



STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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October 31, 2019

Kirk Elliott
Assistant Division Manager, Plant Operations
City of Tacoma
Central Wastewater Treatment Plant
2201 Portland Avenue
Tacoma, WA 98421

Dear Kirk Elliott:

Re: Class I Inspection of the Tacoma Central Wastewater Treatment Plant - National Pollutant Discharge Elimination System (NPDES) Permit No. WA0037087

The Department of Ecology conducted a Class I Inspection of the Tacoma Central Wastewater Treatment Plant (WWTP) on September 5, 2019. I would like to thank you for the time you spent during this plant inspection. Overall, it appeared that Tacoma's WWTP operations staff and management are proactive with plant maintenance, doing well with treatment operations, and are proactive in planning for plant improvement projects.

If you have any questions, please contact me at vicky.epp@ecy.wa.gov or (360) 407-6318.

Sincerely,

A handwritten signature in blue ink, appearing to read "V.Epp".

Victoria Epp, PE
Municipal Facility Engineer
Southwest Regional Office
Water Quality Program

Enclosures: EPA Inspection Report
ECY Inspection Document
Central WWTP Process Diagram
Photo Log

cc: Hugh Messer City of Tacoma, Environmental Services Department





United States Environmental Protection Agency
Washington D.C. 20460

Water Compliance Inspection Report

Section A: National Data System Coding (i.e., PCS)

Section B: Facility Data

Name and Location of Facility Inspected (For industrial users discharging to POTW, also include POTW name and NPDES permit number) City of Tacoma Central (No. 1) Wastewater Treatment Plant 2201 Portland Avenue Tacoma, WA 98421	Entry Time/Date 9:15 am 09/05/2019	Permit Effective Date 10/06/2010
	Exit Time/Date 2:35 pm 09/05/2019	Permit Expiration Date 10/31/2015
Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number Kirk Elliott, Assistant Division Manager, Plant Operations O) 253-404-6922 C) 253-405-1175	Other Facility Data (e.g., SIC NAICS, and other description information)	
Name, Address of Responsible Official/Title/Phone and Fax Number Same as Above	Contacted <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Section C: Areas Evaluated During Inspection (*Check only those areas evaluated*)

- | | | | |
|---|--|--|------------------------------|
| <input checked="" type="checkbox"/> Permit | <input checked="" type="checkbox"/> Self-Monitoring Program | <input type="checkbox"/> Pretreatment | <input type="checkbox"/> MS4 |
| <input checked="" type="checkbox"/> Records/Reports | <input checked="" type="checkbox"/> Compliance Schedules | <input type="checkbox"/> Pollution Prevention | |
| <input checked="" type="checkbox"/> Facility Site Review | <input checked="" type="checkbox"/> Laboratory | <input type="checkbox"/> Stormwater | |
| <input checked="" type="checkbox"/> Effluent/Receiving Waters | <input checked="" type="checkbox"/> Operations & Maintenance | <input type="checkbox"/> Combined Sewer Overflow | |
| <input checked="" type="checkbox"/> Flow Measurement | <input type="checkbox"/> Sludge Handling/Disposal | <input type="checkbox"/> Sanitary Sewer Overflow | |

Section D: Summary of Findings/Comments

(Attach additional sheets of narrative and checklists, including Single Event Violation codes, as necessary)

The purpose of the inspection was to complete a routine Wastewater Treatment Plant (WWTP) facility inspection, that included discussions of plant operations and maintenance, physical plant changes and upcoming projects as well as photos taken during the plant tour. A record of the last WWTP inspection was completed in March 2009 however, the inspection documentation was not located in the central files or within the PARIS Database.

A plant tour was given by Kirk Elliott, Assistant Division Manager to complete this inspection. Kirk described each operational unit, any related improvements and upcoming maintenance, discussed the day-to day operations and described laboratory monitoring, tests and related documentation.

In general, the plant appeared to be running well, and it appeared clean and orderly. The plants' effluent water quality values are within permit limits, according to recent discharge monitoring reports. A narrative report and photos of the plant are attached.

Note: The Biosolids/TAGRO plant was visited, but is not a part of this inspection report.

See attached Inspection Report and Site Photos.

Verify Latitude and Longitude		<input checked="" type="checkbox"/> Announced
Latitude: 47° 16' 41.7" N		<input type="checkbox"/> Unannounced
Longitude: 122° 25' 18.588" W		
Name(s) and Signature(s) of Inspector(s) Victoria Epp	Agency/Office/Phone and Fax Numbers Ecology/SWRO (360) 407-6318	Date: <u>10/31/19</u>
Signature of Management QA Reviewer Gregory Zentner	Agency/Office/Phone and Fax numbers Ecology/SWRO (360) 407-6319	Date: <u>11/4/2019</u>

INSTRUCTIONS

Section A: National Data System Coding (*i.e.*, PCS)

Column 1: Transaction Code: Use N, C, or D for New, Change, or Delete. All inspections will be *new* unless there is an error in the data entered.

Column 3 - 11: NPDES Permit No.: Enter the facility's NPDES permit number – third character in permit number indicates permit type for U=unpermitted, G=general permit, etc.. (*Use the Remarks columns to record the State permit number, if necessary.*)

Columns 12 - 17: Inspection Date: Insert the date entry was made into the facility. Use the year/month/day format (e.g., 94/06/30 = June 30, 1994).

Column 18: Inspection Type*: Use one of the codes listed below to describe the type of inspection:

A	Performance Audit	U	IU Inspection with Pretreatment Audit	!	Pretreatment Compliance (Oversight)
B	Compliance Biomonitoring	X	Toxics Inspection	@	Follow-up (enforcement)
C	Compliance Evaluation (non-sampling)	Z	Sludge – Biosolids	{	Stormwater-Construction-Sampling
D	Diagnostic	#	Combined Sewer Overflow-Sampling	}	Stormwater-Construction-Non-Sampling
F	Pretreatment Follow-up	\$	Combined Sewer Overflow-Non-Sampling	:	Stormwater-Non-Construction-Sampling
G	Pretreatment (Audit)	+	Sanitary Sewer Overflow-Sampling	~	Stormwater-Non-Construction-Non-Sampling
I	Industrial User (IU) Inspection	&	Sanitary Sewer Overflow-Non-Sampling	<	Stormwater-MS4-Sampling
M	Multimedia	\	CAFO-Sampling	-	Stormwater-MS4-Non-Sampling
N	Spill	=	CAFO-Non-Sampling	>	Stormwater-MS4-Audit
O	Compliance Evaluation (Oversight)	2	IU Sampling Inspection		
P	Pretreatment Compliance Inspection	3	IU Non-Sampling Inspection		
R	Reconnaissance	4	IU Toxics Inspections		
S	Compliance Sampling	5	IU Sampling Inspection With Pretreatment		
		6	IU Non-Sampling Inspection with Pretreatment		
		7	IU Toxics With Pretreatment		

P

Column 19: Inspector Code: Use one of the codes listed below to describe the *lead agency* in the inspection

A - State (Contractor)	O - Other Inspectors, Federal/EPA (Specify in Remarks columns)
B - EPA (Contractor)	P - Other Inspectors, State (Specify in Remarks columns)
E - Corps of Engineers	R - EPA Regional Inspector
J - Joint EPA/State Inspectors-EPA Lead	S - State Inspector
L - Local Health Department (State)	T - Joint State/EPA Inspectors-State Lead
N - NEIC Inspectors	

Column 20: Facility Type: Use one of the codes below to describe the facility.

- 1 - Municipal. Publicly Owned Treatment Works (POTWs) with 1987 Standard Industrial Code (SIC) 4952.
- 2 - Industrial. Other than municipal, agricultural, and Federal facilities.
- 3 - Agricultural. Facilities classified with 1987 SIC 0111 to 0971.
- 4 - Federal. Facilities identified as Federal by the EPA Regional Office.
- 5 - Oil & Gas. Facilities classified with 1987 SIC 1311 to 1389

Columns 21-66: Remarks: These columns are reserved for remarks at the discretion of the Region.

Columns 67-69: Inspection Work Days: Estimate the total work effort (to the nearest 0.1 work day), up to 99.9 days, that were used to complete the inspection and submit a QA reviewed report of findings. This estimate includes the accumulative effort participating inspectors; any effort for laboratory analyses, testing, and remote sensing; and the billed payroll time for travel and pre and post inspection preparation. This estimate does not require detailed documentation.

Column 70: Facility Evaluation Rating: Use information gathered during the inspection (regardless of inspection type) to evaluate the quality of the facility self-monitoring program. Grade the program using a scale of 1 to 5 with a score of 5 being used for very reliable self-monitoring programs, 3 being satisfactory, and 1 being used for very unreliable programs.

Column 71: Biomonitoring Information: Enter D for static testing. Enter F for flow through testing. Enter N for no biomonitoring.

Column 72: Quality Assurance Data Inspection: Enter Q if the inspection was conducted as follow-up on quality assurance sample results. Enter N otherwise.

Columns 73-80: These columns are reserved for regionally defined information.

Section B: Facility Data

This section is self-explanatory except for "Other Facility Data," which may include new information not in the permit or PCS (e.g., new outfalls, names of receiving waters, new ownership, and other updates to the record).

Section C: Areas Evaluated During Inspection

Check only those areas evaluated by marking the appropriate box. Use Section D and additional sheets as necessary. Support the findings, as necessary, in a brief narrative report. Use the headings given on the report form (e.g., Permit, Records/Reports) when discussing the areas evaluated during the inspection.

Section D: Summary of Findings/Comments

Briefly summarize the inspection findings. This summary should abstract the pertinent inspection findings, not replace the narrative report. Reference a list of attachments, such as completed checklists taken from the NPDES Compliance Inspection Manuals and pretreatment guidance documents, including effluent data when sampling has been done. Use extra sheets as necessary.

*Footnote: In addition to the inspection types listed above under column 18, a state may continue to use the following wet weather and CAFO inspection types until the state is brought into ICIS-NPDES: K-CAFO, V-SSO, Y-COS, W-Stormwater, 9-MS4. States may also use the new wet weather CAFO and MS4 inspection types shown in column 19 of this form. The EPA regions are required to use the new wet weather CAFO and MS4 inspection types for inspections with an inspection date (DTIN) on or after July 1, 2005.

Operations Staff:

- Kirk is responsible for a staff of 34 persons.
- 25 Operators now. They are currently hiring Operations staff.
- Staff consists of Supervisors, Senior Operators and Operators. All Operators perform lab duties, while two perform lab duties full-time.

Peak Wet Weather Facility (PWWF):

- When the plant experiences sustained wet weather flows (greater than 60 MGD) this facility is put online.
- The SOP includes re-circulating the facility up to 60 MGD. The recirculation mode consist of bringing the PWWF online (warm-up phase) to prepare for when flow blending may be needed at higher flows. Recirculation mode discharges flow back to the primary sedimentation tanks.
- The PWWF has two tanks that are "ballasted sedimentation tanks", each with a capacity of 38 MGD. There are mixing tanks with ballasted media (ballasted flocculation) that can treat up to a total plant flow of 150 MGD.
- Hydrocyclones separate the sand from the solids. The solids from this process is pumped to the Aerated Grit Removal Facility, and the sand is recycled back through this process.
- Excess bags of useable sand are stored in a building adjacent to this facility.
- An additional FTE (for lab work) is called-in for wet weather sampling. Acute and chronic toxicity is tested. In addition, typical monitoring is also completed such as BOD and TSS.

Aerated Grit Removal Facility

- This new facility is located next to the primary sedimentation tanks, and includes three aerated grit tanks and two classifiers.
- Wastewater comes over the weirs into the Primary Clarifiers.
- Settled solids go through the solids settling tank.

Primary Sedimentation:

- Four Sedimentation tanks with v-notch weirs.
- The flights are in constant motion with the ability to add aeration as needed.
- The tanks are rotated monthly or as needed. The rotation and scheduled cleaning helps keep the algae growth down within the tanks and along the v-notch weirs.
- Two tanks are down for maintenance: Tanks 1 & 4.
- Tacoma has a contract to coat Sedimentation Tank 1.
- WWTP Maintenance crews will repair the flights and side rails on Sedimentation Tank No. 4. They will also replace the flight bearings as needed.

Old Chlorine Building:

- This building has been repurposed; it is currently used for storage.
- The building contains used equipment for the Transmission crew's use that includes: couplings, parts, kits for a particular job, pigging's and camera equipment.

Grit Odor Bio-filtration System:

- One of the old grit tanks was repurposed into a biofiltration system for odor control.
- The type of odor control media consists of cedar wood chips for organic foul air treatment.
- The foul air passes through the media for treatment.
- The media is changed out every 6+ years. The media is performing well and has not reached degradation levels. It is anticipated the media will last longer than its typical lifespan (beyond 2022).

Headworks Screening:

- From Tacoma's recent plant upgrades, three new influent ¼-inch bar width screens were installed.
- Two Screens operate to provide up to 150 MGD with the third (new) unit operates as a redundant/standby unit.
- Design capacity of each screen is 75 MGD.

Influent Collection Pipelines:

- There are four feed lines that comes into the plant's Headworks from Portland Ave. This includes two, 48-inch concrete pipe influent sewer lines and manhole lids that are located inside the edge of the WWTP property.
- Every two weeks Transmission cleans one of the two influent lines due to solids settling in the line. Operations lower the forebay level at the Headworks to allow this to occur.

Influent Pump Stations:

- New Influent Pump Station (NIPS) – Two Raw Wastewater Pumps @ 45 MGD capacity each, with a 48-inch Magnetic Flow Meter.
- Old Influent (back up) Pump Station (OIPS) – Three Wastewater pumps @ 39 MGD capacity each.
- Treatment plant capacity is 150 MGD. However, the latest plant upgrade provides for a maximum peak influent flow rate of 200 MGD.

Laboratory:

- The Lab contains plenty of back up laboratory supplies inside covered shelving and cabinets.
- Hazardous material with batch labels are located within a hooded draft enclosure.
- Centers for Urban Waters contracts with the City of Tacoma. They do metals testing, and they send out for disposal for this type of hazardous material. They perform all metal testing (quarterly sampling) for Tacoma.
- The City's lab performs weekly and monthly volatile and nutrient testing of the digesters.

Lab accreditation:

- An on-site Lab Audit was performed on June 25, 2015. From their original report, their scope was revised on July 11, 2019 that restored Tacoma's Lab to Good Standing. TSS and Total chlorine residual are out of provisional status and in good standing as of May 13th and July 11th 2019.
- Tacoma Central's plant is accredited for D.O. & BOD (among other analytes).
- The lab completes some of the solids testing of the digesters.

Primary Control System – (including North Plant No. 3):

- SAP – their software system tracks equipment tags, maintenance plans, work orders, operations history, records and technical information.
- Electronic Document System (EDS) is the City's electronic O&M manual and also contains other documents including their NPDES permit. EDS also contains their Operations SOP's and laboratory SOP's.
- Each employee has a login I.D. into the SAP. The senior operators create work orders here, then Kirk makes sure the work order gets out for completion.
- New servers were recently procured.
- Their laboratory software is called 'Element LIMS' – Laboratory Information Management – for online bench sheets.
- Their PCS software is by Rockwell. PCS is used for evaluating trending at the lift stations. The information from PCS is used to verify that the lift station flow is working properly (flowing in and out of the lift stations). However, Transmission and Maintenance departments oversees the City's lift stations.

Upcoming Electrical Upgrades project:

- Main feeder improvements are in the planning stages for the WWTP, to change-out main feeders up to the main substation.
- A previous power failure event triggered this project.
- One of the main issues is: 100% of the power comes into the WWTP through one manhole. This will be split out in the project.
- This project will help with resiliency (two separate power feeds added to the plant – dual power feeds across the entire plant to maintain power).
- The City is working on a property purchase near the railroad tracks (adjacent to the plant) for this project.

Environmental and Sustainability Management System (ESMS) Standard - ISO 14001:

- This system helps monitor and track operational performance and compliance.
- ESMS is a process with procedures that will allow the plant to operate legally, safely, and efficiently while reducing environmental impacts of activities.
- When an operations system failure is identified – this system yields a ‘Correction Action Request’.
- Short and long-term operational issues are identified, addressed, and tracked with this system.

Blended Solids Storage Tank (BSST):

- One Solids Storage Tank at 1/2 Million Gallons.
- Solids come from the thickened primary sludge (TPS), the thickened waste activated sludge (TWAS), and solids that comes in from the solids receiving station. The receiving station takes solids from North Plant No. 3, Yelm WWTP, and also from Darigold farms.

Heat Exchangers (within Old Digester Building):

- The Plant’s pre-heating requirements are for aerobic and anaerobic sludge digestion.
- The heated Water-to-Solids Heat Exchangers heat blended solids for aerobic digestion.
- The Solids-to-Solids Heat Exchangers (converted to cooled water to sludge) are used for temperature conditioning for anaerobic digestion.
- Heat is removed from the anaerobic digesters and cooled with the cold inflow water via the heat exchangers for stepping down the temperature in the subsequent digester(s) after the thermophilic anaerobic digester (primary digester).

Aerobic Digesters:

- Blended solids is metered and pumped to the aerobic digesters to ultimately achieve Autothermal Thermophilic Aerobic Digestion (ATAD’s). Uses high temperature for an aerobic thermophilic stage.
- Three groups of four reactor (quads) - each quad represents “one” aerobic digester.
- 88,000 gallons each quad (at 3 units) that operate from 59°C to 63°C.
- The heat exchanger units help to maintain thermophilic digestion to ultimately decompose pathogenic organisms.

Anaerobic Digesters:

- The Dual Digestion system uses solids from the Aerobic Digesters for additional solids decomposition.
- Three Anaerobic Digesters at 1 Million Gallons each, with floating covers. These are connected to a gas piping system with waste gas burners.
- The City is working on adding additional digester mixing pumps.
- The City replaced the Belt filter Presses to the Screw Presses installed in 2015.
- Last spring they created a temporary mixing system with mechanical pumping on Primary Digester (Digester No. 1). A permanent pump mixing system is planned to be installed in 2020-2021.
- A temporary mixing pump will be added to Digester No. 2 in 2020.

City of Tacoma WWTP Inspection

Kirk Elliot - Asst. Div. Mgr

Inspection date: 9/5/19

- Previously, the turnover time was 22.5 hours with gas sparging. Currently, it is 7.5 hours with one mixing pump.

Boiler Room:

- Three boilers - Cleaver Brooks Firetube Boilers rated for Digester Gas or Low Sulfur Diesel Fuel Oil.
- These are used for process heat (heated water for aerobic and anaerobic digesters) and building heat.

Anaerobic Digester Gas:

- Excess gas from the Anaerobic Digesters is stored for plant use – as fuel for hot water process needs or heating buildings, or burned off using the methane gas burners.
- A Compressed Natural Gas (CNG) project to sell 100% digester gas to Puget Sound Energy (PSE). This project will capture, filter, dry the gas then send it off to PSE.

Aeration basins:

- Four trains total, two are in-service

Secondary clarifiers:

- Six total, three are in-service.
- With infiltration troughs, effluent troughs, V-notch weirs, and water sprayers to help keep them clean.
- Operators regularly check for:
 - Sludge blanket depth.
 - Grease.
 - Foam skimmer operation to solids handling.
 - Visually inspect flow channels.
- Check & algae growth:
 - Algae growth has been observed with a TSS monitor probe that checks for spikes when algae growth takes over.
- The Secondary Clarifiers topping slabs need to be replaced in the future. City is working on this project.

Effluent Pumps:

- They run the pumps until the end of its useful life.

Secondary Laboratory:

- Testing: Total Suspended Solids and Volatile Solids testing, DAF testing, micro exams, pictures and videos that capture dye stains.

Sludge Thickening:

- Dissolved Air Flotation Thickeners DAFT = Four, 400 square-foot tanks.

Some of the WTP's improvements Kirk is working on is:

- "The right tool for the job". Particularly regarding getting the right spare parts and inventory control.
- Kirk's #1 priority is evaluating the Solids Retention Time (SRT) seasonal goals.

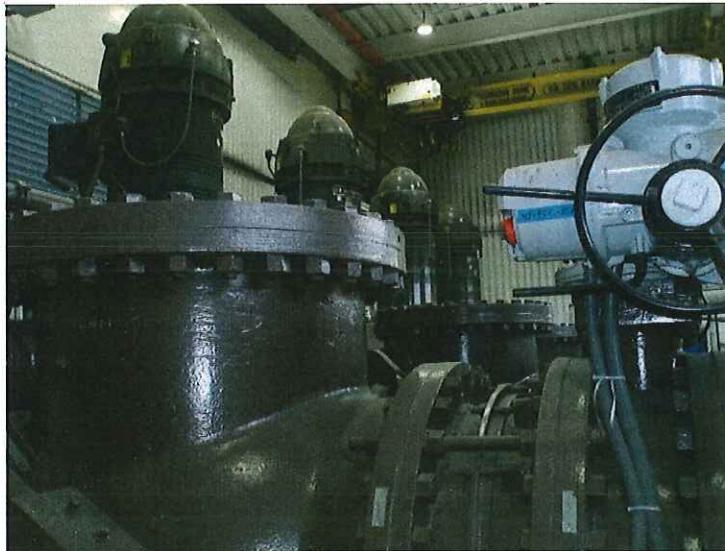
Other Reports:

- Associated Underwater Services - January 31, 2014 Inspection of the City of Tacoma's Wastewater Treatment Plant 1 Outfall Line and Diffuser System.
- Department of Ecology May 8, 2019 Certificate of Lab Accreditation letter.
- Puget Sound Clean Air Agency – Past and current Odor Control Documents.

City of Tacoma's Central WWTP Inspection Photos



Peak Wet Weather Facility (with Lamella plates)



PWWF Final Effluent Pumps

WQ Sampler PWWF



Rectangular Primary Clarifiers (Out of service for Maintenance) Tank No. 4

City of Tacoma's Central WWTP Inspection Photos



Primary Clarifier/Sedimentation Tanks



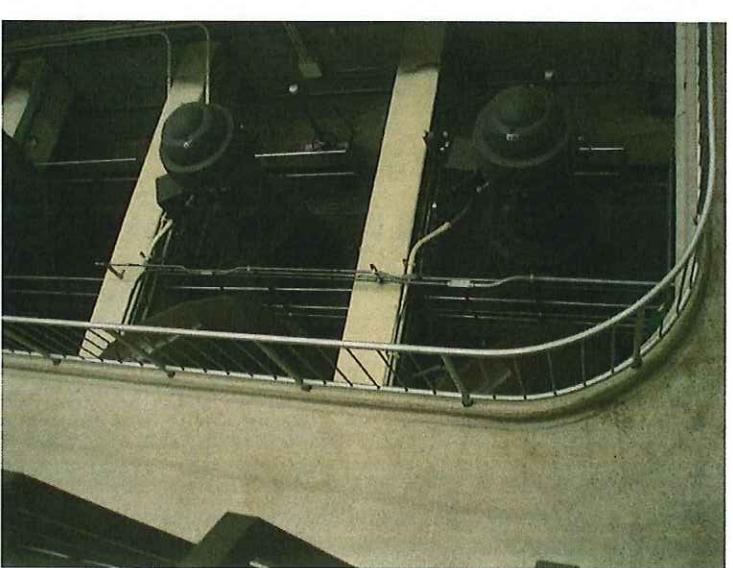
Primary Clarifier No. 4 (Out of Service for Maintenance)



Grit Odor Control Biofilter

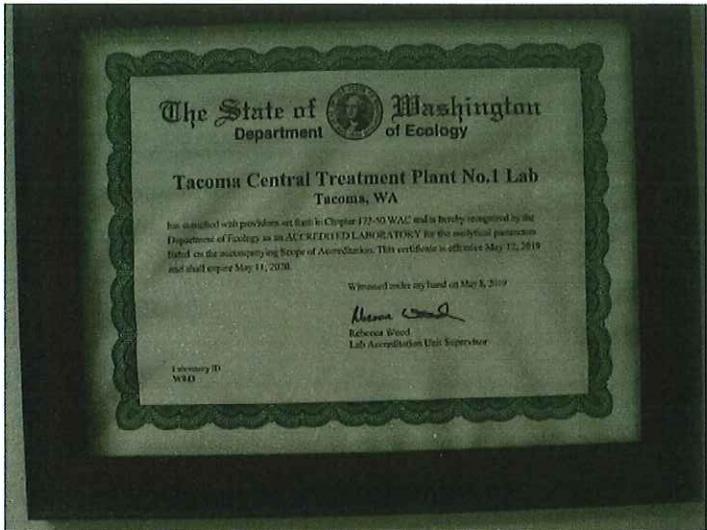


Grit Odor Control Biofilter Blower



Old Influent Pump Station Pumps 1 & 2

City of Tacoma's Central WWTP Inspection Photos



Laboratory Testing Accreditation Certification



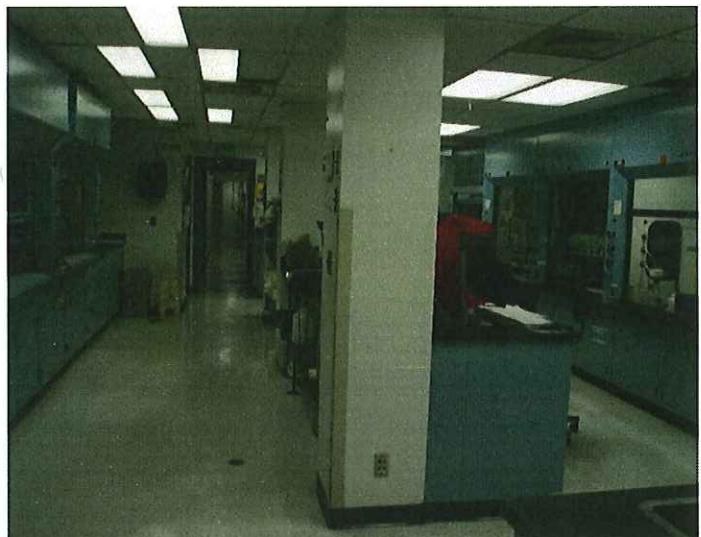
Lab Testing Office



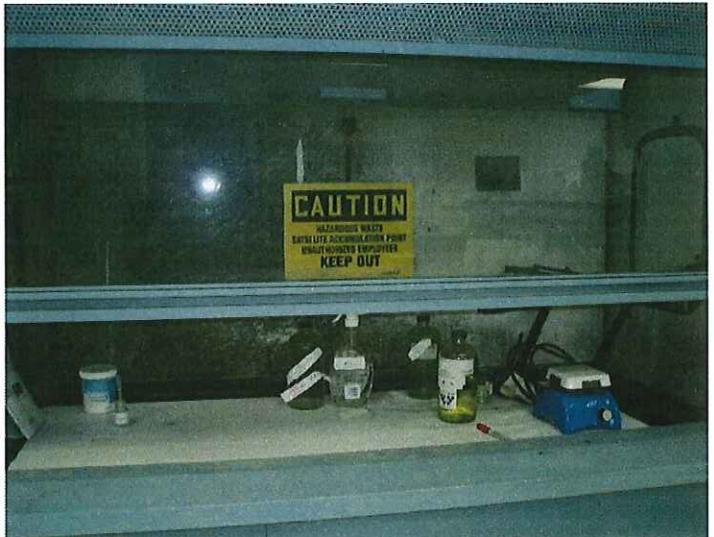
Laboratory Bottle & Equipment Storage



Lab Supply Room



Laboratory Testing Area



Hazardous Waste Liquids Disposal Satellite Area

City of Tacoma's Central WWTP Inspection Photos



Central Operations Control Center



Two, 48" Diameter Wastewater Influent Lines



Headworks Screening & Odor Control Area



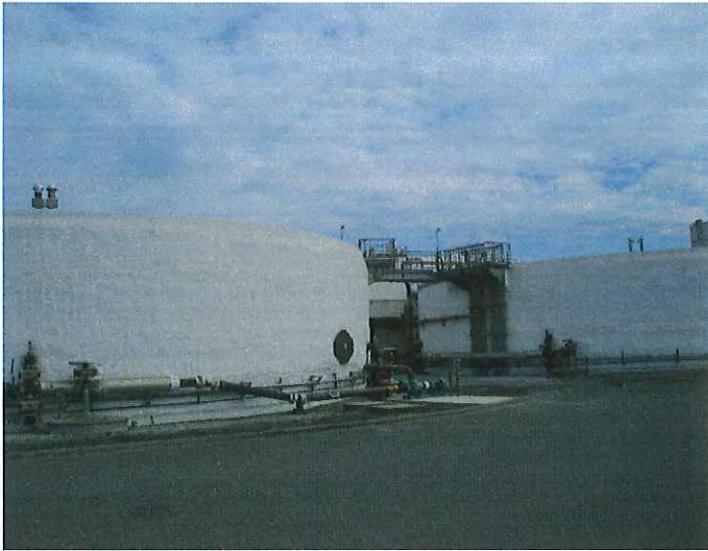
Influent 1/4" Bar Screens



New Influent Pump Station



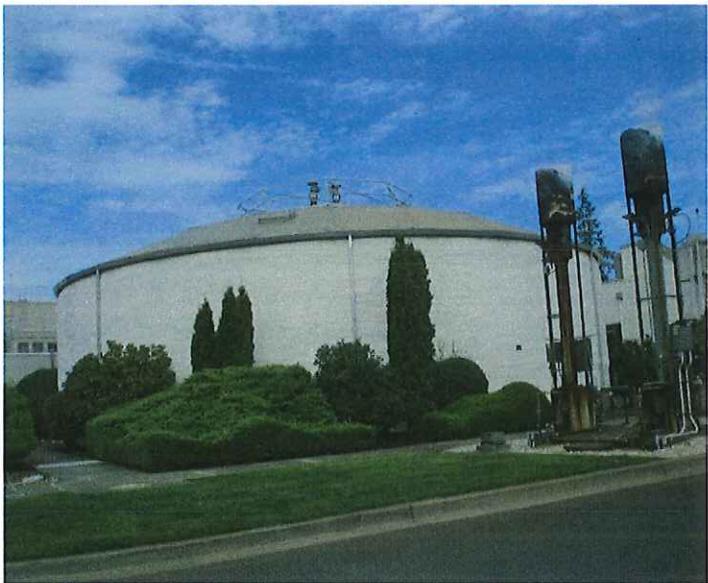
City of Tacoma's Central WWTP Inspection Photos



Anaerobic Digesters 1 & 2



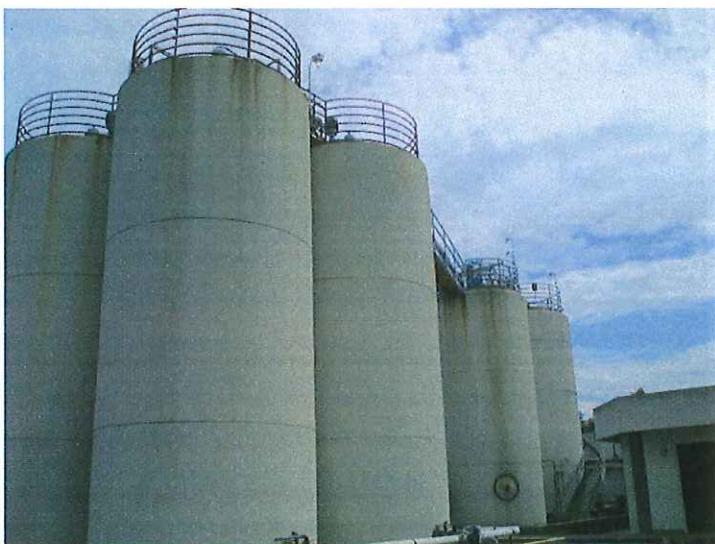
BSST & Boiler Room, Digester No. 1 (right)



Blended Solids Storage Tank (BSST)



Anaerobic Digesters - Waste Gas Burners



Aerobic Digesters in Series

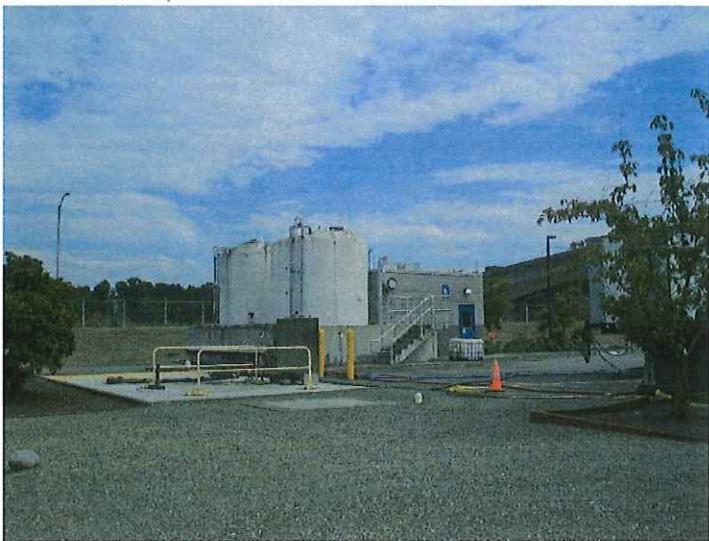


Three Cleaver-Brooks Boilers to Heat Digesters & Buildings

City of Tacoma's Central WWTP Inspection Photos



Heat Exchangers (that either heat up or cool down digested sludge)



Solids Receiving Station & Disinfection Building



Solids Dewatering Chemical Feed Area

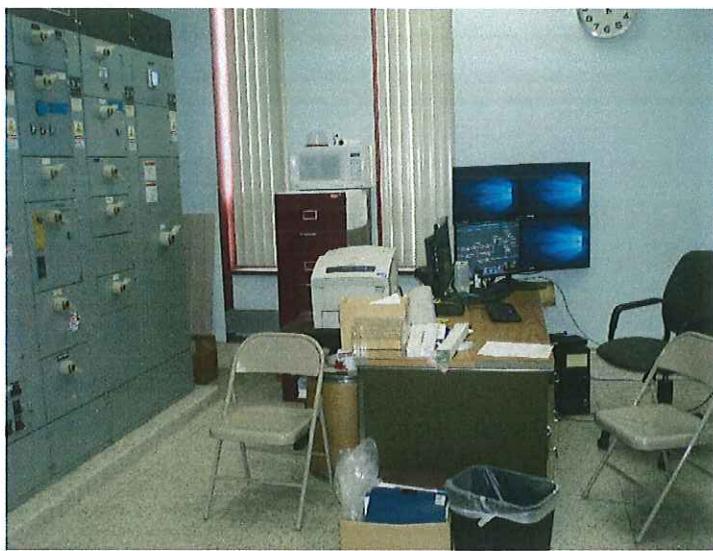


Solids Dewatering – Screw Presses 1, 2 & 3



Screw Press Discharge Auger

City of Tacoma's Central WWTP Inspection Photos



Solids Dewatering Control Room



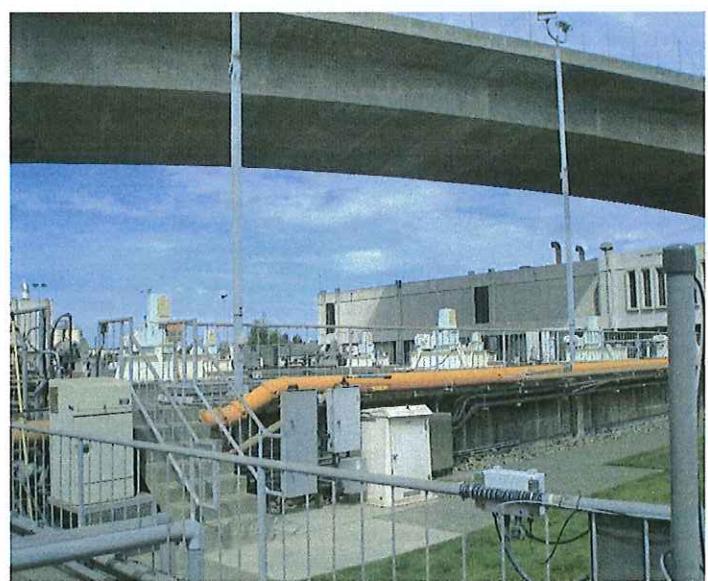
Biosolids Collection



Spare Parts Warehouse



Mixed Liquor Channel



O2 Decks/Aeration Basins

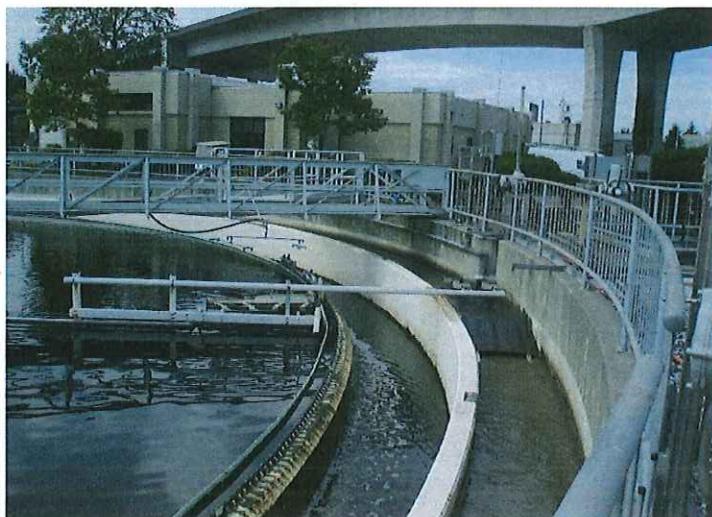
City of Tacoma's Central WWTP Inspection Photos



Mixed Liquor Channel and TAGRO Facility



Secondary Clarifier No. 2 - Weirs



Secondary Clarifier No. 2



Secondary Clarifier No. 4

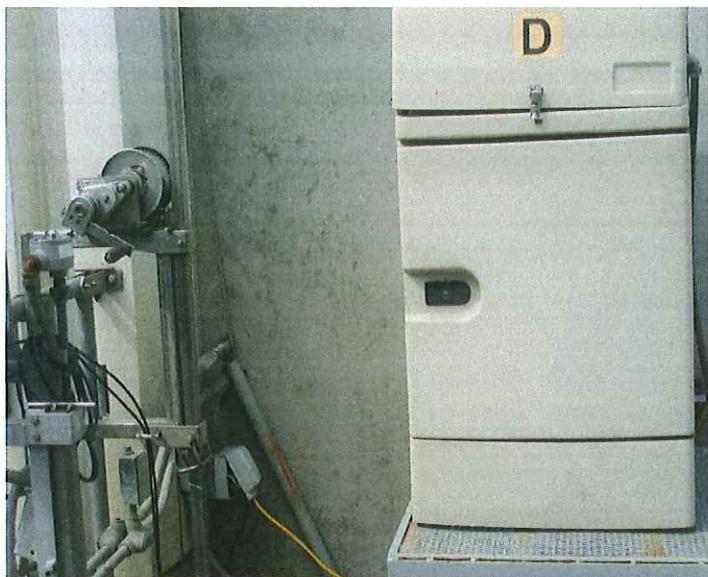


Secondary Clarifier No. 4

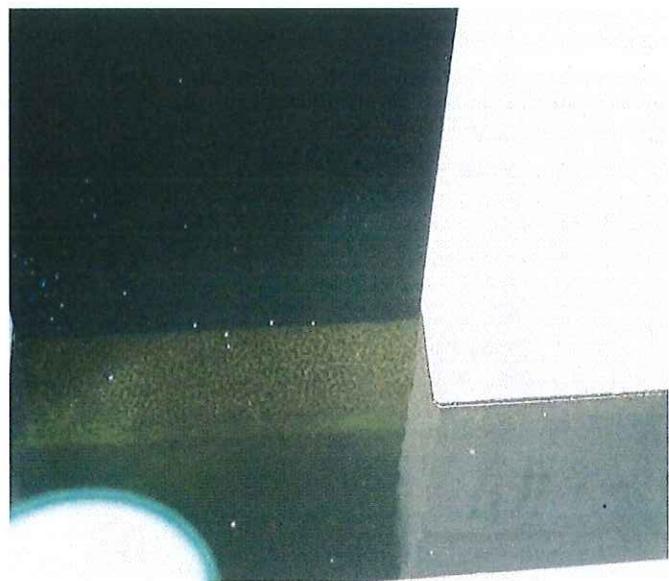


Secondary Clarifier No. 5

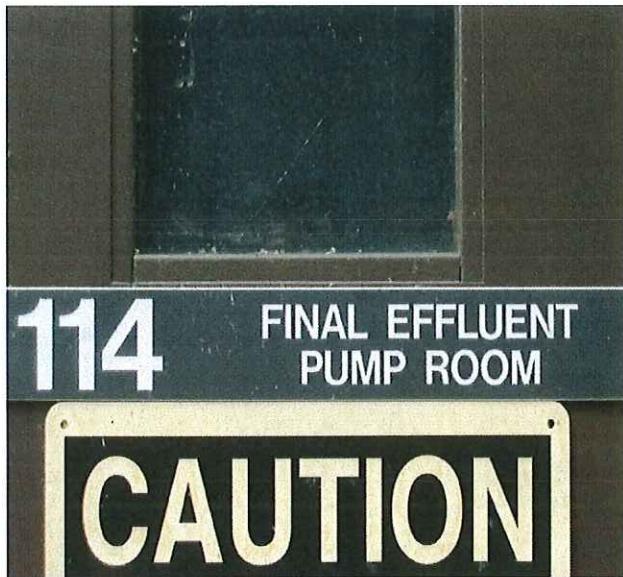
City of Tacoma's Central WWTP Inspection Photos



WQ Effluent Sampler – Used for Secondary Effluent during PWW Events



Secondary Effluent Pump Station Wet Well



Secondary Effluent Pump Room & Pump



Primary Effluent Channel



Aeration Basins (O2 Decks)

City of Tacoma's Central WWTP Inspection Photos



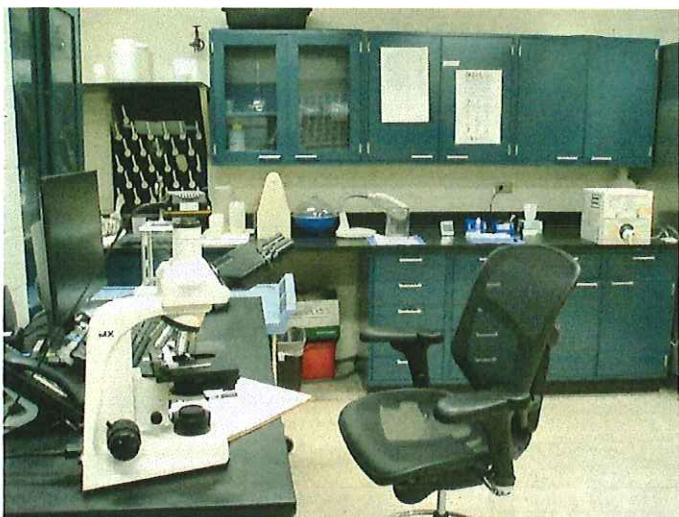
Returned Activated Sludge Pumps



Waste Activated Sludge Pumps



Secondary Laboratory



Dissolved Air Floatation Thickener Odor Scrubber

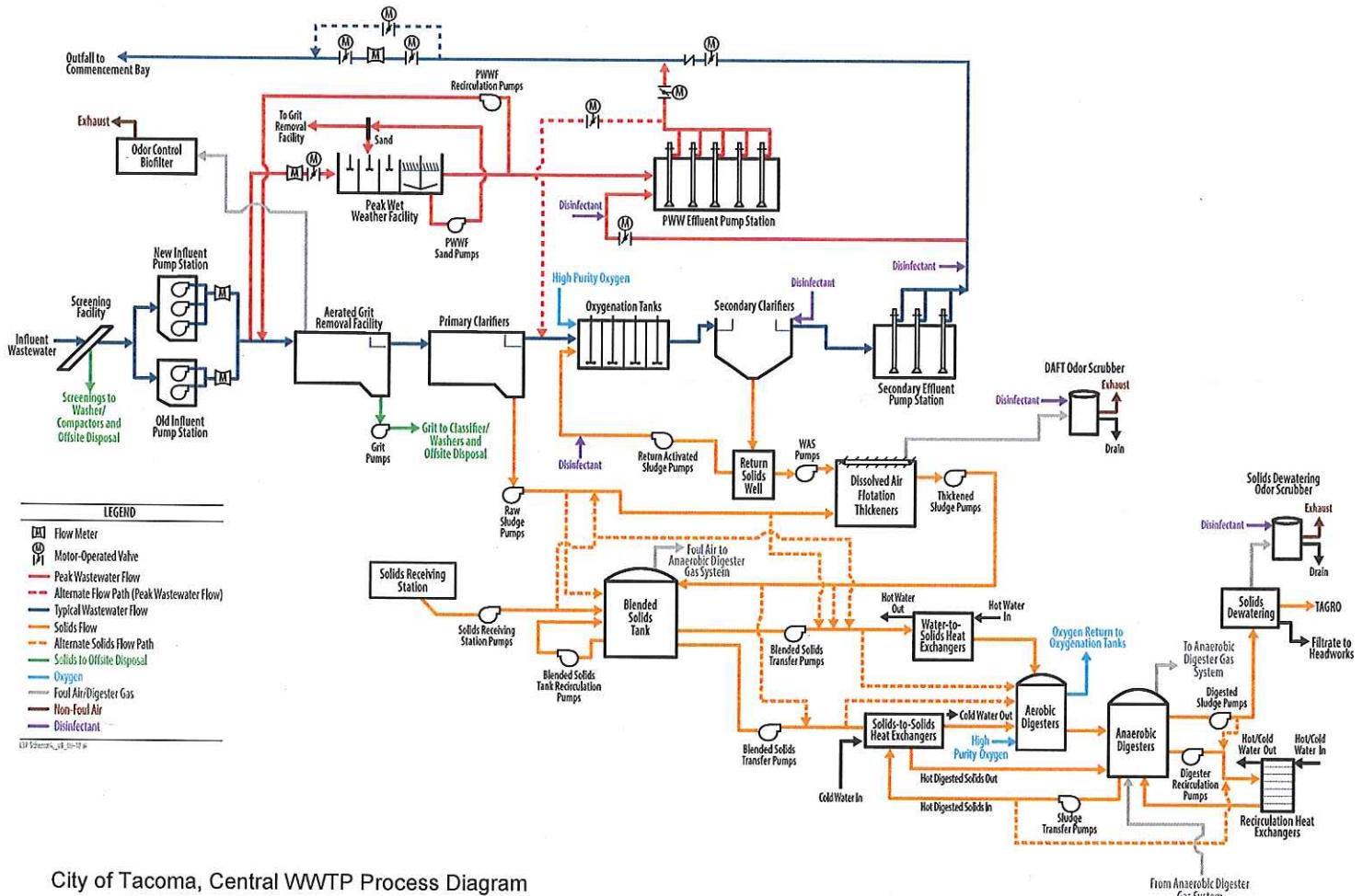


Hazardous Material Storage Locker

City of Tacoma's Central WWTP Inspection Photos



Sludge Thickening – Top of DAF



City of Tacoma, Central WWTP Process Diagram