EPA Region 5 Records Ctr.
299538

The Trustees of the Environmental Conservation and Chemical
Corporation Site Trust Fund
c/o N.W. Bernstein & Associates, LLC
767 Third Avenue
New York, N.Y. 10017

November 11, 2003

Via Fax and Certified Mail
Return Receipt Requested

Matthew J. Ohl
Remedial Project Manager
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL 60604

Re: Envirochem site, Zionsville, IN
Additional Work

Dear Mr. Ohl:

We thank you for your letter of October 16, 2003, in which you clarify EPA's comments of October 9, 2003 regarding the work reflected in Attachment Z-1. We believe that there is no substantive disagreement at this point as to what in fact we are going to do in the field or as to the legal basis for our doing the contemplated work. We also believe that the comments and responses should accurately reflect those understandings.

As noted below, we are in full agreement that all of the work provided for in Attachment Z-1 will be done pursuant to the Additional Work provisions of the Consent Decree. We wish to be certain there is no disagreement that the soil vapor extraction ("SVE") trench system provided for in Attachment Z-1 is in fact an augmentation of the existing SVE system.

The Attachment Z-1 SVE Trench System Is An Augmentation of the Existing SVE System With Additional Trenches

Attachment Z-1 calls for the installation of a system of SVE barrier trenches and other work to prevent migration of residual contamination remaining at the ECC site from impacting Unnamed Ditch. The Attachment Z-1 SVE trench system will be

inoperative until it is connected to and operated in conjunction with the existing SVE system. That system includes the following basic operations:

1. Aeration and equalization of "raw water" within tank T-2.
2. Transfer of the water to the treatment building using influent feed pumps.
3. Filtration of the influent water using suspended solids (TSS) filters.
4. Treatment using counter-current tray aeration air stripper.
5. Combining the air stripper "off-gas" with the SVE "air header pipe".
6. Absorption of organics in the combined air stream using granular activated carbon prior to release to the atmosphere.
7. Filtration of air stripper effluent water through additional TSS filters.
8. Absorption of residual organics in the filtered air stripper effluent water using granular activated carbon.
9. Discharge of treated water to Unnamed Ditch.

Each of these operations that comprise the existing SVE system are described in more detail in Attachment 1 to this letter. All of them are essential to and will be utilized in connection with the Attachment Z-1 work.. The existing SVE system is being maintained in a standby mode pending approval of Attachment Z-1. At that time, the existing SVE system will be connected to the Attachment Z-1 trench system and restarted so that the Attachment Z-1 trenches will function.

As you will recall, the original SVE system consisted of two treatment zones separated by an impervious liner. One SVE treatment zone was a series of SVE trenches in the native till in the northern portion of the site. The other treatment zone was a series of SVE trenches in the upper layer of fill that had been transported to the northern portion of the site from the old Southern Concrete Pad area. Both treatment zones were connected to and used the same SVE treatment system and equipment as will be used for the new Attachment Z-1 SVE trenches. The Attachment Z-1 SVE trench system augments the existing SVE system by providing for the new SVE trenches which will be constructed along the alignment originally contemplated for a passive collection trench.

To protect Unnamed Ditch, two additional features have been added under Attachment Z-1 that were not included in the original SVE trench system. A barrier wall will be placed on the Unnamed Ditch side of the new SVE trenches to provide additional protection to Unnamed Ditch in the event of accumulation of moisture in the trenches, and a reactive gate has been added so that when the SVE system is permanently shut down, any water that may thereafter accumulate in the new trench system will be treated prior to discharge to Unnamed Ditch.

It is not an accurate depiction of what we are constructing to state the "existing system will be used to augment the proposed additional work". As noted above, the new

SVE trenches are one element of the proposed Additional Work and are entirely dependant on and are an extension of the existing SVE system.

The Attachment Z-1 Work Will Be Performed Under the Additional Work Provisions of the Consent Decree

To address any remaining legal concerns that EPA may have, we agree that all of the Attachment Z-1 work, including the augmentation of the SVE system with additional trenches, and the construction of the barrier wall and the reactive gate, will be performed pursuant to the Additional Work provisions of the Consent Decree. We believe that what was intended by the language used in the October 16, 2003 letter is that the Attachment Z-1 work enhances and replaces the Additional Work originally contemplated in Revised Exhibit A to the Consent Decree. It does so by substituting an active SVE trench system, a barrier wall and a reactive gate, for the passive collection system originally envisioned in Revised Exhibit A to the Consent Decree. We agree with that concept. In that regard, we also note that the Attachment Z-1 work provides protection that is equal to or better than the originally contemplated Additional Work.

Revised Exhibit A to the Consent Decree was adopted by a Consent Decree Amendment proceeded by an explanation of significant differences ("ESD"). We assume that a comparable ESD and a comparable amendment to the Consent Decree will be used with respect to Attachment Z-1. We will provide a draft of proposed Consent Decree amendment language under separate cover and will be happy to assist EPA, to the extent EPA desires, in providing information related to the ESD.

Conclusion

The wording of Attachment Z-1 will be modified to clarify that the existing SVE system will be augmented by the additional trenches provided for in Attachment Z-1, and that the new SVE trenches will be connected to the existing SVE system and will be operated using the nine basic operations of the existing SVE system. The wording of Attachment Z-1 will also be clarified to note that in order to provide additional protection to Unnamed Ditch, a barrier wall and reactive gate will also be constructed. The language will be further clarified to note that all of the work called for under Attachment Z-1 enhances and replaces the passive collection trench originally contemplated as the Additional Work in Revised Exhibit A to the Consent Decree, and that all Attachment Z-1 work will be conducted under the Additional Work provisions of the Consent Decree. Finally, draft proposed Consent Decree amendment language would be provided under separate cover.

Matt, we trust this letter satisfactorily resolves these issues so that we may continue to cooperatively move this site towards closure. We will provide our response to your other comments shortly.

Very truly yours,

Norman W. Bernstein, Trustee

Roy O. Ball, Trustee

Cc: Tom Krueger, U.S. EPA
Mike Habeck, IDEM
Tim Harrison, CH2M Hill

SUMMARY OF ECC SITE
SVE TREATMENT SYSTEM

The Enviro-Chem (ECC) site SVE treatment system was designed to treat both water and air derived from soil vapor extraction (SVE) activities. The water and air streams are collected *via* separate pipes in each SVE trench. The water collection pipes connect to a "water header pipe" at the SVE treatment building. Similarly, the air collection pipes connect to an "air header pipe" at the SVE treatment building. The flow in the "water header pipe" is pumped to a "raw water" storage and equalization tank. From there, a steady follow is pumped through an air stripper to remove volatile organic compounds.[1] The flow in the "air header pipe" is directed to vapor-phase granular activated carbon filters to remove volatile organic compounds from the air stream.

The basic operations of the SVE treatment system consist of the following:

1. Aeration and equalization of "raw water" within tank T-2.
2. Transfer of the water to the treatment building using influent feed pumps.
3. Filtration of the influent water using suspended solids (TSS) filters.
4. Treatment using counter-current tray aeration air stripper.
5. Combining the air stripper "off-gas" with the SVE "air header pipe".
6. Absorption of organics in the combined air stream using granular activated carbon prior to release to the atmosphere.
5. Filtration of air stripper effluent water through additional TSS filters.
6. Absorption of residual organics in the filtered air stripper effluent water using granular activated carbon.
7. Discharge of treated water to Unnamed Ditch.

A more detailed description of the Influent Tank and the SVE treatment system is provided below.

[1] The exhaust air from the sir stripper is exhausted *via* vapor-phase carbon absorbers.

INFLUENT TANK: DETAILED DESCRIPTION

The T-2 influent tank has a plastic cover. Under normal conditions, a clean air compressor (BL-400) provides air to diffusers within the bottom of T-2. The constant airflow to the inside of T-2 provides an air bubble that lifts the T-2 cover. Trapped air beneath the T-2 cover is routed through two (2) 180-pound vapor phase GAC units before discharge to the atmosphere. Point level control floats are installed within T-2. Specific attention is paid to the High #1 level control float, which will notify the OPERATOR when T-2 reached 65% of capacity.

Rubber liners and poly fiber geotextile material are sandwiched on the inside of the tank system. Beginning with the material closest to the ground surface and the tank steel walls the following interior liners are installed within the tanks:

- 10 oz per square yard poly-fiber geotextile ground cover;
- 30 mil XR-5 reinforced leak detection secondary impermeable liner;
- 10 oz per square yard poly-fiber geotextile interspace liner (between the two impermeable liners); and
- 30 mil XR-5 reinforced primary water containment liner.

The BL-400 blower is a clean air rotary vane compressor. Atmospheric air is drawn through a particulate filter, compressed to a maximum pressure of 15 psi and injected into the 5 tank aerators within the bottom of T-2. Within the aerators the compressed air is segmented into small bubbles and allowed to rise to the air water interface. Aeration of T-2 has two distinct purposes. Firstly, the minimal air movement provides sufficient circulation to provide mixing of the tank influent. By continually mixing the water, a consistent treatment system influent is maintained which assists in evaluating long-term system performance. Also the addition of atmospheric air increases the dissolved oxygen within the ground water and encourages oxidation of any metals within the ground water, including iron. Most metallic compounds decrease in solubility at a higher valence state increasing the potential for metals removal within the TSS filters in the treatment system.

The two 180-pound GAC's are installed in series. Captured air from beneath the T-2 cover is routed to a PVC vapor influent line to the primary GAC unit. After primary

vapor treatment in the lead GAC unit, vapors are routed through the secondary GAC unit and then to the atmosphere.

The P-200 pump is normally used for the discharge of treated water to the on-site drainage swale and the surface water of Indiana. The P-200 pump operation may be automatically controlled by the Programmable Logic Control (PLC) or manually controlled through the Panel View MMI.

The T-2 tank is constructed atop a compacted soil foundation, but the secondary tank liner is open direct percolation to the ground in the cases of a liner failure. The use of a dual liner system with a geotextile interstitial spacing provides a means of leak detection. Should the primary liner fail; the released fluid will be captured within the interstitial space between the primary and the secondary liners.

The secondary liner includes a bottom drain, which is installed within the middle of the tank system. All fluid released through the primary liner gravity drains to this secondary liner drain. An elbow at approximately 3 feet below the tank bottom routes the liner drain to approximately 3 feet away from the edge of the tank. A 12-inch diameter PVC vertical sump pipe is connected to the 4-inch drain line from thesecondary liner. The sealed leak detection sump allows the collection and storage of drained interstitial fluid.

A portable 120-volt sump pump is installed within the leak detection sump. The sump pump transfers recovered interstitial fluids from the leak detection sump directly back to T-2. The sump pump operates with an integral float system and maintains the water level below the bottom of the tank floor.

Leak detection level switches have also been installed within the leak detection sump. The leak detection switches are set at 2-inches above the floor of each tank. Normally the portable sump pumps will maintain minor seepage water below the level of the leak detection sump. Should a major breach in the primary liner occur, the water level within the leak detection sump would quickly equalize with the internal tank water level, thus tripping the leak detection sump switch. If the leak detection sump switches are activated, the PLC causes the system to go into an alarm condition and notify the system OPERATOR.

TREATMENT SYSTEM: DETAILED DESCRIPTION

The treatment system includes several integrated treatment units. The various surface mounted transfer pumps maintain the system operational. The PLC and the motor starter/overload protection units in the Motor Control Center (MCC) control all pumps. The motor starters include amperage overload protection and thermal overload protection for each of the motors. The following describes each of the process pumps including their specifications and details.

Air Stripper Influent Pumps (PIOOA & PIOOB)

Recovered ground water is equalized and aerated within the T-2 tank. At the pre-set level switch locations the PLC and remote monitoring unit (RMU) will notify the OPERATOR when the liquid level within T-2 is at 65% of capacity.

The P-100 pumps transfer water from the T-2 tank through the two initial suspended solids filters and into the air-stripping unit. Once the high-level switch #1 is contacted, the P-100 pumps will continue to operate until the T-2 low-level switch is deactivated or an alarm conditions occurs within the rest of the system.

GAC Feed Pumps (PIA & PIB)

Air stripper effluent gravity drains into the integral equalization sump within the bottom of the air-stripping unit. At predetermined levels, the level switches within the air stripper sump interface with the PLC to energize the GAC feed pumps. The pumps transfer air stripper effluent through two suspended solids filters and then through the two granular activated carbon units in series. After solids and carbon filtration, the final system effluent is pumped directly to the effluent tank, T-4.

Treated Water Effluent Pump (P-200)

Treated water in T-4 can normally gravity drain to the discharge pipe in the drainage swale near the system. The OPERATOR must manually start the P-200 pump and then allow the PLC to control the pump operation.

Recirculation Pump (P-300)

The treatment system includes a recirculation pump P-300. The recirculation pump allows the OPERATOR to return water from the T-4 effluent tank to the T-2 influent

tank. The P-300 will not normally be operated because the system design should provide 99% treatment with one pass through the system. Because of the suction header design for the P-200/P-300 pumps, the P-300 pump can only pump T-4 down to a level of 4 feet. Further drainage of T-4 must be completed by a piping modification or manual drainage.

Backwash Pump

Although bag filtration units are included before and after the air stripper, accumulation of some suspended solids within the liquid phase GAC units may be expected. In order to remove the solids from the top of the GAC beds and to provide resorting of the carbon particles within the bed, a clean water recirculation pump has been included with the system. The recirculation pump draws water from the T-4 effluent tank and would pump water up through the normally "down flow" GAC units. Water and solids from the GAC units will be pumped to T-2 for equalization and return treatment.

Suspended Solids Filter System

Suspended solids and small particulate matter are always present in some quantity and some form in all ground water remediation systems. Although no suspended solids limit has been established by IDEM, the TSS filters have been installed as maintenance control items. Removal of suspended solids before the flow instrumentation, the air stripping system and the GAC units prolongs the life of each unit and maximizes system operational time.

The treatment system utilizes four identical bag filter units (BF- 1 through BF-4). The bag filters are paired (BF- 1/ BF-2 and BF-3/ BF-4) for treatment before the air-stripping unit and before the GAC units respectively. The system piping includes a valve arrangement allowing the filters to be bypassed, any one of the filters to operate, or the two filters to operate in series.

All influent and effluent piping to each of the bag filters includes visual indicator pressure gauges. The OPERATOR must use both visual indications (sample clarity) and back pressure indications to identify when to replace the filter bags.

Carbonair Low Profile Air Stripper System

The Carbonair low profile air stripper is designed to provide 99.5% removal of all volatile organic compounds that are anticipated within the influent stream. The GAC system will act as a secondary polishing system to confirm compliance with the IDEM discharge approval.

Raw influent is pumped from the T-2 influent tank, through the primary TSS filters and directly into the low profile air stripper. The air stripper is designed for removal of dissolved volatile contaminants at a maximum flow rate of 35 gallons per minute, however the stripper can treat a hydraulic load exceeding 60 gpm without flooding.

The process uses forced draft, counter-current air stripping across baffled aeration trays to remove dissolved VOC's from the water. Impacted ground water is pumped into the air stripper and atomized by a spray nozzle above the top treatment tray. The atomized water collects within the tray and runs across each baffle to a downspout on the opposite corner of the tray. Clean air is blown up through the 3/16" diameter holes in each of the aeration trays to form a froth of bubbles. The froth creates a large surface area for mass transfer of contaminants from the dissolved phase to the air phase.

Air stripper off-gas including VOC contaminants are routed out of the top of the stripper and combine with the SVE air stream. The combined air stream mixes before entering the vapor phase GAC vessels.

Air Stripper Blower Operation

The air stripper blower provides the counter current air stream for the stripping action within the unit. The blower draws fresh air from within the treatment building and forces the air into the sump/base of the air stripper body. The air rises across the stripper trays and exits the stripper through a mist eliminator pad. Effluent air ducting routes the stripper off-gas to merge with the SVE off-gas stream and then through the vapor phase GAC units before discharge to the atmosphere.

Granular Activated Carbon Units

The air stripping system has been designed to provide greater than 99% removal of volatile organics, however the granular activated carbon units provide a treatment redundancy. The two GAC units are installed in series with sampling points and pressure

gauges before and after each unit. The primary GAC unit has been sized to provide 100% compliance with the volatile organic limitations for a period greater than 21 days. The secondary GAC units provide back-up assurances while adsorption occurs within the primary unit.

System Construction

The GAC units are ASME rated, reinforced fiberglass pressure vessels rated to 150 psi. The 36- inch diameter vessels include top and bottom entry/exit ports. Each port is a 3-inch male NPT opening. The only internal piping is a bottom "spider-web" collection laterals. The units may be piped in either up flow or down flow operation. As originally installed the GAC units have been piped in down flow operation, with influent water entering the top and effluent water exiting at the bottom.

GAC Operation and Controls

Additional components are included within the mechanical piping of the system and integral to the GAC operation. Adsorption by activated carbon is a physical process. Maintaining the GAC bed fully flooded without the presence of any air is critical. To maintain a fully "wet bed" the bottom outlet piping exits the vessel and rises above the height of the vessel effluent. A "pressure set" vacuum break is installed. The vacuum break allows a small quantity of air to enter the pipeline and allow the effluent water downstream of the vacuum break to siphon drain, while maintaining the GAC vessels fully wet.

The influent piping to each vessel includes a spring-loaded brass relief valve. Although the maximum head pressure of the largest pump (the backwash pump) is 135 psi, and the pressure rating of the vessels are 150 psi the GAC's should not experience a pressure over 75 psi. Maintaining a less than 75-psi operating pressure lowers the potential for crushing the carbon structure.

The pressure relief valves drain relief water to the building floor sump. If the building floor is wet or includes standing water the system may be shut down using the electrical disconnects in the MCC on the outside of the building before entering the building.

Manual Backwash Pump

Although bag filtration units are included before and after the air stripper, accumulation of some suspended solids within the liquid phase GAC units may be expected. In order to remove the solids from the top of the GAC beds and to provide resorting of the carbon particles within the bed, a clean water recirculation pump has been included with the system. The recirculation pump draws water from the T-4 effluent tank and would pump water up through the normally "down- flow" GAC units. Water and solids from the GAC units will be pumped to T-2 for equalization and return treatment.

The backwash pump will not operate for a period greater than 15 minutes, and will not operate unless sufficient water exists within the T-4 tank AND sufficient free-board exists within the T-2 tank.

Vapor Off-Gas Treatment System

The two vapor phase GAC units are installed in series with automatic vapor sampling points and temperature monitors before and after each unit. The primary GAC unit has been sized to provide 100% compliance with the volatile organic limitations for a period greater than 14 days. The secondary GAC units provide back-up assurances while adsorption occurs within the primary unit.

Carbon Vessel Construction

The vapor phase GAC units are welded steel vessels designed for large carbon volumes and large air flows. The 16.5 feet long vessels include dual bottom inlets and dual top outlets. The units are piped in series with effluent from the primary unit entering the influent side of the secondary unit.

Normal Operational Conditions

Additional components are included within the process piping of the system and integral to the GAC operation. The following points describe the interaction of the instrumentation and the affect each component monitors.

- Temperature monitors are included on the raw influent to the GAC's, the effluent of the primary GAC and the effluent from the secondary GAC. Because adsorption is an exothermic process, the higher the contaminant load to the system, the higher the temperature rise through the system.

- The vapor analyzer monitors the total hydrocarbons which are processes by the system. The flame ionization detector (FID) unit automatically cycles between monitoring the raw system influent, the mid-point between the GAC units and the final system effluent quality.
- A relative humidity sensor is included on the raw influent system piping immediately before the primary GAC unit. Humidity control is a crucial variable for the long term operation of the system. If the influent vapors have a high relative humidity value, the potential for condensation and carbon blocking by water droplets increase. The raw influent to the system should have a relative humidity value less than 50%.

Instruments & Controls

The field instrumentation mounted throughout the system is critical to the system operation. The instruments include digital (On or Off) switches and analog transmitters which send scaleable signals. The analog instruments utilized for this project include 4 basic types; pressure sensing/pressure transmitters, humidity sensing transmitter, Resistance Temperature Detectors (RTD) and volatile organic FID transmitter.

The PLC panel includes intrinsic barriers and terminal strips for connection of all field wiring. All field connections for the digital instruments and for the power outputs to the MCC are along the terminal bar at the bottom of the panel. All field connections for the analog instruments are isolated on the intrinsic barriers on the vertical left hand side of the panel. From the PLC to the various instruments, all instrumentation wiring is enclosed within isolated instrumentation conduits. At no time does instrumentation wiring encroach upon power supply wiring by less than .3-inches of separation.

Each field instrument has been factory tested prior to shipment. Upon receiving and installation of the instruments each unit was checked for "relative accuracy". Extreme care should be taken whenever working with the instrumentation. All units include some type of printed circuitry and close tolerance contacts. Inadvertent electrical surges or mechanical shocks (e.g. dropping a unit) will quickly disable the units and may cause personal injury.

Flow Meter Systems

Flow rate and total flow monitoring is critical to the monitoring of the system performance. The flow meter systems through the process are all identical and supplied by one manufacturer.

The process flow meters are positive displacement meters with analog direct indicating flow totalizers. The following are flow meter locations and general specifications for the flow meter systems:

Programmable Logic controller (PLC)

The PLC panel controls the operations of the recovery and treatment systems. The PLC panel is a 5 feet wide by 6 feet tall, steel electrical panel located immediately outside of the treatment building beneath the building overhang. The panel includes a 24 volt DC power supply for the various field instruments, 120 volt circuit breakers for the smaller loads, the Allen Bradley PLC components and racks, a front mounted MMI plus barrier strips for all field connections.

The PLC is pre-programmed to monitor the condition of all instruments and control the operation of all motors. The PLC itself is divided into two different types of units; input monitoring and output control. A PLC provides greater flexibility in the system control and operation over a "hard-wired" relay based control system. By monitoring individual instrument points (e.g. Tank 2 Level) the PLC can be programmed to provide control for multiple motors (e.g. Tank 2 Level controls the operation P-100A/ P-100B, P-2, P-300 and backwash pumps). The PLC panel is Underwriters Certified to meet industry quality and safety features for a NEMA 4 environment.

ISAAC Remote Monitoring Unit

The PLC panel has been equipped with an ISAAC FGD5000 RMU that is integrally mounted with the PLC. The RMU system is interviewed with the PLC panel to provide operational data and control access from a remote location. The system includes an internal data-logger to document previous operational history and to help troubleshoot "stray" alarm conditions.