BEACON FALLS ENERGY PARK, LLC

PETITION FOR DECLARATORY RULING
CONNECTICUT SITING COUNCIL

AUGUST 31, 2015

CONSTRUCTION, OPERATION AND MAINTENANCE OF A 63.3 MW AC FUEL CELL PROJECT ON LOPUS ROAD IN BEACON FALLS, CONNECTICUT

Submitted By: Beacon Falls Energy Park, LLC
769 Newfield Street
Middletown, CT 06457

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

PETITION OF BEACON FALLS ENERGY PARK, LLC FOR A DECLARATORY RULING THAT NO CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED IS REQUIRED FOR THE CONSTRUCTION, OPERATION AND MAINTENANCE OF A 63.3 MW AC FUEL CELL PROJECT ON LOPUS ROAD IN BEACON FALLS, CONNECTICUT	:	Petition No._____ AUGUST 31, 2015

PETITION OF BEACON FALLS ENERGY PARK, LLC

1.0 INTRODUCTION, PETITIONER, PROJECT DESCRIPTION & HISTORY

1.1 Introduction and Statutory Authority

Pursuant to Section 16-50k(a) and Section 4-176(a) of the Connecticut General Statutes ("CGS") and Section 16-50j-38 *et seq*. of the Regulations of Connecticut State Agencies ("RCSA"), Beacon Falls Energy Park, LLC ("BFEP" or "Petitioner") requests that the Connecticut Siting Council ("Siting Council") issue a declaratory ruling for BFEP's proposed location, construction, operation and maintenance of a 63.3-megawatt ("MW") fuel cell project and associated ground equipment, an ancillary building and a 115 kV electrical interconnection (together, the "Project") located on approximately 8 acres of an approximately 25 acre former sand and gravel mine along Lopus Road in Beacon Falls, Connecticut (together, the "Property") (see Figure 1 and Exhibit A).

Conn Gen. Stat. § 16-50k(a) provides in relevant part:

> *Notwithstanding the provisions of this chapter or title 16a, the council shall, in the exercise of its jurisdiction over the siting of generating facilities, approve by declaratory ruling . . . (B) the construction or location of any . . . grid-side distributed resources project or facility with a capacity of not more than sixty-five megawatts, as long as such project meets air and water quality standards of the Department of Energy and Environmental Protection*. (CGS §16-50k(a))

The construction, operation and maintenance of the Project satisfies the statutory elements of § 16-50k(a). The Project is a grid-side distributed resources facility under 65 MWs and meets the air and water quality standards of the Connecticut Department of Energy and Environmental Protection ("DEEP"). The Project has minimal air pollution emission rates, and minimal to no impacts to water quality. The Project will not have a substantial adverse environmental effect. Accordingly, this Petition for a Declaratory Ruling should be approved by the Council.

Further, the Project is necessary to further Connecticut's renewable energy goals and to contribute to grid reliability. As a Class I renewable energy source pursuant to C.G.S §16-1(a)(20), the project supports Connecticut's renewable energy policy (as stated in C.G.S. §16a-35k), while contributing to the reliability of Connecticut's electric supply and the competiveness of Connecticut's electric market (as stated in C.G.S. §16-50p(c)(1)). Accordingly, if approved, the project will present these public benefits as well as economic benefits such as jobs for Connecticut companies and tax revenue for Connecticut and Beacon Falls.

1.2 Petitioner

BFEP is a Limited Liability Company organized under the laws of the State of Connecticut and has a principal place of business at 769 Newfield Street, Middletown, CT 06457. BFEP is a wholly owned subsidiary of O&G Industries, Inc., ("O&G") a corporation formed under the laws of the State of Connecticut with a principal place of business at 112 Wall Street, Torrington, CT 06790. BFEP will lead the Project development and has engaged skilled and competent contractors to develop the Project.

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1.3 Project Description

BFEP has proposed to construct the Beacon Falls Energy Park, a nominal 63.3 MW base-load fuel cell project in the Town of Beacon Falls. The Project would occupy approximately 8 acres of an approximately 25 acre site currently owned by O&G and located between Connecticut Route 8 and the Naugatuck River (see Figure 1). More specifically, the Property is located adjacent to the western side of the Metro-North Rail line and along the southern side of Lopus Road (see Figure 2 and Exhibit B). The site, a former sand and gravel mining area, consists of predominantly flat terrain, with significant sloping topography along its western and northern boundaries formed by the sand and gravel operations.

The Project consists of the following:

- Five FCE HEFC™ [1]fuel cell plants, each rated at approximately 3.7 MW
- Sixteen FCE DFC3000™[2] fuel cell plants, each rated at approximately 2.8 MW
- Switchyard facilities
- A metering facility

1.4 Project History and Parties

O&G Industries, Inc., ("O&G") based in Torrington, Connecticut will be the "Engineer Procure Construct" ("EPC") contractor for the Project. O&G is a large and experienced EPC contractor and has built and completed energy generating facilities. In addition, O&G owns the Property upon which the Project will be located. The Property is a former sand and gravel mine located on a 25.02 acre parcel in the Town of Beacon Falls, Connecticut. FuelCell Energy, Inc. ("FCE") based in Danbury and Torrington, Connecticut will manufacture, supply, construct and operate the fuel cells. FCE has developed utility grade power plant turnkey projects in the United

[1] FuelCell Energy, Inc. ("FCE") a company with a principal place of business in Danbury, CT and a manufacturing facility in Torrington, CT will manufacture the FCE HEFC™ fuel cell plants.
[2] FCE will also manufacture the FCE DFC3000™ fuel cell plants.

States, including a 2.8 MW AC fuel cell Facility on Seaside Landfill in Bridgeport, Connecticut and a 14.9 MW fuel cell park in Bridgeport, Connecticut. Connecticut Energy and Technology, LLC ("CT E&T"), is a Middletown, Connecticut-based developer of renewable energy projects which originally developed the idea of the Project for Beacon Falls.

The Property is currently underutilized, and O&G, at the recommendation of CT E&T, wished to develop the underutilized Property with a renewable energy facility to provide energy to Connecticut in furtherance of its renewable energy goals. Fuel cell technology, a Class I renewable energy source pursuant to C.G.S. § 16(a)(20) was ultimately chosen for the Project because it was in accord with the O&G and CT E&T's development premise of supplying renewable energy in furtherance of Connecticut's renewable energy goals in an efficient and non-obtrusive manner. Further, the Property is located in close proximity to natural gas and water supplies necessary for fuel cell operation and Fuel Cell Energy ("FCE"), the manufacturer, supplier and operator of the proposed fuel cells, has its manufacturing facility in Torrington, Connecticut, which provides for ease of delivery of major equipment to the Project.

O&G and CT E&T reviewed the use of the Property for other renewables such as solar and wind. They determined, upon their review, that the Property was too small to generate a significant amount of renewable energy using solar technology. It would require more than 300 acres of land to achieve the 63.3 MW of power the proposed fuel cell Project will generate on 8 acres. They rejected wind due to the lack of available wind at the site and the high visibility of the wind turbines.

To maximize the benefit to Connecticut beyond clean energy goals, O&G and CT E&T chose FuelCell Energy, Inc. ("FCE") to manufacture, supply, construct, operate and maintain the fuel cells for the project. FCE is based in Danbury, Connecticut and has a manufacturing facility in Torrington, Connecticut, which is in close proximity to the Property. FCE has completed utility grade, power plant turnkey projects in the United States, including a 2.8 MW fuel cell facility on Seaside Landfill in Bridgeport, Connecticut and a 14.9 MW fuel cell park, also in Bridgeport, Connecticut. Together, O&G as EPC contractor and FCE employ 1500 people in Connecticut who will benefit from the Project by way of jobs. Further, O&G and CT E&T determined that the Project, by returning an unproductive former sand and gravel mine to economic life will produce tax benefits for Connecticut and Beacon Falls.

1.5 Site Selection

The site was selected to minimize the Project's visibility and environmental impact while maximizing its use of the land as a fuel cell powered generation facility. O&G and CT E&T selected the site for the Project based on a detailed evaluation of the following criteria:

- Site availability and site control (ability to acquire the land/site control);
- Site suitability (location, size, topography and geology of the site);
- Proximity to critical infrastructure (proximity to natural gas pipelines, water lines and suitable grid access); and
- Mutual benefits (utilize an otherwise unused and unproductive former sand and gravel mine).

As the Property is owned by O&G, site ownership and site control, an important element in any development, has been easily established. Further, because the site is owned by O&G, BFEP has extensive knowledge of the Property and any related environmental or other issues.

The location of the site is suitable for a fuel cell generating facility. The site is located in an Industrial Park District ("IPD") of Beacon Falls and conforms to lot size and dimensional requirements, as well as to all setbacks, height and coverage requirements. The site is located in close proximity to the growth areas along Route 8 in Beacon Falls and is compatible with existing industrial land uses in the area and consistent with the Plan of Conservation and Development for Beacon Falls and the Conservation and Development Policies Plan for Connecticut.

The Project site will only take up 8 acres of the 25.02 acre Property. The topography of the Property will give the Project a low visibility and profile. The Project site is located in a natural "bowl" approximately 50 feet below Gruber Road. Trees and vegetation will provide visual and sound buffers. Because the geology of the site is one of deep sand and gravel, there will be no net change in the discharge of storm water from the site from existing conditions.

Fuel cells require natural gas and treated water to generate electricity. Access to natural gas and water, is accordingly critical to a fuel cell project. The Project site is located in close proximity to critical infrastructure such as natural gas and water pipelines. The interconnection to the grid is located on Cold Springs Road, in Beacon Falls.

The site was further selected for the benefits the project will bring to Beacon Falls, its host community. While the project will have a low visibility and sound profile, the development of the

Project on an otherwise unused and unproductive sand and gravel mine will have a large-scale, substantial and positive impact on Beacon Falls tax revenues and tax revenues for Connecticut over the life of the project.

2.0 PROJECT DESCRIPTION

2.1 Project Benefits

Projects that are "necessary for the reliability of the electric power supply of the state or for a competitive [electric market]" present a clear public benefit. (Conn. Gen. Stat. § 16-50p(c)(1)). There also exists a public need for renewable energy projects that support Connecticut's energy policies and the legislature's goal to "develop and utilize renewable energy resources….to the maximum practicable extent." (Conn. Gen. Stat. § 16a-35k.) Pursuant to Conn. Gen. Stat. §16-1(a)(20) fuel cell facilities are considered to be a Class I renewable energy source.

The Project provides a clear public benefit as contemplated by Connecticut's legislature by generating and providing a constant and reliable source of electricity that will help stabilize the grid during peak hours when there is high demand. In addition, the fuel cell technology operates regardless of weather or other factors that limit the production of electricity by intermittent renewables such as solar or wind. Further, as a Class I renewable energy facility, the Project will contribute to Connecticut's renewable energy portfolio standards and will advance the state's renewable energy goals by providing constant and reliable generation of electricity with minimal emissions. Accordingly, the Project will not need to be supplemented by combustion-based generation during peak hours when intermittent renewables are often unavailable. This will further contribute to a significant reduction in nitrogen oxides (NO_x), sulfur dioxide (SO_2), carbon monoxide (CO) and other emissions.

The Project also provides a clear economic benefit to the economies of the Town of Beacon Falls and the State of Connecticut. The Project fully intends to employ local labor and Connecticut companies whenever possible and practicable. O&G is a Connecticut based construction company specializing in large-scale construction projects including energy generating facilities. O&G employs approximately 1,000 people in Connecticut. FCE is also a Connecticut company and will be manufacturing the fuel cell equipment and operating the facility. FCE employs more than 500 people in Connecticut at its main office in Danbury and its manufacturing facility in Torrington. Both Connecticut companies and their employees will benefit from the Project in terms of jobs.

By developing an otherwise unused and unproductive sand and gravel mine, the Project will have a mutually beneficial relationship with the Town of Beacon Falls. Currently, the town's tax assessment Grand List indicates total property values for tax purposes is $475,000,000. Given the size of the facility, there will be a substantial economic impact on the town over the life of the Project. Further, by extending a more robust natural gas line to Beacon Falls, the area will enjoy

enhanced availability of natural gas. Similarly, the State of Connecticut will benefit not only from jobs, and enhanced renewable energy capacity and grid reliability, but also from tax revenue generated by the facility.

2.2 Technical Description of the Project

The Project consists of (21) fuel cells, (16) model DFC 3000s and (5) model HEFCs. Each of the 21 fuel cells is equipped with a 10 million British thermal units per hour (MMBtu/hr) air heater, which operates to maintain the associated fuel cell's operating temperature only when the fuel cell is not operating at full power. Specifications for the fuel cells can be found in Exhibit N. The fuel cells and air heaters require natural gas for fuel, treated water for fuel processing and nitrogen for inerting systems during shutdown. Power produced by the fuel cells will be inverted from DC to 13.8 kV AC and will be exported to the electrical grid through a 115 kV switchyard and will be utilized for station service power.

The Project would use natural gas exclusively as fuel. Natural gas from the local utility will enter the site at 40 psi. The natural gas then reaches a regulating station, where two regulators will work together to maintain a downstream pressure of 20-25 psi. After the incoming "gas train", the natural gas is distributed to one of the four identical natural gas desulfurization systems. Each natural gas desulfurization system consists of two desulfurizer vessels and a network of various valves and piping. These vessels are filled with two types of media, intended to remove the sulfur that is inherent in a pipeline quality natural gas supply. Downstream of the after-filter, the natural gas is then distributed to each of the 5 or 6 fuel cells served by the gas desulfurization system.

Water from the local utility will enter the site at 60 psi. Dual backflow preventers will maintain potable water quality from the utility feed, as well as at the hose bibbs located throughout the facility. All of this equipment is contained above ground in an insulated and heated box to prevent freezing. Water is then distributed to each of the four bulk water treatment skids. Each water treatment skid services 5 to 6 fuel cells.

Each water treatment system consists of the following:

- a multimedia filter to remove large suspended solids.
- a UV light for disinfection (as required, if water testing shows elevated biological growth)
- a dechlorination solution (sodium bisulfite) to remove any residual chlorine from the water that might damage the reverse osmosis (RO) membranes downstream.
- an antiscalant solution to protect the RO membranes from scaling and increase the system performance and efficiency.

- A second filter for further removal of solids in the water.

The water treatment systems will be manually cross tied, in the event of long-term maintenance activities. The complete water system shall be controlled by a system capable of Ethernet communication to the customer information system if required.

The fuel cells (DFC3000 and HEFC Units) receive the natural gas and treated water and efficiently convert chemical energy from the hydrogen-rich natural gas into electrical power. Each fuel cell is comprised of many individual cells that are grouped together to form a fuel cell stack. When a hydrogen rich fuel such as natural gas enters the fuel cell stack, it reacts electrochemically with oxygen to produce electric current, heat, and water.

FuelCell Energy's Direct Fuel Cell (DFC) power plants are based on carbonate fuel cell technology. To produce electricity, carbonate fuel cells generate hydrogen directly from a fuel source in a process referred to as internal reforming. Fuel is supplied to the fuel cell stack where methane from the fuel is internally reformed to create hydrogen and carbon dioxide. Spent fuel exits the anode and is consumed to supply oxygen and carbon dioxide to the cathode. Heat and water vapor exit the cathode. The resulting electrochemical reactions in the fuel cell anode and cathode produce direct current (DC) power, which is then converted to alternating current (AC) power by the electrical balance of plant.

Each DFC3000 unit is rated for a power output of 2,800 kW (2.8 MW) and each HEFC unit is rated for 3,700 kW (3.7 MW). The HEFC units are essentially DFC3000 units with modifications made to increase efficiency.

A nitrogen system will deliver nitrogen gas at 120 psi to each of the 21 fuel cells. The nitrogen is used in the event that the system needs to be purged of natural gas after the shutdown or safety sequence has been initiated. Nitrogen is also distributed to each of the four gas desulfurization skids. Nitrogen is necessary to purge these vessels and piping for scheduled maintenance activities, such as desulfurization media replacement. The system will consist of two independent, yet cross-tied, systems. Each system will consist of a single 6,000 gallon liquid nitrogen storage tank, two ambient vaporizers, and various regulators and instrumentation. Each unit will also be supplied with its own remote fill cabinet, which allows for nitrogen deliveries without the need for the liquid nitrogen supplier personnel to enter the facility.

The Project will have a plant-wide control system that controls and monitors the processes. The auxiliary systems will be controlled and monitored by the site control system. The control

system will also connect to the substation equipment, 15kV switchgear and the 480V switchboard to monitor the equipment. Each fuel cell and the auxiliary systems will be remotely monitored from the Global Technical Assistance Center (GTAC) in Danbury, CT. If onsite assistance is needed, GTAC can dispatch locally based field service personnel.

The time line of the Project and its proposed schedule are presented in Exhibit C.

3.0 LOCAL INPUT & NOTICE

Preliminary discussions with the leadership of the Town of Beacon Falls have been favorable and have encouraged the decision to place the Project in Beacon Falls. O&G, the parent company of BFEP, has an existing relationship with the Town of Beacon Falls through other facilities it owns and operates within the town.

BFEP is committed to continuing this relationship with the Town of Beacon Falls and its residents by providing the Town leadership, its government and departments and the public with as much information regarding the Project as possible. In furtherance of its commitment, BFEP has undertaken several informal meetings with municipal officials. In addition, BFEP has undertaken two more formal meetings.

The first of these meetings was a meeting with the Board of Selectmen, which occurred on April 27, 2015. The Board of Selectmen of the Town of Beacon Falls provided the Project with an opportunity to announce the development at a Special Meeting held at Town Hall on April 27, 2015. At that time, representatives of the Project provided preliminary printed PowerPoint presentation material to those in attendance outlining the basic development concept and the potential benefits that the Project would be bringing to the community. This preliminary meeting actually served as the first public announcement. Shortly after the first meeting, arrangements were made with the leadership of the community to move forward with a more formal and comprehensive presentation which would be in conformance with Connecticut Siting Council requirements in preparation for the current petition filing.

The second meeting was a public meeting sponsored by the Town of Beacon Falls Open Space and Land Use Commission on July 7, 2015. The Beacon Falls Open Space and Land Use Committee is a committee whose membership is comprised of members from each of the Town's other boards and committees. Among the tasks the committee undertakes is the review of plans submitted to Planning and Zoning and making recommendations for updates and revisions to the Town's plan of conservation and development. At that public meeting, held at the local high school auditorium, BFEP presented its proposed development to the committee and to the public. Following a detailed PowerPoint presentation by the Project developers, representatives of FCE, engineers and consultants, the meeting was opened to questions from the committee and the public. Copies of the PowerPoint presentation were made available to the public at the meeting and later provided to the 1st Selectman for inclusion on the Town's website. Questions raised by some of the 83 people that attended this hearing were kept track of during the course of the meeting and

written responses were provided to the Office of the 1st Selectman for inclusion on the Town's website.

As part of the public notice process, a list of the abutting property owners has been prepared. These individuals, identified in Exhibit M, have been notified of this petition by certified mail. BFEP will provide the Council with proof of service once all cards have been returned from the Postal Service. In addition, Figure 3 identifies the abutting property owners and their addresses. A copy of the petition is also being provided to the Town of Beacon Falls contemporaneously with this filing.

4.0 PUBLIC HEALTH AND SAFETY EFFECTS

The Project represents a clean and safe method of electricity generation in a manner consistent with state and federal policy to protect public health and safety. In terms of public health, the Project will generate electricity in a cleaner and more environmentally acceptable manner compared to conventional generation such as nuclear, combustible natural gas, coal, or oil as fuel. In terms of safety, the Project will meet all applicable safety requirements for construction, operation and electrical interconnection as specified in Exhibit D. Specific elements of the safety and security systems are described below:

- Security System - The Property has a plant wide security system that consists of video security and fire alarms in the control buildings. The video is recorded and the entire security system can be remotely monitored.

- Emergency Shutdown System - There are three separate levels of emergency shutdown.

    - Individual Fuel Cell Operating Plants - Each of the 21 Fuel Cell power plants is equipped with four (4) Emergency Stop pushbuttons. Depressing one of these pushbuttons shuts down the respective fuel cell plant.

    - Site Equipment Shutdown - There are two (2) Site Equipment Shutdown pushbuttons – one on the outside and one on the inside of the Control Enclosure. Depressing either of these pushbuttons will shut down all the mechanical equipment on the Property, including the site incoming fuel supply.

    - Site Electrical Shutdown (use for Emergency Fire Fighting) - There will be several pushbutton Electrical Feeder Breakers at the facility. Depressing ALL PUSHBUTTONS will open the feeder breakers, effectively rendering the site de-energized.

The Project will have a customized emergency response plan. The plan will include contact information for the owner/s, operators, local emergency response (police and fire department) and utilities (water, natural gas and electrical.) Escape routes will be predominately displayed at various points throughout the Property. All personnel will know where to exit and muster in the event of an emergency.

A Total Flood Sapphire Fire Suppression System will be included in the Main Control Power Distribution Centers (PDC's). The system will include all detection and control equipment and the system will be also capable of being activated by manual discharge devices located at each exit.

The following types of automatic acting emergency sensors are provided with the fuel cell power plant:

- Combustible gas detectors
- UV/IR Flame detectors
- Smoke detectors

In addition, process flows, temperatures, pressures and voltages will be continuously monitored for deviations from expected values.

To protect both the Project and the public, the Project proposes to implement security measures and plans. Lighting will be installed for security purposes, and the proposed lighting will consist of dark sky type fixtures to minimize light impacts at night. Security cameras will be installed within the facility to help monitor the facility's conditions. Access to the Property will be restricted by the installation of a motorized entry gate with swipe card technology at the new access road and installation of 8-foot-high chain link fencing around the perimeter of the site.

5.0 ENVIRONMENTAL AND ECOLOGICAL EFFECTS

5.1 Air Quality Effects

The air quality effects of the Project were evaluated against the current DEEP regulations and potential impacts were assessed. The complete Air Quality Regulatory Review is presented in Exhibit E.

As stated above, the primary byproducts of the fuel cell electrical generation process are water and carbon dioxide (CO_2). Other byproducts include much smaller amounts of criteria air pollutants, including particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), particulate matter less than or equal to 10 microns in diameter (PM_{10}), SO_2, NO_x, CO, and volatile organic compounds (VOC). Tables 1, 2, and 3 provide $PM_{2.5}$, PM_{10}, SO_2, NO_x, CO, VOC, and CO_2 hourly emission rate and potential to emit (PTE) calculations for the HEFC fuel cell plants, DFC3000 fuel cell plants, and air heaters, respectively. These tables present two extreme cases, all fuel cells only operating at full power for 8760 hours per year (Tables 1 and 2), and heaters only operating at full power for 8760 hours per year (Table 3). Table 4 summarizes the Project emissions.

5.1.1 Regulatory Applicability

Several regulatory requirements may be triggered by the PTE of an individual source and an overall facility, such as the BFEP Project. These include the following:

- State Permit to Construct
- Best Available Control Technology (BACT)
- Ambient Impact Analysis
- Nonattainment New Source Review (NNSR)
- Prevention of Significant Deterioration (PSD)
- Title V

In addition, there are other air quality regulatory programs that may be of concern for a new source of air pollutant emissions.

5.1.2 State Permit to Construct

RCSA 22a-174-3a(a)(1)(D) and (E), respectively, state that a permit to construct is required for a new emission unit with potential emissions of 15 tons or more per year of any individual air pollutant. The applicability of those requirements is based on the uncontrolled potential emissions

(or potential emissions increase) of the subject emission unit. In the context of the Project, each of the 21 proposed fuel cell plants is considered to be an emission unit.

As can be seen in Tables 1 and 2, the PTE threshold for a permit to construct is not exceeded for any relevant air pollutant. Note that the greenhouse gas (e.g., CO_2) PTE by itself does not trigger the need for a permit to construct.

5.1.3 BACT

RCSA 22a-174-3a(j)(1)(C) and (D), respectively, state that BACT is required for a new emission unit with potential emissions of 15 tons or more per year of any individual air pollutant. These BACT requirements are determined based on the uncontrolled potential emissions (or potential emissions increase) of the subject emission unit (without taking into account any proposed operating hour limits).

The annual emission rates shown in Table 5 represent the uncontrolled potential emissions and demonstrate that no relevant pollutant uncontrolled PTE exceeds the threshold for BACT.

5.1.4 Ambient Impact Analysis

RCSA 22a-174-3a(d)(3)(B) and (C) require the owner of any source applying for an air permit to demonstrate that the operation of the source will not cause or contribute significantly to a violation of any federal or state ambient air quality standard or PSD increment. RCSA 22a-174-3a(i) requires this demonstration to include estimates of ambient air quality impacts that use models, databases, and techniques approved by the DEEP Commissioner. Owners of sources that are not required to obtain an air permit, such as sources that limit their emissions under RCSA 22a-174-3b, are not subject to the modeling requirements of RCSA 22a-174-3a.

As is discussed above, the Project is not required to obtain an air permit under RCSA 22a-174-3a. Therefore, the Project does not require an ambient impact analysis.

5.1.5 NNSR and PSD

PSD and NNSR were established for pre-construction review of proposed projects in attainment areas and nonattainment areas, respectively. A project can undergo both types of review, depending on its potential emissions and the attainment status of the area in which it is located.

5.1.5.1 NNSR

40 CFR 51.165(a)(1)(iv)(B) indicates that any major source of VOC is also a major source for ozone (O_3). 40 CFR 51.165(a)(1)(iv)(C) stipulates that fugitive emissions shall not be included when determining if a stationary source is major, unless that source belongs to one of 27 listed categories. The Project does not belong to one of these 27 listed categories. As such, fugitive emissions are not included in its major source determination. The Project's fugitive emissions are not expected to be significant.

Beacon Falls is located in New Haven County, which is designed as a moderate nonattainment area for the 1997 8-hour O_3 standard and a marginal nonattainment area for the 2008 8-hour O_3 standard. However, New Haven County was designated as a serious nonattainment area for the 1979 1-hour O_3 standard. EPA revoked the 1-hour O_3 standard, but NNSR obligations remain in effect under "anti-backsliding" provisions.

As such, the NNSR thresholds for NO_x and VOC are 50 tons per year (tpy). The Project is not subject to NNSR review for NO_x or VOC because the Project's PTE of these pollutants do not exceed the major source threshold of 50 tpy for either pollutant.

5.1.5.2 PSD

The PSD program applies to the construction of a new major stationary source of air pollutants in an attainment area. PSD is intended to prevent the new source from significantly worsening air quality in areas where the air is cleaner than the National Ambient Air Quality Standards (NAAQS).

The Project is not subject to PSD review for NO_x, CO, SO_2, and $PM_{10}/PM_{2.5}$ because the Project's PTE of these pollutants do not exceed the major source threshold of 100 tpy for any of these pollutants.

5.1.6 Other Programs

EPA has promulgated standards for air emission sources categories, such as New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP). There are no NSPS or NESHAP which are applicable to fuel cell projects.

The State of Connecticut has promulgated Reasonably Available Control Technology (RACT) standards for air pollution source types. There are no RACT standards applicable to fuel cells.

5.1.7 Title V Permit

A source that falls into one of the categories defined in the regulations is required to obtain a Title V operating permit. The Project does not fall into any of the categories listed above.

5.1.8 Potential Impacts

The Project emissions are much less than the fossil fuel power plants whose operation the Project will tend to displace. The U.S. Environmental Protection Agency (EPA) Emissions and Generation Resource Integrated Database (eGRID)[3] provides data on the environmental characteristics for most of the electric power generated in the United States. eGRID contains information on the average emission rates in pound per megawatt hour (lb/MW-hr) for NO_x, SO_x, and CO_2 for regions and sub-regions in the United States. The 2010 (the most recent year) emission rates for the fossil-fuel power plants in New England are summarized as follows:

- NO_x - 0.48 lb/MW-hr,
- SO_x - 2.10 lb/MW-hr, and
- CO_2 - 1,115 lb/MW-hr.

In comparison, the Project's expected emissions are summarized as follows:

- NO_x - 0.011 lb/MW-hr,
- SO_x - 0.005 lb/MW-hr, and
- CO_2 - 960 lb/MW-hr.

The Project would have air pollutant emission rates much lower than existing fossil fuel power plants in New England. Based on the preceding review, the Project would not require an air permit to construct or operate.

5.2 Water Resources

As articulated in greater detail in Exhibit F, Environmental Assessment, the Project is located within the Housatonic major basin system and the Naugatuck River regional basin. The Naugatuck regional basin drains approximately 310 square miles. The Naugatuck River drainage area comprises approximately 77.3 square miles of the 310 square mile watershed of the Naugatuck regional basin. The closest perennial watercourse to the Property is the Naugatuck River.

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[3] http://www.epa.gov/cleanenergy/energy-resources/egrid/ accessed 05/18/15

5.2.1 Flood Hazard Potential

The Project is located outside of flood hazard areas as delineated on the Flood Insurance Rate Map (FIRM) completed for Beacon Falls pursuant to the Federal Emergency Management Agency (FEMA). According to the FEMA resource mapping, the entire site is located above the published FEMA 100-year flood zone and floodway for the Naugatuck River (see Figure 4 and Exhibit F, the complete Environmental Assessment document).

5.2.2 Surface Water Quality

The open water pond located on site is designated as a Class A waterbody (See Figure 5). Class A surface waters support the following designated uses: potential drinking water supply; fish and wildlife habitat; recreational use; agricultural and industrial supply; and other legitimate uses, including navigation. The following discharges are permittable within this zone: discharges from public or private drinking water treatment systems, dredging and dewatering, emergency and clean water discharges.

The Naugatuck River is located approximately 700 feet to the east of the Property and is classified as a C/B surface water resource. The Naugatuck River can presently support recreational use, fish and wildlife habitat, and agricultural and industrial supply, including navigation, but does support use as a drinking water supply.

5.2.3 Groundwater Quality

The Property is located within a GA groundwater area (See Figure 6). GA areas support the following designated uses: existing private and potential public or private supplies of water suitable for drinking without treatment; baseflow for hydraulically connected surface water bodies. The following discharges are permittable within a GA area: 1) discharges from septage treatment facilities subject to stringent treatment and discharge requirements, and 2) other wastes of natural origin that easily biodegrade and present no threat to groundwater.

Areas to the immediate east of the Property across Railroad Avenue are classified as GB. This area is assumed to be hydraulically downgradient of the Property as groundwater is assumed to move from west to east on site. GB areas are groundwater located within highly urbanized areas of intense industrial activities and where public water supply is available. The groundwater may not be suitable for direct human consumption due to waste discharges, spills, or leaks of chemicals or land use impacts.

5.2.4 Stormwater Quality

The Conservation and Development Policies Plan for the Connecticut (C&DP) and the *DEEP's 2004 Stormwater Quality Manual* recognize the expanding significance of non-point sources in water quality concerns. In rebuilding or expanding urban infrastructure, the C&DP Plan recommends incorporating appropriate stormwater management technologies to minimize adverse impacts of runoff on surface and ground waters. For new development, the C&DP Plan promotes a design and engineering approach to stormwater handling that minimizes the amount of impervious cover and incorporates non-structural design features and management techniques to renovate runoff.

The fundamental storm drainage needs for this Project are to 1) minimize impacts to downstream areas (i.e., open water pond and/or the Naugatuck River) and 2) treat stormwater prior to discharge. Specific concepts include controlling pollutants at their source(s), planning for both frequent and rare storm events, avoiding unnecessary impervious cover, and use of multiple treatment practices to reduce pollution loadings and concentrations are found in the Stormwater Report at Exhibit G.

5.2.5 Wastewater Quality

The operation of the 21 fuel cell units will result in the generation of several wastewater streams. Based upon information supplied by the manufacturer of the fuel cells, these include:

- Approximately 150,000 gallons per day of water treatment wastewater
- Water storage tank draining wastewater of an assumed quantity of 50,000 gallons per year.

The wastewater proposed to be generated at the Property can be classified as Water Treatment Wastewater. These are wastewaters that will result from the purification of raw water as described earlier in this document.

The wastewater will be handled in accordance with the General Permit for the Discharge of Water Treatment Wastewater (Permit DEP-PED-GP-002) and is proposed to be discharged to groundwater after treatment using engineered infiltration basins. The data obtained from similar sites suggests that the permit effluent limitations for discharges to groundwater can be readily met.

As the Project will be unmanned, there will be no generation of sanitary wastewater at the facility.

5.2.6 Potential Impacts

The Project is located outside of any Flood Hazard areas resulting in no impacts to Flood Hazard areas.

As the Project is underlain by deposits of sand and gravel of glacial origin, the underlying unconsolidated materials have a high permeability rate. Stormwater and water treatment wastewaters, kept separate from each other, will be collected and directed into one or more bio-infiltration basins (stormwater) and into two open infiltration basins in the south-central portion of the site (wastewater). The stormwater bio-infiltration basin and the two wastewater infiltration basins will primarily treat water via natural infiltration into the underlying groundwater areas. An overflow spillway has been included on the stormwater basin to help control and convey large stormwater runoff producing events towards the open water pond.

The implementation of stormwater controls for managing non-point source pollution and implementation of Best Management Practices are proposed. It is anticipated that the Project will have no significant impact on the quality or availability of surface water, as no direct discharge of stormwater or wastewater to existing surface water bodies is planned. Furthermore, since no withdrawal of groundwater and only infiltration of permit-compliant stormwater and wastewater is proposed, negative impacts to the quality and availability of groundwater uses are not anticipated.

5.3 Natural Resources

5.3.1 Soils

The NRCS Web Soil survey was reviewed to determine the existing soil types on this parcel (see Figure 7). The resource mapping shows that the unconsolidated materials on site consist of glaciofluvial deposits consisting of stratified sand and gravel. The predominant soil type is identified as the Udorthent-Pits complex which is commonly defined as those soils that have been either filled and/or excavated by at least 2 feet and have no distinct natural horizons that can be taxonomically classified into a known soil series.

5.3.2 Inland Wetlands and Watercourses

The limits of inland wetlands and watercourses were delineated by a professional wetland scientist and certified soil scientist (see Exhibit H). No perennial and/or intermittent watercourses

were observed within the parcel boundaries. No bands and/or troughs of wetland soils were found on site. An open water pond was delineated along the southern portion of the Property and is depicted on the Project site plans.

The open water pond is approximately 2 acres in size and appears to be manmade based on the steep sided slopes (i.e. excavated patterns) observed around the pond edge. The pond appears to have extreme fluctuations in water surface elevations based on observed wrack lines, historic aerial photograph inundation mapping, and littoral zone/shoreline vegetation indicators. The pond is supported hydrologically by groundwater and surface water runoff from Route 8 highway and bordering upland areas. The pond does not appear to have a natural inlet or outlet.

5.3.3 Potential Impacts

Development of the Project on this parcel is not likely to significantly impact the natural resources as efforts will be employed to control influence of nearby water resources and to reduce the overall amount of disturbance of the site during construction.

5.4 Noise

A technical noise assessment of the proposed Project (Exhibit I) was completed and consisted of two parts: an ambient noise monitoring program in the vicinity of the Project in order to characterize the existing noise environment; and a detailed noise modeling study/impact evaluation of the proposed Project. The background ambient noise monitoring program was conducted on July 21-22, 2015. Modeled Project noise levels were compared against the State of Connecticut Noise Standard and the Town of Beacon Falls Noise Ordinance to determine compliance, and further evaluated against the existing minimum ambient noise levels. The results of the noise assessment are summarized below.

5.4.1 Applicable Standards/Guidelines

The State of Connecticut standard (Section 22a-69 of the RCSA) limits noise from a source, as measured at certain Noise Zones when emitted from other Noise Zones. These Zones include the following:

- Class A - Generally residential, hotels, hospitals and other sensitive areas.
- Class B - Commercial areas
- Class C - Industrial uses

The Project is an industrial use in an industrially zoned area (Class C). The nearest noise sensitive areas are the residential uses on Gruber Road (Class A). As such, the applicable portion of the noise standard is a source located in a Class C area, and the measured noise level from that source at a Class A area. Summarized below are the noise limits for this scenario.

Class C source emitting to a Class A receiver

Daytime	Nighttime
61 dBA	51 dBA

The Town of Beacon Falls has a noise ordinance called the Ordinance Regarding Noise. The ordinance contains the same numerical sound level limits applicable to the Project as the State of Connecticut noise standard. The ordinance also limits construction activities to the hours of 7 am to 8 pm weekdays and Saturdays. No construction activity is permitted on Sundays and legal holidays.

5.4.2 Existing Conditions

The land uses immediately bordering the site consist of a combination of residential, industrial, and commercial uses. The nearest residences are located to the west on Gruber Road, approximately 500 feet from the center of the proposed Project. Additional residential uses are located to the north on Lopus Road and to the northeast on Railroad Avenue. Commercial and industrial uses are located to the east and south.

5.4.3 Ambient Monitoring

An ambient noise monitoring program for the proposed Project was conducted on July 21-22, 2015 at three residential areas bordering the site. A figure depicting the Property and the selected noise monitoring locations is provided as Figure 8.

The existing noise environment during daytime hours at the Gruber Road and Lopus Road locations is dominated by traffic noise from Route 8. Noise from passing cars and trucks on Lopus Road was also noted at the Lopus Road location. At the Railroad Avenue location, noise from passing cars and trucks was the dominant noise source, as well as traffic noise from Route 8. Other sounds that were noted during the day, to a much lesser degree, were natural sounds such as birds and rustling leaves.

At night, Route 8 traffic noise was the predominant source of noise at all locations. Additional sounds noted at night included a passing train, faint residential air conditioners, and some rustling leaves. Little to no insect noise was noted during either the daytime or nighttime hours.

A RION NL-31 integrating sound level meter was utilized for continuous monitoring at the Gruber Road location. The meter was programmed to measure and store data in 1-minute increments during the period. The data summary from this monitoring program is presented graphically in Figure 9. The data set was further tabulated into hourly averages and is presented in Table 6.

A review of the plots in Figure 9 indicates that existing L90 noise levels at the Gruber Road location ranged from about 35 dBA at night, up to about 50 dBA during the day. Leq levels, which include all of the sounds present, were higher, ranging from about 35 dBA to 55 dBA. Measured noise levels at night are more variable than during the day, due to periodic brief lulls in the ambient sound that occurs as Route 8 traffic noise varies depending on traffic volumes. Some brief periods of lower sound levels did occur as reflected in the one minute averages presented in Figure 9. The spike in sound levels from approximately 7 pm to 7:30 pm is due to rain showers that occurred.

The tabulated hourly data (Table 6) reveals hourly Leq noise levels ranging from about 44 dBA at night, up to about 54 dBA during the day. The higher Leq levels that occurred at hours 2000 and 2100 were due to the rain showers, and are not typical sound levels for the area.

Short-term monitoring (15 minutes in duration at each location) was also conducted during the day and twice late at night during the monitoring program. A summary of the overall A-weighted $L_{90,}$ $L_{eq\ and}$ L_{10} data measured during the ambient program is presented in Table 7. The short-term data at the Gruber Road location correlates well with the minimum hourly sound levels from the continuous meter at the same location (Table 6).

The data presented in Tables 6 and 7 reveal that low ambient (L_{90}) noise levels currently exist during the late night hours, ranging from 35 dBA to 40 dBA at all locations. The measured L_{eq} levels, which include all sounds present, were higher, ranging from 38 dBA to 60 dBA. Higher ambient levels occurred during the day due to increased vehicular traffic on Route 8 and local roads, and other increased activity.

5.4.4 Noise Modeling - Methodology

Computer noise modeling was conducted utilizing the CadnaA noise model (DataKustik, 2014). This very powerful 3-dimensional model maps the noise contours of the overall Project in accordance with a variety of standards, primarily VDI 2714 Outdoor Sound Propagation and ISO 9613 (ISO, 1996). The software is designed to take into account spreading losses, ground and atmospheric effects, shielding from terrain, barriers and buildings, and reflections from surfaces. These model capabilities are especially important in an area such as the Project site, as the effects of the local terrain can be accounted for. Site specific GIS topographic data were obtained and incorporated into the model.

Each Project fuel cell has several noise generating components that include the following:

- DFC3000 or HEFC Module
- Fresh Air Blower
- Discharge Piping
- Air Heater
- Chiller
- Transformer

In addition, the Project will contain a switchyard with a main step-up transformer.

Sound level data for each fuel cell component were obtained directly from Fuel Cell Energy. Noise emission data for the main step up transformer were developed using standard NEMA sound ratings for the proposed transformer MVA rating (40/53/66 MVA).

Modeling receptors were chosen at specific residential locations near the Project site. An initial noise model was prepared, utilizing the standard design and noise emissions data for the fuel cells.

5.4.5 Noise Modeling - Results

The results of this model indicated that Project related sound levels would exceed the State of Connecticut and Town of Beacon Falls noise standard limits for nighttime hours at some residential locations. The Project therefore opted for Fuel Cell Energy's low noise option design. This design includes enclosures for some fuel cell components, and a silencer on the fresh air blower. The model was revised to include the low noise data sources. In addition to selecting the low noise option, the Project also opted to install a sound barrier wall along Gruber Road to further reduce sound levels in that neighborhood. The sound barrier wall would be located approximately

50 to 100 feet from the eastern edge of Gruber Road, and would extend approximately 900 feet from north to south.

The noise modeling results for each residential location, with the low noise design option and the proposed sound barrier wall included, are presented in Table 8. A noise contour map, depicting the modeled noise levels in the area surrounding the Project, is provided as Figure 10. The data in Table 8 reveal that Project sound levels will be below 51 dBA at all residential locations. The Project is therefore projected to be in compliance with the State of Connecticut noise standard and the Town of Beacon Falls noise ordinance limits for nighttime hours.

Table 9 provides the modeled sound levels for the Project with the low noise option and the proposed sound barrier wall, the existing minimum late night ambient (L_{90}) sound levels, and the subsequent increase in noise anticipated to occur with Project operation.

The existing ambient L_{90} data presented in Table 9 reflect the lowest sound level measured at each location. Because minimum ambient L_{90} noise levels are so low at night, the data presented in Table 9 reveal that during the quietest hours, noise levels at the most proximate residential locations will increase by between 5 dBA and 11 dBA, even though the modeled Project related sound levels are below the nighttime noise level limits in the standards. As noted previously, a 10 dBA increase is perceived as a doubling of the sound level. As was also noted, however, a doubling of a low ambient level is less significant than a doubling of a high ambient level.

5.4.6 Potential Impacts

As noted above, the projected increases are for the quietest hours of the night. During other hours of the night and especially during the day, ambient levels are much higher (45 dBA or more as shown in Table 7). During daytime hours, Project noise levels will be at or below ambient levels, with little to no increases to these higher ambient levels. It is not practical and likely not possible to make the Project sources completely inaudible at all locations under all ambient conditions. The goal of a project such as this should be to minimize the potential for noise impacts to the extent practical.

5.5 Scenic Values and Visual Renderings Effects

As mentioned previously, the Project is located in a "bowl," which will minimize its visual impacts to the surrounding community. A full characterization of these impacts can be seen in Exhibit O, Visual Assessment Report.

5.6 Land Use/ Cultural Resources Effects

5.6.1 Land Use

The Project site is currently and had historically been unoccupied and undeveloped land (see Exhibit J, Phase I Environmental Site Assessment). An open water pond is found along the southern portion of the site. There are no structures, roads, or other improvements currently in existence and active use of the Property, based upon visual and anecdotal evidence, consists of dirt bike and all-terrain vehicle use by trespassers. The current owner, O&G, does not use the site for any purpose.

The current uses of the adjoining properties include residential along Gruber Road to the northwest and residential and industrial (vacant) to the north across Lopus Road. The Property is bordered along the east side by the Metro-North Railroad and River Road Extension. Several industrial facilities are located along the eastern side of River Road Extension. Route 8 is adjacent to the site's south end.

The following land use considerations were reviewed:

- *Statewide Land Use Conservation and Development* - According to the Locational Guide Map contained in the Conservation and Development Policies Plan for Connecticut, the Project site has been classified as a Growth Area. Growth Areas are lands that can support staged urban-scale expansion in areas suitable for long term economic growth that are currently less than 80% built up but have existing or planned infrastructure to support future growth in the region.

- *Local Plan of Conservation and Development* - According to the 2013 Draft Beacon Falls Plan of Conservation and Development, the Property is classified as a resource extraction site (see Figure 11).

- *Zoning* - The Beacon Falls zoning maps indicate that the Project is located within the Industrial Park District (IPD) zone (see Figure 12). There are a wide range of permitted uses within this zone including public utility facilities which may consist of substations, water storage facilities, treatment facilities, and pump stations.

5.6.2 Potential Impacts

Development of the Beacon Falls Energy Park is consistent with the *Conservation and Development Policies Plan for Connecticut* and the *Plan of Conservation and Development for*

Beacon Falls. The Property is located within lands that are locally classified as Industrial Park District, and it is in close proximity to primary growth areas along Route 8. The proposed Beacon Falls Energy Park is believed to be compatible with the existing industrial land uses located along Railroad Avenue Extension.

5.6.3 Cultural Resources

Given the past disturbances to the Property (sand and gravel extraction) and the quantity and depth of materials removed from the site, it is highly unlikely that this site can support significant historical and/or archeological resources. Letters to the State Historic Preservation Office (SHPO), State Archeologist, and Tribal Historic Preservation Offices have been filed and response from these agencies indicates that the site does not have a high likelihood of supporting any sensitive archeological and/or historic properties due to its former use as a sand and gravel pit (see Exhibit K).

5.6.4 Potential Impacts

Based on correspondence received from SHPO, the Project will have no adverse impacts on sensitive archeological and/or historic properties. No further correspondence and/or mitigation is required.

5.7 Wildlife and Habitat Effects

The Environmental Assessment report prepared by Milone & MacBroom, Inc. (MMI) completed an evaluation of the plant and animal habitats at the Project site. The complete Environmental Assessment is located in Exhibit F.

5.7.1 Vegetation Areas

The Property has varying vegetation community zones including mixed hardwood forest, railroad right of way vegetation zone, xeric scrub shrub zone, xeric herbaceous zone and shoreline vegetation (see Figure 13).

The hardwood forest zone consists of a mix of hardwood trees and shrubs. These forested areas appear to be at least 50 to 60 years of age based on the tree sizes observed within these areas. Typical vegetation consisted of white oak (*Quercus alba*), red oak (*Quercus rubra*), black oak (*Quercus velutina*), sugar maple (*Acer saccharum*), Eastern hophornbeam (*Ostrya virginiana*),

shagbark hickory (*Carya ovata*), American beech (*Fagus grandifolia*), black cherry (*Prunus serotina*), lowbush blueberry (*Vaccinium angustofolium*), witchhazel (*Hamamelis virginiana*), winged euonymus (*Euonymus alatus*), Japanese barberry (*Berberis thunbergii);* and various sedges, grasses, and mosses.

The railroad vegetation zone is located along the eastern portion of the Property and consists of a narrow swath ranging between 20 to 30 feet in width. Plants in this zone include eastern red cedar (*Juniperus viginiana*), red oak, black oak, big toothed aspen (*Populus grandidentata*), quaking aspen (*Populus tremuloides*), autumn olive (*Elaeagnus umbellata*), multiflora rose (*Rosa multiflora*), and wormwood (*Artemisia vulgaris*).

The xeric scrub shrub zone is the largest vegetation community on site. This vegetation zone consists of shrubby vegetation that ranges in height from 6 to 12 feet. Some herbaceous vegetation is capable of surviving in areas where sunlight can penetrate to the ground. The dominant vegetation in this community included grey birch (*Betula populifolia*), black cherry, quaking aspen, sassafras (*Sassafrass)*, eastern red cedar, autumn olive, and multiflora rose.

The xeric meadow zone is found along the central portion of the site and is dominated by open barren sandy areas and densely vegetated herbaceous zones. Some shrubs are intermixed amongst the herbaceous vegetation, but are in limited density and height. Plants observed within this zone included sweetfern (*Comptonia peregrine)*, little blue stem (*Schizachyrium scoparium*), wormwood, evening primrose (*Oenothera*), common mullen (*Verbascum Thapsus*), round headed bush clover (*Lespedeza capitate)*, and a variety of other grasses.

The shoreline vegetation consists of a variety of native plants including red maple (*Acer rubrum*), black birch (*Betula lenta*), white oak (*Quercus alba*), American elm (*Ulmus americana*), white pine (*Pinus strobus*), common winterberry (*Ilex verticillata*), highbush blueberry (*Vaccinium corymbosum*), silky dogwood (*Cornus amomum*), steeplebush (*Spiraea tomentosa*), soft rush (*Juncus effusus*), woolgrass (*Scirpus cyperinus*), lurid sedge (*Carex lurida*), American burred (*Sparganium americanum*), and a variety of grasses.

5.7.2 Fish and Wildlife

The open water pond may support a warm water fishery resource; however, no fish and/or signs of fishing (i.e., tangled fishing lines on vegetation) were observed around the pond. The pond may support amphibians and reptiles such as painted turtles, snapping turtles, green frogs, bull frogs, pickerel frogs, and water snakes. No wood frogs, spring peepers, and/or salamanders

were observed during our field visit. Several birds were observed in and/or around the pond edge including mallards, northern cardinal, American robin, black capped chickadee, and tufted titmouse. The DEEP fishery division does not have any fishery data on this pond.

The wildlife habitat in the Project area contains significant indicators of disturbance such as gravel pits and piles, ATV trails, drainage modifications, anthropogenic debris, and introduced invasive vegetation species. The open water pond and its immediate surrounding mixed hardwood forest provide the highest quality habitat on site. The more heavily disturbed portions of the site provide habitat for a variety of scrub shrub habitat type birds, mammals, reptiles, amphibians, and insects. In addition the xeric vegetation communities have the potential to support State listed species of special concern.

5.7.3 Species of Special Concern

The DEEP Natural Diversity Database (NDDB) was accessed to determine whether any areas of special concern for endangered, threatened, and/or special concern species or significant natural communities exist within the Project area. The NDDB mapping indicates that the Property does not support endangered, threatened, and/or special concern species or significant natural communities (See Figure 14). A NDDB inquiry was submitted to DEEP to confirm that there are no known areas of concern on and/or within the immediate vicinity of the Property. DEEP has indicated that although the Property does not have a polygon area of concern over it, there is the potential for state listed special concern species to be present on this site (see NDDB correspondence in Exhibit L). These species include:

- Vascular Plants – Downy wood-mint (*Blephilia ciliate*); Virginia waterleaf (*Hydrophyllum virginianum*) and Hooker's orchid (*Platanthera hookeri*)
- Vertebrate Animals - Brown thrasher (*Taxostoma rufum*) and Hognose snake (*Heterodon platirhrinos*)

In early July 2015, MMI ecologists completed a botanical survey of the Property to determine the presence of the three listed vascular plants. It should be noted that the *Blephilia ciliate* and *Platanthera hookeri* are considered to be extinct in Connecticut. Our botanical surveys did not find any of the listed plants within the Project site.

In addition to the botanical surveys, MMI ecologists have completed both bird and reptile surveys on the Project site. The brown thrasher prefers scrub shrub and early successional

woodland habitats, both of which occur on the Project site. In July 2015, one adult brown thrasher was observed on the Property. The adult appeared to be solitary individual. Protection for this bird species typically requires the maintenance of scrub shrubby habitat. This habitat occurs along the periphery of the Property, most of which will remain intact following construction of the Project.

No eastern hognose snakes were found during multi-day field surveys. In fact, no snakes of any kind were observed on the Property. Several American toads (*Anaxyrus americanus)*, pickerel frogs (*Rana palustris)*, and grey tree frogs (*Hyla versicolor*) were observed on site. No eastern box turtles (*Terrapene carolina carolina)* were found on site.

5.7.4 Potential Impacts

Direct impacts to vegetation and wildlife are expected to be minimal given past activities and the open nature of the Property. A majority of the existing scrub shrub habitats found around the periphery of the site will remain for use by the brown thrasher. Additional shrub and tree plantings are proposed along the southern and eastern limits of the site (Figure 15). The Project will implement several important protection plans and management measures to help protect state listed special concern species.

Although no eastern hognose snakes were found, the Property does have habitat that can support the eastern hognose snake. The following management plan has been developed to help protect these species during construction of the Project:

- Conduct a sweep of the Property by a qualified wildlife biologist prior to installation of silt fence.
- Install silt fencing around the work area prior to the start of any construction.
- Conduct a second sweep of the Property by a qualified wildlife biologist prior to construction.
- Inform the contractor of the potential presence of eastern hognose snakes within the Project site, furnish with a description of the snake for proper identification purposes, provide with suggested working procedures during critical times, and provide proper procedures for removal and relocation.
- Restrict machinery and heavy vehicles from being parked or operated in hognose snake habitat. Confine parking for construction equipment within the limits bound by the silt fence.

- Remove the silt fence once construction is complete and soils have been stabilized to avoid restricting wildlife movement.

5.8 Soil Waste and Hazardous Materials

The Project is not expected to generate significant amounts of solid waste. Natural gas will be used to operate the fuel cells. Natural gas typically contains sulfur at levels that could cause corrosion within the fuel cell units and because of that, a sulfur removal system consisting predominantly of granular activated carbon must be used to treat the natural gas. Once the adsorptive capacity of the granular activated carbon is fully exhausted, it will be removed to an off-site licensed facility for disposal and/or reclamation. The outgoing carbon is classified as hazardous waste for tracking and disposal purposes.

5.8.1 Potential Impacts

The generation and subsequent off-site disposal and/or reclamation of the granular activated carbon will have a minimal impact upon the environment. The generation of spent activated carbon is commonplace in a large number of industries and the anticipated generation by the Project is minimal. No on-site storage of hazardous waste will occur; therefore, the local impact will be negligible.

5.9 Transportation, Infrastructure and Traffic

The Property has access from two local roadways, Gruber Road and Lopus Road. The eastern portion of the site is bordered by the Metro-North Railroad and there is no existing at-grade crossing that services this Property. State Route 8 is located along the southern boundary of the Property and does not provide any viable access to the site. Access to the Project will be provided by the construction of a new access road off of Lopus Road along the northeastern boundary of the Property. This is the only feasible location for a site access road given the steep slopes and the presence of both the rail line and the highway.

Changes to area traffic may result from temporary construction-related impacts and long-term facility operations. The construction of the Project is anticipated to take approximately 3 years. Construction hours will be from 7 a.m. to 3:30 p.m. year round. During the first year of construction, the construction force will consist of approximately 50 employees and will decrease to approximately 25 employees during construction years two and three. It is estimated that during the first year of construction there will be approximately 10 trucks per day on average entering

and leaving the Property to deliver construction-related materials. For construction years two and three, it is estimated that only five delivery trucks will be entering and leaving the site per day. The heavy hauling of the fuel cell units will occur over a 2-year period, and it is estimated that there will be two heavy hauls per month during that time period. The proposed site grading (cuts and fills) has been balanced so that hauling of sand and gravel off site will not be necessary.

All construction related traffic will access the Property from either North Main Street and/or South Main Street. Trucks will turn onto Depot Street and proceed onto Lopus Road.

Once constructed, the Project will be unmanned (with the exception of maintenance) and the Property will not receive deliveries or make outgoing shipments. The Project will not require the use of the adjacent Metro-North Railroad or State Route 8 for any transportation-related activities.

5.9.1 Potential Impacts

The overall transportation and traffic-related impacts proposed by the Project are considered to be minimal given the limited truck trips during construction, the existing industrial uses that border the Property to the east and the long term unmanned operation of the facility.

5.10 Transmission and Public Utility Services

The following analysis examines the potential for impact on public utilities and services, such as the provision of water, sewer, and storm sewers as well as electricity, telephone, cable, and gas.

5.10.1 Water

The 21 FCE units will consume approximately 300,000 gallons of water per day. The water required by the Project will be provided by Aquarion Water Company. Aquarion Water Company services the industrial complexes located east of the Property via an existing 8-inch water main within Railroad Avenue. Two new water main extensions from this line will be installed, including an 8-inch main to serve as the fire protection line ending at a new fire hydrant to be installed on site and a 6-inch line to service the 21 FCE units. The two water main lines will be installed beneath the railroad right-of-way and existing railroad bed requiring coordination and obtainment of temporary rights of entry and license agreements with Metro-North and the

Connecticut Department of Transportation. The two water lines will be installed using directional boring methods to limit the disturbance to the active Metro-North railroad.

5.10.2 Sanitary Sewer

As the Project is an unmanned facility, no formal buildings are being proposed and a sanitary sewer connection will not be needed.

5.10.3 Storm Sewer

There are no stormwater sewers currently located on the Property or on Gruber Road. A single stormwater catch basin is located on Lopus Road which discharges stormwater onto the Project site. Under existing conditions, stormwater on the Property infiltrates into the sandy soils, with no apparent surface water discharge from the site. There are no modifications proposed for the existing stormwater catch basin and outfall on Lopus Road.

Stormwater runoff from undeveloped areas within the Property boundary after Project construction will be collected within bioswales and conveyed along the western and northern portions of the site, where the water will then be discharged into an infiltration basin area. Stormwater from the developed portions of the park (i.e., fuel cell pad, etc.) will be collected in a series of stormwater catch basins and conveyed to a bio infiltration basin located between the fuel cell units and the Metro-North railroad.

5.10.4 Electricity

A small electrical switchyard will be located along the northwest portion of the Project site. This internal switchyard will be connected to the 21 FCE units and the Eversource Cold Spring Road substation, and will transmit the electricity from the Project to the grid. Electricity from the switchyard will be required to service the entry gate, security lighting, and cameras within the facility.

5.10.5 Natural Gas

The 21 FCE units will consume approximately 7,707 cubic feet of natural gas per minute. Eversource will provide natural gas to Property via a new 8 inch gas main extended down Lopus Road into a new Gas Metering Station located within the Project boundary. This gas main extension will be constructed from an existing gas main located approximately 2,000 linear feet

west of the site in Pondview Circle. A new 10 inch gas main will be extended from the Gas Metering Station to the FCE Units.

5.10.6 Telephone and Cable

The Project will be serviced by both telephone and cable lines owned by AT&T. An existing underground AT&T fiber optic cable is located along the northern portion of the Property adjacent to Lopus Road. The proposed access road off of Lopus Road will cross over this fiber optic line. In addition to the underground cable fibers, Lopus Road has overhead cable and telephone lines, which will be pulled from and extended underground along the proposed access driveway to service the Project.

5.10.7 Potential Impacts

Aquarion Water Company has the required volume of water to service the Project and the supply of that amount to the Project will have no significant impact on Aquarion's water supply system for its existing and/or future customer needs. The possibility of a Project effect upon the water pressure in the main located along Railroad Avenue Extension is still being evaluated with the assistance of Aquarion Water Company.

The Project does not require connection to any state and/or local stormwater drainage systems. All stormwater from the Project will be collected, treated, and infiltrated on site; therefore, there is no significant impact to local and/or state storm sewer systems.

The Project is being proposed to help generate clean electrical energy and help reduce strain on the existing electrical grid. The Project will not require a significant amount of energy to run the entry gate, security lighting, and/or cameras. The Project will not significantly affect the electrical consumption rate of the existing grid system.

The Project will require the consumption of natural gas, and Eversource has the necessary natural gas volumes to support this energy park without impacting existing customer and/or future customer needs.

Figures

Tables

EXHIBITS

EXHIBIT A - General Arrangement Plan

EXHIBIT B – Site Rendering

EXHIBIT C – Proposed Project Schedule

EXHIBIT D – O&G Safety Information

EXHIBIT E – Air Quality Report

EXHIBIT F – Environmental Assessment

EXHIBIT G – Stormwater Management

EXHIBIT H – Wetlands Delineation Report

EXHIBIT I – Noise Assessment

EXHIBIT J – Phase I Environmental Site Assessment Report

EXHIBIT K – Cultural/SHPO Correspondence

EXHIBIT L - Natural Diversity Database Correspondence

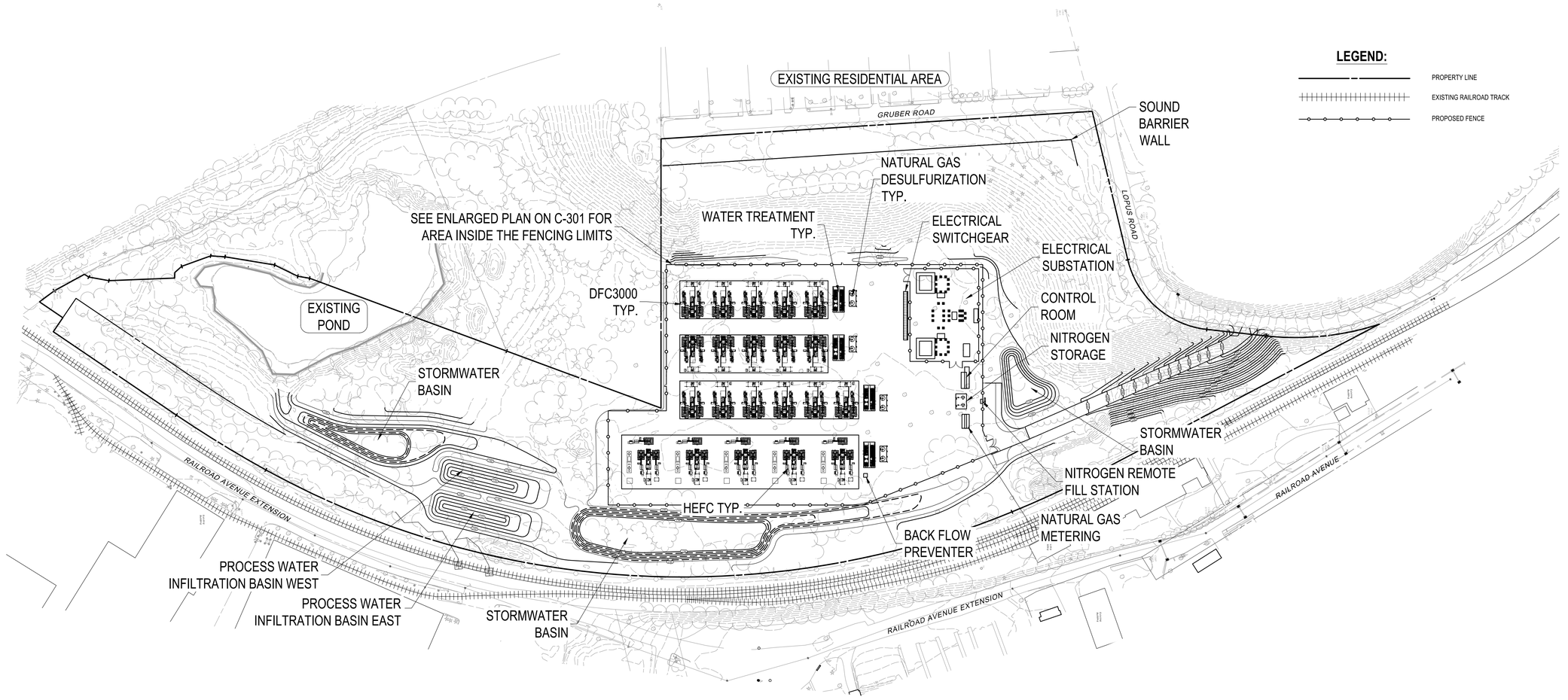
EXHIBIT M – Proof of Service of Notice on Abutting Property Owners

EXHIBIT N – Fuel Cell Specification Sheets

EXHIBIT O – Visual Assessment Report

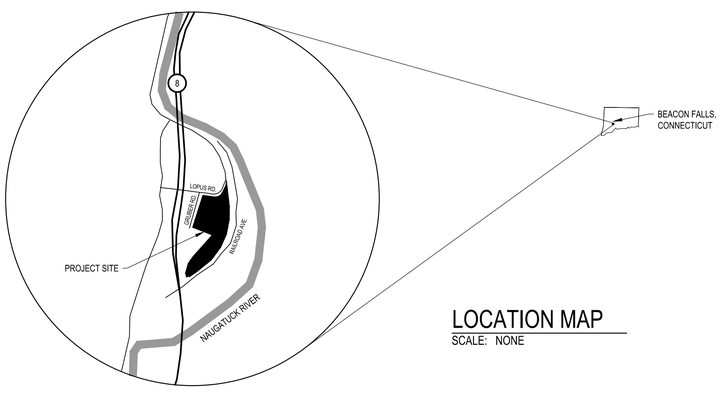
EXHIBIT A

General Arrangement Plans



OVERALL SITE PLAN - GENERAL ARRANGEMENT

SCALE: 1" = 100'-0"



LOCATION MAP

SCALE: NONE

GENERAL NOTES:

1. EXISTING CONTOURS BASED ON SURVEY BY MILONE & MACBROOM DATED APRIL 16, 2015
2. EQUIPMENT LAYOUT FOR DFC3000 AND HEFC UNITS PROVIDED BY FUEL CELL ENERGY.

LEGEND:

- PROPERTY LINE
- EXISTING RAILROAD TRACK
- PROPOSED FENCE

ISSUE	DATE	DESCRIPTION	APP BY
B	07/09/15	SITE LAYOUT CHANGES	PCIS
A	06/11/15	ISSUED FOR PERMITTING	PCIS

MILONE & MACBROOM®
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773 Fax (203) 272-9733
www.miloneandmacbroom.com

PCI | SKANSKA
401 N.W. 1st Street
Evansville, IN 47708
(812) 425 4264

BEACON FALLS ENERGY PARK
O & G INDUSTRIES, INC.
112 WALL STREET
TORRINGTON, CT 06790

PROJECT NORTH / TRUE NORTH

0 1/2" 1"

CREATED BY: RNR	DATE: 04/22/15
CHECKED BY: JWB	PRINTED DATE: 07/10/15

PROJECT NUMBER: 20150106.00.00

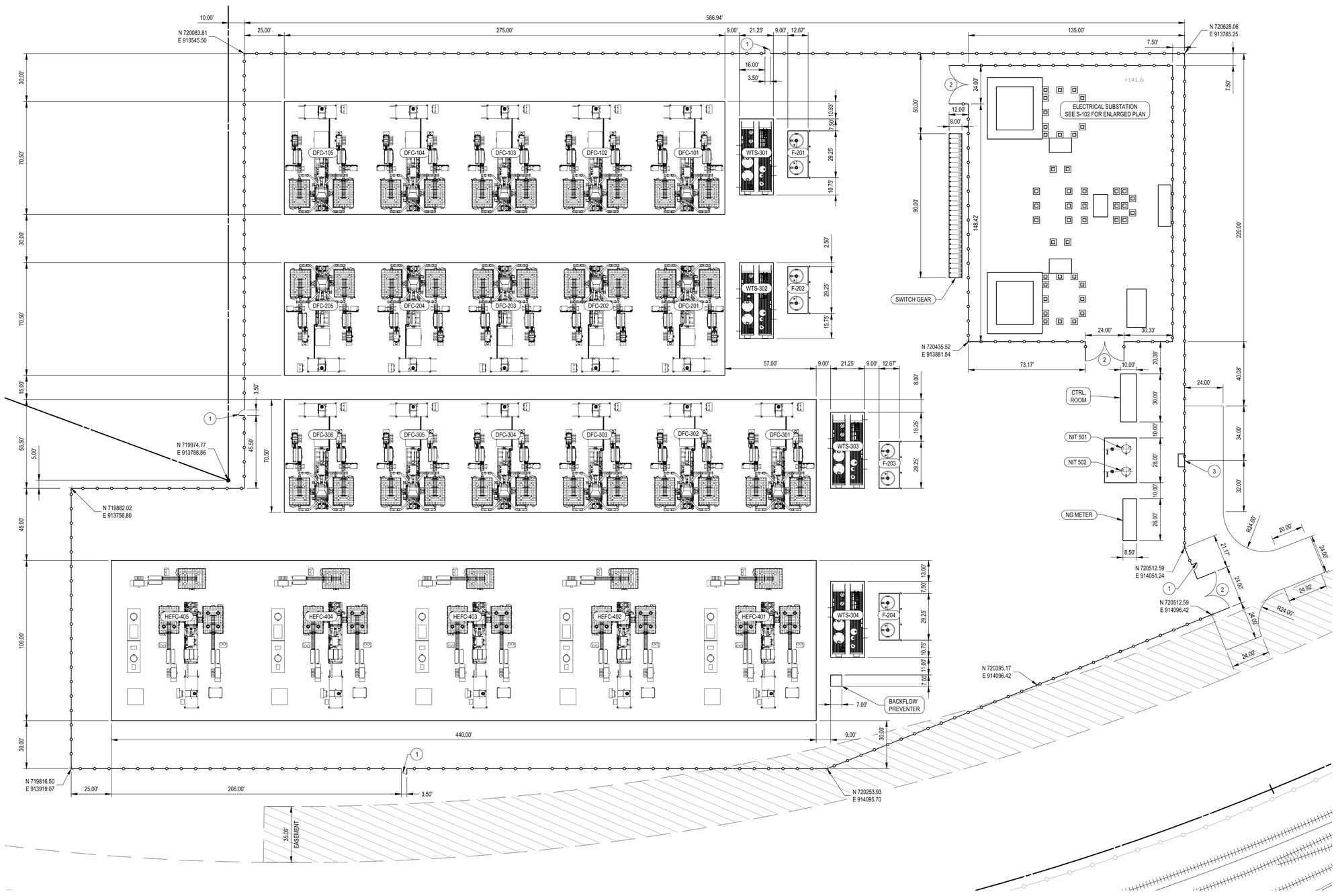
OVERALL SITE PLAN - GENERAL ARRANGEMENT

C-300 SHEET NUMBER

ISSUE B 07/09/15

PCI SKANSKA 24 x 36 Revised (5/25/2012) ELS

ISSUED FOR BID 06/10/15 - NOT FOR CONSTRUCTION



ENLARGED SITE PLAN

SCALE: 1" = 30'-0"

PROJECT NORTH

TRUE NORTH

0 1/2" 1"

GENERAL NOTES:

1. SEE S-101 FOR CONCRETE SLAB AND FOUNDATIONS DETAILS.
2. SEE S-100 FOR STRUCTURAL NOTES AND SPECIFICATIONS.
3. SEE C-501 FOR FENCING DETAILS.

KEY NOTES:

1. MAN GATE, SEE DETAIL 7 ON SHEET C-501
2. VEHICLE ACCESS GATE, SEE DETAIL 3 ON SHEET C-501
3. NITROGEN REFILL GATE, SEE DETAIL 6 ON SHEET C-501

LEGEND:

- PROPERTY LINE
- EXISTING RAILROAD TRACK
- PROPOSED FENCE

ABBREVIATIONS:

- WTS - WATER TREATMENT SKID
- F - NATURAL GAS DESULFURIZATION SKID
- NIT - NITROGEN STORAGE SKID
- NG - NATURAL GAS

ISSUE	DATE	DESCRIPTION	APP BY
B	07/09/15	REVISED PAD DIMS. & LOC., ADD MAN GATES	PCIS
A	06/11/15	ISSUED FOR PERMITTING	PCIS

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TORRINGTON, CT 06790

CREATED BY: RNR	DATE: 04/22/15
CHECKED BY: JWB	PRINTED DATE: 07/09/15
PROJECT NUMBER: 20150106.00.00	

ENLARGED SITE PLAN

C-301
SHEET NUMBER

ISSUE B 07/09/15

ISSUED FOR BID 06/10/15 - NOT FOR CONSTRUCTION

EXHIBIT B

Site Rendering

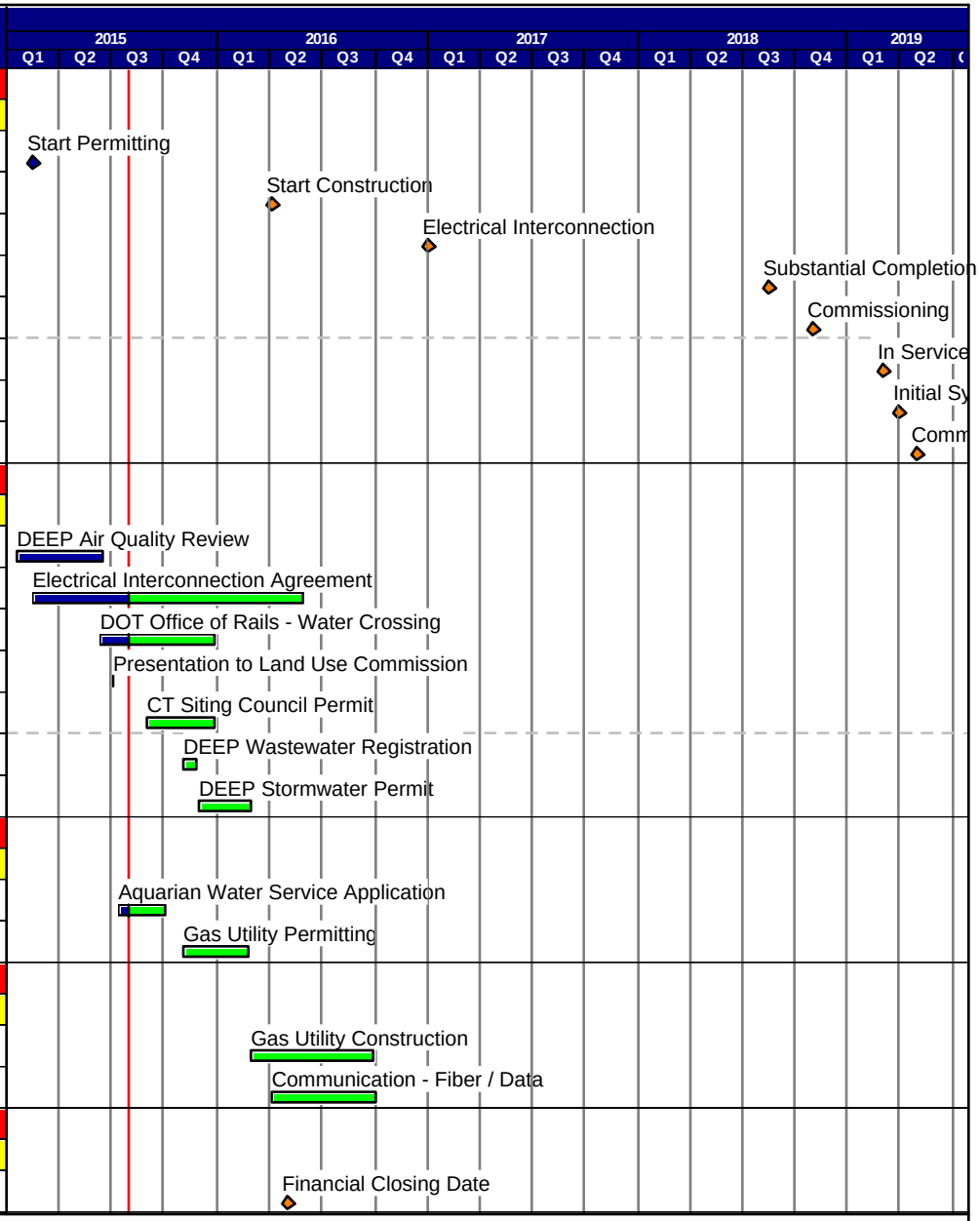
Beacon Falls Energy Park

Beacon Falls, CT

EXHIBIT C

Proposed Project Schedule

Act ID	Description	Orig Dur	Early Start	Early Finish
02 - Major Milestones				
200	Start Permitting	0	16FEB15 A	
202	Start Construction	0	04APR16 *	
210	Electrical Interconnection	0		30DEC16 *
212	Substantial Completion	0		15AUG18 *
214	Commissioning	0		01NOV18 *
204	In Service Date	0	01MAR19 *	
206	Initial Sync	0	01APR19 *	
208	Commercial Operation	0	01MAY19 *	
04 - Major Permits				
012	DEEP Air Quality Review	132	20JAN15 A	22JUN15 A
014	Electrical Interconnection Agreement	336	16FEB15 A	01JUN16
018	DOT Office of Rails - Water Crossing	144	12JUN15 A	31DEC15
002	Presentation to Land Use Commission	1	07JUL15 A	07JUL15 A
008	CT Siting Council Permit	88	31AUG15 *	31DEC15
016	DEEP Wastewater Registration	22	02NOV15 *	01DEC15
006	DEEP Stormwater Permit	66	01DEC15 *	03MAR16
06 - Utility Permitting				
022	Aquarian Water Service Application	61	15JUL15 A	07OCT15
020	Gas Utility Permitting	84	02NOV15 *	29FEB16
08 - Off Site Utility Construction				
030	Gas Utility Construction	154	01MAR16 *	03OCT16
038	Communication - Fiber / Data	132	04APR16 *	05OCT16
10 - Financing				
040	Financial Closing Date	0	02MAY16 *	



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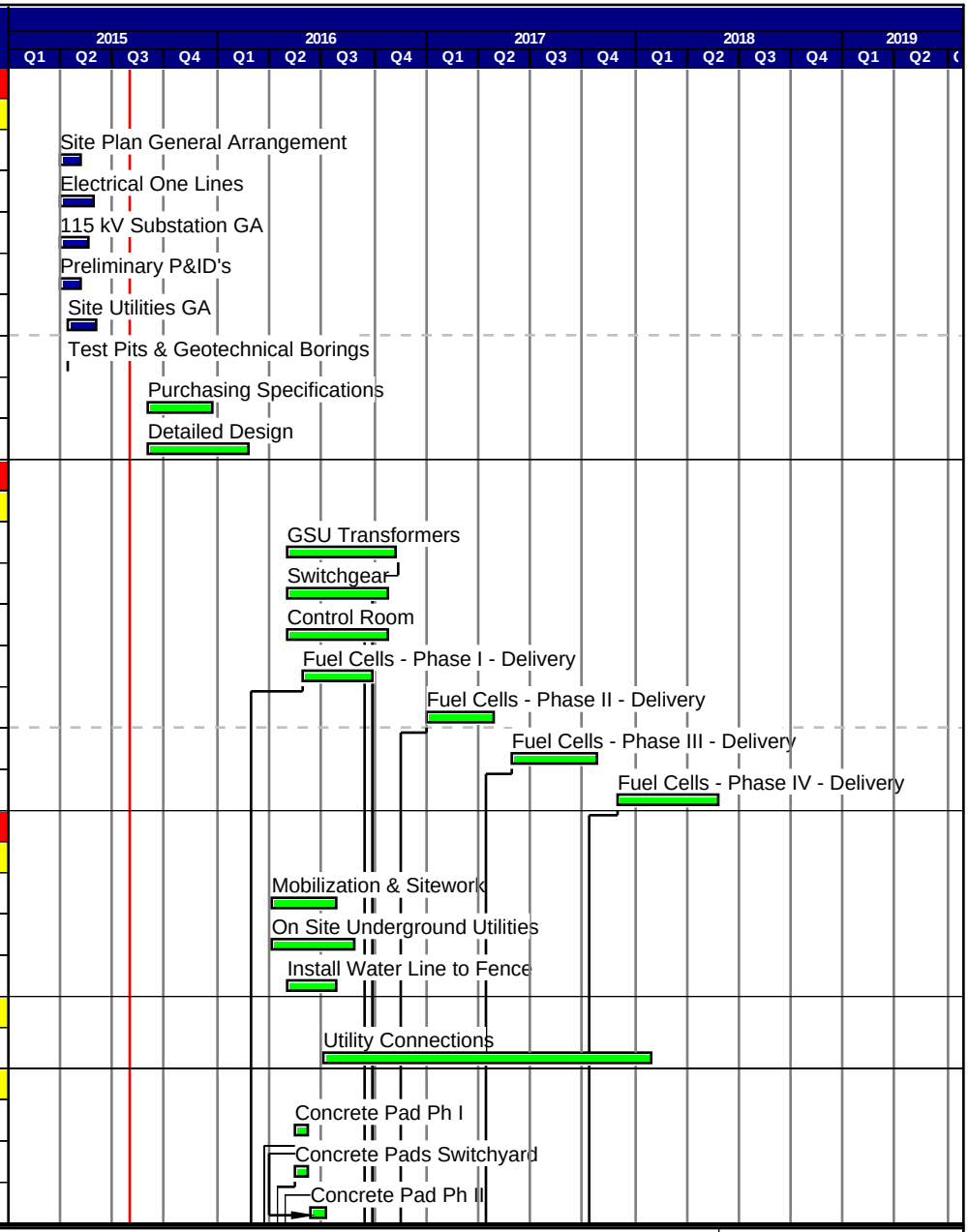
Finish date	30APR19
Data date	03AUG15
Run date	18AUG15
Page number	1A

AAAH

Beacon Falls Energy Park, LLC
Beacon Falls, CT

Early bar
Progress bar
Critical bar
Summary bar
Progress point
Start milestone point
Finish milestone poi

Act ID	Description	Orig Dur	Early Start	Early Finish
12 - Engineering				
056	Site Plan General Arrangement	31	30MAR15 A	11MAY15 A
058	Electrical One Lines	46	30MAR15 A	01JUN15 A
064	115 kV Substation GA	51	30MAR15 A	26MAY15 A
072	Preliminary P&ID's	1	01APR15 A	13MAY15 A
074	Site Utilities GA	41	13APR15 A	08JUN15 A
050	Test Pits & Geotechnical Borings	22	15APR15 A	17APR15 A
052	Purchasing Specifications	85	01SEP15 *	29DEC15
054	Detailed Design	129	01SEP15 *	01MAR16
14 - Procurement - Purchase, Fabricate, Deliver				
066	GSU Transformers	140	02MAY16 *	14NOV16
068	Switchgear	130	02MAY16 *	31OCT16
070	Control Room	130	02MAY16 *	31OCT16
060	Fuel Cells - Phase I - Delivery	89	01JUN16 *	04OCT16
061	Fuel Cells - Phase II - Delivery	86	02JAN17 *	01MAY17
062	Fuel Cells - Phase III - Delivery	109	01JUN17 *	01NOV17
063	Fuel Cells - Phase IV - Delivery	129	01DEC17 *	01JUN18
16 - Construction				
02 - Site				
080	Mobilization & Sitework	84	04APR16 *	29JUL16
082	On Site Underground Utilities	107	04APR16 *	31AUG16
118	Install Water Line to Fence	66	02MAY16 *	02AUG16
04 - Utilities				
094	Utility Connections	409	05JUL16 *	31JAN18
06 - Foundations				
084	Concrete Pad Ph I	20	16MAY16 *	10JUN16
114	Concrete Pads Switchyard	20	16MAY16 *	10JUN16
108	Concrete Pad Ph II	20	13JUN16	11JUL16



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Run date	18AUG15
Page number	2A

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Beacon Falls Energy Park, LLC
Beacon Falls, CT

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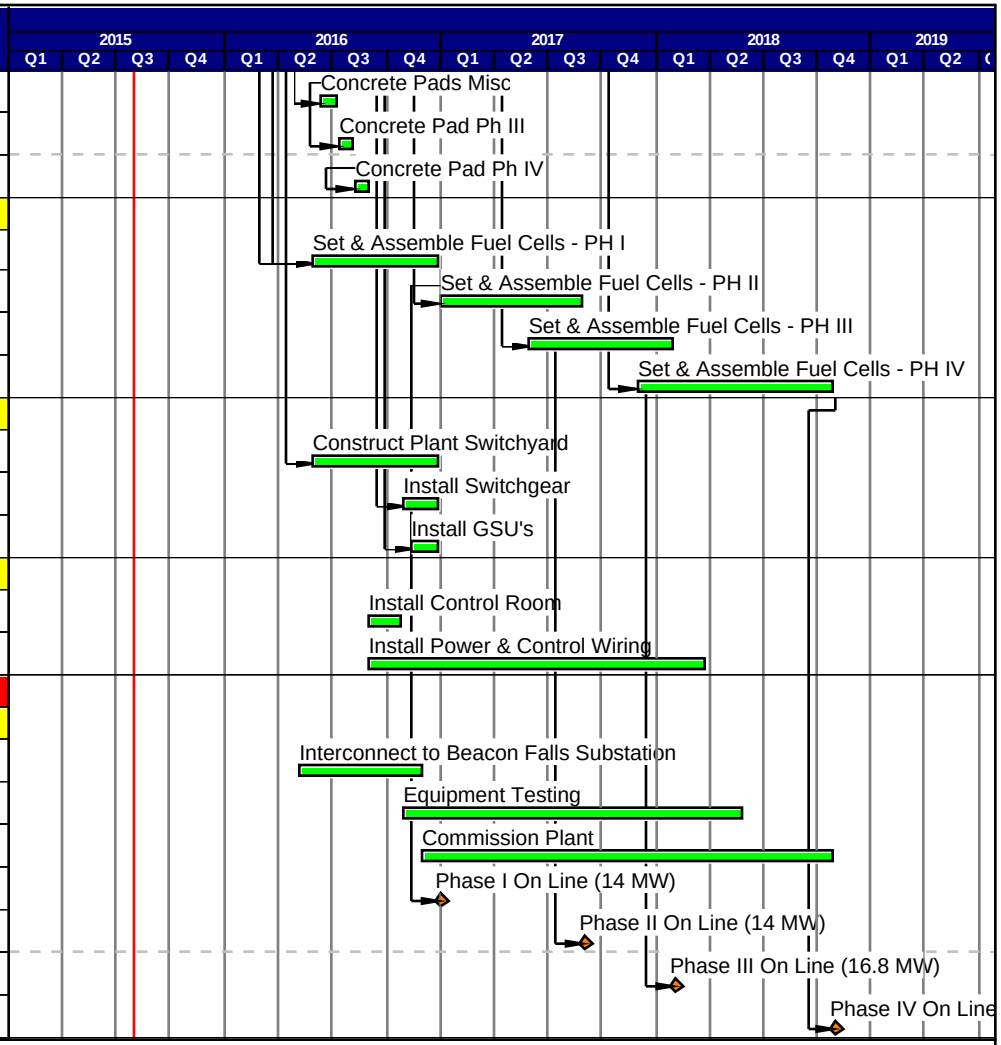
Critical bar
Summary bar
Progress point
Start milestone point
Finish milestone poi

Act ID	Description	Orig Dur	Early Start	Early Finish
116	Concrete Pads Misc.	20	13JUN16	11JUL16
110	Concrete Pad Ph III	20	12JUL16	08AUG16
112	Concrete Pad Ph IV	20	09AUG16	05SEP16
08 - Fuel Cells				
086	Set & Assemble Fuel Cells - PH I	152	01JUN16	30DEC16
090	Set & Assemble Fuel Cells - PH II	174	02JAN17 *	01SEP17
092	Set & Assemble Fuel Cells - PH III	173	01JUN17 *	01FEB18
106	Set & Assemble Fuel Cells - PH IV	237	01DEC17 *	01NOV18
10 - Switchyard				
102	Construct Plant Switchyard	152	01JUN16	30DEC16
096	Install Switchgear	44	01NOV16	30DEC16
100	Install GSU's	34	15NOV16	30DEC16
098	Install Control Room	43	01SEP16 *	31OCT16
104	Install Power & Control Wiring	408	01SEP16 *	29MAR18
18 - Equipment Testing & Commissionong				
124	Interconnect to Beacon Falls Substation	150	09MAY16 *	05DEC16
120	Equipment Testing	408	01NOV16 *	29MAY18
122	Commission Plant	497	01DEC16 *	01NOV18
126	Phase I On Line (14 MW)	0		30DEC16
128	Phase II On Line (14 MW)	0		01SEP17
130	Phase III On Line (16.8 MW)	0		01FEB18
132	Phase IV On Line (18.5 MW)	0		01NOV18



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Run date	18AUG15
Page number	3A

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Beacon Falls Energy Park, LLC
Beacon Falls, CT

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Progress point
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Finish milestone poi

EXHIBIT D

O&G Safety Information

O&G Industries, Inc.

Health & Safety Manual

Rev. 4
July 15, 2014

Table of Contents

1 – Health and Safety Plan Introduction

O&G Industries, Inc. has prepared this plan for its employees. Its purpose is to document our process for management of regulatory compliance and risk reduction during this project with respect to occupational safety and health.

We expect all subcontractors, vendors and suppliers to follow regulations promulgated by _____, the State of Connecticut and the U.S. Federal government. Subcontractors will incorporate the essence of this plan into their own plans assuring the elements are understood and implemented. This plan is not intended to be comprehensive for all applicable regulations subject to subcontractor activities. Where specific regulations exist for subcontractors that are not covered within this plan, it is O&G Industries, Inc.'s, expectation that the subcontractor will develop and implement their own comprehensive process to achieve compliance for those activities.

This plan sets the minimum expectation for all participants working on this project. O&G Industries, Inc. will validate compliance with these programs through continuous observation, 3rd party auditing and periodic team meetings.

James Rodger
Director, Environmental,
Health and Safety

O&G INDUSTRIES, INC.

O&G Industries, Inc.

Memo

To: Employees and Subcontractors

From: James Rodger, Director of Safety

Date: April 1, 2011

Re: Job Safety

Memo from the Director of Safety

Everyone involved with O&G is responsible for preserving health and safety. The success of this safety program depends on the full participation of every employee, subcontractor, manager and vendor. O&G expects each person to be diligent and to ensure that all unsafe conditions are addressed and that the work is preplanned to address all known safety hazards. Health and safety is crucial to a construction project's success. Accidents affect job efficiency, quality, and cost.

As employees and subcontractors to O&G you represent all of us in the workplace, with this in mind I need your pro-active support to continue making safety improvements and continue expanding our market share. Therefore, I am asking all employees and subcontractors to read, understand and practice the enclosed Health and Safety principles and guidelines. This means routinely training employees, conducting weekly toolbox meetings, wearing appropriate personal protective equipment, using fall protection when necessary, and practicing all other safety-related items listed in the Safety and Health Handbook. Even more importantly it means developing a safety-conscious attitude.

I take safety very seriously and I expect you to do the same. If you have any questions call me, or ask the Site Superintendent at your worksite.

Thank you.

2 – Emergency Contact Numbers

All Emergencies Should Be Reported By Calling 911

- **Police Department – Non-Emergency**
- **Fire Department– Non-Emergency**
- **Emergency Department**
- **Hospital**
-

O&G Industries, Inc. Contact Phone Numbers

	Title	Office or Home	Fax or Cell	NEXTEL
Main Office	Torrington	(860) 489-9261	(860) 496-4205 Fax	
Field Office				
Gen. Superintendent				
James Rogers	Safety Director		(860) 601-9065 Cell	
Sean McNeill	Safety Manager Project Engineer Project Manager	(203) 313-2969 Home	(860) 459-9810 Cell	172*973*9470
Leo Nardi	Vice President	(860) 379-5912 Home	(860) 485-4470 Cell	

3 – Health and Safety Policy

It is the policy of O&G Industries, Inc. to provide a work environment free from unacceptable risks to health and safety. All employees and subcontractors are expected to help strive for safety in every facet of their work.

Management Personnel, Site Superintendents, and Foremen will constantly be on alert for unsafe acts and conditions. If any unsafe acts or conditions are discovered, corrective action shall be made with minimal delay. If in the meantime, any employees are in imminent danger of physical harm, the responsible manager or superintendent is expected to suspend the hazardous operation until corrective action can be completed.

It is expected that all O&G Industries, Inc. employees and subcontractors will perform their work assignments in compliance with this policy and will report infractions to their supervisors. No one is expected to (nor will be allowed to) work in an environment where an unacceptable risk exists.

All O&G employees and subcontractors will be trained before working with hazardous chemicals and before performing other duties considered potentially hazardous.

This policy has been designed for the welfare and safety of all O&G Industries, Inc. employees, subcontractors and the community in which we work, to protect life, health, and property. It incorporates the applicable provisions of the Occupational Safety and Health Act (OSHA) of 1970, as amended, as well as relevant state and federal laws and regulations governing employee health and safety.

James Rodger
Director, Environmental,
Health and Safety

4 – Safety Objectives

1.0 Plan and conduct all work in a manner which will avoid personal injury and property damage. (Project Manager & Site Superintendent)

2.0 Involve all employees and subcontractors in the O&G Industries, Inc. Safety Program. (Safety Manager)

3.0 Hold managers and employees strictly accountable for safe work practices. (President)

4.0 Quickly identify and correct all unsafe acts and practices. (All Employees)

5.0 Train new and existing employees to respect and practice safe working conditions. (Safety Manager & Site Superintendent)

6.0 Maintain compliance with all applicable OSHA regulations, including jobsite postings and injury/illness reporting. (Safety Manager)

7.0 Conduct routine safety meetings with all personnel to discuss potential problems, solutions and/or changes in job safety affecting employees and subcontractors. (Safety Manager & Site Superintendent)

8.0 Prepare for foreseeable work place emergencies including fires, medical response, adverse weather conditions, and civil disturbances. (Project Manager & Site Superintendent)

9.0 Prepare to deal with the news media. (Corporate Secretary, K. Merz)

5 – Accident Procedures

1.0 Purpose

1.1 This Incident Reporting and Investigation Program outline the methods and practices for reporting and investigating accidents, managing injury/illness cases and recordkeeping.

2.0 Scope

2.1 Each O&G Industries, Inc, employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Definitions

3.1 An accident/incident can be defined as “A series of unplanned events that caused or could have caused injury/illness or property damage.”

3.2 A “Near-Miss “ can be defined as an event, circumstance or condition which has the potential to cause injury, unexpected death, or significant property damage, but did not actualize due to chance, corrective action, and/or timely intervention.

3.2.1 “Near Misses” should be considered accidents, and therefore, should also be investigated.

4.0 Accident Response

4.1 Accidents must be promptly reported, in accordance with the procedures outlined in Section 5 below, so that the appropriate personnel are involved in:

4.1.1 Providing care to the injured;

4.1.2 Securing the incident scene to ensure the safety of others; and

4.1.3 Preserving the incident scene for investigation (where needed).

4.2 When an injury/illness occurs, caring for the injured person should be the primary objective, whether it is first aid treatment or professional medical treatment.

4.3 If an injury is believed to be serious or the person loses consciousness, DO NOT HESITATE - CALL 9-1-1 IMMEDIATELY!

4.4 If an injury requires professional medical treatment, but is not believed to be serious or life-threatening, the injured should be transported to the nearest medical facility by another person. Injured personnel will not be allowed to transport themselves.

4.5 Only properly trained and authorized personnel shall be permitted to perform first aid treatment, to ensure that wounds are properly cared for and to minimize the possibility of exposure to bloodborne pathogens.

4.6 Only properly trained and authorized personnel that are equipped with appropriate protective equipment shall be permitted to clean up blood, body fluids, or any other potentially infectious materials that may be present following an accident.

5.0 Accident Reporting

5.1 O&G Industries, Inc. employees are required to report any/every accident (whether it results in an injury or not) to their direct supervisor immediately after the occurrence. If a sub-contractor is involved in an accident while working on this project, he/she will immediately report the incident to their immediate supervisor.

5.1.1 Minor incidents must be reported to the Site Superintendent before the end of the work shift.

5.1.1.1 The Site Superintendent must report this information to the Director of Safety, on an accident report form, within 48 hours of the accident.

5.1.2 Accidents involving property damage or fires in excess of $100 and/or any injury to members of the public will immediately be reported to the Site Superintendent by the responsible foreman.

5.1.2.1 The Site Superintendent must report all of this information on an accident form by the end of the current work shift to the Director of Safety and the Corporate Office.

5.1.3 Whenever a job-related accident involves death, dismemberment, and/or hospitalization of any O&G Industries, Inc. employee or subcontractor, the employee's supervisor will immediately notify the Site Superintendent.

5.1.3.1 The Site Superintendent must report this information to the Project Manager, Safety Manager and the Corporate Office immediately.

5.1.3.2 If the injury involves the death of one or more employees or the hospitalization of three or more employees, the Director of Safety must notify OSHA within eight (8) hours.

5.1.3.2.1 The Director of Safety will orally report the fatality/multiple hospitalization by telephone or in person to the Area Office of the Occupational Safety and Health Administration (OSHA), U.S. Department of Labor, that is nearest to the site of the incident or use the OSHA toll-free central telephone number, 1-800-321-OSHA (1-800-321-6742).

5.2 OSHA Recordkeeping

5.2.1 The Log of Work-Related Injuries and Illnesses - Form 300 is used to classify work-related injuries and illnesses and note the extent and severity of each case.

5.2.1.1 Generally, a “Recordable” accident is one in which the affected employee loses consciousness, loses time from work, is unable to perform normal work activities (e.g. has work restrictions) or requires medical attention beyond simple first aid (e.g. prescription medication, stitches, etc.).

5.2.1.2 The Site Superintendent will work with the Director of Safety to evaluate and determine the recordability of each injury/illness case.

5.2.1.2.1 Each recordable case must be entered on the OSHA 300 Form within seven (7) calendar days of receiving information that a recordable case has occurred.

5.2.1.3 The OSHA 300 Form shall be maintained on file for a minimum of five (5) years following the end of the calendar year that is covered. At the end of each year a copy of the OSHA 300 Form shall be sent to Corporate Safety.

5.2.1.4 At the end of each calendar year, a Summary of Work-Related Injuries and Illnesses –Form 300A shall be completed for each work establishment.

5.2.1.4.1 The annual summary must be completed, certified and then posted by no later than February 1 of the year following the year covered by the records and must remain in place until April 30.

5.2.1.4.2 The annual summary must be posted in a location where

employee notices are usually posted and where employees can readily access it.

5.2.1.4.3 The OSHA 300A form shall be maintained on file for a minimum of five (5) years. A copy of each OSHA 300 form shall be sent to Corporate Safety.

5.3 Workers Compensation

5.3.1 An Employer's First Report of Injury shall be completed for every accident where an employee has sustained a recordable injury/illness or has received medical treatment by a physician. Workers' Compensation laws are specific to each jurisdiction, and the reporting guidelines vary from state to state. It is important that claims be reported immediately and in full compliance with state reporting requirements.

6.0 Accident Investigation

6.1 The purpose of an accident investigation is to prevent a recurrence of an incident by determining all facts, through careful questioning and investigation of activities contributing to the event, and then formulating effective preventative measures.

6.2 The Site Superintendent and the foreman/supervisor responsible for the area in which the accident occurred will begin the investigation process once the injured person has been cared for. The Safety Manager will provide any assistance needed.

6.2.1 For serious accidents, the Director of Safety will assume leadership of the accident investigation team.

6.2.2 The first concern is to evaluate the work area where an incident occurred to ensure that hazardous conditions do not exist that could threaten the health & safety of others in the area. If such conditions exist, appropriate actions should be taken to prevent exposure to said hazards (e.g. shut down defective equipment, evacuate/rope-off the area, etc.).

6.2.3 In the event of a serious incident, it may be necessary to isolate and preserve the incident scene, so that important evidence is not compromised before it is properly evaluated and analyzed.

6.2.4 A *Supervisors Accident Investigation Report* (found in Appendix A of this procedure) must be completed during the investigation process to document the facts of the investigation, root cause analysis and corrective/preventive action plans.

6.2.4.1 Upon completion, the report will be forward to the Project Manager, the Director of Safety and the Corporate Office. This should be done as soon as possible and certainly before any employee(s) returns to the job or the site where the accident had occurred.

6.3 The incident report forms provide a format for reporting/documenting the facts of an incident, but an effective accident investigation relies on the person(s) conducting the investigation to uncover all of the facts surrounding the incident to determine the root cause, so that effective corrective actions can be implemented to prevent recurrence. The following are some basic techniques/questions to assist in the investigation process:

6.3.1 The person leading the investigation should involve all persons involved in an incident, whenever possible, in the investigation team.

6.3.2 Immediately assemble facts surrounding the accident, (time, location, names of witnesses, etc.)

6.3.3 If possible, ask the injured person to tell you what happened. (DO NOT FIX BLAME OR FIND FAULT-JUST GET FACTS)

6.3.4 Survey the accident scene for information. (Position of equipment, presence of guards, lighting, floor surface. Take pictures whenever possible and appropriate.)

6.3.5 If there are witnesses, get their account of the accident SEPARATELY. Have them prepare a written statement of facts.

6.3.6 Useful Questions for Accident Investigation:

- Who was injured?
- When did it happen?
- Where did it happen?
- What was immediate (direct, proximate) cause?
- What were contributing (indirect) causes?
- Why was the unsafe act/unsafe condition permitted?
- What was the specific intended task or objective?
- Why was it necessary?
- Why was it being done at that particular time?
- Had he/she ever done it before?
- Was he/she on overtime?
- Did he/she know the hazard?
- Did he/she know how to avoid, minimize, or control the hazard?

- How was the hazard normally controlled or protected?
- What changed to allow the hazard to become uncontrolled?
- Has this type of accident ever happened before?
- Do we have any similar potential circumstances?
- Was PPE (Personal Protective Equipment) required?
  - Was PPE in use?
  - Was PPE adequate?
- Any abnormal weather and element conditions (rain, hot, cold, lightning, etc.)?
- Any special distractions – (other workers, other simultaneous activities or events)?
- How can this be prevented in the future
- What specific corrective actions will be taken?
- When is the target completion date for these corrective actions?
- Who is responsible to ensure completion?

6.4 Based on information learned during the investigation, corrective action should be taken as soon as possible to rectify any hazardous conditions that are identified. Such actions should be made on-the-spot whenever possible (e.g. equipment repairs, taking equipment out of service, etc.).

7.0 Return to Work

7.1 Following a serious work related accident, an employee's ability to return to work must always be evaluated by a licensed medical care provider. Often the attending doctor or nurse practitioner will determine if work restrictions are necessary. If the restrictions limit employee's ability to perform his/her normal duties then O&G Industries, Inc. management will decide if the employee can be assigned alternate work, or if the employee should be sent home for rehabilitation. Every reasonable attempt will be made to work within the physical restrictions provided in a written medical release and keep the employee employed.

7.2 There are four categories of alternate duty work. Each category will be evaluated with consideration to the employee's restrictions in the in the following order:

7.2.1 Return to Normal Job – If an employee's restrictions are such that he/she can return to the normal job without violating any of the medical restrictions then they will be returned as soon as possible. For example, if a restriction indicates an electrician may not lift more than 30 pounds, but he/she doesn't normally lift this much weight, he/she may be reassigned to normal duties.

7.2.1.1 Such a case may not be considered a Recordable Accident for purposes of the OSHA form 300 reporting, as long as other factors

do not trigger recordability requirements, such as loss of consciousness, prescription medication, sutures, or other treatment beyond basic first aid.

7.2.2 Return to Modified Job- If an employee's restrictions are such that he/she can perform most of the normal duties, then every attempt will be made to modify the part of the jobs that does not meet the restrictions and return the employee to a modified job. For example, if a Plumber is only restricted from climbing ladders, he/she may still be able to work effectively at the first floor level. The employee's foreman should try to accommodate the work restrictions while not jeopardizing the safety of his/her employee, or any other employee.

7.2.3 Assign to "Light duty" Job – Very few light duty jobs are readily available, in most cases jobs will need to be created to accommodate the employee's specific restrictions. One possible job would involve delivering materials to the jobsites. The light duty activity would be appropriate as long as the employee's restriction did no exclude driving or sitting for extended periods of time. Another job would be Fall Protection Monitor, when an employee is required to observe the activities of others and to warn them of imminent fall hazards.

7.2.4 No Work - Some employee(s) may be restricted to the point that no light duty job can be created and, in fact, the employee and O&G Industries, Inc. would be better served if the employee were sent home for recuperation. This is the least desirable category but occasionally it cannot be avoided.

Appendix A
Supervisor Incident Investigation Report

SUPERVISOR'S ACCIDENT/ INJURY INVESTIGATION

TO BE COMPLETED BY THE SUPERVISOR/FOREMAN RESPONSIBLE FOR THE JOB/EMPLOYEE AND ATTACHED TO THE FIRST REPORT OF INJURY. TO BE COMPLETED WITHIN 24 HOURS OF FIRST KNOWLEDGE OF THE REPORTED OR ALLEGED INCIDENT.
THIS INFORMATION IS BEING SOLICITED SO THAT ALL FACTS CAN BE ASSESSED AND ANALYZED IN ORDER TO DEVELOP PROCEDURES THAT CAN LEAD TO THE PREVENTION OF SIMILAR INCIDENTS IN THE FUTURE.

REPORTING AN: _____ACCIDENT/INJURY _____NEAR-MISS INCIDENT _____ PROPERTY DAMAGE _____ILLNESS

Name of supervisor/foreman._____Project Number_____
Company employed by_____ Name of Work Area_____
Date of Incident _____ Time _____ _____AM _____PM
Date of this report _____ Time _____ _____AM _____PM
Project Location_____
Exact location, at job site, of the reported incident_____
_____

If injury, name(s) of injured employee(s)_____
_____
Employee(s) craft_____at time of incident?_____
Shift Starting Time_____ Time Shift Ends_____
How many hours has employee(s) worked during the last 48 hours?_____ during the last 24 hours? _____

I. Job superintendent that supervisor/foreman reports to_____
Supervisor/foreman responsible for the work/employee._____ _____
Was supervisor/foreman present at the incident?_____ if not, explain_____
_____
Name of all employees working in the crew at the time of the incident and/or in the area of the reported incident_____
_____
_____
Were any employees from other companies involved, directly or indirectly?_____ if yes, explain - name employees, employee's company and explain relationship and activity._____
_____
Who were these employees contracted to?_____

II Who gave directions for the assigned work?_____
Who were the directions given to?_____
Describe the job/task to be done and any special instructions given._____
_____
_____
Describe requirements for any equipment, safety guards and/or personal protective equipment required for the job and/or work area._____
_____
Were job instructions followed?_____ If no, explain._____
_____
Who was assigned responsibility for supervising the work?_____
Was a safe work permit required?_____ Who secured the permit?_____
Were all provisions of the permit followed?_____ if no, explain_____

III Describe, **in detail,** the incident (including conditions and events leading up to the incident)._____

_____

_____

_____

_____

CONTINUED ON BACK

Describe, **in detail,** any apparent or reported injury and/or damage to equipment and/or property._____

_____

_____

_____

IV. If any equipment, machinery or tools were involved in the incident, describe it (brand name, model, year, company number, serial number, owner, etc._____

_____

OWNER ---_____
How long has the equipment, machinery, tool, etc. been on the job?_____ Who was operating and/or using it?_____Date of last inspection._____ Were all safety guards in place and functioning?_____ If no, explain._____
_____
Were any modifications made or safety guards by-passed or disengaged?_____ If yes, explain._____
_____
Who authorized modifications and or methods of use?_____
Who effected the modifications?_____
Describe any defects or malfunctions found._____
_____
Describe any abuses or misuse of this equipment, tool, machinery, etc._____
_____

V. If scaffolding or ladder was involved in the incident, describe the type and specific height._____
_____
Who owns the scaffolding materials?_____
Who erected the scaffolding?_____Who inspected it?_____
Date inspected._____ Who was the competent person for erection and use?_____
How long has the completed scaffolding been erected?_____ Was the scaffolding moved or modified in any manner?_____ if yes, explain._____
_____

Describe any defects or irregularities found._____
_____
_____

VI. In your opinion why did this incident occur? What were the unsafe actions and/or unsafe conditions and why did they exist? _____
_____
_____
_____

Describe steps to be initiated to avoid similar occurrences in the future._____
_____
_____
_____

Provide any other information that you are aware of that may relate to this incidents._____
_____
_____
_____

_____ _____
Signature of Supervisor/Foreman Signature of Project Superintendent

_____ _____
Date Date

6 – Project Safety Rules

1.0 Purpose

1.1 O&G Industries, Inc. strives to provide a safe and healthful work environment for all of our employees. In order to achieve this goal, it is necessary to set rules and regulations that provide a framework for appropriate conduct of all employees. It is with the highest consideration of our employees' safety and well being, that these general safety rules are set forth.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Project Safety Rules

3.1 O&G Industries, Inc. will take an active role in the safety of all their jobsites. They will assist in identifying and correcting any potentially hazardous situations.

3.2 Accidents or injuries, no matter how minor, must be reported to the Foreman or Site Superintendent (or designee) for immediate treatment. See Section 5 *Accident Procedures*

3.3 Accidents not reported in a timely manner will may not be covered by Worker's Compensation.

3.4 Unsafe acts or conditions must be immediately reported to the Site Superintendent. See Section 5 *Accident Procedures*

3.5 The Site Safety Manager has the authority to immediately stop work on the project. This work includes activities being performed by any sub contractor.

3.6 A First Aid Kit must be readily available on each job site.

3.7 If workers identify any potentially hazardous substances then they should stop and notify their supervisor immediately.

3.8 O&G Industries, Inc.employees will be provided with Tyvek suits, respirators, and gloves

per their request. See Section 15 *Personal Protective Equipment*

3.9 Workers in contact with potential lead paint or other contaminated surfaces should use proper hand and face washing procedures prior to eating, drinking, smoking, chewing tobacco, chewing gum, or applying cosmetics.

3.10 Subcontractor foreman are responsible for reviewing the site safety rules with their employees.

3.11 Hard hats will be worn on site at all times. See Section 15 *Personal Protective Equipment*

3.12 Work boots will be worn by all O&G Industries, Inc personnel and subcontractors when on the work site. (Note: Roofers may wear sneakers when on the roof but they must change into work boots when on the ground.)

3.13 Safety eyewear must be worn on site at all times by all personnel. Welding helmets with integral face/eye protection are required to be worn by all welders.

3.14 Gloves should be worn when handling abrasive materials or materials with sharp edges. See Section 15 *Personal Protective Equipment*

3.15 Shirts and long pants must be worn at all times. No tank tops or sleeveless shirts will be allowed.

3.16 Hearing protection will be worn in work areas exceeding 85 dBA.

3.17 Respiratory protection will be worn when required. All employees required to wear respiratory protection must have proper training. See Section 15, *Personal Protective Equipment and Section 16, Respiratory Protection*

3.18 All Personal Protective Equipment (PPE) must be maintained per the manufacturer's recommendations and applicable OSHA regulations.

3.19 Hand tools must be inspected for damage or excessive wear before each use.

3.20 Electrical extension cords must be inspected before use for missing ground plugs, sliced insulation, and frayed wires. Electrical Cords should not be placed through doors, windows, under equipment, or materials in a manner in which they could be pinched or damaged. Damaged cords will be removed from service. Electrical cords must not be used for hoisting, or lowering equipment or materials. Cords must be protected from damage at all times.

3.21 Ground fault circuit protection will be used on all electrical circuits and temporary power sources. GFCI's will be tested before use. See Section 8, *Electrical Safety*

3.22 Electrically powered tools must be unplugged before being serviced. Authorization will be obtained prior to any service.

3.23 Flammable materials must not be stored in areas used as exits or in a stairway.

3.24 All storage areas must be kept free of unnecessary flammable or combustible materials.

3.25 All tool and blade guards must be in place and operational at all times. The blade guard must be in place on power tools. Table saws shall be equipped with a switch to prevent accidental re-start. All safety devices on power activated tools must be in place and operational at all times.

3.26 Guardrails or barricades must not be removed from openings without permission from the Site Superintendent.

3.27 Work areas are to be maintained in a clean and safe manner at all times. Protruding nails are to be immediately removed from scrap lumber or bent over so there is no chance of punctures.

3.28 Cables, rope, sheaves, shackles and other lifting equipment must be checked for proper operating condition each day before being placed in service. Worn or frayed items are to be immediately replaced or repaired.

3.29 Employees must not work under elevated loads. Loads must be lowered to ground level and the engines turned off whenever lift equipment is left unattended.

3.30 Employees are not permitted to use, possess, or be under the influence of intoxicating drugs (including prescription drugs) or alcohol while on the job site. Refer to the O&G Industries, Inc. Drug Free Workplace Policy for further explanation.

3.31 The possession of fire arms (other than powder actuated nail guns) or other weapons on the job site is expressly forbidden.

3.32 Horseplay, practical jokes, mischief of any kind, or fighting will not be tolerated.

3.33 Employ proper lifting techniques when lifting heavy objects. Get help if something is too heavy to lift on your own.

3.34 Ladders must be free of damage, extend 3' past the upper surface, and be secured from movement. Any ladders that are not acceptable must be removed from service immediately. See Section 12, *Ladders*

3.35 Employees must not work over an occupied area without blocking off the area below. Never enter a barricaded area or remove barricades without checking for overhead

hazards and seeking the approval of a supervisor.

3.36 All employees must be tied off when working at a height greater than 6 feet, unless specifically discussed with the Site Superintendent. Specific fall protection issues in regards to scaffolding and steel erection will be addressed prior to usage. See Section 7, *Fall Protection*

3.37 Personal fall arrest systems (harnesses/lanyards) must be checked daily for signs of damage before use. Any damaged equipment must be taken from service immediately. See Section 7, *Fall Protection*

3.38 Work on low sloped roofs may be performed only if using a safety monitoring system and a warning system. All people working on the roof must be trained in the specific safety procedures. Any work completed outside of this warning line must be completed using a personal fall arrest system. Roofers may use a safety monitor outside the warning line. See Section 7, *Fall Protection*

3.39 All holes greater than 2" must be protected. If any hazardous areas are encountered block them off and report to a supervisor immediately.

3.40 All scaffolding must be inspected daily by a competent person. Scaffolding must be fully decked, have base plates (screw jacks, etc…), and mud sills (unless on concrete). See Section 14, *Scaffolding*

3.41 Guardrails, midrails, and toeboards are required on all scaffolding 10 feet or higher. See Section 14, *Scaffolding*

3.42 Any damaged scaffolding components must be removed from service immediately. See Section 14, *Scaffolding*

3.43 Extra precautions must be taken to ensure debris does not fall of scaffolding, especially over areas where pedestrians may walk.

3.44 O&G Industries, Inc. will confiscate any compressed gas bottles not stored in an approved manner. There will be a $50 per bottle repossession charge. See section 11.4 of section 18 of this plan, Fire Prevention.

3.45 MSDS sheets for all hazardous materials will be maintained on site, in the Superintendent's office for all hazardous materials. These MSDS sheets must be reviewed prior to using any hazardous substances. See Section 11, *Hazard Communication*

3.46 Any employee who is feeling faint, dizzy, short of breath, or ill due to any fumes or other air gases should immediately leave the building and notify the Site Superintendent.

3.47 Reinforcing steel, on which employees could fall, must be capped to eliminate the hazard.

3.48 All excavations 5 feet or greater must be sloped, bench, shielded, or shored. See Section 9, *Excavation*

3.49 All excavations must be inspected daily by a competent person. See Section 9, *Excavation*

3.50 No tours of the site will be given without the permission of the Site Superintendent. All tours must be supervised.

3.51 All equipment operators will be required to have in their possession all appropriate licensing and training as required by OSHA and the State of Connecticut. For example Lull Operators will be required to have both a Connecticut Hoisting Engineers License and an OSHA Forklift Training Card. See Section 22, *Powered Industrial Vehicles*

3.52 No smoking will be allowed inside any buildings.

3.53 All personal trash items (IE: coffee cups, lunch plates, chip bags) need to be removed from the site daily.

3.54 Environmental controls must be used when ever possible to keep dust to a minimum.

3.55 Loud and profane language will not be allowed on the jobsite. Noise must be kept to a minimum.

3.56 All Oxygen and Acetylene bottles must be separated by a minimum of 20 feet when stored, or a non-combustible barrier at least 5 feet high having a fire resistant rating of at least ½ hour can be used.

3.57 While on the job site all employees and visitors must comply with the applicable OSHA standards for the construction industry and the specific directives of O&G Industries, Inc.

3.58 Any deviation from these rules or other applicable regulations may result in immediate removal from the jobsite. Employees violating these rules are also subject to a written warning, suspension, or dismissal.

3.59 Reflective vests, properly and fully fastened, must be worn by all employees, subcontractors, and/or visitors working near traffic and/or moving equipment and when designated by project requirement (i.e. bridge or road projects).

3.60 Personal floatation devices, properly and fully fastened, must be worn by all employees

when working on water vessels, near water, or when standard handrails and/or other acceptable fall protection are not provided.

3.61 Do not attempt to operate any machinery, equipment, or tools unless you are authorized, trained, and qualified to do so, and have been assigned to operate by the Site Superintendent. See Section 22, *Powered Industrial Vehicles*

3.62 The air supply to pneumatic tools must be shut off and "bled down" before disconnecting and/or attempting any modifications, adjustments or repairs. Safety tie wires or whip checks must be used on all hose connections.

3.63 Machines and equipment will are to be shut off, brought to a complete stop and disconnected from their power source at the end of the work shift or when left unattended. All Lockout/Tagout procedures will be followed.

3.64 Seat belts must be properly worn in all moving vehicles and heavy equipment by all individuals riding in/on the vehicle/equipment. Employees can only ride in vehicles and/or equipment when designated seats are provided. See Section 22, *Powered Industrial Vehicles*

3.65 Radios, TV's, or other personal "noise" producing items are not allowed in the work area.

3.66 All barricades, signs, and other warning systems will are to be observed and strictly complied with. No employee must cross a barricade or enter a restricted area without specific authorization from the Site Superintendent. No employee will remove barricades, signs or other warning systems without specific authorization form the Site Superintendent.

3.67 Employees will adhere to designated walkways were identified. Short cuts through work, storage or disposal areas are prohibited.

3.68 Hazardous areas must be tagged, barricaded and appropriate warning signs posted.

7 – Fall Protection

1.0 Purpose

1.1 The purpose of this program is to provide minimum requirements for the use of fall protection equipment and devices to protect employees exposed to fall hazards.

1.2 100 percent fall protection is required anytime an employee is working from an unprotected elevation of six (6) feet or more above the ground or next level. The requirement for fall protection includes any work performed when the employee is stationary, when traveling, and anytime the employee is exposed to a fall and is not protected by a standard guardrail system or other approved form of fall prevention.

2.0 Scope

2.1 O&G Industries, Inc. employees or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Definitions

3.1 100 Percent Fall Protection – the employee is protected at all times from the possibility of falls of six feet or more. This includes protection when moving or in a stationary position. Fall protection may be provided by guardrail systems, floor opening covers, safety nets, or personal fall arrest systems involving the use of body harnesses and lanyards.

3.2 100 Percent Tie Off – body harnesses and lanyard(s) are used exclusively to achieve 100 percent fall protection. This normally requires affected employees to use two lanyards to afford protection during movement.

3.3 Anchorage – means a secure point of attachment for lifelines, lanyards, or deceleration devices. Anchorage points shall be capable of supporting at least 5,000 pounds per employee attached.

3.4 Body Harness – means a configuration of straps to distribute fall arrest forces over at least the thighs, pelvis, chest, waist, and shoulders with a means to attach

it to other components of a fall arrest system.

3.5 Competent Person – an individual knowledgeable of fall protection equipment including manufacturer's recommendations and instructions for proper use, inspection, and maintenance. Capable of identifying existing and potential fall hazards and has authority to take prompt corrective action to eliminate those hazards. Knowledgeable of the requirements of this procedure and applicable regulatory requirements.

3.6 Deceleration Device (Shock Absorber) – any device that serves to dissipate a substantial amount of energy during a fall arrest.

3.7 Fall Prevention – the use of barriers, floor opening covers, etc. to provide a physical means of preventing fall hazards that do not rely on the employee's use of a personal fall arrest system.

3.8 Fall Restraint System – approved device and any necessary components that function together to restrain an employee in such a manner as to prevent the employee from falling to a lower level.

3.9 Hole Cover – a cover installed over a hole to prevent employee and material falls to lower levels. Hole covers shall be designed to support at least twice the intended load, secured to prevent accidental displacement, and marked "Hole Cover, Do Not Remove".

3.10 Low-Slope Roof – means a roof having a slope less than or equal to 4 in 12 (vertical to horizontal)

3.11 Lifeline – a flexible line for connection to an anchorage at one end to hang vertically (vertical lifeline), or for connection at both ends to stretch horizontally (horizontal lifeline), and to which other elements of a personal fall arrest system are attached.

3.12 Personal Fall Arrest System – system used to arrest a fall and consists of anchorage, connectors, body harness and possibly a lanyard, deceleration device, lifeline, or suitable combinations of these.

3.13 Positioning Device System – means a body belt or body harness system rigged to allow an employee to be supported on an elevated vertical surface, such as a wall form, and work with both hands while leaning.

3.14 Self Retracting Lifeline – a fall protection device containing a drum-wound line which can be slowly extracted from, or retracted onto, the drum under slight

tension during normal employee movement, and which, after onset of a fall, automatically locks the drum and arrests a fall.

3.15 Standard Guardrail System – a vertical barrier consisting of, but not limited to, toprails, midrails, toeboards, and posts, erected to prevent employees from falling to a lower level. Toprails must be capable of withstanding a 200 pound force applied in an outward or downward direction. Midrails and intermediate vertical posts must be capable of withstanding a 150 pound force applied in an outward or downward direction.

4.0 Fall Protection Safety Planning

4.1 Potential fall hazards and preventative measures shall be fully addressed during all phases of safety planning. This includes pre-project safety planning, during development of the Job Safety Analysis, and the pre-task planning at the start of each shift and for each new task.

4.2 Safety planning includes considerations such as:

4.2.1 Safety resources and training required based on the nature and extent of anticipated fall exposures.

4.2.2 Fall protection supplies and equipment needs based on work methods selected to prevent falls.

4.2.3 Maximizing use of fall prevention measures such as guardrail systems, scaffolding, aerial lifts, etc., to minimize fall potentials.

4.2.4 Establishing suitable anchorage points for use with personal fall arrest systems.

4.2.5 Addressing inclement weather conditions such as rain, sleet, snow, ice, wind and mud.

4.2.6 Ensuring proper illumination.

4.2.7 Ensuring good housekeeping practices to prevent same level falls.

4.2.8 Expediting erection of permanent guardrail systems and stairways.

4.2.9 Layout and arrangement of tools, materials, and equipment.

4.2.10 Structural capability of walking and working surfaces to safely support employees and required tools, materials and equipment.

4.2.11 Methods to be used to assure 100% fall protection for employees working on

unprotected roofs and designated material landing areas.

5.0 Fall Prevention

5.1 Fall prevention as defined, eliminates the potential for exposure to a fall from elevation. For this reason, it is preferred over fall protection devices that require an action by the employee and should be the first choice for eliminating exposure to fall hazards.

5.2 Fall prevention methods may include the installation of standard guardrail systems on open sided floors and roofs, floor and hole covers, handrail systems on stairways, and scaffolds complete with standard guardrail systems. The use of aerial lifts to access elevated work areas can also be considered a form of fall prevention even though a body harness and secured lanyard is required.

5.3 Guardrail requirements:

5.3.1 Capacity

5.3.1.1 Guardrails must be constructed of at least 2X4 lumber and the top rail will be able to withstand at least 200 pounds of horizontal or downward force.

5.3.2 Dimensions

5.3.2.1 The top rail must be at 42 inches, plus or minus 3 inches from the walking/working surface.

5.3.2.2 The mid rail must be at 21 inches, from the walking/working surface or halfway, between the top rail and the walking/working surface,

5.3.2.3 Toe boards will be installed if an employee is exposed to falling objects. They will be at least 3 ½ inches high, with no more than a ½ inch gap between the toeboard and the walking/working surface.

5.3.3 Other Specifications

5.3.3.1 Railings must be surfaced as to prevent injury to an employee from punctures or lacerations, and to prevent snagging of clothing.

5.3.3.2 All top rails and mid rails must not overhang the terminal posts, except where such overhang does not constitute a projection hazard.

5.4 Protection of Floor Openings

5.5 Floor openings larger than 2 inches will be protected by guardrails or covers.

5.5.1 If guardrails are installed they will be constructed around all unprotected edges.

5.5.2 If covers are used over holes, they will be capable of supporting 4 times the anticipated loads and they will be screwed to prevent accidental removal. In addition, they will be marked with the words “Hole” or “Cover”.

6.0 Fall Protection

6.1 General Requirements

6.1.1 When employees are exposed to a falling hazard from a location 6 feet or more in height, a fall restraint or fall arrest system must be used.

6.1.2 Only approved fall protection equipment shall be allowed.

6.1.3 Fall protection equipment is for fall protection use only and must not be used for any other purpose.

6.1.4 All components of a fall protection system including anchorages, harnesses, lanyards, lifelines, and connectors shall have a minimum breaking strength of at least 5,000 pounds.

6.1.5 Positioning devices shall be rigged to limit potential falls to no more than 2 feet. Anchorage for use with positioning devices shall be capable of supporting at least twice the potential impact load or 3,000 pounds whichever is greater.

6.1.6 In hot work operations or operations involving chemical or other factors that could cause damage, fall protection equipment must be designed and/or protected to avoid burning or deterioration.

6.2 Use of Fall Protection

6.2.1 An approved full body harness must be used when exposed to falls from elevation and guardrails or other Company approved fall prevention means cannot be utilized.

6.2.2 Full body harnesses must be worn and properly connected when employees are working from aerial lifts, scissor lifts, personnel baskets, and similar equipment.

6.2.3 Full body harnesses must fit and be worn properly with the straps tucked in so as not to get caught on equipment or otherwise create a hazard. Chest straps must be worn between the chest and collarbone, with the rear D-ring worn between the shoulder blades.

6.2.4 Full body harnesses must at minimum, be equipped with a D-ring located in the center of the back between the shoulder blades. Harnesses may be equipped

with additional D-rings for various applications, such as:

6.2.4.1 Back – general fall protection use.
6.2.4.2 Front – used with climbing systems.
6.2.4.3 Side – for use with positioning systems only.
6.2.4.4 Shoulder – rigged for rescue.

6.3 Snap Hooks

6.3.1 Only self-closing, self-locking snaphooks are allowed for fall protection use.

6.3.2 Snap hooks must open and close properly, fully close around their anchorage point, and be compatible with the other components of the fall protection system.

6.4 Anchorage Points

6.4.1 Anchorage points should be identified and evaluated by a competent person prior to commencement of a task requiring fall protection equipment.

6.4.2 Anchorage points must be capable of supporting at least a 5,000 pound load per person attached.

6.4.3 The anchorage point should be at least as high as the harness D-ring and preferably higher to minimize the free fall distance.

6.5 Shock Absorbers

6.5.1 Shock absorbers are required as part of the fall protection system.

6.5.1.1 At a minimum, shock absorbers are required as part of fall protection lanyards.

6.6 Lanyards

6.6.1 The shortest length lanyard possible should always be used.

6.6.2 At maximum length, lanyards used must restrict free fall distance to no more than six feet.

6.6.3 Lanyards must be used in conjunction with a shock absorber.

6.6.4 Lanyards must be maintained free of knots.

6.6.5 Dual or “Y” lanyards shall be used as necessary to maintain 100 percent tie-off.

6.6.6 When not in use, lanyards shall be secured in such a way as to eliminate tripping hazards or potential for becoming entangled in equipment.

6.7 Retractable Devices

6.7.1 Retractable devices are designed to limit free falls to less than two feet.

6.7.2 Tag lines shall be used to prevent the uncontrolled retracting of cable.

6.7.3 Retractable devices must be used at less than a 45-degree angle to avoid the potential for injury due to a swing fall. Any manufacturer's instructions related to swing fall hazards shall be followed.

6.7.4 Retractable devices must have current manufacturer's certification.

6.8 Vertical Lifelines

6.8.1 When vertical lifelines are used, each employee shall be attached to a separate lifeline.

6.8.2 Lifelines shall be protected against being cut or abraded.

6.8.3 Grab devices used for employee attachment shall be compatible with the size of rope and or cable used.

6.8.4 The lower end of the vertical lifeline shall be attached to an anchor point or weighted down to provide stability.

6.8.5 Vertical lifeline assemblies including anchorage point shall have a minimum breaking strength of 5,000 pounds.

6.9 Horizontal Lifelines

6.9.1 Horizontal lifelines shall be designed, installed, and used, under the supervision of a qualified person, as part of a complete personal fall arrest system.

6.9.2 Horizontal lifelines must be capable of supporting 5,000 pounds per employee attached.

6.10 Inspection and Storage of Fall Protection Equipment

6.10.1 Inspection

6.10.2 All fall protection must be visually inspected by the employee before each use. Inspections shall consist of an evaluation of the following areas:

6.10.2.1 Harnesses

6.10.2.1.1 Stitching

6.10.2.1.2 Rivets
6.10.2.1.3 Buckles
6.10.2.1.4 Buckle Tabs
6.10.2.1.5 “D” Rings
6.10.2.1.6 Rust and Abrasion
6.10.2.1.7 Burns, Cuts, Tears

6.10.2.2 Lanyards

6.10.2.2.1 Frayed/Broken Strands
6.10.2.2.2 Burns
6.10.2.2.3 Cuts
6.10.2.2.4 Tears
6.10.2.2.5 Snap Hooks
6.10.2.2.6 Connectors
6.10.2.2.7 Corrosion

6.10.3 Any equipment found to be defective must be immediately removed from service, tagged and repaired, or destroyed and replaced.

6.10.4 Documented inspections utilizing the Fall Protection Inspection Log (found in Appendix A of this program) shall be performed on a monthly basis by a Competent Person that is knowledgeable of manufacturer’s recommendations for equipment inspection.

6.10.5 Some types of fall protection equipment including self-retracting lifelines require periodic recertification by the manufacturer.

6.10.6 Fall protection equipment subjected to fall forces shall be immediately removed from service and will either be destroyed or recertified by the manufacturer.

6.11 Employee Training

6.11.1 Employees must be trained on the proper use, care, inspection and limitations of fall protection equipment prior to being assigned tasks where fall protection equipment is required.

6.11.2 Fall protection training shall be provided by a competent person qualified in the following areas:

6.11.2.1 The nature of fall hazards in the work area.

6.11.2.2 Correct procedures for erecting, maintaining, disassembling, and inspecting fall protection systems to be used.

6.11.2.3 The use of guardrail systems, safety nets, and other protection to be used.

6.11.2.4 Company polices and procedures and applicable OSHA Subpart M Fall Protection requirements.

6.11.3 Fall protection training shall at minimum address the following areas:

6.11.3.1 The nature of potential fall hazards that may be encountered.

6.11.3.2 Company policies and procedures related to fall protection and prevention (e.g. this program).

6.11.3.3 Evaluating fall hazards properly during pre-task planning.

6.11.3.4 The correct procedures for erecting, using and disassembling fall protection systems.

6.11.3.5 The correct procedures for handling, storing and inspecting fall protection equipment.

6.11.3.6 The correct procedures for fitting and wearing of fall protection equipment.

6.11.3.7 The requirements for proper anchorage points.

6.11.4 Fall protection training shall be documented and maintained on file. Training records shall include name of employee trained, date of training, and the name of the person who conducted the training.

6.11.5 Retraining is required when a lack of employee proficiency is observed, when new fall protection equipment is introduced, and on an annual refresher basis.

7.0 Safety Nets

7.1.1 Only safety nets designed by the manufacturer as fall protection nets shall be used. Safety nets must be installed in accordance with manufacturer's requirements and as close to the working level as possible.

7.1.2 Safety net openings shall not exceed 6 inches in any direction.

7.1.3 Safety net installations must be certified by a qualified person or pass a 400 pound drop test prior to use.

7.1.4 Safety nets shall be inspected by a competent person at least once a week for wear, damage, or other deterioration. Materials, scrap, pieces of equipment, and tools, which have fallen into the net, shall be removed as soon as possible and at

the latest, before the start of the next shift.

8.0 Roofing Work

8.1 Low Sloped Roofs

8.1.1 Personnel involved in roofing activities on low sloped roofs with unprotected sides/edges 6 feet or more above a lower surface will be protected by: guardrails, safety nets, or personal fall arrest equipment, as specified in the sections above.

8.1.2 Personnel may also be protected by a combination of warning lines and guardrails, warning lines and personal fall arrest systems, warning lines and safety nets, or warning lines and safety monitors. On low sloped roofs with a width of less than 50 feet a safety monitor system may be used alone.

8.1.2.1 Warning Lines:

8.1.2.1.1 The warning lines will consist of rope, wire, or chains with supporting stanchions.

8.1.2.1.2 The lines will be flagged at not more than 6 foot intervals.

8.1.2.1.3 The lines will be between 34-39 inches off the working surface.

8.1.2.1.4 The warning line system (rope, wire, chains and stanchions) will be capable of resisting a force of at least 16 pounds without tipping over.

8.1.2.1.5 The rope, wire, or chain will have a tensile strength of at least 500 pounds.

8.1.2.1.6 The line will be attached to the stanchion in such a way that pulling on one section of line will not result in slack being taken up in adjacent stanchions before the stanchion tips over.

8.1.2.2 Safety Monitors:

8.1.2.2.1 The monitor will be competent in recognizing fall hazards.

8.1.2.2.2 The monitor will warn employees when it appears that the employee is unaware of fall hazards or is acting in an unsafe manner.

8.1.2.2.3 The monitor will be on the same walking/working surface

and within visual distance of the employee(s) being monitored.

8.1.2.2.4 The monitor will be close enough to communicate verbally with the employee(s).

8.2 Steep Roofs

8.2.1 On steep roofs (sloped greater than 4 to 12) 6 feet or more above a lower surface, employees will be protected by guardrails, safety nets, or a personal fall arrest system as specified above.

8.3 Other (Non-Roofing) Rooftop Work

8.3.1 Other trades working on a low sloped roof, with unprotected sides or edges 6 feet or more above a lower level will be protected by guardrails, safety nets, or personal fall arrest systems. They may also be protected by a warning line system that will be placed 15 feet or more from the unprotected edge. If this is infeasible or creates a greater hazard then the line may be placed closer, but no less than 6 feet from the unprotected edge and must be used in conjunction with a safety monitor. Any work performed outside of these warning lines will be completed by use of guardrails, safety nets, or a personal arrest system.

8.4 Controlled Access Zones

8.4.1 A controlled access zone may be used for employees involved in leading edge work or pre-cast concrete erection work, as long as it is infeasible or creates a greater hazard to use conventional fall protection equipment.

8.4.2 A fall protection plan will be put into place if a controlled access zone is used. This plan will adhere to the following:

8.4.2.1 It will be developed and changes will be approved by a qualified person.

8.4.2.2 A copy of the plan will remain on site.

8.4.2.3 A competent person will implement the plan.

8.4.2.4 The plan will document why conventional fall protection (guardrails, safety nets, or personal fall arrest systems) are not feasible, or create a greater hazard.

8.4.2.5 The plan will discuss other measures that can be taken to eliminate fall hazards for workers who cannot be provided with standard fall protection systems. (for example: it will discuss the usage of ladders).

8.4.3 Setup of Controlled Access Zones

8.4.3.1 When performing leading edge work the control line will be not less than 6 feet or more than 25 feet from the leading edge, except when erecting pre-cast concrete.

8.4.3.2 When erecting pre-cast concrete, the control line will be not less than 6 feet nor more than 60 feet from the leading edge.

8.4.3.3 The control line will be approximately parallel to the unprotected edge and extend the entire length of the unprotected edge.

8.4.3.4 The control line will be connected on either side to a wall or guardrail.

8.4.3.5 Control lines will be flagged at 6 foot intervals and have a minimum breaking strength of 200 pounds.

8.4.3.6 Control lines will be between 39 inches at the lowest point and no more than 45 inches at the highest point.

APPENDIX A - FALL PROTECTION EQUIPMENT MONTHLY INSPECTION

APPENDIX A - FALL PROTECTION EQUIPMENT MONTHLY INSPECTION LOG

Inspector:		Date:	ITEMS TO BE CHECKED (ENTER CONDITION CODE FOR EACH ITEM)							
EXT #	Assigned To:	Manufacturer Serial #	Harness Webbing or Leather	All Stitching	Rivets & Eyelets	D-Ring(s) & Buckle(s) (Include Tongue)	Body Pad (If Applicable)	Lanyard	Hook Safety Latch	Certification or Data Tag
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										

Condition Codes:

"P" = Pass (Item is in good condition)
"XX" = Fail (Item is no longer serviceable and must be removed from service) **Include note below describing deficiency and actions taken for all "XX" items

****ALL PARTS OF SAFETY HARNESS AND ATTACHMENTS ARE TO BE CHECKED FOR EXCESSIVE WEAR AND DAMAGE****

NOTES/ACTIONS TAKEN:

8 - Electrical Safety

1.0 Purpose

1.1 The purpose of this program is to establish baseline requirements for the protection of personnel against the risks of electric shock, arc flash or other injuries resulting from direct/indirect electrical contacts to employees working on or near energized or deenergized parts.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 General Electrical Equipment and Conditions

3.1 All temporary circuits, and circuits used during construction will be connected to Ground Fault Circuit Interrupters (GFCI).

3.2 Cords and plugs will be free of defects such as nicks, slices, or lose connections.

3.3 Duplex outlets will be completely covered by insulated face-plates.

3.4 Cords, plugs, and GFCI's will be visually inspected each day before use.

3.5 GFCIs will be routinely tested to ensure proper operation, in accordance with the following:

3.5.1 All equipment grounding conductors will be tested for continuity and shall be electrically continuous; and

3.5.2 Each receptacle and attachment cap or plug will be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

3.5.3 The tests are to performed before first use, before use after repair, after any incident where damage is suspected and periods not to exceed 3 months (except

that cord sets and receptacles which are fixed and not exposed to damage shall be tested at intervals not exceeding 6 months).

3.6 Defective equipment will be immediately removed from service, returned for repair or replacement and tagged “out of service”.

3.7 Extension cords will not be fastened by staples, hung from nails, or suspended by wire. Three-pronged to two-pronged adapters are not to be used under any circumstances.

3.8 Electrical cords will not be used for hoisting or lowering equipment or materials.

3.9 Electrical cords should not be placed through doors, windows, under equipment, or materials, in a manner in which they could be pinched or damaged.

3.10 Lamps used for illumination will be protected with bulb guards. Bulbs will not extend beyond the protective guard.

3.11 Only proper trained employees, under the direction of a licensed electrician, will be allowed to service, repair, and/or install permanent or semi-permanent electrical circuitry.

3.12 All electrical installations will be in accordance with the most recent National Electric Codes (NEC). OSHA requirements and equivalent local requirements.

3.13 Live parts of electrical equipment operating at 30 volts or more will be guarded against accidental contact.

3.14 Controls that are to be deactivated during the course of work on energized or de-energized equipment will be locked and/or tagged, in accordance with the Hazardous Energy Control (Lockout/Tagout) requirements outlined in Section 4.0 of this program.

3.14.1 Equipment or circuits that are de-energized will be rendered inoperative and will have tags attached at all points where such equipment or circuits can be energized.

3.15 Tags will be placed to identify plainly the equipment or circuits being worked on.

3.16 Energized electrical distribution panels will be labeled, covered and locked and never left unattended while conductors are exposed.

3.17 Entrances to rooms containing exposed live parts of electrical equipment will be marked with conspicuous warning signs restricting entry only to qualified individuals. In addition, these areas will be locked when being serviced.

4.0 Control of Hazardous Energy (Lockout/Tagout)

4.1 Before service or maintenance is performed on machines or equipment, the machines or equipment must be turned off and disconnected from the energy source, and the energy source-isolating device must be either locked or tagged out.

4.1.1 All lock-out/ tag-out on existing equipment shall be completed by the trade specific contractor (Mechanical Contractor - Existing Mechanical Equipment, Electrical Contractor - Existing Electrical Equipment.)

4.2 Each Contractor will establish an energy control program that includes (1) documented energy control procedures, (2) an employee-training program, and (3) periodic inspections of the use of the procedures.

4.2.1 Each subcontractor must submit their lockout/tagout procedure to the O&G Industries, Inc. site safety manager/site superintendent for review.

4.2.2 Each Contractor will establish a program to ensure that machines and equipment are isolated and inoperative before any employee performs servicing or maintenance when the unexpected energization, start up, or release of stored energy could occur and cause injury.

4.2.3 The contractor shall train their employees in the safety significance of the lockout/tagout procedures. Each new employee whose work operations are or may be in the area shall be trained in the purpose and use of the lockout/tagout procedure.

4.2.4 Each Contractor will make a survey to locate and identify all isolating devices to be certain which switch (s), valve (s) or other energy-isolating devices apply to the equipment to be locked or tagged out.

4.2.5 The contractor must utilize a procedure that fully meets or exceeds the requirements specified in Title 29 of the Code of Federal Regulations (29 CFR) Part 1910.147, Subpart S (29 CFR) 1910, 29CFR Part 1910.333 and Subpart K,

1926.417 of Federal OSHA Standards, in conjunction with any state or local requirements and NFPA 70E.

5.0 Energized Work / Arc Flash Protection

5.1 Occasionally, work will be performed on energized electrical circuits. This work may only be done by fully Qualified Individuals and only when it is unreasonable or impractical to de-energize the circuit(s).

5.2 The Qualified Individuals will be protected from electrical shock by wearing approved insulating gloves, using appropriately insulated tools, and while standing on an insulating rubber mat. All other employees will be protected from inadvertent electrical shock by guarding exposed with insulation or other effective means.

5.3 Arc Flash Protection Policy and Procedure

5.3.1 O&G Industries, Inc. follows the procedures and uses the tables in NFPA 70E to determine flash potential and necessary protection for our team unless more accurate information is available from a flash potential survey.

5.3.2 In addition, a Live Work Permit (found in Appendix A of this Program) is required to be completed with appropriate signatures before any work is performed live.

5.3.3 Work is to be performed with equipment in an electrically safe condition if at all possible.

5.4 O&G Industries, Inc. Flash Protection Matrix

5.4.1 This matrix clarifies the necessary clothing and personal protective equipment to be worn while working on energized electrical equipment within “Flash Protection Boundary” (within reaching distance).

5.4.2 Personal Protective Equipment (PPE) is considered to be the last resort for working on equipment that presents a hazard of injury, therefore, strict adherence to the requirements contained within O&G Industries, Inc.’s Lock Out/Tag Out, Personal Protective Equipment (PPE) and Electrical Safety Bulletins will be reviewed during the Activity Plan prior to such work being performed.

5.4.3 Hazard Risk 0

5.4.3.1 Exposure (within the “Flash Protection Boundary”) to unguarded, energized parts :

5.4.3.1.1 Long Sleeve 100% Cotton Shirt;
5.4.3.1.2 Cotton Denim Pants;
5.4.3.1.3 Hard Hat (Type 1 Class E);
5.4.3.1.4 Safety Glasses with Side Shields;
5.4.3.1.5 Leather Gloves;
5.4.3.1.6 Safety Boots; and
5.4.3.1.7 Insulated Tools (Where Appropriate);

5.4.4 Hazard Risk 1

5.4.4.1 Exposure (within the “Flash Protection Boundary”) to unguarded, energized parts:

5.4.4.1.1 Long Sleeve 100% Fire Resistant Shirt and Cotton Denim Pants or Long sleeve Fire Resistant Coveralls with a minimum rating of 4 calories;
5.4.4.1.2 Hard Hat (Type 1 Class E) with face shield;
5.4.4.1.3 Safety Glasses with Side Shields;
5.4.4.1.4 Rubber Gloves (Class 0) with Leather Protectors (air tested prior to use);
5.4.4.1.5 Safety Shoes; and
5.4.4.1.6 Insulated Tools rated at 100v and marked with a double triangle symbol

5.4.5 Hazard Risk 2

5.4.5.1 Exposure (within the “Flash Protection Boundary”) to unguarded, within meta-clad switchgear, confined space, or areas within limited means of egress (Motor Controls, Switchgear, Inverters, etc.):

5.4.5.1.1 Short Sleeve 100% Cotton Shirt;
5.4.5.1.2 Cotton Denim Pants;
5.4.5.1.3 Hard Hat (Type 1 Class E) with face shield;
5.4.5.1.4 Safety Glasses with Side Shields;

5.4.5.1.5 Leather Gloves or Rubber Gloves rated at 1000 volts with Leather Protectors (air tested prior to use)
5.4.5.1.6 Safety Shoes;
5.4.5.1.7 Long Sleeved Fire Resistant Coveralls or Fire Resistant Long Sleeve Shirt and Pants with a minimum calorie rating of 8 calories;
5.4.5.1.8 Insulated Tools ;and
5.4.5.1.9 When working in a hazard risk 2 areas a double layer switching hood is required.

5.4.6 Hazard Risks 3, 4 and 5

5.4.6.1 Exposure (within the “Flash Protection Boundary”) to potentially extreme voltages/current levels will require:

5.4.6.1.1 Hard Hat (Type 1 Class E) with Double Layered switching hood;
5.4.6.1.2 Short Sleeve Cotton Shirt (100% minimum);
5.4.6.1.3 Cotton Pants (10% minimum);
5.4.6.1.4 All garments worn will be a non-flammable material;
5.4.6.1.5 Rubber Gloves rated for the voltage being worked on;
5.4.6.1.6 Safety Shoes;
5.4.6.1.7 Hearing Protection; and
5.4.6.1.8 Multi-Layered Flash Suit 40 calories rated.

Appendix A – Energized Electrical Work Permit

(Completed and Authorized by Qualified Electrician)

Personnel Evaluation and Authorization:

1. Location:
   _____
2. Planned *work* dates:
   _____
3. Description of and reason (justification) that the work absolutely must be done live:
   _____
   _____
   _____
4. Task assessment completed?_____
5. All other options explored?_____
6. Shock hazard boundary determined?
   _____
7. Flash hazard boundary determined?
   _____
8. Safe work practices reviewed? Yes: _____ No: _____
9. Necessary PPE determined and issued? List PPE necessary:
   _____
   _____
10. Job briefing completed?_____
11. Can this live work be done safely? _____

CONTINUED ON BACK

12. Foreman authorizing signature: ID #: Date:

_____ _____ _____

_____ _____ _____

13. Additional Review:

_____

_____

_____

14. Requested approval: _____ Requested denied: _____

15. Project Superintendent Signature: ID # Date:

_____ _____ _____

_____ _____ _____

9 – Excavation, Trenching and Shoring

1.0 Purpose

1.1 The purpose of this Excavation and Trenching Safety Program is to put in place work practices and procedures that will protect personnel from hazards that may be found in or around excavations or trenches.

2.0 Scope

2.1 Each O&G Industries, Inc .employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Definitions

3.1 Aluminum hydraulic shoring - An engineered shoring system comprised of aluminum hydraulic cylinders (cross braces), used in conjunction with vertical rails (uprights) or horizontal rails (wales). Such a system is designed specifically to support the sidewalls of an excavation and prevent cave-ins.

3.2 Benching - A method of protecting employees, utilities and structures from cave-ins by excavating the sides of an excavation to form one or a series of horizontal levels or steps, usually with vertical or near-vertical surfaces between levels.

3.3 Cave-in - The separation of a mass of soil or rock material from the side of an excavation, or the loss of soil from under a trench shield or support system, and its sudden movement into the excavation, either by falling or sliding, in sufficient quantity so that it could entrap, bury, or otherwise injure and immobilize a person.

3.4 Competent person - One who is capable of identifying existing and predictable hazards in the surroundings, or working conditions that are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them. A competent person should have appropriate training and experience and be able to demonstrate the following:

3.4.1 Training, experience, and knowledge of:

3.4.1.1 Soil analysis,

3.4.1.2 Use of protective systems, and

3.4.1.3 Requirements of *29 CFR 1926 Subpart P*

3.4.2 Ability to detect:

3.4.2.1 Conditions that could result in cave-ins,

3.4.2.2 Failures in protective systems,

3.4.2.3 Hazardous atmospheres, and

3.4.2.4 Other hazards including those associated with confined spaces.

3.4.3 Authority to take prompt corrective measures to eliminate existing and predictable hazards and to stop work when required.

3.5 Excavation - Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal.

3.6 Shield (shield system) - A structure that is able to withstand the forces imposed on it by a cave-in and thereby protect employees with the structure. Shields can be permanent structure or can be designed to be portable and moved along as work progresses. Also known as trench box or trench shield.

3.7 Shoring (shoring system) - A structure such as a metal hydraulic, mechanical or timber shoring system that supports the sides of an excavation and which is designed to prevent cave-ins.

3.8 Sloping (sloping system) - A method of protecting employees, utilities and structures from cave-ins by excavating to form sides of an excavation that are inclined away from the excavation so as to prevent cave-ins. The angle of incline varies with differences in such factors as the soil type, environmental conditions of exposure, and application of surcharge loads.

3.9 Soil Classification Definitions - Definitions associated with the classification of soils for the purposes of sloping and shoring of trenches are located in Section 6.

3.10 Trench (trench excavation) - A narrow excavation (in relation to its length) made below the surface of the ground. In general, the depth is greater than the width, but the width of a trench is not greater than 15 feet. If forms or other structures are installed or constructed in an excavation as to reduce the dimension measured from the forms or structure to the side of the excavation to 15 feet or less, the excavation is also considered to be a trench.

4.0 Competent Person

4.1 A Competent Person will be identified to manage all excavations.

4.2 Trenches must be inspected by a competent person prior to entry:

4.2.1 Daily and before the start of each shift.

4.2.2 As dictated by the work being done in the trench.

4.2.3 After every rain storm.

4.2.4 After other events that could increase hazards, such as snowstorm, windstorm, thaw, earthquake, dramatic change in weather (specially note temperature rise and fall), etc.

4.2.5 When fissures, tension cracks, sloughing, undercutting, water seepage, bulging at the bottom, or other similar conditions occur.

4.2.6 When there is a change in the size, location, or placement of the spoil pile.

4.2.7 When there is any indication of change or movement in adjacent structures.

4.3 For all excavations 5 feet or greater in depth, a *Trench Inspection Form* (found in Appendix A of this program) should be filled out to document each inspection.

4.4 Trench Inspection Forms should be completed by the "Competent Person" and turned into the Site Superintendent, prior to commencing work activities, to be maintained in project files.

5.0 Subsurface Utilities

5.1 Before ground is broken on any excavation the affected utility companies and *Call Before You Dig* will be contacted by the Competent Person to determine the exact location of the underground utilities.

6.0 Soil Classification

6.1 The competent person in charge of the excavation is responsible for determining the classification of the soil being excavated, for the purposes of sloping and shoring of the trench. The soil shall be classified as one of the following:

6.1.1 Stable Rock - Natural solid mineral matter that can be excavated with vertical

sides and remain intact while exposed.

6.1.2 Type A - cohesive soils with an unconfined, compressive strength of 1.5 ton per square foot (tsf) (144 kPa) or greater.

6.1.2.1 Examples of cohesive soils are clay, silty clay, sandy clay, clay loam and, in some cases, silty clay loam and sandy clay loam. Cemented soils such as caliche and hardpan are also considered Type A.

6.1.2.2 However, no soil is Type A if:

6.1.2.2.1 The soil is fissured; or

6.1.2.2.2 The soil is subject to vibration from heavy traffic, pile driving, or similar effects; or

6.1.2.2.3 The soil has been previously disturbed; or

6.1.2.2.4 The soil is part of a sloped, layered system where the layers dip into the excavation on a slope of four horizontal to one vertical (4H:1V) or greater; or

6.1.2.2.5 The material is subject to other factors that would require it to be classified as a less stable material.

6.1.3 Type B - Meets the criteria below:

6.1.3.1 Cohesive soil with an unconfined compressive strength greater than 0.5 tsf (48 kPa) but less than 1.5 tsf (144 kPa); or

6.1.3.2 Granular cohesionless soils including: angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases, silty clay loam and sandy clay loam.

6.1.3.3 Previously disturbed soils except those which would otherwise be classified as Type C soil.

6.1.3.4 Soil that meets the unconfined compressive strength or cementation requirements for Type A, but is fissured or subject to vibration; or

6.1.3.5 Dry rock that is not stable; or

6.1.3.6 Material that is part of a sloped, layered system where the layers dip into the excavation on a slope less steep than four horizontal to one vertical (4H:1V), but only if the material would otherwise be classified as Type B.

6.1.4 Type C - Meets the criteria below:

6.1.4.1 Cohesive soil with an unconfined compressive strength of 0.5 tsf (48 kPa) or less; or

6.1.4.2 Granular soils including gravel, sand, and loamy sand; or

6.1.4.3 Submerged soil or soil from which water is freely seeping; or

6.1.4.4 Submerged rock that is not stable, or

6.1.4.5 Material in a sloped, layered system where the layers dip into the excavation or a slope of four horizontal to one vertical (4H:1V) or steeper.

6.1.5 NOTE: In Layered Systems, the system shall be classified in accordance with its weakest layer. However, each layer may be classified individually where a more stable layer lies under a less stable layer. For more information regarding the Classification of Soils for Excavation, please reference 29 CFR 1926 Subpart P, Appendix A (Which can be found in Appendix B of this Program)

6.2 Methods for Classifying Soils:

6.2.1 Soil classification shall be made based on the results of at least one visual and at least one manual analysis. Such analyses shall be conducted by the competent person using tests described below, or in other recognized methods of soil classification and testing such as those adopted by the American Society for Testing Materials, or the U.S. Department of Agriculture textural classification system.

6.2.1.1 Visual Analysis - Visual analysis is conducted to determine qualitative information regarding the excavation site in general, the soil adjacent to the excavation, the soil forming the sides of the open excavation, and the soil taken as samples from excavated material using the steps outlined below:

6.2.1.1.1 Observe samples of soil that are excavated and soil in the sides of the excavation. Estimate the range of particle sizes and the relative amounts of the particle sizes. Soil that is primarily composed of fine-grained material is cohesive material. Soil composed primarily of coarse-grained sand or gravel is granular material.

6.2.1.1.2 Observe soil as it is excavated. Soil that remains in clumps when excavated is cohesive. Soil that breaks up easily and does not stay in clumps is granular.

6.2.1.1.3 Observe the side of the opened excavation and the surface area adjacent to the excavation. Crack-like openings such as tension cracks could indicate fissured material. If chunks of soil spall off a vertical side, the soil could be fissured. Small spalls are evidence of moving ground and are indications of potentially hazardous situations.

6.2.1.1.4 Observe the area adjacent to the excavation and the excavation itself for evidence of existing utility and other underground structures, and to identify previously disturbed soil.

6.2.1.1.5 Observed the opened side of the excavation to identify layered systems. Examine layered systems to identify if the layers slope toward the excavation. Estimate the degree of slope of the layers.

6.2.1.1.6 Observe the area adjacent to the excavation and the sides of the opened excavation for evidence of surface water, water seeping from the sides of the excavation, or the location of the level of the water table.

6.2.1.1.7 Observe the area adjacent to the excavation and the area within the excavation for sources of vibration that may affect the stability of the excavation face.

6.2.1.2 Acceptable Methods for Manual Analysis - Manual analysis of soil samples is conducted to determine quantitative as well as qualitative properties of soil and to provide more information in order to classify soil properly. Use at least one manual analysis method below, in conjunction with visual analysis:

6.2.1.2.1 Plasticity - Mold a moist or wet sample of soil into a ball and attempt to roll it into threads as thin as 1/8-inch in diameter. Cohesive material can be successfully rolled into threads without crumbling. For example, if at least a two inch (50 mm) length of 1/8-inch thread can be held on one end without tearing, the soil is cohesive.

6.2.1.2.2 Dry strength - If the soil is dry and crumbles on its own or with moderate pressure into individual grains or fine powder, it is granular (any combination of gravel, sand, or silt). If the soil is dry and falls into clumps which break up into smaller clumps, but the smaller clumps can only be broken up with difficulty, it may be clay in any combination with gravel, sand or silt. If the dry soil breaks into clumps

which do not break up into small clumps and which can only be broken with difficulty, and there is no visual indication the soil is fissured, the soil may be considered unfissured.

6.2.1.2.3 Thumb penetration - The thumb penetration test can be used to estimate the unconfined compressive strength of cohesive soils. (This test is based on the thumb penetration test described in American Society for Testing and Materials (ASTM) Standard designation D2488 - "Standard Recommended Practice for Description of Soils (Visual - Manual Procedure).") Type A soils with an unconfined compressive strength of 1.5 tsf can be readily indented by the thumb; however, they can be penetrated by the thumb only with very great effort. Type C soils with an unconfined compressive strength of 0.5 tsf can be easily penetrated several inches by the thumb, and can be molded by light finger pressure. This test should be conducted on an undisturbed soil sample, such as a large clump of spoil, as soon as practicable after excavation to keep to a minimum the effects of exposure to drying influences. If the excavation is later exposed to wetting influences (rain, flooding), the classification of the soil must be changed accordingly.

6.2.1.2.4 Other strength tests - Estimates of unconfined compressive strength of soils can also be obtained by use of a pocket penetrometer or by using a hand-operated shearvane.

6.2.1.2.5 Drying test - The basic purpose of the drying test is to differentiate between cohesive material with fissures, unfissured cohesive material, and granular material. The procedure for the drying test involves drying a sample of soil that is approximately one inch thick (2.54 cm) and six inches (15.24 cm) in diameter until it is thoroughly dry:

6.2.1.2.5.1 If the sample develops cracks as it dries, significant fissures are indicated.

6.2.1.2.5.2 Samples that dry without cracking are to be broken by hand. If considerable force is necessary to break a sample, the soil has significant cohesive material content. The soil can be classified as an unfissured cohesive material and the unconfined compressive strength should be determined.

6.2.1.2.5.3 If a sample breaks easily by hand, it is either a fissured cohesive material or a granular material. To distinguish between the two, pulverize the dried clumps of the sample by hand or by stepping on them. If the clumps do not pulverize easily, the material is cohesive with fissures. If they pulverize easily into very small fragments, the material is granular.

6.2.1.3 Reclassification - If, after classifying a deposit, the properties, factors, or conditions affecting its classification change in any way, the changes must be evaluated by the competent person. The deposit must be reclassified as necessary to reflect the changed circumstances.

6.3 Definitions Associated with Soil Classification: The definitions and examples given below are based on, in whole or in part, the following; American Society for Testing Materials (ASTM) Standards D653-85 and D2488; The Unified Soils Classification System; The U.S. Department of Agriculture (USDA) Textural Classification Scheme; and The National Bureau of Standards Report BSS-121.

6.3.1 "Cemented soil" means a soil in which the particles are held together by a chemical agent, such as calcium carbonate, such that a hand-size sample cannot be crushed into powder or individual soil particles by finger pressure.

6.3.2 "Cohesive soil" means clay (fine grained soil), or soil with a high clay content, which has cohesive strength. Cohesive soil does not crumble, can be excavated with vertical sideslopes, and is plastic when moist. Cohesive soil is hard to break up when dry, and exhibits significant cohesion when submerged. Cohesive soils include clayey silt, sandy clay, silty clay, clay and organic clay.

6.3.3 "Dry soil" means soil that does not exhibit visible signs of moisture content.

6.3.4 "Fissured" means a soil material that has a tendency to break along definite planes of fracture with little resistance, or a material that exhibits open cracks, such as tension cracks, in an exposed surface.

6.3.5 "Granular soil" means gravel, sand, or silt (coarse grained soil) with little or no clay content. Granular soil has no cohesive strength. Some moist granular soils exhibit apparent cohesion. Granular soil cannot be molded when moist and crumbles easily when dry.

6.3.6 "Layered system" means two or more distinctly different soil or rock types arranged in layers. Micaceous seams or weakened planes in rock or shale are considered layered.

6.3.7 "Moist soil" means a condition in which a soil looks and feels damp. Moist cohesive soil can easily be shaped into a ball and rolled into small diameter threads before crumbling. Moist granular soil that contains some cohesive material will exhibit signs of cohesion between particles.

6.3.8 "Plastic" means a property of a soil which allows the soil to be deformed or molded without cracking, or appreciable volume change.

6.3.9 "Saturated soil" means a soil in which the voids are filled with water. Saturation does not require flow. Saturation, or near saturation, is necessary for the proper use of instruments such as a pocket penetrometer or sheer vane.

6.3.10 "Soil classification system" means a method of categorizing soil and rock deposits in a hierarchy of Stable Rock, Type A, Type B, and Type C, in decreasing order of stability. The categories are determined based on an analysis of the properties and performance characteristics of the deposits and the characteristics of the deposits and the environmental conditions of exposure.

6.3.11 "Stable rock" means natural solid mineral matter that can be excavated with vertical sides and remain intact while exposed.

6.3.12 "Submerged soil" means soil which is underwater or is free seeping.

6.3.13 "Unconfined compressive strength" means the load per unit area at which a soil will fail in compression. It can be determined by laboratory testing, or estimated in the field using a pocket penetrometer, by thumb penetration tests, and other methods.

6.3.14 "Wet soil" means soil that contains significantly more moisture than moist soil, but in such a range of values that cohesive material will slump or begin to flow when vibrated. Granular material that would exhibit cohesive properties when moist will lose those cohesive properties when wet.

7.0 Excavation Safety Requirements

7.1 Pre-Excavation Inspection - The site must be thoroughly inspected by the designated Competent Person and the Safety Manager to determine if special safety measures must be taken.

7.2 Surface Encumbrances - All equipment, materials, supplies, permanent installations (for example, buildings or roadways), trees, brush, boulders and other objects at the surface that could present a hazard to employees working in the excavation shall be removed or supported as necessary to protect employees.

7.3 Subsurface Utilities - Again, verify that all underground utilities have been properly

identified and marked prior to breaking ground.

7.4 Site Control / Protection of the Public:

7.4.1 Barricades, walkways, lighting and posting must be provided as necessary for the protection of the public prior to the start of excavation operations.

7.4.2 Guardrails, fences, or barricades shall be provided on excavations adjacent to walkways, driveways and other pedestrian or vehicle thoroughfares. Warning lights or other illumination shall be maintained as necessary for the safety of the public and employees from sunset to sunrise.

7.4.3 Wells, holes, pits, shafts and all similar hazardous excavations shall be effectively barricaded or covered and posted as necessary to prevent unauthorized access. All temporary excavations of this type shall be backfilled as soon as possible.

7.4.4 Walkways or bridges protected by standard guardrails shall be provided where employees and the general public are permitted to cross over excavations. Where workers in the excavation may pass under these walkways or bridges, a standard guardrail and toeboard shall be used.

7.5 Protective System Requirements:

7.5.1 Protection of Workers in Excavations

7.5.1.1 Workers in an excavation must be protected from cave-ins by using either an adequate sloping and benching system or an adequate support or protective system as outlined in this section. The only exceptions are:

7.5.1.1.1 Excavations made entirely in stable rock; or

7.5.1.1.2 Excavations less than 5 feet in depth where examination of the ground by the designated competent person provides no indication of a potential cave-in.

7.5.1.2 Protective systems must be capable of resisting all loads that could reasonably be expected to be applied to the system.

7.5.1.3 All protective systems for trenches 20 feet or greater in depth must be designed by a registered professional engineer.

7.5.2 Design of Sloping and Benching Systems:

7.5.2.1 OPTION 1 - Excavations must be sloped at an angle not steeper than one and one-half horizontal to one vertical (34 degrees measured from

the horizontal), unless one of the other options listed below is used.

7.5.2.1.1 Slopes specified above must be excavated to form configurations that are in accordance with the slopes shown for Type C soil in Appendix B of 29 CFR 1926 Subpart P (Appendices to Subpart P have been included for reference in Appendix B of this Program).

7.5.2.2 OPTION 2 - Determination of slopes and configurations using the Soil Classification Methods outlined in Section 6 above and Appendix B of 29 CFR 1926 Subpart P. Maximum allowable slopes, and allowable configurations for sloping and benching systems, shall be determined in accordance with the conditions and requirements set forth in Appendix B of 29 CFR 1926 Subpart P (Appendices to Subpart P have been included for reference in Appendix B of this Program).

7.5.2.3 OPTION 3 - Designs Using Other Tabulated Data:

7.5.2.3.1 The tabulated data must be in written form and shall include all of the following:

7.5.2.3.1.1 Identification of the parameters that affect the selection of a sloping or benching system drawn from such data;

7.5.2.3.1.2 Identification of the limits of use of the data, to include the magnitude and configuration of slopes determined to be safe;

7.5.2.3.1.3 Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

7.5.2.3.1.4 At least one copy of the tabulated data which identifies the registered professional engineer who approved the data, must be maintained at the jobsite during construction of the protective system and for the duration of the excavation activities on the site.

7.5.2.4 OPTION 4 - Design by a Registered Professional Engineer:

7.5.2.4.1 Sloping and benching systems not utilizing Options 1, 2 or 3 above, must be approved by a registered

professional engineer.

7.5.2.4.2 Designs must be in written form and must include at least the following:

7.5.2.4.3 The magnitude of the slopes that were determined to be safe for the particular project;

7.5.2.4.4 The configurations that were determined to be safe for the particular project;

7.5.2.4.5 The identity of the registered professional engineer approving the design.

7.5.2.4.6 At least one copy of the design must be maintained at the jobsite during construction of the protective system and for the duration of the excavation activities on the site.

7.5.3 Design of Support Systems, Shield Systems, and Other Protective Systems:

7.5.3.1 The design of support systems, shield systems, and other protective systems shall be selected and constructed by the designated competent person, in accordance with the requirements outlined in this section.

7.5.3.2 OPTION 1 - Designs using the Soil Classification Methods outlined Section 6 in conjunction with Appendix C (Timber Shoring for Trenches) and Appendix D (Aluminum Hydraulic Shoring for Trenches) of 29 CFR 1926 Subpart P (Appendices to Subpart P have been included for reference in Appendix B of this Program).

7.5.3.2.1 Designs for timber shoring in trenches shall be determined in accordance with the conditions and requirements set forth in Appendix C (Timber Shoring for Trenches) of 29 CFR 1926 Subpart P.

7.5.3.2.2 Designs for aluminum hydraulic shoring shall be in accordance with Option 2 below, but if manufacturer's tabulated data cannot be utilized, designs shall be in accordance with Appendix D (Aluminum Hydraulic Shoring for Trenches) of 29 CFR 1926 Subpart P.

7.5.3.3 OPTION 2 - Designs Using Manufacturer's Tabulated Data

7.5.3.3.1 Design of support systems, shield systems, or other protective systems that are drawn from manufacturer's tabulated data must be in accordance with all specifications, recommendations, and limitations issued or made by the manufacturer.

7.5.3.3.2 Deviation from the specifications, recommendations, and limitations issued or made by the manufacturer shall only be allowed after the manufacturer issues specific written approval.

7.5.3.3.3 Manufacturer's specifications, recommendations, and limitations, and manufacturer's approval to deviate from the specifications, recommendations, and limitations shall be in written form at the jobsite during construction of the protective system and for the duration of the excavation activities on the site.

7.5.3.4 OPTION 3 - Designs Using Other Tabulated Data

7.5.3.4.1 Designs of support systems, shield systems, or other protective systems must be selected from and be in accordance with tabulated data, such as tables and charts.

7.5.3.4.2 The tabulated data must be in written form and include all of the following:

7.5.3.4.2.1 Identification of the parameters that affect the selection of a protective system drawn from such data;

7.5.3.4.2.2 Identification of the limits of use of the data;

7.5.3.4.2.3 Explanatory information as may be necessary to aid the user in making a correct selection of a protective system from the data.

7.5.3.4.2.4 At least one copy of the tabulated data, which identifies the registered professional engineer who approved the data, must be maintained at the jobsite during construction of the protective system and for the duration of the excavation activities on the site.

7.5.3.5 OPTION 4 - Design by a Registered Professional Engineer:

7.5.3.5.1 Support systems, shield systems, and other protective systems not utilizing Option 1, Option 2 or Option 3, above, must be approved by a registered professional engineer.

7.5.3.5.2 Designs must be in written form and include all of the following:

7.5.3.5.2.1 A plan indicating the sizes, types, and configurations of the materials to be used in the protective system; and

7.5.3.5.2.2 The identity of the registered professional engineer approving the design.

7.5.3.5.3 At least one copy of the design must be maintained at the jobsite during construction of the protective system and for the duration of the excavation activities on the site.

7.5.4 Materials and Equipment

7.5.4.1 Materials and equipment used for protective systems must be free from damage or defects that might impair their proper function.

7.5.4.2 Manufactured materials and equipment used for protective systems must be used and maintained in accordance with the recommendations of the manufacturer, and in a manner that will prevent worker exposure to hazards.

7.5.4.3 When materials or equipment used for protective systems are damaged, the designated competent person must evaluate its suitability for continued use. If the competent person can not assure the material or equipment is able to support the intended loads or is otherwise suitable for safe use, then such material or equipment shall be removed from service. These materials or equipment shall be evaluated and approved by a registered professional engineer before being returned to service.

7.5.5 Installation and Removal of Support

7.5.5.1 Members of support systems must be securely connected together to prevent sliding, falling, kickouts, or other potential failures.

7.5.5.2 Support systems must be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by members of the support system.

7.5.5.3 Individual members of support systems must not be subjected to loads exceeding those which those members were designed to support.

7.5.5.4 Before temporary removal of individual support members begins, additional precautions shall be taken as directed by the designated competent person to ensure the safety of workers. These precautions could include, for example, the installation other structural members to carry the loads imposed on the support system.

7.5.5.5 Removal of support systems shall begin at, and progress from, the bottom of the excavation. Members must be released slowly. If there is any indication of possible failure of the remaining members of the structure or possible cave-in of the sides of the excavation the work shall be halted until it can be examined by the competent person.

7.5.5.6 Backfilling must progress together with the removal of support systems from excavations.

7.5.5.7 Additional requirements for support systems for trench excavations:

7.5.5.7.1 Excavation of material to a level no greater than 2 feet below the bottom of the members of a support system is permitted ONLY if the system is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the support system.

7.5.5.7.2 Installation of a support system must be closely coordinated with the excavation of trenches.

7.5.6 Sloping and Benching Systems:

7.5.6.1 Workers will not be permitted to work on the faces of sloped or benched excavations at levels above other employees except when employees at the lower levels are adequately protected from the hazard of falling, rolling, or sliding material or equipment.

7.5.7 Shield Systems

7.5.7.1 Shield systems must not be subjected to loads that are greater than those they were designed to withstand.

7.5.7.2 Shields must be installed in a manner that will restrict lateral or other hazardous movement of the shield that could occur during cave-in or unexpected soil movement.

7.5.7.3 Employees must be protected from the hazard of cave-ins when entering or exiting the areas protected by shields.

7.5.7.4 Employees must not be allowed in shields when shields are being installed, removed, or moved vertically.

7.5.7.5 Additional requirement for shield systems used in trench excavations:

7.5.7.5.1 Excavations of earth material to a level not greater than 2 feet below the bottom of a shield shall be permitted, but ONLY if the shield is designed to resist the forces calculated for the full depth of the trench, and there are no indications while the trench is open of a possible loss of soil from behind or below the bottom of the shield.

7.5.8 Access and Means of Egress

7.5.8.1 Stairs, ladders or ramps must be provided where workers are required to enter trench excavations over 4 feet deep. The maximum distance of lateral travel (e.g., along the length of the trench) required to reach the means of egress is not to exceed 25 feet.

7.5.8.2 Structural Ramps:

7.5.8.2.1 Structural ramps used solely by workers as a means of access or egress from excavations must be designed by a competent person. Structural ramps used for access or egress of equipment must be designed by a person qualified in structural design, and must be constructed in accordance with the design.

7.5.8.2.2 Ramps and runways constructed of two or more structural members shall have the structural members connected together to prevent movement or displacement.

7.5.8.2.3 Structural members used for ramps and runways must be of uniform thickness.

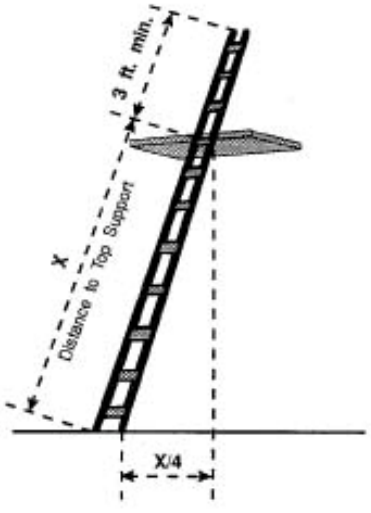
7.5.8.2.4 Cleats or other appropriate means used to connect runway structural members must be attached to the bottom of the runway or be attached in a manner to prevent tripping.

7.5.8.2.5 Structural ramps used in place of steps must be provided

with cleats or other surface treatments on the top surface to prevent slipping.

7.5.8.3 Ladders:

7.5.8.3.1 When portable ladders are used, the ladder side rails must extend a minimum of 3 feet above the upper surface of the excavation (see illustration right).



7.5.8.3.2 Ladders must have nonconductive side rails if work will be performed near exposed energized equipment or systems.

7.5.8.3.3 Two or more ladders, or a double-cleated ladder, will be provided where 25 or more employees will be conducting work in an excavation where ladders serve as the primary means of egress, or where ladders serve two-way traffic.

7.5.8.3.4 Ladders will be inspected prior to use for signs of damage or defects. Damaged ladders will be removed from service and marked with "Do Not Use" until repaired.

7.5.9 Vehicular Traffic

7.5.9.1 Workers exposed to vehicular traffic must be provided with, and wear, warning vests or other suitable garments marked with or made of reflective or high-visibility material. Warning vests worn by flagmen shall be red or orange, and shall be of reflective material if worn during night work.

7.5.10 Worker Exposure to Falling Loads

7.5.10.1 No worker will be permitted underneath loads handled by lifting or digging equipment. Workers are required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials. Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles provide adequate protection for the operator during loading and unloading operations.

7.5.11 Hazardous Atmospheres

7.5.11.1 The atmosphere will be tested in excavations over 4 feet deep if a hazardous atmosphere exists or could reasonably be expected to exist. A hazardous atmosphere could be expected, for example, in excavations in landfill areas, in excavations in areas where hazardous substances are stored nearby, or in excavations near or containing gas pipelines.

7.5.11.2 Any excavation where a hazardous atmosphere has been identified or could reasonably be expected to exist will be considered to be a PERMIT-REQUIRED CONFINED SPACE and may ONLY be entered when ALL of the requirements of the Confined Spaces Program have been satisfied, including an authorized entry permit.

7.5.12 Water Accumulation Hazards

7.5.12.1 Workers must not work in excavations that contain or are accumulating water unless precautions have been taken to protect them from the hazards posed by water accumulation. The precautions taken could include, for example, special support or shield systems to protect from cave-ins, water removal to control the level of accumulating water, or use of safety harnesses and lifelines.

7.5.12.2 If water is controlled or prevented from accumulating by the use of water removal equipment, the water removal equipment and operation will be monitored by a person trained in the use of the equipment.

7.5.12.3 If excavation work interrupts the natural drainage of surface water (such as streams), diversion ditches, dikes, or other suitable means shall be used to prevent surface water from entering the excavation. Precautions shall also be taken to provide adequate drainage of the area adjacent to the excavation. Excavations subject to runoff from heavy rains shall be re-inspected by the Competent Person to determine if additional precautions should be taken.

7.5.12.4 The competent person must inform workers of the precautions or procedures that are to be followed if water accumulates or is accumulating in an excavation.

7.5.13 Walkways and Guardrails

7.5.13.1 Walkways must be provided where workers or equipment are permitted to cross over excavations. Guardrails shall be provided where walkways, accessible only to on-site project personnel, are 6 feet or more above lower levels.

7.5.14 Stability of Adjacent Structures:

7.5.14.1 The designated competent person will determine if the excavation work could affect the stability of adjoining buildings, walls, sidewalks or other structures.

7.5.14.2 Support systems (such as shoring, bracing, or underpinning) must be used to assure the stability of structures and the protection of employees where excavation operations could affect the stability of adjoining buildings, walls, or other structures.

7.5.14.3 Excavation below the level of the base or footing of any foundation or retaining wall that could be reasonably expected to pose a hazard to employees shall not be permitted except when:

7.5.14.3.1 A support system, such as underpinning, is provided to ensure the safety of employees and the stability of the structure; or

7.5.14.3.2 The excavation is in stable rock; or

7.5.14.3.3 A registered professional engineer has approved the determination that the structure is sufficiently removed from the excavation so as to be unaffected by the excavation activity; or

7.5.14.3.4 A registered professional engineer has approved the determination that such excavation work will not pose a hazard.

7.5.14.4 Sidewalks, pavements and appurtenant structures must not be undermined unless a support system or other method of protection is provided to protect personnel from the possible collapse of such structures.

7.5.14.5 Where review or approval of a support system by a registered professional engineer is required, the approval must be in writing and maintained on site for the duration of the excavation activities.

7.5.15 Protection of Workers From Loose Rock or Soil

7.5.15.1 Adequate protection must be provided to protect workers from loose rock or soil that could pose a hazard by falling or rolling from an excavation face. Such protection shall consist of:

7.5.15.1.1 Scaling to remove loose material;

7.5.15.1.2 Installation of protective barricades, such as wire mesh or timber, at appropriate intervals on the face of the slope to stop and contain falling material; or

7.5.15.1.3 Benching sufficient to contain falling material.

7.5.15.2 Excavation personnel shall not be permitted to work above one another where the danger of falling rock or earth exists.

7.5.15.3 Workers must be protected from excavated materials, equipment or other materials that could pose a hazard by falling or rolling into excavations.

7.5.15.4 Protection shall be provided by keeping such materials or equipment at least 2 feet from the edge of excavations, by the use of restraining devices that are sufficient to prevent materials or equipment from falling or rolling into excavations, or by a combination of both if necessary.

7.5.15.5 Materials and equipment may, as determined by the designated competent person, need to be stored further than 2 feet from the edge of the excavation if a hazardous loading condition is created on the face of the excavation.

7.5.15.6 Materials piled, grouped or stacked near the edge of an excavation must be stable and self-supporting.

APPENDIX A – TRENCH INSPECTION FORM

LOCATION:	**DATE:**
TIME OF INSPECTION:	
WEATHER CONDITIONS:	**APPROX. TEMP.:**
CREW LEADER:	**COMPETENT PERSON:**

DIMENTIONS:			
	DEPTH =		
	TOP =	W	L
	BOTTOM =	W	L

SOIL TYPE:	**TESTED:**
❑ Type A	❑ Yes
❑ Type B	❑ No
❑ Type C	
❑ Description:	

Yes No	**HAZARDOUS CONDITIONS**
❑ ❑	..... Saturated soil / standing or seeping water
❑ ❑	..... Cracked or fissured wall(s)
❑ ❑	..... Bulging wall(s)
❑ ❑	..... Floor heaving
❑ ❑	..... Frozen soil
❑ ❑	..... Super-imposed loads
❑ ❑	..... Vibration
❑ ❑	..... Depth greater than 10’

PROTECTION METHODS:
(Walls MUST be vertical—NO voids)
SHORING
❑ Timber
❑ Pneumatic
❑ Hydraulic
❑ Screw Jacks
❑ Trench Shield
UNEVEN, IRREGULAR WALLS
❑ Trench Box
Sloping: q 1:1 (45°) q 1 ½:1 (34°)

PLACEMENT OF SPOILS & EQUIPMENT	
❑ ❑	..... Spoils at least 2 feet from edge of trench
❑ ❑	..... Equipment at least 2 feet from edge
❑ ❑	..... Backhoe at end of trench
❑ ❑	..... Compressor, etc. at remote location
LADDER LOCATION	
❑ ❑	..... Located in protected area
❑ ❑	..... Within 25 feet of safe travel
❑ ❑	..... Secured
❑ ❑	..... Extends 36 inches above the landing
❑ ❑	..... Leads to safe landing

Yes No	**ENVIRONMENTAL CONDITIONS:**		**OTHER:**
❑ ❑	Gas detector used?	❑ ❑	Shoring equip. /materials inspected prior to use?
❑ ❑	Confined space permit issued?	❑ ❑	Is trench SAFE to enter?

COMMENTS:

NOTE All unsafe conditions must be corrected prior to trench entry. If any hazardous conditions are observed, the trench must be immediately evacuated and no one allowed to re-enter until corrective action has been taken.

TO BE FILLED OUT BY EHS PERSONNEL

Excavation Entry Authorized By: _____
Competent Person

Appendix B
29 CFR 1926 Subpart P Appendix A

Soil Characterizations

10 – Confined Space Entry

1.0 Purpose

1.1 Many workplaces contain spaces that are considered to be “confined” because their configurations restrict the activities of employees who must enter into, work in or exit from them. In many instances, personnel who work in confined spaces also face increased risk of exposure to serious physical injury from hazards such as entrapment, engulfment and hazardous atmospheric conditions. Confinement itself may pose entrapment hazards and work in confined spaces may keep workers closer to hazards such as machinery components than they would be otherwise. For example, confinement, limited access and restricted airflow can result in hazardous conditions that would not normally arise in an open workplace. Because confined spaces present spatial limitations for establishing work zones within, management will need to carefully plan activities to prevent workers from being exposed to potential physical and/or chemical hazards

1.2 O&G Industries, Inc. has set forth this confined space program to ensure worker safety and maintain compliance with OSHA Standard 1910.146, Permit Required Confined Spaces. We have determined that periodically, some of our work operations for client projects require confined space entry – both permit required and non-permit-required. Therefore, it is vital that we properly identify confined spaces in work areas, communicate the hazards of confined spaces to our employees/subcontractors and their responsibilities regarding these spaces, provide adequate training and procedures to safely enter confined spaces when necessary.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Responsibilities

3.1 The Site Superintendent is responsible for auditing and evaluating the overall effectiveness of this program. All O&G Industries, Inc. employees and subcontractors entering permit-required confined spaces in the facility or on the property are responsible for complying with the provisions of this program.

3.2 Subcontractors may follow their own confined space entry program as long as it properly addresses all the hazards associated with the space.

3.3 An Inventory (Appendix B of this program) of permit-required confined spaces will be

maintained by the jobsite along with posting the proper signage in order to prevent any unauthorized entry.

4.0 Definitions

4.1 A confined space is:

4.1.1 Is large enough for an employee to enter fully and perform assigned work;

4.1.2 Is not designed for continuous occupancy by an employee; and

4.1.3 Has a limited or restricted means of entry or exit.

4.1.4 These spaces may include underground vaults, tanks, storage bins, pits and diked areas, vessels, silos and other similar areas.

4.2 By definition, a permit-required confined space has one or more of the following characteristics:

4.2.1 Contains or has the potential to contain a hazardous atmosphere;

4.2.2 Contains a material with the potential to engulf someone who enters the space;

4.2.3 Has an internal configuration that might cause an entrant to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section; and/or

4.2.4 Contains any other recognized serious safety or health hazards.

4.3 A Non-permit confined space is a confined space that does not contain or, with respect to atmospheric hazards, have the potential to contain any hazard capable of causing death or serious physical harm.

4.3.1 PLEASE NOTE: ALL CONFINED SPACES ARE CONSIDERED TO BE "PERMIT REQUIRED," UNTIL IT HAS BEEN DETERMINED THAT THE SPACE DOES NOT CONTAIN OR HAVE THE POTENTIAL TO CONTAIN A HAZARDOUS ATMOSPHERE. THIS DETERMINATION WILL BE MADE ONLY WITH THE REVIEW AND APPROVAL OF THE SITE SUPERINTENDENT OR SITE SAFETY MANAGER.

4.4 Hazardous Atmosphere – an atmosphere that exposes employees to the risk of death, incapacitation, injury or acute illness. It may be caused by one or more of the following conditions:

4.4.1 An atmospheric oxygen concentration below 19.5 percent (an oxygen-deficient atmosphere) or above 23.5 per cent (an oxygen-enriched atmosphere) by volume.

4.4.2 A flammable gas, vapor, or mist in excess of 10 per cent of its Lower Explosive Limit (LEL).

4.4.3 A hydrogen sulfide gas concentration above 10 parts per million.

4.4.4 A carbon monoxide concentration above 35 parts per million.

4.4.5 An airborne combustible dust at a concentration that obscures vision at a distance of 5 feet or less.

4.4.6 Presence of any acutely hazardous substance in an atmospheric concentration above the Permissible Exposure Limits (PEL) published in Subpart D of 29 CFR 1926.55. If a contaminant is not published in Subpart D, consult Material Safety Data Sheets (MSDS), or other authoritative sources (TLV, etc.).

4.4.6.1 Company policy is that airborne levels must be less than 50% of the most current PEL's, TLV's or STEL's, whichever is most stringent.

4.4.7 Any atmospheric condition recognized as Immediately Dangerous to Life or Health (IDLH) as specified by the National Institute of Occupational Safety and Health (NIOSH).

5.0 Hazard Identification and Evaluation

5.1 As work sites vary greatly from project to project, it is the responsibility of the Site Superintendent to work with their Site Safety Team to identify, evaluate and label confined spaces while performing hazard analysis for the project.

5.2 An inventory of permit-required confined spaces will be maintained by the jobsite.

5.3 Every confined space shall be tested against the criteria set forth in the definition of a confined space. If the space is found to be a permit-required confined space, it shall be labeled by posting a sign reading "DANGER - PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER." This sign will be permanently posted at potential entry or access points to the space. If the space will not be entered, effective measures should be taken to see that entrances are adequately marked and blocked.

6.0 Confined Space Entry – General Requirements

6.1 The following requirements apply to entry into Permit-Required Confined Spaces:

6.1.1 Any condition making it unsafe to remove an entrance cover shall be eliminated before the cover is removed.

6.1.2 When entrance covers are removed, the entrance shall be properly guarded to prevent an accidental fall by a worker and to protect the worker from foreign objects entering the space.

6.2 Before any worker enters the space, the internal atmosphere shall be tested with a calibrated, direct-reading instrument for the following conditions in the following order:

6.2.1 Oxygen content

6.2.1.1 The OXYGEN level must be in the range of 19.5% to 23.5%.

6.2.2 Flammable gases and vapors

6.2.2.1 The FLAMMABLE GAS/VAPOR level must be less than 10% of the Lower Flammable Level (LFL).

6.2.3 Potential toxic air contaminants

6.2.3.1 Hydrogen sulfide gas concentration must be below 10 parts per million.

6.2.3.2 Carbon monoxide concentration must be below 35 parts per million.

6.2.3.3 The TOXIC GAS/VAPOR level must be less than 50% of the most current PEL's, TLV's or STEL's, whichever is most stringent.

6.2.3.4

6.3 All tests must be accurate and must be completed (documented on the entry permit) before entry.

6.4 The space must be free of any hazardous atmosphere whenever a worker is inside.

6.4.1 NOTE: O&G Industries, Inc. employees will not be allowed to work in confined spaces where the conditions are Immediately Dangerous to Life and Health (IDLH) nor where they exceed the criteria listed above.

6.5 Continuous air ventilation shall be used as follows:

6.5.1 A worker shall not enter the space until ventilation has eliminated the hazard.

6.5.2 The ventilation shall be directed as to ventilate the immediate areas when a worker is present and shall continue until the worker leaves that area.

6.5.3 The air supply for the forced-air ventilation shall come from a clean source and may not increase the hazards in the space.

6.6 The confined space atmosphere shall be continually tested to ensure that the air

ventilation is preventing the accumulation of a hazardous substance.

6.7 If a hazardous substance is detected during entry:

6.7.1 Each worker shall leave the space immediately.

6.7.2 The space shall be evaluated to determine how the atmosphere developed.

6.7.3 Measures shall be taken to protect workers during future entry.

6.8 All necessary equipment used for entry into a confined space shall be provided by the responsible contractor/subcontractor involved and maintained properly.

6.8.1 Workers shall be trained in its proper use. Training shall include, but not be limited to:

6.8.1.1 Testing and monitoring equipment;
6.8.1.2 Ventilation equipment;
6.8.1.3 Communication equipment;
6.8.1.4 Personal Protective Equipment (PPE);
6.8.1.5 Barriers and shields;
6.8.1.6 Ladders and scaffolds (safe ingress and egress equipment); and
6.8.1.7 Rescue and emergency equipment.

6.9 At least one attendant shall be posted outside the permit space into which entry is authorized. An attendant shall be responsible for one permit space.

7.0 Contracted/Subcontracted Confined Space Entry

7.1 If an Employer/Subcontractor decides that its employees will not enter a particular permit-required confined space, and an outside agency is contracted to do the work, the following guidelines should be implemented:

7.1.1 Inform the outside agency of the location of all confined spaces, and require that entry be allowed only through compliance with an approved permit-space program.

7.1.2 Inform the outside agency of all known information about the space, including hazards identified and past experiences.

7.1.3 Inform the outside agency of any precautions or procedures that have been implemented for the protection of workers in or near permit spaces.

7.1.4 Coordinate entry operations with other Contractors/Subcontractors when their workers will be in or near the confined space.

7.1.5 All Contractors/Subcontractors shall provide their Permit-Required Confined Space Entry Program to the Site Safety Manager for review and approval.

8.0 Permit System

8.1 Before any entry, employer/subcontractor supervisory personnel shall complete a Confined Space Entry Permit and sign-in sheet which is at least equivalent to the one provided in Appendix A of this program, and shall conform to the following:

8.1.1 Before any entry, the Employer/Subcontractor supervisor must sign the permit to authorize the entry.

8.1.2 The completed permit and sign-in sheet shall be posted at the entrance of the space before any entry. All authorized entrants shall confirm that pre-entry preparations have been completed.

8.1.3 The duration of the permit shall not exceed 8 hours.

8.1.4 The Employer/Subcontractor supervisor shall terminate entry and cancel the entry permit when the task is completed, or when a condition that is not allowed on the permit arises.

8.2 The following points are areas that shall be completed on the Confined Space Entry Permit:

8.2.1 Permit space to be entered.

8.2.2 Purpose of entry.

8.2.3 Date and authorized duration.

8.2.4 Authorized entrants, with method of determining which authorized entrants are inside the permit space (e.g. sign-in sheet).

8.2.5 Personnel currently serving as attendants.

8.2.6 Individual currently serving as entry supervisor.

8.2.7 Hazards of the permit space.

8.2.8 Measures to isolate the permit space and eliminate or control hazards before entry.

8.2.9 Acceptable entry conditions.

8.2.10 Results of initial and periodic tests, with tester's signature and time performed.

8.2.11 Rescue and emergency services, including equipment and phone numbers.

8.2.12 Communicating procedures for entrants and attendants to maintain contact during entry.

8.2.13 Equipment to be provided for compliance, such as personal protective equipment, communications equipment, alarm systems, and rescue equipment.

8.2.14 Any other information necessary.

8.2.15 Any additional permits issued to authorize work in the permit space, such as hot work permits.

9.0 Training

9.1 Each Employer/Subcontractor shall provide training to all workers involved in confined space entry so that they acquire the understanding, knowledge, and skills necessary to perform their job safely. Also, each Employer/Subcontractor shall certify that the training has been accomplished. This certification shall contain each worker's name, signatures or initials of trainers, and dates of training. This certification shall be available for inspection by workers and their authorized representatives.

9.2 Training shall be provided to each affected worker:

9.2.1 Before the worker's first duty;

9.2.2 Before any change in assigned duty;

9.2.3 When any change in operations occurs that presents a hazard in which the worker has not been trained; and/or

9.2.4 Whenever there is reason to believe that there are deviations from entry procedures that could prove hazardous to workers.

10.0 Roles & Responsibilities Associated With Permit-Space Entries

10.1 Authorized Entrant

10.1.1 An authorized entrant is an employee authorized to enter a permit space.

10.1.2 Duties of an authorized entrant are:

10.1.2.1 Know the hazards that may be faced during entry including mode, signs, symptoms, and consequences of exposure;

10.1.2.2 Proper use of required equipment;

10.1.2.3 Communicate with attendant as necessary;

10.1.2.4 Alert attendant whenever any warning sign or symptom of exposure is detected or a prohibited condition is detected; and

10.1.2.5 Immediately exit permit-space when ordered by attendant, when a warning sign or symptom of exposure is detected, or when an evacuation alarm is activated.

10.2 Entry Supervisor

10.2.1 An Entry Supervisor is responsible for determining if acceptable entry conditions are present at a permit space where entry is planned; for authorizing entry and overseeing entry operations; and for terminating entry as required.

10.2.2 The duties of an entry supervisor are:

10.2.2.1 Know the hazards of exposure faced during entry: mode, signs, symptoms, and consequences;

10.2.2.2 Verify that all tests required by the permit have been conducted and all procedures and equipment are in place before endorsing the permit and allowing work to begin;

10.2.2.3 Terminate the entry and cancel the permit when necessary;

10.2.2.4 Verify that rescue services are available and can be summoned if needed;

10.2.2.5 Remove unauthorized individuals who enter or attempt to enter the permit space during entry operations; and

10.2.2.6 Ensure that entry operations remain consistent with terms of the entry permit whenever responsibility is transferred or at intervals dictated by the hazards or operations performed within the space.

10.3 Attendant

10.3.1 An Attendant is a person stationed outside a permit space who monitors the authorized entrants and performs all duties assigned in the permit space program.

10.3.2 The duties of an attendant are:

10.3.2.1 Know hazards that may be faced during entry including mode, signs, symptoms and consequences of exposure;

10.3.2.2 Be aware of possible behavioral effects of exposure;

10.3.2.3 Continuously maintain an accurate count of entrants in the permit space;

10.3.2.4 Remain outside permit space during entry operations until relieved by another attendant;

10.3.2.5 Communicate with authorized entrants as necessary to monitor entry status and alert entrants of need to evacuate;

10.3.2.6 Monitor activities inside and outside permit space to continue safe operation for entrants. Order evacuation whenever a behavioral effect occurs outside the permit area, or if the attendant cannot effectively and safely perform all required duties.

10.3.2.7 Summon rescue and/or emergency services as soon as entrants may need assistance to escape permit space hazards.

10.3.2.8 Ensure that unauthorized persons not enter the permit space. Notify the authorized entrants and entry supervisor if unauthorized persons have entered the permit space.

10.3.2.9 Perform non-entry rescues as specified by the rescue procedure.

10.3.2.10 Perform no duties that may interfere with their primary duty to monitor and protect authorized entrants.

10.4 The following requirements apply to persons who enter permit spaces to perform rescue services:

10.4.1 Each member is to be aware of hazards that may be faced during rescue operations.

10.4.2 Each member of the rescue service is provided with and trained to use Personal Protective Equipment and rescue equipment necessary for making rescues.

10.4.3 Each member shall receive training on assigned rescue duties and for authorized entrance.

10.4.4 Each member shall practice making permit space rescues at least once a year by means of simulated rescue operations.

10.4.5 Each member shall be trained and certified in basic first aid and CPR.

10.4.6 Retrieval systems shall be used in non-entry rescues whenever an authorized entrant enters a permit space, unless the retrieval equipment would not contribute to the rescue of the entrant.

10.4.7 Each authorized entrant shall use a chest or full body harness with a retrieval line attached at the center of the back near shoulder level or above the head. Wristlets may be used if the chest or full body harness is not feasible or creates a greater hazard.

10.4.8 The other end of the retrieval line shall be attached to a mechanical device or fixed point outside the permit space so that the rescuer can be made aware that rescue is necessary.

10.4.9 Mechanical devices shall be used for retrieval from vertical-type permit spaces more than five feet deep. An MSDS or other similar written information must be made available to any medical facility treating a worker exposed to a hazardous substance.

11.0 Hazardous Energy Control (Lockout/Tagout)

11.1 Safety equipment required during this procedure will be designated by the qualified person and will depend on the potential hazards involved:

11.1.1 A confined space will be completely isolated from all other systems by physical disconnection, double block and bleed, or blanking off all lines.

11.1.2 In continuous systems where complete isolation is not possible, such as sewers or utility tunnels, specific written safety procedures that are approved and enforced by each Employer/Subcontractor will be used.

11.1.3 Blanks used to seal off lines must be capable of withstanding the maximum working pressure or load of the line, with a minimum safety factor of four; provided with a gasket on the pressure side to ensure a leak-proof seal; and made of chemically non-reactive material.

11.1.4 Shutoff valves serving the confined space will be locked out to prevent accidental activation.

11.1.5 All blanks for that specific confined space will be recorded on the entry permit and also in the project file, which will be available for inspection.

11.1.6 If a drain line is located within the confined space, provision will be made to tag it and leave it open when necessary. This will also be recorded on the entry permit.

11.1.7 Additional procedures may become necessary when the confined space is of a double-wall type construction (such as water-jacketed or similar type). These will be determined by the qualified person and noted on the entry permit.

12.0 Records

12.1 Each Employer/Subcontractor will maintain a written record of training including safety drills, inspections, tests, and maintenance. The records will be retained for one year after the last recorded event. In the event of separation of the worker or disposal of the equipment or appliance, records may be disposed of after one year.

12.2 Where atmospheric testing indicated the presence of a toxic substance, records will be maintained in accordance with the existing federal regulation(s). These records will include the dates and times of measurements; duties and location of workers within the confined space; sampling and analytical methods used; number, duration, and results of samples taken; PEL concentrations estimated from these samples; type of Personal Protective Equipment used, if any; and workers' names. These records will be made available to designated representatives of the government, of each Employer/Subcontractor, and the employee or former employee.

Appendix A
Entry Permit

Appendix B
Confined Space Inventory

CONFINED SPACE ENTRY PERMIT

PERMIT VALID FOR 8 HOURS ONLY
PERMIT MUST BE POSTED AT CONFINED SPACE ENTRY POINT
ALL COPIES OF PERMIT WILL REMAIN AT JOB SITE UNTIL JOB IS COMPLETED

DATE ISSUED:	***TIME ISSUED:***	***PROJECT #:***

ENTRY SUPERVISOR:	***AUTHORIZED ENTRANTS:***

STANDBY PERSONNEL / ATTENDANTS:

CONFINED SPACE LOCATION:	***CONFINED SPACE NAME:***

WORK TO BE PERFORMED:

HAZARDS ASSOCIATED WITH THIS PERMIT-REQUIRED CONFINED SPACE (CHECK ALL THAT APPLY)	
❑ **OXYGEN DEFICIENCY**	❑ **CHEMICAL EXPOSURE/DERMAL CONTACT**
❑ **FLAMMABLE GASSES**	❑ **ELECTRICAL HAZARDS**
❑ **FLAMMABLE VAPORS**	❑ **MECHANICAL EXPOSURE**
❑ **COMBUSTIBLE DUSTS**	❑ **TEMPERATURE HAZARDS**
❑ **TOXIC GASSES**	❑ **ENGULFMENT**
❑ **TOXIC VAPORS**	❑ **ENTRAPMENT**
❑ **OTHER (EXPLAIN):**	❑ **OTHER (EXPLAIN):**

CHECK OR LIST THE MEASURES USED TO ISOLATE THE PERMIT SPACE AND TO ELIMINATE OR CONTROL PERMIT SPACE HAZARDS BEFORE ENTRY (CHECK ALL THAT APPLY AND EXPLAIN).	
❑ **PURGE-FLUSH AND VENT**	❑ **VENTILATION**
❑ **LOCKOUT/TAGOUT**	❑ **INERTING**
❑ **BLANKING, BLOCKING, BLEEDING**	❑ **EXTERNAL BARRICADES**
❑ **CONFINED SPACE IDENTIFICATION SIGNS**	❑ **OTHER:**

ACCEPTABLE ENTRY CONDITIONS:

TESTS TO BE TAKEN	PERMISSIBLE ENTRY LEVELS	TEST 1	TEST 2	TEST 3	TEST 4
1. PERCENT OF OXYGEN	**19.5% TO 23.5%**				
2.					
3.					
4.					
5.					
6.					
7.					
8.					
NAME OR INTIALS OF TESTER					
TEST TIMES					

EMERGENCY CONTACTS:		
TITLE	**NAME**	**CONTACT INFORMATION**
POLICE		PHONE:
FIRE		PHONE:
AMBULANCE		PHONE:
OPCO H&S COORDINATOR		OFFICE: CELL:
PROJECT MANAGER		OFFICE: CELL:
PARTNER-IN-CHARGE		OFFICE: CELL:

COMMUNICATION PROCEDURES TO BE USED BY AUTHORIZED ENTRANTS AND ATTENDANTS:

EQUIPMENT SUPPLIED:				
YES	**NO**	**N/A**	**EQUIPMENT**	**DESCRIPTION**
			GAS TEST AND MONITORING	**NAME:** **MODEL:** **SERIAL #:**
			VENTILATING	
			COMMUNICATIONS	
			PPE	❑ **SAFETY HARNESS WITH LIFELINES** ❑ **RESPIRATORY** ❑ **HARD HAT** ❑ **EYE** ❑ **EAR** ❑ **FACE** ❑ **HAND** ❑ **FOOT** ❑ **CLOTHING**
			LIGHTING	
			BARRIERS/SHIELDS	❑ **PEDESTRIAN** ❑ **VEHICLE** ❑ **OTHER**
			SAFE INGRESS/EGRESS	❑ **LADDERS**
			RESCUE/EMERGENCY	❑ **LIFELINES** ❑ **HOISTS** ❑ **RESUSITATOR/ INHHALATOR**
			OTHER SAFETY EQUIPMENT	

OTHER INFORMATION REGARDING THIS CONFINED SPACE TO ENSURE WORKER SAFETY:
ADDITIONAL PERMITS REQUIRED (HOT WORK, ETC.):

ENTRY AUTHORIZATION – ALL ACTIONS OR CONDITONS FOR SAFE ENTRY HAVE BEEN PERFORMED		
ENTRY SUPERVISOR SIGNATURE:	*DATE:*	*TIME:*
CANCELLATION OF PERMIT (UPON COMPLETION OF WORK):		
ENTRY SUPERVISOR SIGNATURE:	*DATE:*	*TIME:*

Appendix B - Site Permit-Required Confined Space Inventory

Description of Space	Location	Hazards / Potential Hazards	Warning Signage in Place

11 – Hazard Communication

1.0 Purpose

1.1 O&G Industries, Inc. has established the following written hazard communication program to meet the requirements of the Occupational Safety and Health Administration's Hazard Communication Standard 29 CFR 1910.1200, Standards for General Industry and 29 CFR1926.59, Standards for the Construction Industry. This program is intended to be used by all O&G Industries, Inc. employees and O&G Industries, Inc. Subcontractor employees when performing work for O&G Industries, Inc.

2.0 Scope

2.1 Each O&G Industries, Inc .employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

2.2 The following requirements are described within this written program:

2.2.1 A Written Program; (this document);
2.2.2 Program Responsibilities;
2.2.3 Hazard Determination;
2.2.4 Container Labeling System;
2.2.5 Material Safety Data Sheet(s);
2.2.6 Employee Training;
2.2.7 Subcontractor Management; and
2.2.8 Hazardous Chemical List (Appendix A).

3.0 Responsibilities

3.1 Management

3.1.1 The Safety Manager is responsible for the overall implementation of this program. Onsite Management will provide the following controls to protect workers from known chemical hazards and the risk of chemical exposures while working on O&G Industries, Inc. sites:

3.1.1.1 Reviewing the plan on an annual basis to ensure it remains effective;

3.1.1.2 Updating this plan as procedures or conditions change;

3.1.1.3 Providing adequate safe work procedures;

3.1.1.4 Providing training and information on known site hazards; and

3.1.1.5 Allotting adequate resources to superintendants and employees.

3.1.2 Superintendents

3.1.2.1 Superintendents are responsible for implementing this program on O&G Industries, Inc. job sites where they are working. Superintendants will be responsible for the following:

3.1.2.2 Ensuring that all O&G Industries, Inc. employees and subcontractors receive appropriate training before they begin working;

3.1.2.3 Properly maintaining Material Safety Data Sheets (MSDSs) onsite;

3.1.2.4 Making MSDSs readily available for all O&G Industries, Inc. employees, subcontractors and visitors;

3.1.2.5 Informing O&G Industries, Inc. employees and subcontractors when new chemicals are brought onsite; and

3.1.2.6 Communicating changes in procedures or conditions to all site personnel.

3.1.3 Employees

3.1.3.1 All employees shall:

3.1.3.1.1 Complete all required training before working onsite with any hazardous materials;

3.1.3.1.2 Follow established safe work practices;

3.1.3.1.3 Wear proper Personal Protective Equipment at all times when using hazardous materials;

3.1.3.1.4 Report any chemical releases and/or employee exposures to superintendants or management;

3.1.3.1.5 Follow established safe work practices; and

3.1.3.1.6 Follow established spill response procedures.

4.0 Hazard Determination

4.1 The manufacturer of each chemical must determine if the product is hazardous under OSHA's Hazard Communication Standard. O&G Industries, Inc. is not responsible for testing any purchased materials to determine its hazardous properties. Product labels, DOT labels, and material safety data sheets will be used to determine the hazards(s) with respect to O&G employees and subcontractors. If any product is deemed hazardous O&G will train their employees and subcontractors on the risks associated with the product prior to its use.

5.0 Safety Data Sheets (SDS)

5.1 Material safety data sheets are intended to provide workers and emergency personnel with procedures for handling or working with a certain product in a safe manner. MSDS formats can vary from product to product depending on the manufacturer. At a minimum, all MSDSs must include chemical information such as physical data, toxicity, health effects, first aid, reactivity, storage, disposal, protective equipment, and spill-handling procedures. O&G Industries, Inc. manages onsite MSDSs by the following:

5.1.1 O&G Industries, Inc. requires all manufacturers, distributors, suppliers and/or subcontractors to provide MSDSs for all products they bring onto O&G Industries, Inc. sites;

5.1.2 The Site Superintendent is responsible for obtaining and replacing outdated material data sheets for all products used onsite;

5.1.3 Copies of the applicable MSDSs are maintained by the Site Superintendent in the office trailer and are available to site employees, subcontractors and visitors upon request;

5.1.4 While respecting a company's right to protect secret formulations (trade secrets), MSDSs which omit health and/or safety information do not meet O&G Industries, Inc. requirements; (O&G Industries, Inc. does not anticipate using materials that have been designated as Trade Secret.) and

5.1.5 No new product containing hazardous chemical(s) may be purchased or used without first reviewing the corresponding MSDS to determine the extent of the hazard and how to properly protect site personnel from exposure.

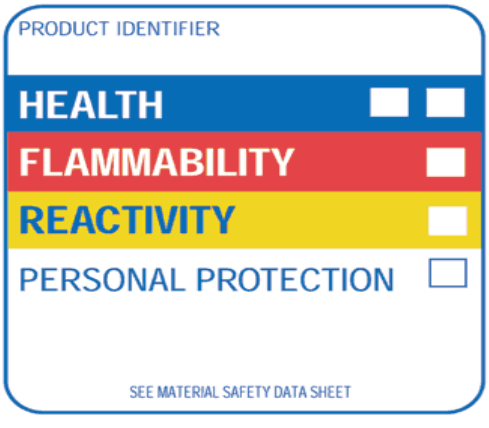
6.0 Labeling

6.1 O&G Industries, Inc. uses the Hazardous Material Information System (HMIS) labeling system to properly identify any chemical containers present onsite.

6.1.1 HMIS uses a label with four color bars and a space at the top where the chemical name is written.

6.1.2 The blue, red, and yellow colored bars indicate, respectively, the health, flammability, and reactivity hazard associated with the material.

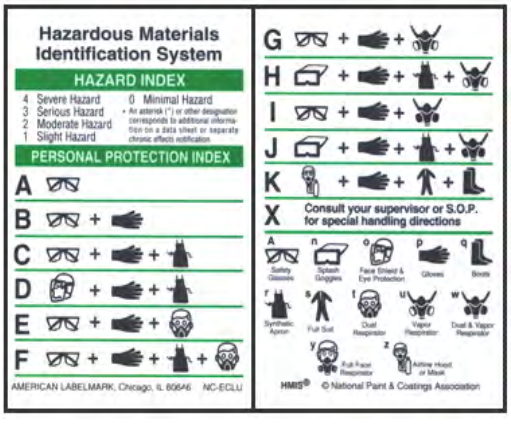
6.1.3 These three bars use a numbering scale ranging from 0 to 4. A value of zero means that the material poses essentially no hazard; a rating of four indicates extreme danger.



6.1.4 A second box is located on the blue (health hazard) bar, if that box contains an asterisk (*) then the health hazard associated with the material is a chronic effect.

6.1.5 The fourth, white bar is marked "personal protection." A letter is shown in this bar (A-K or X) to indicate the kind(s) of personal protective equipment (PPE) that should be used in order to handle the material safely.

6.1.6 Examples of HMIS container labels and corresponding PPE letter/pictograms are pictured (right).



7.0 Training

7.1 The Site Superintendent is responsible for ensuring that all employees who work with hazardous chemicals or have a potential of being exposed to hazardous chemicals have received HAZCOM training. Employees are trained regarding the following:

7.1.1 The regulatory requirements of the OSHA Hazard Communication

(HAZCOM) Standard (29 CFR 1910.1200 as referenced by 29 CFR 1926.59);

7.1.2 The details of the O&G hazard communication program (this document);

7.1.3 The identity and location of hazardous chemicals present onsite;

7.1.4 The physical and health hazards associated with hazardous chemicals present onsite;

7.1.5 Methods and observations that may be used to detect the presence of a release, such as visual monitoring, continuous monitoring devices and the visual appearance or odor of a chemical being released;

7.1.6 How to read and interpret an MSDS and HMIS warning labels;

7.1.7 Appropriate protective measures employees can take including work practices, engineering controls, PPE and emergency procedures;

7.1.8 The location and availability of this written Hazard Communication Program and Material Safety Data Sheets; and

7.1.9 If employees are required to perform non-routine tasks, which could potentially expose them to hazardous chemicals, they will be trained on that specific hazard. Prior to starting work, each affected employee will be given information, through a toolbox talk, by the Site Superintendent about the chemicals to which they may be exposed.

7.2 All onsite personal will be notified of the location of the MSDSs at the time of New Employee Orientation or upon request. The site MSDSs and a copy of the O&G Hazard Communication Program are located in the O&G office trailer.

7.2.1 Retraining is done whenever new chemicals are introduced into the workplace.

7.2.2 All employee and subcontractor training sessions are documented and the records retained by the Site Safety Manager.

8.0 Subcontractors

8.1 O&G Industries, Inc. will inform other employers of any precautionary measures that need to be taken to protect workers during the site's normal operating

conditions and in any foreseeable emergencies. A Safety Stand Down will be held as needed to cover any new hazardous materials that will be arriving at the site or of any changes in normal operating procedures. Any hazardous materials brought onsite by subcontractors will be submitted to the O&G Industries, Inc. engineering department to be approved by the O&G Director of Safety. Once approved, the hazardous material information and MSDS(s) will be forwarded to the Site Superintendent who will inform site personnel about the new product.

8.2 It is the responsibility of the Site Superintendent to provide subcontractors' with the following information at the time of their arrival onsite and update them, as necessary, when changes onsite occur:

8.2.1 A list of hazardous chemicals which are used on the site (Appendix A);

8.2.2 Location of applicable MSDSs;

8.2.3 Measures to reduce the possibility of employee exposure;

8.2.4 Procedures to follow if a chemical release or personnel exposure occurs;

8.2.5 HMIS labeling system; and

8.2.6 Methods of Communication.

Appendix A – Chemical Listing

Appendix B – GHS Supplemental Training Updates

Appendix A - Site Chemical List

Brand	Chemical	Responsible Company	MSDS in Book

Current as of: 5/11/2011

Appendix A - Site Chemical List

Brand	Chemical	Responsible Company	MSDS in Book

Appendix A - Site Chemical List

Brand	Chemical	Responsible Company	MSDS in Book

Current as of: 5/11/2011

Appendix A - Site Chemical List

Brand	Chemical	Responsible Company	MSDS in Book

Current as of: 5/11/2011

Appendix A - Site Chemical List

Brand	Chemical	Responsible Company	MSDS in Book

APPENDIX B – GHS SUPPLIMENTAL TRAINING UPDATES

OSHA's Revised Hazard Communication Standard – What is GHS?

For many years now, employees could gather limited information about the hazardous chemicals they work with by looking at container labels and reading Material Safety Data Sheets (MSDS's). However, there was no set format to govern how the companies that produced or distributed those chemicals categorized the hazards of their products, nor how the labels and MSDS's had to appear. The end result was a confusing mish-mash of information that often failed to help workers quickly discern the hazards of the products they were using.

To address this problem, OSHA recently revised their Hazard Communication Standard to align with the international "Globally Harmonized System of Classification and Labeling of Chemicals", commonly referred to as "GHS". As a result, manufacturers and distributors of hazards chemicals and products must begin to standardize how they categorize the hazards of their products, as well as the information and format of their container labels and Safety Data Sheets. Here is an overview of some of the changes you will start seeing very soon, if not already:

- "Material Safety Data Sheets" (MSDS's) will be replaced by "Safety Data Sheets" (SDS's);
- The new SDS's will be divided into 16 sections, with information about the product's chemical hazards appearing in a set order that is always the same for every sheet;
- Container labels will all display mandatory information, including a product identifier that is exactly the same as that appearing on the corresponding Safety Data Sheet (SDS);
- Container labels will also have standardized "signal words", "hazard statements", and "precautionary statements" to help insure you are alerted to applicable dangers and necessary safeguards you should follow when working with that product;
- All container labels will also display one or more of eight specific "pictograms", which are basically icons that appears in small red boxes that will help you to quickly identify the specific hazard or hazards associated with the product you are using.

OSHA has given employers until December 1, 2013 to train their employees on all of the required elements of the new labeling systems and Safety Data Sheets (SDS's). So our next few toolbox talks will focus more on the specifics of how the new hazard warning systems work. In the meantime, you will still see old labels and MSDS's around until the transition to the revised Hazard Communication Standard is fully implemented.

If you have any remaining questions or concerns regarding any aspects of this training once all phases are reviewed, please make sure to ask your training leader or contact O&G's safety department.

APPENDIX B – GHS SUPPLIMENTAL TRAINING UPDATES

New GHS Pictograms

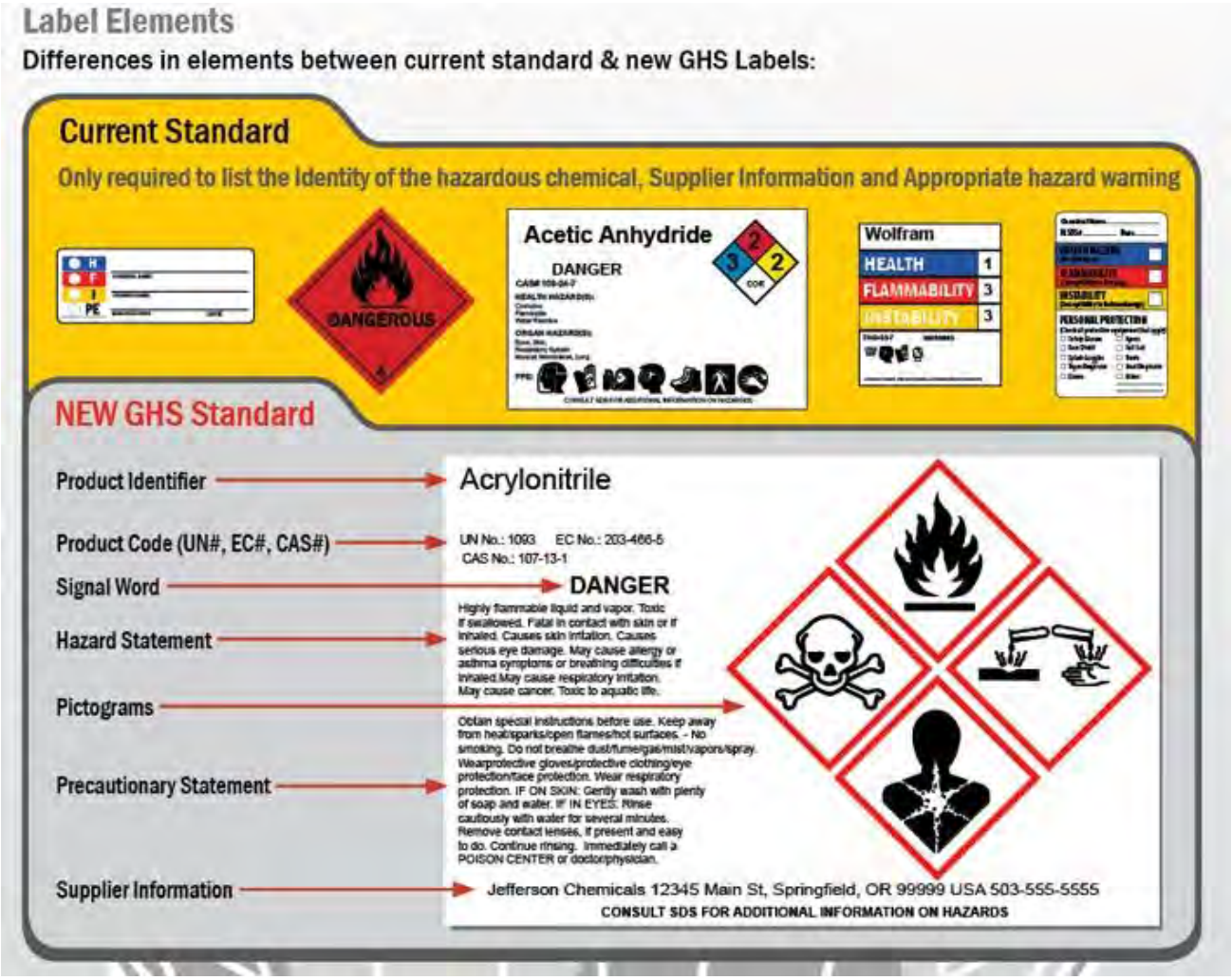
There are nine pictograms that you must know about. Please be sure to study and remember what each of the pictograms below means and how it affects you. As always, if you have any questions or concerns, be sure to ask someone for help.

	**Health Hazard** Carcinogen Mutagen Reproductive Toxicity Respiratory Sensitizer Target Organ Toxicity		**Corrosion** Skin corrosion and burns Eye damage Corrosive to metals
	**Exclamation Mark** Irritant to skin and eyes Acute toxicity (harmful) Narcotic effects Respiratory Irritant Hazardous to Ozone		**Skull & Bones** Acute Toxicity (May be fatal or toxic)
	**Flame** Flammables Self-heating Emits flammable gasses Self reactive		**Flame Over Circle** Oxidizers
	**Gas Cylinder** Gases under pressure		**Exploding Bomb** Explosives Self Reactives Organic Peroxides
	**Environment Hazard** Aquatic Toxicity (Non-Mandatory)		

APPENDIX B – GHS SUPPLIMENTAL TRAINING UPDATES

New GHS Labeling System

This label will now be found on chemicals and products that the company purchases. This should be the ONLY label you see after **December 1, 2015**. The elements that you will find required on all labels include pictograms, product identifier, signal word, hazard statement, precautionary statement, first aid statement and supplier information. You may review the example label provided below for a better understanding of what the new labels will look like. Remember, until **December 1, 2015** you may still find products with the old labeling system in place. It is important that you know how to read and more importantly understand what the label is telling you.



APPENDIX B – GHS SUPPLIMENTAL TRAINING UPDATES

New GHS Safety Data Sheets (SDS)

What we used to know as Material Safety Data Sheets (MSDS) are now called Safety Data Sheets (SDS). The SDS has sixteen sections, and all of them will look the same and follow the same format no matter where in the world they come from. The 16 sections are arranged in order of importance, so that anyone scanning the SDS can quickly find critical hazard information or measures to be taken in case of a spill or employee injury. Here are the **16 sections** with key information to know regarding each:

- **Section 1 – Identifies the product -** May provide an identifier, manufacturer name, address, phone number, emergency phone number recommend use and restrictions
- **Section 2 – Hazard Identification** – Discuss all of the chemical's hazards & required label elements
- **Section 3 – Composition/Information on Ingredients** – Chemical ingredients and trade secret claims are discussed
- **Section 4 – First Aid Measures –** Discusses symptoms, effects of the chemical and treatment
- **Section 5 – Fire Fighting Measures –** Discusses the proper fire extinguishers, fire fighting techniques, equipment and any chemical hazards the fire may produce
- **Section 6 – Accidental Release Measures –** Discusses emergency procedures, protective equipment and proper methods of containment and cleanup
- **Section 7 – Handling and Storage –** Discusses how to safely handle and store the chemical. Will include what the chemical is incompatible with
- **Section 8 – Exposure Control and Personal Protective Equipment (PPE) –** Will provide Permissible Exposure Limits (PEL) information, Threshold Limit Value (TLV) information, appropriate engineering controls and what PPE you will need to wear to handle the chemical
- **Section 9 – Physical and Chemical Properties –** Discusses the chemical characteristics of the product
- **Section 10 – Stability and Reactivity –** Provides information on the chemical stability and potential for a hazardous reaction
- **Section 11 – Toxicological Information –** Discusses exposures routes, symptoms of exposure, acute and chronic effects and the numerical measures of toxicity
- **Section 12 – Ecological Information –** How the product may harm the environment
- **Section 13 – Disposal Consideration** – Discusses how to properly dispose of the product
- **Section 14 – Transport Information –** How to safely transport the product
- **Section 15 – Regulatory Information –** What laws and regulations may apply compliance means
- **Section 16 – Other Information –** Preparation date and any other useful information

12 – Ladder Safety

1.0 Purpose

1.1 The purpose of this Ladder Safety Program is to provide minimum requirements for the for the selection, use, and maintenance of portable ladders used on O&G Industries, Inc. job sites

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Responsibilities

3.1 The Site Superintendent is responsible for:

3.1.1 Ensuring that ladder safety measures are in place according to this program and the applicable OSHA standards;

3.1.2 Ensuring that workers are trained in ladder safety;

3.1.3 Maintaining training records;

3.1.4 Ensuring that ladders meet OSHA regulations; and

3.1.5 Periodically evaluating program implementation.

3.2 The Site Safety Manager is responsible for:

3.2.1 Ensuring that all ladders used are free from defects and all moving parts are working properly;

3.2.2 Ensuring that all affected employees using ladders have been trained;

3.2.3 Ensuring that all affected employees comply with this program;

3.2.4 Conducting periodic inspections of work areas.

3.3 Employees are responsible for:

3.3.1 Complying with the requirements of this program;

3.3.2 Attending required training programs;

3.3.3 Inspecting ladders for defects or possible hazards prior to use;

3.3.4 Tagging any defective ladder as out of service; and

3.3.5 Reporting any ladder defects to their supervisor.

4.0 Definitions

4.1 Ladder - A ladder is an appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

4.2 Extension ladder - An extension ladder is a non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the sum of the lengths of the sections measured along the side rails.

4.3 Step ladder - A stepladder is a self-supporting portable ladder, nonadjustable in length, having flat steps and a hinged back. Its size is designated by the overall length of the ladder measured along the front edge of the side rails.

4.4 Special-purpose ladder - A special-purpose ladder is a portable ladder, which represents either a modification or a combination of design or construction features in one of the general-purpose types of ladders previously defined, in order to adapt the ladder to special or specific uses.

5.0 General Rules for All Ladders

5.1 All ladders will be inspected by a qualified person and approved for use before being put into service.

5.2 Maintain ladders free of oil, grease and other slipping hazards.

5.3 Do not load ladders beyond their maximum intended load nor beyond their manufacturer's rated capacity.

5.4 Use ladders only for their designed purpose.

5.5 Use ladders only on stable and level surfaces unless secured to prevent accidental movement.

5.6 Do not use ladders on slippery surfaces unless secured or provided with slip-resistant feet to prevent accidental movement. Do not use slip-resistant feet as a substitute for exercising care when placing, lashing, or holding a ladder upon slippery surfaces.

5.7 Secure ladders placed in areas such as passageways, doorways, or driveways, or where they can be displaced by workplace activities or traffic to prevent accidental movement. Alternatively, use a barricade to keep traffic or activity away from the ladder.

5.8 Keep areas clear around the top and bottom of ladders.

5.9 Do not move, shift, or extend ladders while in use.

5.10 Use ladders equipped with nonconductive side rails if the worker or the ladder could contact exposed energized electrical equipment.

5.11 Face the ladder when moving up or down.

5.12 Use at least one hand to grasp the ladder when climbing.

5.13 Do not carry objects or loads that could cause loss of balance and falling.

5.14 Metal ladders shall not be used when performing electrical work or when working near exposed electrical circuits.

5.15 Ladders shall not be used on scaffold or aerial lift platforms.

5.16 All ladders shall be inspected prior to use.

5.16.1 Side rails, rungs, and steps.

5.16.2 Safety feet of extension and straight ladders.

5.16.3 Hardware guides, pawls and spreaders of stepladders.

5.16.4 Extension rope and/or tie off rope.

5.17 Painted, broken, or damaged ladders will not be used. They are to be tagged “DO NOT USE” and promptly removed from service. Ladders to be repaired will be reported to your supervisor.

5.18 When working off a ladder:

5.18.1 Face the ladder when ascending or descending.

5.18.2 Only one person at a time on the ladder.

5.18.3 Be sure the ladder is stable.

5.18.4 Keep both feet on the ladder rungs. Do not place one foot on a line or piece of equipment and the other on the ladder to keep within reach of the work.

5.18.5 Do not overreach or extend. If the belt buckle cannot be maintained inside the rail of the ladder, the ladder must be moved.

5.18.6 Check overhead for power lines and other obstructions.

5.18.7 Fall protection is required if you must stand backwards on the ladder, and under certain other hazardous conditions.

5.18.8 Protect other persons in the area by barricading/roping off the area, where necessary.

5.18.9 A person must be tied off to an adequate overhead structure when working the same distance or less from an edge or elevation as the height of the ladder. Example: Working 8' from an edge while working off an 8' or higher ladder.

6.0 Straight and Extension Ladders

6.1 Use help when raising or lowering large ladders. One person should walk the ladder up or down while the second person foots the base of the ladder.

6.2 Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds.

6.3 Where portable straight ladders are used, they shall be of sufficient length to extend three feet (36 inches) above the upper landing surface, and be positively secured or held against shifting or slipping.

6.4 Hand lines shall be used to raise and lower tools and material that cannot be carried in tool belts.

6.5 Straight and Extension Ladders shall be pitched to assure the ladder base is one-quarter the overall working height of the ladder.

6.6 Use a safety harness and tie off when you are on the seventh (7) rung or of a ladder or are six (6) feet or more off the ground. Tying off is required when working backwards or when other critical or hazardous work is being performed.

6.7 All ladders shall be tied off adequately at the top. The only exception is when the ladder is only to be used for inspection or other one-trip activity not involving

actual work. If a ladder is climbed without, being tied off, it must be "footed" and held at the base by a ground person.

7.0 Step Ladders

7.1 The top step of any stepladder, 3 feet and over shall not be used to stand on.

7.2 Stepladders are not to be used as straight ladders.

7.3 Step ladders 10 feet or higher must be tied off.

7.4 A person is required to be tied off when working on the seventh (7) step of a stepladder.

7.5 A person is required to be tied off, when working under (6) foot, when:

7.5.1 The task is critical or hazardous.

7.5.2 The person is standing backwards on the ladder.

7.6 You may step off a stepladder to a suitable safety platform or work area. Good, SAFE, common sense must be utilized. Stepping off is not allowed if:

7.6.1 It is necessary to step off the top or next to the top step of the ladder.

7.6.2 The ladder is not stable and firm. Whenever possible, the top of the ladder should be tied off or held by a second person to enhance stability.

7.6.3 The ladder cannot be secured directly to the platform that the employee is stepping onto.

8.0 Job-Made Ladders

8.1 Job-made ladders will be constructed to conform to the established OSHA/MSHA standards including being constructed of 2 inch x 4 inch material at a minimum, for side rails and rungs and 16 penny nails should be utilized. Ladder spacers will be placed between rungs.

9.0 Training

9.1 All employees shall be trained prior to portable ladder use to recognize hazards and procedures to minimize hazards. Employees shall be trained in the following:

9.1.1 The requirements outlined in this program;

9.1.2 The recognition of possible hazards associated with ladder use, inspection, maintenance, and safety precautions;

9.1.3 The proper use and placement of ladders; and

9.1.4 The maximum intended load capacities of ladders used.

9.2 Employees shall be retrained as necessary to maintain their understanding and knowledge on the safe use of ladders.

13 – Housekeeping

1.0 Purpose

1.1 The purpose of this Housekeeping Program is to provide minimum requirements for the housekeeping, as it pertains to O&G Industries, Inc. job sites.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Housekeeping Rules

3.1.1 Good housekeeping is an important part of any safety program. It is the responsibility of all employees, supervisors and workers to keep the job site clean.

3.1.2 The employee generating construction debris, trash, scraps, etc. is responsible to clean their work area, by disposing debris in designated containers/areas prior to leaving the work site.

3.1.3 The employee is also responsible for ensuring that construction materials do not represent an obstruction or tripping hazard and do not obstruct exits, access routes, door ways, aisle ways, etc.

3.2 Scrap materials and rubbish are accident and fire hazards. If an excess of these materials exists in the work area, request that the supervisor make arrangements for their removal prior to starting work.

3.3 Combustibles and flammables will not be allowed to accumulate at a project site.

3.4 Trash containers will be located in all work areas. Notify the supervisor if one is needed in the immediate work area.

3.4.1 All trash, waste, and scrap will be placed in proper containers.

3.5 All hazardous wastes that may be generated, including solvent soaked rags or debris will be place in appropriate containers, properly labeled, and dated.

3.6 Tools and materials will be placed where they will not create a hazard for others or will not create an obstruction.

3.7 Spilled liquids can cause safety or health hazards and will be protected and cleaned up immediately. For hazardous materials, read the Material Safety Data Sheet for proper spill cleanup and disposal procedures.

3.8 Keep change areas clean and orderly. Do not let soiled clothes, food scraps, and drink containers accumulate. Drinking cups, sandwich wrappers, food containers, paper bags, and other trash will be placed in the disposal containers provided.

3.9 Toilets, wash up facilities, drinking fountains, and water cans are provided for the employee's convenience and comfort. Employees are expected to help keep them clean and sanitary.

3.10 Never remove the top from a drink container, unless authorized by project management, and the use of anything other than single use drinking containers is prohibited. Properly dispose of all single use drinking containers in assigned receptacles.

3.11 Remove all protruding nails, staples, screws, or other objects that present a hazard to employees or vehicles.

3.12 All stairways, corridors, ladders, catwalks, ramps and passageways must be kept clear of construction materials, construction debris, loose materials and trash.

3.13 Combustible material must be kept away from steam lines, heaters, heat producing processes and equipment, and any flame work or other heat sources. All combustibles must be cleared at least 35 feet away from areas in which welding is going on, and below job level.

3.14 Employees that have completed their assigned task(s) are expected to initiate housekeeping activities in their work area until the project supervisor assigns additional work task(s).

3.15 Nails are to be immediately removed from disassembled lumber or bent flush so as not to present a potential hazard to other individuals. Discarded or loose nails shall not be allowed to accumulate on the walking surface.

14 – Scaffolding

1.0 Purpose

1.1 The purpose of this program is to provide minimum requirements for the design, construction, inspection and use of scaffolding equipment and devices to protect employees exposed to fall hazards while working at heights.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Scaffold Design and Construction

3.1 Scaffolding will be designed by a Qualified Person and will be constructed and loaded in accordance with the design.

3.1.1 Scaffolding over 125 feet high needs to be designed by an engineer.

3.2 Capacity

3.2.1 Each component (plank, frame, etc…) will be capable of supporting 4 times the intended load.

3.2.2 Suspension ropes on suspension scaffolding will be capable of supporting 6 times the intended load.

3.3 Construction / Erection

3.3.1 A competent person shall supervise the erection, relocation, alteration and/or dismantling of scaffolds.

3.3.1.1 Scaffolds will be tagged and signed by competent person before use.

3.3.2 Full fall protection will be used during erection and/or dismantling of scaffolds.

3.3.3 Fall protection provided during the erection and use of scaffolding will comply with the requirements specified in 5.0 below.

3.3.4 Footing or anchorage for scaffolds shall be sound, rigid and capable of supporting maximum intended load(s) without settling or displacement.

3.3.5 Scaffold frames, bracing, footings/anchorage, brackets, ladders, trusses, etc. shall not be damaged or weakened from any cause. Damaged or weakened components shall be immediately repaired and/or replaced.

3.3.5.1 Only approved accessories and components shall be used in erection of scaffolds.

3.3.6 Scaffolds shall be plumb, securely and rigidly braced to prevent swaying and displacement.

3.3.7 Platforms on all working levels will be fully decked or planked.

3.3.7.1 Gaps between planks will not be larger than 1 inch.

3.3.8 All planking shall be scaffold grade or equal, overlapped a minimum of 12 inches and extended over end supports not less than 6 inches and not more than 12 inches.

3.3.8.1 Planks will not be painted and will not have any splits greater than 10 inches.

3.3.8.2 The front edge of platforms will not have any splits greater than 10 inches.

3.3.9 All walkways must be at least 18 inches wide.

3.3.9.1 Ladder Jack or Pump Jack scaffolding must have at least 12 inch wide walkways.

3.3.10 Supported Scaffolds

3.3.10.1 Scaffolding must be secured to the building at 4:1 base ratio (at 20 feet for 5 foot wide frames) and then every 26 feet vertically thereafter.

3.3.10.2 Horizontal scaffolding must be secured at each end and no more than 30 feet apart.

3.3.10.3 All guys, ties, and braces must be secured at the nearest cross member.

3.3.10.4 Manufacturer's base plates are required at all times.

3.3.10.5 Mudsills at least 18 inches long, must be used on all surfaces except concrete.

3.3.10.6 The footing or anchorage for scaffolding will be sound, rigid, and capable of carrying the maximum intended loads.

3.3.10.7 Unstable objects such as barrels, boxes, concrete blocks, etc. will not be used to support scaffolds.

3.3.10.8 All scaffold frames will be plumb and braced to prevent swaying.

3.3.11 Suspension Scaffolds

3.3.11.1 Support devices must be able to support 4 times the intended load.

3.3.11.2 Outrigger beams will be made of structural metal and will be secured against movement.

3.3.11.3 Outrigger beams will be stabilized by direct connections to the floor or roof, or will be stabilized by counterweights.

3.3.11.4 Prior to each shift all direct connections and wire ropes will be inspected.

3.3.12 Rolling Scaffolds:

3.3.12.1 No one is allowed to ride rolling scaffolds, except as permitted by OSHA regulations in specific circumstances.

3.3.12.2 Rolling scaffolds will only be used on firm, level surfaces, without holes or obstructions.

3.3.12.3 Caster brakes will be locked when the scaffold is not in motion.

3.3.12.4 Casters will be secured to the scaffold frames by pens or equivalent means.

3.3.12.5 Get help when moving rolling scaffolds. Make certain that the route is clear. Watch for holes and overhead obstructions.

3.3.12.6 Secure or remove all loose materials and equipment before moving rolling scaffolds.

3.3.12.7 Platforms will be tightly planked for the full width of the rolling scaffold.

3.3.12.8 Guardrails, midrails, and toeboards will be installed on all sides of the work platform that are 10 feet or greater above a lower surface.

3.3.13 Access to Scaffolds

3.3.13.1 When platforms are more than 2 feet above or below a point of access, ladders, ramps, stairs, walkways, or other means of safe access are required.

3.3.13.2 Cross braces and end rails will not be climbed unless they are designed to do so.

3.3.13.3 Access frames must have a minimum rung length of at least 8 inches. These rungs will be no more than 16 3/4 inches apart and uniformly spaced.

3.3.13.4 Attachable ladders must be positioned so their bottom rung is no more then 24 inches above the lower level.

3.3.13.5 Attachable ladders must have rung length of at least 11 ½ inches.

3.3.13.6 Portable access ladders must extend above the platform by at least 3 feet and will be secured against movement.

4.0 Scaffold Use

4.1 All scaffolding will be inspected before each shift by a Competent Person.

4.1.1 The inspection will be documented on an inspection tag affixed to the base of the scaffold.

4.2 All damaged components must be removed from service, repaired or replaced immediately.

4.3 The Site Superintendent will establish a safe work plan to ensure that appropriate OSHA standards will be followed when working near power lines.

4.4 Tools, equipment, material or any other debris will not be allowed to accumulate on platforms.

4.5 Employees will be prohibited from working on scaffolds covered with ice, snow, or other slippery materials unless necessary to clear these materials.

4.6 Work will not be performed during high winds or storms.

4.7 Outriggers are to be used for personnel only, not for landing materials, unless designed to do so.

4.8 Ladders, boxes, barrels, cinder blocks, or other makeshift devices will not be used to increase the working height.

4.9 Falling Object Protection

4.9.1 Hard hats are required at all times.

4.9.2 One of the following provisions will also be implemented:

4.9.2.1 Toeboards, at least 3½ inches high, will be erected along the edge.

4.9.2.2 If materials are stacked higher than the toeboard then paneling or screening will be installed at least as high as the stacked material.

4.9.2.3 The area below will be barricaded to prevent employees from entering.

4.9.2.4 Canopies, nets, or catch platforms will be installed below the work area.

5.0 Fall Protection

5.1 Fall protection measures will be consistent with those described in Section 7 of this program, *fall protection.*

5.2 Employees on scaffolding more than 10 feet above a lower level will be protected by guardrails and/or personal fall arrest system.

5.3 Guardrails will be installed along all open sides or edges.

5.4 Guardrails systems will conform to the following:

5.4.1 The top rail will be between 38-45 inches above the platform.

5.4.2 Midrails will be installed midway between the platform and the top rail.

5.4.3 Toeboards will be installed and be at least 3 ½ inches high.

5.4.4 X braces can be used as guardrails if they are between 38-48 inches above the platform.

5.4.5 X braces can be used as midrails if they are between 20-30 inches above the platform.

5.4.6 Personal fall arrest systems and guardrails must both be used when using suspension scaffolding. The personal fall arrest system must be anchored to a point independent of all scaffold system.

15 – Personal Protective Equipment

1.0 Purpose

1.1 The purpose of this program is to protect the health and safety of all employees and to comply with OSHA regulations. 1910.134, Personal Protective Equipment This policy provides guidance for situations in which workers are required to wear Personal Protective Equipment (PPE) and the criteria for selection of that equipment. Such equipment shall be provided, used and maintained in a sanitary and reliable condition.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 General

3.1 Pre-task planning shall be conducted to identify workplace hazards and the PPE requirements necessary to effectively mitigate those hazards.

3.2 PPE requirements shall be communicated to each employee. Employees required to wear PPE shall receive the training necessary to enable them to use the PPE provided properly.

3.3 PPE shall be inspected before each use and any damaged or defective PPE must be immediately removed from service.

3.4 Periodic audits shall be conducted by the Site Safety Manager to monitor compliance with PPE requirements.

4.0 Head Protection

4.1 Employees shall wear Company issued hard hats at all times in construction areas and any other locations that have been designated as a “Hard Hat Area”.

4.2 Hard hats shall meet the requirements of ANSI Z89., *Safety Requirements for Industrial Head Protection*.

4.3 Hard hats that have been altered by drilling or cutting will not be permitted.

4.4 Welders are required to wear hard hats when in a hard hat area. Soft cap welding is not

permitted.

4.5 Hard hats shall be worn with the bill facing forward. The only exception will be welders whose hard hats need to be reversed to accommodate welding shields.

4.6 Equipment operators shall wear hard hats unless a fully enclosed cab protects them.

4.6.1 Operators shall immediately don hard hats upon exiting the protection of the cab.

4.7 "Bump caps" and metallic hard hats are prohibited on Company projects.

4.8 Hard hats will be inspected regularly for signs of cracking, chips, or other visible defects and replaced when damaged. Headband assemblies must be in good condition and should be exchanged whenever they become broken or weakened.

5.0 Eye/Face Protection

5.1 Employees shall wear safety glasses with side shields in all work areas except for offices.

5.1.1 Eye protection will be worn in offices if the task to be performed creates a potential for eye injury.

5.2 Safety glasses shall meet the requirements of ANSI Z87.1, *American National Standard for Occupational and Educational Personal Eye and Face Protection Devices*.

5.3 Employees requiring prescription eyewear must wear glasses with frames and lenses meeting ANSI specifications or wear protective eyewear over their corrective lenses.

5.4 Visitors wearing prescription eyewear must meet the approved applicable standards with side shields or wear goggles or other protective eyewear over their corrective lenses.

5.5 Additional eye and/or face protection, such as goggles, face shields, and welding shields will be required when engaged in operations such as welding, burning, grinding, chipping, handling chemicals, corrosive liquids, molten materials, drilling, using powder-actuated tools, sandblasting, pouring concrete, etc.

5.6 Employees whose presence is required in close proximity to tasks requiring additional eye protection will wear the same level of protection.

5.7 Welder's helpers shall wear filtered safety lenses with the correct color density to provide protection against welder's flash.

5.8 Equipment operators shall be required to wear protective eyewear unless a fully enclosed cab protects them.

5.8.1 Operators shall immediately don safety glasses upon exiting the protection of the

cab.

6.0 Hearing Protection

6.1 Hearing protection shall be worn when employees are subjected to sound levels equal to or exceeding 85 dBA based on a time-weighted average when measured on the A-scale of a standard sound level meter at slow response.

6.2 When administrative and/or engineering controls fail to reduce sound levels below permissible noise exposure levels based on an eight-hour time-weighted average, the company

6.3 Ear protection devices (ear plugs) inserted in the ear shall be fitted or determined by a competent person.

6.4 Hearing protection required signage shall be posted in work areas that exceed permissible noise exposure levels.

7.0 Work Clothing

7.1 Minimum acceptable work clothing for all employees working on project sites includes long pants, safety footwear, and a shirt that completely covers the shoulders with a minimum 4-inch sleeve.

7.2 Additional work clothing such as long-sleeve shirts, flame retardant clothing, etc., may be required for employees visiting and/or working in operating areas of client facilities.

7.3 Loose clothing, rings, watches, necklaces, or having long hair (that is not effectively contained and covered) – all of which may catch in power-driven equipment, shall not be permitted.

7.4 Employees required to work in the immediate vicinity of moving equipment or other vehicular traffic shall wear, as a minimum, orange or red traffic vests.

7.5 Reflective traffic vests shall be worn when such activities are being conducted at night and other periods where low light conditions are present.

8.0 Hand Protection

8.1 Employees performing tasks that present a potential for hand injury shall wear the appropriate gloves suitable for the hazard present.

8.2 Employees working on construction projects shall wear gloves during all work activities, unless the use of gloves would increase the hazard potential of the task.

8.3 Employees operating drill presses, power saws, bench grinders, and similar rotating tools and machinery shall not wear gloves.

8.4 Gloves such as neoprene, nitrile, butyl rubber, polyvinyl alcohol, etc., may be required when handling specific chemicals. The appropriate MSDS shall be reviewed to determine appropriate PPE for hand protection.

8.5 Cut resistant or "Kevlar" gloves shall be worn when handling or working around objects with sharp edges or hot surfaces.

8.6 Leather or other approved gloves shall be worn during welding and burning operations.

9.0 Foot Protection

9.1 When foot protection is necessary to protect employees from the hazards identified, the employee(s) assigned to those work areas or tasks shall be required to wear boots that provide adequate protection and meet the specifications of ANSI Z41 – *American National Standard for Personal Protection - Protective Footwear*.

9.2 All employees on construction projects are required to wear protective (above the ankle all leather steel toe work boot) footwear.

9.3 Additional protective footwear protecting the toes and metatarsal area of the foot shall be worn when performing tasks that present a potential for serious foot injury (e.g. operating jackhammers, drilling to break concrete, operating ground compactors, etc.).

9.4 Employees working with wet concrete shall wear rubber boots.

9.5 Open-toe shoes, sandals, tennis shoes, cowboy boots, athletic shoes, and other such footwear shall not be permitted on construction sites.

9.6 Boots shall be maintained in good repair and those with worn heels or thin or worn soles shall not be permitted.

10.0 Life Jackets/Vests

10.1 Employees required to work over or near water more than 36 inches in depth shall be required to wear a U.S. Coast Guard approved life jacket or buoyant work vest.

11.0 Other

11.1 PPE requirements for Fall Protection are contained in Section 7 of this manual.

11.2 PPE requirements for Respiratory Protection are contained in Section 16 of this manual.

16 - Respiratory Protection

1.0 Purpose

1.1 O&G Industries, Inc. is committed to protecting its employees from exposure to hazardous quantities of airborne dusts, fumes, mists and vapors. It is the purpose of this program to establish minimum requirements for the safe, practical use of respirators in the work environment.

2.0 Scope

2.1 This program applies to all O&G Industries, Inc. employees and subcontractors who wear respiratory protection, regardless of whether the protection is required or used merely as a precautionary measure.

3.0 Definitions

3.1 Air-purifying Respirator – a respirator with an air-purifying filter, cartridge, or canister that removes specific air contaminants by passing ambient air through the air-purifying element.

3.2 Atmosphere-Supplying Respirator – a respirator that supplies the respirator user with breathing air from a source independent of the ambient atmosphere, and includes supplied-air respirators (SARs) and self-contained breathing apparatus (SCBA) units.

3.3 Competent Person – the person designated must meet two qualifications: they should have an excellent working knowledge of the respiratory protection procedures or methods and should have sufficient authority to promptly prevent and/or correct hazardous conditions.

3.4 Hazardous Atmosphere – an atmosphere that may expose employees to the risk of death, incapacitation, impairment of ability to self-rescue, injury or acute illness.

3.5 Immediately Dangerous to Life or Health (IDLH) – any atmosphere that poses an immediate hazard to life or produces immediate irreversible debilitating effects on health.

3.6 Oxygen Deficiency – the concentration of oxygen, by volume, below which atmosphere supplying respiratory protection must be provided. It exists in atmospheres where the percentage of oxygen, by volume, is less than 19.5 percent.

3.7 Permissible Exposure Limit (PEL) – the OSHA established time-weighted average (TWA) concentration of a contaminant that shall not be exceeded.

3.8 Program administrator – the qualified person assigned to administer or oversee the respiratory protection program and conduct the required evaluations of program effectiveness.

3.9 Qualitative fit test (QLFT) – a pass/fail fit test to assess the adequacy of respirator fit that relies on the individual's response to a test agent.

3.10 Quantitative fit test (QNFT) – an assessment of the adequacy of respirator fit by numerically measuring the amount of leakage into the respirator.

3.11 Time-weighted average (TWA) – the average concentration of a contaminant in air during a specific time period.

4.0 Responsibilities

4.1 The Site Superintendent is responsible for the proper implementation of this program.

5.0 General

5.1 Every consideration will be given to the use of effective engineering controls to eliminate or reduce exposure to respiratory hazards to the point where respirators are not required. However, when feasible engineering controls are not effective in controlling toxic substances, the Company will provide appropriate respiratory protective equipment.

5.2 Employees required to use respiratory protective devices because of exposure to toxic substances will wear respiratory protective devices as a condition of employment. Employee required to use respirators will be medically screened, thoroughly trained in their use, properly fitted, and appropriately tested.

6.0 Medical Clearance

6.1 Using a respirator may place a physiological burden on employees that varies with the respirator type worn, the workplace conditions in which the respirator is used, and the medical status of the employee.

6.2 The Company shall provide medical evaluations to employees prior to fit-testing, issuance and use of respiratory protection devices. Medical evaluations shall be under the direct supervision of a licensed physician.

6.3 When conducting the initial medical evaluation, the OSHA Respirator Medical Evaluation Questionnaire, 1910.134 Appendix C or equivalent, shall be used.

6.4 In addition to the standardized questionnaire, the physician must also be furnished with:

6.4.1 A copy of the latest OSHA Standard governing the type of exposure to which the employee will be subjected;

6.4.2 A description of the employee's duties as they relate to the exposure, the anticipated exposure level,

6.4.3 A description of the respiratory protective equipment and additional protective clothing and equipment to be used;

6.4.4 Any temperature and humidity extremes that may be encountered; and

6.4.5 Any available information from previous medical evaluations of the employee.

6.5 At the conclusion of the evaluation, the physician will submit a written opinion to the Company that will include the results of the medical evaluation and any recommendations from the physician concerning the employee's limitations and follow-up examinations if required.

6.6 The Company must furnish a copy of the physician's opinion to the affected employee within thirty (30) days.

6.7 Medical evaluations and questionnaires shall be administered confidentially during the employee's normal working hours.

7.0 Hazard Evaluation and Selection of Equipment

7.1 The Site Superintendent will perform a work place hazard evaluation prior to the start of work to determine where respiratory protection may be appropriate (for example, when personal exposures may be in excess of the most stringent applicable personal exposure limits or where a respirator is appropriate as a precautionary form of personal protection).

7.2 The Site Superintendent will determine the appropriate respirator to be used based on hazards present at the worksite.

7.3 Each employee required to wear (or requesting) respiratory protection will be assigned a respirator for his/her exclusive use. Only respiratory equipment provided by O&G Industries, Inc. may be used, subcontractors will provide their own respiratory protection equipment.

7.4 Air Purifying Respirators

7.4.1 General Considerations and Limitations

7.4.1.1 Chemical cartridge respirators shall not be used in environments immediately dangerous to life or health (IDLH) or in atmospheres containing less than 19.5 percent oxygen.

7.4.1.2 Chemical cartridge respirators shall not be used for exposure to air contaminants that cannot be easily detected by odor or irritations.

7.4.1.2.1 For example, cartridge respirators should not be used to protect against methylene chloride or hydrogen sulfide.

7.4.1.2.2 The former is odorless and the latter, while foul smelling, paralyzes the olfactory nerve so quickly that odor detection is unreliable.

7.4.1.3 Full facepiece respirators must be used when working in environments where concentrations are irritating to the eyes.

7.4.1.4 Chemical cartridge respirators cannot be used for protection against gases that are not effectively stopped by chemical filters utilized (e.g. carbon monoxide).

7.4.2 Cartridge Selection

7.4.2.1 The Site Superintendent will select the cartridge or cartridge/filter group that best fits the type of exposure.

7.4.2.2 Using the wrong cartridge and filter may be equivalent to using no respirator at all. For example, acid gas respirators cannot be used for protection against organic vapors. However, an organic vapor-acid gas respirator can be used for one or both these exposures. Check and recheck cartridge labels to ensure that the correct types are issued.

7.4.3 Use of Air-Purifying Respirators

7.4.3.1 After correct cartridges have been selected, screw the cartridge into the facepiece after checking it for intactness (see Respirator Inspection, Care, Maintenance, and Storage in Section 11 below).

7.4.3.2 Ensure that cartridge seals (usually part of the packaging) have been removed.

7.4.3.3 Do not use a cartridge after the expiration date printed on the label.

7.4.3.4 If the facepiece and cartridge are used by only one employee and the cartridge has not been exhausted, it may be resealed by the worker and reused at a future time until cartridge exhaustion.

7.4.3.5 Inspect, clean, and maintain respirators as outlined in the Respirator Inspection, Care, Maintenance, and Storage in Section11 below .

7.4.3.6 Most respirator manufacturers now supply a given model respirator in different sizes so that many workers can be fitted with the same brand of respirator.

7.5 Powered Air-Purifying Respirators

7.5.1 Powered air-purifying respirators protect against particulates and/or gasses and vapors.

7.5.1.1 A significant advantage of a powered air-purifying respirator is that it usually supplies air at a positive pressure so that any leakage is outward from the facepiece.

7.5.1.2 It can be used with a helmet, hood, or facepiece. Air can be supplied by a user-mounted, battery-powered backpack purifier or by a stationary pump through up to 25 feet of low pressure hose.

7.5.1.3 It has good applicability to abrasive blasting, grinding, pesticide spraying, and operations using asbestos.

7.5.2 Generally, powered air-purifying units can be used for up to 100 times the PEL for dusts, mists, and fumes when used with filters approved for materials with PELs not less than 0.05 mg/m3 or 2 mppcf and nuisance dusts. Such respirators can be used for up to 3000 times the PEL when used with high-efficiency filters.

7.5.3 For use in chemical vapor or gaseous atmospheres, the MUC depends on the chemical cartridge or canister used. In all cases check the manufacturer's specifications and the NIOSH/MSHA approval for the particular configuration used. Consideration should first be given to standard air-purifying units, supplied air devices, and SCBA.

7.6 Self-Contained Breathing Apparatus

7.6.1 The self-contained breathing apparatus (SCBA) affords complete respiratory protection in any atmosphere for which the lungs are the principal route of entry into the body.

7.6.1.1 They supply the wearer with cool, non-contaminated breathing air, as required by the wearer, at approximately ambient atmospheric pressure. (for specific instructions on SCBA units, consult the SCBA manufacturer's manual)

7.6.2 Component Parts

7.6.2.1 A cylinder and valve to contain a supply of compressed air.

7.6.2.2 A high-pressure, flexible hose that routes the compressed air from the cylinder to the regulator.

7.6.2.3 An audible alarm that sounds to indicate low cylinder air pressure.

7.6.2.4 A pressure-demand regulator that reduces the cylinder pressure to a breathable pressure and supplies the wearer with air in direct response to breathing requirements.

7.6.2.4.1 Entry and re-entry into immediately dangerous or hazardous atmospheres requires a pressure-demand regulator.

7.6.2.5 A facepiece assembly consisting of a rubber facepiece and lens with headband, exhalation valve, and breathing tube.

7.6.2.6 A carrier and harness on which the cylinder is mounted and by which the entire apparatus is worn.

7.6.3 General Check-Out Procedure

7.6.3.1 A check of the breathing apparatus is absolutely necessary to ensure proper operation, and records should be kept of such inspections. The following should be accomplished:

7.6.3.1.1 Put on breathing apparatus. Don facepiece.

7.6.3.1.2 Check its normal regulator cycling under exertion or extremely deep breaths.

7.6.3.1.3 Check functioning of emergency bypass.

7.6.3.1.4 Disconnect breathing tube from regulator, and place bottom of tube tightly on palm. Inhale to check seal. Reconnect breathing tube.

7.6.3.1.5 Take off breathing apparatus, and close cylinder valve.

7.6.3.1.6 Observe both gauges to see if they correspond, and check for air leaks in system.

7.6.3.1.7 Crack emergency bypass or use facepiece, and slowly reduce air pressure on regulator gauge to determine that the audible alarm activates at the proper pressure.

7.6.3.2 Check:

7.6.3.2.1 Condition of straps on harness.

7.6.3.2.2 Tightness of screws and fasteners on:

7.6.3.2.2.1 Straps;

7.6.3.2.2.2 Regulator bracket; and

7.6.3.2.2.3 All valve handles.

7.6.3.2.3 Locking devices on:

7.6.3.2.3.1 Main line valve;

7.6.3.2.3.2 Cylinder valve; and

7.6.3.2.3.3 Carrier, to secure cylinder.

7.6.3.2.4 Holes in diaphragm cap on regulator to see if open.

7.6.3.2.5 Facepiece:

7.6.3.2.5.1 Should be clean;

7.6.3.2.5.2 Headband should be in good condition;

7.6.3.2.5.3 Exhalation valve not sticking or held open;

7.6.3.2.5.4 Inhalation valve not sticking or held open; and

7.6.3.2.5.5 Speaking diaphragm and gasket installed correctly.

7.6.3.2.6 Gaskets should be in good condition at:

7.6.3.2.6.1 Regulator side of breathing tube;

7.6.3.2.6.2 Facepiece where breathing tube connects;

7.6.3.2.6.3 Speaking diaphragm assembly; and

7.6.3.2.6.4 O-ring in coupling that connects to cylinder valve.

7.6.3.2.7 Audible alarm bell cap is tight.

7.6.3.2.8 All threads in good condition.

7.6.3.2.9 Hydrostatic test data is current.

7.6.3.2.10 Cylinder pressure at least 1500 psi, 1800 psi, or 4000 psi, depending on model.

7.6.3.2.11 Sanitize facepiece as outlined in Respirator Inspection, Care, Maintenance, and Storage below.

7.6.3.2.12 Return facepiece to plastic bag.

7.6.3.3 NOTE: If diaphragm cap is removed to check condition of diaphragm and level assembly, then unit must be correctly reassembled to operate properly. If diaphragm is removed, an operational test of SCBA must be performed before returning unit to service.

8.0 Warnings Related to Respirator Selection and Use

8.1 Failure to properly select the appropriate respirator for all materials and concentrations to which the respirator wearer may be exposed may result in serious illness, disability, or death of the wearer.

8.2 Only self-contained positive-pressure breathing apparatus are designed for use:

8.2.1 In oxygen-deficient atmospheres (an atmosphere of less than 19.5 percent oxygen by volume at sea level);

8.2.2 In poorly-ventilated areas or confined spaces such as tanks, small rooms, tunnels, or vessels unless the confined space is well ventilated and the concentration of toxic contaminants is known to be below the upper limit recommended for the respirator;

8.2.3 In atmospheres where the concentrations of toxic contaminants are unknown or are IDLH;

8.2.4 For firefighting;

8.2.5 At concentrations of substances higher than the upper limits recommended for air-purifying respirators.

8.2.6 Immediately leave the area and replace the respirator if:

8.2.6.1 Breathing becomes difficult;

8.2.6.2 Dizziness or other distress occur;

8.2.6.3 Wearer senses irritation, or smells or tastes the contaminants;

8.2.6.4 If the respirator becomes damaged.

8.2.7 The respirator selected must properly fit the wearer.

8.2.7.1 To ensure that the respirator fits and operates properly, carefully follow fitting instructions, fit tests, and fit checks outlined in the instruction booklet that accompanies each respirator.

8.2.8 If the worker is exposed to two or more contaminants for which different air purifying elements are recommended (such as ammonia and benzene), and if a combination element is not available, then an air-supplied respirator should be used.

8.2.9 Some toxic contaminants are readily absorbed through the skin. In such cases appropriate gloves and/or protective clothing may be required to protect other areas of the body that might be exposed to the contaminant.

8.2.10 Individuals with beards or other facial hair that passes between the sealing flange of the respirator facepiece and the wearer's face should not use respirators. Facial hair may cause leakage or may interfere with proper operation of the respirator exhalation valve, thereby exposing the wearer to the hazardous contaminants.

8.2.11 8. Air-purifying respirators should not be used for sandblasting, or for gas or vapor contaminants with poor warning properties.

8.2.12 Any air-purifying respirator, when properly selected and fitted, will significantly reduce but not completely eliminate breathing of contaminant(s) by the respirator wearer.

8.2.12.1 The wearer, when working in atmospheres containing substances such as asbestos (reputed to cause cancer in amounts below their TLV), will obtain better protection from a continuous-flow or positive-pressure air-supplied respirator.

9.0 Special Considerations for Respirator Use

9.1 User Fit Checks

9.1.1 The respirator wearer is required to conduct positive and negative pressure fit checks each time he or she dons a respirator and before entering a contaminated area.

9.1.1.1 In the positive pressure fit check, the wearer closes off the exhalation valve by gently placing a palm over the valve and gently exhaling into the facepiece. The fit is considered satisfactory if a slight pressure builds up in the facepiece without any evidence of outward leakage.

9.1.1.2 In the negative pressure fit check, the wearer closes of the inlet(s) with a palm(s) and inhaling gently so that the facepiece collapses slightly. The breath is held for about 10 seconds. If the facepiece remains slightly collapsed and no inward leakage of air is detected, the tightness of the respirator is considered satisfactory.

9.2 Facial hair lying between the sealing surface of a respirator facepiece and the wearer's skin will prevent a good seal.

9.2.1 Except with positive-pressure air-line respirators, powered air-purifying respirators, and pressure-demand SCBA, a negative pressure exists within the mask upon inhalation; a poor seal will permit contaminated air to enter the facepiece.

9.2.2 Even a few days' growth of beard can permit contaminant penetration.

9.2.3 Respirators should not be worn when conditions prevent a good seal of the facepiece to the face.

9.2.4 Facial hair in the form of beards, long mustaches, long sideburns, and stubble should not be permitted on workers required to wear respirators if the hair comes between the facepiece sealing surface and the face.

9.3 Workers wearing corrective eye glasses present a special problem with respect to respiratory protection.

9.3.1 Spectacle temple bars or straps that pass between the sealing surface of a full facepiece respirator and the wearer's face prevent a good seal and thus, must not be worn.

9.3.2 Spectacles with short temple bars that do not interfere with respirator sealing and are taped to the worker's face may be used temporarily.

9.3.3 Special corrective lenses or spectacle inserts that can be permanently mounted inside a full facepiece respirator are available from most manufacturers.

9.3.3.1 Such corrective lenses should be mounted in the facepiece so that it ensures good vision and comfort.

9.3.4 Spectacles or goggles may also interfere with quarter- or half-mask sealing.

9.3.4.1 In this case a full facepiece respirator should be used.

9.3.5 Contact lenses shall not be worn while wearing a respirator in a contaminated atmosphere.

9.3.5.1 Contaminants may get into the eyes and cause severe irritation and/or discomfort with quarter- or half-masks.

9.3.5.2 Full facepieces can pull at the side of the eye and cause the lens to pop out.

9.4 Under cold weather conditions a number of problems can develop, such as fogging of full facepiece respirators, valve sticking, and rubber stiffness that prevents a good facial seal.

9.4.1 Fogging of full facepiece respirators can be eliminated easily by installing a nose-cup into the facepiece. This device, available from most manufacturers, deflects the exhalation breath away from the cold facepiece lens.

9.4.2 Defogging solution should also be used.

9.5 Under some conditions it is necessary for respirator wearers to communicate with other personnel within or outside the contaminated area.

9.5.1 When this is necessary, special communicating equipment, generally available from the respirator manufacturer, can be installed inside the facepiece.

9.5.2 If it is necessary to penetrate the facepiece or alter the respirator in any way to install communications equipment, check with the respirator manufacturer to ensure that NIOSH/MSHA approval will not be voided by such installation.

10.0 Respirator Fit-Testing

10.1 Prior to use of any respirator with a negative or positive pressure tight-fitting facepiece, the employee must be fit tested with the same make, model, style, and size of respirator that will be used.

10.2 Employees using tight-fitting facepiece respirators shall pass the appropriate qualitative (QLFT) or quantitative (QNFT) fit test.

10.3 Employees will be provided with a selection of at least three different respirator models and sizes so that the respirator is acceptable to, and correctly fits, the user.

10.4 Respirator fit testing shall be conducted in compliance with OSHA accepted fit test protocols outlined in 29 CFR 1910.134 Appendix A.

11.0 Respirator Inspection, Care, Maintenance & Storage

11.1 Inspection

11.1.1 All respirators shall be inspected by the user before each use, and at least monthly by a competent person to ensure that they remain in satisfactory working condition.

11.1.2 Respirators shall be thoroughly inspected during and after each cleaning.

11.1.3 Respirators maintained for use in emergency situations shall be inspected at least monthly and checked for proper function before and after each use.

11.1.4 Respirator inspections must include a check of respirator function, tightness of connections, and the condition of various parts including, but not limited to, facepiece, head straps, valves, connecting tube, cartridges, canisters or filters, and a check of elastromeric parts for pliability and signs of deterioration.

11.1.4.1 Monthly inspections shall be documented.

11.1.4.2 Air-Purifying respirators should be inspected as follows before and after each use:

11.1.4.2.1 Examine the facepiece for:

11.1.4.2.2 Excessive dirt;

11.1.4.2.3 Cracks, tears, holes, or physical distortion of shape from improper storage;

11.1.4.2.4 Inflexibility of rubber facepiece (stretch and knead to restore flexibility);

11.1.4.2.5 Cracked or badly scratched lenses in full facepieces

11.1.4.2.6 Incorrectly mounted full facepiece lenses, or broken or missing mounting clips; and

11.1.4.2.7 Cracked or broken air-purifying element holder(s), badly worn threads, or missing gasket(s), if required.

11.1.4.3 Examine the head straps or head harness for:

11.1.4.3.1 Breaks;

11.1.4.3.2 Loss of elasticity;

11.1.4.3.3 Broken or malfunctioning buckles and attachments; and

11.1.4.3.4 Excessively worn serrations on head harness that might permit slippage (full facepiece only).

11.1.4.4 Examine the exhalation valve for the following after removing its cover:

11.1.4.4.1 Foreign material, such as detergent residue, dust particles, or human hair under the valve seat;

11.1.4.4.2 Cracks, tears, or distortion in the valve material;

11.1.4.4.3 Improper insertion of the valve body in the facepiece;

11.1.4.4.4 Cracks, breaks, or chips in the valve body, particularly in the sealing surface; and

11.1.4.4.5 Improper installation of the valve in the valve body.

11.1.4.5 Examine the air-purifying element for:

11.1.4.5.1 Incorrect cartridge, canister, or filter for the hazard;

11.1.4.5.2 Incorrect installation, loose connections, missing or worn gasket(s), or cross-threading in the holder;

11.1.4.5.3 Expired shelf-life date on the cartridge or canister; and

11.1.4.5.4 Cracks or dents in the outside case of the filter, cartridge, or canister indicated by the absence of sealing material, tape, foil, etc. over the inlet.

11.1.4.6 If the device has a corrugated breathing tube, examine it for:

11.1.4.6.1 Broken or missing end connectors;

11.1.4.6.2 Missing or loose hose clamps;

11.1.4.6.3 Deterioration (determined by stretching the tube and looking for cracks)

11.1.4.7 Examine the harness of a front- or back-mounted gas mask for:

11.1.4.7.1 Damage or wear to the canister holder that may prevent its being held in place;

11.1.4.7.2 Broken harness straps for fastening;

11.1.4.8 Atmosphere-Supplying respirators should be inspected as follows before and after each use:

11.1.4.8.1 If the device is a tight-fitting facepiece, follow procedures outlined under air-purifying respirators, except for those pertaining to the air-purifying elements.

11.1.4.8.2 If the device is a hood, helmet, blouse, or full suit, follow these procedures:

11.1.4.8.2.1 Examine the hood, blouse, or full suit for rips and tears, seam integrity, etc.;

11.1.4.8.2.2 Examine the protective headgear, if required, for general condition with emphasis on the suspension inside the headgear;

11.1.4.8.2.3 Examine the protective face shield, if any, for cracks, breaks, or impaired vision;

11.1.4.8.2.4 Ensure that the protective screen is intact and secured correctly over the face shield;

11.1.4.8.2.5 Examine the air supply systems for integrity and good condition of regulators, air supply lines and hoses, including attachment and end fittings.

11.1.4.8.3 In addition to the above, for self-contained breathing apparatus (SCBA) units also determine that:

11.1.4.8.4 Breathing air cylinders are fully charged and recharged when the pressure falls to 90 percent of the manufacturer's recommended pressure level

11.1.4.8.5 Low level alarms are functioning properly on closed-circuit SCBA, a fresh canister of CO2 (carbon dioxide) sorbent is installed.

11.2 Care and Maintenance

11.2.1 Cleaning the Respirator

11.2.1.1 Respirators shall be cleaned and disinfected using the procedures recommended by the manufacturer.

11.2.1.2 When used routinely, respirators should be exchanged frequently for cleaning and disinfecting by specific individuals trained in the proper procedures.

11.2.1.3 Where respirators are individually assigned and the employee is responsible for cleaning, the employee will be trained on proper cleaning and disinfecting procedures.

11.2.1.4 It is recommended that respirators in use be returned daily to a centralized cleaning and maintenance area and that cleaning, disinfecting, and any required maintenance be performed by employees trained in respirator care and maintenance.

11.2.1.5 Respirator wipes are not an adequate substitute for the cleaning and disinfecting process.

11.2.2 Maintenance and Repair

11.2.2.1 Respirators that fail an inspection or are otherwise found to be defective shall be removed from service and discarded or repaired.

11.2.2.2 Employees involved in respirator maintenance and repair shall be thoroughly trained.

11.2.2.3 Repairs and adjustments shall never be made beyond the manufacturer's recommendations.

11.2.2.4 All replacement parts shall be supplied by the respirator manufacturer. No substitutes shall be permitted.

11.2.3 Storage

11.2.3.1 When they are not being used, respirators shall be stored in individually sealed plastic bags and stored at locations established by project management in order to protect them against dust, sunlight, extreme temperatures, excessive moisture, or damaging chemicals.

11.2.3.2 Respirators should not be stored in tool boxes, gang boxes or any other location that might subject them to distortion or damage.

12.0 Training

12.1 The Site Safety Department and/or Superintendent will train and assist site employees in the proper selection, use, handling, storage and maintenance of respiratory equipment. Training of affected employees is conducted upon assignment and at least annually thereafter.

12.1.1 Retraining will also be provided whenever an employee is assigned a new type of respirator or demonstrates deficiencies, with regards to proper use, care/maintenance and storage of respirators.

13.0 Program Evaluation

13.1 Periodic evaluations shall be conducted and documented to ensure that this procedure is being implemented properly during all phases of operation involving the use of respiratory protective equipment.

13.2 Routine walk-through inspections during these activities shall be conducted to monitor supervisor and employee compliance with the requirements of this procedure.

13.3 This procedure shall be revised as necessary to incorporate process improvements based on program evaluations and employee feedback.

14.0 Recordkeeping

15.0 All records pertaining to the employee's medical examination and evaluation shall be retained by the employer for a period of thirty (30) years plus the duration of employment.

16.0 The following records shall be maintained on file:

16.1 Respirator training records;

16.2 Fit test records;

16.3 Maintenance and repair records;

16.4 A copy of the respiratory protection program; and

16.5 Documented audits.

17 – Concrete and Masonry

1.0 Purpose

1.1 Most OSHA regulations that may apply to concrete work are found in other Subparts of the Code of Federal Regulations (such as Personal Protective Equipment, Fall Protection). However, there are some general safety methods common to all concrete work which OSHA specifies in Subpart Q- Concrete and Masonry Construction. This program provides basic guidelines for compliance and worker safety.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 General Requirements

3.1 Gloves, rubber boots, face protection and hardhats will be worn when pumping, pouring or spreading out concrete.

3.2 Cement burns are a potential hazard, especially during the summer months.

3.2.1 The best and easiest first aid treatment is water, which will be available to wash concrete off the skin before it can burn.

3.2.2 Vinegar or a commercial neutralizer can be used to counter act the burning effect.

3.2.3 Report all burns to the foreman/supervisor at once.

3.3 Concrete weighs 150 pounds per cubic foot. Personnel must maintain stable footing and good balance to avoid strains and sprains for over-lifting and shoveling.

3.4 Before using bull floats, because of their long handles, a careful review of the area being worked should be done to determine if any electrical equipment or wires are close.

3.4.1 If so, the bull float handle is required to be insulated, be of non-conductive material, or shortened to a safe working length.

3.5 Masonry saws are required to have a semicircular guard which can retain blade fragments in the event of blade breakage.

3.5.1 This guarding requirement is for all tools.

3.6 Tremies or other concrete conveyances are required to be secured with wire rope (or equivalent) in addition to the regular couplings and connectors.

3.7 When repairs or maintenance work is performed on concrete pumps, mixers, compressors, etc.

3.7.1 The equipment is required to have the power source locked out with a "Do Not Start," or similar tag at the lock.

3.8 Workers are not allowed to ride the concrete bucket, or backhoe bucket.

3.9 When concrete buckets are used, no workers shall be allowed to work directly under the bucket while the bucket is being raised, or lowered into position.

3.10 Concrete buckets shall be routed so that the fewest (preferably no) workers are located under its path.

3.11 No employee will be permitted to place or tie reinforcing steel more than six feet above an adjacent working surface without the use of conventional fall protection devices (harness and lanyard, guardrails, or safety net).

3.12 Reinforcing steel, when ends are exposed at a location which could cause injury if a worker would fall onto or into the ends shall be protected.

3.12.1 Plastic end caps are commercially available for this purpose, however, in some areas protecting the worker with a board laid flat over the rebar ends is preferred.

3.13 Reinforcing steel for walls, columns, and other similar vertical structures shall be braced to prevent overturning or collapse.

3.14 Roll reinforcing mesh shall be turned over (curl down), or have its end secured to prevent mesh from recoiling.

3.15 Concrete formwork shall be designed, fabricated, erected, supported, braced, and maintained so that it will be capable of supporting any loads (vertically and horizontally) that may reasonably be placed upon it.

3.16 Concrete formwork shall not be removed unless in accordance with plans/specification conditions, or when none are present, then by using test cylinder results to verify adequate concrete strength.

3.17 Power troweling machines will be equipped with trigger switches that automatically turn off the equipment when pressure on the switch is released.

3.18]Always provide access across rebar prior to placement. Good access will prevent injuries caused by slips, trips and falls.

4.0 Masonry Construction:

4.1 Limited Access Zone

4.1.1 Established whenever a masonry wall is being constructed.

4.1.1.1 This limited access zone will be established prior to the start of construction of the wall.

4.1.1.2 Be equal to the height of the wall to be constructed plus 4 feet, and will run the entire length of the wall.

4.1.1.3 Be established on the side of the wall that does not have scaffold.

4.1.1.4 Be restricted to entry by employees actively engaged in constructing the wall. No other employees will be permitted to enter the zone.

4.1.2 All masonry walls over 8 feet in height will be braced to prevent overturning and collapse unless the wall is adequately supported.

18 – Fire Prevention and Protection

29 CFR 1926.24 and 29 CFR 1926 Subpart F

1.0 Purpose

1.1 O&G Industries, Inc. has developed this Fire Prevention and Protection Plan to control the causes of fire, prevent loss of life and property damage by fire, and to comply with the Occupational Safety and Health Administration's (OSHA) Fire Prevention and Protection Standard, 29 CFR 1926.24. This program provides employees with information and guidelines that will assist them in recognizing, reporting, and controlling fire hazards.

2.0 Scope:

2.1 All employees and subcontractors are responsible for complying with the provisions of this program when working for O&G Industries, Inc.

3.0 Responsibility:

3.1 *Management*

3.1.1 The Director of Safety is responsible for the overall directing of this program. The Site Safety Manager will provide the following controls to protect workers from forseeable fire hazards and the risk of fire-related emergencies while working on O&G sites:

3.1.1.1 Review of the plan on an annual basis to ensure it remains effective;

3.1.1.2 Update this plan as procedures or conditions change;

3.1.1.3 Provide adequate safe work procedures;

3.1.1.4 Provide training and information on known site hazards;

3.1.1.5 Allotting adequate resources to superintendents and employees.

3.2 *Superintendents*

3.2.1 Superintendents, with assistance from the O&G Site Safety Manager, are responsible for implementing this program on O&G job sites where they are working. Superintendents will be responsible for the following:

3.2.1.1 Ensuring that all O&G Industries, Inc. employees and subcontractors receive appropriate training on fire prevention and protection before they begin working;

3.2.1.2 Making this plan readily available for all O&G Industries, Inc. employees, subcontractors and visitors;

3.2.1.3 Informing O&G Industries, Inc. employees and subcontractors when new potential fire hazards are discovered onsite; and

3.2.1.4 Communicating changes in procedures or conditions to all site personnel.

3.3 *Employees*

3.3.1 All employees shall:

3.3.1.1 Follow the established O&G Industries, Inc. hot work permit system;

3.3.1.2 Wear proper Personal Protective Equipment (PPE) at all times when performing hot work;

3.3.1.3 Store all flammable or combustible materials in an appropriate manner;

3.3.1.4 Follow established safe work practices for the use of flammable or combustible materials; and

3.3.1.5 Follow established fire emergency response procedures.

4.0 Fire Emergency Procedure:

4.1 The Fire Emergency Procedure offers instructions to aid any employee, subcontractor or visitor in properly reporting an onsite fire or emergency. The procedure will be reviewed with all O&G Industries, Inc. and subcontractor employees before they can begin working onsite. This procedure must be posted in the site office, at phones and at all employee entrances. Any updates or changes in the procedure will be discussed and communicated during site safety meetings and toolbox talks. The Fire Emergency Procedure is outlined in Attachments 1 and 2 of this document.

5.0 General Site Rules for Fire Prevention and Protection:

5.1 The following general rules will be followed by all O&G Industries, Inc. employees, subcontractors and visitors while onsite. These rules will be strictly enforced by O&G Industries, Inc. onsite management and superintendents. Any violation of these rules will result in disciplinary action up to and including removal from the project site. General site rules to be followed by all site personnel include but are not limited to the following.

5.2 Work areas shall be maintained on a regular basis. Combustible materials and debris shall not be allowed to accumulate. O&G expects all employees and subcontractors to keep work areas clean and free from fire hazards.

5.3 All flammable liquids should be stored in UL-approved safety containers.

5.4 All fuel and solvent containers shall be stored in UL-approved flammable liquid cabinets.

5.5 Transfer of flammable liquids from one container to another shall be done only when containers are electrically bonded (protected from producing an electrical charge).

5.6 Storage of any material within 10 feet of operational fire hydrants is strictly prohibited.

5.7 All temporary electrical wiring shall be installed in accordance with the requirements of OSHA Construction Industry Standard 29 CFR 1926.405.

5.8 Machinery and/or motors shall not be left running during non-working hours except as directed and by written request that details the necessity to leave machinery or equipment running, which will then be submitted for approval to O&G site management.

5.9 Solid fuel heaters are not permitted to be used on any O&G Industries, Inc. sites.

5.10 A Hot Work Permit must be completed and submitted to the O&G Industries, Inc. Site Safety Manager before any hot work can be performed.

5.11 All oxygen/acetylene torches shall be equipped with flash arresters.

5.12 Smoking is permitted in designated smoking areas only. No smoking is permitted within any enclosed buildings, whether occupied or under renovation/construction and in any areas where “No Smoking or Open Flame” signage is posted. Smoking is also not permitted in any area where flammable or combustible materials are located and near any operation that constitutes a fire hazard.

5.13 All oily rags and cloths must be taken off the site at the end of each shift for proper disposal. Items include, but are not limited to, roof tar mops, urethane wood floor applicators and painters rags. These should not be allowed to accumulate onsite.

6.0 Hot Work:

6.1 Hot work is defined as a process or procedure that could result in a fire if not properly controlled. Common examples of hot work include welding, burning, cutting, brazing, and soldering. Hot work equipment may produce high voltages or utilize compressed gases and requires special awareness training to be used safely.

6.2 Hot work performed within 35 feet in any direction of combustible materials must have a fire watch performed during the work and for at least 30 minutes after the completion of the work. The people responsible for the fire watch must be trained in fire extinguisher use and be familiar with site fire emergency procedures. Fire watch requirement and duration must be indentified on the hot work permit.

6.3 All site contractors are required to complete and submit a “Hot Work Permit” to the O&G Industries, Inc. Site Safety Manager to sign prior to performing any hot

work. All hot work must be fully described during the permitting process including the following:

6.3.1 Start and stop times (hot work is restricted to normal working hours unless otherwise authorized by O&G Industries, Inc.);

6.3.2 Location of the work;

6.3.3 Type of work to be performed (welding, cutting, brazing, burning etc.);

6.3.4 Personnel performing the work; and

6.3.5 Personnel responsible for the duration of the fire watch.

6.4 Contractors must post a copy of the hot work permit in the work area at all times while hot work is being performed. Expired permits should be turned into the O&G Industries, Inc. site safety office to be kept on file.

6.5 A sample permit and "Hot Work Precautions" checklist is included in Attachment 3, "O&G Industries, Inc. Hot Work Permit." Additional copies are available from the O&G safety department.

6.6 O&G Industries, Inc. requires anyone performing hot work to follow the O&G Industries, Inc. Hot Work Permit System and to control the hazards associated with hot work by taking the appropriate precautions. Precautions to be taken when hot work is to be performed include the following:

6.6.1 Verify that all equipment is in satisfactory operation condition;

6.6.2 Check the area for combustibles (flammable liquids, lint, dust, oily deposits and any other hidden or inconspicuous items);

6.6.3 Assure that hot work is not taking place in a flammable atmosphere, near large quantities of readily ignitable materials, or in unauthorized areas;

6.6.4 Verify that floors are free of combustibles for a radius of at least 35 feet. If the floor itself is a combustible, it should be kept wet or otherwise protected, also taking care to protect against possible electric shock;

6.6.5 Cover tightly openings or cracks in walls, floors, or ducts with fire retardant or noncombustible material if within 35 feet of the work to prevent the passage of sparks to adjacent areas;

6.6.6 Shield conveyor systems that might carry sparks to other locations;

6.6.7 If hot work is to be done on a wall, partition, ceiling, or roof, precautions should be taken to prevent ignition of combustibles on the other side by relocating combustibles, or, if not practical, providing a fire watch;

6.6.8 Do not perform any cutting or welding on pipes or other metal that is in contact with combustible materials close enough to cause ignition by heat conduction;

6.6.9 Hot work in close proximity to sprinkler heads requires the head to be protected from accidental discharge. Once hot work is completed, the sprinkler head should be put back in service;

6.6.10 Provide proper ventilation in all areas where hot work is being performed; and

6.6.11 During welding operations, all adjacent areas should be shielded with welding partitions.

6.7 If it is necessary to disable fire alarms or fire detection systems during hot work the shutdown must be scheduled through O&G Industries, Inc. Safety Manager and all other necessary parties that may be affected. A fire watch is required during any hot work performed with the fire alarm or fire detection system disabled.

7.0 Temporary Buildings:

7.1 In accordance with 1926.151.(b), and the fact that temporary buildings are often used on sites. Any temporary building constructed for use onsite must comply with the following guidelines:

7.1.1 Temporary buildings cannot be erected in an area where they will adversely affect any means of egress;

7.1.2 All temporary buildings shall be constructed of fire retardant materials, wood shall be marked with the UL Label;

7.1.3 Temporary buildings located within another building or structure must either be of noncombustible construction or of combustible construction having a fire resistance of not less than 1 hour;

7.1.4 Temporary buildings will only be heated with approved heating devices;

7.1.5 All shall be equipped with at least one (1) ABC #20 Fire Extinguisher in good working order with prominent signage denoting the location, each gang box shall also have an ABC Fire Extinguisher;

7.1.6 All shall have a 55-gallon debris container adjacent to them; and

7.1.7 Temporary buildings cannot be used to store oily rags, oily cloths, or fuels.

8.0 Water Lines:

8.1 Water lines and other fire suppression lines may need to be removed or altered while construction activities are taking place. If at any point the fire sprinkler and or standpipe system in any building needs to be disabled, a notification must be made to O&G Industries, Inc. management. Site representatives will then notify the local Fire Department and the insurance provider and make them aware of the shutdown. During construction activities certain measures can be taken ensure adequate fire water is available such as:

8.1.1 A water line shall be extended as soon as possible behind construction to supplement the Fire Extinguishers placed throughout the construction area;

8.1.2 A temporary fire department standpipe will be installed as soon as practical during the project. The standpipe will follow the project up and will be no more than 2 stories below the leading edge of construction;

8.1.3 During demolition involving combustible materials, charged hose lines, supplied by hydrants, water tank trucks with pumps, or equivalent, will be made available; and

8.1.4 Clearance of at least 36 inches shall be maintained between top level of stored material and sprinkler deflectors.

9.0 Portable Fire Extinguishers:

9.1 Portable fire extinguishing equipment (1926.150(c)(1)(i), suitable for the fire hazard involved, must be provided at convenient, conspicuously accessible locations within the site. O&G Industries, Inc. and its subcontractors will ensure portable fire extinguishers are available as follows:

9.1.1 Throughout the site, at least 1 per every 3,000 square feet of each floor and adjacent to all stairwells and so that the maximum travel distance between extinguishers does not exceed 100 feet;

9.1.2 Present during any hot work and fire watches;

9.1.3 At least one portable fire extinguisher having a rating of not less than 20-B shall be located not less than 25 ft, and no more than 75 ft, from any flammable liquid storage area located outside;

9.1.4 Each temporary building and gang box shall have at least one ABC Fire Extinguisher; and

9.1.5 Outside any building or area used for the storage or refueling of flammable or combustible liquids.

9.2 All fire extinguishers are to be checked monthly by maintenance to ensure they are adequately charged and in good working condition. Each inspection must be documented and turned into the safety office once completed. No fire extinguishers shall be removed or discharged except for fighting fire. Anyone caught discharging an extinguisher as a prank, or attempting to remove one from the site, shall be subject to immediate dismissal from the jobsite.

10.0 Flammable and Combustible Liquids:

10.1 Any flammable or combustible liquids used, stored or dispensed onsite must be done in accordance with the requirements of the OSHA Flammable and Combustible Liquids Standard 29 CFR 1926.152. General requirements for the use, storage and dispensing of flammable or combustible liquids are as follows:

10.1.1 All flammable or combustible liquids must be in UL-approved storage containers and tanks;

10.1.2 All containers must be properly labeled;

10.1.3 At no time shall gasoline, diesel fuel or kerosene be used to clean any equipment or materials;

10.1.4 Flammable or combustible liquids stored in excess of 25 gallons must be stored in an approved cabinet meeting the requirements of 1926.152(b);

10.1.5 Outside storage areas must be at least 20 feet away from any building;

10.1.6 Transfer of flammable liquids from one container to another can only be done when containers are electrically bonded; and

10.1.7 Refueling areas must have the appropriate “No Smoking or Open Flame” signage posted.

11.0 Pressurized Gas

11.1 Pressurized gas may be present in several areas onsite including tanks and pipes. All tanks and pipes onsite must be clearly marked with their contents.

11.2 When working on piping containing pressurized gas special precautions need to be taken before any cutting or “breaking” on the pipes can be performed. Precautions to be taken include but are not limited to:

11.2.1 Complete purging of the line;

11.2.2 Blanking or blinding the line (inserting gasket and metal plate that completely covers the bore so none of the contents can pass through); and

11.2.3 Double Block and Bleed (isolating a section of pipe using valves on either side of the section, then bleeding the section to be worked on).

11.3 Compressed gas cylinders used and stored onsite must be done so in accordance to the following guidelines:

11.3.1 All compressed gas cylinders must be clearly marked with Contractor's name and contents;

11.3.2 All cylinders shall be upright and secured at all times using restraints;

11.3.3 All cylinders shall be provided with safety caps. Delivery of any uncapped cylinders will not be accepted;

11.3.4 All empty cylinders must be marked as such;

11.3.5 All acetylene and fuel gas cylinders shall be separated from oxygen cylinders during storage by a minimum 25 feet or by a non-combustible barrier at least five (5) feet high with a fire resistant rating of at least one-half (1/2) hour per ANSI Z49.1.1973’

11.3.6 All oxygen and acetylene cylinders in use shall be firmly secured on a special carrier intended for this purpose;

11.3.7 Cylinder storage must be located at least 25 feet from any emergency egress routes; and

11.3.8 All cylinders shall be transported on a cart or other approved carrying device.

11.3.9 Liquefied Petroleum Gas (LP-Gas) must be used and stored in a manner in accordance with the OSHA Liquid Petroleum Gas Standard 1926.153. Basic guidelines for the use and storage of LP-Gas include but are not limited to:

11.3.9.1 LP-Gas cylinders may not be stored within any occupied buildings, existing or under construction, at any time, unless in use;

11.3.9.2 LP-Gas cylinders must be stored in a suitable ventilated enclosure or otherwise protected from tampering;

11.3.9.3 The filling of portable containers from larger storage containers must be done at least 50 feet from the nearest building;

11.3.9.4 Valves, fittings, and accessories connected directly to the container, including primary shut off valves, shall have a rated working pressure of at least 250 psig and must be of a material and designed for LP-Gas service; and

11.3.9.5 All LP-Gas cylinders must be equipped with a safety relief valve.

11.4 O&G INDUSTRIES, INC.. WILL CONFISCATE ANY COMPRESSED GAS BOTTLES NOT STORED IN AN APPROVED MANNER. THERE WILL BE A FIFTY-DOLLAR ($50.00) PER BOTTLE REPOSSESSION CHARGE.

12.0 Temporary Heat

12.1 Prior to installation of any temporary heating system, all plans must be presented to O&G Industries, Inc. in writing detailing the duration, fuel handling, safety procedures, and type of heating system. The temporary heating system plans must be approved prior to implementation.

12.2 Any temporary heating systems using propane or any other liquefied petroleum gas (LP-Gas) must have the tanks secured so they cannot be tipped or knocked over. All blower and radiant type heaters should not be aimed at any LP- Gas containers within 20 feet.

12.3 All wood building materials, tarps and blankets shall be made of fire retarding materials. Temporary plastic membrane construction enclosures and partitions, which are susceptible to burning, can be protected from fire when constructed in accordance with the requirements of NFPA 102 Standard for Temporary Membrane Structures. For example:

12.3.1 If plastic sheeting is used, a specification sheet noting fire resistive properties of the plastic will be submitted in advance O&G Industries, Inc. for review;

12.3.2 Plastic sheeting should be installed so as to not come in contact with any heating device, open flame, spark producing equipment, or spark producing procedure;

12.3.3 Exits should be properly marked and maintained, and construction personnel trained on the location of exits and fire extinguisher locations. Personnel should be retrained each time exit configurations change;

12.3.4 Fire extinguishers should be installed and maintained within 75 feet of any location inside the construction area covered by the membrane; and

12.3.5 Hot roofing material kettles should not be operated within 30 feet of any membrane structure.

12.4 All heating equipment shall be wired, piped, and operated in accordance with all applicable State, Federal/Local Codes and Regulations, and installed per the manufacturer's guidelines.

12.5 Open fires shall not be permitted on any O&G Industries, Inc. site. Any employee failing to comply with this regulation shall be subject to immediate dismissal.

ATTACHMENT 1

FIRE EMERGENCY PROCEDURE

IN CASE OF FIRE: NOTIFY O&G Industries, Inc. STAFF IMMEDIATELY

Tell **location**, **size**, and **cause** of fire, and **report any injuries.**

Click for Emergency Contact #

PROCEDURE: FIRE/EVACUATION NOTIFICATION BY AIR HORN SYSTEM

1. Fire emergency on site **(10 long blasts of air horn).**
2. Stop all machinery and power tools.
3. Follow the directions of your foreman.
4. Be prepared to evacuate. If evacuation is necessary, use stairs and/or ladders only.
5. If necessary assist in providing a clear entrance.
6. Assist in clearing street of all public traffic.
7. Await further instructions.
8. All workers are to assemble at O&G Industries, Inc.s' Designated Site Muster Area for employer man-count.

O&G INDUSTRIES, INC. WILL NOTIFY THE FIRE DEPARTMENT AND, IF NECESSARY, THE FIRST AID SQUAD

POST THIS FIRE EMERGENCY PROCEDURE AT ALL EMPLOYEE ENTRANCES AND PHONES, TRAILERS, AND OFFICES.

ATTACHMENT 2

INSTRUCTIONS FOR NOTIFYING FIRE DEPARTMENT

TELEPHONE NUMBER: 911

There is a fire at the:

Located at:

1. **Location of fire:** -- _____
2. **Size of fire:** --_____
3. **Cause of fire:** -- If known, electrical, gas, paper, etc.

Notify O&G Industries, Inc. Project Staff immediately: Reference Emergency Call List

Section 2 of this Plan

INSTRUCTIONS FOR NOTIFYING RESCUE SQUAD

TELEPHONE NUMBER: 911

There is a fire at the:

Located at:

1. **Cause of Emergency:** -_____.
2. **Number of Injuries:** _____
3. **Type of Injuries:** _____(Heart attack, broken leg, severe bleeding, unconscious and breathing, CPR is begin given, etc.)

Notify O&G Industries, Inc. Project Staff immediately.

TO BE POSTED AT ALL O&G Industries, Inc. PROJECT OFFICE TELEPHONES

ATTACHMENT 3

HOT WORK PERMIT

All temporary operations involving open flames or producing heat and/or sparks require a Hot Work Permit. This includes (but is not limited to) Welding, Cutting, Grinding, and brazing.

WARNING!

HOT WORK IN PROGRESS

WATCH FOR FIRE!

DATE: _____ (Permit good for one shift only)

PROJECT: _____

WORK TO BEGIN: _____ AM/PM ENDING AT: _____ AM/PM

LOCATION: _____

WORK TO BE DONE: _____

_____

_____

WORK TO BE PERFORMED BY: _____

NAME(S) OF FIRE WATCH: _____

OTHER SPECIAL PRECAUTIONS TAKEN: _____

_____

_____

_____

SEE PAGE TWO FOR ACKNOWLEDGMENTS

ACKNOWLEDGMENT OF PERSON PERFORMING WORK: I have been instructed and I understand the hazards, as well as the precautions necessary to do this work.

Signature of person performing work *Date & Time*

SITE SAFETY MANAGER VERIFICATION: I verify that the work site has been inspected, all necessary precautions have been taken to prevent fire, and the individual(s) listed on this permit are authorized to perform this work.

Signature of Site Safety Officer *Date & Time*

THIS SECTION TO BE FILLED OUT UPON COMPLETION OF WORK:

FIRE WATCH VERIFICATION: I have monitored the hot work area for at least 30 minutes following completion of the work and find the area to be in safe condition.

Signature of fire watch *Date & Time*

SITE SAFETY MANAGER VERIFICATION: I have inspected the work site at least 30 minutes after completion of the work and find the area to be in safe condition.

Signature of Site Safety Manager ***Date & Time***

HOT WORK SAFETY CHECKLIST: The person performing the work must complete the checklist below to ensure that the proper safety precautions have been met.

1. Have all flammable or combustible materials been removed from the work area (at least 35 feet)? **YES / NO**
2. For any flammable or combustible materials that cannot be removed, have they been properly covered by fire-resistive shields or barricaded? **YES / NO**
3. Have floors in the work area been swept clean? **YES / NO**
4. Are fixed fire-extinguishing systems in service (e.g. sprinklers, etc.)? **YES / NO**
5. Are adequate portable fire extinguishers provided? **YES / NO**
6. Has the affected area been cordoned off? **YES / NO**
7. Have wall or floor openings been properly covered? **YES / NO**
8. Is hot work equipment in good working condition? **YES / NO**
9. Fire watch provided during and for 30 minutes after work, including any breaks? **YES / NO**
10. Is hot work to be performed in a confined space (if yes, contact site H&S Management)? **YES / NO**
11. Are any enclosed equipment, tanks, ducts or containers to be worked on free from combustible gasses, vapors and dusts? **YES/NO**

19 - Lead

1.0 Purpose

1.1 These procedures establish uniform guidelines for providing a program to protect construction employees from excessive exposure to lead while working on a construction site.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this program.

3.0 General

3.1 Potential Lead Exposures

3.1.1 Operations within our Industry that may generate Lead exposure include the following:

3.1.1.1 Removal of lead containing paint.

3.1.1.2 Making intact loose painted surfaces.

3.1.1.3 Manual sanding and feathering of edges for repainting.

3.1.1.4 Machine sanding or grinding of lead painted surfaces.

3.1.1.5 Flame-torch cutting and welding of lead painted surfaces in repair, reconstruction, dismantling, and demolition work.

3.2 Codes and Regulations

3.2.1 General applicability of Codes and Regulations: Except to the extent that more explicit or more stringent requirements are written directly into these guidelines, all applicable codes and regulations have the same force and effect as if copied directly into these guidelines.

3.2.2 Those standards governing the development of this program include, but are not limited to the following:

3.2.2.1 Lead CFR Title 29, Part 1926, Section 62.

3.2.2.2 Respiratory Protection CFR Title 29, Part 1910, Section 134.

3.2.2.3 NIOSH/MSHA Approvals for Respirators CFR Title 30, Part II and 2 CFR Part 84.

3.2.2.4 Sanitation CFR Title 29, Part 1910, Section 141.

3.2.2.5 American National Standards Institute (ANSI) American National Standard. Practices for Respiratory Protection, Z88.2-1980.

3.2.2.6 Local and State Lead Standards.

3.2.2.7 SSPC: The Society for Protective Coatings.

3.3 Exposure Limits

3.3.1 The primary intention of this program is to insure the safety of each O&G Industries, Inc. worker who may be exposed to lead levels within the work place, by reducing all lead exposure levels below the Action Level (AL) and the Permissible Exposure Limit (PEL).

3.3.1.1 Action Level (AL)

3.3.1.1.1 Action Level (AL): 30 micrograms per cubic meter of air (30 ug/m3) averaged over any 8 hour period.

3.3.1.1.2 At this level, the first action must be initiated, such as employee training, medical surveillance and record keeping.

3.3.1.1.3 To maintain a consistent exposure level below the Action Level of 30 ug/m3, it may be necessary to:

3.3.1.1.3.1 Provide daily air monitoring.

3.3.1.1.3.2 Initiate Medical Surveillance or Biological Monitoring.

3.3.1.1.3.3 Provide initial and annual employee training (other than that required by 29 CFR 1926.59, Hazard Communication.

3.3.1.2 Permissible Exposure Level (PEL)

3.3.1.2.1 Permissible Exposure Limit (PEL): 50 micrograms per cubic meter of air (50 ug/m3) averaged over any 8-hour period.

3.3.1.2.2 This is the maximum level employees may be exposed to without using respiratory protection.

3.3.1.2.3 To maintain an exposure level at or above the AL but below the PEL limit of 50 ug.m3 in an 8 hour TWA, 40 ug/ms in a 10 hour TWA, and 40 ugh/m3 in a 23 hour

TWA, it may be necessary to do only the following portions of this Section:

3.3.1.2.3.1 Exposure Assessment and Protection.

3.3.1.2.3.2 Initial Medical Surveillance, Biological Monitoring, and Medical Examinations.

3.3.1.2.3.3 Specific lead training.

4.0 Competent Person(s)

4.1 Whenever the potential exists for lead exposure in a workplace, regardless of the extent of the exposure, the project manager must designate a Lead Competent Person(s), herein after referred to as the Lead CP. The Lead CP(s) must be designated, in writing, by name and title. It is essential that a Lead CP be designated for each work shift. The Lead CP(s) must be at least a member of line management assigned to the specific project and must have local certification as required.

4.1.1 In order to comply with OSHA's definition of a "Competent Person" under the Lead Standard, the individual(s) designated must be capable of identifying existing and predictable lead hazards in the workplace and have authority to take prompt corrective measures to eliminate such hazards.

5.0 Responsibilities

5.1 Safety Manager

5.1.1 It is the responsibility of the Safety Manager to provide the necessary support to the project in order to assist with the successful implementation of this program. The Safety Director will audit the jobsite as necessary to ensure program compliance.

5.1.2 It will be the responsibility of the Safety Manager or his designee to evaluate this written program at least every six (6) months and to revise and update this program as required.

5.2 Competent Person

5.2.1 This individual will have full responsibility for implementation and adherence to all of the provisions of this program. This will include responsibility for identifying lead hazards and implementing corrective action. The Competent Person's duties will also include, at a minimum, the following:

5.2.1.1 Determine, whenever possible prior to the performance of the job, whether or not lead is present within the workplace.

5.2.1.2 Ensuring the adequacy of all employee lead monitoring data and lead exposure assessments.

5.2.1.3 Ensuring that all employees with a potential exposure to lead are wearing the required protective work clothing and proper personal protective equipment, are adequately trained in the correct use of this equipment, and are maintaining appropriate exposure control methods.

5.2.1.4 Ensuring that adequate and proper hygiene facilities are provide, that employees are properly trained in the use of those facilities and that employees are using those facilities as required.

5.2.1.5 Ensuring that engineering controls are adequately designed, effectively operated, and maintained properly.

5.2.1.6 Ensuring that the work areas in which a potential for lead exposure exists, are adequately and properly demarcated and controlled.

5.2.1.7 Conducting frequent (at least daily) inspections to the work area to ensure that all of the corrective measures necessary to decrease the risk potential for lead exposure are properly implemented, correctly maintained, and appropriately effective. Comprehensive notes of these inspections must be recorded in a separate file or log and any deficiencies noted must be immediately corrected and reported to the project supervisor and the Regional Manager.

5.3 Project Manager/Superintendent

5.3.1 It is the responsibility of the Project Manger or Superintendent to ensure that all operations of the project comply with the intent of this program.

5.3.1.1 In addition, it is the responsibility of the Project Manager or Superintendent to provide the necessary training, medical surveillance monitoring and to ensure compliance via documented job site inspections.

5.4 Jobsite Employees

5.4.1 It shall be considered a condition of employment that all employees assigned to a project in which it has been determined that a potential for lead exposure exists, abide by the terms of the Lead Program.

5.5 Disciplinary Action

5.5.1 Violation of this program or refusal to comply with the requirements of this program will result in disciplinary action up to and including discharge from employment.

5.5.2

6.0 Exposure Assessment

6.1 Prior to beginning work in any workplace or operation covered by the Lead Standard, O&G will initially determine if any employee may be exposed to Lead at or above that Action Level.

6.1.1 Exposures are determined based upon airborne concentrations of lead and does not include considerations for respiratory protection.

6.2 This includes work that is done in connection with, but is not limited to, the following:

6.2.1 Demolition of structures where lead-containing materials are present.

6.2.2 Removal or encapsulation of materials containing lead.

6.2.3 Alteration, repair or renovating of structures, substrates, or portions thereof, that contain lead or materials containing lead.

6.2.4 Installation of products containing lead

6.2.5 Emergency or scheduled cleanup of lead contamination.

6.2.6 Transportation, disposal, storage or containment of lead or materials containing lead on the site or location at which the activities are to be performed.

6.2.7 Maintenance activities associated with any of the above.

6.3 Assessment may involve lead levels, which have been previously determined by the customer. The Project Manager will review with the customer's representative any pervious data obtained under normal facility working conditions. This data, obtained during normal facility operations, may not accurately reflect potential exposures to workers conducting O&G Industries, Inc. type of operations: however, overexposure during routine work should signal concern for any workers performing non-routine tasks

6.4 Protection During Assessment

6.4.1 Until exposure assessment has been completed and, an actual employee's exposure is determined, O&G Industries, Inc. employees and subcontractors who are performing the following tasks, within an area in which there is potential exposure to lead, will be treated as though they have been exposed to levels of lead in excess of 500 ug/m3, and will be provided with interim protection to include at least the following:

6.4.1.1 Task Level 1 – A respirator with a protection factor of at least 10 must be used when doing manual demolition, manual scraping, or lead-containing coatings or paint, manual sanding, scraping with a heat gun, or doing power tool cleaning with HEPA Vacuum dust protection.

6.4.1.2 Task Level 2 – A respirator with a protection factor of at least 50 must be used when using lead mortar or lead burning, when rivet busting, doing power tool cleaning without dust collection, doing clean-up activities where dry expendable abrasives are used, and abrasive blasting enclosure movement and/or removal.

6.4.1.3 Task Level 3 - A respirator with a protection factor of 50 or greater must be used when doing abrasive blasting, welding, cutting, or torch burning.

6.4.2 Appropriate respiratory protection, personal protective clothing, clean change areas, hand and face washing facilities, biological monitoring and adequate training will be provided to reduce the employee's chance of exposure.

6.5 Basis of Initial Determination

6.5.1 Except as provided under paragraph 6.5.2 of this Section, O&G Industries, Inc. will monitor employee exposures and will base initial determination on the employee exposure monitoring results and any of the following, relevant considerations:

6.5.1.1 Any information, observations, or calculations which would indicate employees are exposure to lead.

6.5.1.2 Any previous measurement of airborne lead.

6.5.1.3 Any employee complaints of symptoms which many be attributable to exposure to lead.

6.5.2 Historical data

6.5.2.1 OSHA will allow O&G Industries, Inc. to use "historical data" to satisfy the requirements for Initial Air Monitoring, for tasks other than structural dismantling or demolition activities. In order to determine if the "historical data" is close enough to current conditions, the data must meet the following specific conditions:

6.5.2.1.1 The historical data must be scientifically sound and collected using methods that are accurate. Samples should have been obtained within the past twelve-month period.

6.5.2.1.2 Work processes and practices in use when the historical data was obtained must be essentially the same as those to be used during the job for which initial monitoring will not be performed.

6.5.2.1.3 Characteristics of the lead-containing material being handled, and the prevailing environmental conditions when the historical data was obtained, must both be essentially

the same as those on the job for which initial monitoring will not be performed.

6.5.2.2 However, when objective data is used an accurate record must be established and maintained documenting the nature and relevancy of objective data which is used to assess employee exposure in lieu of exposure monitoring.

6.5.2.3 If at any time, it is determined that significant differences exist between the historical data and the current conditions, which could cause the employee's current exposure to be underestimated; this will be considered a violation of the OSHA Standard.

6.6 Initial Air Monitoring

6.6.1 When initial air sampling must be conducted for the designated operations in order to establish an 8-hour TWA of employee exposure, this initial air sampling determination may be limited to a representative sample of the exposed employee to whom it is reasonably believed will be exposed to the greatest airborne concentrations of lead in the workplace.

6.6.2 In lieu of prior sufficient and accurately established historical data, initial air sampling must be conducted while workers are using supplied-air respirators. Results of this sampling will be used to determine the type of respiratory protection required. Each job classification must be tested for at least seven (7) hours.

6.6.3 Frequency

6.6.3.1 Air sampling shall be conducted at the following frequency:

6.6.3.1.1 Below the Action Level – If the results are below the Action Level, monitoring may be discontinued. However, additional monitoring may be required if there is a change in plant operation, process, controls, or any other changes that may increase the exposure to lead.

6.6.3.1.2 At or Above the Action Level – Where a determination shows the possibility of any employee exposure at or above the Action Level, but below the PEL, monitoring which is designated at the exposure for each employee in the workplace who is exposed to lead, must be conducted. If the results are above the Action Level but below the PEL, air sampling must be conducted at least every six (6) months.

6.6.3.1.3 At or Above the Permissible Exposure Limit - With levels above PEL, monitoring will be repeated every quarter until two consecutive measurements taken 7 days apart are

below PEL, at which time, the monitoring requirement of paragraph 2 will be required. Monitoring will continue at this frequency until two consecutive measurements taken 7 days apart or below AL, at which time, the monitoring requirements of paragraph 1 will be required.

6.6.3.2 Additional Exposure Assessments

6.6.3.2.1 Whenever there have been changes of equipment, process, control, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the Action Level or may result in employees already exposed at or above the Action Level being exposed above the PEL, additional monitoring is required.

6.7 Employee Notification

6.7.1 Within 5 working days after completion of the exposure assessment, each employee for whom the results are relevant must be notified in writing. Each employee whose results exceeded the PEL, without regard to the respirator, must receive a statement of such accompanied by a description of the corrective action taken or to be taken to reduce exposure to below that level.

7.0 Methods of Compliance

7.1 Whenever it is anticipated that employees on the jobsite will be exposed to lead, the Safety Manager, Site Superintendent, and/or Project Manager must develop and implement a written Compliance Program for the work site. This written Compliance Program will be in the form of a site specific orientation plan. It will be used to achieve a sufficient reduction of employee exposure below the PEL and must include, at minimum, the following:

7.1.1 A description of each operation in which lead is emitted; e.g., machinery used, material processed, controls in place, crew size, employee job responsibilities, operating procedures, and maintenance practices.

7.1.2 A description of the specific means to be employed to achieve compliance, including engineering plans and studies used to determine methods selected for controlling exposure to lead.

7.1.3 A report of the technology considered in meeting the PEL.

7.1.4 Air monitoring data that documents the source of lead emissions.

7.1.5 Detailed schedule for implementation of the program, including documentation such as copies of purchase orders for equipment, construction contracts, etc.

7.1.6 A work practice program which includes protective work clothing and equipment, housekeeping requirements, and hygiene facilities and practices.

7.1.7 Job rotation schedules if administrative controls are used to reduce employee TWA exposure levels to lead.

7.1.8 A description of arrangements made among contractors on a multi-contactor work site with respect to informing affected potential exposure to lead.

7.1.9 All other relevant information.

7.2 Engineering and Work Practice Controls

7.2.1 O&G Industries, Inc. will implement all practical engineering and work practice controls, including mechanical ventilation, to reduce and maintain employee exposure to lead to below the PEL.

7.2.1.1 Wherever all of the feasible engineering and work practice controls that can be installed are still not sufficient to reduce employee exposure to below PEL, they will nonetheless be used to reduce exposure to the lowest level.

7.2.1.1.1 These controls will be supplemented with appropriate protection.

7.3 Administrative Controls

7.3.1 If administrative controls are used as a means of reducing employee's TWA exposure to lead, then project management must establish and implement a documented job rotation schedule which includes the following:

7.3.1.1 Name and identification number of each affected employee.

7.3.1.2 Duration and exposure levels at each job or workstation where each affected employee is located.

7.3.1.3 Any other information which may be useful in assessing the reliability of administrative controls to reduce exposure to lead.

7.3.2 When an administrative control schedule is used to reduce employee TWA exposure to lead, a copy of this schedule must be maintained and enforced but the Site Superintendent.

7.4 Regulated Areas

7.4.1 Regulated areas will be established where exposures are in excess of the Permissible Exposure Limit.

7.4.1.1 Caution tape will be used to restrict access to regulated areas on all O&G Industries, Inc. job sites.

7.4.2 Warning Signs

7.4.2.1 O&G Industries, Inc. Superintendent will post signs for the appropriate hazards. When airborne lead concentrations exceed the PEL, warnings signs must read:

WARNING
LEAD WORK AREA
POISON
NO SMOKING OR EATING

7.4.2.2 This warning signage will be posted at all entry points into regulated areas.

7.5 Eating Areas

7.5.1 Lead can be unintentionally ingested via eating, drinking, chewing, or smoking on the job site.

7.5.2 O&G Industries, Inc. will strictly enforce the policy of no eating, drinking, smoking, chewing gum, or use of tobacco products in regulated areas.

7.5.3 A clean area, free from exposure to Lead must be provided for employee's to use as an eating area.

7.5.3.1 Employees using the eating area must have access to hot and cold water, soap and towels, and shall be required to wash their hands and face before eating.

7.5.3.2 While drinking water is allowed, proper hygiene practices must be observed with regard to water coolers and drinking cups.

7.6 Notification, Multi-Contractor Work Sites

7.6.1 O&G Industries, Inc. is the General Contractor on this project and is thus responsible for overall site safety. An important aspect of site safety is notifying subcontractors of the presence of hazards so they may address them. In the event lead is present on a jobsite O&G Industries, Inc. will notify subcontractors in the following manners:

7.6.1.1 The written compliance program will consist of a site specific orientation sheet. This orientation will be provided to all subcontractors' foremen who in turn will be responsible for reviewing it with their workers.

7.6.1.2 Letters will be sent to subcontractors advising them of the presence of lead.

7.6.1.3 Superintendents will discuss the presence of lead in their subcontractor meetings and will be included in meeting minutes.

7.6.1.4 The subcontract will contain specific language identifying lead in the project.

7.6.2 Four methods of notification are being used as a fail safe. If a method is not implemented then we can be reasonably assured that at least one of the other methods will be.

8.0 Respiratory Protection

8.1 Respiratory protection will be used in the following circumstances:

8.1.1 Whenever an employee's exposure to lead exceeds the PEL.

8.1.2 In work situations in which engineering controls and work practices are not sufficient to reduce exposure to or below the PEL.

8.1.3 Whenever an employee requests a respirator

8.1.4 When they are used as interim protection for employees performing tasks as specified during paragraph 8.1 of this Section.

8.2 Respiratory Protection Program

8.2.1 Respiratory protection used to comply with the requirements of this Section, must conform to the guidelines of the Respiratory Protection Program (Tab 16 of this Safety Manual), including selection, fit-testing, cleaning and maintenance, etc.

8.3 Changing PARP Cartridges

8.3.1 Filter cartridges and/or pre-filters will be changed whenever there is an increase in breathing resistance and a Flow Check meter indicates the flow rate is below 4 CFM. A sufficient supply of appropriate filters will be maintained on hand to permit replacement.

8.4 Personal Hygiene

8.4.1 Employees will be permitted to wash their face and respirator seal as often as necessary to prevent skin irritation, which is often associated with respirator use. This activity is required at breaks and before eating as a good hygiene practice.

9.0 Protective Equipment

9.1 Where an employee is exposed to lead at or above the PEL, the employee will be provided with (required to use) appropriate personal protective equipment. This personal protective equipment will include, but may not be limited to the following:

9.1.1 Hard Hats

9.1.2 Face Shield

9.1.3 Fall Protection Equipment

9.1.4 Gloves

9.1.5 Hearing Protection

9.1.6 Over Boots

9.1.7 Safety Glasses or goggles

9.1.8 Approved respirator and cartridge

9.2 Protective Work Clothing

9.2.1 Clean protective work clothing and shoe covers, in good condition, will be provided at least weekly to those employees who are exposed at or above the PEL, and at least daily to those employees who are exposed to lead concentrations which are over 2090 pg/m3 as a 8 hour TWA.

9.2.2 Protective work clothing will be repaired or placed as required.

9.2.3 All protective work clothing must be removed at the completion of a work shift and only in those change areas provided for this purpose.

9.3 O&G Industries, Inc. is required to inform in writing, any person who cleans or launders protective work clothing of the harmful effects of exposure to lead.

CAUTION
Clothing contaminated with lead.
Do not remove dust by blowing or shaking.
Dispose of lead contaminated water in accordance with applicable local, state, federal regulation.

10.0 Housekeeping

10.1 General housekeeping is an important part of limiting employee exposure. Every effort shall be made to limit the buildup of dust on surfaces or floors in the work place.

10.2 It is preferred that wet cleaning with RI-Sodium Phosphate (TSP), or HEPA vacuuming be used to clean dust or debris.

10.2.1 Dirt sweeping should be avoided.

10.2.2 Sweeping with a sweeping compound is allowable as long as lead dust does not become airbone and vacuuming is infeasible.

10.3 Compressed Air

10.3.1 Although the use of compressed air for cleaning is generally prohibited by the Standard, there are certain circumstances where the use of this technique is necessary. In this instance, an appropriate exhaust ventilation system which captures the airborne dust must be used with the compressed air.

10.4 Documentation

10.4.1 The site Superintendents or Project Manager will note on their daily safety inspections when lead dust is cleaned from floors or other surfaces.

11.0 Hygiene Facilities

11.1 For employees working in regulated areas, the following will be provided:

11.1.1 Clean change rooms with storage for street clothes and separate storage for personal protective equipment.

11.1.2 When showers are required they will be furnished. When showers are provided, employees must change out of their protective work clothing and shower before changing into their street clothes and leave the work area.

11.1.2.1 The company will provide soap, shampoo, and clean towels.

11.1.3 Eating areas, sufficiently separated from the work area to insure that they are free of lead, will be provided.

11.1.3.1 These eating areas must be wiped at least daily to insure that they are maintained as free from lead as is reasonably possible.

11.1.3.2 Adequate washing facilities will be provided for use by employees to wash their face and hands prior to eating. These facilities will be located in proximity to the work area.

11.1.3.3 It is the employee's responsibility to wash their hands and face prior to eating, drinking, placing anything into their mouth, or using cosmetics. It is the supervisor's responsibility to assure that these employees do an adequate job of washing their hands and face.

11.1.4 Break Decontamination

11.1.4.1 The company will provide for the employee's use, a HEPA vacuum with which to vacuum work clothing and boots prior to entering the change rooms and eating areas.

12.0 Employee Information and Training

12.1 The extent and effectiveness of the employee education and training, as required under the Lead Standard, will be determined in part, by the trainers and CP's ability to address site-specific issues and to demonstrate expertise in the area of lead hazards and their control.

12.1.1 This expertise will be based upon their completion of specialized course degree programs, or work experience.

12.2 Hazard Communication

12.2.1 Although the Lead Standard does reference the Construction Industry's Hazard Communication Standard, 29 CFR 1926.59 and 1910.1200 and requires that all employees covered by the Lead Standard receive hazard communication training, the Hazard Communication Standard would not normally cover employees subject to lead exposure generated from lead-containing materials already in place on the jobsite. However, O&G Industries, Inc. Corporate Safety Policy requires that all employees receive specific hazard communication training for any toxic substance known to be located within the workplace, including lead.

12.3 Exposure to Lead Below the Action Level

12.3.1 Paragraph (2)(b) of OSHA's Safety Training and Education Standard, 29 CFR 1926.21, requires that the employer instruct each employee in the recognition and avoidance of unsafe conditions and in the regulations applicable to his or her work environment in order to control or eliminate any hazards or other exposure to illness or injury.

12.3.1.1 Under this provision, O&G Industries, Inc. is required to instruct all of its employers who are exposed to lead in the specific hazards of lead and in the Construction Standards for Lead 29 CFR 1926.62, even if this exposure does not exceed the action level.

12.4 Exposure to Lead at or above the Action Level

12.4.1 All employees who may be exposed at or above the Action Level must be provided with the following training prior to initial job assignment and at least annually thereafter:

12.4.1.1 The content of the applicable standards (lead and/or inorganic arsenic) and appropriate appendices (29 CFR 1926.62).

12.4.1.2 The specific nature of operations which could result in exposures over the Action Level.

12.4.1.3 The purpose, proper selection, fitting, use and limitations of respirators.

12.4.1.4 The purpose and description of the applicable medical surveillance program.

12.4.1.5 Engineering controls and work practices.

13.0 Medical Surveillance Program

13.1 Program Participation

13.1.1 While the OSHA Standard mandates that O&G Industries, Inc. make available the Medical Surveillance Program to each employee exposed to lead at or above the Action Level, there is nothing in the standard requiring workers to participate in the program.

13.1.1.1 The employee will be advised that all examinations and procedures will be performed by or under the supervision of a licensed physician and that they will be provided to the employee at no cost to the employee and at a reasonable time and place.

13.1.1.2 The employee should further be advised that O&G Industries, Inc. Corporate Safety Policy makes participation in the Medical Surveillance Program, including all prescribed examination components, a condition of employment and that anyone failing to comply with a request to participate in any aspect of the medical surveillance program, as it is outlined in these Lead Guidelines, will be subject to immediate discharge.

13.2 Medical Evaluation – Lead

13.2.1 Prior to each employee beginning a work assignment which will involve the employee's exposure to lead, the employee will be given a medical evaluation.

13.2.1.1 This will consist, for the most part, of the employee completing an occupational history form and providing a blood sample for analysis to determine the individual's blood lead and zinc protoporphyrin levels.

13.3 Medical Evaluation – Respirator

13.3.1 In the event the employee does not have a valid Physician's Written Opinion indicating the individual can wear and use a respirator then the medical evaluation will consist of a medical and work history, a physical examination directed to the pulmonary and gastrointestinal systems, a pulmonary function test and possibly a

chest roentgenogram. It will also include any other examinations or tests deemed necessary by the examining physician.

13.4 Initial Medical Surveillance

13.4.1 Any employee who is occupationally exposed to airborne lead concentrations at or above the Action Level on any day must be provided initial medical surveillance in the form of a blood test for analysis of Blood Lead (BLL) and zinc protoporphyrin (ZPP) levels.

13.4.1.1 The initial medical surveillance must be made available to the employee within 48 hours of the employee's exposure.

13.4.2 Employees with an exposure at or above the Action Level are entitled to coverage under the complete medical surveillance program outlined in the following paragraphs.

13.4.3 Note: Although both the medical evaluation and the initial medical surveillance consist of the same type of biological monitoring in the form of blood sampling and analysis for blood lead (BLL) and zinc protoporphtrin (ZPP) levels, the medical evaluation is a Company required pre-employment examination while the initial medical surveillance is OSHA directed.

13.4.4 However, if O&G Industries, Inc. should anticipate employee exposure, at or above the Action Level, then the medical surveillance program should include a pre-assignment medical examination.

13.5 Biological Monitoring

13.5.1 Biological monitoring for BLL and ZPP will be made available for each employee exposed at or above the Action Level on the following schedule:

13.5.1.1 For each employee exposed at or above the Action Level for more than 30 days in any consecutive 12 month period, biological monitoring will be made available at least every 2 months for the first 6 months and every 6 months thereafter.

13.5.1.2 For each employee exposed at or above the Action Level on any day, or for more than 30 days in any consecutive 12 month period whose blood sampling and analysis indicated a blood level concentration at or above 40 ugh/dl, but less than 50 ugh/dl, biological monitoring will be made available at least every 2 months. This will continue until two consecutive blood samples and analysis indicates a blood lead levels below 40 ug/dl.

13.5.1.3 Should a worker be removed from exposure to lead because of a high blood lead concentration, the worker will be tested at least monthly during the period of removal.

13.5.1.4 While it is necessary that this frequency continue until 2 consecutive tests indicate a concentration of below 40 ugh/dl, please note that when the project ends, so does testing.

13.5.2 Medical Examination and Consultation

13.5.2.1 A medical examination and consolation will be made available to each employee who either has been or may be exposed to lead at or above the Action Level for more than 30 days in any consecutive 12 month period on the following schedule:

13.5.2.1.1 At least annually for each employee for whom a blood sampling test conducted at any time during the preceding 12 months indicated a blood level at or above 40 ugh/dl.

13.5.2.1.2 As soon as possible, upon notification by an employee that he/she has either developed signs or symptoms commonly associated with lead intoxication, that the employee desires a medical exam concerning the effects of current or past exposure to lead in regards to the employee's ability to procreate a healthy child, that the employee is pregnant, or that the employee has demonstrated difficulty in breathing during a respirator fit-test or during its use.

13.5.2.1.3 As medically appropriate for each employee either removed from exposure to lead due to a risk of sustaining material impairment to health, or otherwise limited pursuant to final medical determination.

13.5.3 Lead Removal by Chelation

13.5.3.1 Chelation is the process by which lead is removed from the body of an individual by the use of medication. The OSHA Standard prohibits the use of prophylactic chelation as a means of preventing elevated blood levels or to routinely lower blood levels, since this practice can be associated with many possible harmful complications and/or side effects.

13.5.3.2 If chelation must be performed diagnostically to confirm a diagnosis of lead poisoning, or therapeutically for the treatment of severe toxicity, it

must only be done in a qualified medical setting by a licensed physician and only after the employee has been informed in writing.

13.5.4 Medical Removal

13.5.4.1 If a worker's BLL, taken after exposure to lead, exhibits a blood lead concentration at or above 50 ugh/dl, the Medical Consultant will be immediately notified and the worker will be required to provide a follow-up test within the two week period following receipt of the original test results.

13.5.4.2 Should the worker's last three blood lead concentrations meet or exceed 50 ugh/dl, and the last blood lead concentration is at or above 40 ugh/dl, the Medical Consultant will require that the worker must be removed from further workplace exposure to lead, until the blood lead concentration falls to an acceptable concentration. The "acceptable concentration" depends on the worker's average concentration when removed.

13.5.4.3 Any worker who is determined by the Medical Consultant to no longer be medically qualified to work in lead-exposed tasks will be removed from those tasks until such medical restriction is lifted.

13.5.4.4 Should the worker's blood lead concentration not adequately decline within 18 months of removal, the worker will undergo a special medical evaluation to obtain a final medical determination of whether the worker may return to his/her former job status and recommendations regarding protection of the worker's health.

13.6 Medical Responsibilities

13.6.1 Lead Competent Person (Lead CP)

13.6.1.1 A Lead Competent Person (Lead CP) will be appointed at each jobsite where there is potential exposure to lead, to coordinate scheduling of medical services by a Local Medical Provider and approved Testing Laboratory.

13.6.1.2 The Lead CP will arrange with the Testing Laboratory to have the proper sample containers forwarded to the Local Medical Provider. Once the Local Medical Provider obtains a sample, the Local Medical Provider will ship it directly to the Testing Laboratory.

13.6.1.3 The testing laboratory will then forward all results of the blood analysis directly to the Lead CP at the designated jobsite. The Lead CP will, without delay, review the blood lead levels (BLL) and the zinc protoporphyrin levels (ZPP).

13.6.1.4 High Detection Levels - O&G Industries, Inc. has established an elevated BLL and ZPP level for inter-company use only. If the Lead CP detects any BLL results that are at or above 25 ugh/dl, or and ZPP results that are at or above 50 ugh/dl, the Lead CP will immediately fax a copy of these results to the O&G Industries, Inc. Medical Consultant who will then contact the employee and inform him or her of the test results. In those cases where the BLL is below 25 ugh/dl and/or the ZPP is below 50 ugh/dl, the Lead CP will inform the employees of their results.

13.6.2 Company Medical Consultant

13.6.2.1 In those situations where the company would retain the services of a Medical Consultant, this consultant will act as a medical resource to the Operating Units and to related corporate staff for lead-related medical services.

13.6.2.2 This Medical Consultant will have extensive experience in the field of occupational health, will be knowledgeable regarding OSHA's Lead Standard, 29 CFR 1926.62, and will have oversight responsibility for O&G's Medical Surveillance Program for Lead.

13.6.2.3 Should the Medical Consultant receive a copy of an elevated BLL and/or ZPP results, the Medical Consultant will contact and interview the individual concerned in an effort to determine the reason(s) for the elevated levels. The Medical Consultant will then advise the Lead CP as to whether or not the individual has acceptable levels.

13.6.2.4 The Medical Consultant will also respond to health-related inquiries by O&G personnel that have lead safety and health issues.

13.6.2.4.1 In the event an employee should have a medical question concerning his/her lead levels, the employee could contact the Medical Consultant for resolution, after first discussing the situation with the Lead CP. The purpose of this is to insure that the Medical Consultant would not be tied up in questions that the Lead CP can answer. In cases of this type, the Medical Consultant may request the Local Medical Provider forward pertinent files in order to respond to employee inquiry.

13.6.2.5 The name and address of O&G Company Medical Consultant will be published and posted.

13.6.3 Biological Testing Laboratory

13.6.3.1 OSHA Required Testing: Biological monitoring to determine BLL and ZPP levels for the OSHA required medical surveillance program will only be performed at a laboratory which has been approved by OSHA to provide blood lead sampling analysis.

13.6.3.2 A registry of those laboratories that have been approved for blood lead analysis is published and periodically updated by OSHA. For a list of approved laboratories in your area, contact either your Regional Safety Manager or the O&G Director of Safety.

13.6.3.3 Pre-employment Medical evaluation testing: This testing is a requirement of O&G and is used to obtain a pre-employment medical evaluation of the potential employee, there is no requirement to have the analysis performed by an OSHA approved laboratory.

13.6.3.4 Note: It is important to keep in mind that if the BLL and ZPP level testing has not been performed by an OSHA approved laboratory, the results cannot be used to satisfy the OSHA requirement for biological monitoring.

13.6.4 Local Medical Provider

13.6.4.1 The Local Medical Provider {LMP} will be selected by the Lead CP whose selection criteria will include the LMP's professional credentials, on-site capabilities, distance from the work site, competitive pricing, and experience with similar projects. In the event that oversight responsibility of LMP is required, the Medical Consultant, as the primary contractor, will act as the liaison between the Lead CO and the LMP.

13.6.4.2 The LMP will be provided with a set of lead guidelines that includes examination protocols and instructions, medical and occupational history forms, Physician's Written Opinion forms, laboratory requisitions, a copy of OSHA's Lead Standard,29 CFR 1926.62, and a copy of Company Letter to the Physician relating to lead.

13.6.4.3 The LMP will conduct those medical examinations as requested, and when asked, will also obtain samples for biological monitoring tests in accordance with this section. The LMP will forward the samples for BLL and ZPP analysis only to the laboratory designated by the Lead CP. The LMP will promptly notify any examinee and the O&G site designate whenever a lead related abnormality of an urgent nature is found and will complete the Physician's Written Opinion – Lead.

13.7 Medical Examination Protocol

13.7.1 Examination for Use of Respirator

13.7.1.1 Per Respiratory Protection Program found in Tab 16 of this Safety Manual.

13.7.2 Biological Monitoring

13.7.2.1 Blood sampling and analysis for lead and zinc protoporphyrin levels. **Note:** Blood level sampling and analysis will have an accuracy confidence level 95 percent within plus or minus 15 percent or 6 ugh/dl, whichever is greater and will be conducted by a laboratory approved by OSHA.

13.7.3 Examination and Consultation

13.7.3.1 A detailed work and medical history, with particular attention to past lead exposure, personal habits such as smoking, hygiene, past gastrointestinal, and hematological, renal, cardiovascular, reproductive, and neurological problems, should be performed.

13.7.3.2 A thorough physical examination with particular attention to teeth, gums, hematological, gastrointestinal, renal, cardiovascular, neurological systems, a blood pressure measurement, and a blood sample and analysis which determines blood lead level, hemoglobin, and hematocrit, red cell indices, peripheral smear morphology, zinc protoporphyin, blood urea nitrogen, and serum creatinine should be performed.

13.7.3.3]A routine urinalysis with microscopic examination, and any laboratory or other test relevant to lead exposure which the examining physician finds necessary by sound medical practice should be performed.

13.7.3.4 Additional components may be added in consultation with the O&G Industries, Inc. Regional Safety Manager, the Local Medical Provider, and/or the Medical Consultant. The local medical provider in consultation with the Medical Consultant will determine the scope of special medical evaluations.

14.0 Recordkeeping and Employee Notification

14.1 Recordkeeping shall follow the requirements of 29 CFR 1926.62 (n) for lead as appropriate. O&G Industries, Inc. will establish and maintain an accurate record of all monitoring and other data in conducting employee exposure assessment.

14.2 Exposure Records

14.2.1 Exposure monitoring records will include at minimum, the following.

14.2.1.1 The date, number, duration, location and result of each of the samples taken, including a description of the sampling procedure used to determine employee exposure.

14.2.1.2 A description of the sampling and analytical methods used, and evidence of their accuracy.

14.2.1.3 The type of respiratory protective devices worn.

14.2.1.4 The name, social security numbers, and job-classification of the employee monitored and of all other employees whose exposure the measurement is intended to represent.

14.2.1.5 The environmental variables that could affect the measurement of employee exposure.

14.2.2 These records will be maintained, in accordance with CFR 1910.1020, for the duration of the employment plus 30 years.

14.3 Medical Surveillance Records

14.3.1 O&G Industries, Inc. will establish and maintain accurate records for each employee subject to medical surveillance as required by this Section. These records shall include the following:

14.3.1.1 The name, social security number, and description of the duties of the employee.

14.3.1.2 A copy of the Physician's Written Opinions.

14.3.1.3 Results of any airborne exposure monitoring done on or for the employee and provided to the physician.

14.3.1.4 Any employee medical complaints related to lead exposure.

14.3.1.5 A copy of all medical examination results and work history.

14.3.1.6 A description of the laboratory's quality assurance program.

14.3.1.7 A copy of the results of the biological monitoring.

14.4 Medical Removals

14.4.1 O&G Industries, Inc. will establish and maintain an accurate record for each employee removed from current exposure to lead pursuant to the requirement of this Section. Each record shall include the following:

14.4.1.1 The name and social security number of the employee.

14.4.1.2 The date of each occasion that the employee was removed from current exposure to lead as well as the corresponding date the employee was returned to his/her former job status.

14.4.1.3 A brief explanation of how each removal was or is being accomplished.

14.4.1.4 A statement with respect to each removal indicating whether or not the reason for the removal was an elevated blood lead level.

14.4.1.5 Record Retention

14.5 O&G will maintain accurate and complete records of medical monitoring on each employee.

14.6 Records of exposure monitoring and medical surveillance will be maintained for the duration of employment plus 30 years. Upon termination of the employee, these records will be maintained as per division requirements.

14.7 These records will be available upon formal written request, to the Assistant Secretary of Labor, Director of OSHA, employees, and designated representatives.

14.8 Employees will be informed in writing of the results of blood levels, in excess of the PEL, within 5 working days of receipt of the results.

20-Steel Erection

AT MINIMUM, ALL STEEL ERECTION ACTIVITIES WILL COMPLY WITH APPLICABLE OSHA REGULATIONS.

1926.757 - Open Web Steel Joists.

1926.754 - Structural Steel Assembly.

1926.858 - Removal Of Steel Construction.

1.0 Employees involved in steel erection and disassembly will use conventional fall protection systems when on a surface with an unprotected edge 15 feet or more above a lower level. (Section 7 of this plan, *Fall protection*) These fall protection systems will consist of guardrails, safety nets, personal fall arrest systems, position devices, or fall restraint systems.

2.0 Connections will be provided with a personal fall arrest system, positioning device system, or fall restraint system at height over 15 feet and up to 30 feet. They will wear the equipment necessary to be tied off. 100% protection is required when working over 30 feet. Two lanyards are necessary so the employee will always be attached.

3.0 Fall Protection Equipment:

3.1 Activities being conducted while working at heights will comply with section 7 of this program, *Fall Protection*.

3.2 Only full body harnesses (not belts) lanyards and shock absorbers supplied by O&G Industries, Inc. or respective subcontractors will be used. Attachment points will be above work locations and the entire device must be capable of withstanding shock loading of 5000 lbs.

3.3 If the full body harness cannot be used then safety netting will be installed at a distance of less than 30 feet below the work area.

3.4 All fall protection will be inspected daily by the user prior to use. Defective or questionable equipment will be removed from service and discarded.

3.5 Fall protection devices that have been used to restrain an employee from falling must be removed from service and discarded.

3.6 Only devices, materials, and equipment supplied by or approved by O&G Industries, Inc. will be considered acceptable for use.

4.0 A controlled decking zone will be established for leading edge work in areas over 15 feet, up to 30 feet, above a lower level. This controlled decking zone shall comply with 29 CFR 1926.760.

5.0 Prior to steel installation a safety meeting will be held to outline all safety procedures the used in this portion of the project.

21 – Aerial Lifts

1.0 Purpose

1.1 This procedure is to be used as a comprehensive instruction guide for the use of aerial lifts that are used to position personnel, along with their tools and necessary materials, to work locations.

2.0 Scope

2.1 This procedure applies to all O O&G Industries, Inc. Personnel and Subcontractors using aerial lifts owned by, rented by, or otherwise under the control of O&G Industries, Inc. This policy shall also cover any subcontractors without aerial lift policies.

3.0 Definitions

3.1 Aerial Lift – Any vehicle-mounted or self-propelled device, telescoping extensible, articulating or both which is primarily designed to position personnel.

4.0 Responsibilities

4.1 The Site Superintendent is responsible for implementing and enforcing this procedure.

4.2 The Safety Manager is responsible for monitoring compliance with this procedure.

5.0 Equipment Instructions and Markings

5.1 Each aerial lift will have a manual containing instructions for maintenance and operations.

5.2 If a unit is able to be operated in different configurations, then these configurations will be clearly described, including the rated capacity of each configuration.

5.3 Each aerial lift in service will have a legible plate with the following data (when applicable)

5.3.1 Make, model, and serial number;

5.3.2 Rated capacity;

5.3.3 Platform height and maximum travel height;

5.3.4 Maximum recommended operating pressure of hydraulic or pneumatic systems(s) or both;

5.3.5 Cautions or restrictions of operation or both; and

5.3.6 Operating instructions.

6.0 Pre-start Inspections

6.1 The aerial lift will be inspected daily prior to use. There will be a visual inspection and a functional test including but not limited to the following:

6.1.1 Operating and emergency controls.

6.1.2 Safety devices.

6.1.3 Personal protective devices, including fall protection.

6.1.4 Air, hydraulic, and fuel system leaks.

6.1.5 Cable and wiring harnesses.

6.1.6 Loose and missing parts.

6.1.7 Tiers Tires and wheels.

6.1.8 Placards, warnings control markings, and operators manual.

6.1.9 Outriggers, stabilizers, extendible axels, and other structures.

6.1.10 Guardrail systems.

6.1.11 Any other items specified by the manufacturers.

6.2 An O&G Industries, Inc. Aerial Lift Inspection Sheet (Appendix A of this program) will be completed daily.

6.2.1 A copy of this sheet will remain with the lift while a second copy will be maintained in the Site Superintendent's office.

7.0 Operating Procedures

7.1 Barricades and/or a flag person should be used when operating in high traffic areas.

7.2 Operators will read and obey all warnings placards on the machine and become familiar with the operator's manual. This includes all manufacturer's recommendations and operating instructions.

7.3 All malfunctioning lifts will not be operated until it is repaired per the manufacturer's recommendations and will be tagged out of the service.

7.4 The controls will be plainly marked as to their function.

7.5 A pre-start inspection will be completed daily before use.

7.5.1 A lift that is defective or malfunctioning will not be used.

7.6 Prior to operating the lift the operator will check the area for hazardous conditions including: debris, holes, and bumps.

7.7 The lift will be on the ground at all times when the platform is elevated.

7.8 Stunt driving and horseplay will not be permitted.

7.9 Do not load the platform in excess of the designed working load.

7.9.1 The employee's weight is included as part of the load.

7.10 Materials placed in the basket will not extent beyond the outer edges of the basket.

7.11 Aerial lifts are not to be used as cranes. Lifting with the basket, handling chokers, or boom is not permitted.

7.12 Do not walk under the boom to gain access to the platform.

7.13 Do not tie the platform off to any structure.

7.14 Do not stand on the rail. Always keep your feet on the platform. Plank ladders or other devices will not be used to raise the height of the platform.

7.15 Safety harnesses must be worn and tied off to an approved tie-off point.

7.16 Do not use an aerial lift to access any structure.

7.16.1 Employees may exit a structure with an aerial lift only after receiving approval from the Site Superintendent and only when all other means of access are impractical or create a greater hazard, as long as continual tie off is maintained.

7.17 Use care when exiting the basket; do not jump from the basket.

7.18 Controls will be tested in accordance with the manufacturer's recommendations or instructions to determine if they are working properly.

7.19 Tying off to an adjacent structure, pole, or other equipment is not permitted.

7.20 Modifications or alterations of the lift will not be made unless prior written consent is received from the manufacturer.

8.0 Training

8.1 All O&G Industries, Inc. personnel and Subcontractors using aerial lifts owned by, rented by, or otherwise under the control of O&G Industries, Inc. will be trained by a designated Competent Person before being allowed to operate the lift.

8.1.1 Subcontractors using lifts without their own company aerial lift policy will also be trained.

8.1.2 These trained employees will be designated by an operator's decal to be worn on their hard hats and will be the only employees allowed to operate the lifts.

8.1.3 All training will be documented and kept on file in the field office as well as the Corporate Office.

8.1.4 An outline will be used by the instructor during training sessions to cover all facets of aerial lift operations.

8.1.5 All persons receiving training will perform the following:

8.1.5.1 Hands on operation of controls at the platform and lower level panel.

8.1.5.2 Preoperational inspection of the lift as well as a functional test to ensure competency of the individual who is to operate the lift.

Appendix A - Aerial Lift Inspection

Inspected by: _____ **Company:** _____

Job Site: _____ **Date:** _____ **Aerial Lift #:** _____

Description	(OK)	(Needs Repair or Replacement)	(N/A)
Operating Controls	( )	( )	( )
Safety Devices	( )	( )	( )
Personal Protective Devices, Fall Protection	( )	( )	( )
Air, Hydraulic, Fuel System Leaks	( )	( )	( )
Cable and Wiring Harnesses	( )	( )	( )
Loose and Missing Parts	( )	( )	( )
Tires and Wheels	( )	( )	( )
Placards and Warning Labels	( )	( )	( )
Operations Manual	( )	( )	( )
Outriggers or Other Structures	( )	( )	( )
Guardrails/Gate	( )	( )	( )
Safety Devices	( )	( )	( )

Remarks:

22 – Mobile Equipment

1.0 Purpose

1.1 The purpose of this procedure is to provide minimum requirements for the safe operation of mobile equipment or for working in an area where mobile equipment is being operated.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with Company requirements for Mobile Equipment as outlined in this procedure.

2.2 Only trained and authorized personnel shall be allowed to operate mobile equipment. This is equipment normally operated on a job site as opposed to public vehicles. Examples include, but are not limited to:

- Fork Trucks
- Front End Loaders
- Dozers
- Backhoes/Trackhoes
- Bobcats
- Cranes
- Tractors
- Graders
- Electric Carts
- Aerial Lifts

3.0 Responsibilities

3.1 **Personnel on Site (employee or subcontractor)** shall not operate mobile equipment unless they have been trained and authorized to do so. Personnel without current operator's license /certification shall not operate motorized equipment.

3.2 **Subcontractor Management** shall develop and maintain a current list of authorized equipment operators for their respective personnel, along with a copy of their current operator license/certification. Copies of the list and certification documentation must be provided to the Site Superintendent.

3.3 **The Site Superintendent** shall develop a list of authorized operators and shall provide line supervision with a matrix, which identifies those personnel for accountability purposes.

4.0 Powered Industrial Trucks

4.1 Operator Training and Certification

4.1.1 The O&G Industries, Inc. lift truck operator training program incorporates a combination of classroom instruction (lecture, video, etc.), practical instruction (demonstration and practical exercises) and culminates with an evaluation of operator performance. All prospective operators must demonstrate that they have learned the knowledge and skills necessary to operate lift trucks safely.

4.1.2 The training program covers both the truck-related and workplace-related topics required by the OSHA standards.

4.1.2.1 Operators are trained and certified on each different type of lift truck that they are authorized to use. Key training subject matter includes, but is not limited to:

- Operating instructions, warnings and precautions for the types of truck the operator will be authorized to operate;
- Similarities to and differences from the automobile;
- Controls and instrumentation: location, what they do, and how they work;
- Steering and maneuvering;
- Visibility (including restrictions due to loading);
- Fork and attachment adaptation, operation and limitations of their utilization;
- Vehicle capacity;
- Vehicle stability;
- Vehicle inspection and maintenance;
- Refueling or charging, recharging batteries;
- Operating limitations; and
- Any other operating instruction, warning or precaution listed in the operator's manual for the type vehicle that the employee is being trained to operate.

4.1.2.2 The training program and practical demonstrations/exercises cover the workplace-specific hazards that are likely to be encountered on job sites. Key training subject matter includes, but is not limited to:

- Surface conditions where the vehicle will be operated;
- Composition of probable loads and load stability;
- Load manipulation, stacking and unstacking;

- Pedestrian traffic;
- Motor vehicle traffic
- Narrow aisles/operating pathways and other restricted places of operation;
- Operating in hazardous classified locations;
- Operating the truck on ramps and other sloped surfaces that could affect the stability of the vehicle;
- Operating the vehicle in closed environments and other areas where insufficient ventilation could cause a buildup of carbon monoxide or diesel exhaust; and
- Other unique or potentially hazardous environmental conditions that exist or may exist in the workplace.
- Unique job site hazards will also be communicated to operators via on-the-job training.

4.1.2.3 Lift truck operator trainees are only permitted to practice operating lift trucks under the direct supervision of an O&G Industries, Inc. authorized lift truck trainer.

4.1.3 Refresher training is required whenever:

4.1.3.1 An operator is observed operating a lift truck in an unsafe manner;

4.1.3.2 An operator is involved in an accident or near miss incident while driving a lift truck;

4.1.3.3 An evaluation (see 4.1.4 below) reveals the operator is not operating the vehicle safely;

4.1.3.4 An operator is assigned to a different type of lift truck;

4.1.3.5 A condition in the workplace changes that could affect safe operation;

4.1.4 If retraining is necessary, it shall cover needed topics only and include a demonstration of operator competency to operate the lift truck(s) in a safe manner.

4.1.5 Each certified powered industrial truck operator is evaluated at least once every 3 years to verify that they have retained and use the knowledge and skills needed to drive safely. This evaluation is done conducted by an O&G Industries, Inc. authorized lift truck trainer. If the evaluation shows that the operator is lacking the appropriate skills and knowledge, the operator is

retrained to correct all deficiencies observed and must be able to demonstrate competency.

4.1.6 Subcontractors are required to provide documentation to demonstrate that the personnel operating lift trucks are trained and certified, in accordance with the requirements of 29 CFR 1926.602(d) and 1910.178(l).

4.2 Pre-Use Inspections

4.2.1 Operators must perform pre-operational equipment checks on powered industrial trucks prior to the beginning of each shift in which those trucks will be utilized, to ensure the safe operating condition of the vehicle. The pre-operational check is performed by completing the daily truck inspection checklist, which can be found in Appendix A of this program. Completed checklists are to be turned in to the Site Superintendent each day and maintained on file for at least 30 days.

4.2.1.1 Any vehicle that has deficiencies noted during the pre-shift inspection must be taken out of service until repaired.

4.3 General Safe Operating Requirements

4.3.1 If at any time a forklift is found to be in need of repair, defective or in any way unsafe, the forklift must be taken out of service until it has been restored to a safe operating condition.

4.3.1.1 All repairs must be made by authorized personnel.

4.3.2 Manufacturer's operating instructions must be understood by the operator and lift trucks must only be used for their intended purposes.

4.3.3 Passengers are not permitted on lift trucks, unless specifically designed to hold them.

4.3.4 Load capacity information must be prominently marked on the truck, using an approved data plate. A forklift must never be used to lift a load beyond its capability.

4.3.4.1 When auxiliary removable counterweights are provided by the manufacturer, corresponding alternate rated capacities also shall be clearly shown on the vehicle. These ratings shall not be exceeded.

4.3.4.2 If a load is lifted by two or more trucks working in unison, the

proportion of the total load carried by any one truck shall not exceed its capacity.

4.3.5 No modifications or additions which affect the capacity or safe operation of the equipment shall be made without the manufacturer's written approval. If such modifications or changes are made, the capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. In no case shall the original safety factor of the equipment be reduced.

4.3.6 Fuel tanks must not be filled while the engine is running. Fuel spillage must be avoided.

4.3.7 Seat belts are required to be worn while operating a forklift.

4.3.8 The operator must always drive slowly enough to make a turn without tipping the forklift and bring the vehicle to a safe stop if an unexpected obstacle (e.g. a pedestrian, etc.) is encountered.

4.3.9 Wet or slippery driving surfaces require slower than ordinary speeds.

4.3.10 A forklift must be kept behind any other moving vehicle by at least three times the length of the forklift.

4.3.11 Operators must not pass other vehicles at intersections, blind spots or other dangerous locations.

4.3.12 Operators must slow down and sound the horn at intersections, cross-aisles and other locations where vision is obstructed.

4.3.13 Operators must watch for pedestrians, especially at intersections, passageways and doors leading from toilets, lunchrooms and offices.

4.3.14 Operators must never drive directly toward anyone.

4.3.15 Stunt driving and horseplay is not permitted.

4.3.16 Operators must keep their arms, legs and other parts of the body within the forklift and overhead guard area.

4.3.17 A forklift may be used to elevate workers only if proper precautionary measures are taken:

4.3.17.1 A safety platform with guardrails should be firmly secured to the

forks to keep the worker from falling.

4.3.17.2 The person being lifted should have some way of shutting off the power to the forklift in case of emergency.

4.3.17.3 Protection from falling objects should be provided in accordance with particular conditions.

4.3.17.4 No one can be allowed to stand or pass under the lift portion of any forklift, whether loaded or empty, because injury may result from mechanical failure or falling objects.

4.3.18 Before moving or stacking materials, the operator must survey the path of travel to avoid machinery, overhead obstructions, etc.

4.3.19 Overloading will increase the risk that a forklift will tip over and reduce the ability to control it. Forklifts must not be overloaded.

4.3.19.1 Loaders and/or operators must check the maximum load capacity on the forklift nameplate.

4.3.20 Only attempt to handle stable or safely arranged loads.

4.3.20.1 Lifted loads must be neatly piled and cross-tied, if possible.

4.3.21 To reduce the risk of tipping, the loads must be centered on the lift forks.

4.3.22 Loads must be carried low enough to avoid striking overhead obstructions.

4.3.23 Loads must be carried high enough to avoid raised or uneven surfaces.

4.3.24 Operators should not raise or lower a load while the forklift is moving, lest the operator's attention is distracted from driving and the stability of the lift truck can also be affected.

4.3.25 Operators must drive the forklift in reverse if bulky items obstruct the front view.

4.3.26 Easy and gradual starts and stops help prevent loads from shifting.

4.3.27 Operators must exercise caution on inclines. Always drive with the load pointed uphill (whether ascending or descending).

4.3.28 Never load or park the forklift so as to block emergency equipment and/or

means of egress.

4.3.29 When loading/unloading highway trucks:

4.3.29.1 The brakes of the truck must be set and the wheels must be chocked so that the truck will not move.

4.3.29.2 Immediately upon uncoupling a semitrailer from its tractor, operators must inspect the landing gear to ensure its ability to support the imposed load.

4.3.29.3 If a semitrailer is not coupled to a tractor, fixed jacks may be needed to support the trailer and prevent its upending during loading or unloading.

4.3.29.4 Check the flooring of highway trucks, trailers and railroad cars for breaks and other signs of weakness before boarding.

4.3.29.5 Operators must properly secure the dockboard, then drive over it carefully and without an overload.

4.3.30 A forklift must not be parked closer than 8 feet to a railroad track.

4.3.31 When an operator must leave the forklift unattended, load engaging means must be fully lowered, controls must be neutralized, the power must be shut off, and the brakes must be set. An additional safety precaution is to remove the keys.

4.3.31.1 When an operator is dismounted and is within 25 feet of the vehicle and is in view of the vehicle, the engine may be left running. However, the load engaging mechanism must be fully lowered, controls must be neutralized, and the brakes must be set.

4.3.32 Wheels must be blocked if a forklift is parked on an incline.

4.4 Refueling

4.4.1 Personnel must observe the following rules relative to the refueling of lift trucks:

4.4.1.1 Do not smoke at or near the refueling station.

4.4.1.2 Do shut off the forklift engine when refueling.

4.4.1.3 Do not restart gasoline or diesel-powered forklifts after refueling until all spilled fuel has evaporated, been wiped up or washed away, and until the fuel tank cap is back in place.

4.4.1.3.1 Any spillage of oil or fuel that reaches the ground must be reported to the Site Superintendent immediately for proper cleanup.

4.4.1.4 Do check the LPG tank for damage from dents or gouges.

4.4.1.5 Do inspect the quick-disconnect coupling for damage, deterioration, and damaged or missing flexible seals.

4.4.1.6 Do inspect the valves and fittings of the LPG tank for damage and ensure that the relief valve points are in the direction specified by the manufacturer.

4.4.1.7 Do wear gloves, long sleeves and a face shield when changing LPG tanks. Escaping gas is painfully cold to the skin.

5.0 Mobile Cranes

5.1 Operator Training and Certification

5.1.1 Cranes shall be operated only by the following personnel:

5.1.1.1 Designated operators

5.1.1.1.1 The State of Connecticut requires every crane operator to be licensed by the Department of Public Safety. An unlicensed operator is not allowed to operate lifting equipment, even if licensed operator is on site.

5.1.1.2 Maintenance and test personnel, when necessary in the performance of their duties.

5.1.1.3 Inspectors.

5.1.2 All mobile crane operators must be instructed in and given the opportunity to read and understand the manufacturer's operators manual for each make and model of crane the will operate. The employee shall also be

instructed in the applicable OSHA and ANSI standards. The operator must be authorized on a project-specific basis to operate the specific make and model assigned.

5.1.3 Operators must have ability to read and understand the crane's load chart.

5.1.4 Operators, riggers and ground crew of must have ability to read and understand the ANSI B30 crane hand signal chart, which is included in Appendix B of this program.

5.1.4.1 An illustration of these signals must also be posted at the job site.

5.2 Operator Physical Qualifications

5.2.1 Per ANSI/ASME B30.5:

5.2.1.1 Operators shall have a current physician's certification that the operator meets the following physical qualifications:

5.2.1.1.1 Vision of at least 20/30 Snellen in one eye and 20/50 in the other, with or without corrective lenses;

5.2.1.1.2 Normal depth perception and field of vision;

5.2.1.1.3 Ability to distinguish colors, regardless of position;

5.2.1.1.4 Adequate hearing, with or without hearing aid, for the specific operation;

5.2.1.1.5 Sufficient strength, endurance, agility, coordination, manual dexterity, and speed of reaction to meet the demands of equipment operation; and

5.2.1.1.6 No tendencies to dizziness or similar undesirable characteristics.

5.2.1.2 Evidence of physical defects, emotional instability that could render a hazard to the operator, others, or safe operation of the crane, or evidence that the operator is subject to seizures or loss of physical control shall be sufficient reason for disqualification. In such cases, specialized medical tests may be required to determine these conditions and their effects.

5.3 Mobile Crane Inspections, Servicing and Alterations

5.3.1 Each mobile crane will be inspected by a competent person for mechanical defects upon its arrival, before its use on the project, and monthly thereafter.

5.3.1.1 An Inspection Checklist will be completed and retained in the maintenance records on site.

5.3.2 The operator shall perform a daily inspection on all safety features of the crane and document the findings prior to use on each shift.

5.3.3 A thorough, annual inspection of the hoisting machinery shall be made by a competent person, or by a government or private agency recognized by the U.S. Department of Labor.

5.3.3.1 A record of the dates and results of inspections shall be maintained for each piece of equipment.

5.3.4 It is recommended that the equipment be load tested only in accordance with the manufacturer's specifications and limitations and American Standards Institute (ANSI) B30.5-1982, Mobile and Locomotive Cranes, 5-2.2.2.

5.3.5 No modifications or alterations that affect the capacity or safe operation of the equipment will be made by any individual without the manufacturer's written approval.

5.3.6 A copy of the manufacturer's operator's manual for each make and model machine must be in the cab of the crane and the manufacturer's specifications and limitations noted in it will be observed.

5.4 General Safe Operating Requirements

5.4.1 Accessible areas within the swing radius of the rotating superstructure counterweight of a crane will be barricaded to prevent employees from being struck or crushed by the counterweight.

5.4.2 Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains, or other reciprocating, rotating, or other moving parts or equipment shall be guarded if such parts are exposed to contact by employees, or otherwise create a hazard. Guarding shall meet the requirements of the American National Standards Institute B15.1-1958 Rev., Safety Code for Mechanical Power Transmission Apparatus.

5.4.3 The hand signals to be used are those prescribed by the ANSI B30.5 standard applicable to each crane. Only one (1) individual will assume the flagging duties and no other person shall flag during the lift, with the exception of a person giving an emergency stop signal.

5.4.3.1 If the operator determines that the flagging designee does not have a working knowledge of standard hand signals, he/she shall stop the lifting operation to ask for a qualified flagger.

5.4.4 In the operations and use of any hydraulic crane when both an auxiliary and main hoist lines are reeled, an anti-two blocking warning system is recommended on both auxiliary and main hoist lines.

5.4.5 No person will ride the headache ball, the hook, or the load being handled by the crane. All operations involving the use of suspended personnel baskets or platforms shall comply with OSHA and ANSI regulations. The crane shall be equipped with an anti-two blocking device.

5.4.6 Only one (1) load will be hoisted at a time. Two or more separately rigged loads (i.e. skip pan and steel beam, etc) will never be hoisted in one lift even if the combined loads are within the rated capacity.

5.4.7 A tag line will be used on any load that is being lifted off the ground.

5.4.8 No person shall ride on the machine nor should the machine be used to transport personnel.

5.4.9 Traveling with a load (pick and carry) is not recommended as a means of transporting loads from one location to another on the project and should be used only as a last resort. The use of lift trucks, or other material handling equipment designed for such a purpose should be used to transport loads.

5.4.10 Operators shall not engage in any practice that could divert attention while operating the crane.

5.4.11 Regardless of the size or weight of the load to be lifted, the crane's outrigger beams shall be fully extended and the wheels raised off the ground.

5.4.12 All lifting operations will immediately be suspended in adverse weather conditions, like, lightning, icing, high winds, and/or heavy rain.

5.4.13 Rated load capacities, recommended operating speeds, special hazard

warnings, operating notes and special instructions will be posted on all equipment and will be visible to the operator while he/she is at the control station. Illustrations of the hand

5.4.14 Signals used in connection with the operation of equipment will be posted at the project site.

5.4.15 No operator will leave the controls of a crane or hoist with a load raised unattended.

5.4.16 Operators shall be responsible for those operations under their direct control. Whenever there is reasonable cause to believe that the lift might be dangerous or unsafe, the operator shall have the authority to stop and refuse to handle loads until safety has been assured.

5.4.17 A fire extinguisher of 5BC rating or higher will be available at all lift operator stations

5.5 Rigging

5.5.1 A certified Competent Person is responsible for all for rigging and material handling equipment under his/her direction at each jobsite. The Competent Person will be capable of determining safe lifting loads; following recognized rigging practices and terminating unsafe operations.

5.5.2 The Competent Person will inspect the rigging equipment used for material handling daily before use. Of special importance is the condition of the lifting ropes, slings, and tag lines. A thorough inspection of all components of a rigging system will be inspected at least semi-annually.

5.5.2.1 All inspections must be logged and corrective action noted on the Rigging Inspection Logs found in Appendix C of this program.

5.5.3 Defective rigging equipment will immediately be removed from service. Frayed ropes or slings will be removed from service.

5.6 Critical Lifts

5.6.1 A lift is considered a “Critical Lift” in any of the following circumstances:

5.6.1.1 A lift that exceeds 75% of the crane’s operating chart;
5.6.1.2 When two cranes or combination of equipment and crane will be

used to make a lift;

5.6.1.3 The lift is in proximity (closer than 20 feet) of high voltage lines;

5.6.1.4 The lift is over occupied buildings or public thoroughfares; or

5.6.1.5 The lift if over extremely hazardous areas.

5.6.2 A Critical Lift Team (operator, competent rigger, field supervisor, etc.) shall be designated to develop a written procedure to ensure the safety of personnel equipment and facilities when a critical lift is to be made at the project site.

5.6.3 Final authorization for a critical lift shall come from the Site Superintendent.

5.7 Electrical Hazards

5.7.1 A crane will not be operated under any circumstances wherein any part of the crane or load will come within ten (10) feet of energized electrical distribution lines rated 50 KV or below unless:

5.7.1.1 The lines have been de-energized and are grounded at the point of work; or

5.7.1.2 Insulating barriers that are not part of the equipment have been erected.

5.7.2 For lines rated over 50 KV, the minimum clearance between lines and any part of the machine or load will be ten (10 feet plus 0.4 inches for each kilovolt over 50 KV or twice the length of the line insulator.

5.7.3 All lines will be considered energized unless the person or utility owning the lines indicate in writing that they are not energized and that the lines are grounded at the point of operation.

5.7.4 To ensure that the operator maintains good visibility when working in close proximity to energized lines, a spotter or signal person can be designated to assist the operator in maintaining the ten (10) foot clearance.

6.0 Earth Moving Equipment

6.1 Operator Training/Qualifications

6.1.1 Only qualified personnel shall be allowed to operate earthmoving equipment. A list of operators and the equipment they are authorized to operate shall be maintained at the project site. No on, other than operators,

maintenance personnel, and their trained helpers who are authorized to service the equipment shall enter the cab of earthmoving equipment.

6.2 Daily Inspection

6.2.1 A daily inspection shall take place at the beginning of each shift to determine the safe operation of the equipment. All safety features on the equipment must be in good working order before the equipment is placed in service. Equipment shall be tagged “Out of Service” if any safety equipment is not functioning correctly. These safety features include:

6.2.1.1 Brakes / steering

6.2.1.2 Warning systems (i.e. backup alarms, horn, etc.)

6.2.1.3 Gauges

6.2.1.4 Hydraulics

6.2.1.5 Fuel system

6.2.1.6 Fire suppression equipment (minimum 5lb. ABC extinguisher).

6.3 General Safe Operating Requirements

6.3.1 All earthmoving equipment shall have a service braking system capable of stopping and holding the equipment while fully loaded.

6.3.2 All bi-directional machines, such as rollers, compactors, front-end loaders, bulldozers, and similar equipment, shall be equipped with a horn, distinguishable from the surrounding noise level, which shall be operated as needed when the machine is moving in either direction. The horn shall be maintained in an operative condition.

6.3.3 Earthmoving or compacting equipment, which has an obstructed view to the rear, shall not be used in reverse gear unless either the equipment has in operation a reverse signal alarm distinguishable from the surrounding noise level or an observer is signaling that it is safe to do so.

6.3.4 No personnel shall be allowed to ride with the operator on earthmoving equipment unless the equipment is designed to carry passengers.

6.3.5 Seat belts shall be provided on all equipment with the exception of the following:

6.3.5.1 Equipment that is designed only for stand-up operation.

6.3.5.2 Equipment that does not have Rollover Protective Structures (ROPS) or adequate canopy protection.

6.3.6 Operators shall be instructed in mandatory seat belt use.

6.4 Rollover Protective Structures (ROPS)

6.4.1 All rubber-tired, self-propelled scrapers; rubber-tired front-end loaders; rubber-tired dozers; wheel-type industrial tractors; crawler tractors; crawler-type loaders; and motor graders, with or without attachments, which are used in construction work shall be equipped with ROPS.

6.4.2 Each ROPS shall have the following information permanently affixed to the structure:

6.4.2.1 Manufacturer or fabricator's name and address;

6.4.2.2 ROPS model number, if any; and

6.4.2.3 Machine make, model, or series number that the structure is designed to fit.

6.5 ROPS, which are removed for any reason, shall be remounted with equal or better quality bolts or welding as required for the original mounting.

Appendix A
Powered Industrial Vehicle Checklist

Appendix B
ANSI Hand Signals

Appendix C
Rigging Inspection Logs

Powered Industrial Vehicles

Daily Inspection Checklist

Model No: _____ Serial No: _____

Foreman: _____ Licensed Operator: _____

Week Ending: __/__/__

ITEM	MON	TUE	WED	THU	FRI
Back-up Alarm					
Parking Brake					
Oils & Fluids					
Crankcase					
Transmission					
Hydraulic					
Battery					
Cooling					
Pivots					
Boom					
Hoist					
Tilt Cylinder					
Carriage					
Brake Pedal					
Steer, Cylinders & Spindles					
Tire Inflation					

Know Your Hand Signals!

Basic Standard Hand Signals for Cranes and Hoisting Equipment

HOIST: With forearm vertical, and forefinger pointing up, move hand in small horizontal circle.

LOWER: With arm extended downward, forefinger pointing down, move hand in a small horizontal circle.

RAISE BOOM: Arm extended, fingers closed, thumb pointing upward.

LOWER BOOM: Arm extended, fingers closed, thumb pointing downward.

EXTEND BOOM: Both fists in front of body with thumbs pointing outward.

RETRACT BOOM: Both fists in front of body with thumbs pointing toward each other.

SWING: Arm extended, point with finger in direction of desired boom swing.

STOP DOG EVERYTHING: Clasp hands in front of body.

MOVE SLOWLY: Use one hand to give any motion signal and place the other hand motionless in front of the hand giving the signal.

TRAVEL: Arm extended forward, hand open and slightly raised, make pushing motion in direction of travel.

USE MAIN HOIST: Tap fist on head; then use regular signals.

USE WHIP LINE (AUXILIARY HOIST): Tap elbow with one hand; then use regular signals.

STOP: Arm extended, palm down, move arm back and forth horizontally.

RAISE THE BOOM AND LOWER THE LOAD: With arm extended, thumb pointing up, flex fingers in and out as long as load movement is desired.

LOWER THE BOOM AND RAISE THE LOAD: With arm extended, thumb pointing down, flex fingers in and out as long as load movement is desired.

EMERGENCY STOP: Both arms extended, palms down, move arms back and forth horizontally.

Issued:
Tag # **AP2003-M061**

APPENDIX C - SYNTHETIC SLING INSPECTION LOG

Inspector:		Date:	ITEMS TO BE CHECKED (ENTER CONDITION CODE FOR EACH ITEM)						
Sling #	Serial No.	Description (length, width, etc.)	Capacity Tag	Wear/ Abrasion	Broken Stitches	Holes, Tears, Cuts or Snags	Heat Damage	Chemical Damage	End Fittings (if any)
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

Condition Codes:

"P" = Pass (Item is in good condition)
"M" = Monitor (Item beginning to wear, but still serviceable. Should be monitored) *Please include detailed description of all "M" items
"XX" = Fail (Item is no longer serviceable and must be removed from service) **Include note below describing deficiency and actions taken for all "XX" items

Item Description:

Capacity Tag - Must be in-tact and legible
Wear/Abrasion - Wear must not exceed the amount recommended by manufacturer
Broken Stiches - Must not have any broken or worn stitches
Holes, Tears, Cuts or Snags - Must not have any snags, punctures, tears, or cuts
Heat Damage - Must not have any melting or charring of any part of the surface
Chemical Damage - Must not have any acid or caustic burns on any part of the surface
End Fittings (connectors, shackles, hooks, couplers, etc.) - Must be in-tact, working properly and not corroded.

NOTES/ACTIONS TAKEN:

23 – Vehicle Safety

1.0 Purpose

1.1 The purpose of this Vehicle Safety Program is to provide minimum requirements for the for the motor vehicle operation, as it pertains to O&G Industries, Inc. job sites.

2.0 Scope

2.1 Each O&G Industries, Inc. employee or subcontractor shall comply fully with the Company requirements that are outlined in this procedure.

3.0 Vehicle Safety

3.1 All drivers of company vehicles will:

3.1.1 Be properly trained and licensed to operate the vehicle.

3.1.2 Ensure that all safety requirements for that vehicle are satisfied.

3.1.3 Observe all traffic laws, including seatbelt requirements and company policies and procedures.

3.1.4 Properly tie-down all items on board or in tow.

3.2 All company vehicles will:

3.3 Be inspected daily by the driver with a Driver's Inspection Report completed and properly distributed.

3.3.1 Have safety accessories repaired immediately by either the driver or the shop.

3.3.2 Be properly equipped with safety spare parts to include bulbs and fuses and safety materials, to include appropriate fire extinguisher, (5 BC) first aid kit, and breakdown signaling devices.

3.3.3 Be clean on the outside and neat, organized and free of litter on the inside.

3.3.4 Vehicles will be shut off when being refueled and when left unattended. When appropriate wheels will be chocked and the security brake engaged.

3.4 Driver's inspection reports:

3.4.1 All company vehicles will be inspected daily, before use by the driver.

3.4.2 All company vehicles over 26,001 pounds and/or 10,001 pounds, driving interstate will have a vehicular report (versus driver's log) that complies with the Department of Transportation (D.O.T.) requirements.

3.4.3 Incident Reporting: the following incidents must be reported to the Director of Safety and the Corporate Office:

3.4.3.1 Any and all vehicle accidents* no matter how minor.

3.4.3.2 Proper paperwork must be completed and submitted the same day.

3.5 NOTE: an accident is defined as any damaging contact between a company vehicle and another object.

24 - Bloodborne Pathogens

1.0 PURPOSE

1.1 This Bloodborne Pathogens Exposure Control Plan was developed to eliminate or minimize occupational exposure to bloodborne pathogens (BBP), in accordance with the OSHA Bloodborne Pathogens Standard, 29 CFR1910.1030.

2.0 SCOPE

2.1 O&G Industries, Inc.will administer an Exposure Control Plan whenever and wherever employees have the potential to be exposed to blood or other infectious materials.

3.0 RESPONSIBILITIES

3.1 The Site Superintendent, with the support of the Safety Manager, is responsible for overall implementation of and for ensuring compliance with the requirements of this procedure.

3.2 The Site Safety Manager is responsible for ensuring that affected employees are trained and those training records are maintained.

3.3 The Site Safety Manager is responsible for maintaining applicable medical records, including immunization status, of all site employees.

3.4 All employees are responsible for complying with the provisions of this program when working on O&G Industries, Inc. property or customer's property.

4.0 DEFINITIONS

4.1 Bloodborne Pathogens means pathogenic micro-organisms that are present in human blood and can cause disease in humans. These pathogens include, but are not limited to, Hepatitis B virus (HBV) and Human Immunodeficiency virus (HIV).

4.2 Contaminated means the presence or the reasonably anticipated presence of blood or other potentially infections materials on an item or surface.

4.3 Contaminated Laundry means laundry, which has been soiled with blood or other potentially infectious materials or may contain sharps.

4.4 Contaminated Sharps means any contaminated object that can penetrate the skin including, but not limited to, needles, scalpels, broken glass, broken capillary tubes, and exposed ends of dental wires.

4.5 Decontamination means the use of physical or chemical means to remove, inactivate, or destroy bloodborne pathogens on a surface or item to the point where they are no longer capable of transmitting infectious particles and the surface or item is rendered safe for handling, use or disposal.

4.6 Engineering Controls means controls (e.g., sharps disposal containers, self-sheathing needles) that isolate or remove the bloodborne pathogens hazard from the workplace.

4.7 Exposure Incident means a specific eye, mouth, other mucous membrane, non-intact skin or Parenteral contact with blood or other potentially infectious materials that result from the performance of an employee's duties.

4.8 Hand washing Facilities means a facility providing an adequate supply of running potable water, soap and single use towels or hot air drying machines.

4.9 HBV means Hepatitis B virus.

4.10 HIV means Human Immunodeficiency virus.

4.11 Occupational Exposure means reasonably anticipated skin, eye, mucous membrane, or parenteral contact with blood or other potentially infectious materials that may result from the performance of an employee's duties.

4.12 Other Potentially Infectious Materials means:

4.12.1 The following human body fluids: semen, vaginal secretions, cerebrospinal fluid, synovial fluid, pleural fluid, pericardial fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.

4.12.2 Any unfixed tissue or organ (other than intact skin) from a human (living or dead)

4.12.3 HIV-containing cell or tissue cultures, organ cultures, and HIV- or HBV-containing culture medium or other solutions; and blood, organs or other tissues from experimental animals infect with HIV or HBV

4.13 Parenteral means piercing mucous membranes or the skin barrier through such events as needle sticks, human bites, cuts and abrasions.

4.14 Personal Protective Equipment is specialized clothing or equipment worn by an employee for protection against a hazard. General work clothes (e.g., uniforms, pants, shirts or blouses) not intended to function as protection against a hazard is not considered to be personal protective equipment.

4.15 Regulated Waste means:

4.15.1 Liquid or semi-liquid blood or other potentially infections materials

4.15.2 Contaminated items that would release blood or other potentially infectious materials in a liquid or semi-liquid state if compressed

4.16 Source Individual means any individual (living or dead) whose blood or other potentially infectious materials may be a source of occupational exposure to the employee.

4.17 Sterilize means the use of a physical or chemical procedure to destroy all microbial life including highly resistant bacterial endospores.

4.18 Universal Precautions is an approach to infection control. According to the concept of Universal Precautions, all human blood and certain human body fluids are treated as if known to be infectious for HIV, HBV and other bloodborne pathogens.

4.19 Work Practice Controls means controls that reduce the likelihood of exposure by altering the manner in which a task is performed (e.g., prohibiting recapping of needles by a two-handed technique).

5.0 EXPOSURE DETERMINATION

5.1 The Safety Manager has conducted an exposure determination and based upon the nature of our work operations, the only personnel that have a reasonably anticipated potential for occupational exposure to blood or other infectious materials are designated First Aid/CPR Responder Personnel.

5.1.1 These personnel may be called upon to treat minor injuries and/or clean up messes that contain blood, body fluids or other potentially infectious materials.

6.0 METHODS OF COMPLIANCE – GENERAL

6.1 Universal Precautions

6.1.1 All employees will utilize Universal Precautions. It is an infection control method, which requires employees to treat all human blood and other body fluids as though it is infectious. Universal Precautions will be used regardless of the perceived status of the source individual.

6.1.2 The following procedures carry the risk of exposure to bloodborne diseases:

6.1.2.1 Performance of cardiopulmonary resuscitation (CPR) and/or mouth-to-mouth resuscitation.

6.1.2.2 Dressing or bandaging open, freely bleeding wounds.