling runs must be conducted at the outlet of the relevant digester waste gas incinerator/burner using the methods and test durations specified below.

Constituent	Test Method or Equivalent[1]	Minimum Test Duration
Stack gas flow rate, temperature	EPA Methods 1 and 2	N/A
O_2, CO_2 content	EPA Method 3A	60 minutes
Stack gas moisture content	EPA Method 4	60 minutes
Sulfur dioxide	EPA Method 6C or 8	60 minutes
Nitrogen oxides	EPA Method 7E	60 minutes
Opacity	SWCAA Method 9	20 minutes[2]
Carbon monoxide	EPA Method 10	60 minutes
Total volatile organic compounds[3]	EPA Method 18/25A	60 minute integrated sample

Concurrent with the outlet sampling, three 60-minute integrated samples of digester gas must be collected at the inlet of the digester waste gas incinerator/burner and analyzed for total volatile organic compounds, methane, carbon dioxide, and gross calorific value. This data must be utilized to calculate a fuel factor using the procedures of EPA Method 19. The fuel factor must be used to calculate emission rates of nitrogen oxides, carbon monoxide, sulfur dioxide, and volatile organic compounds in units of lb/MMBtu and lb/MMscf.

[1] The use of an alternate or equivalent test method must be pre-approved by SWCAA in writing.
[2] A single 60-minute opacity test may be performed.
[3] Reported as propane.

3. Source Operation:

a. All relevant process parameters must be recorded during testing and reported with the final test report including:
   (1) Flowrate of digester gas to the unit;
   (2) Flowrate of natural gas to the unit (if any);
   (3) Burner or incinerator temperature as measured by the appropriate thermocouple; and
   (4) Burner or incinerator damper position (if applicable).

b. Source operations during the emissions test must be representative of the maximum level of normal operation.

Appendix A
Emission Testing Requirements
New Digester Waste Gas Burner and Old Digester Waste Gas Incinerator

4. Reporting Requirements:

The results of all required testing must be submitted to SWCAA within 45 days of test completion. Unless otherwise directed by SWCAA, a single hard copy of the report and an electronic copy (e.g. portable document format) of the report must be submitted. The report must include:

a. Description of the source including manufacturer, model number and design capacity of the equipment, and the location of the sample ports or test locations.
b. Time and date of the test and identification and qualifications of the personnel involved.
c. Summary of results, reported in units and averaging periods consistent with the application emissions standard or unit. NO_X, CO, SO_2, and VOC emissions must be reported in units of ppmvd, lb/hr, lb/MMBtu, and lb/MMscf. The New Digester Waste Gas Burner and Old Digester Waste Gas Incinerator destruction removal efficiency (DRE) must be reported as % DRE.
d. Summary of control system or equipment operating conditions.
e. Summary of production related parameters.
f. A description of the test methods or procedures used, including all field data, quality assurance/quality control procedures and documentation.
g. A description of the analytical procedures used, including all laboratory data, quality assurance/quality control procedures and documentation.
h. Copies of field data and example calculations.
i. Chain of custody information.
j. Calibration documentation.
k. Discussion of any abnormalities associated with the results.
l. A statement signed by the senior management official of the testing firm certifying the validity of the source test report.

Appendix B
Emission Testing Requirements
5.231 MMBtu/hr Boiler

1. Introduction:

a. The purpose of this testing is to quantify emissions of nitrogen oxides and carbon monoxide from the 5.231 MMBtu/hr Boiler in order to assure compliance with the emission limitations established in this Air Discharge Permit.

2. Testing Requirements:

a. Source emissions testing of the 5.231 MMBtu/hr Boiler must be conducted no later than the end of December 2029 and no later than the end of December every 10 years thereafter. Tests conducted more than three months before the required due date will not satisfy the periodic source emission testing requirement without prior approval from SWCAA.

Unless otherwise specified, testing for each constituent must consist of a minimum of three sampling runs of the duration specified below.

Constituent	Test Method or Equivalent[1]	Minimum Test Duration
Stack gas velocity, flow rate	EPA Methods 1 and 2	N/A
O_2 and CO_2	EPA Methods 3 or 3A	N/A
Moisture	EPA Method 4	60 minutes
Sulfur oxides	EPA Method 6C or 8	60 minutes
Nitrogen oxides	EPA Method 7E	60 minutes
Carbon monoxide	EPA Method 10	60 minutes

[1] The use of an alternate or equivalent test method must be pre-approved by SWCAA in writing.

Unless otherwise approved by SWCAA, source emissions testing must be conducted on the dominant fuel or fuel mix used by the boiler during the past year.

b. A comprehensive test plan must be submitted to SWCAA for review and approval at least 10 business days prior to testing.

c. SWCAA must be notified of the test date at least 5 business days prior to testing.

3. Source Operation:

a. A complete record of production related parameters applicable to the testing, including but not limited to, FGR damper position (if applicable), oxygen setpoint (if applicable), boiler load (MMBtu/hr), fuel type/mixture (relative amounts of natural gas and digester gas), startups, and shutdowns must be kept during emissions testing to correlate operations with emissions and must be recorded in the final report of the test results.

b. Source operations during emissions testing must be representative of maximum intended operating conditions.

Appendix B
Emission Testing Requirements
5.231 MMBtu/hr Boiler

4. Reporting:

The results of all required testing must be submitted to SWCAA within 45 days of test completion. Each report must include:

a. A description of the source including manufacturer, model number and design capacity of the equipment, and the location of the sample ports or test locations.
b. Time and date of the test and identification and qualifications of the personnel involved.
c. A summary of results, reported in units and averaging periods consistent with the applicable emission standard or limit. NO_X and CO emission concentrations must be corrected to 3% O_2.
d. A summary of control system or equipment operating conditions.
e. A summary of production related parameters.
f. A description of the test methods or procedures used including all field data, quality assurance/quality control procedures and documentation.
g. A description of the analytical procedures used including all laboratory data, quality assurance/quality control procedures and documentation.
h. Copies of field data and example calculations.
i. Chain of custody information.
j. Calibration documentation.
k. Discussion of any abnormalities associated with the results.
l. A statement signed by the senior management official of the testing firm certifying the validity of the source test report.

Appendix C
Performance Monitoring Requirements
4.226 MMBtu/hr Boiler and 5.231 MMBtu/hr Boiler

1. Introduction:

a. The purpose of periodically monitoring the boiler exhausts is to minimize emissions and provide a reasonable assurance that each unit is operating properly.

b. Periodic monitoring may be conducted with an electrochemical cell combustion analyzer, analyzers used for reference method testing, or other analyzers pre-approved by SWCAA.

2. Monitoring Requirements:

a. Monitoring to determine emission concentrations of the following constituents must be conducted annually for each unit, no later than the end of December. Performance monitoring conducted more than three months before the required due date will not satisfy the periodic performance monitoring requirement without prior approval from SWCAA. The use of an alternative test schedule must be pre-approved by SWCAA in writing. Performance monitoring of a specific unit is not required during any year in which source emissions testing of the same unit is performed.

Constituents to be Measured
Carbon Monoxide (CO)
Nitrogen Oxides (NO_X)
Oxygen (O_2)

b. Source operation during monitoring must be representative of maximum intended operating conditions during that year.

c. Alternative monitoring methodologies must be pre-approved by SWCAA.

3. Minimum Quality Assurance/Quality Control Measures:

a. The analyzer(s) response to span (calibration) gas of a known concentration (reference) must be determined before and after testing. No more than 12 hours may elapse between response checks. The test results are invalid if the analyzer zero or span drift exceeds 10% of the span value. The test may not be started until the calibration error (the difference between the reference concentration and the analyzer response) is no more than 10% of the span value.

c. The CO and NO_X span gas concentrations must be no less than 50% and no more than 200% of the emission concentration corresponding to the permitted emission limit. A lower concentration span gas may be used if it is more representative of measured concentrations. Ambient air may be used to zero the CO and NO_X cells/analyzer(s) and span the oxygen cell/analyzer.

Appendix C
Performance Monitoring Requirements
4.226 MMBtu/hr Boiler and 5.231 MMBtu/hr Boiler

3. Minimum Quality Assurance/Quality Control Measures (continued):

c. Sampling of each exhaust stack must consist of at least 1 test consisting of at least 5 minutes of data collection following a "ramp-up phase." The ramp-up phase ends when analyzer readings have stabilized (less than 5%/minute change in emission concentration). Emission concentrations must be recorded at least once every 30 seconds during testing. All test data collected following the ramp-up phase(s) must be reported to SWCAA. Alternative testing methods may be utilized provided pre-approval is obtained from SWCAA.

If the test results from any performance monitoring event for a unit indicate that emission concentrations may exceed the permitted emission concentration, the permittee must either perform 60 minutes of additional monitoring to more accurately quantify CO and NO_X emissions, or initiate corrective action. Additional testing or corrective action must be initiated as soon as practical but no later than three days after the potential exceedance is identified. Corrective action includes tuning, maintenance by service personnel, limitation of unit load, or other action taken to maintain compliance with permitted limits. Monitoring of unit emissions must be conducted within three days following completion of any corrective action to confirm that the corrective action has been effective. Corrective action must be pursued until observed emission concentrations no longer exceed the permitted emission concentrations. Initiation of corrective action does not shield the permittee from enforcement actions by SWCAA.

4. Reporting:

a. All monitoring results must be recorded at the facility and reported to SWCAA in writing using a format designated by the Agency. Results must be reported within 15 calendar days of completion. The following information must be included in the report:

(1) Time and date of the emissions evaluation;
(2) Identification of the personnel involved;
(3) Identification of the affected unit;
(4) A summary of results (NO_X, CO, O_2, etc.), reported in units consistent with the applicable emission standard(s) or limit(s);
(5) A summary of equipment operating conditions (e.g., firing rate, fuel flow, stack temperature, etc.);
(6) A description of the evaluation methods or procedures used including all field data, quality assurance/quality control procedures and documentation; and
(7) Analyzer response check and calibration error documentation.

b. Individual data points must be reported as read. Final average monitoring results must be corrected to 3% O_2 in the exhaust gas and adjusted to reflect analyzer response to zero and span gases.

TECHNICAL SUPPORT DOCUMENT

SALMON CREEK WASTEWATER MANAGEMENT SYSTEM
SWCAA ID: 1834

Air Discharge Permit 20-3379
Air Discharge Permit Application CL-3105

Issued: January 14, 2020

Prepared By: Clint Lamoreaux
Air Quality Engineer
Southwest Clean Air Agency

TABLE OF CONTENTS

Abbreviations

ADP	Air Discharge Permit (Same as Order of Approval)
AP-42	Compilation of Emission Factors, AP-42, Fifth Edition, Volume 1, Stationary Point and Area Sources – published by the US Environmental Protection Agency
BACT	Best Available Control Technology
BART	Best Available Retrofit Technology
Bhp	Brake horsepower
Btu	British thermal unit
CAM	Compliance assurance monitoring (40 CFR 64)
cfh	Cubic feet per hour
cfm	Cubic feet per minute
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2e	Carbon dioxide equivalent
EPA	U.S. Environmental Protection Agency
GWP	Global warming potential
HAP	Hazardous air pollutant listed pursuant to Section 112 of the Federal Clean Air Act
kW	Kilowatt
LAER	Lowest achievable emission rate
lb/MMBtu	Pound per million British thermal units
lb/yr	Pounds per year
lb/10^6 scf	Pounds per million standard cubic feet
lbs	Pounds
mgd	Millions of gallons per day
MMBtu/hr	Millions of British thermal units per hour
NO_X	Nitrogen oxides
NOC	Notice of Construction application (same as Air Discharge Permit application)
PM	Particulate matter with an aerodynamic diameter less than or equal to 100 micrometers (includes both filterable particulate matter measured by EPA Method 5 that is less than 100 micrometers and condensable particulate matter measured by EPA Method 202)
PM_{10}	Particulate matter with an aerodynamic diameter less than or equal to 10 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than or equal to 2.5 micrometers (includes both filterable particulate matter measured by EPA Method 201 or 201A and condensable particulate matter measured by EPA Method 202)
ppmvd	Parts per million, dry volume basis
ppmvd @ X	Parts per million, dry volume basis corrected to X
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RCW	Revised Code of Washington
scfh	Standard (68°F, 1 atmosphere) cubic feet per hour
scfm	Standard (68°F, 1 atmosphere) cubic feet per minute
SQER	Small Quantity Emission Rate listed in WAC 173-460
SO_2	Sulfur dioxide
SWCAA	Southwest Clean Air Agency
TAP	Toxic Air Pollutant pursuant to Chapter 173-460 WAC
T-BACT	Best Available Control Technology for toxic air pollutants
tpy	Tons per year
VOC	Volatile Organic Compound
WAC	Washington Administrative Code

1. FACILITY IDENTIFICATION

Applicant Name: Discovery Clean Water Alliance
Applicant Address: 8000 NE 52nd Court, Vancouver, WA 98665
Contact Person: Dale Lough – Alliance Capital Program Manager

Facility Name: Salmon Creek Wastewater Management System
Facility Address: 15100 NW McCann Road, Vancouver, Washington 98685
SWCAA Identification: 1834
Contact Person: Travis Capson – Operations Manager

Primary Process: Municipal wastewater treatment
SIC / NAICS: 4952 / 22132
Facility Classification: BACT / Minor

2. FACILITY DESCRIPTION

The Salmon Creek Wastewater Management System consists of the following eight components:

1. The Salmon Creek Interceptor (a gravity pipeline which parallels the Salmon Creek Watershed)
2. The Klineline Interceptor (a gravity pipeline which parallels the Salmon Creek Watershed)
3. The 36th Avenue Pump Station
4. The 36th Avenue Force Main Pipeline
5. The Salmon Creek Treatment Plant
6. The Plant Outfall Pipeline to the Columbia River
7. The 117th Street Pump Station
8. The 117th Street Force Main Pipeline

The Salmon Creek Treatment Plant is currently a 14.95 million gallon per day (mgd, maximum monthly capacity) municipal wastewater treatment plant owned by the Discovery Clean Water Alliance and operated via contract by Clark County Public Works.

3. CURRENT PERMITTING ACTION

This permitting action is in response to Air Discharge Permit application number CL-3105 (ADP Application CL-3105) received October 11, 2019. ADP application CL-3105 was originally submitted for approval of the "Phase 5B" plant expansion. Phase 5B consists of "Package 1" and "Package 2". Package 1 consists of the addition of odor control equipment and other non-air quality related improvements. Package 2 consists of a capacity expansion to 17.5 mgd (maximum monthly capacity). Emission details that must be addressed with the plant expansion (Package 2) are have not been finalized. At the request of the applicant, the capacity expansion (Package 2) will be addressed at a later date to enable Package 1 improvements to proceed. This permitting action will reflect the following emission unit changes from Air Discharge Permit 07-2726:

1. The "Klineline Pump Vent" will be referred to as the "117th Street Pump Station Ventilation"
2. The "Force Main Discharge Vent" will be removed. Emissions from the force main will be captured by the "Preliminary/Primary Treatment" unit listed below.
3. The "Klineline Pump Station Emergency Generator Engine" will be referred to as the "117th Street Pump Station Emergency Generator Engine"
4. The "Scum Concentrator" has been removed.
5. The "Onan Emergency Generator Engine" has been replaced by "Cat Emergency Generator #1 Engine" – see Small Unit Notification 055.
6. "Preliminary/Primary Treatment" will be added as an emission unit. Emissions from these portions of the wastewater treatment process will be captured and vented to two new biotrickling filters.

7. "Solids Processing" will be added as an emission unit. Emissions from solids processing will be captured and vented to two new carbon adsorbers.

The applicant provided the following Package 1 project description:

To reduce odor emissions associated with liquid processes, headworks exhaust, primary clarifiers, primary influent and effluent channels and primary effluent/return activated sludge (PE/RAS) mix box will be covered and ventilated to two new biotrickling filters. In addition, the existing odor control unit on the 117th Street Force Main discharge vent will be demolished and the air will be captured and also treated with the two new biotrickling filters. The biotrickling filters are designed to a future capacity of 22,350 cubic feet per minute (cfm), which covers the initial demand of 19,350 cfm. The biotrickling towers design criteria include future expansion and treatment of primary clarifiers 5, 6, and 7. A bypass to the biotrickling towers will be installed to vent uncontrolled odorous air during maintenance episodes.

To reduce odor emissions associated with the solid processes, a new carbon adsorber system will control the odor emissions associated with the BFP stacks, thickened waste activated sludge (TWAS) wet well fan, filtrate wet well, biosolids conveyor, and biosolids hopper. The carbon adsorber system is designed to treat an air flow of 16,000 total cfm and will be located west of the existing biosolids bunker. Similarly to the biotrickling filter towers, a bypass will be installed to vent uncontrolled odorous air during carbon adsorber maintenance.

4. PROCESS DESCRIPTION

The Salmon Creek Treatment Plant (SCTP) is owned by the Discovery Clean Water Alliance and operated via contract by Clark County Public Works. The following process description was provided by the applicant with Air Discharge Permit application CL-3105:

The existing SCTP treatment process consists of preliminary and primary treatment, secondary treatment, and disinfection. Primary sludge, and waste activated sludge (WAS) from secondary treatment, is removed, thickened, digested anaerobically, and stored. The SCTP has an average annual capacity of 11.4 mgd and a maximum monthly capacity of 14.95 mgd. Monitoring records for 2019 indicate that the average annual flow rate is less than 85% of the design capacity. A detailed description of the different process units in the existing SCTP is provided in the following subsections.

Preliminary and Primary Treatment

Influent flow enters the plant headworks through a channel where grit and large solids are removed by two mechanically cleaned bar screens, one manually cleaned bar screen, and two vortex-type grit chambers. The screens and screening channels are enclosed in a building. The solids are sent to a landfill, and the wastewater flows to primary treatment. Primary treatment consists of four rectangular primary clarifiers adjacent to the preliminary treatment facility. Primary sludge from the clarifiers is sent to the sludge blend tank. The remaining liquid is sent to secondary treatment.

Secondary Treatment

Secondary treatment consists of aeration basins and secondary clarifiers. The wastewater is first processed in the six aeration basins using a biological process to metabolize waste. Volatile organic compounds (VOCs) are volatilized from the wastewater during this process. The next step is secondary clarification, where sludge settles and the secondary effluent continues to the disinfection process. Some secondary clarifier solids, known as return activated sludge (RAS), are recycled back to the aeration basins to maintain the microbial population. A sidestream of the RAS (waste activated sludge, or WAS), is sent to the gravity belt thickener for thickening, with the thickened WAS pumped to the sludge blend tank where it is blended with primary sludge prior to digestion. The filtrate from the gravity belt thickener is recycled back to the liquids process and is returned to primary treatment.

Disinfection

An ultraviolet (UV) disinfection facility is located on the northwesterly portion of the site. Secondary effluent from the secondary clarifiers is disinfected by UV light prior to discharge to the Columbia River.

Anaerobic Digestion
Offgas generated during anaerobic digestion is used as a source of fuel for the boilers that provide heat for the digesters and solids area buildings as needed. Excess digester gas is burned in a waste gas incinerator. Following digestion the remaining solids are dewatered in a belt filter press (BFP) and the resulting cake solids are beneficially reused. The filtrate from the dewatering process is sent to the gravity belt thickener and ultimately recycled back to the primary treatment process.

Pump Stations
The 117th Street Pump Station and 36th Avenue Pump Station pump wastewater to the SCTP in addition to the flows arriving from the Felida Trunk. A carbon adsorption system at 117th Street Pump Station and a biofilter at 36th Avenue Pump Station control fugitive odors.

Fuel Combustion and Power Generation
Two hot water boilers (at 4.226 million British thermal unit per hours [MMBtu/hr] and 5.231 MMBtu/hr) fueled by digester gas, natural gas, or a blend of natural gas and digester gas are operated by SCTP to aid in solids processing. The Old Digester Waste Gas Incinerator has been disabled. The digester waste gas burner with the capacity of burning 14,710 standard cubic feet per hour also operates onsite. A Fulton Pulse boiler fired on natural gas is used to provide heat to the administration building. SCTP operates four emergency generators and two engines to power wastewater pumps. In 2014, the existing Onan Emergency Generator (emission unit 13 in the existing permit) was replaced by a new Caterpillar Emergency Generator with a 900-horsepower engine. The additional three emergency generators are as follows:

- 117th Street Pump Station (formerly called Klineline Pump Station) Emergency Generator Engine (existing permit emission unit 6)
- Caterpillar Emergency Generator (existing permit emission unit 12)
- 36th Avenue Pump Station Generator (existing permit emission unit 14)

At the 36th Ave Pump Station, the two engines powering the wastewater pumps during high peak flows are Flow Augmentation Pump Engine 1 and Flow Augmentation Pump Engine 2.

Phase 5B Package 1 – Odor Control and Existing Facilities Improvements
Package 1 odor control will consist of two new biotrickling filters and two new carbon adsorbers. To implement the odor control system, additional changes such as primary treatment covers and air intake louvers will be installed.

To reduce odor emissions associated with liquid processes, headworks exhaust, primary clarifiers, primary influent and effluent channels and primary effluent/return activated sludge (PE/RAS) mix box will be covered and ventilated to two new biotrickling filters. In addition, the existing odor control unit on the 117th Street Force Main discharge vent will be demolished and the air will be captured and also treated with the two new biotrickling filters. The biotrickling filters are designed to a future capacity of 22,350 cubic feet per minute (cfm), which covers the initial demand of 19,350 cfm. The biotrickling towers design criteria include future expansion and treatment of primary clarifiers 5, 6, and 7. A bypass to the biotrickling towers will be installed to vent uncontrolled odorous air during maintenance episodes.

To reduce odor emissions associated with the solid processes, a new carbon adsorber system will control the odor emissions associated with the BFP stacks, thickened waste activated sludge (TWAS) wet well fan, filtrate wet well, biosolids conveyor, and biosolids hopper. The carbon adsorber system is designed to treat an air flow of 16,000 total cfm and will be located west of the existing biosolids bunker. Similarly to the biotrickling filter towers, a bypass will be installed to vent uncontrolled odorous air during carbon adsorber maintenance

Additional improvements to the plant include covers over secondary clarifier launders, aeration basin process upgrades, RAS chlorination, demolishing the former control building, replacing RAS piping in the RAS Pump Station, constructing yard piping, replacing the canopy at the disinfection facility, replacing the existing waste gas incinerator control enclosure, and constructing an oil and lubricant storage building.

5. EQUIPMENT/ACTIVITY IDENTIFICATION

5.a 4.226 MMBtu/hr Boiler (**Boiler 2**). This hot water boiler is a Hurst Boiler and Welding Company, Inc. model S1-X-101-30W, serial number FB505-30-3 with a 6.0MMBtu Weishaupt model G7/1-D, ZDM burner serial no. 5732371. The boiler and burner combination have a heat input capacity of 4.226 MMBtu/hr. The Weishaupt burner fires digester gas, a blend of digester gas and natural gas, or natural gas. The boiler provides heat to the digesters. Emissions are exhausted vertically at a height of approximately 32 feet above ground level through a 16" diameter stack. This boiler was built in 1997.

5.b 5.231 MMBtu/hr (**Boiler 1**).

Make / Model:	Hurst / Series 100
Serial No.:	FB625-30-26
Built:	2007
Configuration:	Fire tube
Input Heat Capacity:	5.231 MMBtu/hr
Turndown Ratio:	8:1
Fuel:	Digester gas, natural gas or blend of digester gas and natural gas
Burner Make / Model:	Weishaupt / G30/2A
Burner Serial No.:	5732676
Stack Parameters:	32' above ground level, 18" diameter, ~ 300 °F

5.c Fulton Pulse Boiler. This boiler is a Fulton Pulse Combustion model PHW-750, fired on natural gas. The boiler is equipped with Leeson burners rated at 0.75 MMBtu/hr and is used to heat the administration building. This boiler was installed in 1996.

5.d Old Digester Waste Gas Incinerator. The digester waste gas incinerator is a Sur-Lite enclosed flare model SDF200. The waste gas incinerator measures 40" by 40" and exhausts approximately 25' above ground level. The waste gas incinerator is designed to achieve a 0.6 second retention time with an exhaust flowrate of 3,200 scfm at 1,500°F. The waste gas incinerator has an operating range of 2,960 cfh to 11,843 cfh of digester gas containing 50% to 70% methane. Up to 1,875 scfh of supplemental natural gas could be burned in the waste gas incinerator when sufficient digester gas is not available. The total heat capacity of the waste gas incinerator is 8.25 MMBtu/hr. Digester gas is only flared when the amount of gas produced exceeds the demand of the Hurst and Superior boilers.

The waste gas incinerator is used to thermally oxidize pollutants in the digester gas. The digesters are estimated to produce up to 833 scfh of process gas with a heating value of 600 Btu/scf. Temperature is monitored at the lowest thermocouple when the waste gas incinerator is firing at a low rate.

5.e New Digester Waste Gas Burner. The digester gas system is estimated to be capable of producing 163,000 cubic feet of digester gas per day. The following details were available for the burner.

Make:	Varec / 244E
Model:	WG244EGC1912017
Capacity:	14,710 scfh digester gas
Turn Down Ratio:	at least 15:1
Stack Parameters:	20' above ground level, 41" diameter, variable temperature
Pilot Fuel:	40 scfh of natural gas

5.f Caterpillar Emergency Generator Engine. This generator is a 1,500 kW Caterpillar model SR-4B powered by a Caterpillar 3516-DITA diesel engine, serial number 25Z05353. The Caterpillar diesel engine is rated at 2,168 horsepower at 1,800 rpm. This generator is used to provide emergency power to the lower portion of the plant including the UV basins, solids processing effluent pumps, electrical lighting, and etc. The generator is operated approximately once per month for 40 – 60 minutes for testing and maintenance purposes and as necessary to provide emergency power. This generator was installed in March of 1998.

Federal Regulations: 40 CFR 63 Subpart ZZZZ

5.g 36th Avenue Pump Station Generator. This Onan generator set, model #800DFJB and serial # J940558588, provides 800 kW of electrical power. This unit is powered by a Cummins model KTA38-G2, engine number 33128676, diesel engine, serial number 97767-16. This generator is located at, and provides emergency power for, the 36th Avenue Pump Station (located at the south end of the Salmon Creek bridge). The generator is operated approximately once per month for 40 – 60 minutes for testing and maintenance purposes and as necessary to provide emergency power. This generator was manufactured September 29, 1994 and installed in August of 1995.

Federal Regulations: 40 CFR 63 Subpart ZZZZ

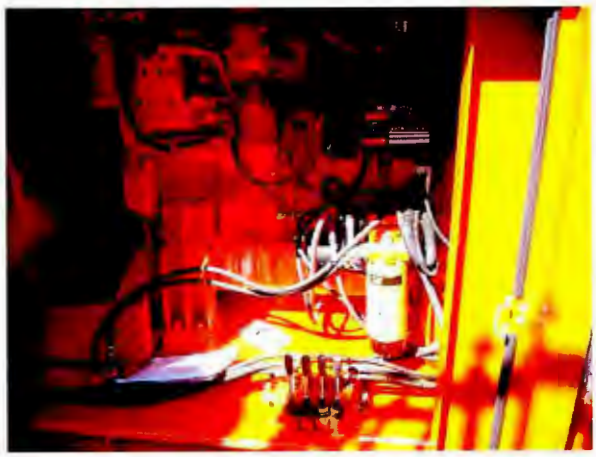
5.h Cat Emergency Generator #1 Engine. This generator replaced a 250 kW Onan Emergency Generator set. This unit provides emergency electrical power to the upper plant.

Unit Identification:	Cat Emergency Generator #1
Engine Make / Model:	Caterpillar / C18
Engine Serial Number:	FST01005
Fuel:	Diesel
Fuel Consumption:	42.7 gph at full standby load
Horsepower Rating:	900 horsepower
Installed:	2014
Engine Built (Date):	June 2014
Engine Certification:	EPA Tier 2
Gen Set Make/Model:	Caterpillar / 600
Generator Set Output:	600 kW
Stack Description:	~8" inside diameter, exhausted at 4,785 acfm, 994°F, ~6' above grade
Federal Regulations:	40 CFR 60 Subpart IIII 40 CFR 63 Subpart ZZZZ

5.i Flow Augmentation Pump Engine #1. This diesel engine is used to power a wastewater pump used only during high peak flows. Specific engine information is listed below:

Engine Make:	Caterpillar
Engine Model:	C-9
Engine Serial #:	CLJ08934
Date Built:	April 6, 2005 (2005 model year)
Fuel:	Diesel
Fuel Consumption:	~14 gph at full load
Horsepower Rating:	275 hp
Certification:	EPA Tier 2 certified
Location:	36th Avenue Pump Station SW of the 36th Ave. Bridge over Salmon Creek
Federal Regulations:	40 CFR 63 Subpart ZZZZ

5.j Flow Augmentation Pump Engine #2. This diesel engine is used to power a wastewater pump used only during high peak flows. Specific engine information is listed below:



Engine Make:	Caterpillar
Engine Model:	C-9
Engine Serial #:	CLJ08815
Date Built:	April 15, 2005 (2005 model year)
Fuel:	Diesel
Fuel Consumption:	~14 gph at full load
Horsepower Rating:	275
Certification:	EPA Tier 2 certified
Location:	36th Avenue Pump Station SW of the 36th Ave. Bridge over Salmon Creek
Federal Regulations:	40 CFR 63 Subpart ZZZZ

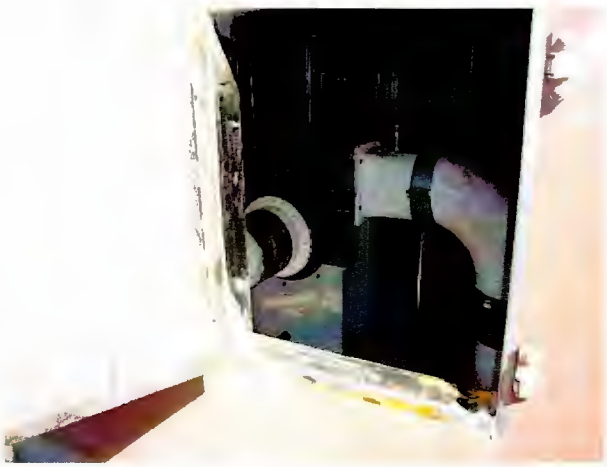
5.k 117th Street Pump Station Emergency Generator Engine. This emergency generator package provides emergency electricity to the 117th Street Pump Station. The following details were provided:

Make / Model:	Cummins / QSK50-G4 NR2
Serial No.:	75702-397
Engine Power:	1,848 horsepower at full standby load
Fuel Consumption:	92.7 gal/hr
Generator Output:	1,250 kW
Stack Details:	TBD
Certification:	EPA Tier 2 certified
Manufacture Date:	6/24/08
Federal Regulations:	40 CFR 60 Subpart IIII 40 CFR 63 Subpart ZZZZ

5.l 117th Street Pump Station Ventilation. Twin 32" diameter force mains from the 117th Street Pump Station move sewage to the Salmon Creek Treatment Plant. The 117th Street Pump Station employs a chemical injection system to control the formation of hydrogen sulfide in the force mains that would be emitted at the headworks of the Salmon Creek Treatment Plant. The system targets a dissolved sulfide level of 0.5 mg/L. In addition, an on-site odor control system was installed. The on-site system draws gas from the wet well and incoming sewer line(s) and passes the gas through a carbon canister system to remove hydrogen sulfide and other odorous compounds. The following details of the system were provided:

Carbon Bed Make / Model:	Daniel Company / Deep Bed OCS – 8' diameter dual bed configuration
Equipment No.:	020CU2404
Serial No.:	1323VES01
Gas Flow Rate:	4,900 acfm (based on expected fan operating conditions)
Carbon Bed Capacity:	7,500 acfm
Dimensions:	2 layers of carbon, 36" thick, contained in a single 8' diameter shell. Each layer treats ~ ½ of the gas stream in parallel.
Design H_2S Control:	95% of gas stream containing 3 ppm H_2S

5.m 36th Avenue Pump Station Ventilation. Odorous air ventilated from the 36th avenue pump station wet well and the lower section of the Salmon Creek Interceptor is treated with an in-ground biofilter. The biofilter is comprised of compost, bark, and wood chips, peat, carbon, and other organic or inorganic materials. The biofilter measures approximately 12' by 42' and treat up to 1,200 cfm of odorous gas. The biofilter is designed to achieve 97% to 99% control of hydrogen sulfide emissions in the concentration ranges expected from the wet well. A rainbird model sprinkler is installed to maintain uniform moisture content.



5.n Sludge Blend Tank. VOCs and odors from the sludge blend tank are vented to a biotrickling filter capable of removing 99% of H_2S emissions at concentrations greater than or equal to 10 ppmv, and conservatively assumed to provide at least 97% control of H_2S emissions. The biotower is capable of treating up to 1,000 cfm of vent flow with an H_2S concentration of up to 300 ppmv (100 ppmv average). The bed is sized to have a residence time of at least 7 seconds.

5.o Preliminary/Primary Treatment. This equipment includes the headworks (preliminary treatment), primary clarifiers, primary effluent / return activated sludge mixing box, and the 117th Street Pump Station Vent (force main discharge vent). This equipment will be enclosed and vented to a biotrickling filter system. The system will need to be bypassed temporarily during maintenance events. Details of the biotrickling filter system is provided below:

Make / Model:	To be determined (BioAir Solutions, Daniel Company, Evoqua Water Technologies, or Environmental Composite Systems allowed)
Installation Date:	Expected in 2020
Description:	Two parallel vessels, with water recirculated to the top of a high porosity synthetic media (polyurethane, polyethylene, or polyvinyl chloride). A nutrient supply system will be included to add nutrients to the water as necessary.
Capacity:	Designed for total flow of 22,350 cfm
H_2S control efficiency:	$\leq$ 0.5 ppm outlet concentration for inlet concentrations below 10 ppm 99% control for inlet concentrations at or above 10 ppm
Odor control efficiency:	90% removal or < 500 dilutions to threshold (D/T), whichever results in greater reduction
Stack Description:	Vertical exhaust on each unit with a bypass for use during system maintenance

5.p Solids Handling. This equipment includes the thickened waste activated sludge wet well fan, belt filter presses, filtrate wet well, hopper vent, and biosolids conveyor. This equipment will be enclosed and vented to a carbon adsorber system consisting of two carbon adsorbers in parallel. The system will need to be bypassed temporarily during maintenance events. Details of the carbon adsorber system is provided below:

Make / Model:	To be determined
Installation Date:	Expected in 2020
Description:	Two parallel beds, 12' diameter, 8' tall, 2.5 second residence time
Media:	29,200 pounds of media, 50/50 blend of potassium permanganate based media and virgin, pelletized, vapor-phase bituminous activated carbon.
Capacity:	Designed for 16,000 cfm.
H_2S control efficiency:	95% control for inlet concentrations below 10 ppm 99% control for inlet concentrations at or above 10 ppm
Odor control efficiency:	90% for inlet concentrations greater than 5,000 dilutions to threshold (D/T) Outlet concentration less than 500 D/T for inlet concentrations less than 5,000 D/T
Stack Description:	Exhausting vertically 3' above the vessels with a bypass for use during system maintenance
Location:	West of the biosolids bunkers

5.q Fugitive Emissions. Volatile organic compounds (VOCs) and toxic air pollutants (TAPs) are volatilized from unenclosed structures. With the Phase 5B project, preliminary and primary treatment activities will be enclosed and ventilated to biotrickling filter systems. Fugitive emissions and odor are possible from various sources including the six aeration basins and four secondary clarifiers.

5.r Equipment/Activity Summary.

ID No.	Generating Equipment/Activity	# of Units	Control Measure/Equipment	# of Units
1	4.226 MMBtu/hr Boiler	1	Low-NO_X burners	1
2	5.231 MMBtu/hr Boiler	1	Low-NO_X burners	1
3	Fulton Pulse Boiler	1	None	0
4	Old Digester Waste Gas Incinerator	1	Low-NO_X design	N/A
5	New Digester Waste Gas Burner	1	Low-NO_X design	N/A
6	Caterpillar Emergency Generator Engine	1	Ultra-low sulfur diesel	N/A
7	36th Avenue Pump Station Generator Engine	1	Ultra-low sulfur diesel	N/A
8	Cat Emergency Generator Engine #1	1	Tier 2 engine design, ultra-low sulfur diesel	N/A
9	Flow Augmentation Pump Engine #1	1	Tier 3 engine design, ultra-low sulfur diesel	N/A
10	Flow Augmentation Pump Engine #2	1	Tier 3 engine design, ultra-low sulfur diesel	N/A
11	117th Street Pump Station Emergency Generator Engine	1	Tier 2 engine design, ultra-low sulfur diesel	N/A
12	117th Street Pump Station Ventilation	1	Carbon adsorber system, liquid sulfide control system	1
13	36th Avenue Pump Station Ventilation	1	Biofilter	1
14	Sludge Blend Tank	1	Biotrickling filter	1

ID No.	Generating Equipment/Activity	# of Units	Control Measure/Equipment	# of Units
15	Preliminary / Primary Treatment (headworks, primary clarifiers, primary effluent / RAS mixing box, force main vent)	1	Biotrickling Filters	2
16	Solids Handling (thickened waste activated sludge wet well fan, belt filter presses, filtrate wet well, hopper vent, biosolids conveyor)	1	Carbon Adsorbers	2
17	Fugitive Emissions (Including six aeration basins, four secondary clarifiers, UV filtration, and effluent pump station)	1	None	0

6. EMISSIONS DETERMINATION

6.a 4.226 MMBtu/hr Boiler. The 4.226 MMBtu/hr Boiler will be fired on both digester gas and natural gas. Potential annual emissions from the combustion of digester gas were estimated conservatively using the assumption that the boiler is operated at full rated load (4.226 MMBtu/hr) for 8,760 hours per year burning digester gas. Potential annual emissions from the combustion of natural gas were estimated conservatively using the assumption that the boiler is operated at full rated load for 8,760 hours per year burning natural gas.

4.226 MMBtu/hr Boiler - Digester Gas

Heat Rate =	4.226 MMBtu/hr
Gas Heat Content =	600 Btu/scf
Fuel Consumption =	59.50 MMscf/yr
Maximum H_2S Content (hourly) =	1,800 ppm
Maximum H_2S Content (annual) =	1,800 ppm

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	EF Souce
NO_X	30	0.039	23.38	0.16	0.70	BACT Limitation
CO	50	0.040	23.72	0.17	0.71	BACT Limitation
VOC		0.0054	3.24	0.023	0.10	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2 (hourly)		0.499	299	2.11	N/A	Applicant's design
SO_X as SO_2 (annual)		0.499	299	2.11	8.90	Applicant's design
PM		0.0075	4.47	0.031	0.13	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	4.47	0.031	0.13	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	4.47	0.031	0.13	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	52.07	1	114.79	68,877	2,049	40 CFR 98
CH_4	0.0032	25	0.176	106	3.1	40 CFR 98
N_2O	0.00063	298	0.414	248	7	40 CFR 98
Total GHG - CO_2e	52.07383		115.385	69,231	2,059	

[1] CO emission factors are equivalent to 50 ppmvd CO @ 3% O_2 for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[2] NO_X emission factors are equivalent to 30 ppmvd @ 3% O_2 for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[3] The AP-42 VOC and PM emission factors were reduced by the ratio of the heat content of the digester gas (600 Btu/scf) to the heat content assumed in AP-42 for natural gas (1,020 Btu/scf).
[4] All particulate matter is assumed to be less than 1 μm in diameter.

4.226 MMBtu/hr Boiler - Natural Gas

Heat Rate =	4.226 MMBtu/hr
Gas Heat Content =	1,020 Btu/scf
Fuel Consumption =	36.29 MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	EF Souce
NO_X	30	0.036	37.1	0.15	0.67	BACT Limitation
CO	50	0.037	37.7	0.16	0.68	BACT Limitation
VOC		0.0054	5.5	0.023	0.10	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.0006	0.6	0.0025	0.011	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.031	0.14	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.031	0.14	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.031	0.14	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	8.7E-06	3.8E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	3.1E-04	1.4E-03	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	53.06	1	116.98	119,317	2,165	40 CFR 98
CH_4	0.001	25	0.055	56	1.0	40 CFR 98
N_2O	0.0001	298	0.066	67	1.2	40 CFR 98
Total GHG - CO_2e	53.0611		117.098	119,440	2,167	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.b 5.231 MMBtu/hr Boiler. The 5.231 MMBtu/hr Boiler will be fired on both digester gas and natural gas. Potential annual emissions from the combustion of digester gas were estimated conservatively using the assumption that the boiler burns the entire amount of digester gas that could be produced at the facility (up to 163,000 standard cubic feet per day). The boiler has the capacity to burn up to 210,000 standard cubic feet per day of digester gas. Potential annual emissions from the combustion of natural gas were estimated conservatively using the assumption that the boiler is operated at full rated load for 8,760 hours per year burning natural gas.

5.231 MMBtu/hr Boiler - Digester Gas

Heat Rate =	5.231 MMBtu/hr
Gas Heat Content =	600 Btu/scf
Fuel Consumption =	59.50 MMscf/yr
Maximum H_2S Content (hourly) =	1,800 ppm
Maximum H_2S Content (annual) =	1,800 ppm

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	EF Souce
NO_X	30	0.039	23.38	0.20	0.70	BACT Limitation
CO	50	0.040	23.72	0.21	0.71	BACT Limitation
VOC		0.0054	3.24	0.028	0.10	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2 (hourly)		0.499	299	2.61	N/A	Applicant's design
SO_X as SO_2 (annual)		0.499	299	2.61	8.90	Applicant's design
PM		0.0075	4.47	0.039	0.13	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	4.47	0.039	0.13	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	4.47	0.039	0.13	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	52.07	1	114.79	68,877	2,049	40 CFR 98
CH_4	0.0032	25	0.176	106	3.1	40 CFR 98
N_2O	0.00063	298	0.414	248	7	40 CFR 98
Total GHG - CO_2e	52.07383		115.385	69,231	2,059	

[1] CO emission factors are equivalent to 50 ppmvd CO @ 3% O_2 for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[2] NO_X emission factors are equivalent to 30 ppmvd @ 3% O_2 for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[3] The AP-42 VOC and PM emission factors were reduced by the ratio of the heat content of the digester gas (600 Btu/scf) to the heat content assumed in AP-42 for natural gas (1,020 Btu/scf).
[4] All particulate matter is assumed to be less than 1 μm in diameter.

5.231 MMBtu/hr Boiler - Natural Gas

Heat Rate =	5.231 MMBtu/hr
Gas Heat Content =	1,020 Btu/scf
Fuel Consumption =	44.93 MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	EF Souce
NO_X	30	0.036	37.1	0.19	0.83	BACT Limitation
CO	50	0.037	37.7	0.19	0.85	BACT Limitation
VOC		0.0054	5.5	0.028	0.12	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.0006	0.6	0.0031	0.013	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.039	0.17	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.039	0.17	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.039	0.17	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	1.1E-05	4.7E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	3.8E-04	1.7E-03	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	53.06	1	116.98	119,317	2,680	40 CFR 98
CH_4	0.001	25	0.055	56	1.3	40 CFR 98
N_2O	0.0001	298	0.066	67	1.5	40 CFR 98
Total GHG - CO_2e	53.0611		117.098	119,440	2,683	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.c Fulton Pulse Boiler. The Fulton Pulse Boiler will be fired solely on natural gas. Potential annual emissions from the combustion of natural gas were estimated conservatively using the assumption that the boiler is operated at full rated load (0.75 MMBtu/hr) for 8,760 hours per year burning natural gas.

Fulton Pulse Boiler

Heat Rate =	0.75 MMBtu/hr
Gas Heat Content =	1,020 Btu/scf
Fuel Consumption =	6.44 MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	EF Souce
NO_X	30	0.036	37.1	0.027	0.12	BACT Limitation
CO	50	0.037	37.7	0.028	0.12	BACT Limitation
VOC		0.0054	5.5	0.0040	0.018	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.0006	0.6	0.00044	0.0019	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0056	0.024	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.0056	0.024	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.0056	0.024	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	1.5E-06	6.8E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	5.5E-05	2.4E-04	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	53.06	1	116.98	119,317	384	40 CFR 98
CH_4	0.001	25	0.055	56	0.2	40 CFR 98
N_2O	0.0001	298	0.066	67	0.2	40 CFR 98
Total GHG - CO_2e	53.0611		117.098	119,440	385	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.d Old Digester Waste Gas Incinerator. Potential emissions from the combustion of digester gas in the old digester waste gas incinerator were estimated assuming the Old Digester Waste Gas Incinerator burns the entire amount of digester gas that could be produced at the facility (up to 163,000 standard cubic feet per day). This is a conservative estimate because the system is designed so that digester gas is burned preferentially in the boilers. In addition, the Old Digester Waste Gas Incinerator will only be used as a backup when the New Digester Waste Gas Incinerator is not available. The Old Digester Waste Gas Incinerator has the capacity to burn up to 330,000 standard cubic feet per day of digester gas.

Old Digester Waste Gas Incinerator - Digester Gas

Heat Rate =	8.25 MMBtu/hr (13,750 scfh)
Gas Heat Content =	600 Btu/scf
Fuel Consumption =	59.50 MMscf/yr
Maximum H_2S Content (hourly) =	1,800 ppm
Maximum H_2S Content (annual) =	1,800 ppm

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	46	0.06	36	0.50	1.07	BACT Limitation
CO	379	0.30	180	2.48	5.35	BACT Limitation
VOC		0.0054	3.24	0.044	0.10	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2 (hourly)		0.4987	299.22	4.11	N/A	Applicant's design
SO_X as SO_2 (annual)		0.4987	299.22	4.11	8.90	Applicant's design
PM		0.0075	4.47	0.061	0.13	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	4.47	0.061	0.13	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	4.47	0.061	0.13	AP-42 Sec. 1.4 (7/98)
Hydrogen Sulfide (H_2S)		0.0027	1.59	0.022	0.05	99% destruction of H_2S

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	52.07	1	114.79	68,877	2,049	40 CFR 98
CH_4	0.0032	25	0.176	106	3.1	40 CFR 98
N_2O	0.00063	298	0.414	248	7	40 CFR 98
Total GHG - CO_2e	52.07383		115.385	69,231	2,059	

[1] CO emission factors are equivalent to the manufacturer supplied emission factor of 0.3 lb/MMBtu for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[2] NO_X emission factors are equivalent to the manufacturer supplied emission factor of 0.06 lb/MMBtu for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[3] All particulate matter is assumed to be less than 1 µm in diameter.
[4] The emission factor for hydrogen sulfide was calculated assuming that 100% of the reduced sulfur compounds in the digester gas are hydrogen sulfide, and that the Old Digester Waste Gas Incinerator provides for 99% destruction removal efficiency (DRE).

The digester waste gas incinerator may burn natural gas as a supplemental fuel to maintain a specified temperature and assure adequate destruction of digester gas. Emissions from the combustion of natural gas are expected to be small relative to emissions from the combustion of digester gas.

Potential emissions from the combustion of natural gas in the digester waste gas incinerator were estimated assuming that the digester waste gas incinerator is operated with the full design rate of supplemental natural gas (1,875 scfh) for 8,760 hours per year.

Old Digester Waste Gas Incinerator - Natural Gas

Heat Rate = 1.9125 MMBtu/hr (1,875 scfh of natural gas)
Gas Heat Content = 1,020 Btu/scf
Fuel Consumption = 16.43 MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	EF Souce
NO_X	49	0.06	61.2	0.11	0.50	BACT Limitation
CO	406	0.30	306	0.57	2.51	BACT Limitation
VOC		0.0054	5.5	0.010	0.045	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.0006	0.6	0.0011	0.0049	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.014	0.062	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.014	0.062	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.014	0.062	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	3.9E-06	1.7E-05	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	1.4E-04	6.2E-04	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	53.06	1	116.98	119,317	980	40 CFR 98
CH_4	0.001	25	0.055	56	0.5	40 CFR 98
N_2O	0.0001	298	0.066	67	0.6	40 CFR 98
Total GHG - CO_2e	53.0611		117.098	119,440	981	

[1] CO emission factors are equivalent to the manufacturer supplied emission factor of 0.3 lb/MMBtu for natural gas with a heat content of 1,020 Btu/scf.
[2] NO_X emission factors are equivalent to the manufacturer supplied emission factor of 0.06 lb/MMBtu for natural gas with a heat content of 1,020 Btu/scf.
[3] All particulate matter is assumed to be less than 1 µm in diameter.

In the future, emissions from the combustion of digester gas will be calculated using emission factors from the most recent source test and the total quantity of digester gas combusted in the waste gas incinerator except where source test data is not available. Where source test data is not available for a specific pollutant, the relevant emission factor identified above shall be used to calculate annual emissions from the combustion of digester gas. Emissions from the combustion of natural gas will be calculated using the natural gas emission factors identified above unless new and better information is obtained through source testing.

6.e New Digester Waste Gas Burner. Potential emissions from the combustion of digester gas in the new digester waste gas burner were estimated by assuming that the New Digester Waste Gas Burner combusts the entire amount of digester gas that could be produced at the facility (up to 163,000 standard cubic feet per day). This is a conservative estimate because the system is designed so that digester gas is burned preferentially in the boilers. The New Digester Waste Gas Burner will have the capacity to burn up to 348,000 standard cubic feet per day of digester gas.

New Digester Waste Gas Burner - Digester Gas

Heat Rate =	8.826 MMBtu/hr (14,710 scfh)
Gas Heat Content =	600 Btu/scf
Fuel Consumption =	59.50 MMscf/yr
Maximum H_2S Content (hourly) =	1,800 ppm
Maximum H_2S Content (annual) =	1,800 ppm

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	Emission Factor Source
NO_X	46	0.06	36	0.53	1.07	BACT Limitation
CO	379	0.30	180	2.65	5.35	BACT Limitation
VOC		0.0054	3.24	0.048	0.10	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2 (hourly)		0.4987	299.22	4.40	N/A	Applicant's design
SO_X as SO_2 (annual)		0.4987	299.22	4.40	8.90	Applicant's design
PM		0.0075	4.47	0.066	0.13	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	4.47	0.066	0.13	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	4.47	0.066	0.13	AP-42 Sec. 1.4 (7/98)
Hydrogen Sulfide (H_2S)		0.0027	1.59	0.023	0.047	99% destruction of H_2S

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	52.07	1	114.79	68,877	2,049	40 CFR 98
CH_4	0.0032	25	0.176	106	3.1	40 CFR 98
N_2O	0.00063	298	0.414	248	7	40 CFR 98
Total GHG - CO_2e	52.07383		115.385	69,231	2,059	

[1] CO emissions are equivalent to the manufacturer supplied emission factor of 0.3 lb/MMBtu for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[2] NO_X emissions are equivalent to the manufacturer supplied emission factor of 0.06 lb/MMBtu for digester gas that is 60.8% methane, 39.2% carbon dioxide, and has a heat content of 600 Btu/scf.
[3] All particulate matter is assumed to be less than 1 μm in diameter.
[4] The emission factor for hydrogen sulfide was calculated assuming that 100% of the reduced sulfur compounds in the digester gas are hydrogen sulfide, and that the New Digester Waste Gas Burner provides for 99% destruction removal efficiency (DRE).

The digester waste gas burner may burn natural gas as a supplemental fuel to maintain a specified temperature and assure adequate destruction of digester gas. Emissions from the combustion of natural gas are expected to be small relative to emissions from the combustion of digester gas.

Potential emissions from the combustion of natural gas in the digester waste gas burner were estimated assuming that the digester waste gas burner is operated with an amount of natural gas equal to the minimum firing rate of the burner (15:1 turndown at 14,710 scfh = 981 scfh) for 8,760 hours per year.

New Digester Waste Gas Burner - Natural Gas

Heat Rate =	1.00028 MMBtu/hr
Gas Heat Content =	1,020 Btu/scf
Fuel Consumption =	8.59 MMscf/yr

Pollutant	ppmvd @ 3% O_2	Emission Factor lb/MMBtu	Emission Factor lb/MMscf	lb/hr	tpy	EF Souce
NO_X	49	0.06	61.2	0.060	0.26	BACT Limitation
CO	406	0.30	306	0.30	1.31	BACT Limitation
VOC		0.0054	5.5	0.0054	0.024	AP-42 Sec. 1.4 (7/98)
SO_X as SO_2		0.0006	0.6	0.00059	0.0026	AP-42 Sec. 1.4 (7/98)
PM		0.0075	7.6	0.0075	0.033	AP-42 Sec. 1.4 (7/98)
PM_{10}		0.0075	7.6	0.0075	0.033	AP-42 Sec. 1.4 (7/98)
$PM_{2.5}$		0.0075	7.6	0.0075	0.033	AP-42 Sec. 1.4 (7/98)
Benzene		2.06E-06	0.0021	2.1E-06	9.0E-06	AP-42 Sec. 1.4 (7/98)
Formaldehyde		7.35E-05	0.075	7.4E-05	3.2E-04	AP-42 Sec. 1.4 (7/98)

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/MMscf	CO_2e tpy	Emission Factor Source
CO_2	53.06	1	116.98	119,317	513	40 CFR 98
CH_4	0.001	25	0.055	56	0.2	40 CFR 98
N_2O	0.0001	298	0.066	67	0.3	40 CFR 98
Total GHG - CO_2e	53.0611		117.098	119,440	513	

[1] CO emissions are equivalent to the manufacturer supplied emission factor of 0.3 lb/MMBtu for natural gas with a heat content of 1,020 Btu/scf.
[2] NO_X emissions are equivalent to the manufacturer supplied emission factor of 0.06 lb/MMBtu for natural gas with a heat content of 1,020 Btu/scf.
[3] All particulate matter is assumed to be less than 1 μm in diameter.

In the future, emissions from the combustion of digester gas will be calculated using emission factors from the most recent source test and the total quantity of digester gas combusted in the waste gas burner except where source test data is not available. Where source test data is not available for a specific pollutant, the relevant emission factor identified above shall be used to calculate annual emissions from the combustion of digester gas. Emissions from the combustion of natural gas will be calculated using the natural gas emission factors identified above unless new and better information is obtained through source testing.

6.f Caterpillar Emergency Generator Engine. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

Caterpillar Emergency Generator Engine

Hours of Operation =	200	hours
Power Output =	2,150.7	horsepower
Diesel Density =	7.206	pounds per gallon
Fuel Sulfur Content =	0.0015	% by weight
Fuel Consumption Rate =	109.09	gallons per hour
Fuel Heat Content =	0.138	MMBtu/gal (for use with GHG factors from 40 CFR 98)
Annual Fuel Consumption =	21,819	gallons

Pollutant	Emission Factor lb/hr	Emissions tpy	Emission Factor Source
NO_X	59.27	5.93	Caterpillar
CO	10.04	1.00	Caterpillar
VOC	1.13	0.11	Caterpillar
SO_X as SO_2	0.0236	0.0024	Mass Balance
PM	0.75	0.075	Caterpillar
PM_{10}	0.75	0.075	Caterpillar
$PM_{2.5}$	0.75	0.075	Caterpillar

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	tpy, CO_2e	
CO_2	73.96	1	163.05	23	245	40 CFR 98
CH_4	0.003	25	0.165	0.023	0.25	40 CFR 98
N_2O	0.0006	298	0.394	0.054	0.59	40 CFR 98
Total GHG - CO_2e	73.9636		163.613	23	246	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.g 36th Avenue Pump Station Emergency Generator Engine. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

36th Avenue Pump Station Emergency Generator Engine

Hours of Operation =	200	hours
Power Output =	1,200	horsepower
Diesel Density =	7.206	pounds per gallon
Fuel Sulfur Content =	0.0015	% by weight
Fuel Consumption Rate =	59.4	gallons per hour
Fuel Heat Content =	0.138	MMBtu/gal (for use with GHG factors from 40 CFR 98)
Annual Fuel Consumption =	11,880	gallons

Pollutant	Emission Factor g/(hp-hr)	Emission Factor lb/hr	Emissions tpy	Emission Factor Source
NO_X	12.5	33.07	3.31	Caterpillar
CO	1.3	3.44	0.34	Caterpillar
VOC	0.1	0.26	0.026	Caterpillar
SO_X as SO_2		0.013	0.0013	Mass Balance
PM	0.1	0.26	0.026	Caterpillar
PM_{10}	0.1	0.26	0.026	Caterpillar
$PM_{2.5}$	0.1	0.26	0.026	Caterpillar

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	tpy, CO_2e	
CO_2	73.96	1	163.05	23	134	40 CFR 98
CH_4	0.003	25	0.165	0.023	0.14	40 CFR 98
N_2O	0.0006	298	0.394	0.054	0.32	40 CFR 98
Total GHG - CO_2e	73.9636		163.613	23	134	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.h Cat Emergency Generator #1 Engine. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

Cat Emergency Generator #1 Engine

Hours of Operation =	200	hours
Power Output =	900	horsepower
Diesel Density =	7.206	pounds per gallon
Fuel Sulfur Content =	0.0015	% by weight
Fuel Consumption Rate =	42.7	gal/hr
Fuel Heat Content =	0.138	MMBtu/gal (for use with GHG factors from 40 CFR 98)

Pollutant	Emission Factor g/(hp-hr)	Emissions lb/hr	Emissions tpy	Emission Factor Source
NO_X	5.75	11.41	1.14	Caterpillar
CO	0.46	0.91	0.091	Caterpillar
VOC	0.01	0.020	0.0020	Caterpillar
SO_X as SO_2		0.0092	0.00092	Mass Balance
PM	0.03	0.060	0.0060	Caterpillar
PM_{10}	0.03	0.060	0.0060	Caterpillar
$PM_{2.5}$	0.03	0.060	0.0060	Caterpillar

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	tpy, CO_2e	Emission Factor Source
CO_2	73.96	1	163.05	23	96	40 CFR 98
CH_4	0.003	25	0.165	0.023	0.10	40 CFR 98
N_2O	0.0006	298	0.394	0.054	0.23	40 CFR 98
Total GHG - CO_2e	74.0		163.6	23	96	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.i Flow Augmentation Pump Engine #1. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

Flow Augmentation Pump Engine #1

Hours of Operation =	200	hours
Power Output =	275.0	horsepower
Diesel Density =	7.206	pounds per gallon
Fuel Sulfur Content =	0.0015	% by weight
Fuel Consumption Rate =	14.0	gallons per hour
Fuel Heat Content =	0.138	MMBtu/gal (for use with GHG factors from 40 CFR 98)
Annual Fuel Consumption =	2,800	gallons

Pollutant	Emission Factor lb/hr	Emissions tpy	Emission Factor Source
NO_X	3.56	0.36	Caterpillar
CO	0.65	0.065	Caterpillar
VOC	0.12	0.012	Caterpillar
SO_X as SO_2	0.0030	0.00030	Mass Balance
PM	0.080	0.0080	Caterpillar
PM_{10}	0.080	0.0080	Caterpillar
$PM_{2.5}$	0.080	0.0080	Caterpillar

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	tpy, CO_2e	
CO_2	73.96	1	163.05	23	32	40 CFR 98
CH_4	0.003	25	0.165	0.023	0.03	40 CFR 98
N_2O	0.0006	298	0.394	0.054	0.08	40 CFR 98
Total GHG - CO_2e	73.9636		163.613	23	32	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.j Flow Augmentation Pump Engine #2. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

Flow Augmentation Pump Engine #2

Hours of Operation =	200	hours
Power Output =	275.0	horsepower
Diesel Density =	7.206	pounds per gallon
Fuel Sulfur Content =	0.0015	% by weight
Fuel Consumption Rate =	14.0	gallons per hour
Fuel Heat Content =	0.138	MMBtu/gal (for use with GHG factors from 40 CFR 98)
Annual Fuel Consumption =	2,800	gallons

Pollutant	Emission Factor lb/hr	Emissions tpy	Emission Factor Source
NO_X	3.56	0.36	Caterpillar
CO	0.65	0.065	Caterpillar
VOC	0.12	0.012	Caterpillar
SO_X as SO_2	0.0030	0.00030	Mass Balance
PM	0.080	0.0080	Caterpillar
PM_{10}	0.080	0.0080	Caterpillar
$PM_{2.5}$	0.080	0.0080	Caterpillar

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	tpy, CO_2e	
CO_2	73.96	1	163.05	23	32	40 CFR 98
CH_4	0.003	25	0.165	0.023	0.03	40 CFR 98
N_2O	0.0006	298	0.394	0.054	0.08	40 CFR 98
Total GHG - CO_2e	73.9636		163.613	23	32	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.k 117th Street Pump Station Emergency Generator Engine. Potential annual emissions from the combustion of ultra-low sulfur diesel (<0.0015% sulfur by weight) were calculated with the assumption that the equipment will operate at full load for up to 200 hours per year.

117th Street Pump Station Emergency Generator Engine

Hours of Operation =	200	hours
Power Output =	1,848	hp (full standby)
Diesel Density =	7.206	pounds per gallon
Fuel Sulfur Content =	0.0015	% by weight
Fuel Consumption Rate =	92.7	gallons per hour
Fuel Heat Content =	0.138	MMBtu/gal (for use with GHG factors from 40 CFR 98)
Annual Fuel Consumption =	18,540	gallons

Pollutant	Emission Factor lb/(hp-hr)	Emission Factor lb/hr	Emissions tpy	Emission Factor Source
NO_X	5.2	21.19	2.12	Cummins - Full Standby
CO	0.45	1.83	0.18	Cummins - Full Standby
VOC	0.06	0.24	0.024	Cummins - Full Standby
SO_X as SO_2		0.020	0.0020	Mass Balance
PM	0.04	0.16	0.0163	Cummins - Full Standby
PM_{10}	0.04	0.16	0.0163	Cummins - Full Standby
$PM_{2.5}$	0.04	0.16	0.0163	Cummins - Full Standby

Greenhouse Gases	kg/MMBtu	GWP	CO_2e lb/MMBtu	CO_2e lb/gallon	tpy, CO_2e	
CO_2	73.96	1	163.05	23	209	40 CFR 98
CH_4	0.003	25	0.165	0.023	0.21	40 CFR 98
N_2O	0.0006	298	0.394	0.054	0.50	40 CFR 98
Total GHG - CO_2e	73.9636		163.613	23	209	

Emissions must be calculated using the emission factors identified above unless new emission factors are provided by the manufacturer or developed through source testing.

6.l 117th Street Pump Station Ventilation. The 117th Street Pump Station Odor Control Unit treats 4,900 scfm of gas drawn from the wet well and incoming sewage piping with a carbon canister. The canister is designed to provide for 95% control of H_2S at a design inlet concentration of 3 ppmv. Potential annual emissions of hydrogen sulfide were calculated using the assumption that the system treats 4,900 cfm of tainted gas 8,760 hours per year, the incoming gas contains 3 ppmv H_2S, and the carbon canister captures 95% of the incoming H_2S.

117th Street Pump Station Ventilation	
Flow =	4,900 cfm
H_2S Content =	3 ppm
Control % of Biological Packed Tower =	95%
Hours of Operation =	8,760 hours
H_2S Emissions =	0.0039 lb/hr
H_2S Emissions =	34 lb/yr

6.m 36th Avenue Pump Station Ventilation. Gases vented from the 36th Avenue Pump Station could be a significant source of nuisance odors if not properly controlled with a biofilter as proposed. Emissions are expected to be so low as to be practically unquantifiable downstream of the control equipment.

6.n Sludge Blend Tank. The Sludge Blend Tank could be a significant source of nuisance odors if not properly controlled with the biological packed tower. Potential emissions of hydrogen sulfide were calculated using the assumption that the tank exhausts at a rate of 1,000 cfm, the exhaust contains 100 ppm of hydrogen sulfide, and the biological packed tower provides for 97% control of hydrogen sulfide emissions.

Sludge Blend Tank	
Flow =	1,000 cfm
H_2S Content =	100 ppm
Control % of Biotrickling Filter =	97%
Hours of Operation =	8,760 hours
H_2S Emissions =	0.0159 lb/hr
H_2S Emissions =	139 lb/yr

6.o Preliminary / Primary Treatment (Biotrickling Filters). This equipment includes the headworks (preliminary treatment), primary clarifiers, primary effluent / return activated sludge mixing box, and the 117th Street Pump Station Vent (force main discharge vent). This equipment will be enclosed and vented to a biotrickling filter system. Potential emissions of hydrogen sulfide were calculated using an assumption that the controlled H2S concentration is 0.5 ppm. The system will be designed to provide 99% control of H_2S for inlet concentrations at or above 10 ppm, and an exhaust concentration of no more than 0.5 ppm for H_2S inlet concentrations below 10 ppm.

Preliminary / Primary Treatment		
	Controlled	
Flow =	22,350	cfm
H_2S Content (Controlled) =	0.5	ppm
Hours of Operation =	8,760	hours
H_2S Emissions =	0.0592	lb/hr
H_2S Emissions =	518	lb/yr

6.p Solids Handling (Carbon Adsorbers). This equipment includes the thickened waste activated sludge wet well fan, belt filter presses, filtrate wet well, hopper vent, and biosolids conveyor. This equipment will be enclosed and vented to a carbon adsorber system consisting of two carbon adsorbers in parallel. Potential emissions of hydrogen sulfide were calculated using an assumption that the controlled H_2S concentration is 0.1 ppm. The system will be designed to provide 99% control of H_2S for inlet concentrations at or above 1 ppm, and an exhaust concentration of no more than 0.01 ppm for H_2S inlet concentrations below 1 ppm.

Solids Handling (Carbon Adsorbers)			
	Controlled	Uncontrolled	
Flow =	16,000	16,000	cfm
H_2S Content =	0.1	0.72	ppm
Control % of Biological Packed Tower =	See note 1	See note 2	
Hours of Operation =	8,760	8,760	hours
H_2S Emissions =	0.0085	0.0610	lb/hr
H_2S Emissions =	74	534	lb/yr

6.q Fugitive Emissions. Volatile organic compounds (VOCs) and toxic air pollutants (TAPs) are volatilized from unenclosed structures. With the Phase 5B Package 1 project, preliminary and primary treatment activities will be enclosed and ventilated to biotrickling filters and solid handling will be vented to carbon adsorbers. These sources will no longer be fugitive. Fugitive emissions and odor will be possible from various sources including the six aeration basins and four secondary clarifiers.

Fugitive emissions consist of volatile organic compounds (VOCs) volatilized from wastewater processing that are vented directly to the ambient air. Some of these VOCs are also toxic air pollutants (TAPs) listed in WAC 173-460 and/or hazardous air pollutants (HAPs) listed in Section 112 of the Federal Clean Air Act Amendments of 1990. Annual emissions were calculated using the assumption that the facility will treat 11.41 mgd on an annual average (this was the design basis presented in Air Discharge Permit Application CL-1753).

HAP and TAP emissions were calculated using emission factors calculated from a Bay Area Sewage Toxics Emissions (BASTE) computer model run by the applicant. The chemical input data came from the applicant's 2015-2019 Annual Pretreatment Reports.

Fugitive Emissions

Throughput = 15 mgd (montly average), maximum
Annual Treated = 4,165 million gallons wastewater treated
BASTE Basis = 11.40 mgd

Pollutant	BASTE Output lb/yr	Emission Factor lb/MMgal	Emissions lb/yr	EF Source
Hydrogen sulfide (Controlled)[1]	146	3.51E-02	146	BASTE, pretx reports, biotrickling filter
Hydrogen sulfide (Uncontrolled)	967	2.32E-01	968	BASTE, 2015-2019 pretx reports
Acetone	22	5.29E-03	22	BASTE, 2015-2019 pretx reports
Bis(2 ethylhexyl)phthalate	0.06	1.44E-05	0.06	BASTE, 2015-2019 pretx reports
Cresol	0.52	1.25E-04	0.52	BASTE, 2015-2019 pretx reports
Dichlorobenzene (1,4) (p)	1.1	2.64E-04	1.1	BASTE, 2015-2019 pretx reports
Pentachlorophenol	4.9	1.18E-03	4.9	BASTE, 2015-2019 pretx reports
Phenol	0.1	2.40E-05	0.10	BASTE, 2015-2019 pretx reports
Tetrachloroethene	3.1	7.45E-04	3.1	BASTE, 2015-2019 pretx reports
Toluene	6.5	1.56E-03	6.5	BASTE, 2015-2019 pretx reports
Xylene	3.5	8.41E-04	3.5	BASTE, 2015-2019 pretx reports
Total VOCs		9.03E-01	3,760	SCAQMD JEIP
Total HAP				
Total TAP				

[1] controlled hydrogen sulfide emissions estimated here do not include preliminary and primary treatment processes, which are covered under "Preliminary and Primary Biotrickling Filter"

BASTE = Bay Area Sewage Toxic Emissions computer model
SCAQMD JEIP = South Coast Air Quality Management District Joint Emission Inv. Program (10/93)

In the future, emissions will be calculated using the emission factors identified above unless new emission factors are provided from new emissions models or wastewater sampling.

6.r Facilitywide Potential Emissions (PTE) Summary.

TAP Summary		
Pollutant	CAS #	Pounds per Year
Hydrogen Sulfide	7783-06-4	177.2
Acetone	64-67-1	23.3
Bis(2 ethylhexyl)phthalate	117-81-7	0.1
Cresol	108-39-4	0.6
Dichlorobenzene (1,4) (p)	106-46-7	1.1
Pentachlorophenol	87-86-5	5.3
Phenol	108-95-2	0.1
Tetrachloroethene	127-18-4	2.9
Toluene	108-88-3	6.4
Xylene	1330-20-7	3.5
Benzene	71-43-2	0.2
Formaldehyde	50-00-0	8.5

Pollutant	**Annual Emissions (tpy)**
Nitrogen oxides	16.67
Carbon monoxide	12.59
Volatile organic compounds	2.48
Sulfur oxides as sulfur dioxide	8.94
Particulate matter	0.70
PM_{10}	0.70
$PM_{2.5}$	0.70
Toxic Air Pollutants	0.54
Hazardous Air Pollutants	0.01
CO_2e	11,610

7. REGULATIONS AND EMISSION STANDARDS

Regulations that have been used to evaluate the acceptability of the proposed facility and establish emission limits and control requirements include, but are not limited to, the regulations, codes, or requirements listed below.

7.a Title 40 Code of Federal Regulations (40 CFR) 63.1580 et seq "Subpart VVV – National Emission Standards for Hazardous Air Pollutants: Publicly Owned Treatment Works" established HAP emission control requirements for wastewater plants that are themselves a major source of hazardous air pollutants or are located at a major source of hazardous air pollutants. This facility is not a major source of hazardous air pollutants and is not located at a major source of hazardous air pollutants, therefore this facility is not subject to this regulation.

7.b 40 CFR Part 60.4200 et seq. "Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines" requires that new diesel engines meet specific emission standards at the point of manufacture and during operation. In addition, maximum fuel sulfur contents are specified and minimum maintenance standards are required. The Cat Emergency Generator #1 and 117th Street Pump Station Emergency Generator Engine are affected sources because they will be manufactured after the April 1, 2006 applicability date.

7.c Revised Code of Washington (RCW) 70.94.141 empowers any activated air pollution control authority to prepare and develop a comprehensive plan or plans for the prevention, abatement and control of air pollution within its jurisdiction. An air pollution control authority may issue such orders as may be necessary to effectuate the purposes

of the Washington Clean Air Act [RCW 70.94] and enforce the same by all appropriate administrative and judicial proceedings subject to the rights of appeal as provided in Chapter 62, Laws of 1970 ex. sess.

7.d RCW 70.94.152 provides for the inclusion of conditions of operation as are reasonably necessary to assure the maintenance of compliance with the applicable ordinances, resolutions, rules and regulations when issuing an Air Discharge Permit for installation and establishment of an air contaminant source.

7.e Washington Administrative Code (WAC) 173-460 "Controls for New Sources of Toxic Air Pollutants" (as in effect August 21, 1998) requires Best Available Control Technology for toxic air pollutants (T-BACT), identification and quantification of emissions of toxic air pollutants and demonstration of protection of human health and safety.

7.f WAC 173-476 "Ambient Air Quality Standards" establishes ambient air quality standards for PM_{10}, $PM_{2.5}$, lead, sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide in the ambient air, which shall not be exceeded.

7.g SWCAA 400-040 "General Standards for Maximum Emissions" requires all new and existing sources and emission units to meet certain performance standards with respect to Reasonably Available Control Technology (RACT), visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, sulfur dioxide, concealment and masking, and fugitive dust.

7.h SWCAA 400-040(1) "Visible Emissions" requires that no emission of an air contaminant from any emissions unit shall exceed twenty percent opacity for more than three minutes in any one hour at the emission point, or within a reasonable distance of the emission point.

7.i SWCAA 400-040(2) "Fallout" requires that no emission of particulate matter from any source shall be deposited beyond the property under direct control of the owner(s) or operator(s) of the source in sufficient quantity to interfere unreasonably with the use and enjoyment of the property upon which the material is deposited.

7.j SWCAA 400-040(3) "Fugitive Emissions" requires that reasonable precautions be taken to prevent the fugitive release of air contaminants to the atmosphere.

7.k SWCAA 400-040(4) "Odors" requires any source which generates odors that may unreasonably interfere with any other property owner's use and enjoyment of their property to use recognized good practice and procedures to reduce these odors to a reasonable minimum.

7.l SWCAA 400-040(8) "Fugitive Dust Sources" requires that reasonable precautions be taken to prevent fugitive dust from becoming airborne and minimize emissions.

7.m SWCAA 400-050 "Emission Standards for Combustion and Incineration Units" requires that all provisions of SWCAA 400-040 be met and that no person shall cause or permit the emission of particulate material from any combustion or incineration unit in excess of 0.23 grams per dry cubic meter (0.1 grains per dry standard cubic foot) of exhaust gas at standard conditions.

7.n SWCAA 400-091 "Voluntary Limits on Emissions" allows sources to request voluntary limits on emissions and potential to emit by submittal of an Air Discharge Permit application as provided in SWCAA 400-109. Upon completing review of the application, SWCAA shall issue a Regulatory Order that reduces the source's potential to emit to an amount agreed upon between SWCAA and the permittee. The permittee has agreed to a voluntary limit of 8.94 tons per year sulfur dioxide (facilitywide). A more thorough review of BACT is warranted if sulfur dioxide emissions exceed this limitation.

7.o SWCAA 400-109 "Air Discharge Permit Applications" requires that an air discharge permit application be submitted for all new installations, modifications, changes, or alterations to process and emission control equipment consistent with the definition of "new source". Sources wishing to modify existing permit terms may submit an Air Discharge

Permit application to request such changes. An air discharge permit must be issued, or written confirmation of exempt status must be received, before beginning any actual construction, or implementing any other modification, change, or alteration of existing equipment, processes, or permits.

7.p SWCAA 400-110 "New Source Review" requires that an Air Discharge Permit be issued by SWCAA prior to establishment of the new source, emission unit, or modification.

7.q SWCAA 400-111 "Requirements for Sources in a Maintenance Plan Area" requires that no approval to construct or alter an air contaminant source shall be granted unless it is evidenced that:

(1) The equipment or technology is designed and will be installed to operate without causing a violation of the applicable emission standards;
(2) Emissions will be minimized to the extent that the new source will not exceed emission levels or other requirements provided in the maintenance plan;
(3) Best Available Control Technology will be employed for all air contaminants to be emitted by the proposed equipment;
(4) The proposed equipment will not cause any ambient air quality standard to be exceeded; and
(5) If the proposed equipment or facility will emit any toxic air pollutant regulated under WAC 173-460, the proposed equipment and control measures will meet all the requirements of that Chapter.

8. RACT/BACT/BART/LAER/PSD/CAM DETERMINATIONS

The proposed equipment and control systems incorporate Best Available Control Technology (BACT) for the types and amounts of air contaminants emitted by the processes as described below:

8.a BACT Determination – Liquid Processes (new). The applicant has proposed to capture emissions from preliminary and primary treatment and treat emissions from this equipment with biotrickling filters to reduce odor and TAP impacts on nearby properties. The applicant conducted a BACT analysis that reviewed chemical scrubbers, mineral and organic biofilters, engineered media biofilters and biotrickling filters. The applicant concluded that a biotrickling filter system capable of removing 99% of the H_2S and 90% of the odor from the inlet stream meets the requirements of BACT and T-BACT. SWCAA concurs.

8.b BACT Determination – Solids Handling (new). The applicant has proposed to capture emissions from solids handling and treat emissions from this equipment with a carbon adsorption system to reduce odor and TAP impacts on nearby properties. The applicant conducted a BACT analysis that reviewed photoionization and carbon adsorption with blended media. The applicant concluded that a carbon adsorption system with blended media capable of removing 99% of the H_2S and 90% of the odor from the inlet stream meets the requirements of BACT and T-BACT. SWCAA concurs.

Pre-Existing BACT Determinations

8.c BACT Determination – 4.226 MMBtu/hr Boiler and 5.231 MMBtu/hr Boiler (SWCAA 07-2726). The applicant proposed to replace the burners in the existing 3.25 MMBtu/hr Hurst Boiler with 4.226 MMBtu/hr burners (the boiler will be renamed the 4.226 MMBtu/hr Boiler) and install and a new 5.231 MMBtu/hr Boiler so that they could both burn a blend of digester gas and natural gas. The applicant's BACT analysis indicated that the lowest emissions guarantee available for a burner system that could burn a mixture of digester gas and natural gas at varying mixture levels limits NO_X emissions to 30 ppmvd @ 3% O_2 and CO emissions to 50 ppmvd @ 3% O_2. Lower emission burners (e.g. 9 or 20 ppm NO_X @ 3% O_2) were not capable of burning the blend of digester gas and natural gas. To produce lower emission concentrations the boilers would need to be equipped with dual gas trains, one burning natural gas, one burning digester gas. The applicant has explained that this configuration (which is currently in use at the facility) would result in greater overall emissions because much of the digester gas would be diverted from the boilers to the New Digester Waste Gas Burner (depending on gas pressures) and natural gas would be used to replace the diverted digester gas.

SWCAA concurs with the applicant's analysis that the proposed emission rates meet the requirements of BACT for the 4.226 MMBtu/hr Boiler and the 5.231 MMBtu/hr Boiler at this facility.

8.d BACT Determination – New Digester Waste Gas Burner (SWCAA 07-2726). The applicant has proposed to utilize a waste gas burner that will limit NO_X emissions to 0.06 lb/MMBtu or less and CO emissions to 0.30 lb/MMBtu or less while providing for 98% or better destruction of volatile organic compounds and 99% or better destruction of hydrogen sulfide. There are fully enclosed flares available that can provide an equivalent level of volatile organic compound control but with lower levels of carbon monoxide or nitrogen oxides emissions. For example, John Zinc's ZULE enclosed flare promises to achieve NO_X emissions of 0.025 lb/MMBtu and CO emissions of 0.06 lb/MMBtu when burning natural gas. A significant downside of the ZULE and other fully enclosed flares is the limited amount of "turn-down." The applicant estimates that the differences in available turn-down would result in the need to burn approximately 25,000 therms of additional natural gas in the fully enclosed flare, at an estimated cost of over $30,000 per year.

In a letter dated February 23, 2007, the applicant provided a BACT analysis comparing the cost-effectiveness of the proposed waste gas burner with John Zinc's ZULE flare. The ZULE flare could emit as much as 0.4 tons per year less NO_X and 6.9 tons per year less carbon monoxide when running at full capacity all year as compared with the Varec 244E waste gas burner. The difference would be much less if the flares are operated as expected, with most digester gas burned in the boilers. The applicant supplied an evaluation of the annualized cost differences using the procedure in EPA's Air Pollution Control Cost Manual – Sixth Edition (EPA 452/B-02-001) Section 3.2 Chapter 1 – Flares. The result of the analysis indicated that the Varec 244E waste gas burner could provide an annualized savings of approximately $128,000 per year. The applicant proposes that this savings alone is enough to justify the potential increase in emissions. SWCAA concurs.

SWCAA has expressed some concern that because the Varec 244E waste gas burner is not fully enclosed and draws in ambient air through a series of annular openings, that areas near the annual walls could be significantly colder than interior areas of the burner. In these colder areas, destruction efficiency could be significantly reduced relative to the destruction efficiency at the center of the flare, with a corresponding increase in carbon monoxide emissions. It is SWCAA's understanding that previous testing of the Varec 244E may have only determined emission concentrations at the center of the burner exhaust. However, SWCAA will approve installation of the Varec 244E because the manufacturer has guaranteed to achieve 0.06 lb/MMBtu NO_X and 0.30 lb/MMBtu CO and because the Old Digester Waste Gas Incinerator will be retained as a backup unit in the event that the Varec 244E flare fails to meet the guaranteed emission levels.

8.e BACT Determination – 117th Street Pump Station Odor Control Unit and Force Main Odor Control Unit (SWCAA 07-2726). The applicant has proposed to control odors from the Klineline Pump Station and the discharge of the force main with carbon beds designed to capture hydrogen sulfide and additives to prevent the formation of hydrogen sulfide in the force main. These systems will reduce the hydrogen sulfide concentration by 95% when the inlet concentration is less than 10 ppm and by 99% when the inlet concentration is 10 ppm or more. This level of control meets or exceeds the level of control provided by a biofilter, biotower or liquid-phase scrubber. SWCAA concurs that this level of control meets the requirements of BACT at this facility.

8.f BACT Determination – 117th Street Emergency Generator Engine (SWCAA 07-2726). Available control measures for diesel engines include ultra-low sulfur fuel and add-on control equipment such as selective catalytic reduction units. Add-on control equipment will not be economically feasible because the engine will be operated only for short periods of time for testing, maintenance, and to provide emergency electricity during a power interruption. In addition, because the engine will normally be operated only for short periods of time, the stable operating temperature required for operation of add-on control equipment is not likely to be achieved.

The use of modern diesel-fired internal combustion engine design (meeting EPA's relevant Tier emission standard (Tier 2 for this engine), ultra-low sulfur diesel fuel ($\leq$ 0.0015% sulfur by weight), limitation of visible emissions to 5% opacity or less, and limitation of engine operation to maintenance checks, readiness testing and as necessary to

provide emergency electricity during power interruptions has been determined to meet the requirements of BACT for the types and quantities of air contaminants emitted from these engines.

8.g BACT Determination – Flow Augmentation Pump Engines (SWCAA 07-2726). Available control measures for diesel engines include low sulfur fuel and add-on control equipment such as selective catalytic reduction units. Add-on control equipment are not economically feasible because the engines will be operated only for short periods of time for testing, maintenance, and to provide pump capacity during peak flow periods. In addition, because the engines will normally be operated only for short periods of time, the stable operating temperature required for operation of add-on control equipment is not likely to be achieved.

The use of modern diesel-fired internal combustion engine design (meeting EPA's Tier 2 or Tier 3 emission limits for off-road diesel engines), ultra-low sulfur diesel fuel (≤ 0.0015% sulfur by weight), limitation of visible emissions to 5% opacity or less, and limitation of engine operation to testing, maintenance and to provide supplemental pump capacity during peak flow periods (≤ 200 hours per year) has been determined to meet the requirements of BACT for the types and quantities of air contaminants emitted from the flow augmentation pump engines.

8.h BACT Determination – Sludge Blend Tank (SWCAA 05-2613). The level of odor control provided by the proposed biological packed tower is equivalent to the level of control provided through the use of activated carbon, and is expected to be the top choice in a "top-down" BACT analysis.

8.i BACT Determination – Flow Augmentation Pump Engines (SWCAA 05-2613). Note that Caterpillar engines were installed in place of the Cummins engines for which the BACT analysis that follows was written: Available control measures for diesel engines include low sulfur fuel and add-on control equipment such as selective catalytic reduction units. Add-on control equipment are not economically feasible because the engines will be operated only for short periods of time for testing, maintenance, and to provide pump capacity during peak flow periods. In addition, because the engines will normally be operated only for short periods of time, the stable operating temperature required for operation of add-on control equipment is not likely to be achieved.

The use of modern diesel-fired internal combustion engine design (meeting EPA's Tier 2 or Tier 3 emission limits for off-road diesel engines), low-sulfur diesel fuel (≤ 0.05% sulfur by weight), limitation of visible emissions to 5% opacity or less, and limitation of engine operation to testing, maintenance and to provide supplemental pump capacity during peak flow periods (≤ 200 hours per year) has been determined to meet the requirements of BACT for the types and quantities of air contaminants emitted from the flow augmentation pump engines.8.a BACT Determination – Generator Engine. Available control measures for new diesel engines include engine design, the use of ultra-low sulfur fuel and add-on control equipment such as selective catalytic reduction (SCR) units and oxidation catalysts. Because emission rates from this engine is relatively low due to the small size and limited use, neither SCR for NO_X emissions, nor an oxidation catalyst for CO, VOC and organic PM emissions would be cost-effective.

The use of ultra-low sulfur diesel fuel (≤ 0.0015% sulfur by weight), limitation of visible emissions to 5% opacity or less, and limitation engine operation to 200 hours per year has been determined to meet the requirements of BACT for the types and quantities of air contaminants emitted.

8.j Prevention of Significant Deterioration (PSD) Applicability Determination. This permitting action will not result in a potential increase in emissions equal to or greater than the PSD thresholds. Therefore, PSD review is not applicable to this action.

8.k Compliance Assurance Monitoring (CAM) Applicability Determination. CAM is not applicable to any emission unit at this facility because it is not a major source and is not required to obtain a Part 70 permit.

9. AMBIENT IMPACT ANALYSIS

This permitting action is not associated with an increase in any air pollutant, therefore ambient impacts were not evaluated.

Conclusions

9.a Operation of the wastewater treatment system as proposed in ADP Application CL-3105 will not cause the ambient air quality requirements of Title 40 Code of Federal Regulations (CFR) Part 50 "National Primary and Secondary Ambient Air Quality Standards" to be violated.

9.b The wastewater treatment system proposed in ADP Application CL-3105 can be operated without causing a violation of the applicable emission standards, which include the limits established under SWCAA 400-040 "General Standards for Maximum Emissions."

9.c Operation of the wastewater treatment system as proposed in ADP application CL-3105 in accordance with the Air Discharge Permit will not cause the requirements of WAC 173-460 "Controls for New Sources of Toxic Air Pollutants," (as in effect August 21, 1998) or WAC 173-476 "Ambient Air Quality Standards" to be violated.

10. DISCUSSION OF APPROVAL CONDITIONS

SWCAA has made a determination to issue Air Discharge Permit 20-3379 in response to ADP Application CL-3105. Air Discharge Permit 20-3379 contains approval requirements deemed necessary to assure compliance with applicable regulations and emission standards as discussed below.

10.a General Basis. Approval conditions for equipment affected by this permitting action incorporate the operating schemes proposed by the permittee in the Air Discharge Permit application.

10.b Emission Limits. The short-term emission limits for the New Digester Waste Gas Burner, 4.226 MMBtu/hr Boiler, 5.231 MMBtu/hr Boiler, and 117th Street Pump Station Odor Control Unit were established at the emission levels that represented BACT. With the exception of sulfur dioxide, annual emissions for each of these emission units were calculated based on 8,760 hours of operation at the maximum short-term emission level. Where the digester gas combustion capacity of the equipment exceeded the digester gas generation capacity, sulfur dioxide emissions were limited to the maximum potential emissions identified in Section 6. Additional review of hydrogen sulfide or sulfur dioxide control options may be appropriate at greater sulfur dioxide emission rates.

Annual NO_X and CO emissions from the 117th Street Pump Station Emergency Generator Engine were limited to the quantity of emissions anticipated from operation of the engine for 100 hours per year for maintenance checks and readiness testing using the emission factors supplied in Section 6. As discussed in Section 8, these emission limits meet the requirements of BACT.

The fugitive H_2S limit was reduced consistent with the new "potential to emit" calculations in Section 6 to account for the installation of the new odor control equipment (biotrickling filter system for the Preliminary/Primary treatment system, carbon adsorber system for Solids Handling). Separate H_2S limits were established for these odor control systems to assure that BACT emission levels are maintained.

The chloroform emission limit has been removed because sampling in recent years has not detected any chloroform in the influent wastewater.

10.c Operating Limits and Requirements. To minimize the local impact on ambient air quality and odor impacts, all exhaust stacks must be oriented vertically and may not utilize a rain-cap or other device that interferes with vertical dispersion.

The 200 hour per year operation limit that applied to most of the emergency generator engines was replaced with a 100 hour limit on maintenance checks and readiness testing, and a restriction on use of the engines for anything other than readiness testing, maintenance, or emergency use.

Only road-grade diesel fuel was evaluated for use in the engines, therefore operation on other, potentially dirtier, fuels was prohibited. The use of ultra low-sulfur ($\leq 0.0015\%$ by weight) diesel by the diesel engines is a reasonable control measure that reduces SO_X and PM emissions relative to diesel with a higher sulfur content. The permit allows the use of "#2 diesel or better." In this case, "or better" includes road-grade diesel fuel with a lower sulfur content, biodiesel, and mixtures of biodiesel and road-grade diesel that meet the definition of "diesel" and contain no more than 0.0015% sulfur by weight.

10.d Monitoring and Recordkeeping. Sufficient monitoring and recordkeeping was established to document compliance with the annual emission limits and provide for general requirements (e.g. excess emission reporting, annual emission inventory submission).

The Permit requires the permittee to determine the amount of digester gas and natural gas burned by each unit (boilers and waste gas incinerators/burners). This can be accomplished by directly measuring fuel flow with a gas meter or by estimating fuel consumption through the use of operating records and engineering judgment. Fuel consumption by individual units must be determined to complete the annual emissions inventory.

10.e Emission Monitoring and Testing Requirements. See Section 12.

10.f Reporting. The permit requires reporting of the annual air emissions inventory, and reporting of the data necessary to develop the inventory. Excess emissions must be reported immediately in order to qualify for relief from monetary penalty in accordance with SWCAA 400-107. In addition, prompt reporting was required because it allows for accurate investigation into the cause of the event and prevention of similar future incidents.

Because this facility has the potential to generate nuisance odors, and because nuisance odors may be an indicator of improper equipment operation, the Permit requires forwarding of all odor complaints to SWCAA within three days of receipt. This helps assure that complaints and equipment breakdowns are addressed in a timely manner.

11. START-UP AND SHUTDOWN/ALTERNATIVE OPERATING SCENARIOS/POLLUTION PREVENTION

11.a Start-up and Shutdown Provisions. Pursuant to SWCAA 400-081 "Start-up and Shutdown," technology based emission standards and control technology determinations shall take into consideration the physical and operational ability of a source to comply with the applicable standards during start-up or shutdown. Where it is determined that a source is not capable of achieving continuous compliance with an emission standard during start-up or shutdown, SWCAA shall include appropriate emission limitations, operating parameters, or other criteria to regulate performance of the source during start-up or shutdown.

The generator engines may exhibit excess opacity upon startup even if the units are in proper working order. Accordingly, the visual emissions limits listed in the permit for the generator engines does not apply during the startup period defined in the permit. The general opacity standard from SWCAA 400-040 continues to apply during startup.

11.b Alternate Operating Scenarios. SWCAA conducted a review of alternate operating scenarios applicable to equipment affected by this permitting action. Because the 5.231 MMBtu/hr Boiler and the 4.226 MMBtu/hr Boiler may be fired on natural gas, digester gas, or a blend of natural gas and digester gas, the permit limitations presume the worst-case emissions from these fuels. In addition, as discussed in section 8, the nitrogen oxides limitation was 30 ppmvd @ 3% O_2 rather than 9 ppmvd @ 3% O_2 to accommodate the blending of digester and natural gas.

11.c Pollution Prevention Measures. SWCAA conducted a review of possible pollution prevention measures for the facility. The applicant reviewed a number of pollution prevention measures for the control of H_2S and other odorous compounds from Preliminary/Primary Treatment and Solids Handling. Those measures identified as meeting the requirements of BACT were incorporated into the Permit.

12. EMISSION MONITORING AND TESTING

Source emissions testing of the New Digester Waste Gas Burner and the Old Digester Waste Gas Incinerator was required every five years with the exception that if the Old Digester Waste Gas Incinerator is operated infrequently (or not at all), source emissions testing of that unit may be delayed until 10,000,000 cubic feet of digester gas has been burned (equivalent to approximately 30 days of operation at full capacity). This is a compromise between the need for SWCAA to periodically assess the operation of the unit if it is utilized periodically, and the cost of performing a source emissions test.

During testing of the New Digester Waste Gas Burner and the Old Digester Waste Gas Incinerator, the composition of the raw digester gas must be determined in order to develop a fuel factor for use with EPA Method 19. This is necessary to accurately calculate outlet emissions in units of lb/MMBtu and assess compliance with the permit limits. Due to the extremely low velocity and high temperature of the exhaust, exhaust gas flowrate is difficult to accurately measure, therefore EPA Method 19 methodology must be used to calculate emissions in units of lb/MMBtu and demonstrate compliance with the permit limits.

Source emissions testing of the 5.231 MMBtu/hr boiler must be conducted initially and at least once every 10 years because potential emissions from this boiler are significant enough to justify the expense of source emissions testing. Source emissions testing of the 4.226 MMBtu/hr boiler was nor required because potential emissions from that unit were considered too small to warrant such testing.

Performance monitoring of the 5.231 MMBtu/hr Boiler and the 4.226 MMBtu/hr Boiler with a combustion analyzer or equivalent is required at least annually. In SWCAA's experience this testing is relatively inexpensive compared to the quantity of emissions that can be prevented by this procedure. It is unlikely that boiler emissions will degrade rapidly enough that more frequent testing is necessary to prevent an exceedance of the permitted emission limits.

Due to the nature and quantity of air pollutant emissions from the emergency generator engines and the fact that post-combustion controls are not utilized, performance monitoring and/or testing requirements were not established for the emergency generator engines.

The hydrogen sulfide content of the digester gas must be measured monthly to enable calculation of sulfur dioxide emissions from the emission units burning digester gas. SWCAA expects that twelve annual samples collected during monthly sampling will provide a reasonable representation of average total sulfur in the digester gas.

The Permit requires that the hydrogen sulfide content of the gas being vented from the 117th Street Pump Station Odor Control Unit, the Preliminary/Primary Treatment biotrickling filters, and the Solids Handling carbon adsorbers be measured monthly with a colorimetric detector tube or equivalent. For the 117th Street Pump Station Odor Control Unit and the Solids Handling carbon adsorbers, SWCAA expects that this schedule will provide a reasonable assurance that the carbon is replaced before degrading to the point where excess emissions or nuisance odor would be emitted.

13. FACILITY HISTORY

13.a General History. Construction of the original Salmon Creek Treatment Plant was completed in 1976. The original facility was designed to treat 2 mgd average annual daily flow (ADF). In 1989 an expansion of the plant was completed, bringing the capacity of the plant to 3.1 mgd ADF. In 1993 an expansion of the plant was completed, bringing the capacity of the plant to 4.5 mgd ADF. In 1995 an expansion of the plant was completed, bringing the capacity of the plant to 5.7 mgd ADF. In 1999 an expansion of the plant was completed, bringing the capacity of

the plant to 10.3 mgd (monthly average) ADF. Expansion to the current plant capacity of 14.95 mgd (maximum monthly flow) was completed in 2008.

13.b Previous Approvals: The following Orders/Permits have been issued for this facility:

Order/Permit Number	Application #	Date Issued	Description
92-1472	CL-954	12-22-1992	Consent Order for installation of anaerobic digester, heater (primarily fired on digester gas), excess digester gas waste gas incinerator, aeration basin to bring capacity to 4.5 mdg ADF.
97-2053	CL-1292	10-23-1997	Installation of headworks, three primary clarifiers, one aeration basin, one secondary clarifier, one gravity belt thickener, two conventional digesters, Hurst hot water boiler, enclosed waste gas incinerator (replacing existing flare), two belt filter presses, and covered biosolids storage holding bays to bring plant capacity to 10.3 mgd ADF.
97-2053R1	CL-1563	8-7-2002	Modification of minimum waste gas incinerator temperature limit consistent with source test results and establishment of limitations for three existing emergency generators.
05-2613	CL-1689	6-8-2005	Replacement of sludge blend tank and installation of an odor control unit on the sludge blend tank, installation of two diesel-fired flow augmentation pumps and a odor control biofilter at the 36th Avenue Pump Station, and modification of the emission limits for the existing Hurst and Superior boilers.
07-2726	CL-1753	5-13-2008	Plant expansion bringing capacity to 14.95 mgd (maximum monthly flow) including adding 5.231 MMBtu/hr Hurst Boiler, adding odor control systems at the force main discharge and at 117th Street Pump Station, installing a new emergency generator at the 117th Street Pump Station, and installation of a new digester waste gas burner.

Bold font indicates that the Order or Air Discharge Permit was superceded or will no longer be in effect when Air Discharge Permit 20-3379 becomes fully effective.

14. PUBLIC INVOLVEMENT

14.a Public Notice for Air Discharge Permit Application CL-3105. Public notice for Air Discharge Permit Application CL-3105 was published on the SWCAA internet website for a minimum of 15 days beginning on October 18, 2019.

14.b Public/Applicant Comment for Air Discharge Permit Application CL-3105. SWCAA did not receive formal comments, a comment period request, or any other inquiry from the public or the applicant regarding this Air Discharge Permit application. Therefore, no public comment period was provided for this permitting action.

14.c State Environmental Policy Act. The Discovery Clean Water Alliance issued a Determination of Non-Significance on September 14, 2018 for the Phase 5B project. The permitting action addresses the first part of the Phase 5B expansion (Package 1).