

# **Wyckoff/Eagle Harbor Superfund Site, Monthly Groundwater Extraction and Treatment System Operations Report July 2002**

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FROM: Travis Shaw – Site Manager, Seattle District, USACE

This letter report represents the seventh report to Project Managers after the transition of operational responsibility of the existing groundwater extraction and treatment system to USACE oversight. The purpose of the report is to document operational milestones, document treatment plant operations, demonstrate compliance with project objectives, and describe activities undertaken to prepare for thermal operations. Under the current operational scenario, the primary objectives of groundwater extraction/treatment system are three-fold:

- 1) Maintain hydraulic control of the upper aquifer underlying the Former Process Area
- 2) Treat extracted groundwater to standards defined in the NPDES permit (detailed in the Record of Decision, Feb. 2000).
- 3) Recover NAPL contamination from the upper aquifer underlying the Former Process Area.

In October 2002, additional objectives will include treatment of liquid waste streams resulting from the Thermal Remediation Pilot Study.

## **Significant Operational Milestones**

Significant operational activities are summarized below:

- General Housekeeping on treatment plant, shop and storage areas.
- The standby generator continues to perform flawlessly.
- Worked on price quotes for critical equipment list.
- Cleaned and primed foundation for P-205A pump.
- Pressure washed filter cloths on the plate frame filter press. Press is now ready to be used again when needed.
- Pressure washed treatment pad and cleaned area.

- Water levels in monitoring wells collected to confirm hydraulic control of the site.
- Updated Maintenance Pro software system.
- Welded locking chain to plant gate at the top of the hill, painted the gate, and installed new sign and reflective tape. We are now locking the gate at the top of the hill; last person off site will lock this gate.
- A reconditioned/recalibrated probe was installed on the pH meter
- Routine maintenance was performed on auto sampler unit.
- Pressure washed top of aeration basin and painted non-skid paint on all solid walkways.
- Completed drumming of all Geo-Probe waste. Twenty-three drums of waste added to accumulation area. The total number of drums in accumulation area is sixty-five.
- Cleared brush from the electrical out building in the trailer park area.
- GE Capital installed new aluminum trailer steps for two site trailers.
- Updated Callout SOP.
- Removed insulation from T-402 piping to aeration basin. The heat trace will be removed by Pease and Sons construction.
- Completed rebuilding of all exclusion zones around all active pumping wells; this includes new fence and cleaning all brush from inside exclusion zones.
- Air compressor dryer system failed. A bypass line was hard piped around the system to allow the compressor to supply air to the treatment pad. Replacement parts were ordered and will be installed soon.
- Cleared brush in upper parking lot area.

## **System Operations**

**Extraction System** - Average pumping rates for the entire month are summarized below (Table 1) along with the cumulative total of extracted groundwater to date. The decreased pumping rates from the initial water level survey in April and recommendations of the USACE Project Hydrogeologist were continued throughout July, with the average pumping rate about 35 gpm.

**Table 1  
Wyckoff Project Extraction Well Operation, Daily Flow, and Groundwater Recovery  
July 2002**

Extraction Well #	Operating Days	Days Down	Average Flow-gals. (Daily)	Average Flow (gpm)	Total Monthly Flow-gals.	Cumulative to date since start-up (gals.)
1	31	0	6,769	4.7	209,839	33,985,150
2	0	31	0	0.0	0	33,828,438
3	0	31	0	0.0	0	23,560,859
4	31	0	8,210	5.7	254,510	22,817,511
5	31	0	11,938	8.3	370,078	46,306,322
6	31	0	9,930	6.9	307,830	34,280,220
7						11,889,547
8	31	0	8,166	5.7	253,146	30,475,404
9	31	0	5,749	4.0	178,219	12,460,135
T-402 Influent			53,388	37.1	1,655,028	
Well Total			50,762	35.3	1,573,622	249,603,586 <sup>a</sup>
Total Recovered by PSR						127,390,614 <sup>b</sup>
Total Recovered Groundwater						376,994,200

<sup>a</sup> Total contaminated groundwater recovered and treated since Nov. 1993.

<sup>b</sup> Total contaminated groundwater recovered and treated prior to EPA operation of the on-site facilities in Nov. 1993.

The NAPL recovery rates decreased from those experienced in June due in part to the failure of pumps 2 and 3, which continued to be off line for the duration of July (Table 2). Overall, the quantity of recovered NAPL decreased from 100 gallons in June to 89 gallons in July (Table 2).

**Table 2  
Wyckoff Project Product Recovery and Onsite Storage  
July 2002**

Extraction Well	D-NAPL gals.	L-NAPL gals.	Cumulative to Date gals.
1	40	0	7,584
2	0	0	5,663
3	0	0	771
4	0	0	145
5	0	0	9,678
6	0	18	6,406
7			102
8	15	0	3,556
9	16	0	3,091
<b>Extraction Sub-total</b>	<b>71</b>	<b>18</b>	<b>36,996</b>
<b>Product From Plant Operations</b>	<b>0</b>	<b>0</b>	<b>22,157</b>
<b>Total for Month</b>	<b>71</b>	<b>18</b>	
<b>Historic Quantities From Plant Operations</b>			<b>621<sup>a</sup></b>
<b>Total Recovered by PSR</b>			<b>39,653<sup>b</sup></b>
<b>Total Recovered Product</b>			<b>99,427</b>
<b>Product Currently Stored Onsite</b>			
Prod. sent to T-105	250		1,650
Prod. sent to T-107	0		0

<sup>a</sup> Represents quantities recovered from T-101 and SEP-102, which are no longer in operation.

<sup>b</sup> Product recovered by PSR prior to EPA assuming operation of on-site facilities in Nov. 1993

A summary of maintenance and repair activity to the extraction system is provided below:

- Normal operations throughout the month.
- Probed and pumped well field as needed.
- Water levels measured on weekly probe and pump work appear to be static with the exception of tidal influences.
- Individual well flows were adjusted to match target values.

- Installed Lexan flow meter covers on PW-1, 4, 5, 6, and 8.
- The battery holder contacts were adjusted for PW-1. The battery holder (or the entire meter) may need to be replaced.
- Flow meter PW-8 was not functioning properly. Site employees trouble shot the unit and determined the flow meter assembly was inoperative. To temporarily solve the problem, the flow meter assembly from PW-2 was installed at PW-8

Monthly ground water level measurements to maintain hydraulic control outside the pilot area continued during July. Testing is done to better monitor pumping rates.

## Treatment System Operations

With the exception of effluent PAH data, data used to produce the figures represents validated data from the Manchester Laboratory. Preliminary data was used for the PAH effluent chart for July because the laboratory was delayed in validating that data set. Preliminary data used to make operational decisions by the operators is presented in the attachments and may consist of values different from the validated data set.

**Primary System** - The concentration of contaminants received by the treatment plant was consistent during the month of July. Oil and grease concentrations in weeks 27 through 31 from the well field ranged between 14.8 mg/l and 11.5 mg/l (Figure 1).

The range of PAH concentrations from the well field during weeks 27 through 31 ranged between 19,054.9 µg/l and 11,467.37 µg/l (Figure 2). PCP concentrations from the well field were down from May and ranged between 720.0 µg/l and 350 µg/l (Figure 3).

Data shown here reflect validated results received after the preliminary plant performance reviews were completed and thus values may not be the same in the reviews.

Primary treatment of the groundwater treatment system remained inconsistent as observed in previous months. Treatment efficiency across the depurator ranged between 0% and 35.27% (Figure 4).

Maintenance and repair activity to the treatment plants primary treatment system is summarized below:

- Depurator oil and grease efficiencies continue to be less than stellar. The age and general degradation of this system is the likely culprit.
- The number two aerator bearings on the depurator are becoming increasingly noisy. All fittings on the aerator were greased in an effort to get as much life out of it before the depurator is replaced with the new DAF unit next month.
- The float mechanism on the depurator 104-air control module was operating erratically. Tightening the mechanism set screws solved the problem.
- Transfer pump 104 B failed during the night of 7/26/02 the rubber coupling between the motor and the pump shredded. Most likely cause was a pump bearing failure; this pump is scheduled for complete rebuild soon. The other pump is in

good shape since it was rebuilt earlier this year. We will keep the alpha pump on line until a rebuild is done on the bravo pump. We have a spare rubber coupling in stock but the potential for even more damage to that pump exists if we run it again.

- Began cleaning, priming, and painting DP-104 pump, including pump base support.

**Secondary System** – Treatment efficiency across the aeration basin remained high overall, however during weeks 29 and 31, PCP removal efficiency dropped below 97% for the first time in several months, with a low of 95.88% during week 31. During July, the reductions in PAH concentrations across the basin were above 99.3% (figure 5). SCS noted the decrease in efficiency of PCP removal across the aeration basin during the month. Numbers from week 29 show an increase in the PCP coming in from the well field, and an increase in the amount of PCP coming out of the aeration basin, however the system is still providing adequate efficiencies to provide good polishing down stream.

Additional maintenance or repair activity to the Secondary Treatment system included

- Microbial exam of aeration basin has shown good biological activity throughout the month. Microscopic exam shows good diversity of species and robust activity. Reduction of primary pollutants has exceeded ninety nine percent each week for PAH and ninety six percent for PCP. We have seen a slight drop in treatment of PCP possibly due to need to waste solids. This was done during the month and we expect this number to increase. Good settling and over five feet of visibility in the clarifier existed through out the month.
- Approximately 1500 gallons of solids were wasted from the aeration basin to aerobic digester.
- Final total on wasted solids from digester: twenty-three fifty five-gallon drums of pressed solids waste generated from our wasting activities. Good quality cake, twenty three percent solids average from in-house lab analysis.
- Cleaned valve stems on 104, 402 and 205 air control valves, these valve stems build up solids from the salt water and tend to hang up if they have to regulate flows swings.
- The Fisher flow control valve, which services the 205 pumps, was replaced with a spare unit. The valve stem was sticking, which caused the control valve to improperly operate. Several attempts were made to repair the sticky stem prior to replacing the control valve. The control valve that was removed will be rebuilt and stored as a spare.
- In early July, the rebuilt 205A transfer pump was installed. During test operation of the pump, the electric motor bearings appeared to be causing motor vibration and generating heat. New bearings were ordered and installed. The motor continued to vibrate and generate heat. The motor was removed and sent to Cascade Machinery for inspection. Cascade determined the motor needed a rebuild or should be replaced. A joint decision was made to replace the motor. The new motor was installed and operated during the day July 27 through July 28

and will be run continuously beginning mid week. Historically, this pump and motor were not frequently operated.

- The 205-B pump will not be rebuilt until the 205-A pump is proven to be dependable.
- Decanted liquid from digester to aeration basin. The volume of supernate transferred was approximately 1200 gallons or two and half feet liquid level in digester.
- Flushed poly-blend system and piping.
- Adjusted proportional band on P-205 flow control system.

**Tertiary System** – The tertiary system continued to function normally. Detections of PAH and PCP remained below the change-out criteria for the both the lead and lag carbon vessels.

Maintenance or repair activity of the tertiary treatment system included the following:

- Normal operations during the month.
- Carbon vessels continue to polish effluent with out exceeding permit limits and saturation levels. This can be directly attributed to aeration basin efficiencies. Based on the current trends on carbon should last until we begin steaming operations. New carbon is on hand in the upper parking lot for use when needed. Intent for carbon change outs is to replace lead carbon before steaming operations begin.

## **Compliance Monitoring**

Compliance monitoring of the extraction/treatment system's discharge to Puget Sound was conducted as scheduled in the Sampling and Analysis Plan (SAP).

Concentrations of PAHs and PCP were well below the NPDES permit discharge requirements (Figures 6 and 7). Concentrations of dissolved oxygen in the effluent discharged by the treatment plant ranged between 3-4 mg/l. While the concentrations of dissolved oxygen were well below the marine surface water criteria for Class AA water (7.0 mg/l), the concentrations of dissolved oxygen at the offshore mixing zone boundary were probably not exceeded.

Treatment plant effluent did not exceed Washington State Class AA marine surface water criteria for temperature (Figure 9) or pH (Figure 10), though the water temperature is showing an overall gradual increasing trend.

## **Thermal Operations Preparation**

Contracting actions were initiated to purchase rebuild kits for all critical pumps in the treatment plant and to upgrade PVC and control valves.

## Operational Expenses

Costs associated with the operations and maintenance of the extraction/treatment system by SCS is summarized below in Table 3. Detailed cost information is provided in the attachments.

<b>Table 3</b>				
<b>Wyckoff Operating Costs and Expenses</b>				
<b>July 2002</b>				
<b>Date</b>	<b>Description</b>	<b>Labor Costs</b>	<b>Material Costs</b>	<b>Total</b>
12/01	Transition / MP Expenses			\$18,500
1/02	Operating Costs (fixed by contract)			\$51,023
2/02	Operating Costs (fixed by contract)			\$51,023
3/02	Operating Costs (fixed by contract)			\$51,023
4/02	Operating Costs (fixed by contract)			\$51,273
5/02	Operating Costs (fixed by contract)			\$51,023
6/02	Operating Costs (fixed by contract)			\$51,023
7/02	Operating Costs (fixed by contract)			\$51,023
	<b>Fixed Operating Costs</b>			<b>\$375,911</b>
<b>Repair and Maintenance Expenses</b>				
1/02	January Expenses			\$741.74
2/02	February Expenses			\$1265.39
3/02	March Expenses	\$1144.48	\$820.70	\$1965.18
4/02	April Expenses	\$822.93	\$676.91	\$1499.84
5/02	May Expenses	\$471.55	\$966.47	\$1438.02
6/02	June Expenses	\$868.10	\$199.43	\$1067.53
7/02	July Expenses	\$993.00	\$955.19	\$1948.19
	<b>Total Repair Expenses</b>			<b>\$9925.89</b>

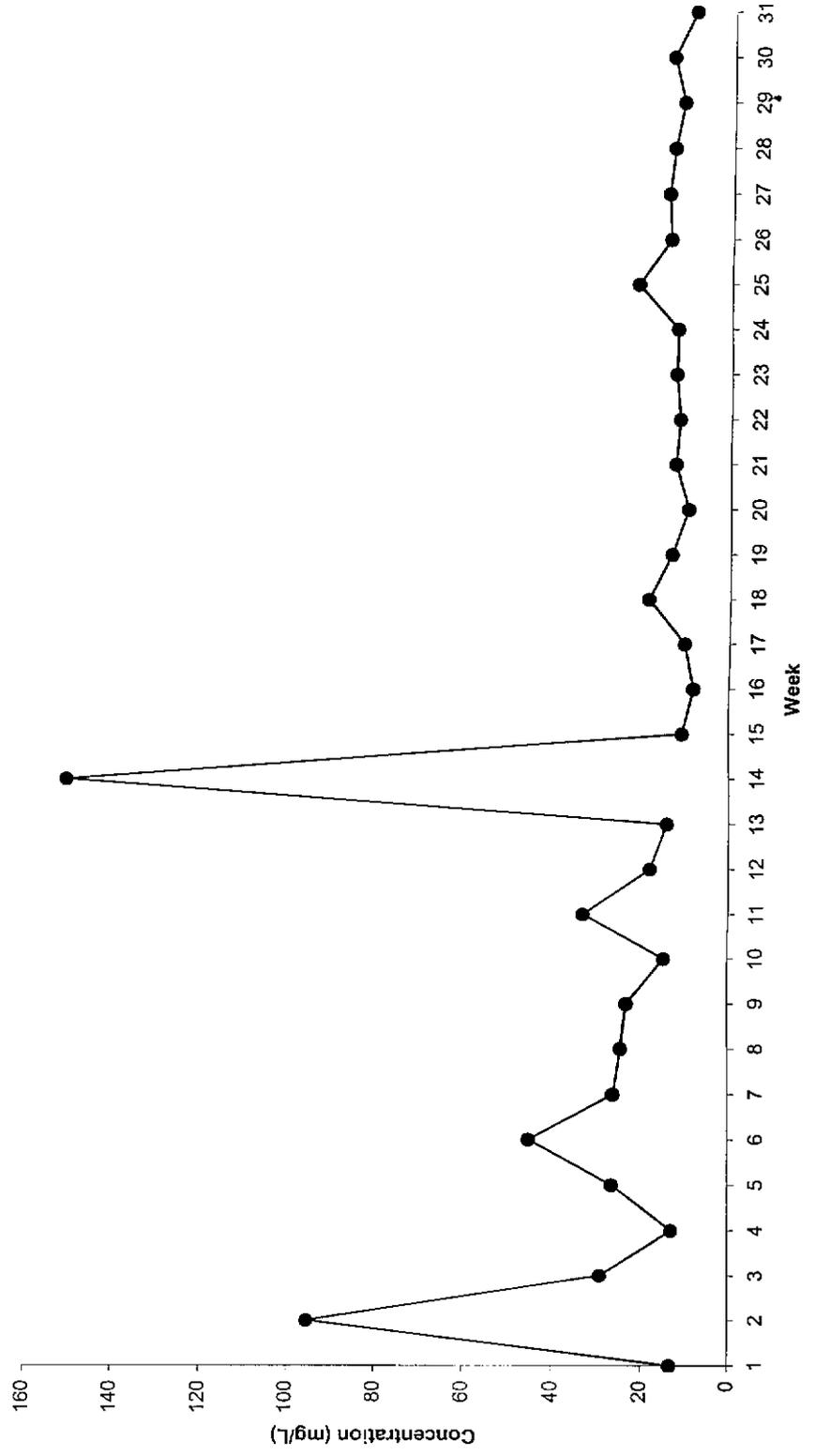
## Attachments

Summary data sheets for extraction/treatment system performance monitoring and repair costs.

## Figures

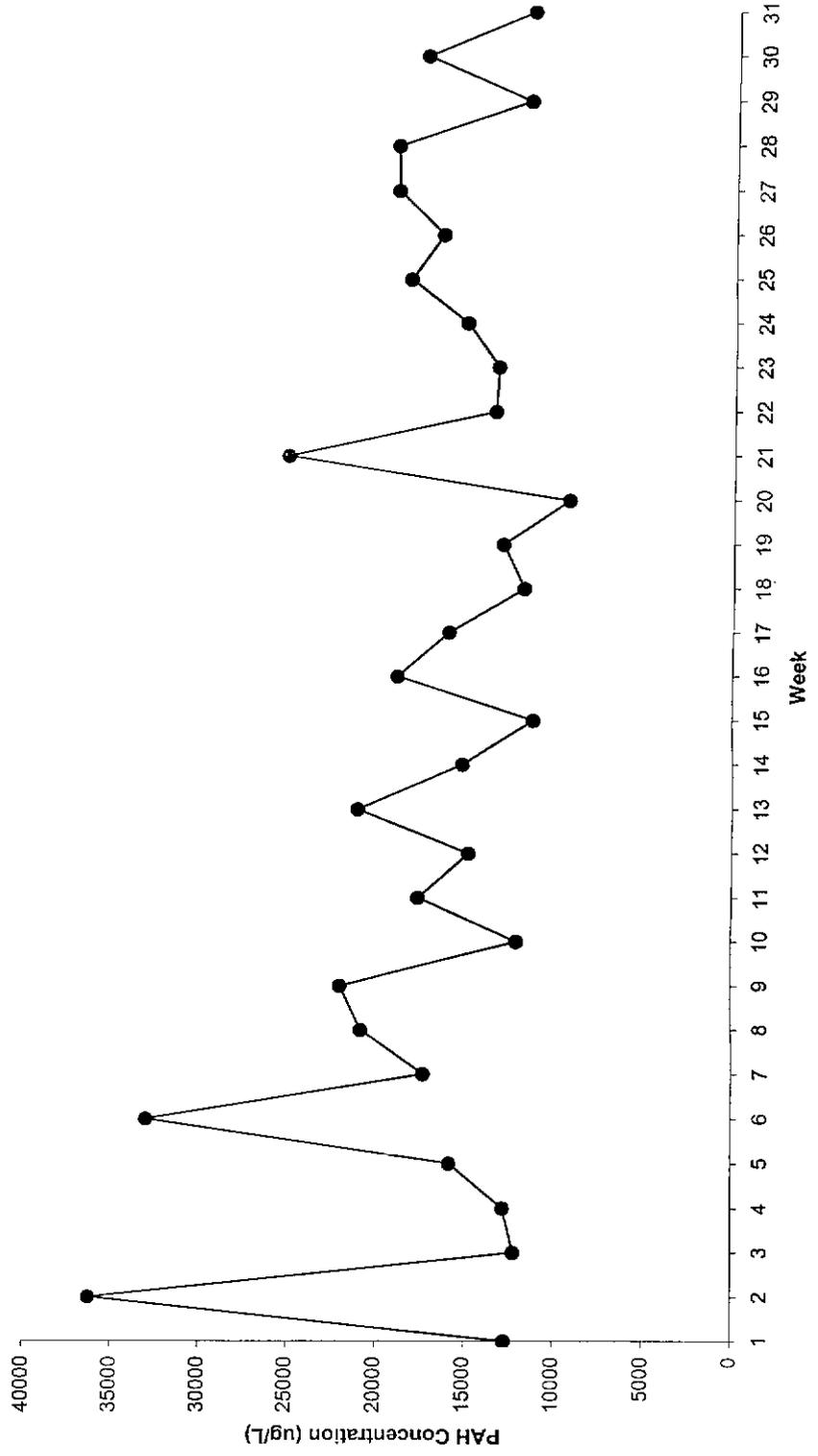
# WYCKOFF GWTP Performance Monitoring Results

Figure 1. Oil and Grease Concentration at Influent from Well Field



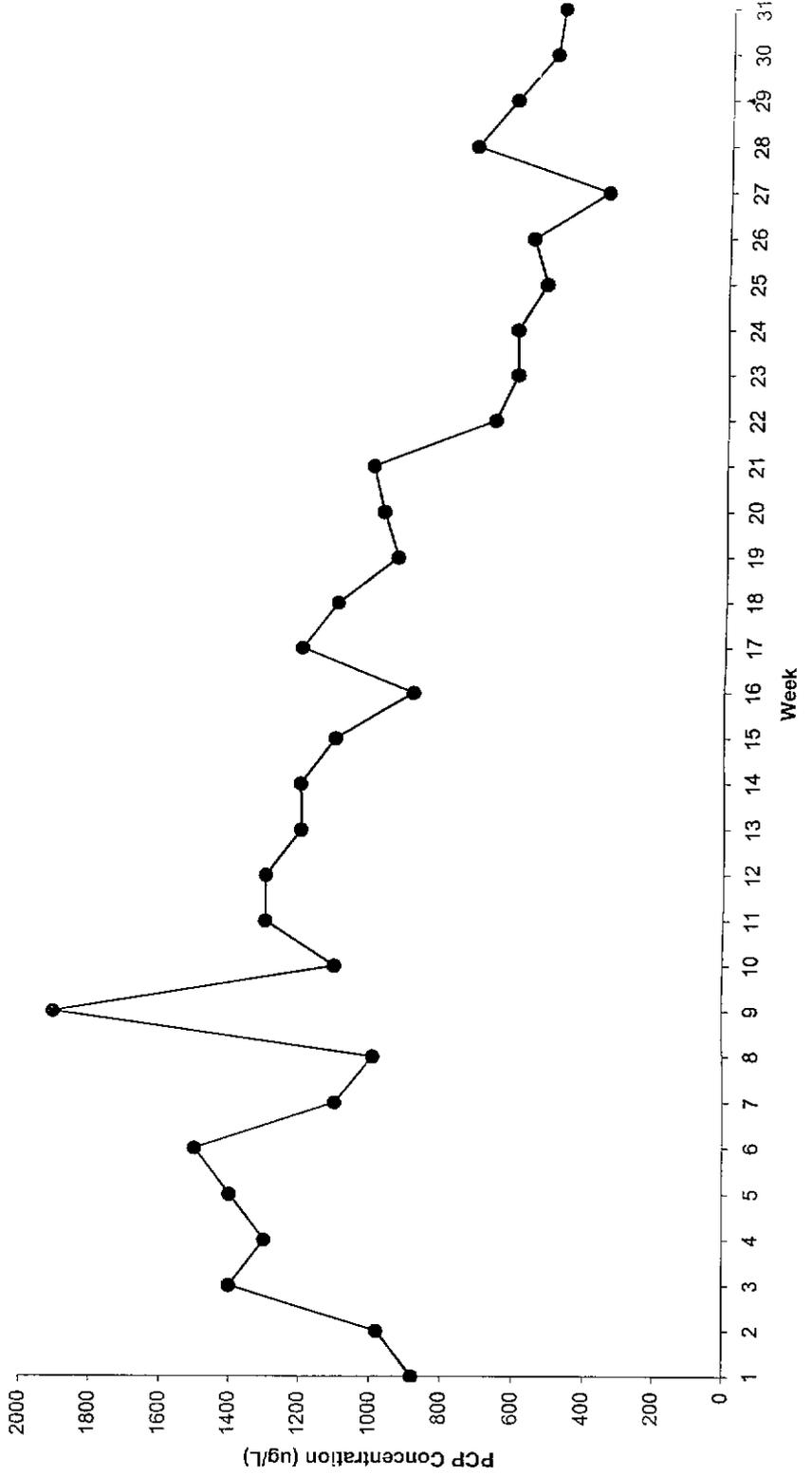
# WYCKOFF GWTP Performance Monitoring Results

Figure 2. PAH Concentration at Influent from Well Field



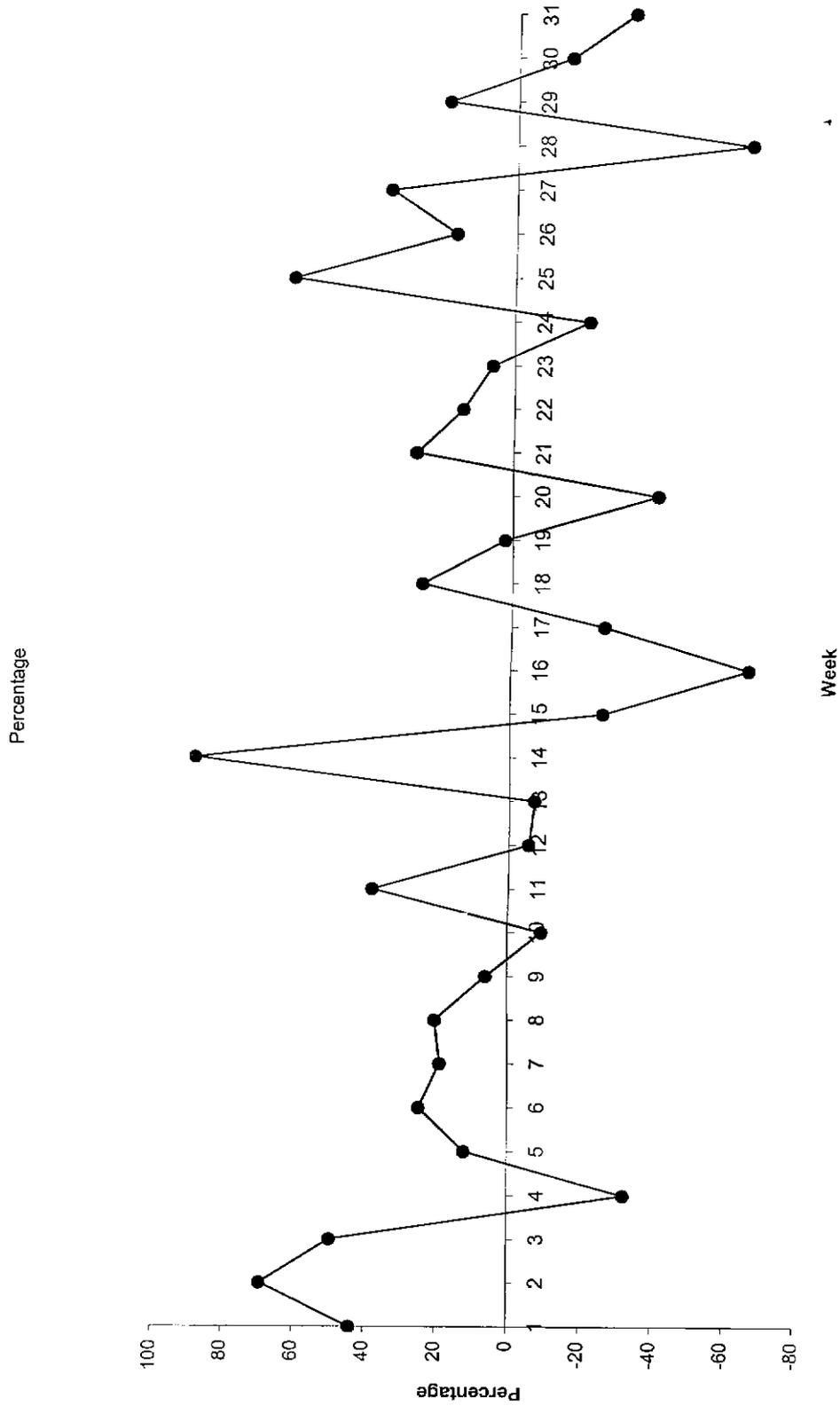
# WYCKOFF GWTP Performance Monitoring Results

Figure 3. PCP Concentration at Influent from Well Field



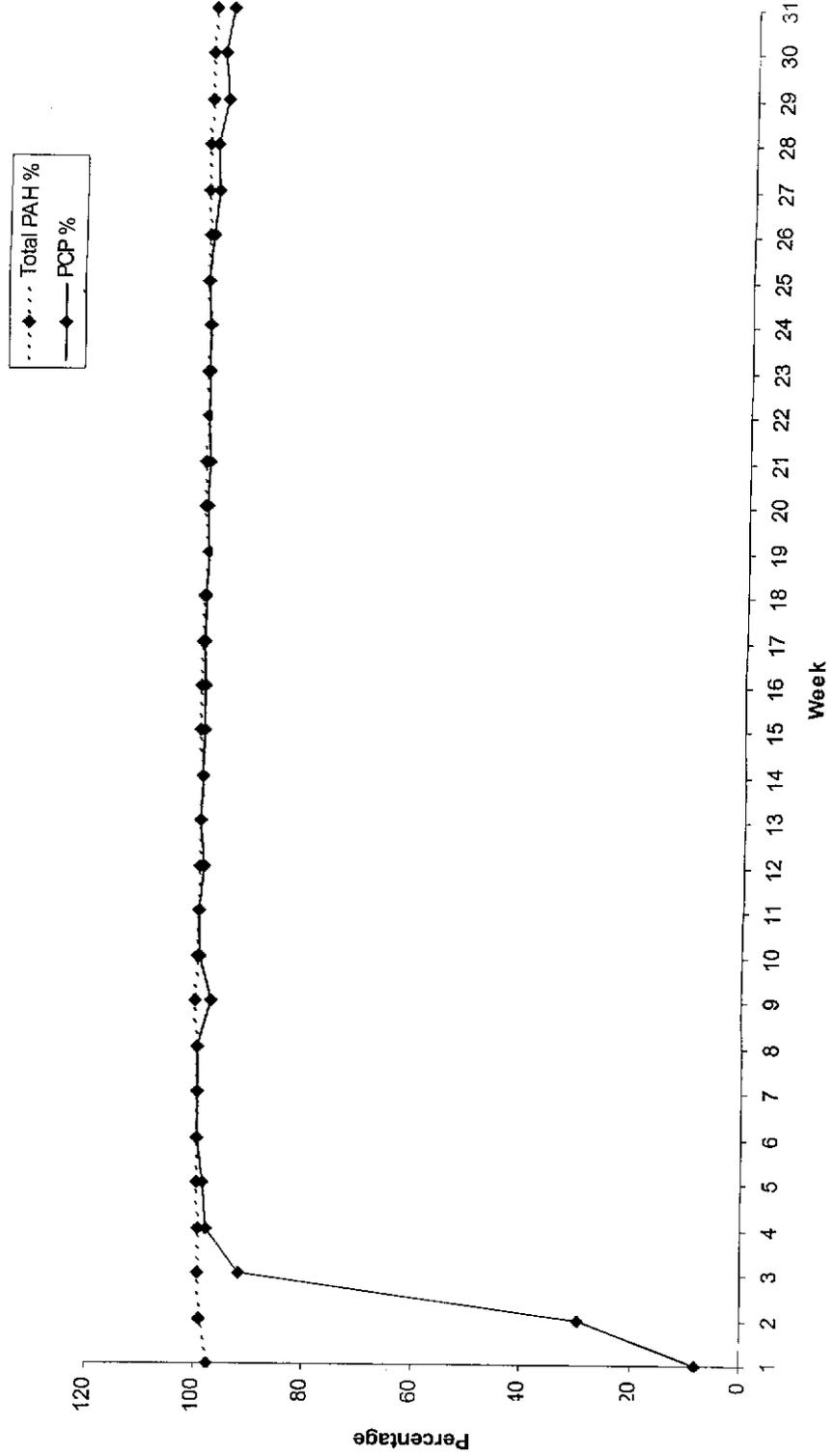
# WYCKOFF GWTP Performance Monitoring Results

Figure 4. Treatment Efficiency across the Depurator for Oil and Grease



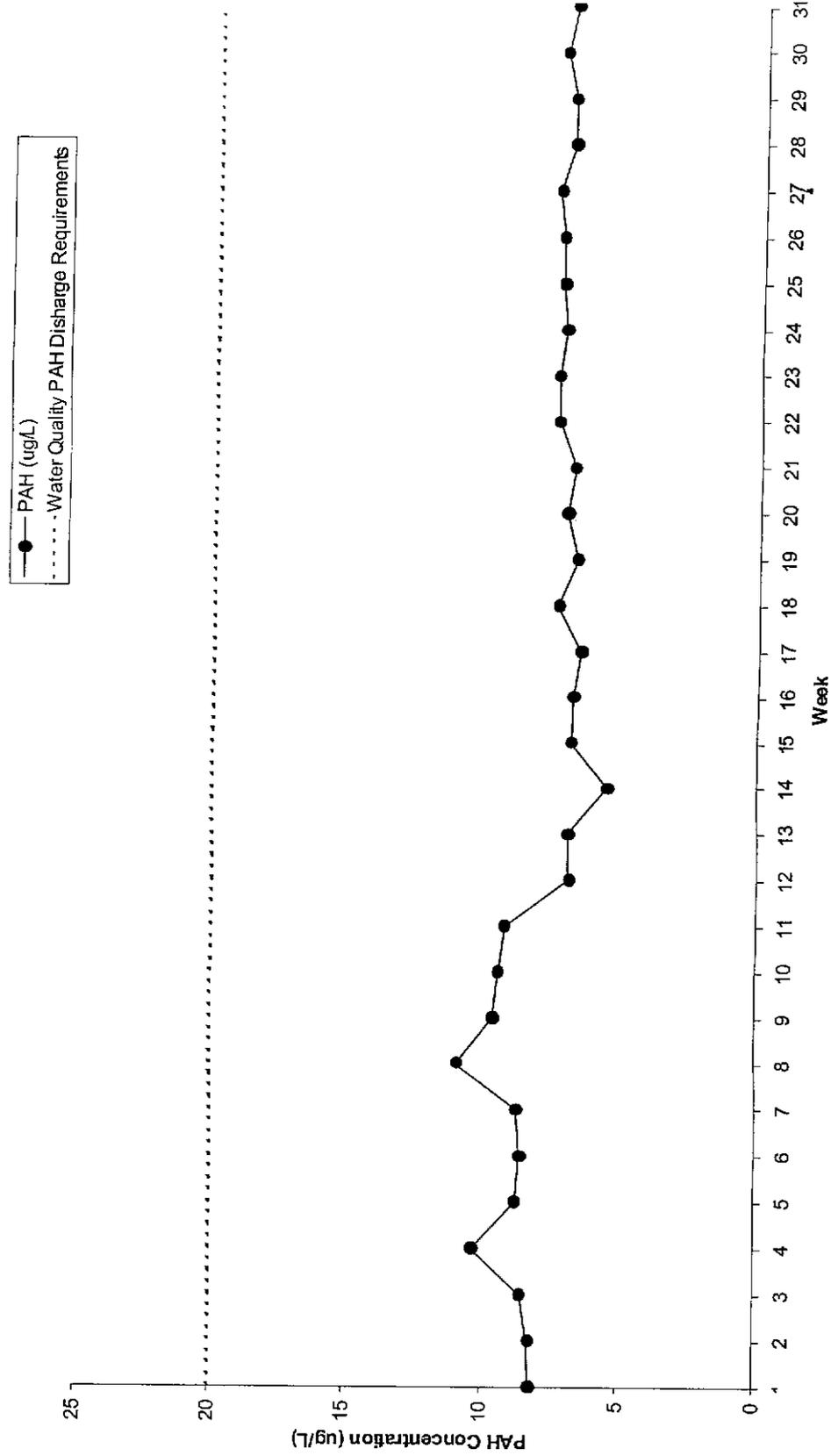
# WYCKOFF GWTP Performance Monitoring Results

Figure 5. Aeration Basin Efficiency for PAH and PCP



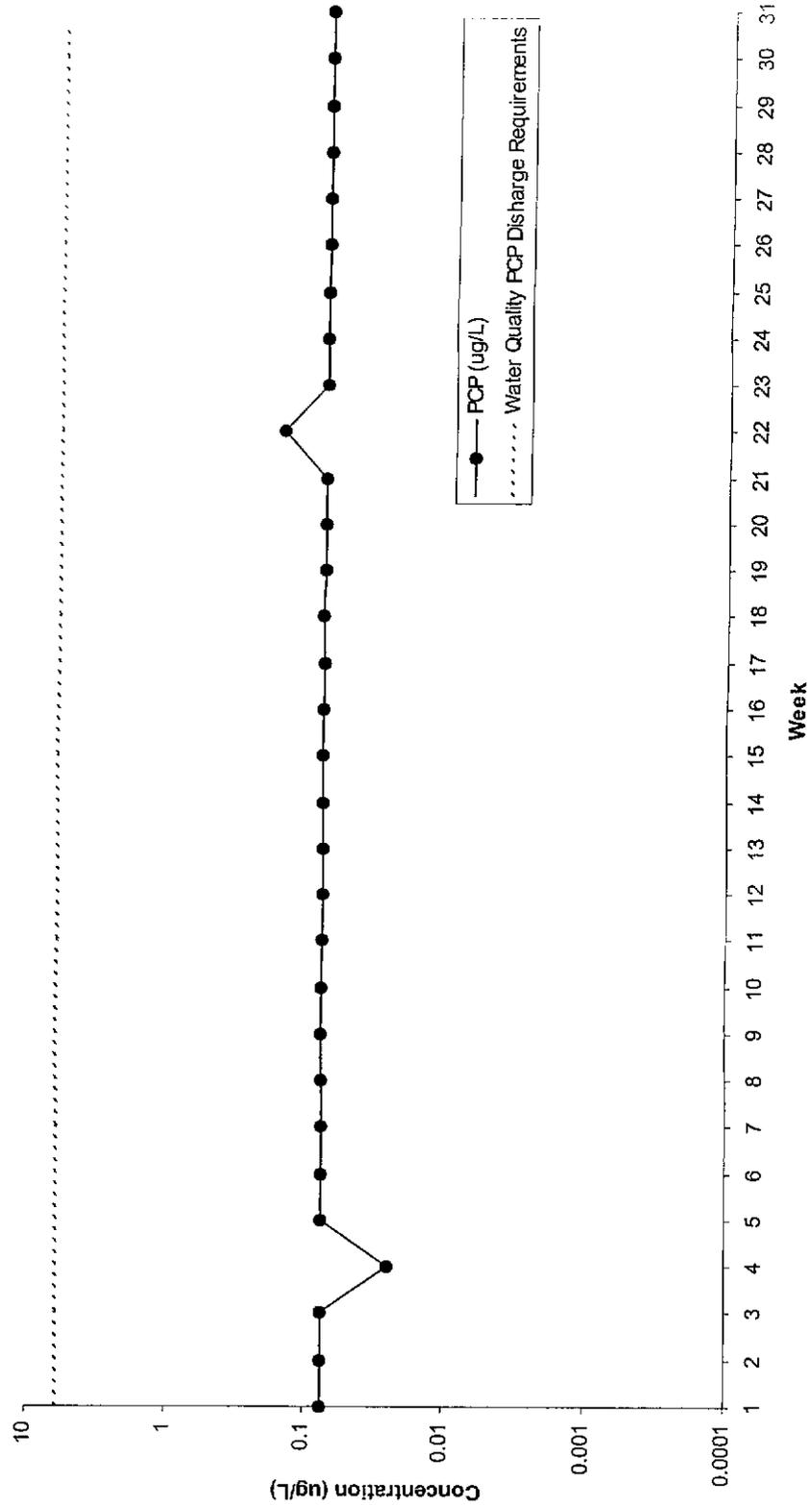
# WYCKOFF GWTP Preliminary Compliance Monitoring Results

Figure 6. PAH Concentration at Effluent Discharge into Puget Sound



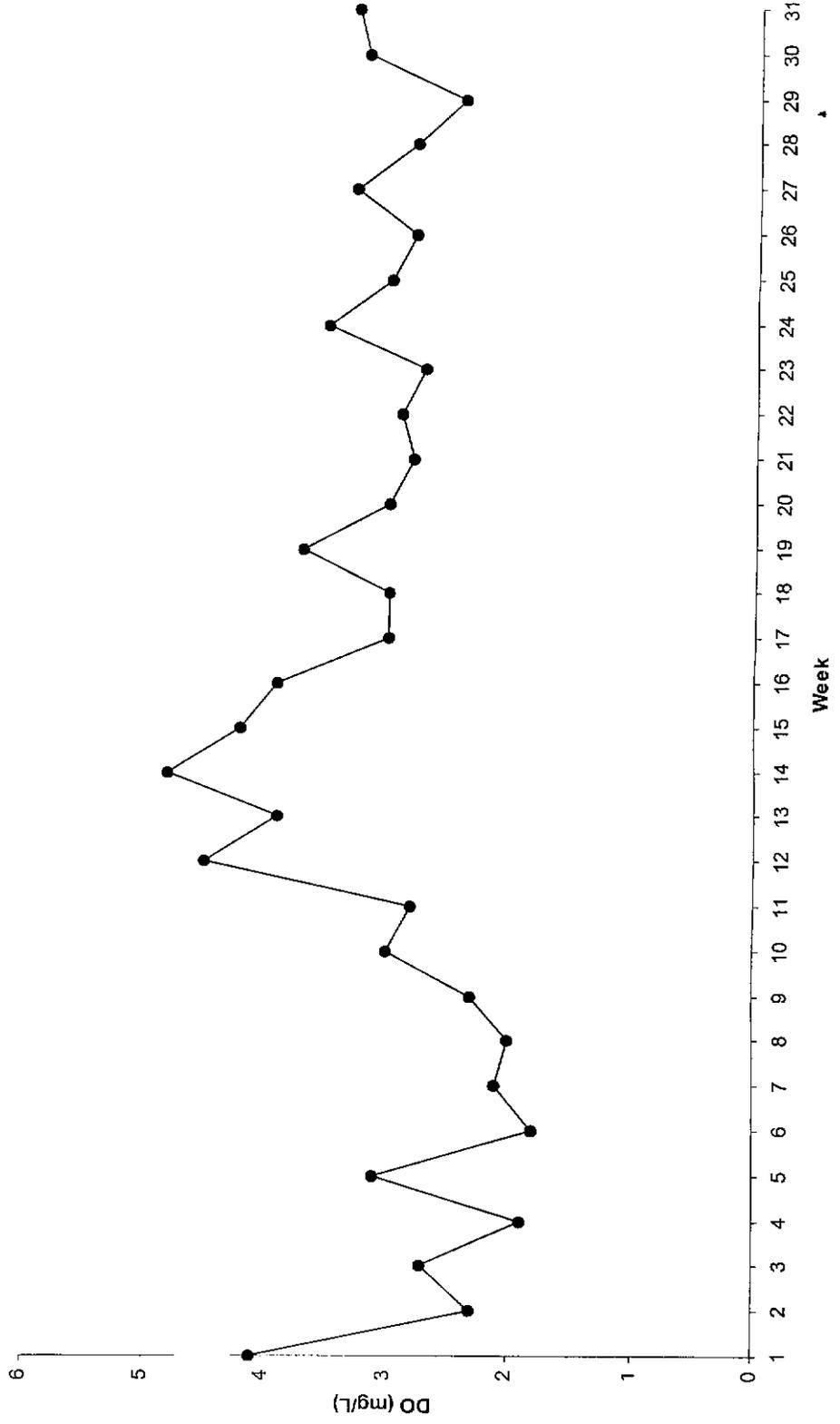
# WYCKOFF GWTP Compliance Monitoring Results

Figure 7. PCP at Effluent Discharge into Puget Sound



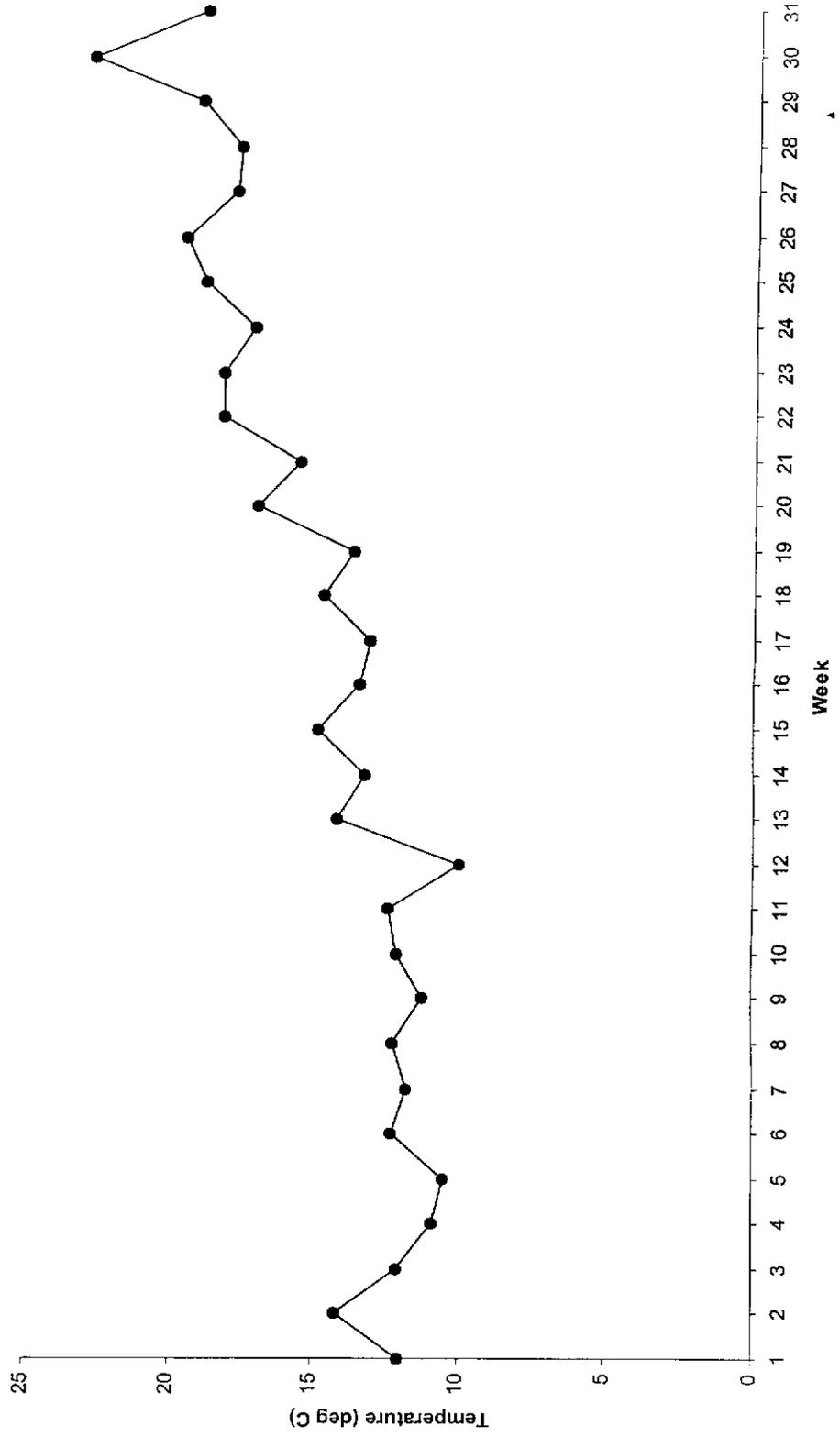
# WYCKOFF GWTP Compliance Monitoring Results

Figure 8. Dissolved Oxygen Content at Effluent Discharge into Puget Sound



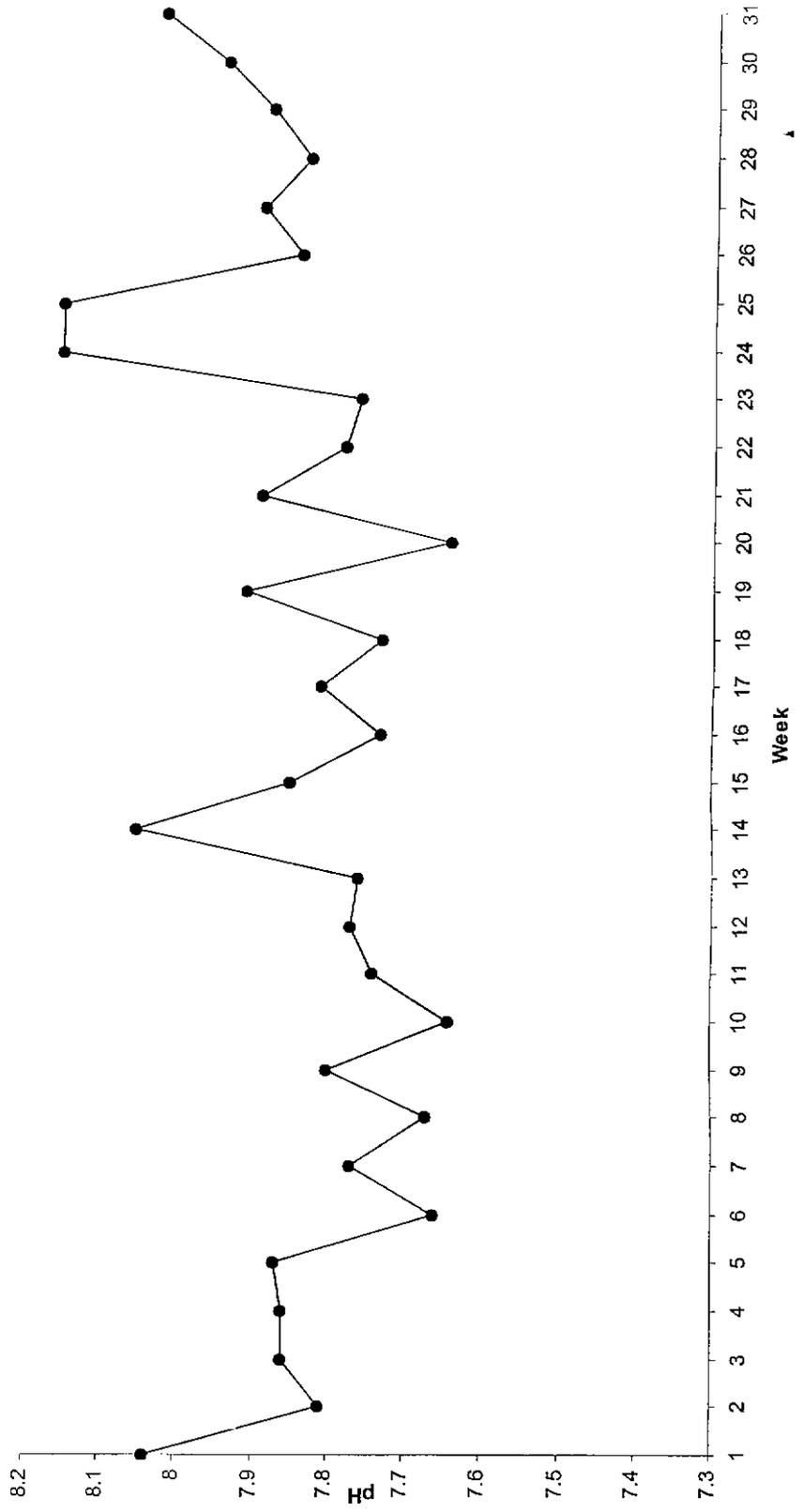
# WYCKOFF GWTP Compliance Monitoring Results

Figure 9. Temperature at Effluent Discharge into Puget Sound



# WYCKOFF GWTP Compliance Monitoring Results

Figure 10. pH at Effluent Discharge into Puget Sound



## **Attachments**

**Monthly Groundwater Level Measurements**

**July 2, 2002**

Upper Aquifer								
Location Feet, NAD83			Elevation Feet, MLLW		High Tide (7.1 at 1117)		Low Tide (3.4 at 1700)	
Well ID	Easting	Northing	Ground	Inner Casing	Depth to Water Feet	Elevation MLLW Feet	Depth to Water Feet	Elevation MLLW Feet
EWC3	1229298.6	229634.4	15.40	15.11	8.29	6.82	9.31	5.80
EW3	1228701.4	229365.8	17.10	17.23	12.60	4.63	12.69	4.54
EW7	1229398.4	229370.1	15.00	16.86	11.77	5.09	11.77	5.09
EW8	1229332.1	229276.7	15.10	17.37	11.85	5.52	11.99	5.38
MW14	1229086.2	229768.8	15.71	17.90	12.77	5.13	12.72	5.18
MW17	1228939.2	229413.8	16.24	19.06	14.35	4.71	14.30	4.76
MW19	1228759.7	229101.7	18.59	18.45	6.85	11.60	6.79	11.66
MW21	1229326.1	229097.5	18.60	18.26	10.90	7.36	10.70	7.56
MW23	1228518.9	229114.7	18.20	17.45	6.62	10.83	6.68	10.77
PO3	1229157.8	229514.3	14.22	16.36	12.00	4.36	12.05	4.31
PO5	1229254.5	229439.6	14.52	16.72	12.00	4.72	11.95	4.77
PO9	1228998.9	229473.5	16.37	18.54	14.70	3.84	14.62	3.92
PO13	1229366.1	229490.7	14.90	16.78	11.65	5.13	11.44	5.34
PO18	1229459.8	229258.2	15.80	17.62	11.90	5.72	11.82	5.80
CW04	1229209.0	229672.4	17.44	17.44	11.75	5.69	11.89	5.55
CW07	1229157.4	229798.8	14.59	16.69	11.54	5.15	11.60	5.09
CW08	1228978.4	229714.8	15.44	17.85	12.42	5.43	12.46	5.39
CW10	1229377.3	229444.4	15.17	17.38	12.58	4.80	12.66	4.72
CW13	1228791.5	229460.3	14.88	17.37	12.17	5.20	12.39	4.98
Lower Aquifer								
Location Feet, NAD83			Elevation Feet, MLLW		High Tide (7.1 at 1117)		Low Tide (3.4 at 1700)	
Well ID	Easting	Northing	Ground	Inner Casing	Depth to Water Feet	Elevation MLLW Feet	Depth to Water Feet	Elevation MLLW Feet
CW02	1229448.8	229253.9	19.45	19.45	12.00	7.45	11.71	7.74
CW05	1229083.7	229749.7	18.30	18.30	10.15	8.15	10.10	8.20
CW09	1229309.5	229580.6	15.41	17.79	10.50	7.29	9.96	7.83
CW12	1229061.5	229416.6	16.24	18.64	9.70	8.94	9.70	8.94
CW15	1229160.2	229731.0	14.31	16.33	8.39	7.94	8.21	8.12
99CDMW02	1229118.2	229522.8	14.30	16.80	8.12	8.68	8.35	8.45
99CDMW04	1229145.1	229421.6	15.73	18.23	9.61	8.62	9.91	8.32

**Wyckoff Project**  
**Preliminary EPA Lab Data / Plant Performance Review Week 27 of Year 2002**

**Lab Data**

PAH                      Influent = 19017.5 ug/l

PCP                      Influent = 350 ug/l

O&G                     Influent = 14.8 mg/l

**Plant Performance**

Primary System        O&G removal across DEP-104= 35.27 % = 14.8 / 9.58 mg/l  
Deperator Efficiency    (in/out)

Secondary System     PAH removal: 99.90 % = 2228 / 2.29 ug/l. (in/out)

Aeration basin  
efficiency                PCP removal: 98.19 % = 430 / 7.8 ug/l. (in/out)

Tertiary System        PAH: Undetect in lead carbon filter effluent (0.237 J) ug/l

Lead carbon vessel     PAH: Undetect in lag carbon filter effluent.( 0.076 J ) ug/l

Lag carbon vessel      PCP: Detect in lead carbon filter effluent (0.12) ug/l

PCP: Undetect in lag carbon filter effluent.

**Wyckoff Project**  
**Preliminary EPA Lab Data / Plant Performance Review Week 28 of Year 2002**

**Lab Data**

PAH                      Influent = 19054.9 ug/l  
PCP                      Influent = 480 ug/l  
O&G                     Influent = 13.6 mg/l

**Plant Performance**

Primary System        O&G removal across DEP-104= 0 % = 13.6 / 22.5 mg/l. (in/out)  
Deperator Efficiency

Secondary System    PAH removal: 99.87 % = 2192.3 / 2.776 ug/l. (in/out)

Aeration basin  
efficiency              PCP removal: 98.4% = 480 / 7.6 ug/l. (in/out)

Tertiary System      PAH: Undetect in lead carbon filter effluent (0.25 J) ug/l  
Lead carbon vessel    PAH: Undetect in lag carbon filter effluent.( 0.10 J) ug/l

Lag carbon vessel     PCP: Detect in lead carbon filter effluent (0.19) ug/l  
PCP: Undetect in lag carbon filter effluent.

**Wyckoff Project**  
**Preliminary EPA Lab Data / Plant Performance Review Week 29 of Year 2002**

**Lab Data**

PAH                      Influent = 11606.4 ug/l

PCP                      Influent = 570.0 ug/l

O&G                     Influent = 11.5 mg/l

**Plant Performance**

Primary System        O&G removal across DEP-104 = 19.22% = 11.5 / 9.29 mg/l. (in/out)

**Deperator Efficiency**

Secondary System    PAH removal: 99.84 % = 1585.0 / 2.606 ug/l. (in/out)

Aeration basin  
efficiency              PCP removal: 96.66 % = 570.0 / 19.0 ug/l. (in/out)

Tertiary System      PAH: Undetect in lead carbon filter effluent (0.12 J) ug/l

Lead carbon vessel    PAH: Undetect in lag carbon filter effluent

Lag carbon vessel     PCP: Detect in lead carbon filter effluent (0.17) ug/l

PCP: Undetect in lag carbon filter effluent.

Note: We have seen a decrease in the efficiency of PCP removal across the aeration basin for the last two weeks. This weeks numbers show an increase in the PCP coming in from the well field and an increase in the amount of PCP coming out of the aeration basin. Numbers are still showing adequate efficiencies to provide good polishing down stream....

**Wyckoff Project**  
**Preliminary EPA Lab Data / Plant Performance Review Week 30 of Year 2002**

**Lab Data**

PAH                      Influent = 17471.6 ug/l  
PCP                      Influent = 500.0 ug/l  
O&G                      Influent = 14.0 mg/l

**Plant Performance**

Primary System        O&G removal across DEP-104 = 0 % =14.0 /16.0 mg/l. (in/out)  
Deperator Efficiency

Secondary System    PAH removal: 99.87 % = 1882.9 / 2.384 ug/l. (in/out)

Aeration basin  
efficiency              PCP removal: 97.45 % = 550. / 14.0 ug/l. (in/out)

Tertiary System        PAH: Undetect in lead carbon filter effluent (0 .058 J ) ug/l  
Lead carbon vessel    PAH: Undetect in lag carbon filter effluent

Lag carbon vessel      PCP: Detect in lead carbon filter effluent (0.15) ug/l  
PCP: Undetect in lag carbon filter effluent.

**Wyckoff Project**  
**Preliminary EPA Lab Data / Plant Performance Review Week 31 of Year 2002**

**Lab Data**

PAH                      Influent = 11467.37 ug/l

PCP                      Influent = 480 ug/l

O&G                     Influent = 8.99 mg/l

**Plant Performance**

Primary System        O&G removal across DEP-104 = 0 % = 8.99 / 11.9 mg/l. (in/out)

**Deperator Efficiency**

Secondary System    PAH removal: 99.68 % = 763.24 / 2.471 ug/l. (in/out)

Aeration basin  
efficiency              PCP removal: 96.31 % = 340 / 14.0 ug/l. (in/out)

Tertiary System       PAH: Undetect in lead carbon filter effluent

Lead carbon vessel    PAH: Undetect in lag carbon filter effluent( 0.051 J )

Lag carbon vessel     PCP: Detect in lead carbon filter effluent 0.13 ug/l

PCP: Undetect in lag carbon filter effluent.

JUL-02  
Nyckoff Project

DATE	PW-1		PW-2		PW-3		PW-4		PW-5		PW-6		PW-8		PW-9		PW-9		MELL		T-401		A.B. FLOW		
	TOTAL Q	Liquid Level (FT.)	TOTAL Q	Liquid Level (FT.)	TOTAL Q																				
7/1/2002	5829		0		0		8483		11833		9949		8444		5615		5615		50153		0		0		50153
7/2/2002	6162		0		0		8523		12119		9294		8624		5976		5976		51498		0		0		51498
7/3/2002	6044	17.3	0		0		8509	11.9	12000	11.9	9910	18.7	8532	12.6	5852	25.2	5852		50847		0		0		50847
7/4/2002	5863		0		0		8228		11770		9881		8344		5554		5554		49640		0		0		49640
7/5/2002	5113		0		0		8119		11299		9724		8532		5600		5600		48587		0		0		48587
7/6/2002	6121		0		0		8458		11960		9819		8832		5798		5798		50988		0		0		50988
7/7/2002	6128		0		0		8575		12092		9843		8999		5977		5977		51913		0		0		51913
7/8/2002	5755		0		0		8286		11724		9780		8654		5287		5287		49486		0		0		49486
7/9/2002	6194		0		0		8682		12076		9944		8838		5707		5707		51441		0		0		51441
7/10/2002	6324	17.3	0		0		8691	11.6	11890	11.7	9553	22.1	8608	12.6	6002	2.6	6002		51068		14400		14400		65468
7/11/2002	6270		0		0		8702		11813		9422		8564		5852		5852		50223		14400		14400		65223
7/12/2002	6306		0		0		8596		11975		9717		8658		5854		5854		51006		14400		14400		65406
7/13/2002	6306		0		0		8771		12238		9885		8689		6040		6040		51929		14400		14400		66329
7/14/2002	9580		0		0		8202		11748		9450		8142		5328		5328		53450		4200		4200		56550
7/15/2002	9661		0		0		8116		11792		9571		8088		5330		5330		52558		0		0		52558
7/16/2002	7275		0		0		8599		12235		10308		8566		5784		5784		52777		0		0		52777
7/17/2002	6270		0		0		8770		11813		9622		8564		5852		5852		50891		0		0		50891
7/18/2002	6915	17.6	0		0		8228	10.9	11933	10.6	10104	18.7	8299	11.8	5667	26.2	5667		51146		0		0		51146
7/19/2002	7235		0		0		8363		12418		10493		8611		5946		5946		53066		0		0		53066
7/20/2002	7243		0		0		8006		11976		10141		8280		5673		5673		51319		0		0		51319
7/21/2002	6950		0		0		7902		11869		9974		8160		5646		5646		50501		0		0		50501
7/22/2002	7250		0		0		8128		12248		10224		7976		5969		5969		51795		0		0		51795
7/23/2002	7333		0		0		8050		12354		10297		7776		5985		5985		51795		0		0		51795
7/24/2002	7348	17.4	0		0		7823	11.5	12281	11.8	10173	17.7	7329	12.2	5950	24	5950		50504		0		0		50504
7/25/2002	7076		0		0		7541		11980		10139		7165		5587		5587		49488		0		0		49488
7/26/2002	6760		0		0		6805		11591		9880		6892		5285		5285		47133		0		0		47133
7/27/2002	7088		0		0		8496		12359		10513		7500		6073		6073		52029		0		0		52029
7/28/2002	6590		0		0		7430		11167		9368		6507		5677		5677		46739		13300		13300		60039
7/29/2002	6510		0		0		7313		11780		10052		7100		5835		5835		48890		3700		3700		52590
7/30/2002	6881		0		0		7716		11802		9962		7794		5839		5839		49994		0		0		49994
7/31/2002	6708		0		0		8813		11635		9807		8299		5726		5726		50988		0		0		50988
Total	203080		0		0		246311		358135		297891		244967		172470		172470		1522854		78800		78800		1601654
Avg.	6769		0		0		8210		11938		9930		8166		5749		5749		50762		2627		2627		53388
MIN.	5313		0		0		6805		11167		9368		6507		5205		5205		46739		0		0		47133
MAX.	9661		0		0		8771		12418		10513		8999		6073		6073		53066		14400		14400		66329

Jul-02  
Wyckoff Project

DATE	RPW-1		RPW-2		RPW-3		RPW-4		RPW-5		RPW-6		RPW-8		RPW-9	
	L-NAPL (gal)	D-NAPL (gal)	L-NAPL (gal)	D-NAPL (gal)	L-NAPL (gal)	D-NAPL (gal)	L-NAPL (gal)	D-NAPL (gal)	L-NAPL (gal)	D-NAPL (gal)	L-NAPL (gal)	D-NAPL (gal)	L-NAPL (gal)	D-NAPL (gal)	L-NAPL (gal)	D-NAPL (gal)
7/1/2002																
7/2/2002																
7/3/2002																
7/4/2002																
7/5/2002																
7/6/2002																
7/7/2002																
7/8/2002																
7/9/2002																
7/10/2002		25														
7/11/2002											18					16
7/12/2002																
7/13/2002																
7/14/2002																
7/15/2002																
7/16/2002																
7/17/2002																
7/18/2002																
7/19/2002																
7/20/2002																
7/21/2002																
7/22/2002																
7/23/2002		15														
7/24/2002																
7/25/2002																
7/26/2002																
7/27/2002																
7/28/2002																
7/29/2002																
7/30/2002																
7/31/2002																
TOTAL	0	40	0	0	0	0	0	0	0	0	18	0	0	0	15	16
	<b>MONTHLY TOTAL</b>															<b>89</b>

Note: Probed product wells 3 July 02. There was no product to pump.

WYCKOFF GWTP

IN-HOUSE LAB DATA

DATE: June 30, 2002 through July 6, 2002  
 WEEK NUMBER: 27

SAMPLE LOCATION	SAMPLE DATE	FLOW (gpd)	FLOW (gpm)	TSS (mg/L)	VSS (mg/L)	COD (mg/L)	sCOD (mg/L)	NH3-N (mg/L)	PO4 (mg/L)	PH	TEMP (C)	D.O. (mg/L)
SP-4	7/1/2002			7	4	186						
Aer Basin (MLSS)	7/1/2002			2420	1810					8.04	17.3	4.6
Aer Basin (RAS)	7/1/2002			4190	3130							
Digest (% solids)	7/1/2002			1.93	1.28							
SP-6	7/1/2002			5	2		130	0.28				
SP-7	7/1/2002			3	1							
SP-8	7/1/2002			0								
SP-11	7/1/2002											
SP-4	6/30/2002		51405								7.89	3.3
SP-4	7/1/2002		50153									
SP-4	7/2/2002		51498									
SP-4	7/3/2002		50847									
SP-4	7/4/2002		49640									
SP-4	7/5/2002		48587									
SP-4	7/6/2002		50988									
SP-4(AVE)			50445									

ND: Denotes No Data

SP-4 = Influent to aeration basin

MLSS= Total Suspended Solids in aeration basin

VSS= Volatile Suspended Solids / inorganic residual after ashing at 550 C

RAS= Clarifier Suspended Solids in return to aeration basin

SP-6= Clarifier effluent

SP-7= Total Suspended Solids in Biofilter effluent

SP-8= Multimedii Filter effluent

SP-11= Tank 303 effluent discharge to sound

Digester solids are shown in Total Solids percentage.

Changed target flows on 4/17/02 35 gpm

WYCKOFF GWTP

IN-HOUSE LAB DATA

DATE: July 7, 2002 through July 13, 2002  
 WEEK NUMBER: 28

SAMPLE LOCATION	SAMPLE DATE	FLOW (gpd)	FLOW (gpm)	TSS (mg/L)	VSS (mg/L)	COD (mg/L)	sCOD (mg/L)	NH3-N (mg/L)	PO4 (mg/L)	PH	TEMP (C)	D.O. (mg/L)
SP-4	7/8/2002			9	7	207						
Aer Basin (MLSS)	7/8/2002			2380	1760					8.13	17.4	4.3
Aer Basin (RAS)	7/8/2002			4230	3150							
Digest( % solids)	7/8/2002			2.2	1.45							
SP-6	7/8/2002			6	4		133	0.28	3.2			
SP-7	7/8/2002			4	3							
SP-8	7/8/2002			2								
SP-11	7/8/2002											
SP-4	7/7/2002	51913	36.1							7.83	17.7	2.8
SP-4	7/8/2002	49486	34.4									
SP-4	7/9/2002	51441	35.7									
SP-4	7/10/2002	65468	45.5									
SP-4	7/11/2002	65223	45.3									
SP-4	7/12/2002	65406	45.4									
SP-4	7/13/2002	66329	46.1									
SP-4(AVE)		59324	41.2									

ND: Denotes No Data

SP-4 = Influent to aeration basin

MLSS= Total Suspended Solids in aeration basin

VSS= Volatile Suspended Solids / inorganic residual after ashing at 550 C

RAS= Clarifier Suspended Solids in return to aeration basin

SP-6= Clarifier effluent

SP-7= Total Suspended Solids in Biofilter effluent

SP-8= Multimedija Filter effluent

SP-11= Tank 303 effluent discharge to sound

Digester solids are shown in Total Solids percentage.

Changed target flows on 4/17/02 35 gpm  
 Feeding from T-401 on 7/10/02-7/13/02

WYCKOFF GWTP

IN-HOUSE LAB DATA

DATE: July 15, 2002 through July 20, 2002  
 WEEK NUMBER: 29

SAMPLE LOCATION	SAMPLE DATE	FLOW (gpd)	FLOW (gpm)	TSS (mg/L)	VSS (mg/L)	COD (mg/L)	sCOD (mg/L)	NH3-N (mg/L)	PO4 (mg/L)	PH	TEMP (C)	D.O. (mg/L)
SP-4	7/15/2002			7	5	203						
Aer Basin (MLSS)	7/15/2002			2430	1810					8.04	19	4.3
Aer Basin (RAS)	7/15/2002			4160	3090							
Digest (% solids)	7/15/2002			2.31	1.48							
SP-6	7/15/2002			6	3		129	0.32	3.6			
SP-7	7/15/2002			4	3							
SP-8	7/15/2002			2								
SP-11	7/15/2002											
SP-4	7/14/2002	56650	39.3							7.88	19	2.4
SP-4	7/15/2002	52558	36.5									
SP-4	7/16/2002	52777	36.7									
SP-4	7/17/2002	50891	35.3									
SP-4	7/18/2002	51146	35.5									
SP-4	7/19/2002	53066	36.9									
SP-4	7/20/2002	51319	35.6									
SP-4(AVE)		52630	36.5									

ND: Denotes No Data

SP-4 = Influent to aeration basin

MLSS= Total Suspended Solids in aeration basin

VSS= Volatile Suspended Solids / inorganic residual after ashing at 550 C

RAS= Clarifier Suspended Solids in return to aeration basin

SP-6= Clarifier effluent

SP-7= Total Suspended Solids in Biofilter effluent

SP-8= Multimedial Filter effluent

SP-11= Tank 303 effluent discharge to sound

Digester solids are shown in Total Solids percentage.

Changed target flows on 4/17/02 35 gpm  
 Feeding from T-401 on 7/10/02-7/13/02

WYCKOFF GWTP

IN-HOUSE LAB DATA

DATE: July 21, 2002 through July 27, 2002  
 WEEK NUMBER: 30

SAMPLE LOCATION	SAMPLE DATE	FLOW (gpd)	FLOW (gpm)	TSS (mg/L)	VSS (mg/L)	COD (mg/L)	sCOD (mg/L)	NH3-N (mg/L)	PO4 (mg/L)	PH	TEMP (C)	D.O. (mg/L)
SP-4	7/22/2002			13	9	185						
Aer Basin (MLSS)	7/22/2002			2440	1770					8.03	20.7	4
Aer Basin (RAS)	7/22/2002			4440	3230							
Digest( % solids)	7/22/2002			2.46	1.53							
SP-6	7/22/2002			13	6		113	0.32	3.6			
SP-7	7/22/2002			7	3							
SP-8	7/22/2002			5								
SP-11	7/22/2002											
SP-4	7/21/2002	50501	35.1									
SP-4	7/22/2002	51795	36.0									
SP-4	7/23/2002	51795	36.0									
SP-4	7/24/2002	50904	35.4									
SP-4	7/25/2002	49488	34.4									
SP-4	7/26/2002	47133	32.7									
SP-4	7/27/2002	52029	36.1									
SP-4(AVE)		50521	35.1									

Changed target flows on 4/17/02 35 gpm

ND: Denotes No Data

SP-4 = Influent to aeration basin

MLSS= Total Suspended Solids in aeration basin

VSS= Volatile Suspended Solids / inorganic residual after ashing at 550 C

RAS= Clarifier Suspended Solids in return to aeration basin

SP-6= Clarifier effluent

SP-7= Total Suspended Solids in Biofilter effluent

SP-8= Multimedia Filter effluent

SP-11= Tank 303 effluent discharge to sound

Digester solids are shown in Total Solids percentage.

WYCKOFF GWTP

IN-HOUSE LAB DATA

DATE: July 28, 2002 through August 3, 2002  
 WEEK NUMBER: 31

SAMPLE LOCATION	SAMPLE DATE	FLOW (gpd)	FLOW (gpm)	TSS (mg/L)	VSS (mg/L)	COD (mg/L)	sCOD (mg/L)	NH3-N (mg/L)	PO4 (mg/L)	PH	TEMP (C)	D.O. (mg/L)
SP-4	7/29/2002			11	8	177						
Aer Basin (MLSS)	7/29/2002			1800	1370					8.1	18.3	4.4
Aer Basin (RAS)	7/29/2002			2870	2170							
Digest( % solids)	7/29/2002			3.38	1.77							
SP-6	7/29/2002			17.1	6		123	0.28	3.2			
SP-7	7/29/2002			9	5							
SP-8	7/29/2002			5								
SP-11	7/29/2002									8.02	18.9	3.3
SP-4	7/28/2002	60039	41.7									
SP-4	7/29/2002	52590	36.5									
SP-4	7/30/2002	49994	34.7									
SP-4	7/31/2002	50988	35.4									
SP-4	8/1/2002	52705	36.6									
SP-4	8/2/2002	49652	34.5									
SP-4	8/3/2002	50541	35.1									
SP-4(AVE)		52358	36.4									

ND: Denotes No Data

SP-4 = Influent to aeration basin

MLSS= Total Suspended Solids in aeration basin

VSS= Volatile Suspended Solids / inorganic residual after ashing at 550 C

RAS= Clarifier Suspended Solids in return to aeration basin

SP-6= Clarifier effluent

SP-7= Total Suspended Solids in Biofilter effluent

SP-8= Multimedia Filter effluent

SP-11= Tank 303 effluent discharge to sound

Digester solids are shown in Total Solids percentage.

Changed target flows on 4/17/02 35 gpm  
 Wasted solids to the digester last week from the aeration basin to the aerobic digester. We see a corresponding loss of solids in our Mlss and RAS numbers this week.