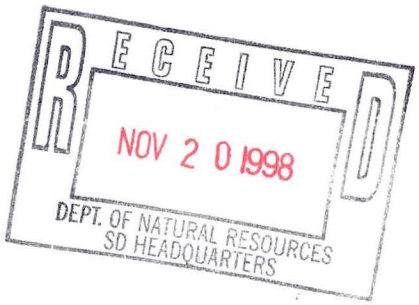


November 15, 1998

Paul Kozol
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53590

Re: Monthly O&M Report for the Oconomowoc Groundwater Treatment Facility

Dear Mr. Kozol:

Attached is the Monthly O&M Report for October, 1998, for the above referenced project. Questions regarding this report should be directed to me at the treatment plant. The treatment plant phone number is (920) 474-3212.

Thank you for your continued cooperation and assistance with this project.

Sincerely,

Dean Groleau

Dean Groleau, Plant Supervisor
APL, Inc.

cc: James Chang, APL, Inc.
Mike Boehlar, Black and Veatch
Arne Thomsen, USACE, St. Paul District
David Brodzinski, WDNR, Horicon
Steve Peterson, USACE, Omaha District
Thomas Williams, USEPA

8222 W. Calumet Road, P. O. Box 23785, Milwaukee, WI 53223 (414) 355-5800 • Fax#: (414) 355-3099
Wisconsin Dept. of Natural Resources Certificate #241340550

MONTHLY OPERATIONS AND MAINTENANCE REPORT
FOR THE
OCONOMOWOC ELECTROPLATING
GROUNDWATER TREATMENT FACILITY

2572 Oak Street
ASHIPPUN, WISCONSIN 53003

Prepared for:

U.S. Army Corps Of Engineers
St. Paul District
Hastings, Minnesota
Contract DACW37-98-C-0009

Prepared by:

APL, Inc.
8222 West Calumet Road
Milwaukee, Wisconsin 53223

November 15, 1998

1.0 Introduction

This report is submitted to provide information concerning the operations and maintenance (O&M) problems encountered at the Oconomowoc Electroplating Groundwater Treatment Plant during the month of October, 1998. O&M problems that led to a plant shut down are discussed in the *Monthly Monitoring Report for the Oconomowoc Electroplating Groundwater Treatment Facility.*

The O&M difficulties encountered in October include:

1. Tertiary Filtration System (TF-600) needs daily backwashing.
2. Sulfuric Acid Pumping Station needs rebuilding.
3. Sludge Thickener Drive (TD-401) needs shaft seal replaced.
4. Extraction Wells' pipelines needed cleaning.
5. Filtrate Feed Pumps (FFP-810/811) were leaking.
6. PH-203 Probe temperature compensator malfunctioned.
7. Press Filtrate Tank (PFT-840) access ladder has cracked supports.
8. Personal Computer's Printer jams.
9. Sodium Hypochlorite Pump (SCP-252) needs to be sent to the manufacturer for inspection and repair.
10. South Overhead Door needed realigning.
11. Motor Operated Valve (MOV-113) needs to be replaced.
12. NPDES Station needed pH probe recalibrated.
13. Diffused Air Stripper (DAS-500) Magnehelic gauge needs replacing.
14. Diffused Air Stripper (DAS-500) sump has pin holes.
15. Office Personal Computer (Acer) not recognizing CD ROM drive.
16. Metals Package pH & ORP Probes needed recalibrating.
17. Metals Package needed sludge removed.
18. Thickened Sludge Pump (TSP-411) has a leak.
19. Sodium Hydroxide Pump (SHP-361) influent line crystallized.
20. Flocculation Tank (FT-311) had low pH.
21. Polymer Feed Units (PFU-350/351) clogged up.
22. Press Filtrate Pumps (PFP-310/311) air regulator leaking.
23. Treatment System Feed Pumps (TFP-110/111) failed.
24. Flocculation Tank (FT-311) discharge line clogged up.
25. Clarifier (C-400) overfilled with sludge.
26. Diffused Air Stripper (DAS-500) filter element needed cleaning.

27. Metals Package Mixers (CTM-202/212 & RTM-302) needed lubricating.
28. Sulfuric Acid Static Mixer started leaking.
29. Sodium Hypochlorite Pump (SCT-252) discharge line valve leaked.
30. Granulated Activated Carbon Filters (GAC-650/651) needed carbon changed out.
31. Floor Sump Trench needed cleaning.
32. Floor Trench Sump Pumps (SP-960A/B) check valves were clogged.
33. Cyanide Tank Mixer (CTM-202) had a bent shaft.
34. NPDES pH Probe needed recalibrating.
35. Replaced all door, gate, and Extraction Well cover locks.

2.0 Process Difficulties

Ten process systems experienced difficulties in October, 1998. The treatment plant was shut down six times due to the problems experienced with these processes. All of the difficulties have been resolved either by permanent or temporary solutions. Technical assistance from equipment suppliers was sought whenever possible. For information regarding plant shut downs, see the *Monthly Monitoring Report for the Oconomowoc Electroplating Groundwater Treatment Facility.*

2.0.1. Tertiary Filtration System

The Tertiary Filtration System's (TF-600) needs backwashing with effluent every two days due to too much polymer going through the Metals Package. TF-600 started experiencing media binding problems after running the Sludge Filter Press (FP-800) and transferring the filtrate to the Equalization Tank (EQT-100). The Polymer Feed Pumps (PFU-350/351) are at their lowest settings without damaging the pumps. This has been an on-going problem since the initial Treatment Plant's start-up in 1996. The Polymer Process is currently under modification to up-grade and reduce this situation. On October 29, Enza-Clean was added to TF-600 and percolated with air overnight. It was backwashed with effluent 3 times and put back on line.

2.0.2. Metals Package

On July 1, it was discovered that the Thickener Drive (TD-401) seal on the clarifier auger was leaking. A garbage can has been put under the leak to contain the liquid and a portable sump pump is used to transfer the water to the sump trench to be retreated. This is a temporary remedy

until the seal can be acquired. The leakage has subsided. On September 24, the supplier sent a special seal and more information on the auger. The part arrived on October 20. The auger drive was disassembled on October 26 and a gear tooth was damaged while attempting to remove the auger drive sprocket. A local welding company was notified and a technician was to be sent out when time permitted.

On July 1, the plant's influent motor operated valve (MOV-113) would not operate in the Automatic or Manual modes. Technicians from Pieper Electric inspected it and determined that the valve needs to be replaced. A quote was received from the supplier (Bertsch Co.) and sent to the USACE on July 28. On September 14, a replacement valve was ordered by the USACE. The replacement valve was received on October 13. Three 2" x 10" nipples were ordered on October 20, but were placed on back order.

On July 17, the pH probe #203 for the first stage of the metals package would not recalibrate. A technician from the supplier (Great Lakes Instruments) instructed the operator to take mV readings using different buffer solutions and reconnect the probe directly to the pH analyzer. While doing this, it was noticed that several wires to the probe had broken insulation. After the wiring was fixed, the readings were still inconsistent. The technician instructed the operator to de-program the analyzer and recalibrate the pH probe. The analyzer accepted the recalibration, the mV and pH slope readings were consistent, and probe readings were stable, but the probe analyzer remained in the alarm state. The relay parameters were re-installed and the diagnostic faults were read. The probe's temperature compensator is not responding. The technician wants Ohm readings taken at the junction box connections before the probe is sent in for warranty repairs. The Ohm readings were taken on October 6 and the temperature compensator was found to be inoperative. A repair quote and a replacement quote were obtained from the manufacturer and submitted to the USACE on October 13. The probe was removed from the Metals Package and sent to the manufacturer on October 16. The manufacturer repaired the probe and it was received at the plant on October 26. It was reinstalled in CRT-201 and recalibrated. No further problems have occurred since it was reinstalled.

On October 13 and 26, all of the ORP & pH Probes located in the Metals Package were cleaned and recalibrated. This will be on the monthly preventive maintenance schedule.

On September 23, it was discovered that the Thickened Sludge Pump (TSP-411) would not operate and liquid was leaking from the air exhaust. This indicates a ruptured diaphragm. The problem is being investigated. On October 1, the pump was disassembled and it was discovered that both diaphragms were ruptured. The inner and outer diaphragm plates on both diaphragms were corroded together and were damaged while trying to separate them. Quotes for replacement

parts were obtained from 3 suppliers and submitted to the USACE on October 13. The replacement parts were ordered on October 15.

On October 5, it was discovered that the Flocculation Tank (FT-311) had a low pH reading and that no flocculation was occurring. The problem was a result of low Sodium Hydroxide Room temperature that caused the feed line Y-strainer for the Sodium Hydroxide Pump (SHP-361) to clog up with crystallized Sodium Hydroxide. SHP-361 had air-locked and prevented the Sodium Hydroxide from reaching the Rapid Mix Tank (RMT-301) and elevating the pH to allow flocculation to occur in FT-311. The flow from SHP-261 was temporarily diverted to RMT-301 and put in Manual mode to speed up the pH elevation while SHP-361 was being worked on. The Y-strainer was removed, cleaned, and reinstalled and SHP-361 was reprimed. SHP-261 was returned to its normal operating parameters. The pH in the RMT-301 returned to normal but the no flocculation was occurring in the FT-311. It was discovered that the Polymer Feed Unit (PFU-351) had clogged up with old polymer chunks. The stand-by Polymer Feed Unit (PFU-350) was put on line, but it also was clogged. PFU-351's suction valve was removed, cleaned, and reassembled and the pump was reprimed. Flocculation returned in the FT-311. PFU-350's water injection valve was removed, cleaned, reassembled, tested, and put back in the stand-by position. A new curtain was hung across the doorway to the Sodium Hydroxide room to aid in keeping the room warmer.

On October 22, the plant was found shut down upon the arrival for the work day. The plant had been shut down since 5:30P.M. on October 21 due to the failure of the Treatment System Feed Pump (TFP-111). The stand-by pump (TFP-110) was put on-line, but it would not activate either. Both pumps were removed from service, disassembled, and the wet ends were acid cleaned with a dilute Muriatic Acid solution. Both pumps were rinsed off, lubricated, reassembled, and tested. TFP-110 was put back on-line and the Treatment Plant was restarted at 9:45A.M. on October 22. The reason for the pumps' failing was the hardness/sludge build-up caused from the elevated pH in the Equalization Tank (EQT-100).

At the end of the day of October 22, it was discovered that the first and second stages of the Metals Package (CRT-201/211) were over-flowing from the manways onto the floor. The Treatment Plant was shut down and the Metals Package was investigated. It was discovered that the discharge line from FT-311 to the Clarifier (C-400) was partially plugged. A water hose was connected to Sample Port #3 and the flow from FT-311 to C-400 had increased and the levels in CRT-201/211 had dropped. The Treatment Plant was restarted with only a 1 hour downtime. At the beginning of the work day on October 23, the Metals Package was inspected. The tank levels were rising, again. The Treatment Plant was shut down and partially drained to allow the removal of the FT-311 discharge line. The 4" discharge line was removed and inspected. It was

coated with at least 1" of hardness/sludge build-up and the C-400 flange connection was completely plugged. The hardness/sludge build-up was removed by hand for as far as the operators could reach and the rest was cleaned with the use of a water jetter nozzle. The discharge line was reinstalled and the plant was restarted. Downtime was only 2 hours.

On October 25, the Sunday operator discovered that the floor sump trench had over-filled and the floor was partially flooded. He could not get rid of the excess water. The Treatment Plant was shut down until the next work day. On October 26, the situation was investigated and it was discovered that the problem resulted from the Sludge Holding Tank (ST-820) was full and that prevented the Thickened Sludge Pump (TSP-410) from extracting the sludge from C-400 that caused sludge to spill into TF-600. The sludge plugged the media and prevented the treated water from flowing beyond the Tertiary Sand Filter (TF-600). TF-600 over-flowed into the Floor Sump Trench and back to the EQT-100 until it was full. When the EQT-100 was full, it shut down the Floor Trench Sump Pumps (SP-960A/B) causing the treated water to over-fill the Floor Sump Trench. The Filter Press was filled and emptied 2 times before this situation was corrected.

On October 26, all mixers (CTM-202, 212, RTM-302, & TD-401) that had Zerk fittings in the Metals Package were lubricated. This will be on the monthly preventive maintenance schedule.

On October 30, the first and second stages of the Metals Package (CRT-201/211) were by-passed and drained to ST-820. While draining CRT-201, it was discovered that CTM-202 had been reactivated and its mixing shaft had been damaged. CTM-202 spins at a speed of 1750 RPMs and was coated with 2" of hardness/sludge build-up. The liquid was removed from the mixer while it was still activated and combined with the weight of the hardness/sludge build-up caused it to go out of balance and bent the shaft. A replacement shaft had been ordered. Both tanks were cleaned with a pressure washer and pumped to ST-820.

2.0.3. Sulfuric Acid System

On July 1, it was discovered that several of the Sulfuric Acid pumping station's fittings were leaking. It appeared that acid had dissolved the pipe's fitting compound and dripped onto the galvanized electrical conduit, causing them to corrode. The repair of the leaks has been put on hold since there is a plan to rebuild the pumping station. The area is under constant observation so that the leakage does not increase. New fittings for the Sulfuric Acid Pumps (SAP-750/751) were ordered on August 28. On September 16, the new pump fittings were received and they were installed on September 17. The problem with the leaking pipe fittings is still a hazard.

On October 26, it was discovered that the Static Mixer had started to leak at the connection where the injection quill was attached to the acid feed line. On October 27, the leaking stopped and has not restarted. It is under constant inspection and will be worked on if the leaking resumes.

2.0.4. Sodium Hypochlorite System

On July 13, SCP-252 was found locked into the Programming mode and would not respond to any changes made on its key pad face. A technician from Liqui-Systems assisted in troubleshooting the problem but the pump would not respond. The pump had been knocked out of its External (Automatic) mode but does respond to the 4 to 20 milliamp programming parameters. The only way to shut the pump off is by the switch on the control panel. Liqui-Systems recommended that the pump be sent back to the factory so that they could get a better look at the problem. The operators are waiting for further instructions from the USACE on this matter.

On October 26, it was discovered that SCP-252 discharge line isolation valve was leaking. No further action had been taken on this situation during the month of October.

2.0.5. Diffused Air Stripping System

On July 10, it was discovered that the Diffused Air Stripper (DAS-500) Magnehelic gauge was not responding. Moisture was drained out of the air lines but the Pitot tube is inaccessible. The operators are waiting for further instructions. On September 28, the Magnehelic gauge was found filled with water and would not adjust after the water was removed. A quote for a replacement was submitted to APL, Inc. on October 2. The replacement Magnehelic gauge was ordered on October 6. It was received and installed on October 13.

On September 4, it was noticed that the DAS-500 had several pin holes that were leaking. These pin holes had been siliconed over before and the silicone had worn away. On September 23, the old silicone had been removed and fresh silicone applied. Some of the fresh silicone had been blown away and the leaks have restarted. A more permanent solution is being investigated. The leaking had stopped on October 15. On October 22, the leaking had resumed. No further action had been taken on this situation during the month of October.

On October 26, the DAS-500 air blower filter element was removed, cleaned, and inspected. This will be on the monthly preventive maintenance schedule.

2.0.6. Press Filtrate System

On July 1, it was noticed that the ladder supports for the Press Filtrate Tank (PFT-840) are still cracked and have never been reinforced. This was first noted in 1996. The operators are waiting for further instructions from the USACE on this matter.

On October 19, the Press Filtrate Pumps' (PFP-830/831) air line regulator started leaking. On October 22, the leaking stopped.

2.0.7. Sodium Hydroxide System

On October 26, it was discovered that all of the Sodium Hydroxide Pumps (SHP-261/ 262/ 361) discharge lines were leaking. No further action had been taken on this situation during the month of October.

2.0.8. NPDES Monitoring Station

On October 16, 26, and 31, the NPDES Monitoring Station's pH probe was removed, cleaned, inspected, and recalibrated. This will be on the monthly preventive maintenance schedule.

On October 31, after restarting the Treatment Plant, the system shut down automatically due to high effluent pH in the Effluent Holding Tank (EHT-700). The EHT-700 was recirculated back to the EQT-100 and retreated but the effluent pH would not reduce below 9.0. The Treatment Plant was shut down until the Sunday operator would arrive. See the up-coming November O & M Report.

2.0.9. Filter Press

On October 13, it was noticed that the Filter Press Feed Pumps (FFP-810/811) were leaking sludge from their diaphragms. The diaphragm retainer clamps were tightened and the leakage had stopped.

2.0.10. Granulated Activated Carbon System

On October 27, the Granulated Activated Carbon Filter (GAC-651) was removed from line and drained. The manway was opened and the spent carbon was removed. The new carbon was added and was backwashed with effluent to remove the "fines" as recommended by the supplier. GAC-651 was put on line and GAC-650 was removed from line and drained. GAC-650's manway was opened and it was allowed to drain overnight. On October 28, GAC-650's spent carbon was removed and the new carbon was added and was backwashed with effluent to remove the "fines" as recommended by the supplier. GAC-650 remained out of line in the stand-by position and will be put back on-line if any break-through occurs.

2.0.11. General Equipment

On September 10, the South Overhead Bay Door would not operate, again. The electric motor would not shut off when the door was closed, causing it to overheat and trip its breaker. On September 18, one of the treatment plant operator's adjusted the open and close position parameters. The door would not operate again on September 23, so the operator realigned the door but it quit operating, again, on September 24. This problem is still under investigation. On October 1, the supplier was notified of the problems and a technician was sent out on October 5. The technician discovered that the original wire connections had been crimped on too tightly and cut through the wire's insulation causing the switch to short out periodically. The technician also stated that the overhead door springs need to be lubricated to prevent the coils from binding, over-working the lift mechanism, and knocking the door out of alignment.

On July 1, it was noticed that the desk top personal computer (Acer) would not recognize it's CD ROM drive. After many attempts to get it working, it was sent back to the supplier (Best Buy), on July 20, to be tested. Dakota Environmental provided another computer until the treatment plant's computer is repaired. On September 17, the Acer computer was brought back from Best Buy, but there still is problems with re-booting the system and re-installing software. This problem is still under investigation. On October 23, the USACE authorized the purchase of a new p.c. and to shelf the Acer because of all of the problems associated with it.

On August 3, it was noticed that the treatment plant's personal computer's printer kept jamming. APL Environmental took it to a repair shop to obtain a repair quote on it. The printer was professionally cleaned and returned to the site on October 6.

On October 30, the Floor Sump Trench was cleaned and all sand, carbon, and sludge was removed and placed in the sludge hopper. Both Sump Pump (SP-960A&B) check valves were clogged and were dismantled, cleaned, and reassembled. This will be on the monthly preventive maintenance schedule.

On October 6, all building door locks, gate locks, and Extraction Well cover locks were changed out as directed by the USACE.

3.0 Summary

The following is a list of outstanding maintenance items encountered at the Oconomowoc Groundwater Treatment System in October, 1998.

The Tertiary Filter needs to be backwashed daily to keep it running to its expected performance capabilities. The main problem is still the over polymerization of the Metals Package that causes the media to bind. See Section 2.0.1.

The Extraction Wells pipelines need to be cleaned periodically to increase the flow into the Equalization Tank and to dilute down the pH in the tank coming in from the Tertiary Filter backwash water.

The Sodium Hypochlorite Pump (SCP-252) needs to be returned to the factory to be reprogrammed.

The Sludge Thickener Drive Seal needed to be replaced.

The PH-203 probe needed to be sent back to the factory to be inspected.

The plant's influent controlling Motor Operated Valve (MOV-113) needs to be installed.

The Diffused Air Stripper (DAS-500) Magnehelic gauge needed replacing.

The Press Filtrate Tank's (PFT-840) access ladder's supports need to be reinforced.

Most of the chemical feed pumps need replacement parts to keep them running at expected performance levels.

4.0 Recommendations

In order to reduce the pH in the EQT-100, Backwash from the TF-600 could be redirected to the Press Filtrate Holding Tank (PFT-840) . The flow from the Press Filtrate Holding Tank could also be redirected to the Cyanide/ Metals Treatment Package.

The Sulfuric Acid System could be rearranged so that the electrical connections are not below the acid lines. The electrical conduit should be replaced with acid resistant conduit to prolong the life of the electrical system. The SAP's should be lowered to reduce the pumping head to the pumps. Installing an acid tank would reduce the number of barrel changes and reduce the risks to the operators while handling the acid barrels.

Periodic cleaning of the Metals Package, transfer pumps, Extraction Well piping, and the Floor Sump Trench would reduce the monthly amount of unexpected down time.

Having a spare parts inventory for the chemical feed pumps would also aid in reducing the monthly amount of unexpected down time. There are 6 different models of LMI Chemical Metering Pumps used at this Treatment Plant and very few of their parts are inter-changeable.

Replacing the existing Tertiary Sand Filter (TF-600) with 2 smaller Sand Filters that could be rotated out with a clean unit when one plugs. The plugged Sand Filter would be cleaned and left in the Stand-By position, ready to be put on-line when the Operating filter plugs. This could increase the amount of treated water discharged and reduce the amount of treated water returned to the EQT-100. This would keep the pH in the EQT-100 lower, reduce the amount of polymer that is reintroduced to the Metals Package, and reduce the amount of premature precipitation of metals in the wrong locations.

5.0 Steps for Plant Self-Automation

We are in the process of installing the Polymer Dilution System and the Effluent Neutralization Stage between the Clarifier and the Tertiary Sand Filter in the very near future. Once these stages are installed, on-line, and the "bugs" are worked out of them, it will become clearer as to what the next steps to Plant Self-Automation may be.

Some of the problems that I have already seen is the inconsistent flow coming to the Equalization Tank from the Extraction Well Field. The Treatment Plant sends out an alarm if the

flow is <19GPM. Extraction Well #4 is a shallow well that loses its level very often and shuts down to re-fill. The low flow alarm was constantly going off.

Semi-hardened chunks of polymer plug the suction end of the Polymer Feed Pumps (PFP-350/351) and prevents polymer to be added to the Flocculation Tank (FT-311) or the precipitation of metals to occur in the Clarifier (C-400). This leads to plugging of the media in the Tertiary Sand Filter (TF-600) and metals exceedences in the effluent.

The crystallization of the Sodium Hydroxide and plugging the in-line Y-strainers for the influent lines to the Sodium Hydroxide Pumps (SHP-261/262/361) prevents the Sodium Hydroxide to reach the Metals Package to increase the pH's adequately to allow the polymer to work or metals to precipitate. This leads to plugging of the media in the Tertiary Sand Filter (TF-600) and metals exceedences in the effluent.

November 15, 1998

Mr. Paul Kozol
Wisconsin Department of Natural Resources
3911 Fish Hatchery Road
Fitchburg, WI 53590

Re: Monthly Monitoring Report for the Oconomowoc Groundwater Treatment Facility

Dear Mr. Kozol:

Attached is the Monthly Monitoring Report for October, 1998 for the above referenced project. Questions regarding these reports should be directed to James Chang of APL, Inc. at (414) 355-5800.

Thank you for your continued cooperation and assistance with this project.

Sincerely,

Dean Groleau

Dean Groleau, Plant Supervisor
APL, Inc.

cc: Arne Thomsen, USACE, St. Paul District
Steve Peterson, USACE, Omaha District
Tom Williams, USEPA
James Chang, APL, Inc.
Mike Boehlar, Black and Veatch
David Brodzinski, WDNR, Horicon

8222 W. Calumet Road, P. O. Box 23785, Milwaukee, WI 53223 (414) 355-5800 • Fax#: (414) 355-3099
Wisconsin Dept. of Natural Resources Certificate #241340550

MONTHLY MONITORING REPORT
FOR THE
OCONOMOWOC ELECTROPLATING
GROUNDWATER TREATMENT FACILITY

ASHIPPUN, WISCONSIN 53003

Prepared for:

U.S. ARMY CORPS OF ENGINEERS
ST. PAUL DISTRICT
HASTINGS, MINNESOTA
CONTRACT DACW37-98-C-0009

Prepared by:

APL Environmental, Inc.
8222 West Calumet Road
Milwaukee, WI 53223

November 15, 1998

1.0 Introduction

This report summarizes the monthly effluent monitoring results for the Oconomowoc Electroplating Groundwater Treatment Plant (OEGTP) for October, 1998. The OEGTP is located at the site of the former Oconomowoc Electroplating Company, in ASHIPPUN, WI.

Laboratory results of effluent sampling can be found in the Discharge Monitoring Report Form, sent under separate cover. The effluent sampling was conducted by Scott Harrison, Tony Goodman, and Dave Dugan of APL Env., Inc. Laboratory analysis was provided by APL Environmental, Inc., 8222 W. Calumet Road, Milwaukee WI 53223 and U.S. Oil Co., Inc., 1090 Kennedy Ave., Kimberly, WI 54136. All sampling and analyses were conducted in accordance with the Oconomowoc Electroplating Groundwater Treatment System's Chemical Data Acquisition Plan (CDAP). The parameters tested for, frequency of testing, sample type, and limits are set forth in the Final Discharge Limits, Table 1 of the Oconomowoc Electroplating Superfund Site Limits and Requirements for Discharge of Treated Groundwater, issued by the Wisconsin Department of Natural Resources (WDNR) on September 24, 1996. This report is submitted in accordance with the reporting requirements of the WDNR permit.

1.1 Site Background Review

The OEGTP is located at 2572 Oak Street in Ashippun, Wisconsin, in the NW 1/4 of the SE 1/4 of Section 30, Township 30 North, Range 17 East. The site consists of approximately 10 acres, which includes approximately 3.5 acres of the former electroplating facility. The site is bounded by Oak Street (Highway 'O') and Eva Street to the North, and Davey Creek and the Town of Ashippun's garage facilities to the South. The property directly across Oak Street is occupied by Thermogas, Inc. A residential area is located across Eva Street, and a wetlands surrounds Davey Creek.

The contact person is Arne Thomsen of the U.S. Army Corps of Engineers (USACE). Mr. Thomsen's phone number is (612) 438-3076, Fax (612) 438-2464. APL Environmental, Inc. is contracted by the USACE to operate and maintain the plant. The phone number for the treatment plant is (920) 474-3212, Fax (920) 474-4241. The contact for APL Environmental, Inc. is James Chang, who can be reached at (414) 355-5800, Fax (414) 355-3099.

1.2 Project Objectives

The objective of this project is to prevent the spreading of any plume of contamination that may exist at the site. Contaminated groundwater is pumped from five extraction wells, treated for cyanide, metals, suspended solids, and volatile organic compounds (VOC's). The treated water is then transferred to a groundwater effluent gallery, located south of Elm Street, near Davey Creek.

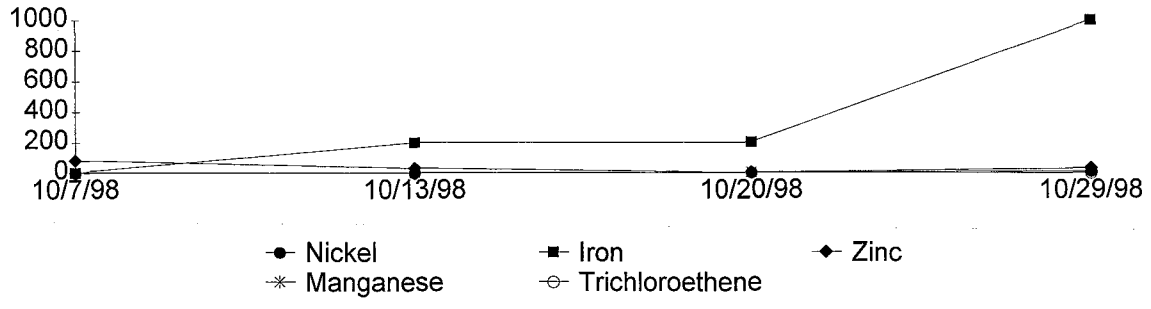
1.3 Effluent Monitoring

Weekly monitoring was conducted on October 7, 13, 20, and 29. The weekly samples for October were tested by APL, Inc., except for the VOC's for October 13. The U.S. Oil Co., Inc. tested for all VOC's that were sampled on October 13. The results of the effluent monitoring tests for the samples taken on October 29 showed that Trichloroethene equaled the limit of the WDNR effluent discharge permit. The possible causes of the high level is discussed in Section 2.0.

1.4 Monitoring Results

Results from weekly effluent monitoring can be found in the Discharge Monitoring Report Form, sent under a separate cover. Chart 1, below, shows the results of effluent monitoring for five important indicator parameters listed in the Monitoring Requirements of the Oconomowoc Electroplating Superfund Site Substantive WPDES Permit Requirements Summary (9/96). The October sampling results showed no exceedences.

Chart 1 - 5 Important Indicator Parameters



2.0 Plant Permit Exceedences

The possible cause for high level for TCE in the October 29 sampling may be due to the spent granulated activated Carbon being replaced on October 27 and 28.

2.1 Plant Shut Down

The treatment plant was shut down five times for a total of 64.5 hours in October, 1998. There was one shut down due to TFP-111 failure. The second shut down was due to the FT-311 discharge line clogging. The third shut down was due to too high of a level in the ST-820 which caused the C-400 to over-fill with sludge and plug TF-600. The fourth shut down was due to cleaning out the sludge from the Metals Package and not able to fill it before the end of the work day. The fifth shut down was due to high effluent pH in the EHT-720 caused by the too much Sodium Hydroxide being pumped into the Metals Package. Table 1 shows the summary of the plant down time for the month of October, 1998.

Table 1 - Plant Down Time Summary

Date(s)	Number Hours Shut Down	Reason
10/21-22	15	Hardness Build-Up In TFP-110/111
10/22-23	3	FT-311's Discharge Line Clogged
10/25-31	16	ST-820 High Tank Level
10/30	3.5	Cleaning & Filling Metals Package
10/30-31	27	High pH in the EHT-700
TOTAL	**64.5**	

2.1.1. Shut Down Due To TFP-111 Failure

On October 22, the Treatment System was found shut down upon the arrival of the operator. After a walk-through inspection, it was discovered that the Treatment System Feed Pump (TFP-111) had quit pumping at 7:15 P.M. on October 21. The stand-by Treatment System Feed Pump (TFP-110) was put on-line but it would not pump either. Both TFP's had failed because of hardness/sludge build-up on the impellers preventing them from turning. Both TFP's were isolated from the system, disassembled, and the wet ends were cleaned with a dilute Muriatic Acid solution. Both TFP's were lubricated, reassembled, and test run. TFP-110 was put on-line and TFP-111 was put in the stand-by position. The Treatment System was up and running at 10:15 A.M. on October 22.

2.1.2. Shut Down Due To FT-311's Discharge Line Clogging

On October 22, at 2:30 P.M., it was discovered that the first and second stages of the Metals Package (CRT-201/211) were leaking from their manway covers. The Treatment System was shut down and the Metals Package was inspected. The discharge line from the Flocculation Tank (FT-311) to the Clarifier (C-400) had a very low flow. A water hose was connected to Sample Port #3 and turned on. The flow from FT-311 to C-400 increased and the levels in CRT-201 and 211 went back down. On October 23, the Metals Package was found rising upon the arrival of the operator. The Treatment System was shut down and the discharge line from the FT-311 to the C-400 was removed and inspected. There was at least 1" of hardness/sludge build-up coating the inside of the 4" pipe and the flange connection to C-400 was completely plugged. The hardness/sludge build-up was removed by hand as far as the operators could reach and the rest of the pipe was cleaned with the use of a water powered jetter nozzle. The discharge line was reinstalled and the Treatment System restarted. Total down time was 3 hours.

2.1.3. Shut Down Due To ST-820 High Tank Level

On Sunday, October 25, the Treatment System Floor Sump Trench was discovered flooded upon the arrival of the operator. The operator could not get rid of the excess water, so I was notified. I told him to fax messages to the WDNR, USACE, and APL, Inc. and shut the Treatment System off until Monday. On October 26, the Treatment System was inspected and it was discovered that the reason for the flooding was due to a high tank level in the Sludge Holding Tank (ST-820). The high level prevented the Thickened Sludge Pump (TSP-410) from activating which caused the sludge to spill into the Tertiary Sand Filter (TF-600) and binding the media. TF-600 plugged and the treated water flowed to the Floor Sump Trench and back to the Equalization Tank (EQT-100) until its level reached 90% and shut down the Floor Trench Sump Pumps (SP-960A/B). The Treatment System was restarted, TF-600 was by-passed, the Extraction Well Pumps were shut down, and the Filter Press (FP-800) was started. APL, Inc., WDNR, and USACE were notified. This procedure was repeated each day until the FP-800 was filled and emptied twice. On October 31, an attempt to restart the Treatment System was made but another problem developed. Total actual down time due to the high ST-820 level was 16 hours.

2.1.4. Shut Down Due To Cleaning And Filling Of The Metals Package

On October 30, the first stage of the Metals Package (CRT-201) was drained to the Sludge Tank (ST-820) and most of the sludge was removed with a pressure washer. During the draining of CRT-201, it was discovered that the Cyanide Tank Mixer (CTM-202) had been reactivated and it was coated with 1" of sludge. The weight of the sludge combined with the speed of the mixer (1750 RPM's) and no liquid in CRT-201 caused the shaft to bend. CRT-211 was drained to the ST-820 and the sludge was removed with a pressure washer. Both tanks were emptied and cleaned on October 30. CRT-201 was partially filled on October 30. CRT-201 and CRT-211 were completely filled on October 31. The Treatment System was ready to be put back in normal operating parameters when another problem developed.

2.1.5. Shut Down Due To High pH In The Effluent Holding Tank

At 1:10 P.M. on October 31, the Treatment System shut down due to high pH level in the Effluent Holding Tank (EHT-700). There appeared to be no cause for the high pH after an initial investigation. It is possible that the PID controllers for the Sodium Hydroxide over compensated for the low pH in the Metals Package after refilling the Metals Package. The Treatment System was restarted in the Manual mode and the EHT-700 was recirculated to EQT-100. The Granular Activated Carbon Filter Tanks (GAC-650/651) were drained and backwashed to lower their pH. The EQT-100 was pumped to the ST-820 using the Equalization Tank Solids Pump (ESP-120) to lower its level and to dilute its pH with the 5 EWs and the recirculated effluent water. The USACE, WDNR, and APL were sent faxes and the plant was shut down overnight. See the up-coming November 1998 Monthly Monitoring Report for more information.

4.0 Summary

Groundwater treatment plant effluent monitoring was conducted on October 7, 13, 20, and 29 of 1998. The laboratory results of these samples show that all contaminants listed in the Requirements of the Oconomowoc Electroplating Superfund Site Substantive WPDES Permit Requirements Summary (9/96) comply with the permit. See Chart 1, Section 1.4 for important indicator parameters.

During the month of October, 1998, the plant was shut down five times for a total of 64.5 hours. See Table 1, Section 2.1 for shut down times. All equipment operation and maintenance related issues are detailed in a separate report, entitled "*Monthly Operation and Maintenance Report for the Oconomowoc Electroplating Groundwater Treatment Facility*". That report will be submitted to APL Environmental by October 15, 1998.

OCONOMOWOC GROUNDWATER TREATMENT PLANT							
Weekly Sampling Results					Date:	10-7-98	
Parameter	Influent	After Metals Package	After Stripper	Between Carbon Filters	Effluent	WDNR Site Permit ug/l	
pH	7.1	11	N/A	N/A	NT	Monitor	
TSS	NT	NT	NT	NT	NT	Monitor	mg/l
Arsenic	ND	NT	NT	NT	ND	5	
Barium	100	NT	NT	NT	10	400	
Cadmium	ND	NT	NT	NT	ND	0.5	
Cadmium Total Recoverable	ND	NT	NT	NT	ND	Monitor	
Chromium +6	ND	NT	NT	NT	ND	Monitor	
Chromium Total	ND	NT	NT	NT	ND	10	
Copper	ND	NT	NT	NT	ND	Monitor	
Iron	900	NT	NT	NT	ND	Monitor	
Lead	ND	NT	NT	NT	ND	1.5	
Manganese	200	NT	NT	NT	ND	Monitor	
Mercury	0.2	NT	NT	NT	ND	0.2	
Nickel	40	NT	NT	NT	ND	20	
Selenium	22	NT	NT	NT	ND	10	
Silver	ND	NT	NT	NT	ND	10	
Thallium	ND	NT	NT	NT	ND	0.4	
Zinc	ND	NT	NT	NT	80	Monitor	
Cyanide	4.9	NT	NT	NT	6	40	
Cyanide Free	ND	NT	NT	NT	ND	Monitor	
1,1-dichloroethane	39	NT	NT	NT	ND	85	
1,2-dichloroethane	ND	NT	NT	NT	ND	0.5	
1,1-dichloroethene	ND	NT	NT	NT	ND	0.7	
1,2-dichloroethene cis	76	NT	NT	NT	ND	7	
1,2-dichloroethene trans	18	NT	NT	NT	ND	20	
Ethylbenzene	ND	NT	NT	NT	ND	140	
Methylene Chloride	ND	NT	NT	NT	ND	0.5	
Tetrachloroethene	13	NT	NT	NT	ND	0.5	
Toluene	ND	NT	NT	NT	ND	68	
1,1,1-trichloroethane	263	NT	NT	NT	ND	40	
1,1,2-trichloroethane	ND	NT	NT	NT	ND	0.5	
TCE	719	NT	NT	NT	0.4	0.5	
Vinyl Chloride	ND	NT	NT	NT	ND	0.2	
Xylene Total	ND	NT	NT	NT	ND	124	
COD	NT	NT	NT	NT	NT	Monitor	mg/l
Phosphorus total	NT	NT	NT	NT	NT	Monitor	mg/l
Nitrate + Nitrite	NT	NT	NT	NT	NT	Monitor	mg/l
Ammonia Nitrogen	NT	NT	NT	NT	NT	Monitor	mg/l

OCONOMOWOC GROUNDWATER TREATMENT PLANT							
Weekly Sampling Results					Date:	10-13-98	
Parameter	Influent	After Metals Package	After Stripper	Between Carbon Filters	Effluent	WDNR Site Permit ug/l	
pH	7.1	11	N/A	N/A	8.4	Monitor	
TSS	NT	NT	NT	NT	NT	Monitor	mg/l
Arsenic	ND	NT	NT	NT	ND	5	
Barium	100	NT	NT	NT	ND	400	
Cadmium	ND	NT	NT	NT	ND	0.5	
Cadmium Total Recoverable	ND	NT	NT	NT	ND	Monitor	
Chromium +6	ND	NT	NT	NT	ND	Monitor	
Chromium Total	ND	NT	NT	NT	ND	10	
Copper	ND	NT	NT	NT	ND	Monitor	
Iron	900	NT	NT	NT	200	Monitor	
Lead	ND	NT	NT	NT	ND	1.5	
Manganese	200	NT	NT	NT	ND	Monitor	
Mercury	ND	NT	NT	NT	ND	0.2	
Nickel	30	NT	NT	NT	ND	20	
Selenium	ND	NT	NT	NT	ND	10	
Silver	ND	NT	NT	NT	ND	10	
Thallium	ND	NT	NT	NT	ND	0.4	
Zinc	ND	NT	NT	NT	30	Monitor	
Cyanide	ND	NT	NT	NT	ND	40	
Cyanide Free	ND	NT	NT	NT	ND	Monitor	
1,1-dichloroethane	43	NT	NT	NT	ND	85	
1,2-dichloroethane	0.28	NT	NT	NT	ND	0.5	
1,1-dichloroethene	17	NT	NT	NT	ND	0.7	
1,2-dichloroethene cis	88	NT	NT	NT	0.68	7	
1,2-dichloroethene trans	20	NT	NT	NT	ND	20	
Ethylbenzene	ND	NT	NT	NT	ND	140	
Methylene Chloride	ND	NT	NT	NT	ND	0.5	
Tetrachloroethene	13	NT	NT	NT	ND	0.5	
Toluene	ND	NT	NT	NT	ND	68	
1,1,1-trichloroethane	320	NT	NT	NT	ND	40	
1,1,2-trichloroethane	0.42	NT	NT	NT	ND	0.5	
TCE	730	NT	NT	NT	ND	0.5	
Vinyl Chloride	2	NT	NT	NT	ND	0.2	
Xylene Total	ND	NT	NT	NT	ND	124	
COD	NT	NT	NT	NT	NT	Monitor	mg/l
Phosphorus total	NT	NT	NT	NT	NT	Monitor	mg/l
Nitrate + Nitrite	NT	NT	NT	NT	NT	Monitor	mg/l
Ammonia Nitrogen	NT	NT	NT	NT	NT	Monitor	mg/l

OCONOMOWOC GROUNDWATER TREATMENT PLANT							
Weekly Sampling Results					Date:	10-20-98	
Parameter	Influent	After Metals Package	After Stripper	Between Carbon Filters	Effluent	WDNR Site Permit ug/l	
pH	7.3	11	N/A	N/A	NT	Monitor	
TSS	3.5	NT	NT	NT	1	Monitor	mg/l
Arsenic	ND	NT	NT	NT	ND	5	
Barium	100	NT	NT	NT	3	400	
Cadmium	ND	NT	NT	NT	ND	0.5	
Cadmium Total Recoverable	ND	NT	NT	NT	ND	Monitor	
Chromium +6	ND	NT	NT	NT	ND	Monitor	
Chromium Total	ND	NT	NT	NT	ND	10	
Copper	ND	NT	NT	NT	ND	Monitor	
Iron	800	NT	NT	NT	200	Monitor	
Lead	ND	NT	NT	NT	ND	1.5	
Manganese	200	NT	NT	NT	ND	Monitor	
Mercury	ND	NT	NT	NT	ND	0.2	
Nickel	40	NT	NT	NT	ND	20	
Selenium	12	NT	NT	NT	ND	10	
Silver	ND	NT	NT	NT	ND	10	
Thallium	ND	NT	NT	NT	ND	0.4	
Zinc	ND	NT	NT	NT	ND	Monitor	
Cyanide	ND	NT	NT	NT	ND	40	
Cyanide Free	ND	NT	NT	NT	ND	Monitor	
1,1-dichloroethane	50	NT	ND	NT	ND	85	
1,2-dichloroethane	ND	NT	ND	NT	ND	0.5	
1,1-dichloroethene	ND	NT	ND	NT	ND	0.7	
1,2-dichloroethene cis	99	NT	ND	NT	ND	7	
1,2-dichloroethene trans	22	NT	ND	NT	ND	20	
Ethylbenzene	ND	NT	ND	NT	ND	140	
Methylene Chloride	ND	NT	ND	NT	ND	0.5	
Tetrachloroethene	13	NT	ND	NT	ND	0.5	
Toluene	ND	NT	ND	NT	ND	68	
1,1,1-trichloroethane	332	NT	ND	NT	ND	40	
1,1,2-trichloroethane	ND	NT	ND	NT	ND	0.5	
TCE	838	NT	1.2	NT	ND	0.5	
Vinyl Chloride	ND	NT	ND	NT	ND	0.2	
Xylene Total	ND	NT	ND	NT	ND	124	
COD	25	NT	NT	NT	34	Monitor	mg/l
Phosphorus total	NT	NT	NT	NT	ND	Monitor	mg/l
Nitrate + Nitrite	NT	NT	NT	NT	0.2	Monitor	mg/l
Ammonia Nitrogen	NT	NT	NT	NT	ND	Monitor	mg/l

OCONOMOWOC GROUNDWATER TREATMENT PLANT							
Weekly Sampling Results					Date:	10-29-98	
Parameter	Influent	After Metals Package	After Stripper	Between Carbon Filters	Effluent	WDNR Site Permit ug/l	
pH	7.2	11	N/A	N/A	NT	Monitor	
TSS	NT	NT	NT	NT	NT	Monitor	mg/l
Arsenic	ND	NT	NT	NT	ND	5	
Barium	100	NT	NT	NT	30	400	
Cadmium	ND	NT	NT	NT	ND	0.5	
Cadmium Total Recoverable	ND	NT	NT	NT	ND	Monitor	
Chromium +6	ND	NT	NT	NT	ND	Monitor	
Chromium Total	ND	NT	NT	NT	ND	10	
Copper	10	NT	NT	NT	20	Monitor	
Iron	1000	NT	NT	NT	1000	Monitor	
Lead	ND	NT	NT	NT	ND	1.5	
Manganese	200	NT	NT	NT	10	Monitor	
Mercury	0.6	NT	NT	NT	ND	0.2	
Nickel	50	NT	NT	NT	10	20	
Selenium	ND	NT	NT	NT	ND	10	
Silver	ND	NT	NT	NT	ND	10	
Thallium	7.6	NT	NT	NT	ND	0.4	
Zinc	30	NT	NT	NT	30	Monitor	
Cyanide	ND	NT	NT	NT	ND	40	
Cyanide Free	ND	NT	NT	NT	ND	Monitor	
1,1-dichloroethane	58	NT	NT	NT	ND	85	
1,2-dichloroethane	ND	NT	NT	NT	ND	0.5	
1,1-dichloroethene	25	NT	NT	NT	ND	0.7	
1,2-dichloroethene cis	149	NT	NT	NT	ND	7	
1,2-dichloroethene trans	25	NT	NT	NT	ND	20	
Ethylbenzene	ND	NT	NT	NT	ND	140	
Methylene Chloride	ND	NT	NT	NT	ND	0.5	
Tetrachloroethene	11	NT	NT	NT	ND	0.5	
Toluene	ND	NT	NT	NT	ND	68	
1,1,1-trichloroethane	522	NT	NT	NT	ND	40	
1,1,2-trichloroethane	ND	NT	NT	NT	ND	0.5	
TCE	1050	NT	NT	NT	0.5	0.5	
Vinyl Chloride	ND	NT	NT	NT	ND	0.2	
Xylene Total	ND	NT	NT	NT	ND	124	
COD	NT	NT	NT	NT	NT	Monitor	mg/l
Phosphorus total	NT	NT	NT	NT	NT	Monitor	mg/l
Nitrate + Nitrite	NT	NT	NT	NT	NT	Monitor	mg/l
Ammonia Nitrogen	NT	NT	NT	NT	NT	Monitor	mg/l

FLOW FROM EXTRACTION WELLS

YEAR: 1998

MONTH: OCT. DAY	FE-100 FLOW TOTALIZER	TOTAL DAY'S FLOW (GAL.)	DAILY FLOW MGD	
1	130,860.32	28,104.84	0.028	
2	158,965.16	25,373.76	0.025	
3	184,338.92	41,030.92	0.041	
4	225,369.84	12,847.36	0.013	
5	238,217.20	27,117.52	0.027	
6	265,334.72	24,976.84	0.025	
7	290,311.56	30,390.03	0.030	
8	320,701.59	23,596.25	0.024	
9	344,297.84	21,592.07	0.022	
10	365,889.91	42,036.81	0.042	
11	407,926.72	18,792.03	0.019	
12	426,718.75	24,660.41	0.025	
13	451,379.16	30,173.84	0.030	
14	481,553.00	21,620.09	0.022	
15	503,173.09	25,180.54	0.025	
16	528,353.63	18,188.68	0.018	
17	546,542.31	1,905.19	0.002	
18	548,447.50	61,078.69	0.061	
19	609,526.19	27,423.19	0.027	
20	636,949.38	24,688.25	0.025	
21	661,637.63	4,930.93	0.005	
22	666,568.56	26,556.69	0.027	
23	693,125.25	19,602.81	0.020	
24	712,728.06	0.00	0.000	
25	0.00	0.00	0.000	RESET
26	0.00	0.00	0.000	SHUT DOWN
27	10,950.13	7,142.57	0.007	
28	18,092.70	12,646.79	0.013	
29	30,739.49	3,777.02	0.004	
30	34,516.51	10,431.90	0.010	
31	44,948.41	4,100.80	0.004	SHUT DOWN
Nov. 1	49,049.21			
		TOTAL	0.620	
		AVERAGE	0.022	

FLOW FROM EQT-100

YEAR: 1998				
MONTH: OCT. DAY	FE-112 FLOW TOTALIZER	TOTAL DAY'S FLOW (GAL.)	DAILY FLOW MGD	
1	2,159,656.75	37,667.00	0.038	
2	2,197,323.75	33,324.25	0.033	
3	2,230,648.00	48,491.25	0.048	
4	2,279,139.25	28,029.75	0.028	
5	2,307,169.00	43,543.25	0.044	
6	2,350,712.25	34,392.00	0.034	
7	2,385,104.25	43,441.25	0.043	
8	2,428,545.50	32,211.50	0.032	
9	2,460,757.00	30,350.00	0.030	
10	2,491,107.00	58,596.50	0.059	
11	2,549,703.50	31,751.75	0.032	
12	2,581,455.25	28,806.00	0.029	
13	2,610,261.25	42,291.75	0.042	
14	2,652,553.00	31,444.50	0.031	
15	2,683,997.50	45,296.25	0.045	
16	2,729,293.75	26,728.50	0.027	
17	2,756,022.25	46,291.25	0.046	
18	2,802,313.50	44,419.25	0.044	
19	2,846,732.75	39,317.75	0.039	
20	2,886,050.50	35,328.50	0.035	
21	2,921,379.00	12,062.25	0.012	
22	2,933,441.25	37,512.00	0.038	
23	2,970,953.25	34,323.25	0.034	
24	3,005,276.50	56,509.00	0.057	
25	3,061,785.50	8,686.00	0.009	SHUT DOWN
26	3,070,471.50	55,909.00	0.056	
27	3,126,380.50	48,540.00	0.049	
28	3,174,920.50	55,015.75	0.055	
29	3,229,936.25	26,799.50	0.027	
30	3,256,735.75	6,327.25	0.006	
31	3,263,063.00	5,019.00	0.005	SHUT DOWN
Nov. 1	3,268,082.00			
		TOTAL	1.108	
		AVERAGE	0.036	

EFFLUENT FLOW FROM PLANT

YEAR: 1998

MONTH: OCT. DAY	NPDES STATION TOTALIZER	TOTAL DAY'S FLOW (GAL.)	X2	DAILY FLOW MGD	
1	435,393.00	15,094.94	30,189.88	0.030	
2	450,487.94	14,386.97	28,773.94	0.029	
3	464,874.91	17,175.68	34,351.36	0.034	
4	482,050.59	5,551.79	11,103.58	0.011	
5	487,602.38	11,851.87	23,703.74	0.024	
6	499,454.25	6,616.03	13,232.06	0.013	
7	506,070.28	5,714.69	11,429.38	0.011	
8	511,784.97	13,529.72	27,059.44	0.027	
9	525,314.69	10,839.12	21,678.24	0.022	
10	536,153.81	22,201.38	44,402.76	0.044	
11	558,355.19	10,046.50	20,093.00	0.020	
12	568,401.69	11,159.37	22,318.74	0.022	
13	579,561.06	15,539.82	31,079.64	0.031	
14	595,100.88	11,518.56	23,037.12	0.023	
15	606,619.44	11,036.56	22,073.12	0.022	
16	617,656.00	7,833.94	15,667.88	0.016	
17	625,489.94	15,464.50	30,929.00	0.031	
18	640,954.44	17,100.12	34,200.24	0.034	
19	658,054.56	13,538.44	27,076.88	0.027	
20	671,593.00	14,310.44	28,620.88	0.029	
21	685,903.44	4,312.81	8,625.62	0.009	
22	690,216.25	11,888.31	23,776.62	0.024	
23	702,104.56	8,679.82	17,359.64	0.017	
24	710,784.38	7,307.12	14,614.24	0.015	
25	718,091.50	2,223.31	4,446.62	0.004	
26	720,314.81	7,973.38	15,946.76	0.016	
27	728,288.19	3,522.49	7,044.98	0.007	
28	731,810.68	6,273.45	12,546.90	0.013	
29	738,084.13	12,870.18	25,740.36	0.026	
30	750,954.31	0.00	0.00	0.000	SHUT DOWN
31	750,954.31	37.13	74.26	0.000	SHUT DOWN
Nov. 1	750,991.44				
			TOTAL	0.631	
			AVERAGE	0.022	

APL#980848

NOVA Environmental Laboratory
8222 W. Calumet Road • Milwaukee, WI 53223
800-236-3909 (414) 355-5800 FAX: (414) 355-3099

CHAIN OF CUSTODY

_____ Page ___ of ___

CLIENT INFORMATION	
Project Manager:	Tony Goodman
Company:	OGTP.
Mailing Address:	
City, State, Zip:	
Phone:	FAX:

REPORTING / INVOICING INFORMATION		
Project I.D.:		
Pricing/Quote Reference:		
Person to be Invoiced:	☐ Client	☐ Property Owner
Mail Invoice to:	☐ Client	☐ Property Owner
Mail Lab Reports to:	☐ Client	☐ Property Owner

PROPERTY OWNER INFORMATION	
Property Owner:	
Owner's Company:	
Street Address:	
City, State, Zip:	
Phone:	FAX:

TURNAROUND

☒ NORMAL (about 2 weeks for non-TCLP samples)
☐ ***RUSH*** *Date report needed:* _____
NOTE: Call to confirm *that we can provide the desired Rush processing* ***before shipping samples!***

SPECIAL NEEDS / INSTRUCTIONS

SAMPLE CHARACTERISTICS

☒ NON-HAZARDOUS
☐ Possibly Hazardous; *use special handling*
NOTE: Left-over, hazardous samples will be returned to you for proper disposal.

SAMPLE RECEIVING RECORDS

Samples received "on ice" ☒
Temperature (if not "on ice") ____°C
Samples intact / not leaking ☐

Enter "Preservation/Filtration Codes":

A. HCl
B. HNO_3
C. NaOH
D. H_2SO_4
E. Methanol
F. Field Filtered

LAB I.D.	SAMPLE (Field) I.D.	Additional SAMPLE or SAMPLING INFORMATION (optional)	DATE	TIME	Matrix *	ANALYSIS NEEDED: Total metals	VOC's	CN-	COD	Phosphorus	Ammonia (Nitrogen)	N. Kjeldahl (Nitrogen)	TSS	pH	Heat Cc.	CONTAINERS / SAMPLE: Total	40mL	250mL	500mL	1 L	Other
12692		981020WA01P pH-7.3	10/20/98	14:00	G.W	X	X	X	X					X	X	X	9	1	1	3	2	2
12693		981020WA02P pH-10.2		14:10											X		1	1				
12694		981020WA03P pH-11.4		14:20											X		1	1				
12695		981020WA05P pH-7.1		14:30											X		1	1				
12696		981020WA07P		14:20			X	X*									2					2
12697		981020WA09P		14:40		X*	X	X								X	5			1	2	2
12698		981020WA09R		14:45		X			X	X	X	X	X				7		4	3		
12699		trip Blank					X										1					1

* Soil **(S)** Surface Water **(SW)** Groundwater **(GW)** *WASTES: Waste, Solid* ***(WS)*** *Waste, Liquid* ***(WL)*** *Waste, TCLP* ***(TCLP)*** If applicable: Composite **(C)** or Grab **(G)**

Relinquished by (signature):	Date / Time:	Received by (signature):
Tony Goodman	10/20/98 15:00 P.	Tammy Wilcox
Relinquished by (signature):	Date / Time:	Received by (signature):

Relinquished by (signature):	Date / Time:	Received by (signature):
Relinquished by (signature):	Date / Time:	Received by (signature):

CLIENT COPY: Pink **COPY FOR REPORT: Yellow** LAB FILE COPY: White

APL Environmental
8222 W. Calumet Rd., Milwaukee, WI 53223
Phone: (414) 355-5800 Fax: (414) 355-3099

INORGANIC REPORT

WDNR# 241340550

INVOICE NUMBER **980848**
DATE REPORTED: 12-Nov-98
DATE RECEIVED: 20-Oct-98
SAMPLE TEMP (C): Rec On Ice
PROJECT ID:
PROJECT NAME: OGTP

James Chang
Oconomowoc Groundwater Treatment Plant
2572 Oak St.
Ashippun , WI 53003

Test	Result	Units	RQ	LOD	LOQ	Method	Analyst	Date Anal	QC#	Comments
Nova Sample Number: 12692										
Client ID:								Collection: 10/20/98	Time: 14:00	
								Sample Description: 981020WA01P		
Arsenic - Furnace AA	**<9.9**	**ug/l**	**RJ**	9.9	31	206.2	dmd	11/2/98	*982227*	
Barium - ICAP	**0.1**	**mg/l**	**RJ**	0.003	0.010	200.7	en	10/28/98	*982177*	
Cadmium - Furnace AA	**<0.7**	**ug/l**	**TTR**	0.7	2.2	213.2		10/29/98	*982203*	
Chromium, Total - ICAP	**<0.010**	**mg/l**	**RJ**	0.01	0.03	200.7	en	10/28/98	*982177*	
Copper- ICAP	**<0.008**	**mg/l**	**RJ**	0.008	0.03	200.7	en	10/28/98	*982177*	
Iron - ICAP	**0.8**	**mg/l**	**RJ**	0.071	0.2	200.7	en	10/28/98	*982177*	
Lead - Furnace AA	**<1.06**	**ug/l**	**TD**	1.06	3.4	239.2	dmd	10/29/98	*982201*	
Manganese - ICAP	**0.2**	**mg/l**	**RJ**	0.009	0.03	200.7	en	10/28/98	*982177*	
Mercury CV	**<0.0002**	**mg/l**	**RJ**	0.0002	0.0006	245.1	dmd	10/23/98	*982110*	
Nickel - ICAP	**0.04**	**mg/l**	**RJ**	0.011	0.03	200.7	en	10/28/98	*982177*	
Selenium - Furnace AA	**12**	**ug/l**	***J* TD**	7.8	25	270.2	dmd	10/21/98	*982091*	
Silver - ICAP	**<0.006**	**mg/l**	**RJ**	0.006	0.02	200.7	en	10/28/98	*982177*	
Thallium - Furnace AA	**<5.0**	**ug/l**	**RJ**	5	16	279.2	dmd	11/2/98	*982233*	
Zinc - ICAP	**<0.021**	**mg/l**	**RJ**	0.021	0.07	200.7	en	10/28/98	*982177*	
Chromium, Hexavalent	**<10**	**mg/l**		0.012	0.04	SM 3500D	mvtl	10/21/98	*982242*	
COD. Total	**25**	**mg/l**		3.4	11	410.4-CT	van	10/22/98	*982098*	
Cyanide, Amenable	**<.018**	**mg/l**		0.018	0.06	335.2	van	10/28/98	*982186*	
Cyanide, Total	**<.018**	**mg/l**		0.018	0.06	335.2	van	10/28/98	*982185*	
pH (water)	**7.3**	**s.u.**	**#**			150.1	tg	10/20/98	*982087*	*analyzed at ogtp*
Solids, Total Suspended	**3.5**	**mg/l**		0.5	1.6	SM 2540D	van	10/23/98	*982107*	
Nova Sample Number: 12693										
Client ID:								Collection: 10/20/98	Time: 14:10	
								Sample Description: 981020WA02P		
pH (water)	**10**	**s.u.**	**#**			150.1	tg	10/20/98	*982087*	*analyzed at ogtp*
Nova Sample Number: 12694										
Client ID:								Collection: 10/20/98	Time: 14:30	
								Sample Description: 981020WA03P		
pH (water)	**11**	**s.u.**	**#**			150.1	tg	10/20/98	*982087*	*analyzed at ogtp*

"J" = Results between LOD and LOQ **"#" = no LOD or LOQ required.**

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INORGANIC REPORT

WDNR# 241340550

INVOICE NUMBER **980848**
DATE REPORTED: 12-Nov-98
DATE RECEIVED: 20-Oct-98
SAMPLE TEMP (C): Rec On Ice
PROJECT ID:
PROJECT NAME: OGTP

James Chang
Oconomowoc Groundwater Treatment Plant
2572 Oak St.
Ashippun , WI 53003

Test	Result	Units		RQ	LOD	LOQ	Method	Analyst	Date Anal	QC#	Comments
Nova Sample Number: 12695											
Client ID:									Collection: 10/20/98	Time: 14:30	
									Sample Description: 981020WA05P		
pH (water)	**7.1**	**s.u.**		**#**			150.1	tg	10/20/98	*982087*	*analyzed at ogtp*
Nova Sample Number: 12697											
Client ID:									Collection: 10/20/98	Time: 14:40	
									Sample Description: 981020WA09P		
Chromium, Hexavalent	**<10**	**mg/l**			0.012	0.04	SM 3500D	mvtl	10/21/98	*982242*	
Cyanide, Amenable	**<.018**	**mg/l**			0.018	0.06	335.2	van	10/28/98	*982186*	
Cyanide, Total	**<.018**	**mg/l**			0.018	0.06	335.2	van	10/28/98	*982185*	
Nova Sample Number: 12698											
Client ID:									Collection: 10/20/98	Time: 14:45	
									Sample Description: 981020WA09R		
Arsenic - Furnace AA	**<9.9**	**ug/l**		**RJ**	9.9	31	206.2	dmd	11/2/98	*982227*	
Barium - ICAP	**0.003**	**mg/l**	***J***	**RJ**	0.003	0.010	200.7	en	10/28/98	*982177*	
Cadmium - Furnace AA	**<0.7**	**ug/l**		**TTR**	0.7	2.2	213.2		10/29/98	*982203*	
Chromium, Total - ICAP	**<0.010**	**mg/l**		**RJ**	0.01	0.03	200.7	en	10/28/98	*982177*	
Copper- ICAP	**<0.008**	**mg/l**		**RJ**	0.008	0.03	200.7	en	10/28/98	*982177*	
Iron - ICAP	**0.2**	**mg/l**	***J***	**RJ**	0.071	0.2	200.7	en	10/28/98	*982177*	
Lead - Furnace AA	**<1.06**	**ug/l**		**TD**	1.06	3.4	239.2	dmd	10/29/98	*982201*	
Manganese - ICAP	**<0.009**	**mg/l**		**RJ**	0.009	0.03	200.7	en	10/28/98	*982177*	
Mercury CV	**<0.0002**	**mg/l**		**RJ**	0.0002	0.0006	245.1	dmd	10/23/98	*982110*	
Nickel - ICAP	**<0.011**	**mg/l**		**RJ**	0.011	0.03	200.7	en	10/28/98	*982177*	
Selenium - Furnace AA	**<7.8**	**ug/l**		**TD**	7.8	25	270.2	dmd	10/21/98	*982091*	
Silver - ICAP	**<0.006**	**mg/l**		**RJ**	0.006	0.02	200.7	en	10/28/98	*982177*	
Thallium - Furnace AA	**<5.0**	**ug/l**		**RJ**	5	16	279.2	dmd	11/2/98	*982233*	
Zinc - ICAP	**<0.021**	**mg/l**		**RJ**	0.021	0.07	200.7	en	10/28/98	*982177*	
COD. Total	**34**	**mg/l**			3.4	11	410.4-CT	van	10/22/98	*982098*	
Nitrate + Nitrite Nitrogen	**0.2**	**mg/l**			0.04	0.1	353.3	mvtl	10/22/98	*982244*	
Nitrogen, Ammonia	**<0.08**	**mg/l**			1.25	4.0	350.1	mvtl	10/30/98	*982296*	
Phosphorus, Total	**<0.033**	**mg/l**			0.033	0.1	365.2	van	10/23/98	*982115*	
Solids, Total Suspended	**1**	**mg/l**	***J***		0.5	1.6	SM 2540D	van	10/23/98	*982107*	

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INORGANIC REPORT

WDNR# 241340550

INVOICE NUMBER	**980848**
DATE REPORTED:	12-Nov-98
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SAMPLE TEMP (C):	Rec On Ice
PROJECT ID:	
PROJECT NAME:	OGTP

James Chang
Oconomowoc Groundwater Treatment Plant
2572 Oak St.
Ashippun , WI 53003

Test	Result	Units	RQ	LOD	LOQ	Method	Analyst	Date Anal	QC#	Comments

Approved By: _____ **Date:** 11/12/98
James Chang, Ph.D. , Lab Director

RJ *Result expressed as Total.*
TD *Result expressed as Total Dissolved.*
TTR *Result expressed as total and total recoverable.*

MDL: Method Detection Limit determined by 40CFR Part 136 Appendix B
LOQ = 10 (S) x Dilution Facor, where "S" is the Standard Deviation from the MDL Study
LOD = 3.143 (S) x Dilution Facor, where "S" is the Standard Deviation from the MDL Study

Rounding Rules: Three significant figures were used for concentrations above 99 ug/L, two significant figures for concentrations between 1-99 ug/L, and one significant figure for lower concentrations.
DNR Analytical Detection Limit Guidance, April 1995.