Brown and Caldwell

Final
Corrective Measures
Implementation
Ciba Site
Glens Falls, New York

November 2001

FINAL CORRECTIVE MEASURES IMPLEMENTATION
CIBA SITE
GLENS FALLS, NEW YORK

POST-CLOSURE PLAN

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1.0 INTRODUCTION

This Post-Closure Plan addresses the operation and maintenance (O&M) requirements of the Corrective Measures implemented at the Ciba Specialty Chemicals Corporation (Ciba)/Hercules Incorporated (Hercules) facility, as follows:

- Main Plant Site located in the Town of Queensbury, New York;
- Pond West of CAMU, on property belonging to the Glens Falls Lehigh Cement Company, also in the Town of Queensbury;
- Restored shoreline of the Hudson River adjacent to and immediately downstream of Main Plant Site, in the Town of Queensbury; and
- Ponded & backwater Area, located in the Town of Queensbury and the Town of Hudson Falls.

The designs for the selected and approved Corrective Measures were presented in the following documents:

- Corrective Measures Design Report and the Drawings and Specifications, which are Attachments A and B to that report (June 1999); and
- Corrective Measures Work Plan, Ponded and Backwater Area, Hudson River Sub-Part Sediments AOC (November 1999).

This Post-Closure Plan has been prepared in accordance with the requirements described in Appendix II-A, Section I.B of the Hazardous Waste Management Permit (HWM Permit), which was issued by the New York State Department of Environmental Conservation (NYSDEC), effective January 6, 1997, as modified on January 12, 1999. The HWM Permit specifies that the Post-Closure Plan is to address implementation and long term maintenance of the Corrective Measures not addressed in the groundwater monitoring plans, including:

1. Description of normal operation and maintenance (O&M);
2. Description of potential operating problems;
3. Description of routine monitoring and laboratory testing;
4. Description of alternative O&M;
5. Safety and security plan;
6. Description of equipment;
7. Records and reporting mechanisms required.

Further specifics are provided in the HWM Permit.

Operation and maintenance of the Groundwater Extraction Systems (GWES) is described in Sections 2.0 through 7.0. Performance monitoring of the GWES is addressed in the CMI Groundwater Monitoring Plan (Attachment E to the Corrective Measures Design Report). General site inspection and maintenance is described in Section 8.0. A schedule for the O&M activities reporting associated with the GWES is presented in Section 9.0.

O&M activities associated with temporary continued use of the existing, on-site Pre-Treatment System (processing water from the GWES) are described in Sections 10.0 through 13.0. The O&M schedule and reporting related to the Pre-treatment System are described in Section 14.0.

2.0 GWES DESCRIPTION

The Groundwater Extraction Systems (GWES) are designed to extract groundwater from the Overburden and upper Bedrock (Horizons A and B) water-bearing zones in order to intercept groundwater flow from the site which contains constituents at concentrations above Groundwater Protection Concentrations (GWPCs). Groundwater from the extraction systems, in the near future, is expected be discharged directly to the City of Glens Falls Publicly Owned Treatment Works (POTW). The rationale for direct discharge to the POTW is described in Section 9.0 of the June 1999 Corrective Measures Design Report. However, due to the recent privatization of the POTW operations, negotiations for the Permit changes required to enable direct discharge have been delayed. As a consequence, CM construction has been completed, the GWES is transitioned to the O&M phase and it is necessary to temporarily continue to use the Existing PTS to process the effluent from the GWES before discharging that water to the POTW. After direct discharge arrangements are made with the POTW, a revision to this PCP will be filed with the NYSDEC.

A brief description of the objectives and design of the GWES is presented below.

2.1 GROUNDWATER EXTRACTION SYSTEMS

2.1.1 Overburden Extraction System

The objective of the Overburden Extraction System is to intercept groundwater flow in the Overburden from the Main Plant Site before it discharges to the Hudson River. This system is, therefore, positioned north of the Hudson River near the downgradient boundary of the Main Plant Site. The system employs a french drain to collect the groundwater. The french drain is installed at the base of the Overburden water-bearing zone. The alignment of the french drain is depicted in Drawing 60484-011. The

estimated capture zone for the Overburden extraction system is also depicted in Drawing 60484-011.

An evaluation of the estimated flow to the Overburden Extraction System under the conditions of a Permeable Cover/RCRA Cap configuration is described in the Corrective Measures Design Report. The predicted rate of flow to the french drain is approximately 14 gpm after the RCRA Cap and Permeable Cover are constructed, which will reduce the infiltration from precipitation in the western portion of the site; and after the lagoon underdrains, the industrial sewer system, and the Building 56 Area groundwater extraction system are decommissioned. The french drain is constructed with sumps that are equipped with submersible pumps, which convey forward flow in the sumps to the forcemain.

20 extraction wells!

2.1.2 Bedrock Extraction Systems

The objective of the Bedrock Extraction Systems is to intercept groundwater flow from the site, in Horizons A and B, which contains constituent concentrations in excess of GWPCs. The configuration of the systems required to meet this objective was estimated through computer groundwater flow modeling and consists of the following:

- Fourteen extraction wells in Horizon A, spaced approximately 75 feet apart, near the crest of the river bank along the southern side of the site from approximately 60 feet east of the western property boundary to just west of the estimated position of the Horizon A subcrop (see Drawing 60484-013). Each well is expected to be pumped at approximately 0.2 gpm for a total estimated average flow of 2.8 gpm.

- Six extraction wells in Horizon B, spaced approximately 300 feet apart, along the same general alignment as Horizon A, from approximately 60 feet east of the western property boundary to just west of the estimated position of the

Horizon B subcrop (see Drawing 60484-014). Each of these wells is expected to be pumped at approximately 1 gpm for a total estimated average flow of 6 gpm.

Predicted capture zones for the Horizons A and B Extraction Systems are shown in Drawings 60484-013 and 60484-014, respectively. Submersible pumps capable of producing the required extracted groundwater flow rate are installed in the extraction wells. The systems are designed to return a portion of the discharge water to the well. The desired net extraction rate is conveyed to the Effluent Pump Station or the currently operating PTS via the forcemain.

2.1.3 Discharge Forcemain

The forward flow from the GWES is to be conveyed to the Effluent Pump Station or the existing PTS via the forcemain. Alignment of the forcemain is generally parallel to the french drain/sumps and the groundwater extraction wells. The alignment and the profile of the forcemain are shown on Drawing 60484-015. The flow diversion controls are positioned within the Effluent Pump Station (EPS). During the Corrective Measures construction activities and until appropriate Permit arrangements are made with the POTW for direct discharge, the flow diversion controls enable shunting of flow from the GWES to the existing Pre-treatment Plant (after pre-treatment, such waters are returned to the wet well in the EPS). Forcemain piping within the EPS is designed with valves, controls and flanged end caps that, with minor reconfiguration, enable the GWES to discharge directly to the EPS wet well. From the EPS wet well, pumps convey effluent to the POTW via a dedicated pipeline.

3.0 GWES MAJOR EQUIPMENT

The Groundwater Extraction Systems (GWES) consist of various elements that, when operated together, intercept, collect, pump and discharge groundwater from the Overburden and upper Bedrock (Horizons A and B) water-bearing zones at the downgradient facility boundary to the POTW (though temporarily passing first through the existing PTS). The major elements of the GWES are as follows:

- Overburden french drain (including 3 sumps with submersible, float-switch operated discharge pumps);
- Overburden and bedrock extraction wells, equipped with submersible pumps and electronic liquid level operating controls;
- Sumps and wells are equipped with flow measuring devices (instantaneous and totalizing) and operational status monitoring devices;
- A cumulative flow measuring unit (to track the combined flow from GWES wells/sumps) at the EPS; and
- Flow sensors at each extraction well and sump to detect malfunction or failure of a unit and send an electric alarm to the monitoring center in the EPS and, from there, to the remote monitoring location.

Plans, profiles and details of the GWES are presented in Drawings 60484-011 through 60484-020. The GWES specifications are summarized in Table 3-1. The Drawings, Specifications and/or vendor manuals may be referenced for additional information.

TABLE 3-1

GWES SPECIFICATIONS SUMMARY

	Horizon A Bedrock Extraction System	Horizon B Bedrock Extraction System	Overburden Extraction System (French Drain)
Predicted Yield	0.2 gpm/well	1 gpm/well	14 gpm
Number of Extraction Wells	14	6	-
Well Diameters (in.)	8	8	-
Well Casing Type	Single	Single and Double	-
Well Depths (ft.) [1]	32 to 48	52 to 76	-
Number of Sumps	-	-	3
Sump Depths (ft.) [1]	-	-	31 to 33
Number of Manholes	-	-	6
Manhole Depths [1]	-	-	11 to 24
Submersible Pumps:			
Pump Horsepower (hp)	1/2	1/2	1
Design Flow Rate (gpm) [3]	0.2	1	5[2]

NOTES:

(1) Depths are based on final grades for the well chambers and sump cover-doors.
(2) Flow rate per pump is based on a total design flow rate of 14 gpm.
(3) Pump Model Nos.
Extraction Wells - Grundfos 10S05-9
French Drain Sumps - Grundfos 16E7

4.0 GWES OPERATION

This section discusses the normal operation and alternate operation for the Groundwater Extraction Systems (GWES). A description of how each process should typically function is included under normal operation. Alternate operation addresses how identified unit processes may be bypassed or operated in an alternate arrangement, as applicable. Section 3.0 may be referenced for specific information on design parameters.

4.1 GROUNDWATER EXTRACTION SYSTEMS

4.1.1 Overburden Extraction System

Normal Operation. Overburden GWES operations consist of a french drain at the base of the Overburden water-bearing zone near the downgradient boundary of the site, as shown in Drawing 60484-011 (Attachment A to the Corrective Measures Design Report). Groundwater collected by the french drain is pumped from three sumps positioned at low elevation points along the drain. The associated pumps and controls are connected to a manifold piping system (forcemain), which conveys the groundwater to the Effluent Pump Station and temporarily to the existing PTS. The design basis is summarized in Section 2.1.1 and described in greater detail in the Corrective Measures Design Report. Equipment characteristics are summarized in Table 3-1.

The maximum yield of the Overburden Extraction System is governed by the transmissivity (hydraulic conductivity times saturated thickness) of the Overburden rather than the individual or cumulative capacity of the pumps. For normal operations, therefore, the expected rate of flow to the french drain is estimated to be approximately 14 gpm, now that the RCRA Cap and Permeable Cover are constructed, and the lagoon underdrains, the industrial sewer system, and the Building 56 Area groundwater extraction system are decommissioned. The flow rates from each of the sumps will be electronically monitored and can be manually adjusted, as necessary, to meet the

objectives of the system. Monitoring of groundwater levels will be in accordance with the CMI Groundwater Monitoring Plan.

Alternate Operation. Due to local variations in the transmissivity of the Overburden, the rate of flow to the french drain may be different than the estimated flow rate. If necessary, the required flow rate will be accommodated by adjusting the valves on the discharge of the pumps to achieve the desired system objectives. The flow rate and the discharge pressure are measured locally at each sump.

During the course of CM construction, it was determined that water leaking from the Glens Falls Feeder Canal and water emanating as storm runoff from the Town of Queensbury to the Sliver Quarry (north of the Canal, opposite the CAMU) flows to the overburden at the Site, travels through bedding stone for former piping and foundations, and is being captured by the french drain. Most of this extraneous flow (ranging from about 10 to 70 gpm, depending on precipitation and Canal flow level) enters the french drain and flows to Sump B. In order to handle this additional flow, a temporary backup pump, with flow switch controls, was installed in Sump B (along with the design pump). The temporary backup pump discharge (ranging from about 10 to 70 gpm) flows to its own 2" diameter forcemain leading to the existing PTS. Efforts are in progress to get the New York State Canal Corporation to effect repairs to the Canal and reduce or eliminate leakage to the Site. Efforts are also underway to have Town of Queensbury storm runoff diverted directly into the Canal, relieving the french drain at the Site of this extraneous flow. At some time in the future, after Canal leakage and Queensbury runoff to the Site are eliminated, the backup pumping equipment in Sump B may be shutdown and an appropriate revision to this PCP filed with the NYSDEC.

4.1.2 Bedrock Extraction Systems

Normal Operation. The Bedrock GWES operations consist of 14 groundwater extraction wells in Horizon A and six in Horizon B, as shown in Drawings 60484-013 and 60484-014. Their associated pumps and controls are connected to a manifold piping

system (forcemain) that conveys the groundwater to the Effluent Pump Station (and temporarily to the existing PTS). The design basis is summarized in Section 2.1.2 and described in greater detail in the Corrective Measures Design Report. Well and equipment characteristics are summarized in Table 3-1.

The maximum yield of the Bedrock Extraction Systems is governed by the transmissivity of the Horizon A and Horizon B water-bearing zones, rather than the individual or cumulative capacity of the well pumps. The expected average yield from each Horizon A and Horizon B extraction well is estimated to be approximately 0.2 gpm and 1 gpm, respectively, based upon a safe yield predicted from the Horizon A and B aquifer tests. For normal operations, therefore, it has been predicted that the Horizon A and Horizon B Bedrock Extraction Systems will operate at total average flow rates of 2.8 and 6 gpm, respectively. The flow rates from each of the individual wells will be electronically monitored and can be manually adjusted, as necessary, to meet the objectives of the system. Monitoring of groundwater levels will be in accordance with the CMI Groundwater Monitoring Plan.

Alternate Operation. Due to local variations in the transmissivity inherent in fractured bedrock water-bearing zones, the maximum practicable yield of each of the extraction wells in each horizon may be different than anticipated. Thus, alternate operations may include varying the pumping rate from individual wells to achieve the required conditions. This will be accomplished by adjusting the valves on the discharge of the pumps to achieve the desired flow rates. The flow rate from each well and the discharge pressure are measured locally at each well. The computerized monitoring system, located in the EPS, tracks and records individual and cumulative flow data from the extraction wells. Depending on the response of groundwater levels in Horizons A and B, it may be appropriate to discontinue pumping from one or more of the extraction wells in the bedrock horizons. For example, some wells may potentially go dry if the water-bearing fractures are locally dewatered.

6.0 GWES MAINTENANCE

This section describes the maintenance plan for the Groundwater Extraction Systems (GWES). Maintenance of these systems is intended for personnel with the appropriate training and/or experience. Contractors and vendor representatives will be used, as necessary. The frequency of maintenance activities will be in accordance with equipment manufacturer recommendations and experience at the site. Equipment replacement will be on an as-needed basis consistent with equipment function.

6.1 GROUNDWATER EXTRACTION SYSTEMS

The extraction systems have been designed and constructed as semi-automated systems and, therefore, should require minimal operator interaction on a day-to-day basis. However, maintenance activities will be assessed based on routine inspections and will be performed as required. It is anticipated that maintenance activities may be required as indicated by operation of the following:

- Well and sump pumps.
- Piping and valving.
- Monitoring and alarm equipment.

6.1.1 Well and Sump Pumps

Prescheduled pump maintenance will be conducted in accordance with manufacturer's pump manuals and recommended maintenance intervals. The operation of the pumps will be monitored. If an operation interruption is detected, an inspection will be conducted to assess the cause and effect repairs. The GWES design provides sufficient additional capacity to maintain groundwater capture conditions. One spare pump of each model type is maintained on site to minimize well downtime in the event of pump failure.

In addition, spare pumps are readily available in the marketplace for installation, if necessary.

Model numbers for each pump are documented for replacement ordering, when required. Table 3-1, herein, and the Specifications can assist personnel in identifying key design information on the extraction system pumps.

6.1.2 Piping and Valving

The discharge piping system delivers groundwater from the various well and sump locations to the flow diversion controls and on to either the temporary on-site PTS or the wet well in the EPS. The effluent discharge forcemain from the GWES (and PTS) and the separate sanitary discharge flow from the operator's trailer combine in the wet well of the Effluent Pump Station. If a leak in the forcemain piping system were to occur, it would be detected as a sudden change in monitored operation in the well vaults or sumps. The operator would shut off the appropriate well or sump pump(s), investigate the leak, and effect repairs as soon as feasible. Noteworthy is that the discharge piping system is situated within the capture zone of the Overburden Extraction System.

6.1.3 Instrumentation and Controls

Locally mounted pressure indicators are located in the piping system to monitor pressure drops and provide early indication of solid material build-up in the wells or lengths of the french drain or forcemain piping. This will allow for scheduled cleaning of the pipelines or well redevelopment before flow restrictions occur. Monitoring of the system operation will take place locally at the individual wells and sumps. Local monitoring will include pressure and flow information.

In addition to the local monitoring at each well and sump, a computerized monitoring system is located in the EPS. This system receives electronically transmitted data from each well and sump, tracks performance of each well/sump and totalizes the combine flow from the entire design GWES. These data will be use to observe performance trends for each well/sump and to aid in planning GWES maintenance activities. This computerized monitoring system will be checked for internal function at each periodic Site inspection and during special visits to respond to alarm or malfunction signals from the system.

7.0 GWES TROUBLESHOOTING

This section contains troubleshooting guides for the major functions of the Groundwater Extraction Systems (GWES). The guides are presented in tabular format and are intended to help diagnose the potential cause of performance-related operating problems or irregularities. Possible corrective actions to be selected are also identified. As operating experience increases, the information contained herein would be revised, as appropriate, to reflect current conditions. Equipment manufacturer troubleshooting manuals will be used, as necessary, to supplement this information.

The troubleshooting guide for the GWES is included in Table 7-1.

The troubleshooting format is divided into four sections: Observation (the problem), Potential Cause, Sequence of Action, and Corrective Action. The Observation column contains a brief statement of the observed irregularity. The Potential Cause column identifies a possible cause for the observed problem. The listed potential causes should be initially reviewed to consider the most likely cause of a problem once it has been identified or identify a cause not defined in the guides. Then, an appropriate Sequence of Action can be selected to determine the cause of the problem. A stepwise procedure has been presented to determine the cause of the identified problem. Each step should be pursued to completion before proceeding to the next step, until the problem has been solved and Corrective Measures initiated. The Corrective Action column lists possible measures to resolve the potential cause of the problem.

Appropriate personnel should be familiar with the troubleshooting guides and procedures in order to minimize review time and more quickly identify potential causes of problems. Malfunctions should be evaluated, logged and discussed with appropriate personnel.

TABLE 7-1

GWES TROUBLESHOOTING GUIDE

Observation	Potential Cause	Sequence of Action	Corrective Action
1. Decrease in an individual extraction well yield (flow rate).	A. Damaged or clogged pump.	1. Check maintenance records on well pump.	1. Repair or replace, as necessary.
	B. Clogged well screen or sediment buildup.	1. Check well history.	1. Purge sediments and/or redevelop, as necessary.
	C. Local freezing.	1. Conduct inspection of heat tracing, low spots in piping.	1. Thaw frozen areas, repair and/or replace heat tracing, as necessary.
	D. Pump mechanical wear.	1. Inspect pump.	1. Repair or replace.
	E. Reduced water levels.	1. Review water levels.	1. Maintain or adjust to desired pumping rate.
2. Increase in individual extraction well yield.	A. Equipment malfunction.	1. Visual check of equipment.	1. Repair or replace equipment, as necessary
3. Decrease in flow rate from individual french drain sump.	A. Damaged or clogged pump.	1. Check maintenance records on well pump.	1. Repair or replace, as necessary.
			2. Clean out sump.

TABLE 7-1 (Continued)

GWES TROUBLESHOOTING GUIDE

Observation	Potential Cause	Sequence of Action	Corrective Action
	B. Local freezing.	1. Conduct inspection of heat tracing, piping, and valving	1. Thaw frozen areas, repair and/or replace heat tracing, as necessary.
	C. Pump mechanical wear.	1. Inspect pump.	1. Repair or replace.
	D. Reduced water levels.	1. Review water levels in sumps and manholes.	1. Maintain or adjust to desired pumping rate.
			2. Inspect french drain piping for sediment build-up; water jet clean, as necessary.
4. Significant decrease in EPS influent flow.	A. Electrical failure.	1. Investigate source.	1. Identify problem and correct.
	B. Leak in above-ground forcemain piping.	1. Visual inspection of piping.	1. Repair and/or correct problem.
			2. Shut down GWES if necessary.

TABLE 7-1 (Continued)

GWES TROUBLESHOOTING GUIDE

Observation	Potential Cause	Sequence of Action	Corrective Action
	C. Leak in below-ground forcemain piping.	1. Conduct inspection (follow enclosed space entry procedures if entering a manway).	1. Repair problem, as necessary. 2. Shutdown GWES, if necessary.
		2. Pressure test forcemain.	1. Locate and repair leak. 2. Shutdown GWES, as necessary.

8.0 GENERAL SITE INSPECTION AND MAINTENANCE

This section addresses general inspection and maintenance of various site features, including the RCRA Cap, Permeable Cover, Pond West of CAMU, stormwater management systems, access roads, and security fence and gates and the Ponded & Backwater Area. General site inspections will be performed on a quarterly basis to evaluate the condition of the site features. Scheduled inspections will be supplemented as necessary (e.g., when severe weather or flooding occurs). At the time the GWES is inspected, the Contract Operations firm will be required to conduct a basic site inspection. The Contract Operations firm will be provided a checklist for the basic site inspection. Maintenance will be performed as needed based on the findings of the inspections, in addition to regularly scheduled maintenance activities. Inspection and maintenance of the Groundwater Extraction Systems (GWES) are addressed in Sections 5.0 and 6.0, and in the CMI Groundwater Monitoring Plan.

8.1 RCRA CAP AND PERMEABLE COVER

The RCRA Cap and Permeable Cover, including the building slabs and river bank slope, will be inspected to check for evidence of settlement, subsidence, surface desiccation (cracks) or sloughing, erosion, or other defects. If minor defects or disturbances are detected, repairs will be performed by addition of material or by regrading, as appropriate. In the event that larger disturbances have occurred which significantly alter the direction of runoff flow, sufficient steps will be taken to restore the conditions to those shown on the Drawings, or as necessary to promote drainage and maintain the integrity of the cap/cover.

8.2 VEGETATIVE COVER

Inspections of the grassed portions of the RCRA Cap and Permeable Cover will be performed to evaluate its condition. In the event that ground cover is observed to have

become inadequate, the affected areas will be reseeded. Overgrowth of shrubs and other deep-rooted vegetation will be controlled, as necessary, to preserve the continued integrity of the RCRA Cap.

Routine maintenance of the vegetative cover will include mowing. Mowing will be performed eight times annually during the growing season for the five years immediately following construction, and then four times annually through to the end of the post-closure period, unless a greater frequency is required or a lesser frequency is sufficient to control growth. Other vegetative management operations (i.e., fertilizing, liming, and reseeding) will be performed on an annual basis, or as needed.

8.3 POND WEST OF CAMU

CM for the Pond west of the CAMU (referred to in the design documents as the Cement Company Pond) consists of a geotextile placed over the original ground surface in the pond, then covered with a 1-foot layer of crushed stone. Inspection of the crushed stone cover will be conducted to check for evidence of erosion or displacement of the stone and for exposure of the underlying geotextile. If evidence of erosion/displacement of the stone is detected, the stone surface will be either regraded to the required thickness shown on the Drawings or additional stone will be placed to achieve the design thickness. Should damage to the geotextile be detected, the damaged area will be patched, then covered with the thickness of crushed stone called for on the Drawings.

8.4 RIP-RAP

Rip-rap located along the toe of the riverbank, including rip-rap placed to restore areas in the river where designated deposits were removed, and at other site locations (e.g., as part of the surface drainage system) will be inspected to verify that it is intact and undisturbed. Rip-rap will be replaced, as necessary, to preserve the integrity of the riverbank slope and to provide erosion protection. Should it be established that other methods of erosion

control are warranted, problem areas will be corrected by adding additional erosion protection, as necessary.

8.5 STORMWATER MANAGEMENT SYSTEMS

The stormwater management systems will be inspected to verify that swales, level spreaders, and catch basins are clear to permit unimpaired movement of surface runoff, and that structures are intact and undisturbed. Maintenance of the swales and level spreader components of the surface drainage system will be performed semi-annually, at a minimum. Swales and level spreaders will be mowed or cleaned to remove excess vegetation, sediment, and other debris that may accumulate. Obstructions found in swales, level spreaders, catch basins, or at pipe or culvert outlets will be removed. In the event that swales or level spreaders are found to be damaged or incapable of retaining internal drainage; or that pipes, culverts, catch basins, and other appurtenances are not draining properly; repairs will be made as necessary for proper operation. Manholes and catch basins will be inspected on an annual basis to evaluate any damage or existence of sediment build-up; and repairs or cleaning will be performed as necessary.

8.6 ACCESS ROADS

The access roads consist of a compacted gravel surface to accommodate O&M vehicles. The roadways will be inspected annually for damage (e.g., cracks, potholes, or worn surfaces) and will be plowed, as necessary to facilitate operations and maintenance activities. Damage to the access roads will be repaired as soon as practical. Potential

repairs include filling potholes in gravel road surfaces and regrading along edges of the roadways, as necessary.

8.7 SECURITY FENCE AND GATES

The condition of the perimeter security fence, and gates and locks, will be inspected during periodic site visits to maintain site security and restrict access. Gates will remain locked to maintain access control. Repairs to fencing and gates, if needed, will be made as soon as practical. Gates and locks will be lubricated as needed, and locks will be replaced if damaged or corroded.

8.8 PONDED & BACKWATER AREA

The Ponded & Backwater Area (PBA), including the upland, wetland and free-water components, will be inspected to check for evidence of subsidence, surface sloughing or erosion, loss of vegetative cover, or other defects in the Corrective Measures, wetland mitigation or the wetland creation work. Should minor defects or disturbances be detected, repairs will be performed by addition of material or by regrading, as appropriate. Deteriorated vegetation will be replaced with comparable upland or wetland seed or plantings. In the event that larger disturbances occur, which might significantly alter the long-term performance of the corrective measures installed, appropriate steps would be taken to restore the affected area to conditions shown on the Drawings, or as necessary to repair and maintain the integrity of the corrective measures for the PBA.

In addition to the quarterly inspections of the PBA to monitor the integrity of the Corrective Measures (as approved by the NYSDEC), the U.S. Army Corps of Engineers (USACE) has mandated a program of monitoring and maintenance activities that focus on the wetland mitigation and creation and are to be conducted during the first 5 years following completion of the corrective measures and wetland mitigation/creation. The USACE monitoring program includes:

- Relative frequency and percent of cover of all plant species, identified using 10' by 10' plots, with one representative plot in each of the habitat types (i.e., upland, wetland and free-water). Plot locations to be recorded on a plan view drawing of the PBA.
- Vegetative cover maps prepared for each growing season; at a scale of 1"=100' or less.
- Photos of the wetland creation and mitigation areas, taken between June 1st and September 1st each year.
- Surface water and groundwater elevations in representative areas of the wetland creation and mitigation areas, taken twice per month from April 1st to September 1st. Well or gauging location(s) to be shown on a plan view drawing.
- Verification that all plantings in conjunction with the mitigation effort have an 85% survival and/or coverage rate by the end of the 2nd growing season following initial planting/seeding and that this survival/coverage rate is maintained thereafter. If the survival/coverage rate is not met, appropriate replanting and/or regrading measures, as necessary, would be performed so as to achieve the 85% rate by the end of the next growing season.
- Verify that no mowing of the mitigation area has occurred.
- Submit to the USACE an annual report on the status of all wetland creation and mitigation activities. This report is to be prepared during the growing season and submitted by September 30th of each year.

9.0 GENERAL SITE O&M SCHEDULE AND REPORTING

This section presents a summary of the frequency of O&M activities and describes the reporting of these activities during the post-closure period for the general site (i.e., exclusive of the PTS, which are discussed in Section). O&M activities begin at the completion of construction of the Corrective Measures as defined in the Project Construction Schedule (Attachment F to the Corrective Measures Design Report – June 1999) prepared pursuant to Module II, Section E.2.(a) of the HWM Permit.

9.1 SCHEDULE

The frequency of O&M activities for the General Site is summarized as follows:

GENERAL SITE O&M SCHEDULE

Activity	Frequency
Groundwater Extraction Systems O&M	
• Groundwater monitoring	(as described in the CMI Groundwater Monitoring Plan)
• Monitoring well inspection	(as described in the CMI Groundwater Monitoring Plan)
• Inspection of Extraction Systems components	Monthly
• Extraction well redevelopment	As needed
• French drain (e.g., piping, sumps, manholes) clean-out	As needed
• Equipment repair/replacement	As needed
• Monitoring well abandonment and installation	As needed

GENERAL SITE O&M SCHEDULE (Continued)

Activity	Frequency
General Site Maintenance	
• Inspection	Quarterly
• Cap/Cover repairs or regrading	As needed
• Reseeding	As needed
• Rip-rap replacement	As needed
• Stormwater Management Systems repair	As needed
• Mowing of vegetative cover	8/4 times annually [a]
• Fertilizing/liming of vegetative cover	As needed
• Cleaning of swales/level spreaders	Semi-annually
• Inspection of manholes/catch basins	Semi-annually
• Inspection of access roads	Quarterly
• Inspection of security fence/gates	Quarterly
• Access road repair	As needed
• Fence/gate repair	As needed
Ponded & Backwater Area	
• Inspection – upland and wetland	Quarterly
• Cover repairs or regrading	As needed
• Upland reseed	As needed
• Wetland reseed &/or replant	As needed

GENERAL SITE O&M SCHEDULE (Continued)

Activity	Frequency
Reporting	
• General Site Post-Closure O&M Reports	Quarterly
• Groundwater Monitoring Reports	Quarterly/Semi-annually (as described in the CMI Groundwater Monitoring Plan)
• Annual Reports	Annually
• Ponded & Backwater Area Annual Reports to USACE	Annually (for the first 5 years following wetland mitigation/creation; i.e., for 2002 through 2006)

[a] Mowing of the Main Plant Site grass (i.e., RCRA Cap area and Permeable Cover area) will be performed eight times annually during the growing season for the five years immediately following construction, and then four times annually through to the end of the post-closure period, unless a greater frequency is required or a lesser frequency is sufficient to control growth.

9.2 REPORTING

Post-Closure Operations and Maintenance Reports will be submitted to the NYSDEC on a quarterly basis. These reports will contain the following information for the reporting period:

- work completed;
- summaries of changes made;
- summaries of contacts made with representatives of the local community and public interest groups;

10.0 PTS DESCRIPTION

The Groundwater Extraction Systems (GWES) by design extract groundwater from the Overburden and upper Bedrock (Horizons A and B) water-bearing zones and intercept groundwater flow from the site that contains constituents at concentrations above Groundwater Protection Concentrations (GWPCs). Groundwater from the extraction systems is ultimately discharged to the City of Glens Falls Publicly Owned Treatment Works (POTW). On December 20, 2000 Hercules and Ciba submitted an application to the City of Glens Falls - Water and Sewer Department to renew the existing Industrial Wastewater Discharge Permit No. 002 (A). In this application, phased limitations were requested. A stay of current limitations was requested until the completion of Corrective Measures construction, plus 30 days, as Phase 1. Thereafter, Phase 2 limitations were requested to be based on estimated post-construction groundwater characteristics and available PTS capacity. As stated in this application, whether or not pretreatment is needed and the degree of any required pretreatment depends on actual groundwater characteristics observed, and the final (Phase 2) criteria issued by the City of Glens Falls. If water received from the Groundwater Extraction System (GWES) is below POTW discharge criteria, then GWES effluent would be pumped directly from the Effluent Pump Station (EPS) to the POTW.

As of November 2001, Phase 2 discharge criteria have not been issued by the City and long-term GWES effluent charcteristics are not yet defined. Thus, it is not possible to define what pretreatment requirements will be for the long-term. However, Hercules/Ciba are committed to operating current PTS, as necessary, to meet discharge criteria established by the City. Presently, this involves operating the PTS used by the Contractor to pretreat contact waters during CM construction. Use of this system would continue at least until long-term discharge criteria are issued by the City and long term groundwater influent characteristics are better defined. Operation and maintenance components described in this PCP are, therefore, primarily relevant to the contingent plan for utilizing the existing PTS until arrangements are complete for direct GWES effluent discharge to the POTW.

PTS = Pre-Treatment System

10.1 INTRODUCTION

This plan addresses the treatment of waters generated from GWES, in the event pretreatment continues to be necessary. These waters will be treated on site by the existing Pre-Treatment System (PTS). This PTS is the system (configuration and process) set up by the Contractor and successfully used during construction of the Corrective Measures (CM) to pre-treat contact waters (i.e., runoff water, french drain water and extraction well water). The PTS modifications (i.e., from the system that pre-dated the CM construction) were designed, built, maintained, and repaired by IT Corporation (the CM construction contractor) during the CM construction phase. IT Corporation and Water Remediation Technologies (the company that supplied each treatment resin) conducted field tests to confirm the adequacy of these PTS processes. IT Corporation subsequently prepared an Operation and Maintenance Manual for use by the PTS operators and those responsible for it maintenance. Hercules employees have operated the system, collected influent and effluent samples, and performed basic maintenance tasks during the course of the construction work, under the direction of IT's site superintendent. Treated contact water was discharged to the POTW, via the pre-existing (i.e., prior to CM construction) dedicated forcemain, in accordance with the current Permit. The existing PTS has demonstrated that the treatment processes reduce cyanide and chromium concentrations, as well as other permit-limited parameters, to levels that meet the Permit criteria. This PTS will continue to be operated and maintained, by Hercules , in such a manner that water discharged will meet the criteria identified in the Permit. The current Permit was initially issued June 24, 1991 and renewed without change on June 12, 1996 (a copy of the full Permit is presented in Appendix A).

During the course of CM constructrion at the site, the PTS, as presently configured, has been effectively treating site related contact water and discharging the treated water with constituent concentratins well below the POTW criteria. Influent and effluent samples

for the site related contact waters have demonstrated the effectiveness of the MetallX process in removing the constituents of concern.

10.2 GENERAL DESCRIPTION

The PTS begins with the discharge of collected groundwater, from the extraction wells and french drain sumps, to the equalization tank T-110. Water derived from the GWES is conveyed to T-110 by the buried forcemain, which is a part of the GWES. A detailed functional description of the PTS equipment components is described in subsequent sections of this plan.

The equipment comprising the PTS are identified in Table 10-1, the Major Equipment List, and their positions in the process are illustrated in Figure 1, Process Flow Diagram and Figure 2, Process & Instrumentation Diagram (both figure were prepared by IT Corporation, the CM construction contractor responsible for the design and construction of the plant as presently configured). The PTS has a maximum flow rate of 200 gpm, but more typically operates on an intermittent basis at a rate in the range of 100 to 150 gpm. With a maximum operating flow of 200 gpm, the system is capable of handling fluctuations of influent water volumes. Fluctuations in the influent water volume are believed to be a consequence of leakage of water from the Glens Falls Feeder Canal and stormwater runoff from the Town of Queensbury that infiltrate the overburden at the site and are captured by the french drain. Efforts are in progress to reduce the contribution of water from these two sources to the french drain. If and when these efforts are successful, the fluctuations in flow from the GWES to the PTS are expected to greatly diminish. As was explained in the CM Design Report, design flow from the GWES (independent of canal leakage and runoff from Queensbury) is predicted to be in the range of about 20 to 30 gpm. Data collected during CM construction indicated surge flow from the canal leakage and Queensbury runoff in the range of about 10 to 70 gpm, depending on canal flow-level and climatic conditions. Surges in the flow rate due to local storms and/or canal leakage are handled by increasing flow rates through the PTS, extending the process operation duration and by maintaining T-110 at an operating capacity of 100,000

TABLE 10-1
MAJOR EQUIPMENT LIST (MEL)[1]

ITEM	QUANTITY (and ID#)	TYPE	PURPOSE and (STATUS)
Equalization Tank	1 (T-110)	Coated steel tank, 500,000-gallon total capacity, 350,000-gallon typical operating capacity	Receives influent from the GWES, provides for contaminant load equalization and allows settlement of particulates. In addition, receives recycled water from backwash operations and stores influent and backwash water during PTS shutdown for maintenance/repairs. Its large storage volume compared to the GWES pumping rate enables operation of the PTS on an intermittent, batch-treatment basis.
Influent Pump	2 (P-1001, P1002)	End Suction 2.5" x 3"	Transfer water through the process train at 200 gpm, at 70' TDH (1-operating, 1 spare)
Chemical Addition System	2 New units, CFP-1 & CFP-2	HCL and NaOH	To add a chemical prior to anion exchange to lower pH (HCL) or raise pH (NaOH). Chemical pumps are positive displacement metering pumps, 100:1 turndown ration, 100 psig.
Sand Filter	1 Duplex Unit (SF-1, SF-2)	IT Corporation 15 psig (maximum allowed for these non-pressure vessels), 8,000 lb. unit, 100 gpm each.	Filter particulates that did not precipitate in T-110 (350,000-gallon Equalization Tank). Backwash at 8 – 10 psid increase compared to clean units.
Holding Tank And Mixer	1 (T-1001) and (M1001)	New, IT, 2000-gallon, HDPE vertical, flat bottom.	Pump reservoir for P-1003 transfer to IX and MX vessels. Also, pH adjustment. (Chemtainer).
IX, MX Transfer Pump	1 (P-1003)	New, End Suction 2" x 3"	Transfer water through filters, anion vessels and MetallX vessels. (Goulds 3657/3757, 200 gpm @ 170' TDH – 20 HP)

TABLE 10-1
MAJOR EQUIPMENT LIST (MEL)[1]

ITEM	QUANTITY (and ID#)	TYPE	PURPOSE and (STATUS)
Bag Filters	2 Duplex Units (BF-1 & BF-2)	IT Corporation 150 psig, 100 gpm each pair; 200 gpm total	Filter particulates from process stream downstream of treatment media. Change bags at 8 – 10 psid increase compared to new units. (ASME Model by Rosedale.)
Anion Exchange System	1 Duplex Unit (IX-1, IX-2)	IT Corporation 80 psig, 8,000 lb. unit, 100 gpm each; 200 gpm total	Remove sulfate from the process stream prior to metals removal. Brine regeneration on site; ASME rated, but not stamped, fiberglass vessels; top mounted motorized cycle valve. Backwash at 8 – 10 psid increase compared to clean units.
Brine Tank and Eductor	1 each (T-1002	1000-gallon storage vessel, Fiberglass	Regenerate SBA resin for sulfate removal and reuse. Eductor provides "pumpless" addition of Brine or Bleach (NaOCl) solution using city water. Bleach for cyanide rinse of anion resin.
MetallX Resin Filter	1 Duplex Unit (MX-1, MX-2)	IT Corporation 80 psig, 8,000 lb. unit, 100 gpm each; 200 gpm total	Remove multivalent anions from the process stream prior to discharge, last stage on WTP. No on site regeneration planned. Backwash at 8 to 10 psid increase compared to clean units.
Backwash Pump And Tank	1 (P-1004, T1003)	New, IT, End Suction 2" x3" 1000-g Tank, HDPE Vertical Flat	Backwash media filters to remove collected solids. (Goulds Pump No. 3657/3757 200 gpm @ 100" TDH, 10 HP)

1. This table is adapted from Table 1 prepared by IT Corporation as part of the Contractor's Pre-treatment Plan for contact –water management and treatment during construction of the CM at the site.

IMAGE	X-REF	OFFICE	DRAWING NUMBER
---	---	Trenton, NJ	805837-B2

GW EXTRACTION SYSTEM

(EXISTING) 500,000 GALLON EQUALIZATION TANK

SOCK FILTER (EXISTING)

SOCK FILTER (EXISTING)

BACKWASH RETURN LINE (EXISTING)

(EXISTING)

(EXISTING)

INFLUENT PUMPS

(EXISTING) SAND FILTER (1)

(EXISTING) SAND FILTER (2)

pH ADJUST (NaOH) CAUSTIC

HOLDING TANK

IX TRANSFER PUMP

1,000 GALLON BACKWASH TANK

BACKWASH PUMP

BACKWASH WATER SUPPLY (CITY SOURCE)

BACKWASH RETURN

SO4/ BRINE REGENERANT SOLUTION

CN/BLEACH REGENERANT

CN/

SO4/ BRINE REGENERANT

METALLX VESSEL (A)

METALLX VESSEL (B)

ANION ION EXCHANGE VESSEL (A)

ANION ION EXCHANGE VESSEL (B)

BAG FILTER 3

BAG FILTER 1

BAG FILTER 4

BAG FILTER 2

BACKWASH LINE

BACKWASH LINE

DISCHARGE TO POTW

BRINE TANK

REGENERATION (INTERMITTENT)

BLEACH

REGENERATION (INTERMITTENT)

EDUCTOR

pH ADJUST

HCl ACID

SEAL

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

IT CORPORATION

HERCULES
WILMINGTON, DELAWARE

FIGURE 1
PROCESS FLOW DIAGRAM
HERCULES
GLENS FALLS, NEW YORK

DESIGNED BY			CHECKED BY	
DRAWN BY	D. Leach	5/24/00	APPROVED BY	
SCALE: NTS	DRAWING NO. 805837-B2		SHEET NO. P-1	REVISION NO.

PLOT DATE: 5/24/00
FORMAT REVISION 3/25/99

IMAGE	X-REF	OFFICE	DRAWING NUMBER
---	---	Trenton, NJ	805837-B4

BF-1, BF-2, BF-3 AND BF-4
BAG FILTER UNITS

MX-1, MX-2
RESIN CONTACTORS UNITS

SF-1
SAND FILTER (EXISTING)

SF-2
SAND FILTER (EXISTING)

IX-1, IX-2
AXION EXCHANGE VESSELS SBA RESIN

P-1001, P-1002
INFLUENT PUMP AND SPARE

P-1003
IX, MX FEED PUMP

P-1004
BACKWASH PUMP

T-1001
HOLDING TANK

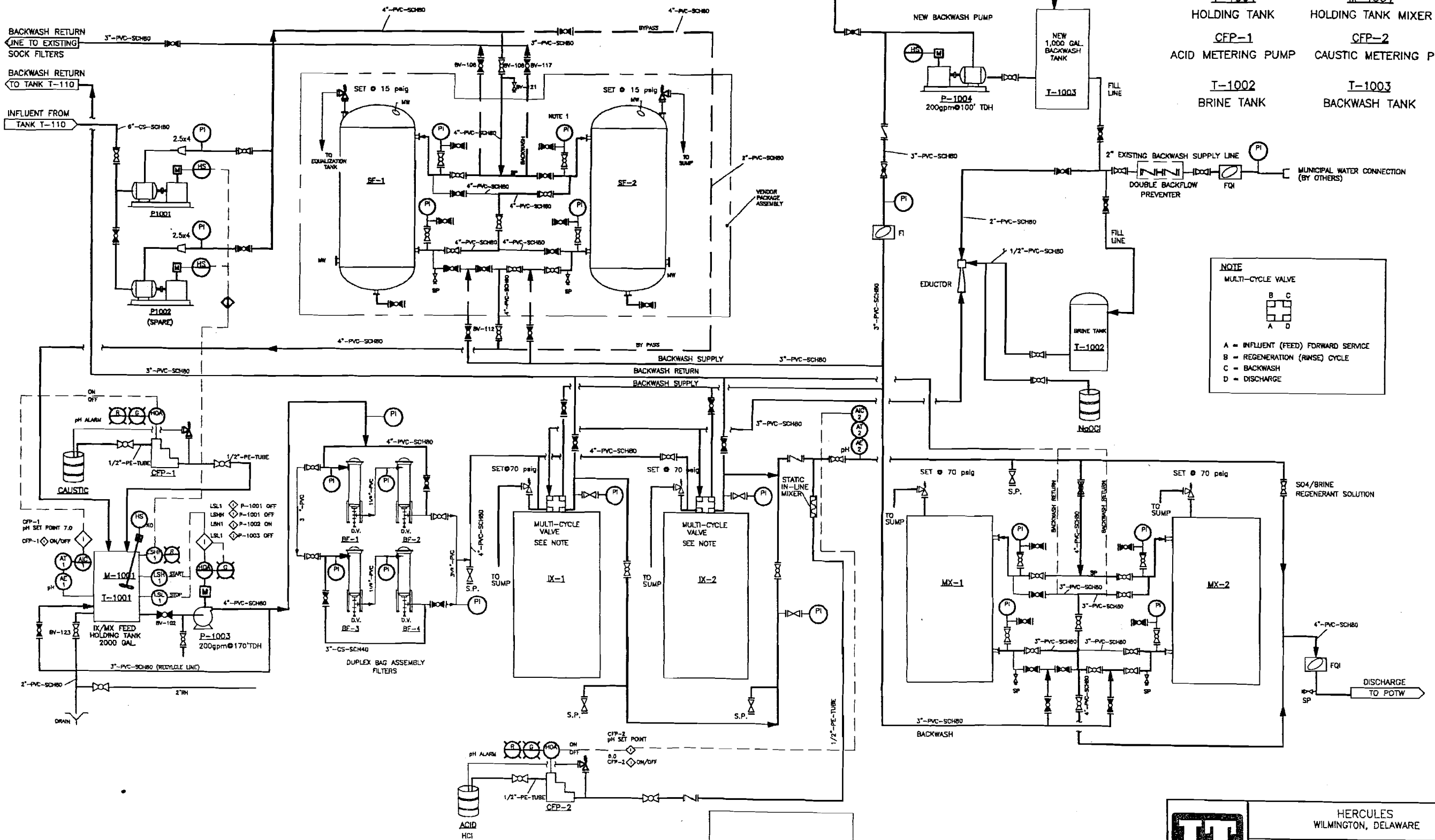
M-1001
HOLDING TANK MIXER

CFP-1
ACID METERING PUMP

CFP-2
CAUSTIC METERING PUMP

T-1002
BRINE TANK

T-1003
BACKWASH TANK



SEAL

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

IT CORPORATION

HERCULES
WILMINGTON, DELAWARE

FIGURE 2
PROCESS & INSTRUMENTATION DIAGRAM
HERCULES
GLEN FALLS, NEW YORK

DESIGNED BY	E. Weinberg	5/24/00	CHECKED BY	TA	
DRAWN BY	D. Leech	5/24/00	APPROVED BY		
SCALE: NTS	DRAWING NO. 805837-B4		SHEET NO. P-2		REVISION NO.

PLOT DATE: 5/30/00
FORMAT REVISION 3/25/99

gallons, leaving a surge capacity of 250,000 gallons available (based on a total volume of T-110 of 500,000 gallons and a safety margin of 150,000 gallons). On the basis of using the PTS at its typical processing rate (i.e., 100 to 150 gpm) during normal influent flow volume (about 30 gpm) and the upper processing capacity during surge flow volume (i.e., around 100 gpm), the PTS would typically operate for 1 shift or less per day at the normal influent volume and 1.5 to 2 shifts per day during high flow conditions.

The basic configuration of the PTS uses specialty resin (MetallX) in contactors for continuous removal of Cyanide (CN) and Chromium (Cr). A benefit of a resin-based ion exchange syetem is that the adsorption process is resilient to variability in the influent concentrations of the contaminants the resin is removing. Useful life of the non-regenerable MetallX resin is a function of the chemical equalibrium established between the influent water and the media, as well as the capacity to exchange ions and chemically react with the particular matrix. Compounds within the matrix, such as salts and non-target inorganic constituents of concern can directly affect the efficiency and useful life of the MetallX process. Because site groundwater exhibits elevated concentrations of sulfates and carbonates, a potential existed to impede the Cr and CN removal process. Consequently, an anion exchange system was incorporated, before the specialty media (MetallX), to protect the integrity of the metal removal process. Details of the anion exchange system are described in Section 10.3.1.4.

10.3 PROCESS EQUIPMENT

The existing PTS incorporates equipment that will reduce contaminant levels from the concentrations in the waters received from the GWES to below the regulated discharge concentrations as stipulated in the POTW Permit. The PTS includes the following major equipment components:

- Equalization Tank
- Influent Feed Pump and Filtration Systems (Duplex Sand Filter and Bag Filter Assemblies)

- Anion Exchange System
- Chemical Addition System
- MetallX Contactor Assemblies in series
- Backwash System

A brief description of these components and their function in the system follows. The Major Equipment List (MEL), prepared by IT Corporation, is presented in Table 10-1. The arrangement of these components in the process and in the plant building is shown on Figure 2 (P&ID) and Figure 3 (General Equipment Arrangement, also prepared by the CM construction contractor).

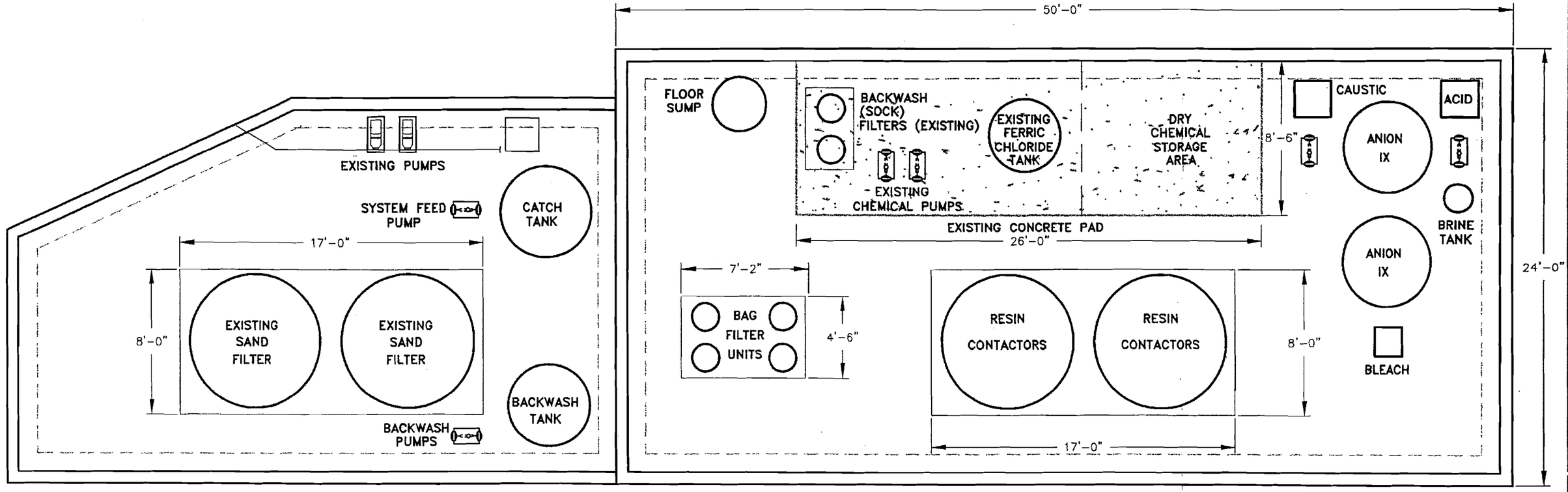
10.3.1 Equipment Description

10.3.1.1 Equalization Tank

The purpose of equalization is to provide attenuation and allow excessive solids to settle. The existing equalization tank (T-110) has a maximum capacity of approximately 500,000 gallons of water. This tank size provides an adequate storage volume in the event that the PTS is to be shut down for backwashing, maintenance, or repairs. During PTS operations tank T-110 would maintain an operational volume of 100,000 gallons and have an additional 250,000-gallon storage capacity to handle surge flows and water that accumulates during periods of PTS shutdown. During off hours (i.e., when the PTS is not operating and an operator is not present), if excessive volume is encountered in T-110 (i.e., filling to 350,000 gallons or greater), a high alarm float would activate an auto-dialer that contacts the on-call PTS operator.

10.3.1.2 Sand Filter

Water from the equalization tank T-110 is pumped, using the Influent Feed Pump, through a non-pressure-rated sand filter, capturing solids by filtering the flow



SCALE: 3/16"=1'-0"

SCALE: 3/16" = 1'-0"

0 2 4 6 8 10 FEET

REV	DATE	BY	CHK'D	APR'VD	DESCRIPTION/ISSUE

IT CORPORATION

HERCULES
WILMINGTON, DELAWARE

FIGURE 3
GENERAL EQUIPMENT ARRANGEMENT

DESIGNED BY	TA	5/24/00	CHECKED BY	EW	5/30/00
DRAWN BY	DL	5/30/00	APPROVED BY		
SCALE: AS SHOWN	DRAWING NO. 805837-B5		SHEET NO.		REVISION NO.

through a layer of fine sand media. This helps protect the downstream resin contactors from being fouled by suspended or flocculated particulates. Continuous filter operation is periodically interrupted to backwash the accumulated particulates. During backwashing, rejected water is transferred via a backwash pump to the tank T-110, where it can be re-processed through the PTS. The sand are designed to be operated at pressures of less than 15 psi. Process water coming from the sand filter is discharged into an overflow tank equipped with a pump that transfers process-water through the remaining components of the treatment system. This overflow tank is equipped with alarm floats that activate/deactivate the pump and shutdown the sand filter influent pumps in the event the liquid level in the tank reaches a high tank level sensor/switch. By changing the position of the valves on the overflow-tank side, backwash procedures flush particulates from the media back to tank T-110, from which it would be re-processed through the PTS.

10.3.1.3 Duplex Bag Filter Assemblies

Two Rosedale duplex bag filter assemblies are used to remove solids that are not removed by the sand filters, so as to protect the specialty resin that follows from fouling. These units are capable of handling 150 psi, are equipped with Kunkle relief valves, and may be operated at a forward flow rate of 200 gpm. Each unit is piped with 3" diameter, Schedule 40 carbon steel, Nibsco butterfly valves. These units are pressure certified and are ASME stamped. The duplex arrangement enables bag change-out without interrupting the operation of the PTS.

10.3.1.4 Anion Exchange System

Due to elevated concentrations of sulfate in the water to be treated, an anion exchange system is installed to prevent the MetallX resin from adsorbing sulfate. This step extends the life of the resin by not allowing sulfates to reach the resin and occupy sites intended for the capture of Cd or CN. Thus, preserving its metal

removal abilities. The anion exchange unit is a pre-piped system, designed to process 200 gpm and consists of two 63" diameter by 60" high fiberglass vessels, each equipped with programmable, automatic four way control valves and adjustable pressure relief valves. A strong base anion exchange resin, SBG1, supplied by Resin Tech of Cherry Hill, NJ is used to remove the sulfate from influent water. The anion exchange resin design parameters are 2-4 gpm/sq. ft. of resin surface, and a minimum bed depth of 2 feet. These vessels provide freeboard for a 40-60% bed expansion during backwashing. Also included in the system are two pH controllers: one that adjusts or maintains the influent pH at 7 and a second controller on the system effluent to suppress the pH to 6 through hydrochloric acid injection. Using hydrochloric acid to suppress the pH converts residual divalent carbonate anion to bicarbonate. This prevents the MetallX resin from adsorbing carbonate, preserving the MetallX for cyanide and chromium (as well as other metals or ferrocyanide, as may be present) removal.

Maintaining the anion exchange resin's sulfate removal efficiency is accomplished by utilizing an on-site brine regeneration system. Approximately every three to seven days (depending on influent sulfate concentration) the anion exchange system needs to be regenerated by rinsing with 1000 gallons of a 15% brine solution, which is an application rate of approximately 10 lbs. of salt per cubic foot of anion exchange resin. The spent regenerating-solution only contains the sulfate anion and may be directly discharged to the sewer system (pipeline to the POTW). In this manner, concentrated sulfate is not routinely re-introduced into the PTS.

The anion exchange resin also removes ferrocyanide, which complements the MetallX removal efficiency and requires on-site regeneration using bleach. This regeneration process occurs approximately once per month and requires a 5% solution of sodium hypochlorite. The solution is applied using the brine eductor system. The regenerant solution is sent directly to the MetallX vessels where the MetallX resin adsorbs the ferrocyanide complex.

A four cycle motorized valve in this component of the system allows a backwash cycle that is manually initiated when the pressure drop (PSID) across either vessel reaches approximately 8 to 10 psi. During backwashing, one vessel remains on line while the other vessel goes through a backwash cycle. Flow from the backwash cycle is directed to tank T-110, from which its is re-processed.

10.3.1.5 Contactor Assembly Solmetex MetallX Resin

This 200-gpm system is configured with two 84" diameter vessels, each containing 3400 pounds of MetallX resin (see attached product literature). These units are skid-mounted and were furnished pre-piped. They are installed for lead-lag, series operation. The unit is equipped with 3" influent and effluent lines, 80-psi water and air relief valves, 20" cam-lock manways, access ladders, 0-60 psi pressure gauges, and is capable of handling 200 gpm. Tank units are welded and stamped to meet ASME codes. Each is constructed of 5/8", A-36 carbon steel plates, and has a 1/8" corrosion allowance on the tank heads and shell.

The use of the specialty resin has proven (based on laboratory analyses of influent and effluent samples) to be an effective means to allow the PTS to handle a wide range of concentrations in the inlet COCs. The column life is projected to be in excess of one year, because the life-shortening divalent anions present in the GWES water (e.g., carbonate, and sulfate) are removed by the anion exchange system and, if necessary, by pH adjustment. As stated above, the rinse and regeneration cycles for the anion exchange system are performed on a routine basis, so as to enable the MetallX resin to efficiently perform removal of multi-valent metals and other COCs from the process water.

A backwash system is used to clean (not regenerate) the MetallX resin, as necessary. One vessel would remain on-line while the other vessel goes through its backwash cycle. A backwash cycle would be manually initiated when the

PSID across either vessel reaches approximately 8 to 10 psi. Flow from the backwash cycle is directed to tank T-110, from which its is re-processed.

10.3.1.6 Miscellaneous Equipment

The PTS is equipped with two influent pumps, recently updated with new larger motors and new larger impellers. These pump upgrades enable the system to operate as described herein.

The existing backwash system receives water from a connection to a city (Town of Queensbury) water source. This connection routes water to a 1000-gallon holding tank, equipped with a pump to force flow back through the various elements subject to backwashing, as discussed above. An existing backwash sock-filter system continues to be used in the system to filter backwash liquid from the sand filters and the MetallX contactors before such water is returned to T-110.

11.0 PTS OPERATION

This section discusses the normal operation and alternate operation for the PTS. A description of how each process should typically function is included under normal operation. Alternate operation addresses how the identified unit processes may be bypassed or operated in an alternate arrangement, as applicable. Section 10.3 may be referenced for specific information on system components.

11.1 OVERVIEW

The PTS is manually operated intermittently to semi-continuously at a flow rate commensurate with the influent rate of extracted groundwater. Based on the projected flow rate (see CM Design Report – June 1999) of approximately 22 gpm from the design GWES, plus an additional 10 to 70 gpm from the backup pump in french drain Sump B, it would take from ¾ to 2 days to raise the level in T-110 by 100,000 gallons. With the PTS operating at a processing rate of 150 gpm (it is capable of processing 200 gpm), the plant would only have to operate from about 5 to 15 hours per day to pre-treat water received from the GWES. Operating hours and operator shifts will be adjusted, as needed, to coincide with the water flow being received from the GWES. The following sections describe PTS operations under normal and alternative operating procedures.

The PTS process flow diagram (Figure 1, in Section 10.0) shows the major pre-treatment processes and their inter-relationships. The major components of these processes are described in Section 10.3. Equipment specifications are summarized in Table 10-1 (Major Equipment List).

A description of the normal and alternative operating procedures for each major unit process is provided in the following sections.

11.2 PERMITTIING

Permitting associated with operations of the PTS and discharge to the POTW currently exists in the name of Hercules and Ciba. The current Permit [#002(B), a renewal of #002(A)] was renewed by the City of Glens Falls Water & Sewer Department on June 12, 1996. A complete copy of this Permit is included in Appendix A to this PCP. This Permit is renewable every 5 years; i.e., renewal was schedule for June to July, 2001. However, as stated in the correspondence from the City of Glens Falls Water & Sewer Department (dated July 31, 1996) renewing the initial Permit, the terms of this permit are to remain unchanged until evaluation of the Permittees request to modify the terms of the Permit (see discussion in Section 10.0) are finished.

CMI = Corrective Measures Implementation

Activities associated with the treatment and discharge of GWES waters, as the closure moves from CM construction into the O&M phase of the CMI, are the same as presently underway and, as such, remain covered under existing permits. It is understood that no modifications or amendments to these permits are known to be required and that Hercules/Ciba plan to continue to abide by current permit requirements. In the event that an agreement is reached with the City of Glens Falls POTW that permits direct discharge (i.e., without pre-treatment) of GWES waters, an amendment to this PCP, to account for such change, will be presented for NYSDEC review and approval.

11.3 COMPONENT FUNCTION

Normal and Contingency Operation.

11.3.1 Equalization Tank (T-110)

Normal Operation. Waters collected by the GWES are pumped directly to tank T-110. This is the first step of the pre-treatment process and is used to effect load equalization in a 350,000-gallon holding tank (T-110). Tank T-110 has a maximum total volume of 500,000 gallons, but its operating capacity is limited to 350,000 gallons to provide freeboard and surge storage. The size of this tank also provides adequate storage volume in the event the PTS has to be shutdown for backwashing, repairs or maintenance.

Groundwater is pumped from the extraction wells and french drain sumps to the equalization tank (T-110), located adjacent to the Pre-treatment Building. The flow to T-110 is measured using flow meters in each well and sump of the GWES and is totalized by a computerized monitoring system (refer to Section 6.1.3), located in the Effluent Pump Station (EPS). The purpose of Tank T-110 is to store a quantity of influent in order to minimize variations in the concentrations of constituents in the groundwater. Also, this tank provides sufficient storage volume to allow for internal recycles for operational flexibility. The tank is baffled and equipped with a manually operated, top-entering, constant speed mixer to to disperse a floculant in the event such is necessary to remove suspended solids. The pH of the T-110 effluent is measured by an in-line pH analyzer.

T-110 is equipped with a high level (HL) sensor with output signals to an internal alarm system. The GWES pumps operate on a semi-continuous basis (i.e., cycling on and off occasionally), sending flow to T-110. If a malfunction occurs in the PTS, the liquid level in T-110 could continue to rise to the HL sensor. At HL, an alarm activates to notify the operator on duty. The operator, in turn, is to shut off any operating components of the PTS as well as the groundwater extraction pumps. After ascertaining and correcting the malfunction, the PTS and the GWES systems would be returned to the operating mode.

Alternate Operation. Alternate operation of T-110 could consist of the introduction of flocculants (e.g., ferrous sulfate) and allowing residence time for flocculation and settlement of cyanide/metals, in the event of a substantial concentration increase in the influent stream or for some other modification to enhance metals removal. In the event of a pH imbalance, the pH may be adjusted in T-110 to improve metals removal, by the introduction of a compatible pH adjustment chemical.

11.3.2 Sand Filtration

Normal Operation. Effluent from T-110 is pumped through the non-pressure (less than 15 psi) sand filters to remove suspended solids. These filters are operated in downflow, parallel mode, with one in operation and one in standby mode. The pumps are manually alternated on a regular basis to provide equivalent run times.

Each sand filter is manually backwashed based on pressure buildup in the vessel, while maintaining forward flow through the other unit. Backwashing is performed based on a prescribed pressure build-up across a filter. The filter to be backwashed is manually taken off-line and the standby filter is put into operation. City water, taken from a 1000-gallon backwash holding tank, is pumped by the backwash pump through the sand filters. Backwash water is returned to T-110 for reprocessing, after first passing through in-line sock filters.

Alternate Operation. In the event of equipment failure or normal maintenance (e.g. media change-out), one filter may be taken off line. However, in this mode of operation, it would not be possible to backwash the filter that remained in operation. Due to the storage volume of T-110, there is expected to be adequate storage capacity such that GWES pumping would not be have to be interrupted during this operating condition. The complete sand filtration system can be bypassed for maintenance or operational flexibility. Additional filtration of the forward flow is provided by the subsequent bag filtration system.

11.3.3 Duplex Bag Filtration System

Normal Operation. The duplex bag filtration system consists of two trains, with two filter units in each train. Effluent from the sand filters flows under pressure through known nominal-rated bag filters, which may be operated in series or parallel mode. Typically, 5- to 10-micron filters are used to obtain required performance. The filtration system is manually switched between trains at a predetermined intervals. During the time

when one train is shutdown, the bags in that off-line filter are changed. The pressure drop for switching filter trains may be modified based on experience and to optimize performance. Used filter bags are placed into drums for storage until disposal.

Alternate Operation. In the event one of the two filter trains must be removed from service for an extended period, the system can be operated with a single filtration train. However, with only one train functioning, forward flow through the filtration system would have to be temporarily discontinued for filter bag replacement. T-110 is has adequate capacity to allow for a temporary interruption of the forward flow without interruption of GWES pumping. The entire filtration system may also be bypassed, if necessary, for equipment maintenance or for operational flexibility.

11.3.4 Anion Exchange System

Normal Operation Process water coming from the duplex bag filters is routed through one of the two anion exchange vessels. The anion exchange resin functions to reduce sulfate concentration in the process water to be subsequently sent through the MetallX resin contactors (see Section 11.2.5). By reducing the sulfate concentration before the water enters the MetallX the useful life of the MetallX resin is extended. Flow is routed through one vessel at a time. Flow is manually switched betweeen units to maintain approximately equal operation times.

Alternate Operation On a periodic basis, depending on the flow rate from the GWES and the sulfate/carbonate concentrations in the GWES water, the anion exchange resin requires regeneration to restore efficiency. In the alternate operating mode, the anion exchange resin is rinsed, using a 15% brine solution, at the rate of about 10 pounds of salt per cubic foot of resin. The parallel arrangement of the 2 vessels enables backwashing of one while the other remains in operation. The anion resin also removes ferrocyanide from the process water. As a consequence, the resin has to be periodically regenerated using a bleach solution. As with the sulfate, ferrocyanide accumulates based on the flow volume and concentration in the water from the GWES. Regeneration is expected to be

needed about once per month or less and is accomplished using a 5% solution of sodium hypochlorite. The sodium hypochlorite regenerant solution is sent to the MetallX contactor where that resin adsorbs the ferrocyanide complex.

11.3.5 MetallX Resin Contactors

Normal Operation After being pumped throught the sand filters, then through the anion exchange system, process water is directed throught the MetallX resin contactors. In passing through this resin, multi-valent anionic metal species are removed from the process water stream. There are 2 contactor vessels, each of which is able to process the full anticipated forward flow throught the PTS. Typically, only one vessel is active at any given time. However, these vessels are plumbed in series and parallel so as to provide maximum flexibility in system efficiency.

Alternate Operation The alternate operating mode for the MetallX resin system is to cease processing water through one vessel in order to change-out the resin media. This is accomplished by changing valve positions to redirect flow through the other vessel. Spent MetallX adsorbent is then removed from the isolated vessel and fresh resin refilled into that vessel. This resin is not amenable to regeneration and must be disposed of after use. Because of the presence of the anion exchange system in the treatment process, the life of the MetallX resin is significantly prolonged. Based on the performance of this resin system during the CM construction activities, it is anticipated that each vessel-charge of this resin may last for 2 years or more.

11.3.6 Wet Well in EPS and Discharge Forcemain

Normal Operation. Post-treatment, effluent is pumped to the wet well located in the EPS. This acts as a temporary storage vessel and provides a means to accumulate approximately 20,000 gallons of treated effluent and batch pump it to the POTW, which is more efficient than continuous pumping. Effluent is pumped (by either or both of the 150 gpm discharge pumps) from the EPS wet well to the POTW through an existing,

dedicated 20" diameter forcemain. In normal operation, float switches in the EPS wet well activate and deactivate the discharge pumps. These discharge pumps are manually alternated on a regular basis to provide equivalent run times. The EPS is equipped with an in-line pH meter for effluent monitoring. A high level alarm in the EPS alerts the PTS operator so as to shutdown forward flow in the PTS and prevent overflow of the wet well in the EPS. Sanitary discharge from the PTS and the Site operator's trailer is discharged into the wet well of the EPS for discharge to the POTW. Check valves are provided to prevent backflow.

Alternate Operation. If a pH or other compliance problem is detected in the process flow reaching the EPS wet well, it is possible to manually recycled the water to T-110 for reprocessing. Alternate operation of the EPS wet well itself is expected only to consist of shutdown of the pumping equipment for maintenance/repair or to facilitate sludge removal/cleaning of the wet well. In this alternate mode, the PTS would be temporarily shutdown. During such PTS shutdown period, the available storage capacity in T-110 would be utilized to accumulate influent from the GWES.

11.4 HAZARDOUS WASTE DISPOSAL

The Permittee is responsible for the coordination and proper disposal of site generated K002 to K007 listed hazardous waste from the treatment process. Bag filters generated from the PTS will be placed in a satellite storage accumulation drum, staged in a secure storage room inside the existing PTS building. When this drum is full, it is to be marked with an accumulation date and moved, within 3 days, to the exempt drum storage location. Full accumulation drum(s) are to be stored in the exempt storage location for less than 90 days prior to shipment for disposal.

Spent MetallX resin adsorbent from the contactors would be sampled and subjected to Toxicity Characteristic Leaching Procedure (TCLP) testing to evaluate requirements for proper shipping and disposal. Expended sand filter media, when removed during change-out, is to be treated as hazardous waste and disposed off-site. Hazardous waste disposal

services are to be performed by a licensed hazardous waste contractor, and such materials are to be disposed at a properly licensed facility. These practices remain unchanged from the procedures that have been followed by Hercules for many years in operating the PTS.

Drums containing hazardous waste are to be labeled with an EPA Hazardous Waste label and a DOT Class 9 label, as noted on the "DOT Labels for Hazardous Waste Drums". In addition, a copy of the DOT Emergency Response Guide (ERG) Number 171" is to be provided to the transporter, when shipping the drums to an approved disposal facility.

11.5 ROUTINE PROCEDURES

Routine PTS operations are monitored and recorded at the beginning and end of each shift (typically one or two 8-hour shifts per day, depending on the influent volume and processing flow rate). Operational data are recorded on a form that is preserved in the performance files for the PTS. Listed below are certain parameters that are monitored and recorded specifically for the PTS:

- Effluent totalizers at the Effluent Pump Station
- pH (at the Effluent Pump Station)
- Line and vessel pressures at various locations throughout the system
- Water level within T-110

Along with daily readings, a notebook is used to log completed daily activities and maintenance tasks. This is to be kept on site for reference and historical purposes.

11.6 STAFFING

Hercules will provide the necessary resouces to staff, operate, sample and perform routine O&M on the PTS during the course of each workday. A lead operator is to be designated and assigned the responsibility for scheduling on-site O&M activities and for providing coordination among the other daily operators. Except for maintenance/repair purposes,

operation of the GWES is to be on a continuous basis; i.e., 24 hrs. per day, 7 days per week. However, because the PTS is able to process water faster than influent is received from the GWES, operation of the PTS is typically expected to be conducted approximately eight to twelve hours per day, five days per week. This schedule may be varied during periods of high flow to the GWES (due to storms, snow melt, or similar event) and, from there, on to the PTS. Based on the range of flows observed during the CM construction, over the last 16 months, it is unlikely that the PTS would have to operate for more than 16 hours per day or on weekends, except to respond to emergencies or to handle maintenance or repairs. The schedule is planned to allow water generated during the day to be treated on a real-time basis, such that, at the end of each shift the water level in T-110 is at or below the 100,000-gallon level. In the event that additional time is needed, due to high flows, operational problems, or anything that would impede the water treatment process, additional hours or shifts would be added to the schedule until conditions return to normal.

During the periods when an operator is not on-site, an emergency pager system will be used to alert an on-call operator of a problem. Once the emergency pager system has been activated, the on-call operator is required to visit the site (within 4 hours or less) to correct the situation or malfunction and reset the paging system.

11.7 PERFORMANCE MONITORING AND COMPLIANCE SAMPLING

In order to periodically evaluate and document the performance of the PTS, quality control samples are to be taken of the water discharged from the PTS to the Effluent Pump Station, from which the water is pumped to the POTW. Included in this evaluation effort is periodic monitoring of influent water (from the GWES to the PTS) for contaminant concentrations. Sampling events related to PTS performance monitoring are to be conducted by Hercules at a frequency to be established based on the volume of water being processed and the constituent concentrations being enconuntered. Collected data will be utilized to:

- Demonstrate and document that the PTS is maintaining compliance with the existing permits;
- Monitor/validate the efficiency of the treatment process; and
- Monitor contaminant loading in the GWES water.

11.7.1 POTW Compliance Sampling

Samples obtained for compliance with the POTW Permit are taken at the composite sampler located at the "compliance point" in the POTW facility. This composite sampler has been performing this function for many years and will continue in the same vein. These sampling events are performed on a once per week basis on influent water coming from the Ciba Site via the dedicated pipeline. Parameters, criteria and concentration criteria for influent water to the POTW from the site are dictated by the Permit (see Appendix A). When and if there is any change to the discharge criteria, an amendment to this PCP would be filed with the NYSDEC.

Water quality sample results will be documented for historical purposes and will be included, as attachments, to appropriate compliance reports to be sent to regulatory agencies, as required by the HWM Permit.

12.0 PTS MAINTENANCE

Routine maintenance of the PTS includes the following activities, some of which occur relatively infrequently:

- lubrication and/or maintenance of moving parts on process equipment per manufacturer's specification;
- replacement of multi-media filter media, as needed;
- replacement of bag filters, as needed;
- replacement of bag dump workstation filter cartridges, as needed;
- replacement of anion exchange resin, as needed;
- replacement of MetallX resin, as needed;
- replacement of worn or damaged parts on PTS processes per manufacturer's specifications and warranty;
- instrumentation calibration checks and maintenance (e.g., pH probes, pressure gauges, liquid flow meters) per manufacturers specification, or as necessary;
- mixer and pump repairs per manufacturer's recommended schedule;
- valve and piping inspections, and repair or replacement, as needed;
- general housekeeping, building maintenance, and decontamination following spills or leaks;
- install andor activate spares for rotating equipment (i.e., pumps), as necessary;
- perform other maintenance requirements, as necessary, to maintain PTS operations, performance, and/or efficiency.

Process & Instrumentation Diagram

A record drawing (prepared by IT Corporation) of the P&ID (see Figure 2, in Section 10.0), locating and numbering each piece of equipment, was prepared and is available in the PTS building for use by operator and maintenance personnel. Manufacturer and/or vendor O&M manuals for components are also available on-site to maintenance personnel. An O&M Manual for this PTS (cited in Section 10.1) also contain spare parts lists with the original equipment manufacturer, model, or identification number. These manuals are to be consulted, as necessary, by the personnel responsible for operation and maintenance of the PTS.

13.0 PTS TROUBLESHOOTING

This section presents troubleshooting guides for the major processes of the PTS. These guides are presented in tabular form and are intended to help diagnose potential causes of performance-related operating problems or irregularities. Possible corrective actions to consider are also identified. As operating experience increases, the information contained herein should be revised as appropriate to reflect then current conditions. Equipment manufacturer troubleshooting manuals would also be used, as necessary, to supplement this information.

The troubleshooting guide for the PTS is divided into sections, based on normal operating mode for the system, including: sand filters, duplex bag filter, anion exchange system, and MetallX resin contactors. Table 13-1 presents these guidelines.

Each page of the troubleshooting table is divided into four sections: Observation (the problem), Potential Cause, Sequence of Action, and Corrective Action. The Observation column contains a brief statement of the observed irregularity. The Potential Cause column identifies a possible cause to the observed problem. Listed potential causes should be initially reviewed to consider the most likely cause of a problem, once it has been identified, or to identify a cause not defined in the guides. Then, an appropriate Sequence of Action may be selected to determine the cause of the problem. A stepwise procedure has been presented to identify the cause of the apparent problem. Each step should be pursued to completion before proceeding to the next step, until the problem has been solved and corrective measures initiated. The Corrective Action column lists possible measures to resolve the identified potential cause(s) of the problem.

- PTS operating personnel are familiar with the troubleshooting guides and procedures so as to minimize review time and more quickly identify potential causes of problems. Malfunctions are to be evaluated, logged and discussed with appropriate personnel, so as to develop and institute preventive measures, should such be applicable.

TABLE 13-1

PTS TROUBLESHOOTING GUIDE

Observation	Potential Cause	Sequence of Action	Corrective Action
Sand Filters			
1. Increase in granular media filter turbidity or TSS.	1. Filter needs to be backwashed.	1. Check backwash frequency for past few days.	1. Backwash filter. 2. Adjust backwash frequency, as necessary
	2. Loss of media from backwashing.	1. Check media volume.	1. Replace media, if required.
2. Pressure build-up through filter bed (or decreased run time between backwashes).	1. Insufficient backwash time to clean media.	1. Check initial head loss through filter.	1. Extend backwash time per equipment vendor maintenance recommendations (first evaluate potential for hydraulic surge due to increased recycle).
3. Low head loss through filter bed (or extended run time between backwashes).	1. Loss of media from backwashing.	1. Check media volume.	1. Add/replace media, as needed.
4. Percentage of backwash water recycled exceeds 5% of forward flow.	1. Solids carried in from Tank T-110 is too high.	1. Check T-110 for sediment/sludge buildup.	1. Clean/remove sludge from T-110.
5. Very rapid increase in head loss after backwash.	1. Insufficient backwash or fluidization rate.	1. Check optimal fluidization rate against observed.	1. Adjust backwash rate and re-evaluate performance.

PTS TROUBLESHOOTING GUIDE

Observation	Potential Cause	Sequence of Action	Corrective Action
	2. Backwash period used is too long.	1. Select revised backwash volume.	1. Implement shorter duration backwash and re-evaluate performance closely.
6. Mud ball formation.	1. Insufficient backwash or fluidization rate.	1. Check optimal fluidization rate against observed.	1. Adjust backwash rate and re-evaluate performance.
7. Gravel displacement.	1. Introduction of air into filter underdrain in the backwash water.	1. Visual inspection of gravel bed.	1. Reduce backwash flow and replace filter media, as necessary.
8. Loss of media from backwashing.	1. Excessive backwash rate.	1. Check recommended backwash rate against observed.	1. Decrease backwash rate in accordance with the filter vendors recommendations.
Cyanide/Metals Removal Systems			
1. Higher than normal effluent cyanide/metals concentrations (but below Pre-treatment Permit Limits)	1. Analytical related.	1. Check quality assurance (QA) report of sample in question and contact analytical lab.	1. Resample if there is a potential problem with the analysis.
	2. Increased influent cyanide/metals concentrations.	1. Sample influent for cyanide/metals.	1. Monitor influent cyanide/metals concentrations with time.
		2. Sample T-110 effluent and conduct tests around target set points for pH	1. Activate the standby floculant system, if necessary, and monitor results carefully.

PTS TROUBLESHOOTING GUIDE

Observation	Potential Cause	Sequence of Action	Corrective Action
2. Effluent cyanide/metals result above Pre-treatment Permit Limits.	1. Analytical related.	1. Check quality assurance (QA) report of sample in question, and contact analytical lab.	1. Resample if there is a potential problem with result.
	2. Cyanide/metals removal system related.	1. Resample effluent with rush turnaround on sample (24 to 48 hours).	1. If result is less than Pre-treatment Permit limit, continue discharge and evaluate high result. 2. Check previous data point and operational logs for period around sample collection. 3. If result is greater than Pre-treatment Permit limit, then shut down extraction and discharge systems and notify applicable regulatory agencies, as necessary. 4. Sample extraction wells for cyanide/metals to identify source. If high levels from a specific well, reduce flow as required to maintain permit compliance with POTW.

PTS TROUBLESHOOTING GUIDE

Observation	Potential Cause	Sequence of Action	Corrective Action
		2. Switch flow through the other MetallX resin contactor.	1. If result is less than Pre-treatment Permit limit, continue discharge and evaluate first contactor for reaching adsorbent limit. Dispose of spent resin, as necessary. 2. If result is greater than Pre-treatment Permit limit, then shut down PTS and evaluated both contactors for reaching adsorbent limit. Replace resin in contactors, as needed and dispose of spent resin, as necessary.
3. Premature expentiture of MetallX resin.	1. Increased influent cyanide/metals concentrations	1. Sample influent for cyanide/metals..	1. Monitor influent cyanide/metals concentrations with time.
3. Premature expentiture of MetallX resin.	2. Excessive sulfates and/or ferrocyanide passing through anion exchange units.	1. Switch flow to alternate anion exchange vessel.	1. Regenerate anion exchange resin with brine or sodium hypochlorite on a more frequent basis.

14.0 PTS O&M SCHEDULE AND REPORTING

This section presents a summary of the frequency of O&M activities and describes the reporting of these activities during the post-closure period. O&M activities will begin at the completion of construction of the Corrective Measures as defined in the Project Construction Schedule (Attachment F to the Corrective Measures Design Report) prepared pursuant to Module II, Section E.2.(a) of the HWM Permit.

14.1 SCHEDULE

The frequency of O&M activities is summarized as follows:

TEMPORARY PTS O&M SCHEDULE

Activity	Frequency
• Aqueous sample collection	As needed
• Sludge sample collection	As needed
• Equipment maintenance and inspection	Weekly
• Equipment replacement	As needed
• Sand filter backwash	As needed
• Sand filter media replacement	As needed
• Bag filter replacement	As needed
• Anion exchange resin brine regeneration	Approx. Weekly
• Anion exchange resin sodium hypochlorite regeneration	Approx. Monthly
• MetallX resin replacement	Est. 2 to 3 years
• Tank T-110 sludge removal	As needed
• EPS sludge removal	As needed
• Compliance monitoring	(as required in the POTW Permit)
Reporting	
• Compliance Reports to POTW	Monthly
• Post-Closure O&M Reports to NYSDEC[1]	Quarterly
• Annual Reports to NYSDEC	Annually

1. Reports to include summaries of daily operating logs.

APPENDIX A

City of Glens Falls
NEW YORK
WATER & SEWER DEPARTMENT
Phone: (518) 761-3814
WASTE WATER TREATMENT PLANT
Phone: (518) 761-3850
FAX (518) 761-3862

ld Coalts III
perintendent

2 Shermantown Road
Glens Falls, N.Y. 12801

July 31, 1996

CERTIFIED

Mr. Barry J. Behrdahl, PhD, CHMM
Ciba Geigy Corporation
P. O. Box 71
Toms River, New Jersey 08754

Re: Permit Renewal (Permit #002A to #002B)
Ciba Geigy Site

Dear Mr. Behrdahl:

On June 12, 1996, the Glens Falls Water & Sewer Board renewed Permit #002(A) as #002(B) for the period from June 15, 1996, to Midnight on June 24, 2001.

As the City is considering your joint request regarding changes in the terms of your permit, and is awaiting data from the recently completed five-day system-wide sampling program to assist in reviewing your request, we are only sending this letter for attachment to your "old permit" extending the terms of same unchanged until evaluation of your request is finished.

Please contact Lawrence J. Glasheen, the City's Pretreatment Coordinator, if you have any further questions regarding this matter.

Sincerely,

Donald Coalts
Water & Sewer Superintendent

sec
pc: G. Schmiesing, PE
Hercules, Inc.
1313 North Market Street
Wilmington, DE 19894-0001

JUL

CITY OF GLENS FALLS
INDUSTRIAL WASTEWATER DISCHARGE PERMIT

No. 002 (A)

THE BOARD OF WATER AND SEWER COMMISSIONERS OF THE CITY OF GLENS FALLS, NEW YORK hereby authorizes the industrial users specified in this Permit to discharge their industrial wastewater to the Glens Falls Wastewater Treatment Plant subject to the Conditions and Pretreatment Standards set forth in the attached Appendix.

I. NAME OF INDUSTRIAL USERS:

CIBA-GEIGY Corporation and Hercules Incorporated

II. ADDRESSES OF INDUSTRIAL USERS:

CIBA-GEIGY Corporation
444 Saw Mill River Road
Ardsely, New York 10502

Hercules Incorporated
Hercules Plaza
Wilmington, DE 19894

III. LOCATION OF FACILITY AUTHORIZED TO DISCHARGE:

Lower Warren Street
Queensbury, New York

Mailing address:

CIBA-GEIGY Corporation
Attn: Harold W. Moats
444 Saw Mill river Road
Ardsely, New York 10502

Hercules Incorporated
Attn: Marvin W. Livesay
Hercules Plaza
Wilmington, DE 19894

IV. TELEPHONE NO. AT FACILITY:

(518) 761-0767 or 0768

V. DURATION OF PERMIT:

This Permit is valid for a period of five (5) years following its date of issuance.

VI. Compliance with this permit does not relieve the joint permittees of their obligations to comply with any or all applicable pretreatment regulations, standards or requirements under local, State and Federal laws, including any such regulations, standards, requirements, or laws that may become effective during the term of this permit.

Appendix to
Industrial Wastewater Discharge Permit
No. 002 (A)

Conditions and Pretreatment Standards

PART 1 - DISCHARGE LIMITATIONS

A. During the term of this permit the CIBA-GEIGY Corporation and Hercules Incorporated (hereinafter referred to as "the permittee") are authorized to discharge wastewater to the Glens Falls Wastewater Treatment Plant (hereinafter referred to as "POTW") from the outfall listed below.

Description of outfall: Dedicated 24" pipe line from Permittee site to primary effluent flume of POTW.

B. During the term of this permit the discharge from this outfall shall conform to the following:

1. FLOW

Flow from this outfall shall not exceed 175,000 gpd as a monthly average; or 350,000 gpd daily maximum flow.

2. pH:
Must remain within the range of 5.0 - 9.0, standard units.

The permittee shall continuously measure the pH of wastewater and shall maintain the pH of such wastewater within the range set forth in the applicable effluent limitations guidelines, except excursions from the range are permitted subject to the following limitations: (1) The total time during which the pH values are outside the required range of pH values shall not exceed 7 hours and 26 minutes in any calendar month; and (2) No individual excursion from the range of pH values shall exceed 60 minutes.

3. EFFLUENT LIMITATIONS

Parameter (mg/l)	Daily maximum (mg/l)	Monthly average (mg/l)
Chromium/Total	5.0	2.5
Mercury	0.025	0.005
Antimony	10.0	
Ammonia	40.0	
Arsenic	0.25	
Boron	5.0	
Cadmium	0.25	
Calcium	500.0	
Copper	1.0	

Iron	5.0
Lead	1.0
Manganese	5.0
Nickel	3.0
Silver	0.2
Zinc	1.5
Cyanide, Total	3.0
Phenols	5.0
Benzene	0.1
Chloroform	1.0
Ethylbenzene	0.1
Methylene Chloride	1.0
Naphthalene	1.0
1,1,1-Trichloroethane	1.0
Toluene	0.1
Xylene	0.1

C. The permittee shall not discharge wastewater containing any of the following substances, except as specifically authorized herein.

1. Fats, wax, grease, or oils of petroleum origin, whether emulsified or not, in excess of fifty (50) mg/1 or containing substances which may solidify or become viscous at temperatures between 32 degrees F (0 degrees C) and 140 degrees F (60 degrees C);

2. Containing any gasoline, benzene, naphtha, fuel oil or other flammable or explosive liquids, solids or gases; and in no case pollutants with a closed cap flashpoint of less than one hundred forty (140) degrees Fahrenheit (60 degrees C), or pollutants which cause an exceedance of 10 percent of the Lower Explosive Limit (LEL) at any point within the POTW.

3. Any effluent having a temperature higher than 104 degrees F (40 degrees C);

4. Any solid or viscous substances containing ashes, cinders, sand, mud, straw, shavings, metal, glass, rags, feathers, tar, plastics, wood, paunch, manure, or any other solids or viscous substances capable of causing obstructions or the interferences with proper operation of the sewer system;

5. Any pollutant, including oxygen demanding pollutants (BOD etc.) at flow rate and/or concentration which will cause the pollutant to pass through to the receiving waters or interfere with the POTW. For the purpose of this section, the term "interference" has the same definition as appears in Chapter 88 of the City Code.

6. Any garbage that has not been ground by household type or other suitable garbage grinders;

7. Any toxic or poisonous substances in sufficient quantity to injure or interfere with any wastewater treatment process, to constitute hazards to humans or animals, or to create any hazard in waters which receive treated effluent from the sewer system treatment plant. Toxic wastes shall include, but are not limited to wastes containing cyanide, chromium, mercury, copper, and nickel ions;

8. Any noxious or malodorous gases or substances capable of creating a public nuisance; including pollutants which result in the presence of toxic gases, vapors or fumes;

9. Any solids of such character and quantity that special and unusual attention is required for their handling;

10. Any substance which may effect the treatment plant's effluent and cause violation of the SPDES permit requirements;

11. Any substance which would cause the treatment plant to be in noncompliance with sludge use, recycle or disposal criteria pursuant to guidelines or regulations developed under Section 405 of the Federal Act, the Solid Waste Disposal Act, the Clean Air Act, the Toxic Substances Control Act or other regulations or criteria for sludge management and disposal as required by the State;

12. Any color which can not be removed in the treatment processes at the POTW;

13. Any medical or infectious wastes;

14. Any radioactive wastes or isotopes; or

D. Unless otherwise provided herein, all discharges shall comply with all other applicable laws, regulations, standards,, and requirements contained in Chapter 88 of the City Code and any applicable State and Federal pretreatment laws, regulations, standards, and requirements including any such laws, regulations, standards, or requirements that may become effective during the term of this permit.

PART 2 - MONITORING REQUIREMENTS

A. From the period beginning on the effective date of the permit through the term of this permit, the permittees shall monitor their outfall for the following parameters, at the indicated frequency:

Parameter (units)	Sample Measurement Location	Frequency	Sample Type
Arsenic	See Note 1	1/Year	24 hr Composite
BOD5	See Note 1	1/Year	24 hr Composite
Cadmium (mg/1)	See Note 1	1/Year	24 hr Composite
Chromium (mg/1)	See Note 1	1/Week	24 hr Composite
Copper (mg/1)	See Note 1	1/Year	24 hr Composite
Cyanide, total	See Note 1	1/Week	24 hr Composite
Flow (gpd)	See Note 1	Continuous	24 hr TOTAL
Lead (mg/1)	See Note 1	1/Week	24 hr Composite
Mercury (mg/1)	See Note 1	1/Week	24 hr Composite
Nickel (mg/1)	See Note 1	1/Year	24 hr Composite
Pentachlorophenol (mg/1)	See Note 1	1/Year	Grab
pH	See Note 2	Continuous	Meter/Recorder
Phenols, Total		1/Month	24 hr Composite
Trichlorophenol (mg/1)	See Note 1	1/Year	Grab
TSS	See Note 1	2/Year	24 hr Composite
Zinc (mg/1)	See Note 1	1/Year	24 hr Composite

B. All handling and preservation of collected samples and laboratory analysis of samples shall be performed in accordance with 40 CFR Part 136 and amendments thereto unless specified otherwise in the monitoring conditions of this permit.

[Note 1: Sampler located at southern end of Preliminary Treatment Building of the POTW]

[Note 2: pH meter continuous strip chart located at Permittee's site of type and at a location to the approval of the Superintendent]

PART 3 - REPORTING REQUIREMENTS

A. Monitoring Reports

Monitoring results obtained shall be summarized and reported to the Chief Operator of the POTW ("Chief Operator") on an Industrial User Monitoring Report once per month. The

reports are due one week after receipt of last sample analysis, but not later than the last day of the subsequent month. The report shall indicate the nature and concentration of all pollutants in the effluent for which sampling and analysis were performed during the calendar month preceding the submission of each report including measured maximum and average daily flows.

B. If the permittee monitors any pollutants more frequently than required by this permit, using test procedures prescribed in 40 CFR Part 136 or amendments thereto, the results of such monitoring shall be included in any calculations of actual daily maximum or monthly average pollutant discharge and results shall be reported in the monthly report submitted to the Chief Operator. Such increase monitoring frequency shall also be indicated in the monthly report.

C. Automatic Resampling

If the results of the permittee's wastewater analysis indicates that a violation of this permit has occurred, the permittee must:

1. Inform the Chief Operator, orally, within 2 hours of becoming aware of a violation, followed by written notification to the Chief Operator by the end of the next business day, and

2. Repeat the sampling and pollutant analysis and submit, in writing, the results of this second analysis within thirty (30) days of notification or discovery of the first violation.

D. Accidental Discharge Report

1. The permittee shall notify the Chief Operator orally (within 2 hours) upon the discovery of the occurrence of an accidental discharge of substances prohibited by Chapter 88 of the City Code that may enter the public sewer. During normal business hours the Chief Operator should be notified by telephone at (518) 761-3854. At all other times, the POTW should be notified by telephone at (518) 761-3857 after 5 p.m. Monday - Friday or weekends and holidays. The notification shall include location of discharge, date and time thereof, type of waste, including concentration and volume, and corrective actions taken. The permittee's notification of accidental releases in accordance with this section does not relieve it of other reporting requirements that arise under local, State or Federal laws. A notice setting forth this procedure shall be

permanently posted in a conspicuous place at the local office of the Permittee.

Within five (5) days following accidental discharge, the permittee shall submit to the Chief Operator a detailed written report. This report shall specify:

a. Description and cause of the accidental discharge, the cause thereof, and the impact on the permittee's compliance status. The description should also include location of discharge, type, concentration and volume of waste.

b. Duration of noncompliance, including exact dates and times of noncompliance and, if the noncompliance is continuing, the time by which compliance is reasonably expected to occur.

c. All steps taken or to be taken to reduce, eliminate, and/or prevent recurrence of such an accidental discharge, or other conditions of noncompliance.

E. All reports required by this permit shall be submitted to the Chief Operator at the following address:

Glens Falls Wastewater Treatment Plant
Water and Sewer Department
Chief Operator
2 Shermantown Road
Glens Falls, New York 12801

F. All reports submitted to the Chief Operator as required by this permit shall be deemed submitted to the Board in compliance with the reporting requirements of Chapter 88 of the Code of the City of Glens Falls. All reports required to be submitted in writing may be submitted by facsimile within the stated time period, with prompt follow-up transmittal of the original.

SECTION 2 - COMPLIANCE SCHEDULE

A. The permittee has accomplished the following tasks in the designated time period.

	Event	No Later Than (date)
1.	Modified wastewater pretreatment plant design completed and submitted to the Superintendent	September 17, 1990

2.	Equipment and materials ordered	September 27, 1990
3.	Developed, implemented and submitted a copy of written operational procedures to the Superintendent	September 27, 1990
4.	Completed installation of modified wastewater pretreatment plant	October 17, 1990
5.	Obtained full pretreatment plant operational status and achieved full compliance	November 17, 1990
6.	Submitted a detailed written statement to the Superintendent setting forth Hercules Inc.'s current legal interest in and relationship to the facility covered by this Permit. The statement is sufficient to justify joining Hercules Inc., as a Co-permittee under this Permit.	September 17, 1990

B. Compliance Schedule Reporting

The permittee has submitted to the Chief Operator a report documenting that it complied with the schedule identified above.

PART 5 - STANDARD CONDITIONS

SECTION A. GENERAL CONDITIONS AND DEFINITIONS

1. Severability

The provisions of this permit are severable, and if any provisions of this permit, or the application of any provision of this permit to any circumstances, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

2. Duty to Comply

The permittee must comply with all conditions of this permit. Failure to comply with the requirements of this permit may be grounds for administrative action, or enforcement proceedings including civil or criminal penalties, injunctive relief, and summary abatement.

3. Duty to Mitigate

The permittee shall take all reasonable steps to minimize or

correct any adverse impact to the POTW or the environment resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

4. Permit Modification

This permit may be modified by the Board after notice and an opportunity for a hearing for good cause including, but not limited to, the following:

a. To incorporate any new or revised Federal,l State, or local pretreatment standards or requirements.

b. Material or substantial alterations or additions to the discharger's operation processes, or discharge volume or character which were not considered in drafting the effective permit.

c. A change in any condition in either the industrial user or the POTW that requires either a temporary or permanent reduction or elimination of the authorized discharge.

d. Information indicating that the permitted discharge poses a threat to the Control Authority's collection and treatment systems, POTW personnel or the receiving waters.

e. Violation of any terms or conditions of the permit.

f. Misrepresentation or failure to disclose fully all relevant facts in the permit application or in any required reporting.

g. Revision of or a grant of variance from such categorical standards pursuant to 40 CFR 403.13.

h. To correct typographical or other errors in the permit.

i. To reflect transfer of the facility ownership and/or operation to a new owner/operator.

j. Upon written request of the permittee, provided such request does not create a violation of any applicable requirements, standards, laws or rules and regulations.

The filing with the Board of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

Any request for a variance from the terms of Chapter 88 of the City Code will require a public hearing pursuant to Section 5.4.8 of the City Charter.

5. Permit Termination

This permit may be terminated by the Board after notice and an opportunity for a hearing for the following reasons:

a. Falsifying self-monitoring reports.

b. Tampering with monitoring equipment.

c. Refusing to allow timely access to the facility premises and records.

d. Failure to meet effluent limitations.

e. Failure to pay fines.

f. Failure to pay sewer charges in a timely fashion.

g. Failure to meet compliance schedules.

6. Permit Suspension or Revocation

The Board or Superintendent may in accordance with the procedures specified in Chapter 88 of the City Code, suspend or revoke this permit or take any other measures deemed necessary in the event of an actual or threatened serious noncomplying discharge.

7. Permit Appeals

The permittee may petition the Board to appeal the terms of this permit within thirty (30) days of its issuance pursuant to the requirements of Chapter 88 of the Code of the City of Glens Falls, New York.

This petition must be in writing; a failure to submit a petition for review shall be deemed to be a waiver of the appeal. In its petition, the permittee must indicate the permit provisions objected to, the reasons for this objection, and the alternative condition, if any, it seeks to be placed in the permit.

The effectiveness of this permit shall not be stayed pending a reconsideration by the Board. If, after considering the petition and any arguments put forth by the Superintendent, the Board determines that reconsideration is proper, it shall remand the permit back to the Superintendent for reissuance. Those permit provisions being reconsidered by the Superintendent shall be stayed pending reissuance.

8. Property Rights

The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any violation of Federal, State or local laws of regulations.

9. Limitation on Permit Transfer

Permits may not be reassigned or transferred to a new owner and/or operator without prior written approval of the Superintendent:

a. The permittee must give at least thirty (30) days advance written notice to the Superintendent.

b. The notice must include a written certification by the new owner which:

(i) States that the new owner has no immediate intent to change the facility's operations and processes.

(ii) Identifies the specific date on which the transfer is to occur.

(iii) Acknowledges full responsibility for complying with the existing permit.

10. Continuation of Expired Permits

An expired permit will continue to be effective and enforceable until a renewal permit is issued if:

a) The permittee has submitted a complete application at least one hundred eighty (180) days prior to the expiration date of the user's existing permit.

b) The failure to reissue the permit, prior to expiration of the previous permit, is not due to any act or failure on the part of the permittee.

11. Dilution

The permittee shall not increase the use of potable or process water or, in any way, attempt to dilute an effluent as a partial or complete substitute for adequate treatment to achieve compliance with the limitations contained in this permit.

12. Definitions

a) Daily Maximum - The maximum allowable discharge of pollutant during a twenty four hour period. Where daily maximum limitations are expressed in units of mass, the daily discharge is the total mass discharged over the course of a twenty-four hour period. Where daily maximum limitations are expressed in units of concentration, the daily discharge is the arithmetic average measurements of the pollutant derived from all measurements taken that twenty-four hour period.

b) Composite Sample - A sample that is collected over time, formed either by continuous sampling or by mixing discrete samples. The sample may be composites either as a time composite sample: composed of discrete sample aliquot collected in one container at constant time intervals providing representative samples irrespective of stream flow; or as a flow proportional composite sample: collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increases while maintaining a constant time interval between the aliquot.

c) Grab Sample - An individual sample collected in less than 15 minutes, without regard for flow or time.

d) Instantaneous Maximum Concentration - The maximum concentration allowed in any single grab sample.

e) Monthly Average - The arithmetic mean of the values for effluent samples collected during a calendar month or specified thirty (30) day period (as opposed to a rolling thirty (30) day window).

f) Weekly Average - The arithmetic mean of the values of effluent samples collected over a period of seven consecutive days.

g) Bi-Weekly - Once every other week.

h) Bi-Monthly - Once every other month.

i) Upset - Means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee, excluding such factors as operational error, improperly designed or inadequate treatment facilities, or improper operation and maintenance or lack thereof.

j) Bypass - Means the intentional diversion of wastes from any portion of a treatment facility.

13. Compliance with Applicable Pretreatment Standards and Requirements

Compliance with this permit does not relieve the permittee from its obligations regarding compliance with any and all applicable local, State and Federal pretreatment standards and requirements including any such standards or requirements that may become effective during the term of this permit.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTANT CONTROLS

1. Proper Operation and Maintenance

The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes but is not limited to: effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of the permit.

2. Duty to Halt or Reduce Activity

Upon a significant reduction of efficiency of operation, or loss or failure of all or part of the treatment facility, the permittee shall to the extent necessary and feasible to maintain compliance with its permit, control its discharge until operation of the treatment facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

3. Bypass of Treatment Facilities

a) Bypass is prohibited unless it is unavoidable to prevent loss of life, personal injury, or severe property damage or no feasible alternatives exist.

b) Notification of bypass:

(1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, it shall submit prior written notice, at least ten (10) days before the date of the bypass, to the Chief Operator for approval to by-pass.

(2) Unanticipated bypass. The permittee shall orally notify the Chief Operator within two hours and submit a written notice to the POTW prior to the end of the next business day. This report shall specify:

(i) A description of the bypass, and its cause, including its duration;

(ii) Whether the bypass has been corrected; and

(iii) The steps being taken or to be taken to reduce, eliminate and prevent a reoccurrence of the bypass.

4. Removed Substances

Solids, sludge, filter backwash, or other pollutants removed in the course of treatment or control of wastewater shall be disposed of in accordance with applicable provisions of Section 405 of the Clean Water Act and Subtitles C and D of the Resource Conservation and Recovery Act, and applicable State and local laws.

SECTION C. MONITORING AND RECORDS

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring points specified in this permit and, unless otherwise specified, before the effluent joins or is diluted by any other wastestream, body of water or substance. All equipment used sampling and analysis must be routinely calibrated, inspected and maintained to ensure their accuracy. Monitoring point shall not be changed without notification to and the approval of the Chief Operator.

2. Flow Measurement

If flow measurement is required by this permit, the appropriate flow measurement devices and methods consistent with approved scientific practices shall be selected and used to ensure the accuracy and reliability of measurement of the volume of monitored discharges. The device shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements

are consistent with the accepted capacity of that type of device. Devices selected shall be capable of measuring flows with a maximum deviation of less than 10 percent from true discharge throughout the range of expected discharge volume.

3. Analytical Methods to Demonstrate Continued Compliance

All sampling and analysis required by this permit shall be performed in accordance with the techniques prescribed in 40 CFR part 136 and amendments thereto, otherwise approved by EPA, or as specified in this permit.

4. Additional Monitoring by the Permittee

If the permittee monitors any pollutant more frequently than required by this permit, using test procedures identified in Section C.3, the results of this monitoring shall be included in the permittee's self-monitoring reports.

5. Inspection and Entry

The permittee shall allow an authorized representative of the POTW, upon the presentation of credentials and other documents as may be required by law, to:

a) Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this permit;

b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit;

d) Sample or monitor, for the purposes of assuring permit compliance, any substances or parameters at any location; and

e) Inspect any production, manufacturing, fabricating, or storage area where pollutants, regulated under the permit, could originate, be stored, or be discharged to the sewer system.

6. Retention of Records

a) The permittee shall retain records of all monitoring information, including all calibration and maintenance

records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application.

This period may be extended by request of the Chief Operator or Superintendent at any time.

b) All records that pertain to matters that are the subject of special orders or any other enforcement or litigation activities brought by the POTW shall be retained and preserved by the permittee until all enforcement activities have concluded and all periods of limitation with respect to any and all appeals have expired.

7. Record Contents

Records of sampling and analysis shall include:

a) The date, exact place, time, and methods of sampling or measurements, and sample preservation techniques or procedures;

b) Who performed the sampling or measurement;

c) The date(s) analyses were performed;

d) Who performed the analyses;

e) The analytical techniques or methods used; and

f) The results of such analyses.

8. Falsifying Information

Knowingly making any false statement on any report or other document required by this permit or knowingly rendering any monitoring device or method inaccurate, is a crime and may result in the imposition of criminal sanctions and/or civil penalties.

SECTION D. ADDITIONAL REPORTING REQUIREMENTS

1. Planned Changes

The permittee shall give advance written notice to the Chief Operator at least ninety (90) days prior to any facility expansion or process modifications which results in new or

substantially increased discharges or a change in the nature of the discharge.

2. Anticipated Noncompliance

The permittee shall give advance written notice to the Chief Operator at least ninety (90) days any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. Such notice shall be given, in writing, to the POTW ninety (90) days prior to the changes.

3. Duty to Provide Information

The permittee shall furnish the POTW, within three (3) business days, any information which the Chief Operator or Superintendent may reasonably request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also, upon request, furnish to the POTW, within three (3) business days, copies of any records required to be kept by this permit.

4. Signatory Requirements

All applications, reports, or information submitted to the POTW must contain the following certification statement and be signed as required in Sections (a), (b), (c) or (d) below:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

a) By a responsible corporate officer, if the Industrial User submitting the report is a corporation. For the purpose of this paragraph, a responsible corporate officer means:

(i) a president, secretary, treasurer, or vice president or any other person who performs similar policy-or decision-making functions for the corporation, or;

(ii) the manager of one or more manufacturing, production, or operation facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

b) By a general partner or proprietor if the Industrial User submitting the reports is a partnership or sole proprietorship respectively.

c) The principal executive officer or director having responsibility for the overall operation of the discharging facility if the Industrial User submitting the reports is a Federal, State, or local governmental entity, or their agents.

d) By a duly authorized representative of the individual designated in paragraph (a), (b) or (c) of this section of:

(i) the authorization is made in writing by the individual described in paragraph (a), (b) or (c);

(ii) the authorization specified either an individual or a position having responsibility for the overall operation of the facility from which the Industrial Discharge originates, such as the position of plant manager, operator of a well, or a well field superintendent, or a position of equivalent responsibility, or having overall responsibility for environmental matters for the company; and

(iii) the written authorization is submitted to the City.

e. If an authorization under paragraph (d) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, or overall responsibility for the environmental matters for the company, a new authorization satisfying the requirements of paragraph (d) of this section must be submitted to the City prior to or together with any reports to be signed by an authorized representative.

5. Operating Upsets

Any permittee that experiences an upset in operations that places the permittee in a temporary state of noncompliance with the provisions of either this permit or with Chapter 88 of the Code of the City of Glens Falls shall inform the Chief Operator within 24 hours of becoming aware of the upset at (518) 761-3850 or (518) 761-3857 after 5 p.m. Monday - Friday or weekends and holidays.

A written follow-up of the upset shall be filed by the permittee with the POTW within five (5) days. The report shall specify:

a) Description of the upset, the cause(s) thereof and the upset's impact on the permittee's compliance status;

b) Duration of noncompliance, including exact dates and times of noncompliance, and if not corrected, the anticipated time the noncompliance is expected to continue; and

c) All steps taken or to be taken to reduce, eliminate and prevent recurrence of such an upset.

The report must also demonstrate that the treatment facility was being operated in a prudent and workpersonlike manner.

A documented and verified operating upset shall be an affirmative defense to any enforcement action brought against the permittee for violations attributable to the upset event.

6. Annual Publication

A list of all industrial users which were subject to enforcement proceedings during the twelve (12) previous months shall be annually published by the Board of Water and Sewer Commissioners of the City of Glens Falls in the largest daily newspaper within its service area. Accordingly, the permittee is apprised that noncompliance with this permit may lead to an enforcement action and must result in publication of its name in an appropriate newspaper in accordance with this section.

7. Civil and Criminal Liability

Nothing in this permit shall be construed to relieve the permittee from civil and/or criminal penalties for noncompliance under Chapter 88 of the City Code or State or Federal laws or regulations.

8. Penalties for Violations of Permit Conditions

Chapter 88 of the City Code provides that any person who violates a permit condition is subject to a civil penalty of at least One Hundred Dollars ($100.00) per day of violation, or by imprisonment for not more than six (6) months, or both. The permittee may also be subject to sanctions under State and/or Federal law.

9. Recovery of Costs Incurred

In addition to civil and criminal liability, the permittee violating any of the provisions of this permit or Chapter 88 of the City of Glens Falls or causing damage to or otherwise inhibiting the POTW wastewater disposal system shall be liable to the POTW for any expense, loss, or damage caused by such violation or discharge. The POTW shall bill the permittee for the costs incurred by the POTW for any cleaning, repair or replacement work extraordinary administrative costs and legal fees caused by the violation or discharge.

SECTION E. DISPUTE RESOLUTION

If the Permittee disputes the applicability of any national or state pretreatment standard it may request that the Board contact the appropriate regional office of the Environmental Protection Agency or the Department of Environmental Conservation, as the case may be, to provide a written opinion on the applicability of such standard. The Board may, in its discretion, defer its decision to enforce compliance until after it has had an opportunity to consider such opinion.