

## BP OIL -- TOLEDO REFINERY

	<b>Toledo Refinery</b>	<b>Procedure No.:</b> SAF 054
<b>Effective Date:</b> September 1, 2011	Ground Disturbance	<b>Rev. No.: 8</b>  MOC# M20112560-001
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<b>SCOPE</b>	This procedure is intended to highlight hazards inherent with ground disturbance and excavating. No attempt is made to provide a detailed step-by-step approach to the completion.
<b>HEALTH</b>  <b>Special PPE &amp; Special Hazards</b>	Cave in, Underground electrical, Process line, Sewer gases, Lack of O <sub>2</sub> . The presence of underground facilities such as utility lines, electricity, water, gas, telephone, process piping & sewers. If these are cut or damaged, there may be serious injury to workmen.
<b>SAFETY</b>	Safety hat, safety glasses, long sleeves, gloves and hard sole boots suitable for digging required.
<b>REFERENCE DOCUMENTS</b>	OSHA 29 CFR 1910.146, 29 CFR 1926.21(b)(6)(ii) 29 CFR 1926.650 29 CFR 1926.651 29 CFR 1926.652 ENV 04.001 Waste Disposal Procedure Refining Defined Practice for Control of Work
<b>SPECIAL MATERIALS &amp; EQUIPMENT</b>	Air purifying respirator SCBA Air monitor equipment Gas monitoring equipment
<b>QUALITY</b>	If underground utilities are cut or damaged, there may be costly disruption of operations.
<b>ENVIRONMENTAL</b>	Procedure No. ENV 04.001 Waste Disposal Procedure.

## **Overview**

Ground disturbance must not commence until it has been authorized by a competent person, i.e. one who can identify the hazards and put in place the right measures to control them. Particular care is required if members of the workforce are required to enter the excavation, and conditions must be monitored during their entry to make sure that they are not endangered by changes in soil stability as a result of the weather or other work that is going on.

The Golden Rule on Ground Disturbance states:

Work that involves a man-made cut, cavity, trench or depression in the earth's surface formed by earth removal cannot proceed unless:

- A hazard assessment of the work site is completed by the competent person(s)
- All underground hazards, i.e. pipelines, electric cables, etc., have been identified, located and if necessary, isolated

Where persons are to enter an excavation:

- A confined space entry permit must be issued if the entry meets the confined space definition (greater than 4 feet)
- Ground movement must be controlled and collapse prevented by systematically shoring, sloping, benching, etc., as appropriate
- Ground and environmental conditions must be continuously monitored for change.

### 1.0 Procedure

- Prior to undertaking any underground work Refinery Drawings will be examined to determine if any underground lines or cables are located in the area. (Caution: Engineering data may be incorrect, inadequate or nonexistent.)
- A Level 2 Risk Assessment shall be completed for all excavation tasks. An excavation competent person shall be involved in the Level 2 Risk Assessment. Approval levels are detailed in the Task Risk Category Table.

- Ground disturbance has been broken into two categories:

#### **1. Hand digging <18 inches deep with a shovel**

- Hand dig less than 18" deep with a shovel requires a level 2 Risk Assessment. A pre-approved Level 2 could be used for this task. This category only applies to hand digging with a shovel, spade, or other similar blunt instrument. Use of a pick-ax does not fall into this category. The Ground Disturbance Supplementary Certificate and inspections by an excavation competent person are not required.

#### **2. All other ground disturbance - including any mechanical excavation, hand dig ≥18" with a shovel, or hand dig at any depth with something other than a shovel.**

- All ground disturbance in this category requires a Level 2 Risk Assessment. A Ground Disturbance Supplementary Certificate shall be completed for these tasks. If a pre-approved Level 2 is used, a Ground Disturbance

Supplementary Certificate is still required.

- There is some soil in the refinery classified as an Area of Concern for environmental reasons. These areas can be found on the Environmental webpage under Waste - Areas of Concern. For ground disturbance in these Areas of Concern, no matter what the depth, a member of the environmental group should be consulted.
- The Ground Disturbance Supplementary Certificate shall be completed and approved as part of the WCC packet. The certificates are valid for the duration of the job, but shall be reviewed if the task changes.
- Utility companies or owners shall be contacted to establish the location of the underground utility installations. The location shall be marked indicating the type of service.
- The estimated location of utility installations, such as sewer, telephone, fuel, electric, water lines, or any other underground installations that reasonably may be expected to be encountered during excavation work, shall be determined prior to opening the excavation.
- Power cable locators will be used to locate buried energized power cables. A power cable locator is available for use by contacting the Maintenance Supervisor – Specialty Services.
- No mechanical device, such as dragline or other digging machine, shall be allowed to excavate within six inches of any underground facility. The excavation shall be completed by hand digging.
- In hand excavations, the workmen must be warned about driving picks or powered tools through the envelope of buried facilities. Proper controls for all anticipated hazards must be in place prior to starting the excavation. It is possible that all electric lines are not encased in RED concrete. Prior to 1953 lines were buried in general purpose concrete. Direct burial of 480V power lines protected by wooden planks in offsite areas has until recently been an accepted practice.
- The supervisors in charge of excavation will check before work begins to make sure that there are no live electrical lines in the area where twist or rock drills are to be used. If there are electrical lines, the supervisor should have them de-energized if possible. If an air hammer is required, the air hose to be used shall be the type with built-in braided ground wire from the hammer to the compressor. The equipment and/or compressor then should be grounded to continue the circuit. This low resistance path will protect the worker in case he comes in contact with energized electrical lines.
- When making excavations and digging trenches, always be on alert for buried red concrete, regular concrete, electrical power lines, piping, sewers, etc. Also be alert to the condition of the sidewalls of a trench or excavation to determine the need for bracing or shoring to prevent cave-ins.

- Work should be stopped immediately when red concrete, regular concrete, wooden planks, electrical power lines, cables, pipe and sewers are uncovered at excavation site. Contact supervisor who will coordinate updating of risk assessment for additional hazards and controls.
- The Inspection Department shall be contacted any time buried “hydrocarbon” piping has been exposed. The Inspector will determine the extent of inspection required and if any repairs are needed. This requirement will be worked with the WCC and the Ground Disturbance - Supplementary Certificate. Piping exposed that is not in hydrocarbon service may also need inspection and repair but does not fall under the SPCC requirement.
- Close coordination is required between laborers and backhoe or other power equipment operator when working together on excavations.
- Always cover, barricade or rope off excavations before leaving job for any length of time. When the work is left uncovered at night, warning lights should be in place.
- Ladders or stairways are to be provided in excavations of 4 feet or more and shall be located not more than 25 feet apart.
- Excavations greater than 4 feet shall be treated as confined spaces. See SAF-032 Confined Space Entry for requirements.

2.0 Competent Person Responsibilities

- Competent person is defined as anyone capable of identifying existing and predictable hazards in the work environment and who has authority to correct such hazards.
- The competent person must have a thorough knowledge of all requirements and aspects of excavation work.
- The competent person should attend the Level 2 Risk Assessment. The competent person should be able to discuss potential hazards of the excavation, shoring requirements, access and egress, waste disposal hazards, and appropriate controls.
- The competent person shall inform the Environmental Waste Specialist of the excavation during the planning phase. Refer to the environmental webpage: Environmental Guidance for Management of Excavated Soils.
- The competent person shall complete the appropriate section of the Ground Disturbance Supplementary Certificate. The competent person shall mark on the Ground Disturbance Supplementary Certificate whether daily inspections are required.
- The competent person shall perform inspections as required. Inspections are required when employee exposure can be reasonable anticipated. Inspections are also required for all excavations greater than 4 feet deep.
- Inspections shall be documented. Proof of inspections shall be kept at the job site while work is going on and should include the date and time of the inspection along with the name and signature of the person performing the

inspection.

- It is the responsibility of each competent person who supervises employees performing such work as described above to:
  - ◆ Evaluate whether the excavation may also be considered a confined space.
  - ◆ Perform and document daily inspections of excavations, the adjacent areas and protective systems before the start of work each day and as necessary throughout the shift.
  - ◆ Inspections shall be made and documented after every rainstorm or other hazard increasing occurrence.
  - ◆ Where evidence indicates a possible cave in, failure of protective system, hazardous atmosphere or other hazardous conditions, employees shall be removed until the proper precautions have been taken.
  - ◆ While the excavation is open, underground installations shall be protected, supported or removed to safeguard employees.
  - ◆ All surface objects that may present a hazard to employees by rolling or falling into an excavation shall be removed or supported.
  - ◆ All excavations 4 feet or more in depth require a safe means of egress.
  - ◆ On trenches and excavations, more than 5 feet in depth, the exposed faces shall be supported and held in place by at least one of the following methods:
    1. A substantial shoring system
    2. Soil sloped to the proper ratio based on soil type
    3. Appropriately benched based on soil type.
  - ◆ OSHA regulation 29 CFR 1926.652 Subpart P Appendix A-F will give you the proper shoring, sloping, and benching information

### 3.0 Competent Person List

- The competent person signing the Ground Disturbance Supplementary Certificate and overseeing the job shall be on the list of Excavation Competent Persons posted on the Toledo HSSE webpage.
- To be added to the list, all of the following steps apply:
  1. Provide letter or proof of training.
    - BP employees provide a copy of certificate of successful completion of excavation competent person training.

- Contractors must have their company submit a letter to the Contract Management Program Superintendent stating the people by name to be added. The letter shall state that those people are trained in the OSHA requirements to be an excavation competent person.
- 2. Receive training on this SAF procedure by the Maintenance Supervisor – Specialty Services or Safety Advisor serving as SME on excavations.
- 3. Demonstrate understanding of this SAF procedure by successfully completing an exam.

- 4.0 Access and Egress
- A stairway, ladder, ramp or other safe means of egress shall be located in excavations that are 4 feet or more in depth so as to require no more than 25 feet lateral travel for employees.
  - Ladders must extend 36 inches above the point of support at the top of the excavation.
  - Structural ramps used solely by employees shall be designed by a competent person.
  - Structural ramps used by equipment shall be designed by a competent person qualified in structural design and shall be constructed accordingly.
- 5.0 Hazardous Atmosphere
- Atmospheric Testing shall be performed before entry for excavations greater than 4 feet in depth. Continuous monitoring is also required during entry into these excavations. Testing shall be done in accordance with SAF-032 Confined Space Entry.
  - Adequate precautions shall be taken to prevent employee exposure to oxygen deficiency or hazardous atmospheres. These precautions may include providing proper respiratory protection or ventilation.
- 6.0 Protection of Employees from loose rock or soil and equipment
- Excavated or other material and equipment shall be kept at least 2 feet from the edge of excavations or behind retaining devices sufficient to prevent material or equipment from falling or rolling into the excavation.
  - If the operator of mobile equipment adjacent to or near the edge of an excavation does not have a clear view of the edge of the excavation, a warning system such as barricades, stop logs or hand signals shall be used. If possible, the grade should be away from the excavation.
- 7.0 Fall Protection
- Where employees or equipment are required or permitted to cross over excavations, walkways or bridges with standard guard rails shall be provided.
  - Adequate barricades providing physical protection shall be provided at all excavations. All wells, pits, shafts, etc., shall be barricaded or covered.
  - Upon completion of operations, temporary wells, pits, shafts, etc., shall be

promptly and adequately back filled.

- 8.0 Soil Classification
- Each soil and rock deposit shall be classified by a competent person as stable rock, Type A, Type B or Type C in accordance with the definitions set forth in 29 CFR 1926.652 (Appendix A).
  - Soil in Toledo Refinery is mainly Type C. (Sandy, Loose, etc.)
  - The classification shall be based on at least one visual and at least one manual analysis. Such analysis shall be conducted by a competent person using tests described in 29 CFR 1926.652 (Appendix A).
- 9.0 Support and Shield Systems (Shoring)
- Refer to 29 CFR 1926.652 Subpart P, Appendix A-F for specifications for the specific type of protective system in use.

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