Phosphate Program – Environmental, Health and Safety (EHS) Department

Trenching and Excavation Program

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1. PURPOSE

To protect all personnel from the risk of injury due to hazards inherent in trenching and excavation activities, which includes drilling and driving objects below existing grade.

2. SCOPE

The program covers all Mosaic employees and contractors performing work at Mosaic Fertilizer LLC Phosphates Business Unit facilities.

The Trenching & Excavation Program does not apply to the following:

- The removal and stacking of gypsum on gypsum stacks
- Dragline operations, pit moves, water jack ramps, or the cleaning of ditches or storm ponds
- Mine dredging operations.

3. DEFINITIONS

3.1 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 box or support system and its sudden movement into the excavation by falling or sliding so as to entrap, bury, immobilize, or otherwise injure a person.

3.2 Competent Person – A designated Mosaic employee or contract employee who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary or otherwise hazardous to employees or contractors, and who has authorization to take prompt corrective measures to eliminate them. A trenching and excavation Competent

Person will be trained in accordance with section 5.1 (Competent Person training) of this Program.

3.3 Excavation – Any man-made cut, cavity, trench, or depression in an earth surface, formed by earth removal. The term excavation (for the purposes of this program) does not apply to the removal and stacking of gypsum on gypsum stacks during maintenance and operations, dragline operations (pit moves, water jack ramps), or the cleaning of ditches or storm ponds.

3.4 Hazardous gases – Gases that are hazardous to employees and could potentially be present in a trench or excavation. Examples of hazardous gases include hydrogen sulfide, methane, and ammonia.

3.5 Protective systems – Methods of protecting employees from cave-ins or collapse of materials or adjacent structures. Protective systems include sloping, shoring, and trench boxes. Protective systems will be utilized according to manufacturer specifications or be approved by a registered professional engineer.

3.6 Ramp – an inclined walking or working surface that is used to gain access to one point from another, and is constructed from earth or from structural materials such as steel or wood.

3.7 Red Concrete – Used in underground installations to indicate electrical systems or lines. Trenching or excavation work should stop immediately when this is identified until safe measures are taken to proceed.

3.8 Sloping – Method of protecting employees from cave-ins by inclining the sides of the excavation. Slope is expressed as the ratio of horizontal distance to vertical rise (H:V).

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

3.10 Trench box – A manufactured or engineered structure that is able to withstand the forces imposed on it by a cave-in. Trench boxes must be designed to sustain the forces that may be applied under the specific conditions in which they are used.

3.11 Trenching and Excavation Permit – A permit utilized to identify and eliminate potential hazards during job preparation, and to authorize trenching / excavation work. The permit is initiated and completed at the direction of the Competent Person.

3.12 Open Pit – A cavity or hole formed in the ground by the process of cutting, digging or scooping large openings that are greater across and wider than a trench. Open pits have compacted material in the bottom to set the boring machine on to keep it level. The walls in front of the boring machine are shored with metal plates to protect workers while the pipe is being pushed. Open pits are mostly used for Jack and Bores projects. Open pits do not require a permit.

3.13 Jack and Bores - Large open pit usually with an opening of 70’ x 70’ or larger, and has an access road to drive into the site.

4. PROCEDURE

4.1 General Requirements

4.1.1 A Trenching and Excavation Permit (Appendix A) is required prior to the start of trenches or excavations work:

a. Greater than 2 feet in depth at Mosaic Concentrates facilities.

b. Greater than 4 feet in depth at Mosaic Mining facilities.

4.1.2 A diagram illustrating the Minimum Slope Requirements is shown on the next page (page 3).

4.1.3 Excavations 4 feet or more in depth must be protected from cave in hazards by sloping, shoring (support systems), or shielding (trench box) when an employee is required to enter the excavation for any reason.

4.1.4 Excavations less than 4 feet in depth that will be entered by employees do not need to have protective systems (sloping, shoring, trench box) when examination by a Competent Person determines there is no hazard of a cave-in.

4.1.5 Excavations that are 20 feet or more in depth will not be made without approval of a registered professional engineer.

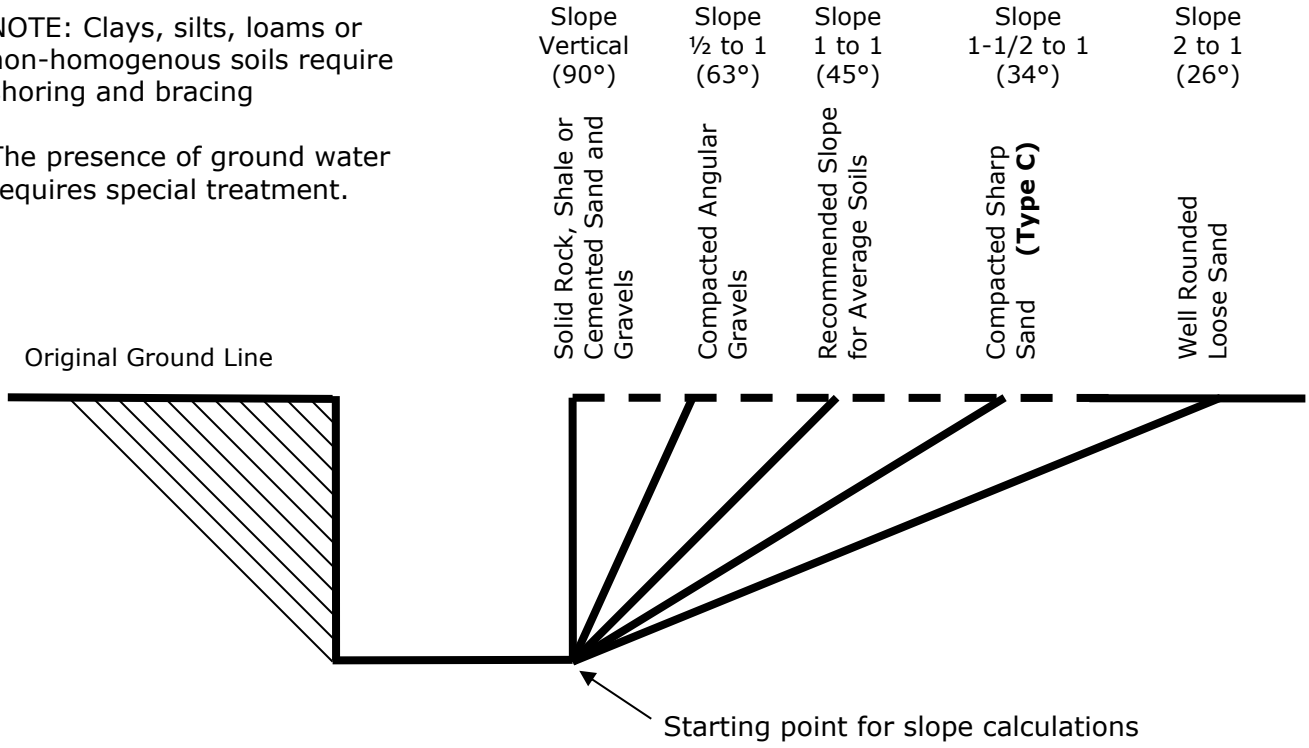
4.1.6 A ladder, ramp or other safe means of egress shall be located in excavations that are 4 feet or more in depth so as to require no more than 25 feet of lateral travel for employees.

4.1.7 Walkways will be provided where employees are required or permitted to cross over excavations. Guardrails will be provided where walkways are 4 feet or more above the lowest point of the excavation.

MINIMUM SLOPE REQUIREMENTS

NOTE: Clays, silts, loams or non-homogenous soils require shoring and bracing

The presence of ground water requires special treatment.



Notes:

1. Benching is NOT allowed in type C Soils.
2. All Florida and South Louisiana soil is considered type C.

4.1.8 Employees will not be permitted underneath loads handled by lifting or digging equipment. Employees will be required to stand away from any vehicle being loaded or unloaded to avoid being struck by spillage or falling materials.

4.1.9 A warning system such as barricades or stop logs will be used when mobile equipment is operated adjacent to or is required to approach the edge of an excavation. The grade will slope away from the excavation whenever possible.

4.1.10 Adequate protection will be provided to protect employees from loose rock or soil that could pose a hazard by falling or rolling from an excavation face.

4.1.11 Excavated materials or equipment will be kept at least 2 feet from the edge of excavations. Retaining devices, sufficient to prevent materials or equipment from falling or rolling into excavations will be used if the edge distance is less than two feet.

4.1.12 Employees who are exposed to hazardous vehicular traffic shall be provided with appropriate high visibility or reflectorized shirt or traffic safety vests. The high visibility or reflectorized shirt or traffic vests shall be used at all times while exposed to vehicular traffic.

4.1.13 Trenches and excavations will be barricaded or otherwise protected to prevent personnel from entering the immediate area around the opening.

4.1.14 Special rescue or safety equipment (harnesses, lifelines, stretcher baskets, etc.) will be available or used in trenches and excavations where hazardous conditions are present or likely to be expected. This equipment shall be attended when in use.

4.2 Atmospheric Testing

4.2.1 Excavations greater than 4 feet deep will be tested with a direct reading instrument for adequate oxygen, flammable or hazardous gases before employees enter. Results of the atmospheric testing will be documented on the Excavation Permit. Safe limits for oxygen, combustibles and other hazardous gasses are designated on the Trenching and Excavation Permit.

4.2.2 The person(s) performing the atmospheric testing will be familiar with the testing equipment used and shall ensure that the instrument calibration is in accordance with manufacturers' recommendations. The name of the person(s) performing atmospheric testing will be signed in the appropriate section on the Excavation Permit.

4.2.3 Entry into the excavation is prohibited until all atmospheric hazards are eliminated. Mechanical ventilation shall be used in any excavation where potential exists for the presence or development of a hazardous atmosphere.

4.3 Local "One Call"

4.3.1 The location of underground pipelines and utility installations such as sewer, telephone, fuel, electric and water lines shall be determined prior to opening an excavation. Louisiana or Florida One Call (LA: 800-272-3020; FL: 800-432-4770) must be called 24 to 48 hours prior to digging when there is any doubt concerning these installations. Because the exact location of underground installations may not be certain, due caution should be used when digging.

4.4 Water

4.4.1 Employees will not work in excavations where accumulated water poses a hazard to employees in the excavation. In excavations where water is entering, water removal equipment must be employed to prevent other than minor water accumulation before employees enter and work in the excavation.

4.4.2 The Competent Person will monitor water removal equipment and water removal operations to ensure proper water control.

4.4.3 When excavation work interferes with water drainage, suitable means will be employed to prevent surface water from entering the excavation.

4.5 Utilities

4.5.1 The estimated location of utility installations such as sewer, telephone, fuel, electric, or water lines (that may be expected to be present at the excavation site) will be determined by the Competent Person prior to opening an excavation. The Competent Person shall use Engineering, drawings, utility company services or other resources as appropriate. Any special precautions, such as hand digging until the cables/piping are located, shall be noted on the Trenching & Excavation permit. Copies of available drawings of any underground cables should be given to the Competent Person.

4.5.2 The appropriate utility companies and Mosaic staff who have responsibility for the area will be notified prior to opening the excavation.

4.5.3 The exact location of utility installations will be determined by the Competent Person when excavations approach the estimated location of underground installations.

4.5.4 Excavation work will stop when wire, conduit, cable, piping or utilities/red concrete (which indicates electrical installations) are encountered. Work will not proceed until the Competent Person has inspected the excavation and taken the necessary precautions to make the resumption of work safe.

4.6 Sloping

4.6.1 Excavations 4 to 20 feet deep will be sloped at an angle not steeper than 1½H:1V (34°) unless a trench box or an engineered support system is utilized. Excavations 20 feet or more in depth will not be made without approval of a registered professional engineer.

4.6.2 Excavations not utilizing a 1½H:1V (34°) slope or a trench box will be approved in writing by a registered professional engineer and the written evaluation will be attached to the Trenching and Excavation Permit at the jobsite. The written evaluation/opinion will include:

a. The type of soil identified;

b. Magnitude and configurations of slopes that were determined to be safe; and

c. The identity of the registered professional engineer.

4.6.3 Employees will not be permitted to work on the faces of sloped 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.

4.6.4 When there are signs that a cave-in is imminent or likely the Competent Person will remove all entrants. Indicators include:

a. The development of fissures in the face of or adjacent to an open excavation;

b. The subsidence of the edge of an excavation;

c. The slumping of material from the face or the bulging or heaving of material from the bottom of an excavation;

d. The spalling of material from the face of an excavation;

e. The observance of trickling or rolling of small amounts of material such as pebble or small clumps down into the excavation.

4.6.5 The Competent Person will determine the degree to which the excavation slope must be reduced below the maximum allowable slope when surcharge loads from stored material or equipment, operating equipment, or traffic are present, and will assure that such reduction is achieved.

4.7 Shoring Systems

4.7.1 All shoring systems installed and used as protective systems will be at the direction of the Competent Person responsible for the job.

4.7.2 Shoring systems shall be used in accordance with manufacturer recommendations. Deviations from the manufacturer recommendations are not permitted without written permission from the manufacturer.

4.7.3 All shoring systems shall be installed and removed in a manner that protects workers from cave-ins, structural collapses, or from being struck by members of the support system.

4.7.4 Timber shoring systems may be used only under the following circumstances:

a. Other means of protective systems are not feasible or available.
b. The timber shoring system is designed and approved by a registered professional engineer. Documentation of the design and approval shall be maintained at the jobsite.
c. The use of timber shoring will follow the guidelines set forth in OSHA 1926 Subpart P Appendix C – timber shoring for trenches. Guidelines for class "C" soil will be used when determining timber dimensions and construction of systems.
d. Timber shoring shall not be used in trenches or excavations greater than 20 feet in depth.

4.8 Trench Boxes

4.8.1 Trench boxes will be manufactured and properly labeled or designed by a registered professional engineer. A copy of the written design specifications, recommendations, and limitations will be kept on file by the trench box owner.

4.8.2 Trench boxes will not be subjected to loads exceeding those for which the trench box was designed to withstand.

4.8.3 A Competent Person will inspect each trench box prior to each use to assure the box is able to support the intended loads and is otherwise suitable for safe use. If a trench box is damaged such that the structural integrity or containment capability may be compromised, the trench box will be removed from service, evaluated by a registered professional engineer and approved or repaired/approved before being returned to service. Approval must be by a registered professional engineer.

4.8.4 Trench boxes will be installed and removed in a manner that protects employees from cave-ins, structural collapses, or from being struck by the box.

4.8.5 Back filling will progress as soon as practical after the removal of trench boxes from excavations.

4.8.6 Excavation of material to a level no greater than 2 feet below the bottom of the trench box will be permitted if the box is designed to resist the forces calculated for the full depth of the excavation and there are no indications of a possible loss of soil from behind or below the bottom of the box.

4.8.7 Trench boxes will be installed in a manner to restrict movement of the trench box in the event of the application of sudden lateral loads.

4.8.8 Employees will be protected from the hazard of cave-ins when entering or exiting the areas protected by trench boxes.

4.8.9 Employees will not be allowed inside trench boxes when the trench boxes are being installed.

4.8.10 Excavations deeper than the depth of the trench box will be sloped to a maximum allowable slope of 1½H:1V (34°) beginning at least 18 inches below the top of the trench box and continuing to the top of the trench edge.

5. TRAINING

5.1 Competent Person training – Training for the designated Competent Persons will be provided by a recognized Manufacturer or Association, such as the NES or Speed Shore Manufacturer Competent Person Training Program (or equivalent). The program will consist of a minimum of

8 hours of initial training in the subject matter contained in OSHA Standards for the Construction Industry (29 CFR PART 1926) Subpart P – Excavations (latest issue).

5.2 Hazard Training (Minerals only) – Employees working at the excavation site will receive Mosaic site specific hazard training before starting work. Employees will log in daily at the site mine or plant office before starting work.

6. INSPECTION AND PERMITTING

6.1 The Competent Person will inspect the excavation prior to the start of work.

6.2 The Trenching and Excavation Permit will be completed at the direction of the Competent Person and posted on site prior to the start of work.

NOTE: *The Trenching and Excavation Permit has been updated to correct the header and have the title match the program. It has an effective date of 07/01/2021 however, all previous permits printed in bulk with effective date of 11/01/2012 are still acceptable for use until out of inventory.*

6.3 Inspections of excavations, adjacent areas, and protective systems will be performed daily, or more often as needed throughout the shift, by the Competent Person for evidence of a situation that could result in cave-ins, failure of protective systems, hazardous atmospheres, or other hazardous conditions. Inspections will be made after every rainstorm or other event that increases hazards. The log on the permit will be completed and initialed for each inspection.

6.4 Employees will be removed from the excavation when the Competent Person or other workers determines that a situation could result in a cave-in, failure of protective systems, creation of hazardous atmospheres, or other hazardous conditions. Precautions must been taken to ensure safe working conditions before employees are allowed to re-enter the trench or excavation.

7. POLICY REVIEW

7.1 The Trenching and Excavation Policy will be reviewed under the authority of the Mosaic Safety Department on a seven year schedule.

8. APPENDICES

8.1 Appendix A - Trenching and Excavation Permit

9. REFERENCES

9.1 OSHA 29 CFR PART 1926 Subpart P – Excavations (latest edition)

9.2 Florida Statutes / Title XXXIII / Chapter 553 / Part III – Trench Safety Act

9.3 Florida Statutes / Title XXXIII / Chapter 556 / Underground Facility Damage Prevention and Safety

9.4 MSHA 56.3131 Open Pits or Quarry

10. REVISION LOG

Revision Log				
Rev. No.	Requested By	Approved By	Revised By	Rev. Date
0	Initial Issue for Mosaic	Safety Dept.	Safety Dept.	5/14/07
0	Reformat for ISO		D. Allen	9/16/2011
1	Update for policy review		Larry Rails	5/4/2012
2	Safety Depart	Mike Neal	Larry Rials	8/21/2012
2.1	PMO		Nicole Jacobson	9/12/2016
2.2	Review date past	PMO	PMO	6/30/2021