Excavation, Trenching and Shoring

Purpose

The purpose of this document is to ensure working conditions are safe when entering/work in excavations and trenches. Also, to ensure excavated soils are monitored for volatile organic compounds (VOC'S) and hazardous materials to meet Environmental requirements.

Scope

The scope of this standard practice applies to all Marathon Employees and Contractors working in the Los Angeles Refinery (LAR), to ensure compliance with the various regulations and define requirements and responsibilities.

Note: All personnel (Marathon Employees and Contractors) performing work in LAR shall review the Site Standard that applies to their individual work scope prior to engaging in that work.

Supersedes

Both FS 520 Excavation and Shoring, SAF 034 Trenching and Excavation and MWI-LABOR-014 will be archived upon issuance of this document.

Records Retention

Printed copies of this document should not be retained more than 12 months. Any revision to this document will be retained a maximum of 10 years following the revision. Unit sign-in sheets should not be retained for more than 30 days.

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1.0 References

1.1 Refining The table below lists the Refining references used with this document.

Name	Description
HSS 201	Safe Work Permit
LAR-Form E40	Excavating up to 20feet
TENV 226	Soils Handling Procedure.
TENV 117	Excavation Planning & Soil Management Procedure
FS 315	Confined Space Entry
HSS-410	Asbestos Exposure Prevention Program

1.2 Industrial The table below lists the industry references used with this document.

Name	Description
ANSI A10.12	Safety Requirements for Excavation-Construction and Demolition Operations

1.3 Government The table below lists the State and Federal References used with this document.

Number	Description
CFR 1926, 650-652	Excavation-Subpart J &P, Appendix A-F
CCR T8-1539-1542, 341	Excavation, Permit Requirements
California Government Code	4216-4216.9 Dig Alert

1.4 Terms The following terms are used in this document:

- A.1 Affected Person
- A.2 Competent Person
- A.3 Confined Space Entry
- A.4 Contaminated Soil
- A.5 Electrical Representative
- A.5 Emergency
- A.6 Engulfment
- A.7 Excavation
- A.8 Hand Tool
- A.9 Mechanical Representative
- A.10 Registered Engineer
- A.11 Sloping
- A.12 Subsurface Installation
- A.14 Tolerance Zone
- A.15 Trench
- A.16 VOC Contaminated Soil
- A.17 Warning System

References: For details, see **Appendix A**, Terms and Definitions.

2.0 Pre-Requisites

2.1 Training

2.1.1 Persons involved with excavations must be trained and/or proficient on the following material:

- Competent Person Qualification (applies to those filling the role as Competent Person)
- Excavation Awareness Training
- DOT Operator Qualifications (only applies to those working on or with DOT pipelines).

2.1.2 Additional training and site standard review is required for all persons involved in excavation and trenching work in Los Angeles Refinery

- HSS-201 Permit to Work (permit issuers and recipients)
- HSS 002 Safety Attendant (standbys for CSE)
  - Contractors are required to have the OSCA Safety Attendant training before performing this work.

3.0 Excavation Permitting

3.1 Annual Permits

3.1.1 Contractors or MPC Employees performing trenching or excavating operations within the confines of LAR must provide valid annual permits from the State of California, Division of Industrial Safety to Los Angeles Refinery Health & Safety Department.

3.2 OSHA Permitting Exceptions

The following exceptions apply for OSHA permitting of excavations:

3.2.1 Construction of excavations for the purpose of performing emergency repair work to underground facilities.

3.2.2 Construction or final use of excavations where the construction or final use does not require a person to descend into the excavation.

The following requirements apply for excavation less than 5 feet: No Cal/OSHA annual permit required.

3.3 Annual Cal-OSHA Permitting Requirements

The following requirements apply for **excavation 5 feet or deeper into which any person is required to descend**:

3.3.1 The excavation is to be performed under the Contractors Annual Construction Permit number, to verify more details see Contractors Cal/OSHA annual permit.

3.3.2 Excavating Contractors must:

- Complete **Activity Notification Form**, indicating intent to excavate prior to start of excavation; indicating the location of the project, and the date, time the work activity is to commence.
- Notify the nearest Division of Occupational Safety and Health office **Note:** Long Beach DOSH Office covers excavations in both the city of Carson and Wilmington, see contact information below:

  - Long Beach District Office
  - 1500 Hughes Way, Suite C-201
  - Long Beach, CA 90810
  - phone:(424) 450-2630
  - fax:(424) 450-2675
  - email: DOSHLBO@dir.ca.gov

3.3.3 Excavation will be supervised by the competent person.

3.3.4 Excavation design, review and approval of excavations 5 feet deep or deeper must comply with the requirements and limitations established by applicable Cal/OSHA standards (§1541, §1541.1 and §341.)

3.4 Los Angeles Refinery Permitting Requirements

The following permitting requirements apply at LAR for excavations:

3.4.1 Refer to HSS-201 Safe Work Permit and Permitted Task List.

3.4.2 Regardless of the type of permit:

- Dig Alert number must be written on the permit
- Excavation Approval Form must be attached to the permit

3.4.3 Ensure that conditions where the work is to occur including conditions of nearby equipment are such that the work can be performed safely with regards to both personnel and equipment.

4.0 Excavation Notification

4.1 Pre-Excavation Form

4.1.1 Prior to any excavation, regardless of size or amount of material, notification shall be made to the Environmental Specialist using the **Pre-Excavation Notification Form**, see link below:

https://forms.office.com/Pages/ResponsePage.aspx?id=zvRAFsaG8kSkdwa9OWF-l0ZJ7jzA75RHq6fBFVO79RVUMk81WUxHUTY5R0NNNjBIM0tGRldNRlVPTC4u

4.2 California One Call Law

Contractor performing excavation will follow all the requirements of the California One Call Law by notifying Dig Alert at least 2 calendar days no more than 14 calendar days prior to digging or moving of any earth. Please see the Dig Alert contact information below:

4.2.1 Phone: 1-800-422-4133 or 811

4.2.2 Website: https://www.digalert.org/

4.2.3 The Dig Alert Notification number is valid 28 days from the first notification date (e.g. 28 days from the call-in date).

a. Dig Alert Notification Number can be renewed online or by calling the Dig alert number and asking for a renewal.

4.2.4 Other pipeline owners (Right of Way) and /or utility companies must be contacted within customary local response times (48 -72 hours) prior to the start of excavation either through direct contact or the Dig Alert system and advised on the proposed work and a request made to establish locations of underground installations, as well as having above ground and underground obstructions identified and marked.

4.2.5 In the event the location of underground obstructions or installations cannot be confirmed and the guidelines for pre-excavations have been completed within the allotted time frame, excavation operations may proceed with approval from the competent person provided steps identified in this procedure for excavation are followed.

4.3 AQMD

4.3.1 A notification for excavation, using the **Rule 1166 Notification Form**, to the AQMD must be faxed or emailed (Rule1166notifications@aqmd.com) by the excavation contractor or MPC competent person, in accordance with their Rule 1166 Plan.

4.3.2 In general, no excavating can begin until 24 hours after this notification has be made, except if deemed an emergency by the **authorized officer,** i.e., City/County Fire Department or by Los Angeles Refinery's Fire Department (Fire Chief).

4.3.3 If the **authorized officer** has deemed an excavation an emergency, work can begin immediately but the **Rule 1166 Notification Form** must be faxed or emailed by the MPC or contractor competent person, to AQMD no later than 48 hours following the beginning of the excavation and must include emergency declaration (i.e., why the excavation is an emergency (in the comment section) and approved in writing by the **authorized officer**, i.e., City/County Fire Department or by Los Angeles Refinery Fire Department (Fire Chief.).

4.3.4 Example of an Emergency Excavation:

a. An excavation that has identified contaminated soil which poses a threat of fire or a threat to the facility or community. This could involve a release containing a significant amount of benzene or an underground line leak where excavation is required to expose the pipe to stop the leak.

5.0 Roles and Responsibilities

5.1 Roles and Responsibilities The table below describes the roles and responsibilities related to this document.

Roles	Responsibilities
5.1.1 Servicing Group (MPC Employee or Contractor) **Note**: The competent person shall come from this group.	Is responsible for the following: • Initiates the Safe Work Permit • Initiates the Excavation Approval Form • Initiates Dig Alert System Note: within 14 days of excavation (note: a minimum of 2-days prior to excavation) notification • Acquire the Ground Penetrating Radar (GPR) report (when applicable) • Acquire the reference number for the excavation from the AQMD. Note: Notification 24 hours prior. • Ensure the necessary signatures are on the Permit Package prior to excavation. • Prior to start of job. ensure the Soil Monitor for VOC monitoring is trained and records must be kept available on the job site. • Participates in a review of all permits, procedures and forms with the Owning Department and all stakeholders in the excavation, during Joint Job Site Visit (JJSV), to ensure the work is clearly defined and can be completed safely

5.1.2 Permit Writer (Owning Department)	Is the responsible person for the following tasks:
	• When it is determined there is a requirement to conduct excavation or trenching operation, complete the following:
	  ○ Verify the Safe Work Permit is complete and signed by all required parties.
	  ○ Verify Excavation Approval Form completed
	  ○ Verify that all excavations that have been determined as CSE have all the required CSE forms, including a request for CSE Rescue Plan (as needed), personnel available to enter the PRCS, i.e. entry supervisor, entrants, Stand by Attendant and Rescue Personnel and all safety/rescue equipment required is in place and personnel are trained in the proper use of the equipment.
	• Reviewing of all permits, procedures and forms with the Servicing Group and all stakeholders in the excavation, during Joint Job Site Visit (JJSV), to ensure the work is clearly defined and can be completed safely
	  ○ Including reviewing all available maps, plans, and/or drawings for buried conduits, cables and piping running within 5 feet of the excavation site with the work group prior to excavation.
	• Review any specific restrictions, precautions, and/or approvals which may be required.
	• Excavations removing more than 1 cubic yard of soil must follow AQMD requirements described TENV-117-Excavations Planning and Soil Management.
	• Review TENV-226-Soil Handling Procedure for all handling of containment soil (Rule 1166).
	• Verify the Dig Alert System has been used:
	  ○ To request line locations,
	  ○ Verify any known utilities have been marked,
	  ○ Obtain the request confirmation number,
	  ○ Ensure the number is documented on the Excavation Permit Form,
	  ○ Call for a re-request if lines are not marked.
	• Alert all affected persons in the area where work is to be completed.
	• Verify the time limits and job location boundaries for the excavation on the permit and sign the Excavation Approval Form.
	• Make final inspection of job site along with the person doing the work to ensure all permit conditions are met.

5.1.3 Competent Person	The Competent Person shall perform and include but is not limited to the following: • Complete the Daily Inspection and document it on the Daily Excavation Checklist, shall be keep with the JSA • Daily inspections of trench and excavations, the adjacent areas, and protective systems (if used) for evidence of a situation that could result in possible cave-ins, indications of failure of protective systems, hazardous atmospheres, or other hazardous conditions. If any hazards exist ensure all hazards are mitigated prior to work beginning. o Prior to job beginning to ensure the work site is safeguarded, i.e. warning lights (if necessary), barricades (hard or soft), Identification of Soil Type, Shoring, Sloping, Benching (as required), safe access/egress to excavation/trench and jobsite and mitigate any identified traffic Safety **Appendix D** o An inspection shall be conducted prior to the start of work and as needed throughout the shift. Inspections shall also be made after every rainstorm or other hazard increasing occurrences. o Inspect the excavation and determine soil type and what type protective system will be required to prevent cave-in. • Review the job plan to ensure all precautions have been considered. • Notify Refinery Shift Supervisor (RSS) if the roads need to be closed • Complete the daily inspections check list during daily periodic inspection of the excavation site to check for changes which may result in a change in the permits, failure in the protective systems, hazardous atmosphere, or other unsafe conditions. • The LAR Safe Work Permit will be renewed at a minimum daily or as the conditions change. • Exercise Stop Work Obligation and/or take prompt corrective action to safeguard the workers at the site whenever conditions become hazardous to workers, ensuring workers are removed from the area, the situation is corrected, and new permits are completed. • Any accumulations of water which could be deemed hazardous to the operation must be removed and the source controlled, review T8, 1541 (h) (1) for more details. • Any damaged structures or equipment shall be evaluated by the competent person, reported to Operations or the MPC area owner, safety and section 8.1 of this document shall be followed, as required.

5.1.4 Entrant	Entrants shall perform the following: • Review Daily Excavation Inspection Form, JSA, Safe Work Permit and, when applicable, any additional mitigation forms/checklists, as required, including a Confined Space Entry Rescue Plan when a Confined Space Entry is listed on the Safe Work Permit. • Know and be able to summon the competent person responsible for the excavation. • Report any potentially hazardous condition to the competent person, project or maintenance representative and operations as necessary
5.1.5 Electrical and Mechanical Representatives	Prior to signing the **Excavation Approval Form**, the electrical and mechanical representatives need to visit the proposed excavation site to review any potential concerns and/or mark any lines if necessary.
5.1.6 Civil Engineer	Civil Engineer shall approve the use of non-contaminated soil for backfill to ensure material possesses proper compaction qualities.
5.1.7 Soil Monitor **(MPC employee or contractor)**	The employee monitoring the soil will perform testing on all excavation soils and immediately following the detection of VOC contaminated soils (>50ppm or higher), begin the Soils Handling Procedure requirements are within TENV 226 Soil Handling-Rule-1166 If discovery is after normal business hours or on the weekend, contact the Refinery Shift Supervisor (501) or the on-call environmental contact.
5.1.8 Equipment Operator	The following applies to the operator performing work in LAR: • Shall be trained on the equipment he/she is operating. • Shall verify dig instructions and dig locations with excavation supervision or competent person prior to digging • Shall use a "**Warning System**" whenever he/she approaches the edge of an excavation and do not have clear and direct view of the digging equipment (i.e., bucket) or the edge of the excavation.

6.0 General Requirements

6.1 Access/Egress

6.1.1 Proper means of access/egress are established in accordance with 29 CFR 1926.651 (c). The means of egress shall allow for the employee to egress in an upright position(walking)

6.1.2 Ladders, ramps or other means of egress shall be provided in all excavations 4 feet or greater. These means of egress shall be no further than 25 feet from the worker and ladders shall extend at least 3 feet above excavation.

Barricades, stop logs, hand or mechanical signals must be utilized to warn against mobile equipment operating close to the excavation area, see CFR 1926.651(l) (7)(ii)) and refer to HSS 027 Barricades for more details.

6.2 Barricades and Guardrails

6.2.1 Adequate barrier physical protection shall be provided at all remotely located excavations

6.2.2 Physical barricades or covered shall be the primary barricades used for all wells, pits, shafts, etc., when not in use.

(a) Upon completion of exploration and other similar operations, temporary wells, pits, shafts, etc., shall be backfilled or covered unless otherwise is approved by MPC representative and the competent person.

6.2.3 Where equipment and personnel are permitted or required to cross excavations, a walkway with a guardrail shall be provided (see 1926.502 (b)).

6.3 Traffic Safety

The competent person must access the jobsite and verify what level of traffic safety is required for all excavations that are close to a road or street:

6.3.1 A traffic safety plan addressing flagmen and warning barriers must be prepared

6.3.2 Workers exposed to vehicular traffic shall have Hi Visibility reflective warning vests

6.3.3 A hard barricade shall be provided at all excavations to provide physical protection against traffic.

6.4 Safeguards

6.4.1 Surface and overhead obstructions will be guarded, removed, or supported to safeguard workers.

6.5 Spoils

6.7.1 Spoils and equipment are to maintain a minimum of 2 feet away from the excavation opening.

6.6 Equipment

6.6.1 Any internal combustion engine i.e. generators, light plants, vehicles etc. must be placed a minimum of 3 feet from excavation.

6.7 Adjacent structures

6.7.1 Excavations beneath the level of adjacent foundations, retaining walls, or other structures including sidewalks and roadways shall be approved by a registered engineer verifying the work will not undermine the structures.

6.8 Identifying Unknown Subsurface Installations

The following methods must be used for identifying unknown underground obstructions i.e., piping or structures for water, gas, communication, or electrical service:

6.8.1 Underground drawings and completed GPR data shall be thoroughly reviewed by servicing group prior to beginning excavation. Potential underground obstruction locations that have been noted on the reference drawings shall be clearly marked in the field.

6.8.2 When using an excavating equipment probe ahead to a depth of 8 - 12 inches in a 6”x6” grid pattern. The excavator shall not dig any deeper than the probed depth.

6.8.3 A spotter to be present when operating excavation equipment for exploratory excavation.

6.8.4 When using a drilling auger, probe to a depth and pattern provided by engineering prior to drilling.

6.8.5 Additional probing or other methods such as hydro excavation, hand tools, Ground Penetrating Radar (GPR), Line Finders etc. are available to reduce the risk of striking underground obstructions.

6.8.6 Where hydro-excavation is the necessary excavation method, probing is not required.

6.8.7 Obstructions shall be identified with markers, flags or paint. These marking shall be remarked as needed throughout the duration of the excavation as conditions change.

6.8.8 While the excavation is open all underground installations must be protected, supported or removed.

6.8.9 Notify the Engineering and Owning department if unexpected lines found during excavations.

6.9 Close Proximity to Subsurface Installations.

When the excavation is known to be within Tolerance Zone (2ft.) of pipelines and/or conduits the precise location of the pipelines/conduits shall be completed by the means of hand tool digging or probing.

6.9.1 Once located, the use of power equipment may be authorized after the following measures have been met.

a. A Competent Person or owner or owner of the pipeline or conduit has been notified and is present or declined to be present

b. The electrical conduit is safely encased in concrete, often red in color

c. The Competent Person or owner person authorizes the work to continue.

610 Tank Berm Walls	**6.10.1**	Any time a tank berm wall will be disturbed contact Environmental Specialist for the review prior to beginning work. Dig Alert is not required to be notified unless excavation or trench will be reaching ground level.
6.11 Discovery of Bones		If bones are discovered while excavating at LAR, the following steps are to be followed:
	6.11.1	Stop work and secure the area, do not disturb the bones further
	6.11.2	Notify area EHS representative, Security, External Affairs and Refinery Manager
6.12 Fall Protection		If Fall Protection is required while excavating at LAR, the following steps are to be followed:
	6.12.1	Fall protection and suitable anchorage point required for all personnel potentially exposed to falls greater than 6 feet.
	6.12.2	Employees entering bell-bottom pier holes, or other similar deep and confined footing excavations, shall wear a harness with a lifeline securely attached to it. The lifeline shall be separate from any line used to handle materials, and shall be always individually attended while the employee wearing the lifeline is in the excavation
6.13 Loading or Unloading Operations		While loading or unloading operations are being performed at LAR, the following safeguards are to be followed:
	6.13.1	No employee shall be permitted underneath loads handled by lifting or digging equipment.
	6.13.2	Employees shall be required to stand away from any vehicle being loaded or unloaded to avoid being struck by any spillage or falling materials.
	6.13.3	Operators may remain in the cabs of vehicles being loaded or unloaded when the vehicles are equipped to provide adequate protection for the operator during loading and unloading operations.
6.14 Contaminated Soil	**6.14.1**	Refer to TENV 226 Soils Handling Procedure for guidelines and requirements

6.15 Emergency Rescue Equipment

6.15.1 Emergency rescue equipment, such as breathing apparatus, a safety harness and line, or a basket stretcher, shall be readily available where hazardous atmospheric conditions exist or may reasonably be expected to develop during work in an excavation. This equipment shall always be attended when employees enter bell-bottom pier holes, deep confined spaces, or other similar hazards.

7.0 Prior to Excavation Entry

7. 1 Soil Classification

7.1.1 If an employee is expected to enter an excavated site, the LAR responsible person shall have a competent person test and classify the soil conditions and enter the result of their analysis on the **Daily Excavation Inspection Checklist.**

7.1.2 The competent person shall classify soils by both visual and manual methods per OSHA standard, 29 CFR 1926.652 and 1541.1. Requirements for Protective Systems, Appendix A-Soil Classification, at which point the need for shoring, benching and /or sloping shall be determined.

7.2 Employee Protection

7.2.1 The competent person shall determine the level of employee protection required for the excavation. The four (4) main types of employee protection are as follows:

- Shield - can be permanent or portable. Also known as trench box or trench shield.
- Shoring - such as metal hydraulic, mechanical, or timber shoring system that supports the sides.
- Sloping - form sides of an excavation that are inclined away from the excavation.
- Benching - excavating the sides of an excavation to form one or a series of horizontal levels or step

Important: If the excavation is greater than 20 deep feet, the employee protection must be designed by a registered engineer. The competent person shall also ensure that shoring design has been certified by a registered engineer.

7.3 Employee Protection Exemption

An exemption may be given by the competent person regarding the need for Employee Protection if:

7.3.1 The excavation is less than 5 feet deep and there is no potential for cave in; or

7.3.2 The excavation is made entirely in stable rock that has no potential for collapse.

7.3.3 This exemption is only given upon certification from a competent person that all precautions have been taken to eliminate the risk to the employee regarding cave in, and in accordance with Federal, State, and local regulations.

7.4 Hazardous Atmospheres

7.4.1 Where an excavation is 4 feet or greater in depth and considered a confined space entry, continuous multi-gas monitoring per the HSS 201 Safe Work Permit shall be completed and documented on the Safe Work Permit before employees enter the excavation.

7.4.2 The following steps shall be taken to reduce the exposure to hazardous atmospheres, oxygen deficient atmospheres, and/or flammable atmospheres:

a. Competent Person shall ensure adequate forced air ventilation of the excavation.

b. If respirators are required to enter the excavation, the Competent Person shall review HSS 306 Respirator Program to access the appropriate respiration equipment is used and in compliance with HSS 306 Respirator Program.

c. If the excavation less than 4 feet in depth the Competent Person shall ensure safe atmospheric conditions prior to allowing employee entry into the workspace, verified via initial multi-gas monitoring of the workspace to verify safe atmospheric conditions. Continuous monitoring of the excavation may be required during work, based on the of the initial monitoring.

8.0 Line Strike or Release

8.1 Accidental Release Mitigation.

In the event of accidental release of product or energy resulting from a line strike complete the following steps:

8.1.1 Stop work

8.1.2 Evacuate the work area

8.1.3 Use the following methods of reporting a site emergency release:

a. Contact 501/RSS via Radio Channel C-1

b. Dial 6911 or 222 or 8888 from any Refinery phone to reach security

c. Use the Orange button on your filed radio (hold for 3 seconds)

8.1.4 Ensure you communicate the following information during your report out:

Report Element	Required/Optional
Location of Hazard	Required
Description of Hazard	Required
Potential consequences	Required
Steps taken to mitigate hazard	Required
MPC Employee or Contractor Name	Optional
Contact information (company, phone etc.)	Optional

8.1.5 Subsequent notifications will be made according to TENV 226 Soils Handling Procedure.

8.2 Electrical The following minimum

8.2.1 In the event of an electrical line strike workers should not move, do not touch the machine, stay clear of water, and note that anything connected to the equipment may be highly charged. If electrical strike sensing systems are used, they must follow the manufacturer's guidelines. Operators should remain calm and attempt to reverse direction in an effort to break contact. The utility company is to be contacted at once.

8.3 Gas Line.

8.3.1 In the event of a gas line strike, shut down all equipment, evacuate the work area, call emergency services and the gas utility service to turn off the gas feeding the ruptured pipe.

8.4 Fiber Optic Line.

8.4.1 In the event of a fiber optic line strike workers must never look at the exposed cable as severe eye damage may occur. Stop work at once and contact the proper utility owner.

8.5 Communications Line.

8.5.1 In the event a communications line strike occurs, stop work at once and contact the proper utility owner

8.6 Water/Sewer Line.

8.6.1 In the event a water or sewer line strike occurs, work must stop at once, all personnel are to be notified that the strike has occurred and to stay away from the area.

8.7 Unknown or Hazardous Material.

8.7.1 A strike of any line in which is not noted or marked on a map or the contents cannot be identified, or a line known to carry a hazardous material the competent person shall follow the steps in 8.1 of this section and contact Dig Alert report the incident and help identify the line owner.

Appendix A: Terms and Definitions

A.1 Affected Person	Affected by the work being done, may be a Marathon employee, contract employee or surrounding population.
A.2 Competent Person	A person with knowledge of this procedure and the regulatory requirements, e.g., project, maintenance, or contractor representative, who upon request, is capable of providing the following information regarding the excavation. • Soil condition including analysis, if necessary • Shoring method applicable to the soil condition and depth • Methods of egress and or rescue • Proper use of shoring materials
A.3 Confined Space Entry	The action by which a person passes through an opening into a permit-required confined space (for this standard an excavation/trench identified as a PRCS) Entry includes ensuing work activities in that space and is considered to have occurred as soon as any part of the entrant's body breaks the plane of an opening into the space.
A.4 Contaminated Soil	Soil which contains odors or visible contamination with materials, such as, acids, caustics, hydrocarbons, asbestos or other waste characteristics. This includes VOC contaminated soil.
A.5 Electrical Representative	Electrical representative is defined as an E&I inspector, E&I supervisor, electrical engineer or coordinator with knowledge and understanding of underground electrical conduits, vaults and connections.
A.6 Emergency	A sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.
A.7 Engulfment	The surrounding and enclosure of a person by liquid, or other fine substance which if inhaled may cause death by filling or plugging the respiratory system or may exert enough force on the body as to cause strangulation, constriction, or crushing
A.8 Excavation	Any operation in which earth, rock, or other material in the ground is moved, removed, or otherwise displaced by means of tools, equipment, or explosives in any of the following ways: grading, trenching, digging, ditching, drilling, augering, tunneling, scraping, cable or pipe plowing and driving, hydro excavations or any other way.

A.9 Hand Tool	Means a piece of equipment used for excavating that uses human power and is not powered by any motor, engine, hydraulic, or pneumatic device.
A.10 Mechanical Representative	Mechanical representative is defined as a construction or maintenance supervisor, engineer or coordinator with knowledge and understanding of underground pipes and obstructions
A.11 Registered Engineer	Professional engineer registered in the state the work is to be performed. An engineer registered in any state is classified a "registered professional engineer."
A.12 Sloping	Method of cave-in protection achieved by the sides of the excavation being inclined away from the excavation to prevent cave in. Varies with conditions of the excavation.
A.13 Subsurface Installation	Any underground pipeline, conduit, duct, wire or other structure, except non-pressurized sewer lines, storm drains or other non-pressurized lines.
A.14 Tolerance Zone	Means 24 inches on each side of the field marking placed by the operator in one of the following ways: **1)** Twenty-four inches from each side of a single marking, assumed to be the centerline of the subsurface installation. **2)** Twenty-four inches plus one-half the specified size on each side of a single marking with the size of installation specified. **3)** Twenty-four inches from each outside marking that graphically shows the width of the outside surface of the subsurface installation on a horizontal plane.
A.15 Trench	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 (measured at the bottom) is not greater than 15 feet.
A.16 VOC Contaminated Soil	A soil which registers 50 PPM or greater VOC concentration as measured with an Organic Vapor Analyzer (OVA).
A.17 Warning System	A method used to indicate an impending hazard i.e. barricades (in the case of warning system for excavations the barricade shall be physical barricade), spotter/attendant using hand signals, mechanical signals or signs or a stop log. This must be used when equipment must approach the edge of an excavation, close (3feet.-5feet.) to process equipment or the operator does not have a clear and direct view of the edge.

Appendix B: Excavation Approval Form

B.1 Form

The following for is link the hard copy of Excavation Approval Form: LAR-REF-HAS-LAR-600-DOC-0612-2.docx

	Excavation Approval Form	Appendix B

The Competent Persons shall initiate this form during the planning phase prior to excavation/trenching operations. This form shall be maintained with Safe Work Permit.

Section A – General Information

Mandatory for all Excavation and Trench Activity at LAR

Servicing Group: _____	Date: _____
Type of Excavation to be performed: _____	
Location: _____	Area: _____
Project Name/Description: _____	
Equipment to be used: _____	

Section B – Excavation Activity Preparation

Mandatory for all Excavation and Trench Activity at LAR

Yes	No	N/A	Questionnaire
			Online Pre-Excavation Notification sent to MPC Environmental/Safety?
			Depth greater than 4 ft? (Confined Space Entry Permitting)
			Drawing reviewed? ☐ Plot plans ☐ U/G Drawings ☐ Previous Excavation Record ☐ P&ID's ☐ Process Knowledge/Operations Interviews ☐ Other _____
			Excavation Area clearly outlined prior to excavation?
			U/G Survey performed? ☐ Electromagnetic (EM) Method ☐ Ground Penetrating Radar (GPR) ☐ Pot holing
			U/G Electrical identified? (If yes, hand dig within 3 feet)
			U/G Piping identified?
			Dig Alert Completed? One Call Confirmation # _____
			Proper organizations notified? (Local Utilities) _____
			Shoring Methods determined? (Describe) _____
			Any traffic concerns addressed with a traffic safety plan and detours marked?
			Is there equipment nearby with vibration monitoring, vibration alarms, and/or vibration shutdowns? (If necessary, Operations to follow Safety Device Bypass process to bypass equipment vibration sensors)

Section C – Signature Approval

Mandatory for all Excavation and Trench Activity at LAR

Competent Person: _____	Signature: _____	Date: _____
MPC Mechanical Representative: _____	Signature: _____	Date: _____
MPC Electrical Representative: _____	Signature: _____	Date: _____

Appendix C: Daily Excavation Inspection Checklist

C.1 Table

The following is the link for the Daily Excavation Inspection Checklist: LAR-REF-HAS-LAR-600-DOC-0612-1

	Daily Excavation Inspection Checklist	Appendix C

The Competent Persons shall complete this form daily prior to excavation/trenching operations. This form shall be attached to Safe Work Permit. Competent Persons shall review all potential excavation hazards with Excavation Entrants prior to beginning of work.

Section A – General Information	
Mandatory for all Excavation and Trench Activity at LAR	
Servicing Group: _____	Date: _____
Soil Classification: ☐ Type A ☐ Type B ☐ Type C	
Excavation Depth: _____	Excavation Width: _____
Type of Protective System Used: _____	
Safe Work Permit #: _____	

Section B – General Inspection of Jobsite

Mandatory for all Excavation and Trench Activity at LAR

Yes	No	N/A	Questionnaire
			Personnel is aware of the Rule 1166 Requirements? (Monitoring Log, Stockpile Inspection, etc.)
			Competent Person is aware that inspections are to be made after hazard-increasing occurrence?
			PPE and respiratory protection are documented on Safe Work Permit based on the scope, gas testing, and hazards?
			Warning vests or highly visible clothing are worn by all personnel exposed to vehicular traffic hazards?
			Protective systems are in place at high traffic area?
			Location of the excavation is marked by flagging, tape, or barricades?
			Excavations and trenches are properly barricaded or covered to prevent falls?
			Fall protection requirement is in place working within 6 feet of the edge of an excavation and a potential fall of 6 feet or greater?
			Walkways and bridges over excavation with a fall greater than six feet are equipped with standard guardrails, toe boards and/or netting to prevent falling object?
			Are personnel working on the faces of slopes or benched excavations above other personnel?
			Spoils, materials, and equipment removed, supported, or set-back are at least two feet from the edge of the excavation?
			Personnel is protected from loose rock or soil near the excavation?
			Personnel is aware of stop work obligation when foreign material (Other than sand, soil, dirt, concrete, asphalt, gravel, or rock) encountered?
			Is a spotter being used when operating heavy equipment at the work site?
			Warning system is established and utilized when mobile equipment is operating near the edge of the excavation?
			Personnel is aware of NOT working inside an excavation when heavy equipment is operating within 3 feet from the edge?
			Personnel is aware of NOT being underneath loads handled by lifting or digging equipment?

Appendix D: Excavations: Hazard Recognition in Trenching and Shoring

D.1 List

The following is a comprehensive overview of the hazards and mitigation requirements for excavations and trenching as outlined by OSHA Technical Manual (OTM) Section V: Chapter 2-Excavation: Hazard Recognition in Trenching and Shoring This list is to serve as a guide and should be reviewed by competent person prior to beginning the work.

- Soil Mechanics
- Determination of Soil Type
- Test Equipment and Methods for Evaluating Soil Type
- Shoring Types
- Shielding Types
- Sloping and Benching
- Spoil
- Additional Special Health and Safety Considerations (specific to Excavation/Trenching work)

Please click the above link for more specific details.

Revision History

Document Revision History Complete the following table for each document revision.

Rev. No.	Description of Change	Author	Approved By	Rev. Date	Effective Date
0	First issue of document.	Dave Van Ginkel	Refinery Leadership Team	2/22/2022	2/22/2022