CONSTRUCTION WORK PLAN

OU-3 Transition Zone Ground Water Collection

General Electric Corporation

June 2003

O'BRIEN & GERE
OF NORTH AMERICA

O'Brien & Gere Inc. of North America
5000 Brittonfield Pkwy.
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FIGURES

ATTACHMENTS

1 PURPOSE

This Work Plan has been developed per the June 2003 Remedial Design Report for the OU-3 Remedial Design for the Transition Zone Ground Water Collection at the General Electric (GE) Ft. Edward, New York facility. O'Brien & Gere, Inc. of North America (OGINA) has been contracted by GE to perform the site activities, including:

- Perform site surveying to establish control points, locate transition zone recovery wells, locate the pre-engineered transfer building, and develop as-built survey drawings.
- Perform site preparation activities to establish work zones and stockpile areas, setup temporary facilities, locate utilities, and install dewatering facilities.
- Perform work activities in accordance with the site-specific Health and Safety Plan (HASP, included under separate cover).
- Conduct weekly construction progress meetings to review completed and/or ongoing construction activities, planned construction activities, health and safety activities, action items, and schedule.
- Install a 16-foot x 22-foot pre-engineered building to enclose the piping, transfer tank, pumps and ancillary equipment for collection of ground water from the recovery wells and transfer of the ground water via existing force main to the GE Ft. Edward water treatment facility. The pre-engineered building will also enclose the DNAPL collection piping and containers for the recovery wells.
- Install four, new phase vertical recovery wells (RW-7, RW-8, RW-9, and RW-10).
- Install new ground water pumping and conveyance systems from the four, new recovery wells. Existing ground water pumping and conveyance systems at RW-2, RW-3, and RW-4 will be modified and routed to the new transfer building.
- Install DNAPL pumping and conveyance systems from the four, new recovery wells to the transfer building.
- Install instrumentation and controls to monitor systems operations, and to allow for fully automatic operation of the ground water recovery and DNAPL recovery systems.
- Demolish the existing recovery well house and associated equipment. Also remove ground water pumps and ancillary equipment from RW-1A, RW-5, and RW-6.

- Collect drill cuttings and development water for on site pre-treatment, amendment, and/or off-site disposal.
- Restore the work areas back to pre-construction condition.

This Work Plan has been developed to describe construction procedures to be implemented during the site remediation activities. If necessary, measures beyond those described in this Work Plan will be utilized to meet the intent of the design and protect workers and the surrounding community. Contract Drawings G-2 and G-3 from the OU-3 Remedial Design (O'Brien & Gere Engineers, June 2003) provide an overview of the work areas anticipated for the construction activities.

2 KEY PERSONNEL

Below is a table summarizing key personnel and their responsibilities for the site work and waste handling activities for the GE Rensselaer, NY remediation activities.

GE	CONTACT INFORMATION	RESPONSIBILITIES
Site Manager – David L. West	Office: 518-746-5560	1. Confirming site utility locations 2. Signing waste manifest/bills of lading 3. Coordinating disposal w/ on site Contractor reps. 4. Overall facility environmental health & safety responsibilities.
O'BRIEN & GERE ENGINEERS		
Managing Engineer – Steve Anagnost, P.E.	Office: 315-437-6100 x2259	1. Overall responsibility for design. 2. Developing final certification report 3. Engineering contact for reg. agencies and Owner.
Designer- Marvin Hull	Office: 315-437-6100 x2290	1. Review daily reports, confirm quantities, review submittals 2. Respond to Contractor questions
Managing Geologist – Ralph Morse, CPG	Office: 518-452-9392 x 12	1. Overall responsibility for installation and development of recovery wells.
O'BRIEN & GERE, INC. OF NORTH AMERICA (OGINA)		
Project Manager – Paul Mazurkiewicz, PE	Office: 315-437-6400 x2826 Cell: 315-254-4710	1. Overall responsibility for prime contract and subcontract administration. 2. Overall responsibility for project health and safety and quality control. 3. Contractor contact for Owner, Engineer, & reg. agencies. 4. Attend progress meetings, as needed.

Construction Supervisor - TBD		1. Schedule weekly progress meetings, develop agenda, meeting minutes. 2. Coordinate activities, deliveries with Superintendent & Foreman. 3. Coordinate site security requirements with Owner. 4. Maintain daily reports for construction activities. 5. Coordinate changes to design with Engineer, Owner, reg. agency(s). 6. On site rep. for maintaining quality control. 7. Coordinate waste handling with Owner representatives.
Construction/Resource Superintendent – Kevin Koennecke	Office: 315-437-6400 x2818 Cell: 315-729-3311	1. Responsible for materials and equipment procurement, finalizing subcontractor selection, submittals, and plan development. 2. Coordinate subcontractors, equipment and materials deliveries. 3. Coordinate initial and as-built surveying 4. Coordinate building inspections, as needed, with local agencies 5. Overall responsibility for coordination/scheduling of site construction activities.
Site Foreman – John Baker	Cell: 315-440-9514	1. Coordinate field activities with subcontractors and OGINA field personnel. 2. Responsible for construction quality control. 3. Coordinate field activities with on site H&S monitoring personnel. 4. Measure daily quantities. 5. Maintain dewatering system(s), as needed. 6. Attend progress meetings. 7. Coordinate site activities with on-site Health and Safety Monitor.
Health and Safety Monitor – TBD		1. Oversee site activities to confirm work performed according to site-specific HASP and GE plant policies. 2. Personnel toolbox safety meeting and prework safety briefings.

		3. Maintain daily records of work activities. 4. Define exclusion & support zones for work activities, coordinate with Owner rep. 5. Responsible for personnel and community air monitoring. Maintain daily weather data for site.

As indicated on the above table, the Project Manager will be responsible for the overall quality control on the project with the Construction Supervisor acting as the on site quality control representative. The Project Manager will review all work and confirm that the work is performed in accordance with the technical specifications. Figure 1 shows the project management flow chart and reporting chain-of-command described above.

3 MOBILIZATION, SITE PREPARATION AND TEMPORARY FACILITIES

OGINA will mobilize personnel and equipment to the Ft. Edward facility and setup temporary facilities. The proposed location of the temporary facilities for the transition zone groundwater collection activities is included as Figure 2 (Temporary Facilities Partial Site Plan). As part of the mobilization/site preparation activities, OGINA will perform the following:

- A licensed NYS land surveyor will layout the proposed vertical recovery well locations and the transfer building footprint (10-foot offsets).
- All utilities will be marked and necessary contacts made regarding working in the parking lot. Anticipated daily activities will be coordinated with designated GE personnel and work areas will be clearly marked daily.
- Equipment and material lay down and stockpile areas will be established. These areas will be selected to minimize interfering with facility activities and will be approved by GE.
- Erosion controls will be installed, if needed, along the southern property line along Park Ave. Catch basins/storm sewers which are in the work zone will have temporary erosion controls installed to prevent sediment from entering the basin.
- Setup community air monitoring equipment for intrusive activities. It is anticipated that the community air monitoring will be installed during drilling and development activities to monitor dusts and odors. It is anticipated that the community monitoring will be installed for measuring dusts during the other site activities.
- Temporary water collection and pretreatment measures will be installed for the well development water. Drill cuttings will be collected, containerized, dewatered and/or solidified (if necessary), and disposed by GE.
- If necessary, the forcemains and conduits for RW-3 and RW-4 will be temporarily re-routed to accommodate installation of the transfer building foundation.

4 RECOVERY WELLS

Four vertical recovery wells will be installed in the main parking lot area of the GE Ft. Edward, New York facility. The locations of the new recovery wells (RW-7, RW-8, RW-9, and RW-10) are shown on Contract Drawing G-3 (O'Brien & Gere Engineers, June 2003). The well installation details are shown on Contract Drawing G-4 (O'Brien & Gere Engineers, June 2003) and described in the June 2003 Final Technical Specifications (O'Brien & Gere Engineers, Fort Edward Facility OU-3 Remedial Design). Construction details of the recovery wells are described below:

- A licensed well driller, familiar with similar environmental well installations, will be subcontracted to perform the work. Based on GE requirements and the site-specific HASP, barricades and/or safety fence/tape will be placed around the work zone to prevent unauthorized personnel entry in or around work area.

- A representative from O'Brien & Gere will be on site to oversee all the well drilling activities to confirm techniques, and screen and well depths, and ensure the well is installed in accordance with the remedial design. Additionally, O'Brien & Gere personnel will be on site to monitor the drilling/well installation health and safety activities and perform any required community air monitoring.

- A total of four direct push samples (Geoprobe) will be installed immediately adjacent to the proposed new recovery well locations to evaluate the subsurface conditions and confirm the depths of each soil strata. The Geoprobe installation will be utilized in finalizing specific well sizing and depths. Boring logs of the push sample installation will be completed by the driller and on site O'Brien & Gere representative.

- All new recovery wells will be constructed of 304 stainless steel with a 6-inch nominal diameter. The well screens will be 304 stainless steel continuous slot wound wire with V-shaped slot openings.

- RW-7, RW-8, and RW-9 will each have two screens, one immediately above the transition zone (sand and gravel unit), and the second screen will be installed in the

transition zone and above the top of the clay unit. The screen in the sand and gravel unit shall have a slot size of 0.045 inches. The screen in the transition zone shall have a slot size of 0.010 inches. RW-10 will only have a screened interval in the transition zone and above the clay. A 12-inch to 18-inch section of stainless steel casing will be installed between the two well screens in RW-7, RW-8, and RW-9. As indicated on Contract Drawing G-4, the slot size, depth, and length of the screens in each well will vary.

- All of the new recovery wells will have a 5-foot deep sump on the bottom of the well for collection and pumping of DNAPL. The sump will be grouted in place using a mixture of Portland Cement, bentonite and water. Each well will have a collar located at the top of the clay layer, immediately above the sump interval.

- The 6-inch diameter recovery wells will be installed using 10 ¼-inch (ID) hollow stem auger casing to advance the well borehole through the upper sand and gravel unit down to the transition zone. Once the transition zone is reached, the well borehole will be advanced down into (5-feet) the lacustrine clay unit using mud rotary techniques.

  A filter pack will be installed at each screened interval on the well. As indicated on Contract Drawing G-4, the filter pack for the sand and gravel screened interval shall be #2 Morie sand, and the screened interval in the transition zone shall be #0 Morie sand. The upper filter pack shall extend from approximately 3 feet below the screened interval to 3 feet above the screened interval. The transition zone filter pack shall extend from the upper screened interval (approximately 8 inches above the transition zone screen) to the bottom of the screen (immediately above the collar/sump/grout interval).

  A 2-foot thick bentonite pellet seal shall be installed above the upper filter pack with a cement-bentonite grout extending above the bentonite seal up to the top of the riser pipe. The riser will be extended to approximately existing grade of the parking lot, with the final elevation of the riser pipe determined once the recovery well manhole installation is complete.

  The driller will be responsible to ensure the well plumbness meets the remedial design requirements. The on-site representatives from O'Brien & Gere and the driller will

complete a drilling log for each well, with detailed descriptions of: the overall well depth; the various soil strata and ground water depth; depth(s) of the well screen(s); sump depth; and amount of gravel pack, bentonite, and grout installed.

- The four new recovery wells will be developed by the well driller until the well yields clear, sediment-free water, and the specific capacity of the water has equilibrated. The well driller will develop the well using mechanical surging and pumping to restore the hydraulic conductivity between the formation(s) and the respective filter pack, and maximize the well yield. Each screened interval shall be developed separately. An O'Brien & Gere representative will be on site overseeing the well development activities.

  The well development water and any DNAPL will be collected on site for either on site treatment or off site disposal. Any water collected will be ultimately treated at the on site water treatment facility, with pretreatment equipment available to reduce suspended solids from the water prior to introduction to the facility treatment system. Any DNAPL recovered during well development activities will be placed in DOT-approved containers for characterization and off site disposal by GE.

- Once well development is complete, a well performance test will be performed on the new recovery wells. The performance test will be completed by the well driller and/or O'Brien & Gere, with each well being tested for up to six hours. It is anticipated that the wells will be pumped at 10 gpm, 20 gpm, and 30 gpm consecutively for two hours at each pumping rate. Once the testing is initiated, the on site O'Brien & Gere representative will determine the maximum pumping rate for each well, and determine when the water level stabilizes at each pumping rate. There will be a minimum 12-hour period in between completion of the performance test on one well and starting the testing on another well.

  Per the technical specifications (O'Brien & Gere Engineers, June 2003), O'Brien & Gere will measure the well yield and well drawdown at specified intervals, and the well recovery will also be measured for two hours following completion of the 6-hour test period.

Water generated during the performance testing will be treated on site using the GE water treatment facility, pretreating the water on site as needed to reduce suspended solids concentrations and/or separate any free product generated during the test.

The on site O'Brien & Gere representative will be responsible for maintaining records of all test data and measurements, and record site conditions and events which may effect the performance test.

5 TRANSITION ZONE GROUND WATER COLLECTION

The transition zone ground water collection activities includes the following:

- Installation of a 16' x 22' x 12' pre-engineered transfer building with one mandoor and one equipment door to be used to enclose the piping, tanks and ancillary equipment associated with the ground water and product recovered from the transition zone recovery wells. The building will be installed on a concrete foundation, with a 8-inch thick concrete floor and 4-inch high curb around the floor perimeter. A 2-foot x 2-foot x 2-foot concrete sump will be installed in the floor. Structural details of the transfer building are included on Contract Drawings S-1, S-2, and S-3. The transfer building electrical and HVAC layout is included on Contract Drawing E-2. The technical specifications also include equipment, materials, and installation requirements for the transfer building.

  The asphalt in the transfer building footprint will be saw cut, removed and stockpiled in an area adjacent to the excavation area (without disturbing facility parking). A backhoe will be used to excavate the building foundation down to approximately 5½-feet below grade and the floor slab approximately 8-inches below grade, stockpiling the excavated spoils on site. It is anticipated that the asphalt will be disposed off site, while the foundation spoils remain on site for stockpile and/or reuse as backfill.

  Personnel will then install necessary concrete forms and reinforcing bar (rebar) for the building foundation. Once the concrete is poured and cured (approximately 2-3 days), the forms for the foundation will be removed, and the forms, rebar and pipe sleeves for the foundation walls installed. After the concrete for the walls is cured, the forms removed, the insulation placed on the walls, and the area around the foundation backfilled with native material up to approximately 6-inches below the floor (approximately 14-inches below finished floor elevation). A 6-inch layer of borrow material (Type A - crushed gravel, or Type B – crushed stone) will be brought in and compacted to 95% of maximum dry density prior to installing the rebar for the floor. Similarly, the building floor sump area will be excavated to the required depth (approximately 32-inches below finished floor elevation), the backfill

placed and compacted, and concrete forms and rebar for the sump floor installed. After the sump floor concrete is poured and cured, the sump walls will be formed and poured. After the sump walls are poured and cured, the insulation board will be installed on the walls, the isolation joint for the building floor installed on the foundation walls, and the backfill placed and compacted for the building floor installation. The floor rebar and pipe sleeves, and equipment pad rebar will be placed and the concrete for the floor placed, finished and cured. The equipment pads will be formed and placed after the floor is cured. Any floor coatings will be installed prior to placement of equipment inside the building and again once all construction related activities are complete.

Once the building foundation walls have cured for approximately seven days, the building anchor bolts will be drilled into the foundation walls. Epoxy will be placed in the drilled hole and the anchor bolt set. Once the anchor bolts are installed, the building frame will be erected. Once the frame is installed, the roof and wall panels will be installed per the manufacturer's instructions. Once the building installation is complete, the required wall coatings/finishes will be applied.

- Equipment for the transition zone pumping and collection system control system, power feeds, collection tanks/drums will be installed in the transfer building. The equipment installed in the transfer building includes:

  - A 550-gallon (minimum), conical bottom, transfer tank that temporarily collects the ground water recovered from the seven recovery wells. Two transfer pumps will be installed to convey the collected water from the transfer tank to the water treatment plant air stripper via an existing 3-inch force main. The transfer tank will be equipped with an overflow baffle to contain any residual DNAPL recovered by the groundwater system within the tank. If DNAPL is detected in the transfer tank, it will be manually drained and disposed of by GE. A 4-inch vent line will be installed to run from the tank to a point two foot above the building roof.

There will be two level switches, one high level alarm to prevent overflow (shut down well pumps), and one low level alarm to prevent the transfer pumps from continuing to pump at low level. The transfer pumps will be equipped with a level transmitter which will control the pump speed and maintain relatively constant flow to the water treatment plant air stripper.

- A 60-gallon, single-stage air compressor which will supply the air to the product pumps in RW-7, RW-8, RW-9, and RW-10.

- The controllers for the QED product pumps. These controllers are designed to control the pump fill and discharge cycles.

- The process piping for the ground water and DNAPL pumping and collection systems. The process piping will include the following:

  - Ground water conveyance piping – HDPE
  - DNAPL conveyance piping – stainless steel or Teflon

- The motor control centers which will contain the motor starters and relays for operating the pumping and collection electrical components.

- Installation of a trench across the facility parking lot trench for installation of the ground water and DNAPL force mains, and associated compressed air and electrical conduit from the new recovery wells to the transfer building. The trench will be approximately four feet wide and 5½-feet deep. The existing asphalt will be saw cut, removed, and stockpiled on site for off site debris disposal. Once the asphalt is removed, the trench will be excavated to the required depth, with the excavation soils temporarily staged adjacent to the trench for reuse as backfill above the pipe (see details on Contract Drawing G-4). Initially, approximately 4 inches of the specified borrow material (Type D) will be installed in the bottom of the trench, and the force main piping installed atop the bedding. Once placed, the force main piping will be covered with a minimum of one foot of bedding material. The stockpiled trench

excavation soils will then be placed over the bedding material up to approximately 15-inch to 18-inch below grade. The force main portion of the trench will include:

- The ground water force mains from RW-7, RW-8, RW-9, and RW-10. The force main piping will be ¾-inch HDPE tubing which will run directly from the recovery well to the transfer building. It is anticipated that the force main tubing will be installed in one single coil of the appropriate length coils to avoid joints/connections in the pipe. As designed, the only connections for the ground water force main tubing will be inside the transfer building and at the recovery well manhole. A ¾-inch pitless adapter will be installed on the well casing (5-foot below grade) to connect the force main piping to the down well pipe.

- The product tubing which will convey the recovered DNAPL from RW-7, RW-8, RW-9, and RW-10. The specified QED product recovery system includes a ½-inch diameter product line and 3/8-inch air supply line for each pump. The product and air supply lines tubing bundle will be supplied to run from the transfer building to the product recovery pump without joints. The product recovery tubing bundle will be installed inside 4-inch, Sch 40 PVC containment pipe. Up to two tubing bundles will be installed in each 4-inch containment pipe.

Electrical conduit will be installed approximately 24-inches below existing grade immediately adjacent to either side of the force main trench. The conduit will contain the power wires feeding the recovery well ground water pumps, with up to three sets of wire (power feed to 3 recovery pumps) being installed in one conduit. The control wiring for the all four of the wells (transducers) will be installed in one conduit which does not contain any of the pump power feeds. The conduits will be bedded with off site borrow material (Type D), with six inches of bedding material above and below the conduit.

A 12-inch thick layer of subbase material (NYSDOT No. 304.04 or approved equal) will be placed and compacted (90%) above the conduit bedding and native soils placed in the

force main trench. Once the trench is completed, the asphalt will be replaced to existing grade.

The force mains from RW-2, RW-3, and RW-4 will be re-routed to the new transfer building once the equipment inside the building is installed and operational. The force main piping and electrical conduit for the three existing recovery wells will continue to pump to the existing well house located immediately east of the new transfer building. If necessary during construction of the transition zone collection system, the existing recovery well piping and conduit may be temporarily relocated to get out of the new transfer building footprint. Similarly, the force main which conveys the ground water from the well house to the facility water treatment building (air stripper inlet) will likely be temporarily relocated outside the transfer building footprint during construction and modified once the transition zone collection system is operational. There may be a temporary shutdown (5-10 days) of the existing recovery wells and the air stripper influent force main while the force mains and conduits are transitioned to the new system.

During the trench installation, care shall be taken to delineate the work area with temporary fencing and/or barricades to prevent authorized personnel entry into the work zone. Additionally, work activities shall be performed to minimize the amount of trench open each day.

- Installation of a recovery well manhole at RW-7, RW-8, RW-9, and RW-10. The manhole will consist of a precast concrete slab (min. 4-foot diameter) with a 18-inch to 24-inch gasketed steel frame and cover (H-20 rated). The manhole cover will include a skirt that extends approximately 18-inch to 24-inch below grade. Pump cables, electrical junction boxes will be secured to the manhole skirt.

- Installation of a product recovery pump that will be installed in the sump installed in the four new recovery wells (RW-7, RW-8, RW-9, and RW-10). The QED pneumatic displacement, product recovery pump will be connected to the nylon tubing bundle (product and air lines) and stainless steel cable used for removing the pump for maintenance. A thermal conductivity sensor FCI-series FLT93S will be

installed in the recovery wells sump to detect the presence of product in the well and actuate the product pump controller.

- Installation of submersible, transition zone ground water pumps in the each of the four new recovery wells and the three existing wells (RW-2, RW-3, RW-4). The down well, ¾-inch diameter, stainless steel piping in the new recovery wells will extend from the pump up to the pitless adapter along the well casing wall. The pump will also have a stainless steel cable attached to allow for removal during maintenance. A level transducer will be installed in the transition zone to measure level in the well and turn the pump on and off based on level.

6 WATER & WASTE MANAGEMENT

It is anticipated that water and waste materials will be generated during the OU-3 Transition Zone Collection System construction activities. O'Brien & Gere will be responsible for collecting and/or containing the water and waste generated during the activities, with GE being responsible for the on site treatment and/or off site disposal of the materials.

The sources of construction water which are to be collected and managed in accordance with this Section are as follows:

- Well development and well performance test water – It is anticipated that this will represent the largest volume of water to be managed during the construction activities. Water generated during these activities will be containerized (temporary tank) in the vicinity of the work area, pretreated if necessary, and subsequently introduced to the on-site water treatment facility. Temporary pretreatment may include separation of any free product, and/or filtration (bag filters) to remove high concentrations of suspended solids. If utilized, any pretreatment system wastes will be containerized, characterized and disposed off site by GE.

- Personnel and equipment decontamination wash waters – Personnel and equipment will be decontaminated in a temporary decontamination area located immediately north of Building 40. The proposed decontamination area was utilized during the OU-3 Foil Mill construction activities.

- Precipitation for surface runoff – As necessary, erosion and sediment control measures will be installed in areas where runoff can enter and/or exit work areas. Hay bales and/or silt fence will be installed around work areas and around nearby catch basins to control runoff.

Based on the elevation of the excavations being performed during the transition zone collection activities, it is not anticipated that ground water will be encountered and not be managed. If ground water is encountered, temporary pumping systems and containers will be provided to accommodate the anticipated flows.

In areas where water is collected and/or temporarily containerized, temporary bermed staging areas will be established. Polyethylene sheeting (minimum 20-mil or equivalent) will be placed under containers, and berms (soil or hay bales covered with the poly) will be placed around the perimeter of the temporary staging area.

It is also anticipated that some solid wastes will be generated during the construction activities, including:

- Drill cuttings/drilling mud – this material will be temporarily stockpiled and/or containerized adjacent to the drilling area, subsequently placing cuttings in a waste transport container (rolloff box or similar). Polyethylene sheeting (20-mil or equivalent) will be placed under the containers, building temporary berms around the area to contain the waste within the lined area. If necessary, stabilizing/solidifying agents will be used on high moisture content solids prior to off site disposal.

- Asphalt and excavation spoils – asphalt removed during the construction activities will be containerized and disposed off site as construction debris. Excavation spoils from the force main trench will be either placed back in the trench as backfill or spread over low-lying areas on the property. Similarly, excavation spoils from the transfer building excavation will be relocated on site for reuse as fill material.

7. HEALTH AND SAFETY

Attached at the end of this Work Plan is a Job Safety Analysis (JSA) for the proposed site activities. The JSA for the site activities is an amendment to the September 2002 site-specific Health and Safety Plan for the OU-3 Foil Mill Remediation Activities. O'Brien & Gere will perform the necessary air monitoring personnel and work zone monitoring during intrusive activities. Similar to the CAMP monitoring conducted during the OU-3 Foil Mill construction activities conducted at the site, the CAMP monitoring will be conducted at the downwind perimeter of the work area(s) during intrusive work activities. It is anticipated that the CAMP monitoring conducted for the Transition Zone will include:

- Particulate Monitoring – conducted during all intrusive activities, including drilling and excavation work.
- Volatile Organic Monitoring – conducted during drilling activities and any other site activities where the potential that contaminated ground water and/or DNAPL will be encountered.

The response levels and actions required by NYSDEC and utilized for the OU-3 Foil Mill activities will also be administered for the Transition Zone Ground Water collection activities.

In addition to the CAMP monitoring data, on site weather/wind direction information will be recorded, with the field records of the monitoring maintained on site by O'Brien & Gere.

8. SCHEDULE

The anticipated project schedule for the Transition Zone Ground Water Collection construction activities is attached as Figure 3. As indicated on the schedule, O'Brien & Gere plans on performing a number of tasks concurrently to minimize interruptions of any ongoing production facility activities.

Figure 1

FIGURE 1

OU-3 Transition Zone
Groundwater Colleciton
Project Management Flow Chart
June 24, 2003

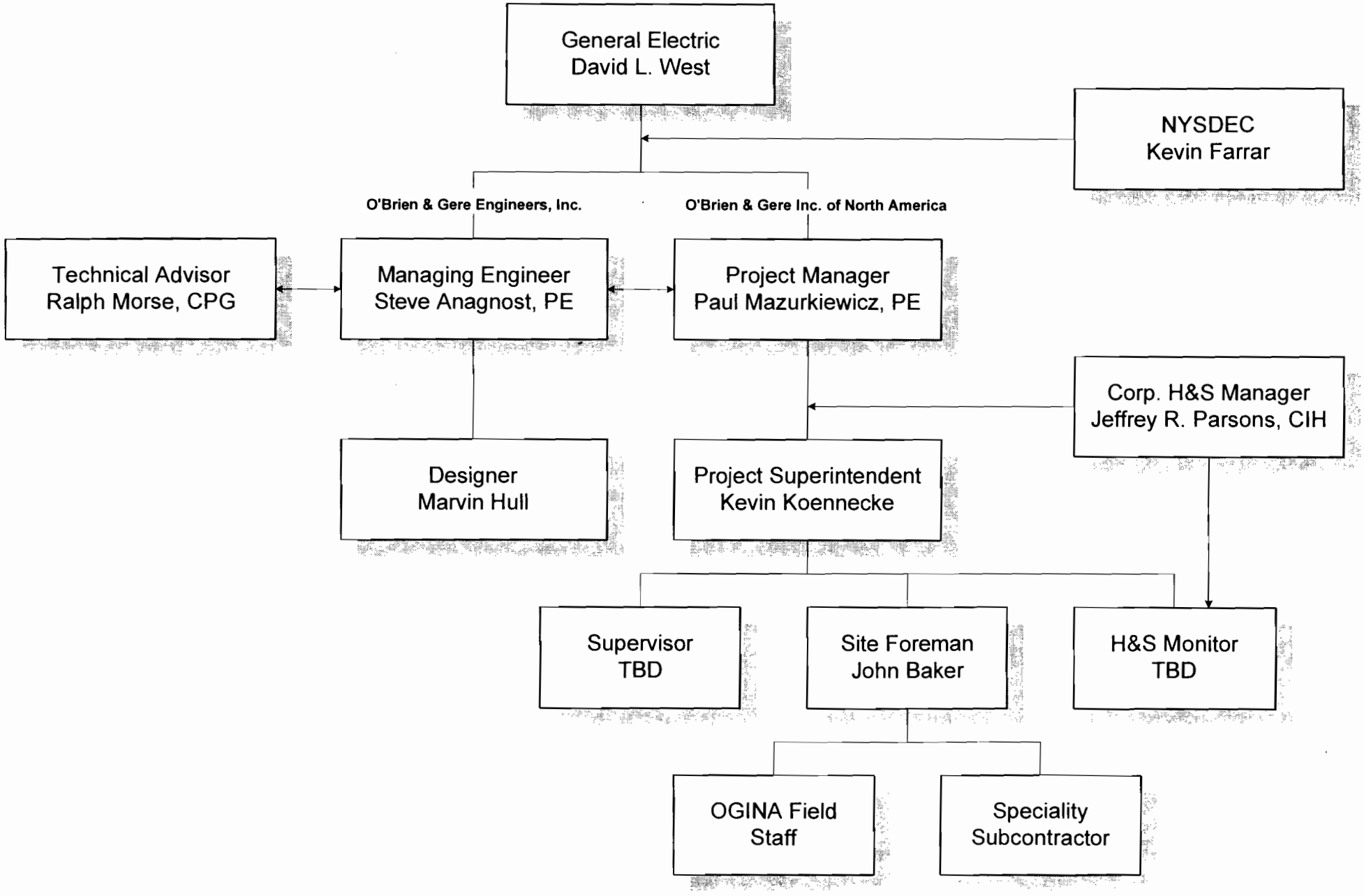

Figure 2

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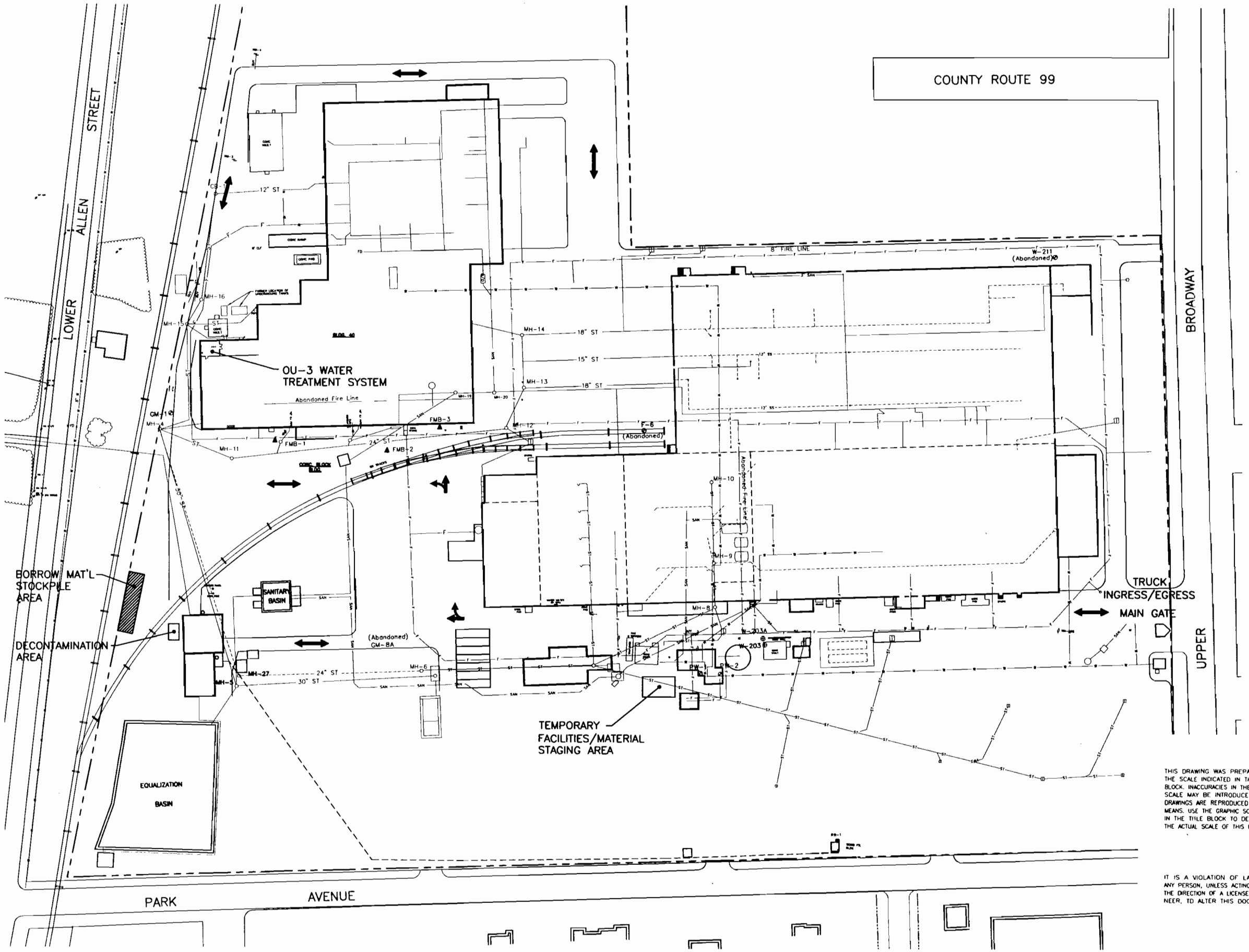


LEGEND

- MONITORING WELL
- SOIL BORING
- RAILROAD
- TREES
- PROPERTY BOUNDRY
- —X— FENCE
- UTILITY POLE
- —SAN— SANITARY SEWER
- —ST— STORM SEWER
- —F— FIRE LINE
- —W— WATER LINE
- MH MANHOLE
- CB CATCH BASIN
- ABANDONED SEWERS

NO.	DATE	REVISION	INIT.
A	6/30/03	ISSUED FOR NYSDEC APPROVAL	

1"=60' 60 0 60 120

THIS DRAWING WAS PREPARED AT THE SCALE INDICATED IN THE TITLE BLOCK. INACCURACIES IN THE STATED SCALE MAY BE INTRODUCED WHEN DRAWINGS ARE REPRODUCED BY ANY MEANS. USE THE GRAPHIC SCALE BAR IN THE TITLE BLOCK TO DETERMINE THE ACTUAL SCALE OF THIS DRAWING.

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS ACTING UNDER THE DIRECTION OF A LICENSED ENGINEER, TO ALTER THIS DOCUMENT.

O'BRIEN & GERE ENGINEERS INC.

GENERAL ELECTRIC COMPANY
FORT EDWARD FACILITY FORT EDWARD, NY
OU3 REMEDIAL DESIGN

– TRANSITION ZONE GROUND WATER COLLECTION

GENERAL

TEMPORARY FACILITIES PARTIAL SITE PLAN

IN CHARGE OF
DESIGNED BY CHECKED BY
DRAWN BY

FILE NO. 5731.30137.046

DATE JUNE 2003

FIG 2

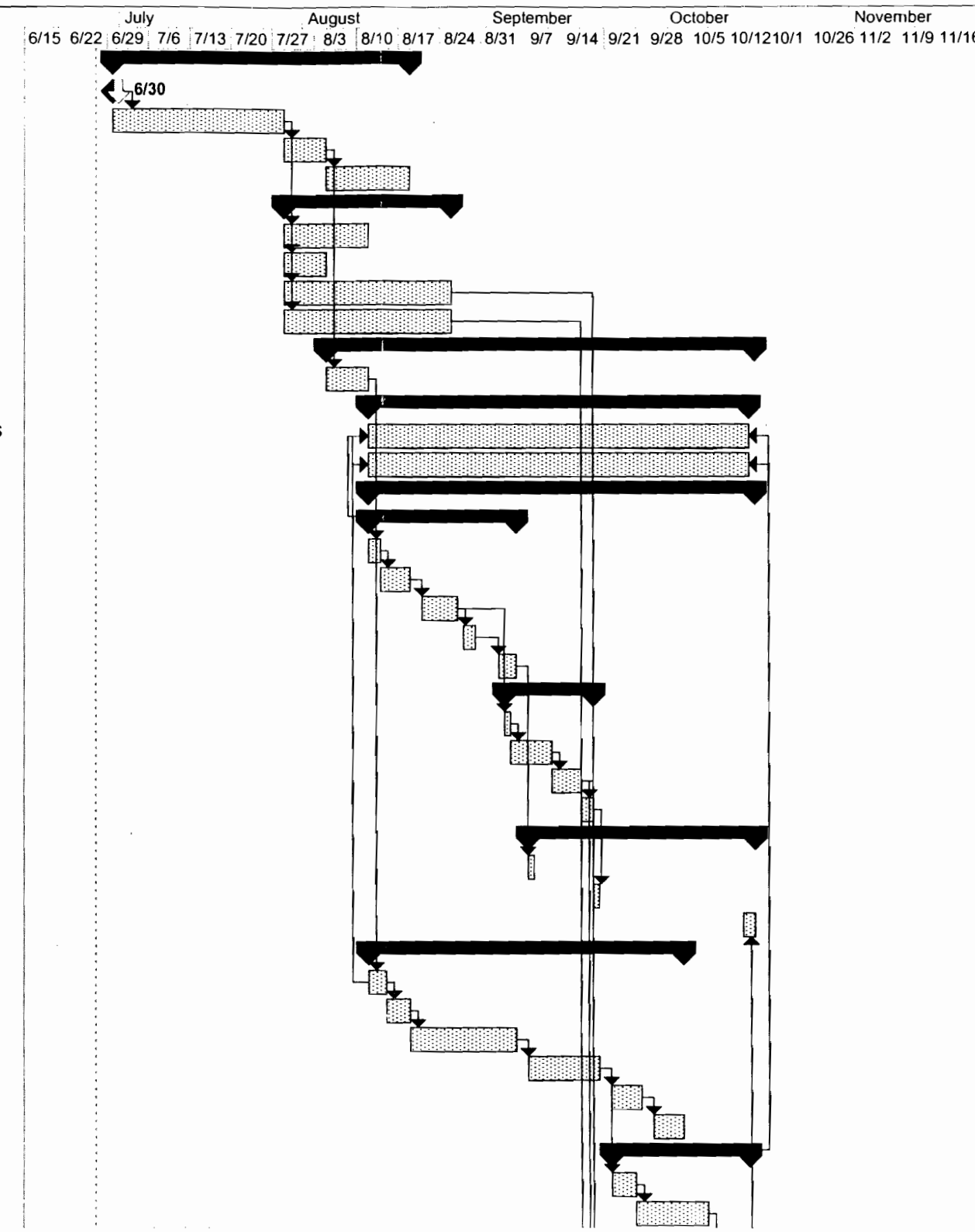
PLOT DATE:

Figure 3

OU-3 TRANSITION ZONE COLLECTION SYSTEM
GENERAL ELECTRIC COMPANY
FT. EDWARD, NY FACILITY

FIGURE 3

ID	Task Name	Duration	Start	Finish	Predecessors
1	**CONSTRUCTION WORK PLAN**	**35 days**	**Mon 6/30/03**	**Mon 8/18/03**	
2	Submit Work Plan to NYSDEC for review	0 days	Mon 6/30/03	Mon 6/30/03	
3	NYSDEC review of Work Plan	20 days	Mon 6/30/03	Mon 7/28/03	2
4	OGINA finalize Work Plan w/ NYSDEC comments/resubmit	5 days	Tue 7/29/03	Mon 8/4/03	3
5	NYSDEC approval of Work Plan	10 days	Tue 8/5/03	Mon 8/18/03	4
6	**PROCUREMENT ACTIVITIES**	**20 days**	**Tue 7/29/03**	**Mon 8/25/03**	
7	Building Procurement/Delivery	10 days	Tue 7/29/03	Mon 8/11/03	3
8	Well Driller Procurement	5 days	Tue 7/29/03	Mon 8/4/03	3
9	Equipment/Tanks/Pumping Systems Procurement/Delivery	20 days	Tue 7/29/03	Mon 8/25/03	3
10	Electrical & Control Systems Procurment/Delivery	20 days	Tue 7/29/03	Mon 8/25/03	3
11	**CONSTRUCTION ACTIVITIES**	**51 days**	**Tue 8/5/03**	**Wed 10/15/03**	
12	Mobilize/Install Temp Facilities/Temp Controls/Site Survey & Layout	5 days	Tue 8/5/03	Mon 8/11/03	4
13	**Health & Safety/Community Air Monitoring**	**45 days**	**Tue 8/12/03**	**Tue 10/14/03**	
14	CAMP Monitoring	45 days	Tue 8/12/03	Tue 10/14/03	39FF,17SS,33SS
15	Work Zone/Personnel Monitoring	45 days	Tue 8/12/03	Tue 10/14/03	39FF,33SS
16	**Transfer Building Construction**	**46 days**	**Tue 8/12/03**	**Wed 10/15/03**	
17	**Concrete Installation**	**18 days**	**Tue 8/12/03**	**Fri 9/5/03**	
18	Building Foundation Excavation	2 days	Tue 8/12/03	Wed 8/13/03	12
19	Form/Pour Foundation	3 days	Thu 8/14/03	Mon 8/18/03	18
20	Form/Pour Foundation Walls	4 days	Thu 8/21/03	Tue 8/26/03	19FS+2 days
21	Form/Pour Floor Sump	2 days	Thu 8/28/03	Fri 8/29/03	20FS+1 day
22	Form/Pour Floor Slab	3 days	Wed 9/3/03	Fri 9/5/03	21FS+1 day
23	**Building Installation**	**11 days**	**Thu 9/4/03**	**Thu 9/18/03**	
24	Install Anchor Bolts	1 day	Thu 9/4/03	Thu 9/4/03	20FS+5 days
25	Install Building Support Steel	5 days	Fri 9/5/03	Thu 9/11/03	24
26	Install Building Walls/Roof	3 days	Fri 9/12/03	Tue 9/16/03	25
27	Frame/Install Doors	2 days	Wed 9/17/03	Thu 9/18/03	26
28	**Install Building Coatings**	**28 days**	**Mon 9/8/03**	**Wed 10/15/03**	
29	Initial Concrete Coating	1 day	Mon 9/8/03	Mon 9/8/03	22
30	Install Steel Coatings	1 day	Fri 9/19/03	Fri 9/19/03	27
31	Finish Coatings/Touch up	2 days	Tue 10/14/03	Wed 10/15/03	51
32	**Recovery Wells**	**38 days**	**Tue 8/12/03**	**Fri 10/3/03**	
33	Install Geoprobes/Recovery Well Depth Confirmation	3 days	Tue 8/12/03	Thu 8/14/03	12
34	Final Transition Zone Recovery Well (RW-7, RW-8, RW-9, & RW-10) Design	2 days	Fri 8/15/03	Mon 8/18/03	33
35	Well Driller Material Procurement/Mobilization	13 days	Tue 8/19/03	Fri 9/5/03	34
36	Transition Zone Recovery Well Installation	10 days	Mon 9/8/03	Fri 9/19/03	35
37	Transition Zone Recovery Well Development	5 days	Mon 9/22/03	Fri 9/26/03	36
38	Transition Zone Recovery Well Performance Test	5 days	Mon 9/29/03	Fri 10/3/03	37
39	**Site Work**	**17 days**	**Mon 9/22/03**	**Tue 10/14/03**	
40	Installation of Recovery Well Manholes/Appurtances	4 days	Mon 9/22/03	Thu 9/25/03	36
41	Installation of Ground Water Force Mains/Product Lines/Compressed Air Lines/Electrical Conduit	8 days	Fri 9/26/03	Tue 10/7/03	40



Project: OU-3DNAPL_rev0
Date: Fri 6/27/03

Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

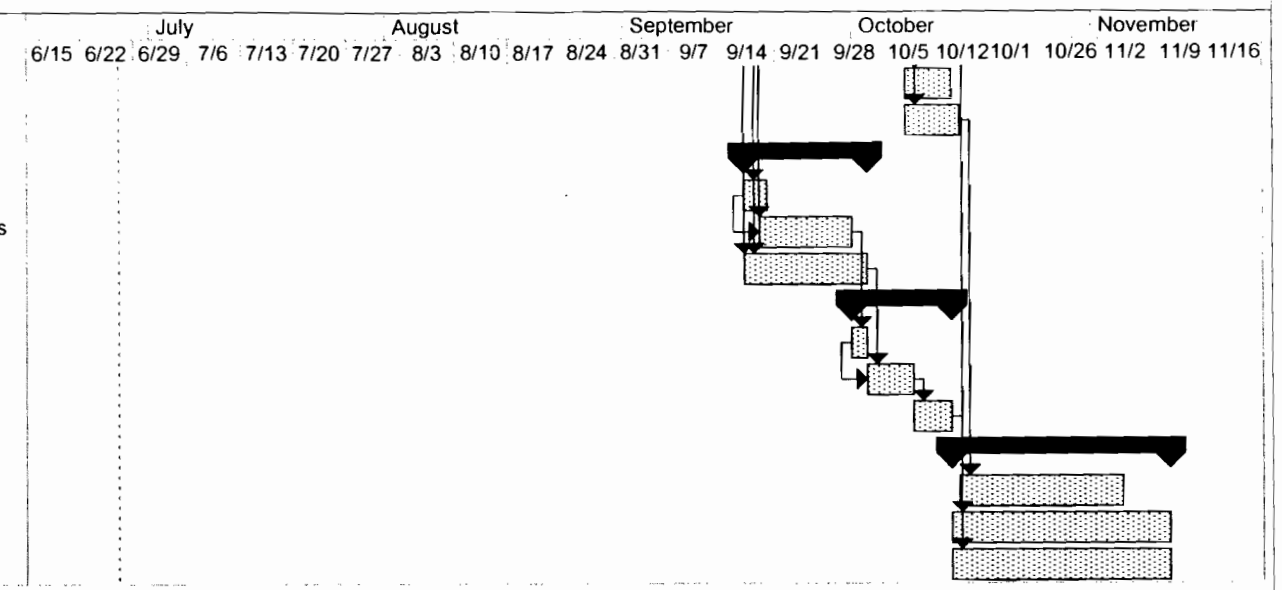
REV 0 (06/30/03)

O'BRIEN & GERE

OU-3 TRANSITION ZONE COLLECTION SYSTEM
GENERAL ELECTRIC COMPANY
FT. EDWARD, NY FACILITY

FIGURE 3

ID	Task Name	Duration	Start	Finish	Predecessors
42	Installation of Well Pumping Systems/Monitoring & Control Devices	4 days	Wed 10/8/03	Mon 10/13/03	41
43	Backfill Force Main Trench/Restoration of Surfaces	5 days	Wed 10/8/03	Tue 10/14/03	41
44	**Mechanical & Electrical Installations**	**12 days**	**Wed 9/17/03**	**Thu 10/2/03**	
45	Installation of Tanks, Pumps, Ancillary Equipment	3 days	Wed 9/17/03	Fri 9/19/03	26
46	Forcemain Tie-ins, Building Interior Piping	8 days	Fri 9/19/03	Tue 9/30/03	26,9,45SS+2 days
47	Interior Electrical/Power & Control Wires to Recovery Wells	12 days	Wed 9/17/03	Thu 10/2/03	26,10
48	**Startup & Testing**	**9 days**	**Wed 10/1/03**	**Mon 10/13/03**	
49	Installation Qualification (dry testing)	2 days	Wed 10/1/03	Thu 10/2/03	46
50	Operational Qualification (wet testing, manual & automatic)	4 days	Fri 10/3/03	Wed 10/8/03	49SS+1 day,47
51	Full system startup/testing with ground water, product	3 days	Thu 10/9/03	Mon 10/13/03	50
52	**CLOSEOUT ACTIVITIES**	**20 days**	**Tue 10/14/03**	**Mon 11/10/03**	
53	As-Built Survey/Drawing Development	15 days	Wed 10/15/03	Tue 11/4/03	43
54	Startup Documentation/O&M Plan Development	20 days	Tue 10/14/03	Mon 11/10/03	51
55	Certification Report Development	20 days	Tue 10/14/03	Mon 11/10/03	51



Project: OU-3DNAPL_rev0
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Task | Split | Progress | Milestone | Summary | Project Summary | External Tasks | External Milestone | Deadline

ATTACHMENT 1

Client:	GE	**OGINA Project manager:** **OGINA Project Superintendent:** **OGINA Site Foreman:**	**Paul Mazurkiewicz, P.E.** Work: (315) 437-6400 x2826 Cell: (315) 254-4710 **Kevin Koennecke** Work: (315) 437-6400 x2818 Cell: (315) 437-729-3311 **John Baker** Cell: (315) 440-9514	**Date of JSA:** **Revision:**	June 23, 2003 0
Project Name:	OU-3 Transition Zone Ground Water Collection	**Client Site Manager:**	David L. West Work: (518) 746-5560	**CHS Review on:**	April 6, 2002
Project Location:	Ft. Edward, NY	**OGINA SSHC:**	John Baker	**OU-3 Transition Zone Ground Water Collection JSA** **This JSA is to be utilized in conjunction with the existing site safety plan and the OGINA Corporate H&S Manual.**	
Job No.:	33007.010.005	**OGINA CHS Review by:**	Jeffrey R. Parsons, CIH Work: (315) 437-6400 x2871 Cell: (315) 391-0638		
Project Phone No.:	Baker Cell: (315) 440-9514	**JSA Conducted by:**	OGINA		
Project Fax No.:	tbd	**JSA Prepared by:**	Jeffrey R. Parsons, CIH		

BACKGROUND & SCOPE

This Hazard Identification and Control or JSA document is intended specifically for OGINA's scope of work and is intended to supplement existing site safety procedures and the OGINA Corporate Health & Safety (CHS) Manual. OGINA personnel are required to follow the more stringent (conservative) safety requirements when there is a difference between site safety requirements and OGINA corporate requirements. The Site Supervisor and OGINA Corporate H&S Manager should be consulted if requirements remain unclear. This OU-3 TRANSITION ZONE GROUND WATER COLLECTION JSA must be reviewed with the affected personnel prior to conducting activities specified in this JSA. This JSA covers the following tasks and may be amended as necessary to reflect changes to the scope of work.

- **Project Planning, Mobilization, and Site Preparation** – Site survey, mark utilities, establish equipment lay down areas and soil staging areas, Install erosion controls, Setup temporary collection and pretreatment equipment for well water and cuttings, relocate force mains and conduits for RW-3 and RW-4 (if necessary).
- **Well Installation & Development** – install 4 dual phase recovery wells, develop wells, containerize and/or treat well water and cuttings
- **Concrete Work and Treatment Building Installation** – Install 16'x22'x12' pre-engineered transfer building, Install building foundation requiring 5.5' excavation, 8" concrete slab, saw cut and remove existing asphalt, coat concrete floor (as required), install 4' diameter by 2' deep manholes around each recovery well
- **Mechanical and Electrical Installations** – Install pumping and collection control system, power feeds, collection tanks and drums, 550G transfer tank, 2 transfer pumps, 60G air compressor, Installation of pneumatic product recover pump in each well, installation of ground water pumps in each well, Install schd 80 piping for ground water conveyance and stainless steel or teflon piping for DNAPL conveyance, Install DNAPL and ground water force mains in 5.5' deep by 4' wide trench through parking lot, Installation of electrical conduit and air line in force main trenches, re-route force mains for RW-2, RW-3, and RW-4.
- **Startup** – Conduct pressure tests/leak checks, repair leaks, adjust system controls and programming

All individuals reviewing this JSA must sign a **Pre-Work Briefing form** that references this JSA (and other relevant safety requirements) prior to performing

covered activities. The Pre-Work Briefing form is in the OGINA CHS Manual or is available online.

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
PROJECT MOBILIZATION & PLANNING **Mandatory PPE: LEVEL D -** hard hat, safety glasses, safety shoes, leather/cut resistant gloves **As needed PPE-** hearing protection **Covered tasks:** *Subcontractor Safety Prequalification-* If subcontractors are used, have subcontractors complete a pre-qualification form and submit it to Corporate Safety for review. Authorized subcontractor representatives are required to review and sign the "CHS Manual Overview." *New/Temp Employee & Contract Labor Safety Training* – Site Supervisor must ensure that new employees receive and complete a New Hire Safety Orientation Manual which is available from OGINA Corporate H&S or Human Resources. *Obtain and Stage Safety Equipment* - fall protection harnesses, face shields, hard hats, safety glasses, hearing protection *Site Orientation* – When required by the site owner or client, all site personnel will be required to attend a site orientation by the site owner/client. *Project Kickoff Safety Meeting* - Document project safety meeting and orientation on a "Toolbox Meeting Form". Review site HASP and/or JSAs. Review any client-specific safety rules if no Site Orientation was conducted. Review MSDS for ethanol. *Mobilization of Tools & Equipment* - Transporting tools and equipment, inspecting condition of equipment and making repairs as necessary. In particular, inspect all power tools, electrical cords, ladders, fall protection	Well Installation Crew Site Engineer/Geologist	A. Slip, trips, and falls B. Manual lifting C. Noise- during operation of power tools D. Electrical- • overhead/buried utilities, • set-up of temporary power • using power tools. E. Heat/cold stress F. Exposure to poisonous plants, insects, and snakes	A. Prevention of slips, trips, and falls includes: 1. Maintain housekeeping daily. 2. Place equipment and materials in designated areas. Maintain clear walkways between pallets and containers. 3. De-ice work areas with excessively slippery work surfaces. B. Safety controls for manual lifting primarily include the use of proper lifting technique: 1. Keep load in close to the body 2. Keep hips and shoulders aligned (no twisting). 3. Maintain stability (keep a balanced position); and 4. Think and plan difficult lifts. 5. Use mechanical devices when possible: forklift, pallet jack, lull, hoist/chainfall, etc. C. Hearing protection safety controls include: Wear hearing protection while operating heavy equipment (unless with enclosed cab) or noisy power tools. Wear hearing protection if you have to raise your voice talking to someone 5 feet away. D. Electrical safety controls include: 1. Locate an verify all utilities with owner representative. 2. Use GFCIs on all power tools and extension cords. 3. Inspect all extension cords and power tools prior to use and ensure outer insulation is not cut through. 4. Discard damaged cords and remove defective tools from service. 5. Special consideration shall be given when working near any overhead power lines for which 20' clearance must be maintained. Work closer than 20' requires implementation of the OGINA Power Line Safety Procedure. E. Review symptoms and controls for heat/cold stress: 1. Drink fluids regularly (NOT coffee, tea, soda, etc.); 2. Take breaks periodically to prevent heat/cold stress; and 3. Look for symptoms of heat/cold stress in coworkers. F. Safety controls for biological hazards include: 1. Be able to identify hazardous plants, insects, and snakes commonly found in the area. 2. Perform a personal inspection of extremities when leaving the work area. 3. Insect repellant may be utilized during warm-weather

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
equipment, rigging equipment, and fire extinguishers on a monthly basis.			
WELL INSTALLATION & DEVELOPMENT ***(Intrusive)*** **Mandatory PPE:** • *Level D PPE* consists of hard hat, safety glasses with rigid side shields, safety shoes and leather/cut resistant gloves. Level D PP may be used for non-intrusive work wear contaminated materials will not be handled. • *Lightweight Modified Level D PPE* consists of nitrile gloves (or equiv), boots or boot covers, hard hat, safety shoes, safety glasses. Drillers must wear cut resistant gloves over nitrile gloves. Lightweight Modified level D is necessary when minimal contact with contaminated materials in anticipated and contamination control must be maintained. • *Full Modified Level D PPE* consists of is similar to Lightweight Modified Level except coveralls or rain-suit must be used. Full Modified Level D PPE is necessary when extensive contact with contaminated materials is anticipated, such as the manual-excavation of contaminated soils. **As needed PPE-** • *Level C PPE* consists of Modified Level D PPE plus a half or full-face respirator with organic vapor cartridges and P95 or P100 pre-filter. Use when air monitoring action levels are exceeded. • *Hearing Protection* during operation of drill rig, • *Face shield* if there is a potential for splashes of contaminated groundwater. **Intrusive tasks:** • Drilling four (4) dual phase recovery wells • Develop wells	Site Supervisor Drill Crew Site Geologist	A. Drill rig stability problems associated with setting up on uneven or unstable surface. B. Unsafe relocation of drill rig when moving between drill sites. • Damaged equipment from contact with overhead obstructions (i.e., trees) • Electric shock from contact with power lines • Contact with, or crush by, drill rig C. Exposure to rotating machinery • Loose clothing or hair caught in equipment • Hand injuries D. Slip, trips, and falls E. Manual lifting of drill rods and heavy equipment	A. Safety controls to maintain drill rig stability include: 1. Inspect proposed drilling areas for depressions, manholes, ditches, and other uneven or unstable surfaces that may be hidden by vegetation. 2. Avoiding uneven or unstable surfaces whenever possible. 3. Use cribbing, outriggers, guy wires etc. to improve stability as long as such devices are used in accordance with drill rig manufacturer recommendations. B. Safety controls associated with relocating the drill rig from one drill site to another include: 1. Do not move the rig with a raised mast (unless moving on a level pit floor or when special precautions have been implemented) 2. Do not operate drill rig within 20' of power lines at any time during the movement and setup process. 3. Do not setup drill rig when lightning has been spotted or when the potential for lightning is high. 4. Inspect the path of travel for hidden depressions and overhead obstructions prior to moving the drill rig. 5. Ensure all project persons are clear from the drill rig during the setup and relocation process. 6. Allow only experienced and qualified persons to move the drill rig. C. Safety controls for rotating machinery and moving parts include: 1. Persons working within 10' of rotating machinery must not wear loose clothing or jewelry or have loose shop rags on them. 2. Long hair must be tied back and tucked under a hard hat. 3. Do not operate machinery without all machine guards in place. 4. Do not start the drill rig motor when the drill bit is not secure. 5. Do not touch a revolving drill pipe. D. Prevention of slips, trips, and falls includes: 1. Maintain housekeeping daily. 2. Place equipment and materials in designated areas. Maintain clear walkways between pallets and containers. 3. De-ice work areas with excessively slippery work surfaces 4. Cover exposed or open bore holes immediately after completion E. Safety controls for manual lifting primarily include the use of proper lifting technique: 1. Keep load in close to the body; 2. Keep hips and shoulders aligned (no twisting); 3. Maintain stability (keep a balanced position); and

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
• Containerize well cuttings and water • Installing well piping and equipment			4. Think and plan difficult lifts. 5. Use mechanical devices when possible: forklift, pallet jack, lull, hoist/chainfall, etc.
		F. General operation and maintenance of drill rig • Exposure to rotating motion • Exposure to stored energy sources (hydraulic, air) • Exposure to hot surfaces • Struck by falling components from mast as a result of poor maintenance or operational abuse.	F. Additional safety controls for drill rig operation and maintenance include: 1. Only qualified persons may operate a drill rig 2. Only qualified mechanics may repair and service a drill rig. No major modifications or structural repairs may be made without approval from the manufacturer 3. Equipment must be inspected daily. (Ensure all mast components are in good condition and secured) 4. All machine guards must be in place. 5. Ensure project personnel are kept clear of hot surfaces associated with mufflers, mud pumps, and drill rig engines.
		G. Noise- during operation of power tools	G. Hearing protection safety controls include: 1. Wear hearing protection while operating heavy equipment (unless with enclosed cab) or noisy power tools. Wear hearing protection if you have to raise your voice talking to someone 5 feet away.
		H. Electrical shock - • overhead/buried utilities, • set-up of temporary power • pumps for well development • using power tools.	H. Electrical safety controls include: 1. Locate an verify all utilities with owner representative as required for safe operation of the drill rig. 2. Use GFCIs on all power tools and extension cords. 3. Inspect all extension cords and power tools prior to use and ensure outer insulation is not cut through. Discard damaged cords and remove defective tools from service. 4. Special consideration shall be given when working near any overhead power lines for which 20' clearance must be maintained. Work closer than 20' requires implementation of the OGINA Power Line Safety Procedure.
		I. Heat/cold stress	I. Review symptoms and controls for heat/cold stress: 1. Drink fluids regularly (NOT coffee, tea, soda, etc.); 2. Take breaks periodically to prevent heat/cold stress; and 3. Look for symptoms of heat/cold stress in coworkers.
		J. Exposure to poisonous plants, insects, and snakes	J. Safety controls for biological hazards include: 1. Be able to identify hazardous plants, insects, and snakes commonly found in the area. 2. Perform a personal inspection of extremities when leaving the work area. 3. Insect repellant may be utilized during warm-weather.
		K. <u>Exposure to VOCs (DNAPL) and dust</u> released from soil/groundwater	K. Safety controls to minimize exposure to VOCs include 1. Initial PPE for well drilling and development is Level D PPE or

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
		• Contact with contaminate ground water and soil • Vapors/Odors released during driling and well development.	Modified Level D PPE as outlined in this JSA. 2. Monitor for organic vapors and upgrade to level C if required based on air monitoring results (sustained readings of 1 minute) • 5 ppm – Half or Full-face Level C PPE • 10 ppm – Full-Face level C PPE • 50 ppm – Stop Work, Notify GE Representative and the OGINA Manager of Corporate H&S 3. Setup an exclusion zone with a minimum of 20' diameter radius around the well during drilling and well development. 4. Use water as necessary to control dust. 5. Control and containerize contaminated water and cuttings during drilling and well development.
CONCRETE WORK & TREATMENT BUILDING INSTALLATION ***(Non-Intrusive)*** **Mandatory PPE:** • *Level D PPE* consists of hard hat, safety glasses with rigid side shields, safety shoes and leather/cut resistant gloves. Level D PP may be used for non-intrusive work wear contaminated materials will not be handled. **As Needed PPE –** • *Faceshield* – if grinding or torch cutting rebar • *Hearing protection* – when operating loud power tools. • *Fall Protection Harness and Lanyard* – when working in manlifts or working over 6 feet in height. **Non-Intrusive Activities** • *Install foundation requiring 5.5' excavation* • *Install building slab* • *Saw cut and remove existing asphalt* • *Install 16'x22'x12' pre-engineered transfer building* • *Install 4' diameter by 2' deep manholes*	Field Technicians Equipment Operator.	A. Heavy Equipment hazards (excavator, bulldozer, loader, off-road truck) • turnover due to slope angle and/or stability • struck by injuries (counterweight swing or run-over) B. Excavation Hazards • Excavation of building footings (5.5' deep). • Any general grading activities that create vehicle or fall hazards due to trenches, pits, or other excavations.	A. Heavy equipment safety precautions include: 1. Ensure slopes in designated work areas does not exceed slopes allowed by manufacturer's safe operating guidelines. 2. Keep non-essential personnel out of excavation and grading work areas. *NOTE – barricades should not be necessary since work is not conducted in a high traffic area.* 3. Ensure all operators are qualified and familiar with the manufacturer's safe operating guidelines for the equipment they are operating. 4. Inspect heavy equipment daily prior to use. 5. Operators must wear seatbelts at all times unless seat belts are not provided by the manufacturer. 6. Equipment operators must ensure workers are kept clear from crush points created by counterweight swings and fork/boom movement. \ 7. Although none of the following equipment is anticipated during this project, specific equipment requirements include: • Lull Operators must submit a copy of license/certificate • Manlift operators must submit copies of training documentation. • Crane Operator must submit copy of certification or qualifications. • Annual crane maintenance certification must be submitted. • Most recent monthly or periodic inspection checklist must be submitted. B. At a minimum, implement the following safety requirements work areas in excavations: 1. **Excavations >4'** are handled as Permit Required Confined Spaces unless downgraded in accordance with a Confined Space Entry Procedure. 2. A **competent person** must be on-site during all excavation activities where employees will enter the excavation. Excavations must be sloped or shored when >5' deep OR when there is a

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
around recovery wells			cave-in hazard to workers. 3. A competent person must document daily excavation inspections using the *Daily Excavation Checklist* on all days during which persons must enter excavations. 4. Soil sloping must be based on Type C classification unless a Competent Person has determined a different classification on a *Soil Analysis Checklist*. 5. Manufacturer's data for trench boxes, shields, and aluminum hydraulic shoring must attached to this JSA. 6. When trench boxes or manhole boxes must have the ends closed off, a sketch showing the location and size of bracing/shoring materials must be attached to this JSA. Bracing must be in accordance with OSHA Subpart P. 7. If possible, do not backfill completely to the top of trench boxes. Let the top of the trench box or shoring act as a guardrail to minimize falls into the excavation. 8. Do not excavate more than 2' below the bottom of a trench box. 9. If excavations are to be left unattended, then secure with barricades. In high traffic areas, use only portable chain-link fence, saw horses, or other solid barriers. Safety fence may be used in low traffic areas. Use **flashing lights** for excavations left open overnight that obstruct plant roads. 10. Operators must have training and experience sufficient to demonstrate safe operation of the equipment they will be operating. Operators must ensure site workers are kept clear of potential crush points between pieces of equipment or fixed structures. 11. Assume all lines and pipes encountered during excavation activities are live until field inspections indicate otherwise. **12. Hand dig** and use a spotter when **within 3 feet** of an anticipated utility location.
		C. Masonry/Concrete Hazards ▪ Skin rash/burns caused by excessive contact with concrete ▪ Cuts from rebar ends ▪ Trips and Falls while walking on rebar for concrete slab	**C. Masonry Safety Controls** include: 1. Wear coveralls and gloves as necessary to prevent skin contact. 2. Knee pads should be worn if excessive kneeling is required during finishing work. 3. All rebar ends less than 6' above ground require rebar caps 4. Only those persons tying rebar are allowed to walk on rebar installed for the slab. Exceptions include work inspection and concrete finishers.
		D. Fall Hazards (Ladders) • Ladders may be used during construction of the treatment building and during other miscellaneous activities.	**D.** Provide fall protection when working from ladders >6' (Merck Requirement) 1. Fall protection is not required if ladders are used for access and egress and 3-point contact is maintained. 2. Working from ladders where 3-point contact cannot be maintained requires fall protection when >6'. 3. Ensure all ladders are stable 4. Extend straight/extension ladders 3 feet past the upper surface and secure in place.

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
			5. Do not use a stepladder as a straight ladder 6. Do not step on the top two steps of a stepladder.
		E. Fire/Explosion from welding/cutting • torch cutting rebar used during construction of concrete weir	**E.** Hot work safety controls include the following: 1. Get Hot Work Permit from GE (if necessary). Comply with all permit requirements. 2. If GE Permit is not necessary, Then the O'Brien & Gere Site Supervisor will issue an O'Brien & Gere Hot Work Permit to his crew(s) and review hot work requirements with all affected individuals. 3. Provide 1 fire extinguisher for each hot work area. NO CARBON DIOXIDE extinguishers. 4. Provide a fire watch who must remain 30 minutes after hot work stops. 5. Fire watch must be designated by name on the permit 6. Ensure combustible materials are removed or protected. This includes dried brush and grass.
		F. Use of Power Tools and Extension Cords • shock • flying dust, cuttings, debris • fire from sparks igniting combustibles or flammable vapors • Hand injuries from cutting blades/bits	F. Perform the following to ensure that tools are in good working order 1. Inspect tools and electrical cords for visible damage prior to use 2. Discard electrical cords where the outer insulation has been cut through. Electrical cords less than 12 guage may NOT be repaired. 3. Removed damaged tools from service. 4. Use GFCIs on all outlets, flexible cords, and hand power tools 5. Wear faceshield during grinding. 6. Do not operate tools without guards and use only in accordance with manufacturer's operating instructions. 7. necessary Hot work permits
		G. Material Handling (Back Strain)	G. Follow proper lifting guidelines (IMPORTANT): 1. Keep load close to the body. 2. Keep hips and shoulders aligned (no twisting) 3. Maintain stability (keep a balanced position) 4. Think and plan difficult lifts (get a second person or use mechanical devices when possible.) 5. No individual worker should lift more than 75 lbs. On uneven surfaces it is recommended that 55 lbs be used as a guideline
		H. Slips, Trips, and Falls and general housekeeping • slippery slopes associated with run-off basin and drainage ditch • Trip hazards created by grading activities	H. Housekeeping controls include: • Daily cleanup. • Unused materials must be place in designated laydown areas at the end of each day. • Unused tools must be picked up daily • All trash, scrap metal, and construction debris must be place in the appropriate dumpsters or staging areas each day • Icy walkways, stairs, work platforms, and scaffolding must be salted prior to use.

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
		I. Noise J. Heat/Cold stress	I. Hearing protection is required while operating noisy equipment or when noise interferes with talking when persons are <5 feet away. J. Review symptoms and controls for heat/cold stress: • Drink fluids regularly (not coffee, soda, etc.) – Drinking stations must be coolers with water and a cup dispenser with cone-bottom single-use cups and a waste basket. Do not place coolers in areas which may become contaminated with process chemicals/waste. • Take breaks periodically to prevent heat/cold stress • Look for symptoms of heat/cold stress in co-workers
MECHANICAL & ELECTRICAL INSTALLATIONS *(intrusive & non-intrusive)* **Mandatory PPE:** • *Level D PPE* consists of hard hat, safety glasses with rigid side shields, safety shoes and leather/cut resistant gloves. Level D PP may be used for non-intrusive work wear contaminated materials will not be handled. • *Lightweight Modified Level D PPE* consists of nitrile gloves (or equiv), boots or boot covers, hard hat, safety shoes, safety glasses. Drillers must wear cut resistant gloves over nitrile gloves. Lightweight Modified level D is necessary when minimal contact with contaminated materials in anticipated and contamination control must be maintained. • *Full Modified Level D PPE* consists of is similar to Lightweight Modified Level except coveralls or rain-suit must be used. Full Modified Level D PPE is necessary when extensive contact with contaminated materials is anticipated, such as the manual-excavation of contaminated soils. **As needed PPE-** • *Level C PPE* consists of Modified Level D PPE plus a half or full-face respirator with organic vapor cartridges and P95 or P100 pre-filter. Use when air monitoring action	Field Technicians Operators Laborers	A. **Unexpected exposure to energy sources related to mechanical systems:** • **Release of contaminated water** from treatment system piping or equipment during construction or line breaking activities. • Rotating or moving parts associated with pumps, blowers, etc. *NOTE: If the contaminated water is not pumped into newly installed equipment during construction and mechanical systems are not otherwise energized, then mechanical LOTO is not anticipated* B. **Heavy Equipment** hazards (manlift, boom truck, backhoe w/ fork attachment) • turnover due to slope angle and/or stability • struck by injuries (counterweight swing or run-over) • Hydraulic fluid leaks	A. All persons exposed to potential injury from the unexpected energization of system components must have perform work under a **lockout/tagout (LOTO) program** with their own lock(s) in place Ensure pumps and fans are in a safe condition and piping is purged and blanked when necessary. 1. OBG SSHC (with support from GE if necessary) will identify lockout boundaries and operate necessary valves, breakers etc necessary to install injection tubing. 2. *Purge and drain piping* if appropriate. 3. Merck will place a lock onto each device or authorize the OGINA site foreman or supervisor (or designated subcontractor) to place a lock on each device. 4. OGINA (or designated subcontractor) shall keep a list of locks and tags placed on each equipment or system that is locked out. An *Equipment-Specific LOTO form* may be used. 5. Keys to all locks will be placed in a lock box 6. Each person working on a system or equipment that is locked out must place their lock and tag on the lock box. 7. **Locks and tags must be removed from lock boxes at the end of each shift.** B. Heavy equipment safety precautions include: 1. Ensure **slopes** in designated work areas do not exceed slopes allowed by manufacturer's safe operating guidelines. 2. Keep **non-essential personnel** out of areas in which manlifts and cranes will be operating. *NOTE – barricades should not be necessary since work is not conducted in a high traffic area* 3. Ensure all operators are qualified and familiar with the **manufacturer's safe operating guidelines** for the equipment they are operating. 4. **Inspect heavy equipment daily** prior to use. Immediately repair any leaks. 5. Operators must wear **seatbelts** at all times unless seat belts are not provided by the manufacturer. 6. Equipment operators must ensure workers are kept clear from **crush points** created by counterweight swings and fork/boom

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
levels are exceeded. • *Hearing Protection* during operation of drill rig, • *Face shield* if there is a potential for splashes of contaminated groundwater. ***Covered Tasks:*** • *Transfer of sodium hypochlorite into empty drums (Mod D PPE)* • *Isolation of recirculation pump* • *Installation of injection tubing and metering pump* • *Testing*			movement. 7. Never lift or suspend a load over people. 8. Inspect all rigging materials prior to use. 9. **Manlift** operators must submit copies of training documentation. • Operators must be trained to operate the type of manlift being used. • Manlifts must be inspected by a qualified mechanic within the last year • Tie-off when operating manlifts. • Manliftts may be used to access elevated work areas as long as workers are tied off when entering or exiting the basket or are otherwise protected from fall hazards. • Do not use a manlift to rig and hoist equipment and materials beyond that tools and supplies that fit inside the basket. Never exceed the lift's maximum load capacity. 10. **Forklift** safety guidelines include the following: • Operators must have a training certificate/license for the type of forklift they are operating. • Operators must review site-specific forklift procedures and hazards such as posted speed limits, traffic patterns, hazardous intersections, and potential surface hazards (slopes, soft gravel/sand, trenches, etc.) • Do not rig directly to the forks of a forklift (unless allowed by the manufacturer). Use a rigging attachment (i.e., stinger) that is approved by the forklift manufacturer • Do not exceed the rated capacity of the forklift. 11. **Crane** Operator must submit copy of certification or qualifications. In order of preference, operators should have a license, CCO certification, or "good guy" letter from the rental company that indicates the number of years of experience the operator has. • Annual crane maintenance certification must be submitted. • Most recent monthly or periodic inspection checklist must be submitted. • Rigging plans must be submitted when the crane will lift more than 75% of its rated capacity for a specific lift or series of lifts. • Loads must not be hoisted over people.
		C. **Excavation Hazards** • Excavation of 5.5' trench for conveyance piping, air lines, and electrical conduits. • Any general grading activities that create vehicle or fall hazards due to trenches, pits, or other excavations.	C. At a minimum, implement the following safety requirements work areas in **excavations:** *1.* **Excavations >4'** are handled as Permit Required Confined Spaces unless downgraded in accordance with a Confined Space Entry Procedure. 2. A **competent person** must be on-site during all excavation activities where employees will enter the excavation. Excavations must be sloped or shored when >5' deep OR when there is a cave-in hazard to workers. 3. A competent person must document daily excavation inspections using the *Daily Excavation Checklist* on all days during which

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
			persons must enter excavations. 4. Soil sloping must be based on Type C classification unless a Competent Person has determined a different classification on a *Soil Analysis Checklist*. 5. Manufacturer's data for trench boxes, shields, and aluminum hydraulic shoring must attached to this JSA. 6. When trench boxes or manhole boxes must have the ends closed off, a sketch showing the location and size of bracing/shoring materials must be attached to this JSA. Bracing must be in accordance with OSHA Subpart P. 7. If possible, do not backfill completely to the top of trench boxes. Let the top of the trench box or shoring act as a guardrail to minimize falls into the excavation. 8. Do not excavate more than 2' below the bottom of a trench box 9. If excavations are to be left unattended, then secure with barricades. In high traffic areas, use only portable chain-link fence, saw horses, or other solid barriers. Safety fence may be used in low traffic areas. Use **flashing lights** for excavations left open overnight that obstruct plant roads. 10. Operators must have training and experience sufficient to demonstrate safe operation of the equipment they will be operating. Operators must ensure site workers are kept clear of potential crush points between pieces of equipment or fixed structures. 11. Assume all lines and pipes encountered during excavation activities are live until field inspections indicate otherwise. **12. Hand dig** and use a spotter when **within 3 feet** of an anticipated utility location.
		D. Confined Space Hazards • Trenches and Manholes may be classified as permit-required confined spaces due to airborne VOC concentrations >5 ppm.	**D. Confined space hazards** must controlled as follows: 1. Evaluating entry into manholes in accordance with the OGINA confined space entry procedure. Excavations and manholes >4' deep are potential permit-required confined spaces. 2. Verifying that off-site rescue support is available. 3. Determine if there are serious hazards present. Refer to paragraphs 6.1 and 6.2 of the OGINA Confined Space Entry procedure for additional guidance. Serious hazards are defined as LEL >10%, carbon monoxide >35 ppm PEL, and VOCs >5 ppm action level based on a sustained reading. 4. If no serious hazards are present, then downgrade to a non-permit space per paragraph 4.4B of the OGINA Confined Space Entry procedure. 5. If serious hazards are <u>potentially</u> present AND can be controlled with forced mechanical ventilation (e.g., explosion-proof blowers), then enter using Alternate Entry procedures outlined in paragraph 4.5 of the OGINA Confined Space Entry procedure. 6. If serious hazards cannot be eliminated or controlled with ventilation, then full permit-required entry procedures must be implemented. An on-site confined space rescue team may have

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
			to be established prior to using this type of entry 7. Regardless of confined space classification, air monitoring for VOCs must be conducted and feasible mechanical ventilation must be provided.
		E. **Pressure testing** and **leak checks**	E. Pressure testing is inherently dangerous activity. It only takes a small amount of pressure to be hazardous depending on pipe diameter Implement the following safety controls: 1. Read the Safety/Toolbox Meeting Topic on Pressure Testing Safety and Corporate Safety Procedure #2.35 prior to conducting pressure tests/leack checks. 2. Do not test with process chemicals. 3. Do not exceed test pressures in Corporate Safety Procedure #2.35 unless authorized in another test procedure approved by a professional engineer. 4. Secure/block all inflate-type pipe plugs
		F. **General fall hazards** when working above 6' or are within 6' of a leading edge • Working from a ladder in a manner where all of the above safety precautions cannot be implemented. • Entering or exiting a manbasket to an elevated work surface which is not protected by guardrails. • Working on top of the air stripper when guardrails are not available.	**F.** Safety controls for general **fall hazards** include: 1. Install temporary guardrails (if possible) which can support 200 pounds of lateral force. 2. Install a warning line system at least 6 feet from an exposed edge (if possible) 3. Use personal fall arrest equipment: • Use 6' lanyard and shock absorber above 15' • Use a non-shock absorbing lanyard and/or adjustable length lanyard between 6-15 feet. • Anchor points must be able to withstand 5,000 pounds of force • Use D-straps to wrap around beams or similar anchor points with sharp edges. Attach lanyard to the D-strap
		G. **Ladder** hazards: • Ladders kicking out or tipping over during use. • Users fall from a ladder • Falling objects strike workers or pedestrians on lower work surfaces.	**G. Ladders** must be used in accordance with OSHA guidelines or fall protection must be implemented above 6 feet. Ladder safe use guidelines include, but are not limited to: 1. Ensure all ladders are inspected and properly labeled 2. Maintain 3 point contact while working on step ladders and extension ladders. (Work requiring the use of both hands when on a ladder will require the worker to tie-off.) 3. Keep your torso between the rails of the ladder 4. Do not use a step ladder as a straight ladder 5. Do not stand on the top two steps of a step ladder 6. Extend extension ladders 3 feet above the upper level 7. Secure the top and base of extension ladders 8. Extension ladders should have a 4:1 height to base ratio 9. Do not use metal ladders within 20' of exposed conductors or overhead powerlines
		H. Power Tools • Shock	**H.** Perform the following to ensure that tools are in good working order 1. Inspect tools for visible damage.

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
		• Hand cuts • Eye injuries from flying debris	2. Inspect all flexible extension cords and power tool cords. Discard all flexible cords without a ground plug or outer insulation that is cut through. Tool cords must be in similarly good condition. Do not repair flexible cords smaller than 12 guage. 3. Wear faceshield during grinding in addition to safety glasses. 4. Ensure grinding wheels are properly rated for the grinder 5. Do not operate tools without guards and use only in accordance with manufacturer's operating instructions.
		I. **Material Handling** (Back Strain)	I. Follow **proper lifting guidelines** (IMPORTANT): 1. Keep load close to the body. 2. Keep hips and shoulders aligned (no twisting) 3. Maintain stability (keep a balanced position) 4. Think and plan difficult lifts (get a second person or use mechanical devices when possible.)
		J. Slips, Trips, and Falls	J. Safety controls for slips trips and falls include: 1. Maintain housekeeping daily. Remove all trash daily. 2. Ensure aisles, walkways, and roads are kept clear. 3. Do not obstruct building exits. 4. Secure extension cords and hoses so they do not represent a tripping hazard.Establish material laydown areas. Remove only those materials that will be used or consumed during a single day Return tools, equipment, and unused materials to laydown areas at the end of the day.
		K. Noise	**K.** Hearing protection is required while operating noisy equipment or when noise interferes with talking when persons are <5 feet away.
		L. **Contact** with contaminated water or soil. • Dermatitis/rash • Eye irritation	**L.** Safety controls for contact hazards include: 1. Don LIGHTWEIGHT MODIFIED LEVEL D protective equipment when there is a potential for contact with contaminated groundwater. 2. Review MSDS. 3. Identify the nearest emergency shower/eyewash.
		M. Atmospheric hazards **associated with mechanical construction.** • Flammable atmosphere inside contaminated piping and equipment. • Nuisance VOC odors to project personnel and to persons working in adjacent areas.	**M.** Safety Controls for **atmospheric hazards** include: 1. Monitor for organic vapors and upgrade to level C if required based on air monitoring results (sustained readings of 1 minute) • 5 ppm – Half or Full-face Level C PPE • 10 ppm – Full-Face level C PPE • 50 ppm – Stop Work, Notify GE Representative and the OGINA Manager of Corporate H&S 2. Measure combustible gases and oxygen with a gas meter prior to conducting any work which will cause a spark inside confined or enclosed spaces which contain VOC contamination. If **explosive vapors are >10%LEL** then work may not continue until the system is purged.

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
			3. Use non-sparking work methods such as a portaband saw in place of a cutting disk if flammable atmospheres are potentially present 4. Coordinate work with other site activities to minimize the impact that nuisance odors may have on persons in adjacent areas
STARTUP AND O&M OF TREATMENT SYSTEM *(intrusive / non-intrusive)* **Mandatory PPE:** • *Level D PPE* consists of hard hat, safety glasses with rigid side shields, safety shoes and leather/cut resistant gloves. Level D PP may be used for non-intrusive work wear contaminated materials will not be handled. **As needed PPE-** • *Lightweight Modified Level D PPE* consists of nitrile gloves (or equiv), boots or boot covers, hard hat, safety shoes, safety glasses. Drillers must wear cut resistant gloves over nitrile gloves. Lightweight Modified level D is necessary when minimal contact with contaminated materials in anticipated and contamination control must be maintained. • *Full Modified Level D PPE* consists of is similar to Lightweight Modified Level except coveralls or rain-suit must be used. Full Modified Level D PPE is necessary when extensive contact with contaminated materials is anticipated, such as the manual-excavation of contaminated soils. • *Level C PPE* consists of Modified Level D PPE plus a half or full-face respirator with organic vapor cartridges and P95 or P100 pre-filter. Use when air monitoring action levels are exceeded. • *Hearing Protection* during operation of drill rig, • *Face shield* if there is a potential for splashes of contaminated groundwater.	Laborers Operators O&M Technicians Equipment Vendor Technicians	A. Slips, trips, & falls B. Manual lifting back strain, twisting injuries, shoulder strains C. Noise – during operation heavy equipment and power tools D. Electrical shock while using power tools and when using ladders E. Confined space hazards NOTE – Excavations >4' deep may be considered permit-required confined spaces unless downgraded in accordance with the confined space procedure. F. Falls from heights >6' • when using ladders and manlifts.	A. Safety precautions for slips, trips, and falls include 1. Maintain housekeeping daily 2. Store tools, equipment, and materials in designated laydown areas. 3. Return unused tools and materials to laydown areas at the end of each day. 4. Discard all trash and debris at the end of each day B. Manual lifting safety precautions include following proper lifting technique. Review primary precautions below: 1. Keep load in close to the body; 2. Keep hips and shoulders aligned (no twisting); 3. Maintain stability (keep a balanced position); and 4. Think and plan difficult lifts. 5. Maximum weight to be lifted by a single individual is 75 lbs under ideal conditions. Otherwise maximum weight is 55 lbs. C. Hearing protections includes: 1. Wear hearing protection while operating heavy equipment (unless with enclosed cab) or noisy power tools. 2. Wear hearing protection if you have to raise your voice talking to someone 5 feet away. D. Electrical safety precautions include: 1. Use GFIs on all tools and extension cords 2. Inspect all electrical cords prior to use and discard damaged ones. 3. Do not use aluminum ladders within 20' of overhead powerlines. 4. De-energize and lockout electrical equipment. Do not perform live-connects. E. Confined space precautions include: 1. Follow confined space entry procedures including permits, air monitoring, rescue equipment, and training. 2. *Downgrade excavations to non-permit spaces if all serious hazards (including engulfment) have been eliminated. A gas meter and/or PID is necessary to take an initial air test before downgrading.* 3. Install ramps and/or stairs for excavations >4' (if possible). Excavations with ramps or stairs are not considered confined spaces. F. Fall protection safety controls include those listed below. Fall protection methods are listed in order of preference.

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
Non-Intrusive Tasks: • Inspections • Maintenance, calibration, and operating activities that don't require line-breaking or potential contact with contaminated materials *Intrusive Tasks:* • Maintenance, calibration, and operating activities that require line-breaking • Sampling • Pressure Testing/Leak Checks • Leak Repairs.		• when working from elevated work platforms.	1. **Manlift** (tie-off when operating manlifts) 2. **Scaffold** (if the type and amount of work justify it's setup and use) 3. **Ladders** (only if setup and used in accordance with OSHA requirements) Tie-off if 3-point contact cannot be maintained while using ladders. 4. **Climbing** and the use of personal fall arrest equipment • Use 6' lanyard and shock absorber above 15' • Use a non-shock absorbing lanyard and/or adjustable length lanyard between 6-15 feet. • Anchor points must be able to withstand 5,000 pounds of force • Use D-straps to wrap around beams or similar anchor points with sharp edges. Attach lanyard to the D-strap.
		G. Hot Work • welding/cutting • grinding • any activity involving open flame and sparks	G. Hot work safety precautions include: 1. Issue an OGINA Hot Work Permit for all hot work activities 2. Comply with all permit requirements 3. Provide 1 fire extinguisher for each hot work area. NO CARBON DIOXIDE extinguishers in confined or enclosed spaces. 4. Protect or remove combustibles 5. Provide a fire watch who must remain 30 minutes after hot work stops. 6. Fire watch must be designated by name on the permit.
		H. Unexpected startup of equipment or release of energy. • shock when trouble shooting energized equipment during startup • pinchpoints from moving parts associated with pumps, blowers, and generator	H. Safety precautions include the following: 1. No "live tie-ins" are permitted. Use lockout/tagout procedures to denergize equipment. 2. All other mechanical tie-ins will be conducted with equipment and lines de-energized and locked out per the standard lockout/tagout program. (*NOTE - Most mechanical and electrical installations should be performed before the equipment is energized or operational and lockouts will not be required.*) • Identify lockout boundaries and operate necessary valves, breakers, etc. • Place a lock onto each device or authorize a subcontractor to place a lock on each device. • OGINA (or designated subcontractor) shall keep a list of locks and tags placed on each equipment or system that is locked out. • Keys to all locks will be placed in a lock box • Each person working on a system or equipment that is locked out must place their lock and tag on the lock box. • Locks and tags must be removed from lock boxes at the end of each shift.
		I. **Pressure testing** and **leak checks** if necessary to check that repairs and equipment installations are free of leaks.	I. It only takes a small amount of pressure to be hazardous depending on pipe diameter. Implement the following safety controls: 1. Read the Safety/Toolbox Meeting Topic on Pressure Testing Safety and Corporate Safety Procedure #2.35 prior to conducting

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
			pressure tests/leak checks. 2. Do not test with process chemicals or contaminated water. 3. Do not exceed test pressures in Corporate Safety Procedure #2.35 unless authorized in another test procedure approved by a professional engineer. 4. Secure/block all inflate-type pipe plugs
		J. Contact with contaminated groundwater or contaminated equipment • Leaks of contaminated water during startup and operation • Intrusive maintenance requiring line-breaks • sampling activities	J. Safety controls to prevent contact with contaminated materials include. 1. Initial PPE is Level D. 2. Intrusive startup and maintenance activities that will require contact with contaminated materials but not significant splash hazard will use Light-Weight Modified Level D PPE. 3. Intrusive startup and maintenance activities that may result in splashes of contaminated water will use Full Modified Level D PPE. Examples include line-breaking activities for lines that cannot be drained and flushed.
		K. Exposure to vapors released from untreated groundwater during leak repairs or sampling activities.	K. Safety controls for airborne VOCs includes the following: 1. Monitor for organic vapors and upgrade to level C if required based on air monitoring results (sustained readings of 1 minute) • 5 ppm – Half or Full-face Level C PPE • 10 ppm – Full-Face level C PPE • 50 ppm – Stop Work, Notify GE Representative and the OGINA Manager of Corporate H&S 2. Level C PPE (Respiratory Protection) is not anticipated unless air monitoring indicates that VOC levels are exceeded. 3. Respiratory protection consists of a Half or Full face Air Purifying Respirator with P100/Organic Vapor cartridges 4. Take air measurements as required by this HASP and upgrade or downgrade respiratory protection based on air monitoring results.
DECONTAMINATION *(intrusive)* **Mandatory PPE:** • *Full Modified Level D PPE* consists of is similar to Lightweight Modified Level except coveralls or rain-suit must be used. Full Modified Level D PPE is necessary when extensive contact with contaminated materials is anticipated, such as the manual-excavation of contaminated soils. **As needed PPE-** • *Hearing Protection* during operation of pressure washer/steam decon,	Drilling crew Excavation Crew Sampling Technician Surveyor Scientist	A. Slips, trips, & falls B. Manual lifting C. Noise – while deconning heavy equipment and equipment is operating. D. Electrical shock during installation of site/office utilities and/or using power tools	A. 1. Maintain housekeeping daily B. 1. Follow proper lifting technique. Review primary precautions below Keep load in close to the body; Keep hips and shoulders aligned (no twisting) Maintain stability (keep a balanced position); and Think and plan difficult lifts. C. 1. Wear hearing protection while operating heavy equipment (unless with enclosed cab) or noisy power tools. Wear hearing protection if you have to raise your voice talking to someone 5 feet away D. 1. Use GFIs on all tools and extension cords. 2. Inspect all electrical cords prior to use and discard damaged ones. 3. Do not use aluminum ladders within 20' of overhead powerlines.

ACTIVITY and Tasks	Affected Personnel	Safety Hazards	Safety Hazard Controls
• *Face shield* when using pressure washing equipment. *Intrusive Tasks:* • Discard disposable PPE upon exiting Exclusion Zones. • Remove gross contamination from PPE prior to doffing. • Setup temporary decon areas to remove contamination from tools and equipment. • Use water rinse. Containerize waste water.		E. Contact with contaminated soil & groundwater	4. De-energize and lockout electrical equipment. Do not perform live-connects. E. 1. Initial PPE is Modified Level D with the potential to intermittently upgrade to Level C base on air monitoring results. 2. Wear or modify PPE as required in this HASP to minimize contact with contaminated soil. 3. If it is raining or soil is excessively wet from groundwater, wear Saranex (or equivalent) coveralls in place of standard Tyvek 4. Follow proper decontamination procedures to remove gross contamination from protective clothing, especially boots