

State of Washington Department of Ecology
**WASTEWATER TREATMENT PLANT
COMPLIANCE INSPECTION REPORT**

Northwest Regional Office
3190160th Ave SE
Bellevue, WA 98008
(425) 649-7000 ph
(425) 649-7098 fax
(last update 4-15-05)

Section A: General Information

Report Version <input checked="" type="checkbox"/> New <input type="checkbox"/> Amended	PERMIT # WA-003207-7	mo/day/yr 11/19/14	Inspection Type A	Inspector Code E	Facility Type <input checked="" type="checkbox"/> Public <input type="checkbox"/> Private
--	--------------------------------	------------------------------	-----------------------------	----------------------------	--

Remarks

Inspection work days 1.5	Facility Self-Monitoring Evaluation Rating 5	Photos Taken <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Samples Taken <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Lead Ecology Inspector(s) Lazaro Eleuterio, Ph.D., PE
------------------------------------	--	---	--	--

Section B: Facility Data

Name, Location, and Phone of Facility Inspected Kingston WWTP (Kitsap County – Wastewater Division) 23055 South Kingston Road NE Kingston, WA 98346	Entry Time 08:51 AM	Permit Effective Date 12/01/2010
	Exit Time 10:48 AM	Permit Expiration Date 11/30/2015
Name(s)/Title(s) of On-Site Representative(s) Patrick Kongslie, Operations Supervisor Brian Fletcher, Operator II Ken Young, Operator III	Ecology Staff On-Site Lazaro Eleuterio (NWRO) Carl Jones (SWRO)	
Name, Address, Title, Phone, and Fax Number of Responsible Official Stella Vakarcus, Senior Program Manager Kitsap County Public Works – Wastewater Division 614 Division Street (MS 27), Port Orchard, WA 98366-4699 Phone Number (360) 337-4896 Contacted? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Other Facility Data	

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

<input checked="" type="checkbox"/> Permit	<input checked="" type="checkbox"/> Flow Measurement	<input checked="" type="checkbox"/> Operations & Maintenance	<input type="checkbox"/> CSO/SSO (Sewer Overflow)
<input type="checkbox"/> Records/Reports	<input checked="" type="checkbox"/> Effluent	<input checked="" type="checkbox"/> Sludge Handling/Disposal	<input type="checkbox"/> Pollution Prevention
<input checked="" type="checkbox"/> Facility Site Review	<input type="checkbox"/> Receiving Water	<input type="checkbox"/> Pretreatment	<input type="checkbox"/> Multimedia
<input checked="" type="checkbox"/> Self-Monitoring Program	<input type="checkbox"/> Laboratory	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Other

Section D: Summary of Findings/Comments

I. INTRODUCTION:

An announced Class I inspection was conducted at the Kitsap County's Kingston WWTP on November 19, 2014. Lazaro Eleuterio (Municipal Permit Manager) and Carl Jones (Operators Outreach Coordinator) with the Washington State Department of Ecology conducted the inspection. Kitsap County WWTP staff Brian Fletcher, Patrick Kongslie and Ken Young assisted in the tour of the plant.

The purpose of this inspection was to fulfill the NPDES Class I compliance inspection requirements by conducting a site inspection, assessing flow measurements and evaluating compliance with the permit requirements.

Permit Status

The plant is regulated by NPDES Permit no. WA-003207-7 issued on November 09, 2010 and expires on November 30, 2015. The plant was commissioned in 2005 and is designed to treat a maximum month flow of 0.292 MGD. This capacity will accommodate the population growth for the next 20 years. Kingston WWTP provides secondary treatment via oxidation ditch and secondary clarifiers. Final effluent is disinfected with an UV disinfection system before discharging to Appletree Cove, Puget Sound. The plant has received eight consecutive Outstanding Performance Awards by the Washington State Department of Ecology since 2006.

Collection System

Pump Station 71, located in downtown Kingston, receives raw sewage from the collection system that serves the City of Kingston and surroundings areas. Raw sewage flows by gravity into the pump station wet well and is periodically pumped through a force main to the wastewater treatment plant. The plant serves a population of approximately 2,100 residents.

II. RESULTS AND DISCUSSION:

Treatment Process

At the headworks, raw sewage flows through a 6-mm rotary bar screen (Photo # 1) and a Pista grit chamber (Photo # 2). Washed and compressed screenings fall into a dumpster for offsite disposal. Dewatered grit is deposited in the waste dumpster with the screenings. A grit classifier (Photo # 3) is used to separate and dewater the concentrated grit for disposal into the dumpster.

Degritted wastewater is directed through an influent channel (Photo # 4) and a Parshall Flume equipped with ultrasonic flowmeter (Photo # 5), then flows by gravity to the oxidation ditches influent splitter box. The flow splitter box was designed to distribute the influent flow evenly (50/50) between two oxidation ditches. According to Mr. Kongsle, only 38 percent of hydraulic capacity has been utilized. As a result, only oxidation ditch No.1 is in service. Oxidation ditch No.1 (Photo # 7) is equipped with adjustable effluent weirs, and two rotating brush aerators to provide an aerobic environment and completely mix the suspended biomass. The oxidation ditch consistently achieves 96 percent of BOD removal, and also nitrifies and denitrifies at a 27-day SRT. Typical mixed liquor concentration is about 3,500 mg/L.

The aerators are operated to maintain a minimum dissolved oxygen concentration of 2 mg/L during the aeration cycle. The brush aerators have four on/off operating cycles per day. Each cycle consists of 4 hours ON and 2 hours OFF. Air is supplied by three single-stage centrifugal blowers (Photo # 8). One blower is on duty and the other two are on standby. The blowers are rotated on a regular basis to ensure that they operate and function on demand.

Oxidation ditch No.2 has been offline since 2005 and can provide additional capacity in the future.

Mixed liquor exits the oxidation ditch No.1 through a weir structure and flows by gravity to a flow splitter box upstream (Photo # 9) of the secondary clarifiers. The splitter box is equipped with slide flow gates (Photo # 10) and is designed to balance the flow between the two secondary clarifiers. Only one secondary clarifier (Photo # 11) is needed to meet the treatment demands year around. The plant staff rotates the clarifiers for operation and maintenance purposes on a yearly basis. At the time of the inspection, clarifier No.2 was offline.

Each clarifier has water sprays and a skimmer arm that direct scum towards the perimeter of the clarifier. The scum is collected into the scum trough and flows by gravity to a common scum sump where is pumped to the sludge storage tank.

Return activated sludge (RAS) pumps recycle approximately 75 percent of the plant influent flow to the oxidation ditch No.1. According to Mr. Fletcher, the constant speed RAS pumps turn off every time the sludge return portion is less than 75 percent of the influent flow. This is a strong indication that the RAS pumps are reaching the end of their life cycle and need to be replaced. The remainder of the sludge (WAS) is wasted from the secondary clarifiers for further processing and offsite disposal. The RAS pumps have double duty, they handle both the RAS and WAS.

Secondary effluent overflows the weir, drops into the launder that extends around the perimeter of the clarifier, and then flows by gravity (Photo # 12) to a Trojan 300 UV disinfection system (Photo # 13). The UV system consists of two UV banks designed to disinfect approximately 1.6 MGD. Each bank has 48 lamps. Currently, the plant operates only one bank that provides sufficient disinfection for the current flows. If there is a need to increase disinfection capacity in the future, both UV banks can operate in series to accommodate increased flows.

The UV banks are housed in a channel designed with a downstream weir that maintains constant water surface elevation and submerges the lamps to assure the final effluent is properly in contact with the UV lamps. The banks are rotated weekly for routine maintenance and inspection.

Both influent and effluent composite samplers were inspected. The composite influent sample (Photo # 6) and composite effluent sample (Photo # 15) have been refrigerated at 2.0° C and 4.0° C, respectively. The temperatures of both composite samplers were within the typical range for sample storage and preservation (2 – 4° C). The samplers are setup to collect 100 mL of wastewater every 20 minutes.

Mr. Fletcher monitors dissolved oxygen in the influent and effluent daily using a portable DO meter. The DO concentration in influent is about 1 mg/L and in the effluent varies between 2 – 4 mg/L. A DO value of 2 mg/L in the effluent is considered low, which is directly associated to the long solids retention time (27 days) in the oxidation ditch No. 1 and the extent of the aerobic cycle.

Solid Stream

Screenings and grit removed at the headworks are drained and collected in a dumpster. The County's contractor, Waste Management Company, hauls the dumpster contents to dispose of as solid waste at a local landfill. Originally, the wastes were set to be hauled once a week, but now they are hauled on an on-call basis.

The solids stream treatment system consists of two 25,000-gallon WAS storage tanks (Photo # 16), one gravity belt thickener (GBT) (Photo # 17), and one 16,000-gallon thickened WAS storage tank (Photo # 16). The WAS is stored for 12 days prior to thickening through the GBT, and the TWAS tank has a storage capacity of approximately 7 days. The tanks are continuously aerated to minimize the risk of septic conditions and odor generation. The air is supplied by three positive-displacement blowers interconnected through a single air pipe. One blower is on duty, the other two are on standby. Blowers are controlled manually.

The GBT thickens the WAS to approximately 3.5% solids concentration, and then is stored in TWAS storage tank. GBT is operated approximately once a week for approximately 4 hours. TWAS is hauled weekly to the County's Central Kitsap WWTP for further treatment and utilization.

Operation and Maintenance

The plant is operated with almost 100 percent redundancy due to the low hydraulic and treatment capacity demands. Precisely, since its commission, the plant utilizes only 38 percent of its hydraulic capacity, which makes it easy to maintain and inspect. To date, no routine maintenance or inspection has been conducted in the oxidation ditch No.1. The secondary clarifiers are rotated once a year for inspection and maintenance. Secondary clarifier weir and launders are cleaned once a week to remove biological growth.

Both oxidation ditches and secondary clarifiers can be operated either independently or hydraulically connected.

Once a year, the treatment processes at the headworks are bypassed and taken offline for inspection and maintenance following the manufacturer's recommendations.

RAS/WAS pumps are rotated weekly. One pump is on duty, one pump is on standby.

Flow Measurement

Influent flow is measured downstream of the Pista Grit Chamber using an ultrasonic flowmeter above a Parshall flume (Photo # 5). The effluent is measured after the UV disinfection channel also using an ultrasonic flowmeter above a Parshall flume (Photo # 14). Influent and effluent flowmeters are calibrated once a year as part of the plant's preventative maintenance program per manufacturer's recommendations.

Infiltration and Inflow (I/I)

Mr. Kongsli and Mr. Fletcher have not identified any I/I issues in the last few years. Therefore, no I/I studies have been conducted.

Odor Control

The odor control system consists of an odor control fan and a biofilter system (Photo # 18 and # 19) to process odorous air generated from headworks, screens and grit dumpsters, WAS and TWAS storage tanks and GBT room. The fan collects and conveys odorous air to the biofilter where naturally occurring microorganisms reduce sulfur compounds and volatile organic compounds.

Alarms/Back-up Power

One standby generator with a total capacity of approximately 350 kW can power the entire plant during power outages (Photo # 20).

Staffing

The plant is staffed with one supervisor and one operator II. The normal operating hours are from 7 a.m. to 3:30 p.m., from Monday through Friday. The plant is also staffed with an operator on call during the weekends.

Records Review

The laboratory records were not reviewed during this inspection.

III. RECOMMENDATIONS:

The RAS/WAS pumps are reaching the end of their life-cycle and Ecology recommends that they be replaced to ensure proper operation and maintenance at the plant. The RAS/WAS pumps are single-speed pumps and can no longer convey sludge recycle rates lower than 75 percent. The current recycle rates seem too high and increase the power consumption unnecessarily. Ecology recommends applying to the Puget Sound Energy's (PSE) Energy-efficiency Incentives for Municipalities program for possible funding. High efficiency pumps equipped with variable speed drives will enhance the oxidation ditches and secondary clarifiers overall performance and decrease energy costs. For more information, please visit the PSE website at <https://www.pse.com>.


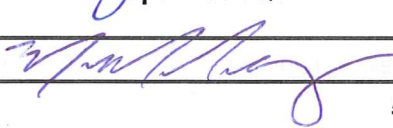
IV. CONCLUSION:

The plant is well operated and maintained. The effluent looked clear at the time of inspection. Contact Lazaro Eleuterio, Municipal Permit Manager, at 425.649.7027 if there are any questions related to this inspection report.

Copies to:
Patrick Kongsle, Operations Supervisor, Kitsap County
Brian Fletcher, Operator II, Kitsap County
Ken Young, Operator III, Kitsap County

V. ACKNOWLEDGEMENTS:

The author of this inspection report wants to thank Mr. Fletcher, Mr. Kongsle and Mr. Young for the informative tour at the Kitsap County's Kingston WWTP and the discussions regarding the facility's operation and maintenance. The author also wants to thank Mr. Carl Jones for coming along during this inspection and for his support.

Name(s) and Signatures of Inspector(s)	Agency/Office/Telephone	Date
Lazaro Eleuterio 	WA Dept. of Ecology, NWRO, (425) 649-7027	December 01, 2014
Name and Signature of Supervisor/QA Reviewer		
Mark Henley 	WA Dept. of Ecology, NWRO, (425) 649-7103	December 01, 2014

ANNOUNCED Inspection

INSTRUCTIONS

Section A: General Information

Report Version: New for 1st version, Amended for amended versions

NPDES Permit No.: Enter the facility's NPDES or State permit number.

Inspection Date: Insert the date entry was made into the facility. Use the month/day/year format (e.g., 06/30/04 = June 30, 2004).

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

- | | |
|--|--|
| A Compliance Evaluation (non-sampling) | G Compliance Evaluation (Sampling) Re-Sample |
| B Compliance Evaluation (sampling) | H Reconnaissance |
| C Enforcement Case Support | I Reconnaissance |
| D Multimedia | J Site Visit |
| E Pretreatment Compliance Inspection | K Other |
| F Compliance Evaluation (non sampling) Follow-up | |

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

- | | |
|---|--|
| E - Ecology Inspector | L - Joint Ecology/Laboratory Accreditation Inspectors – Ecology Lead |
| H - Joint Ecology/Health – Ecology Lead | T - Joint EPA/Ecology Inspectors - EPA Lead |
| J - Joint Ecology/EPA Inspectors - Ecology Lead | C - Contractor or Other Inspectors (<i>Specify in Remarks Columns</i>) |

Facility Type: Use one of the choices below to describe the facility.

Public - Municipal Publicly Owned Treatment Works (POTWs)

Private - Municipal Privately Owned Treatment Works

Remarks: These columns are reserved for remarks.

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. This estimate includes the accumulative effort of all participating inspectors; any effort for laboratory analyses, testing, travel time and preparation time. This estimate does not require detailed documentation.

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.

Photos Taken: Yes or No

Samples Taken: Yes or No

Lead Ecology Inspector: Enter lead inspector's name

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), e-mail addresses...; and "Ecology Staff On-Site", which may include staff names, titles, phone numbers, or e-mail addresses.

Section C: Areas Evaluated During Inspection

Check only those areas evaluated by marking the appropriate box. Use Section D and additional sheets as necessary.

Section D: Summary of Findings/Comments

Support the findings, as necessary, in a narrative report. Use the headings given on the report form (staffing, back-up power) as appropriate. Reference a list of attachments, such as completed checklists, photos, lab reports, etc. Use extra sheets as necessary.

PHOTO ADDENDUM – KITSAP KINGSTON WASTEWATER TREATMENT PLANT



PHOTO #:01 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: HEADWORKS – ROTARY FINE SCREEN



PHOTO #:02 NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: HEADWORKS - PISTA GRIT CHAMBER

PHOTO ADDENDUM – KITSAP KINGSTON WASTEWATER TREATMENT PLANT



PHOTO #:03 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: HEADWORKS - GRIT CLASSIFIER



PHOTO #:04 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: INFLUENT CHANNEL

PHOTO ADDENDUM – KITSAP KINGSTON WASTEWATER TREATMENT PLANT



PHOTO #:05 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: INFLUENT PARSHALL FLUME



PHOTO #:06 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: INFLUENT SAMPLER



PHOTO #:07 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: OXIDATION DITCH



PHOTO #:08 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: SINGLE-STAGE CENTRIFUGAL BLOWERS



PHOTO #:09 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: SECONDARY CLARIFIER INFLUENT SPLITTER BOX AND WET WELL

PHOTO ADDENDUM – KITSAP KINGSTON WASTEWATER TREATMENT PLANT



PHOTO #:10 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: CLARIFIER INFLUENT SPLITTER BOX AND FLOW GATE



PHOTO #:11 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: SECONDARY CLARIFIER



PHOTO #:12 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: SECONDARY CLARIFIER EFFLUENT CHANNEL



PHOTO #:13 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: UV DISINFECTION CHANNEL

PHOTO ADDENDUM – KITSAP KINGSTON WASTEWATER TREATMENT PLANT



PHOTO #:14 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: EFFLUENT PARSHALL FLUME

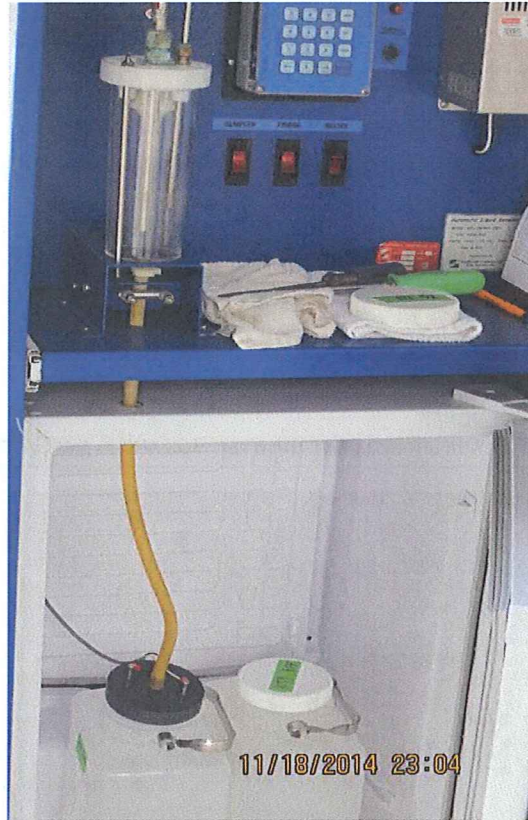


PHOTO #:15 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: EFFLUENT SAMPLER



PHOTO #:16 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: WAS AND TWAS STORAGE TANKS
(UNDERGROUND)



PHOTO #:17 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: GRAVITY BELT THICKENER (GBT)

PHOTO ADDENDUM – KITSAP KINGSTON WASTEWATER TREATMENT PLANT



PHOTO #:18 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: CHEMICAL FEED SYSTEM FOR GBT, ODOR CONTROL AND FILAMENTOUS CONTROL



PHOTO #:19 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: BIOFILTER FOR ODOR CONTROL



PHOTO #: 20 DATE: NOVEMBER 19, 2014
TAKEN BY: CARL JONES
DESCRIPTION: BACKUP POWER GENERATOR

LINKS AND INFORMATION:

"Informational Manual for Treatment Plant Operators"; February 2004; by the Department of Ecology
Publication Number 04-10-020:

<http://www.ecy.wa.gov/pubs/0410020.pdf>

The manual was prepared to help wastewater treatment plant operators complete and submit their Discharge Monitoring Reports (DMRs) and other annual reports to the Department of Ecology. The manual is available in hard copy. To request a copy, contact the Department of Ecology, Publications Distribution Center at P.O. Box 47600, Olympia, WA 98504-7600 or by Telephone: (360) 407-7472. Updates to the manual are included on the website version.

Ecology's Wastewater and Reuse website:

<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>

Ecology's Operator Certification website:

http://www.ecy.wa.gov/programs/wq/wastewater/op_cert/index.html

Ecology's Laboratory Accreditation website:

http://www.ecy.wa.gov/programs/eap/labs/labs_main.html

Ecology's Biosolids website:

<http://www.ecy.wa.gov/programs/swfa/biosolids/>

Ecology's Operator Outreach: Carl Jones (360) 407-6431; cjon461@ecy.wa.gov

Ecology's Municipal Compliance Specialist (Northwest Regional Office): Amy Jankowiak (425) 649-7195;

ajan461@ecy.wa.gov

Ecology's Wastewater Operator Certification Coordinator: Poppy Carre (360) 407-6449; 1-800-633-6193 (within the state)

poca461@ecy.wa.gov

Ecology's Biosolids Coordinator (Northwest Regional Office)" Marietta Sharp (425) 649-7258 mars461@ecy.wa.gov

Reporting Spills/Overflows/Upsets/Bypasses/Loss of Disinfection IMMEDIATELY:

Ecology's 24-hour Number: (425) 649-7000 to report a spill

Department of Health – Shellfish Program Number: (360) 236-3330 (Business Hours), (360)-786-4183 (24 hours)