Remedial Action Work Plan

Douglas Reduction Works Soil Program
Douglas, Arizona

Freeport Minerals Corporation

August 29, 2024

→ The Power of Commitment

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List of Acronyms

BSA	Backfill Staging Area
CC	Construction Contractor
CL	Cleanup Level
CPC	Construction Project Coordinator
Cu	Copper
DRW	Douglas Reduction Works
EPA	United States Environmental Protection Agency
ESI	Expanded Site Investigation
ESSA	Excavated Soil Staging Area
FMC	Freeport Minerals Corporation
HSEP	Health Safety and Environment Plan
mg/kg	milligrams per kilogram
Pb	lead
PCCR	Property Cleanup Completion Report
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RAWP	Remedial Action Work Plan
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SPLP	Synthetic Precipitation Leaching Procedure
SRLs	soil remediation levels
TCs	Target Constituents
TCLP	Toxicity Characteristic Leaching Procedure
VRP	Voluntary Remediation Program

1. Introduction

This Remedial Action Work Plan (RAWP) presents implementation details for soil remediation (i.e., cleanup) activities to be performed by Freeport Minerals Corporation (FMC) for residential, non-residential, and publicly owned properties in the vicinity of Douglas and Pirtleville, Arizona (**Figure 1**).

The FMC Douglas Reduction Works (DRW) site, located near the cities of Douglas and Pirtleville, Arizona, was the historical location of two separate copper (Cu) smelting operations.

The United States Environmental Protection Agency (EPA) performed several environmental assessments of the DRW site and surrounding area ending with an Expanded Site Investigation/Remedial Investigation (ESI/RI) of the DRW site (EPA, 1997). According to the ESI/RI, the DRW site investigations were conducted to address concerns pertaining to potential lead (Pb) contamination in surface soils at the DRW facility and in the area between the DRW site and the towns of Douglas and Pirtleville. The report includes the evaluation of soil sampling data collected both within the former DRW site boundaries and at off-site locations within Douglas and Pirtleville. EPA's design of the soil sampling program assumed that emissions from the former smelter stacks represented the primary contaminant source.

Based on the results of the ESI/RI, EPA determined that no further action at the DRW site was necessary. The results of the EPA investigation notwithstanding, FMC has elected to enter into the Arizona Department of Environmental Quality's (ADEQ) Voluntary Remediation Program (VRP) to further address the potential that historic smelter operations may have contributed to elevated metals concentrations in soil on properties near the DRW site (i.e., off-site). Under the VRP, FMC is performing a soil characterization and remediation program (the DRW Soil Program) within the area shown on **Figure 1** (the Study Area). The northern boundary of the Study Area is West Irvine Avenue; the southern boundary is the international border; the eastern boundary is North E Avenue, and the western boundary is North County Hospital Road.

The cleanup activities addressed by this RAWP are part of the DRW Soil Program, which is being implemented by FMC under the ADEQ VRP. Previous activities as related to the DRW Soil Program were summarized in the Remedial Action Completion Report submitted to ADEQ in October 2018.

FMC has voluntarily decided to continue implementation of the VRP as related to the DRW Soil Program in 2024. Sampling is being performed in accordance with the Soil Sampling and Analysis Plan (SAP) (GHD, 2024a) and the Quality Assurance Project Plan, Voluntary Remediation Program, Arizona Projects (QAPP) (GHD, 2024b), which were approved by ADEQ on March 26, 2024. The sampling is designed to determine representative concentrations of arsenic (As), Cu, and Pb for properties in the Study Area for comparison to site-specific soil remediation levels (SRLs) that have been established for the DRW Soil Program by ADEQ. The cleanup levels (CLs) for the DRW Soil Program include both predetermined SRLs specified in Arizona Administrative Code (AAC) R18205, and site-specific SRLs developed pursuant to AAC R18206 as described below.

1.1 Soil Cleanup Objective

The objective of the DRW Soil Program cleanup activities is to excavate and replace soils within individual use or yard areas within a given property where soil concentrations of As, Cu, or Pb exceed the cleanup levels approved by ADEQ to ensure that post-cleanup average metals concentrations no longer exceed the cleanup levels. The purpose of this RAWP is to provide the specific implementation details for achieving that objective. The cleanup levels for the DRW Soil Program are included in **Table 1-1**.

Table 1-1 Cleanup levels

Target Constituent	Remediation level by Land Use (mg/kg)	
	Residential	Non-Residential
As	30[(1)]	30[(2)]
Cu	9,000[(1)]	41,000[(3)]
Pb	425[(1)]	800[(3)]

Notes:

mg/kg = milligrams per kilogram

[(1)] The residential CLs for As, Cu and Pb are site specific CLs that have been approved by ADEQ by email dated November 19, 2013, for the DRW Soil Program.

[(2)] The non-residential CL for As is set equal to the residential CL consistent with the approach used by ADEQ's for predetermined values.

[(3)] Pre-determined CLs specified in AAC R-18-7-205.

2. Project Administration

The project administration activities for the cleanup program will include:

– Coordination among representatives of FMC, ADEQ, Construction Project Coordinator (CPC), Construction Contractors (CCs), and City officials.
– Technical oversight of project activities.
– Administration of the CCs.

2.1 Organization

The cleanup program organization will provide consistent management of the cleanup activities and integration with the ongoing sampling program. The key positions for this organization are:

– FMC Project Manager
– FMC Social Performance Manager
– CPC
– CCs
– ADEQ

These key positions have been developed to ensure that the organization, objectives, functional activities, quality assurance/quality control (QA/QC) activities, and data reporting are managed and implemented in a manner that meets the requirements of this RAWP. Assignment of the CPC and CCs will be made by FMC with notification to ADEQ.

The FMC Project Manager will have responsibility for coordinating with ADEQ on the overall RAWP project activities. The FMC Social Performance Manager will be responsible for community and stakeholder engagement. The CPC is responsible for coordinating with FMC, the CCs, the property owner, and ADEQ in the field. The CPC is responsible for ensuring that the CCs implement the cleanup activities in accordance with this RAWP and the QAPP (GHD, 2024b). The CPC is also responsible for coordinating and documenting the cleanup activities.

2.2 Schedule

The cleanup of individual properties will be prioritized as described in Section 4.1. After the priority of the property is determined, cleanup activities will be scheduled to facilitate logistics and use of equipment. Properties will be scheduled for cleanup after access is received and, when possible, generally grouped into neighborhoods to enable the crews to perform required activities and reduce disruption to the neighborhood. The progress of the cleanup program will be documented in monthly progress reports to ADEQ issued by the FMC Project Manager or the CPC. Specific details regarding progress reporting are described in Section 5.2.

3. Cleanup Activities

In general, the Soil Program soil cleanup activities will include:

– Excavation of soils that have concentrations of As, Cu, or Pb in excess of ADEQ approved cleanup levels
– Replacement of those excavated soils with clean backfill
– Replacement of landscaping with materials that, unless otherwise approved by the property owner, are comparable to the pre-existing conditions
– Temporary and final management of the excavated soils

Implementation details for the above activities are provided in this section. Properties that present significant safety or property damage concerns (e.g. deteriorating retaining walls) will be deferred until the property owner adequately addresses the concerns. If future activities/repairs are completed by the property owner to adequately address the concerns, FMC will consider soil remediation at that time.

3.1 Property -Specific Cleanup Activities

This section presents a description of cleanup construction activities to be performed at individual properties. Included in this section are the details for obtaining access, pre-excavation yard preparation, excavation activities, noise control, dust control, maintaining access for the property residents, decontamination procedures, backfill and revegetation procedures, and follow up activities.

3.1.1 Property Access

Cleanup construction activities at a particular property cannot proceed until a property owner has signed an access agreement for cleanup. If the property is occupied by a tenant instead of the owner, the tenant may also be requested to sign the access agreement. However, FMC will consider moving forward without the tenant access agreement if so directed by the property owner. The cleanup access agreement is separate and in addition to the soil sampling access agreement previously obtained through the Soil Program.

Specific cleanup details will be developed on a property-by-property basis. Individual property cleanup work plans will be prepared for each property to identify the soil removal areas, excavation depth, and restoration requirements. Cleanup work plans will be reviewed with the property owner and tenant, if applicable, during a pre-excavation property inspection. The inspection will be attended by the property owner (and/or tenant if he/she requests to be present and is available) and the CPC.

The cleanup work plan will document all pertinent details of the cleanup construction activities, including items to be relocated for access, excavation areas, specific areas or landscaping that the owner or their representative requests not to be excavated or removed, landscaping that will be removed and replaced, and plants that the owner requests to be replanted.

After the inspection, the property owner will be asked to acknowledge the details of the cleanup by signing the property cleanup work plan.

3.1.2 State and Local Municipality Permits

The Stormwater Management Plan for the Excavated Soil Staging Area (ESSA) and Soil Repository (**Appendix D**) was prepared in accordance with the requirements of the ADEQ, Water Quality Division, Arizona Pollutant Discharge Elimination System General Permit for Discharge from Construction Activities to Waters of the United States, also known as the Construction General Permit, Permit Number AZG2020-001. This project will be permitted under the current Construction General Permit and will have an authorization number prior to beginning work.

Currently, local permits are not required to complete this work; however, efforts will be made to comply with local ordinances should a revision occur.

3.1.3 Pre-Excavation Area Preparation

The CPC will notify the property owner and tenant of the intended start date at least 7 calendar days prior to the start of construction at a particular property. Implementation may proceed at a given property with shorter notice if the property owner or tenant does not object.

Prior to beginning work on a particular property, the CC will mark the lateral excavation limits and set up construction tape or fencing to limit unauthorized access. Excavation will be performed in the accessible portions of the use areas designated for cleanup. Use areas eligible for remediation may include grass covered and bare areas; gardens and flowerbeds (unless the owner requests otherwise), and unpaved driveways and parking areas. Examples of use areas not eligible for remediation include those covered by grouted brick or pavement surfaces (such as concrete pads, patios, paths, and driveways) where permanent structures are present (such as houses, garages, and sheds), areas covered by large landscaping items (such as retaining walls, water features, etc.), and setbacks from structures, large landscaping items, buried utilities, and steep slope areas. Appropriate precautions will also be taken to avoid contact with overhead power lines during soil remediation activities by observing proper work activity setbacks, which could also result in some portions of impacted use areas not being remediated.

In addition, the CPC will survey (via photographs and/or video) each property to establish pre-cleanup conditions. The condition of buildings and other fixtures will also be documented, including the integrity of structures and foundations immediately adjacent to the target excavation areas. The quality and depth of field of the photographs and video images will be adequate to ascertain whether cracks or other types of damage to the buildings and other fixtures existed pre-cleanup.

Prior to initiation of cleanup construction activities, the CC will contact the local utility companies to locate the underground electrical, water, sewer, gas, cable, and telephone lines. The owner and tenant will also be asked to provide information on subsurface obstacles such as septic systems, abandoned water lines, and wells. The utility companies will mark the boundary position of the utilities on the ground following their normal convention. The CC will also locate the layout of utilities within the use areas to be excavated. In use areas requiring soil excavation, the CC will confirm locations of subsurface obstacles, including gas lines, by hand digging to trace the orientation of the obstacle and will mark it with spray paint.

The property owner or tenant will be required to relocate recreational vehicles, lawn furniture, spare lumber/building supplies, boats, vehicles or other similar items to a location where they will not hinder cleanup activities. Additionally, the property owner or tenant will be required to relocate pets, poultry, and livestock to a location where they will not hinder cleanup activities. Assistance will be provided if the property owner is not capable of performing these activities. If off-site storage/boarding is required, FMC will make arrangements and pay for the storage/boarding. The CPC will also request that the property owner or tenant remove and store inside their buildings all yard ornaments, personal possessions, and keepsakes requiring special care. The items to be relocated by the property owner will be noted on the cleanup work plan as well as any concerns or special requests that the property owner or tenant may have in removing surface obstacles or in otherwise preparing their property for cleanup activities.

If practicable, the CC will temporarily relocate woodpiles, walkway stepping-stones, and other miscellaneous small landscape articles on the property; large obstructions such as fences and gates may be removed, if necessary, by the CC to allow for equipment and work crew access. Removed landscape articles and obstructions will be stored on the property and will be replaced by the CC following completion of cleanup activities.

3.1.4 Excavation Activities

Excavations may be required in a front use area, back use area, separate side use area or combination thereof. Side use areas that are less than 15 feet wide, but greater than 5 feet wide, will have been sampled as part of either the front yard or back yard as described in the SAP (GHD, 2024a). In this case, the side use area will be excavated only if the front yard or back use area that it was a part of is excavated. In the event that a side use area is less than 5 feet wide (and therefore, not sampled) and accessible, it will be excavated if either the front or back yard requires cleanup. In this case, the entire accessible portion of the side use area will be excavated.

For purposes of the cleanup activities, a use area will be defined as extending to the edge of the adjoining street or alley; property line; or any drainage ditch/wash, inclusive of any right-of-way that may be owned by the city or municipality. Generally, a curb or, in the absence of a curb, the edge of the pavement will define the edge of the alley or street.

If a use area is larger than 3,600 square feet, it will have already been subdivided into grids for the purpose of property sampling. In this case, the designated excavation area will be the grid area represented by the composite sample that has soil concentrations above the ADEQ approved cleanup levels for one or more target constituents (TCs). For areas designated for excavation by discrete sample results, the horizontal limits of excavation will be defined by discrete sample locations with concentrations less than the cleanup levels or by significant physical obstructions such as foundations, streets, or sidewalks.

The depth of excavation will be determined by sampling in multiple intervals as specified in the SAP and will generally extend to the top of the sample interval where the soil concentrations for As, Cu, and Pb are below the cleanup levels. In the event only a 0- to 3-inch interval exceeds any TC, the excavation will be extended to the 0- to 6-inch interval as a practical excavation technique. FMC will attempt to remove all soils with elevated TCs; however, an excavation may be terminated at a shallower depth if full removal is not practical (e.g., encountering roots of mature trees or bedrock) or the CC cannot safely excavate the soil. In such a case, the removal will extend to the deepest depth practicable, and the excavation backfilled as described in Section 3.1.10.

The CC will remove soil using a variety of mechanized equipment and hand tools. The primary equipment used will consist of skid steer loaders (e.g., bobcats), small excavators, or other similar equipment. Soil will be removed to the specified depth, taking care to hand excavate next to buildings, sidewalks, fences, and other structures as necessary to achieve an objective of maximizing the extent of soil removal. The potential for damage to structures and utilities will be considered on a case-by-case basis in determining the extent of the excavation. Any nominal amounts of soil that may be left in place as a result of these considerations will not affect the achievement of the primary objective of the cleanup, which is to excavate and replace soils within a designated area of the property, to the extent necessary, to ensure that the post cleanup- average metals concentrations no longer exceed the cleanup levels.

The nominal setbacks that will be considered as guidance in weighing the considerations described above are as follows:

– Horizontal distance of 12 to 18 inches from permanent structures (house, garage, outbuildings, etc.).
– Horizontal distance of 6 to 12 inches from other improvements (sidewalks, paved areas, etc.).
– Within the drip line of shrubs.
– Within the root line of trees.
– Horizontal distance of 24 inches from active underground utilities when mechanized equipment is used.
– Horizontal distance of 6 inches from active underground utilities when hand tools are used.
– Limit depth of removal to 12 inches within 2 feet from other permanent appurtenances or improvements (e.g., power poles, light poles).

– Horizontal distance of 6 to 12 inches around large stationary objects (e.g., sheds, animal shelters, inoperable automobiles).
– Appropriate distance from structures with basements so as not to impact basement walls (to be determined on a case-by-case basis).
– Horizontal distance of 6 inches from fences that are not removed for access.
– Horizontal distance of 6 to 12 inches from the property line.

In addition to a setback, soil excavation will be sloped at a 45 degree angle away from the edges of rock structures, retaining walls, weak concrete foundations, or other supporting structures to prevent loss of support and potential weakening of these features. Utility lines (including water, electric, sewer, gas, cable, and telephone) damaged by cleanup activities will be reinstalled to current building code requirements by the CC as soon as practicable after the damage occurs. Utility companies shall be notified of any damage to their infrastructure. Appropriate measures will be taken to provide for the property owner's needs while repair is being performed.

Soil excavation may not be conducted in or near areas with deteriorating or unstable retaining walls which present potentially significant safety or property damage concerns. FMC will consider returning to remediate the areas if the property owner addresses the safety concerns (i.e. repairs or stabilizes the wall).

Excavation by hand will be performed, as necessary, to mitigate damage to structures (e.g., houses, garages, sheds, paved driveways, and sidewalks) and vegetation (e.g., trees, hedges, and large shrubs). The CC will routinely inspect structures during excavation operations and will take reasonable and appropriate corrective action if damage occurs.

Excavation beyond the setback specified above for trees and shrubs will extend to the full designated depth for that area. Excavation within the setback of trees and shrubs will be limited to the removal of existing grass and the immediately underlying soils (3 to 6 inches) to minimize potential damage to the root structure.

If required for access, fences may be removed, salvaged, and replaced upon completion of the backfilling by the CC. Damaged fences or fences that cannot be reinstalled following backfilling will be repaired or replaced with fencing that is equivalent to the existing fence.

The exteriors of structures and buildings will be inspected for evidence of deformation or changes in condition attributable to the cleanup activities based on a review of the pre-excavation photographs/video documentation. The CPC will contact the property owner when conditions are discovered that warrant such notifications.

The CC and CPC will jointly perform the field measurements specified in the QAPP (GHD, 2024b) to confirm that the required excavation extent and depth have been achieved. Once the CPC has verified that an excavation meets the project requirements, the area will be approved for backfilling.

3.1.5 Loading Excavated Materials

Loading of the material excavated from individual properties for transport to the ESSA will be performed in a manner that prevents spillage or spreading of the material. A protective temporary covering, such as polyethylene sheeting (6-mil Visqueen or equivalent) or a CPC-approved geotextile, will be used to protect clean areas situated between the hauling vehicle and the excavation area from cross-contamination due to spillage.

Spilled soil will be isolated by traffic cones as necessary and will be picked up immediately to minimize any subsequent tracking of materials or transport of materials beyond the work site or into local storm drains.

Loading of trucks will be performed to avoid contact with overhead electrical lines and other utilities. Dust control methods in compliance with relevant and applicable local regulations will be maintained in accordance with the Fugitive Dust Control Plan presented in **Appendix A**.

After loading, trucks will be covered with an adequately secured tarp or other device and inspected for loose/spilled material within the loading zone. Loose materials accumulated on the sides, tires, wheels or dump gates of the trucks will be removed and placed within the truck. Spilled soils in the vicinity of the loading area will be removed (using a

broom and shovel or other suitable means) and placed in the truck. Then, the excavated soils will be transported to the ESSA.

3.1.6 Noise Control

Normal working hours will begin no earlier than 7:00 a.m. and will generally extend no later than 7:00 p.m. All equipment shall be maintained in proper condition with exhaust controls to minimize noise levels, and proper driving habits will be enforced. Residents will be provided with the Soil Program office telephone number to allow reporting of any noise complaints. If noise complaints are received, the CPC will assess the issue and, if deemed necessary, require the CC to modify equipment or operational procedures, to mitigate the noise. Ordinance No. 20-1121 shall apply to noise complaints submitted to the City of Douglas.

3.1.7 Dust Control

Dust control requirements and personal monitoring procedures during cleanup activities are described in the Fugitive Dust Control Plan presented in **Appendix A**. Water application will be used as necessary to reduce fugitive dust. Application rates will be regulated to control dust, yet not result in the generation of mud that could be transported from work areas on haul trucks or other mobile equipment or in the generation of runoff to adjacent properties, the adjacent roadway or storm drains. Dust suppression equipment may consist of standard garden hoses and spray regulators, misters, or other equipment proposed by the CC and acceptable to the CPC.

3.1.8 Access for Property Residents

During construction activities, access to the home will be provided to the residents at all times. Appropriate measures will be taken to ensure that the resident will not have to walk through exposed soil prior to entering their home. Sidewalks will be brushed or washed after each workday to provide as clean an entryway as possible. If there is no sidewalk, a clean pathway will be provided by laying down plywood or other means to prevent exposure and tracking of soils. All residents (especially children) will be requested to stay away from the construction area, which will be demarked with construction tape or fencing. Handicap access and special needs will be addressed as needed. Should residents need to temporarily relocate during construction activities, FMC will make arrangements and pay for those relocation expenses.

3.1.9 Decontamination Procedures

Heavy equipment and tools used in the cleanup process will be decontaminated prior to leaving the work area. Decontamination will first involve a brush down of equipment in the work area to remove visible accumulations of materials from the body of the equipment and tires. Limited quantities of water may be used to remove residual visible soil following dry brushing; however, water use will be minimized. If washing is necessary, equipment will be washed while on the premises and the wash water mixed with the last load of excavated soil prior to transportation to the ESSA. In all instances, which includes rainy days, the CC will work to minimize the migration of mud and water to the street. Visible accumulations of soil, dust, or debris that are attributable to construction activities found on streets, rights-of-way, and access routes will be cleaned at a minimum of once per day.

3.1.10 Backfill and Revegetation of Excavated Areas

After field measurements, collected in accordance with the QAPP (GHD, 2024b), confirm that the design excavation depths have been achieved, the CPC will approve excavated areas for backfilling with soil. Backfilling will follow excavation as soon as practicable in order to minimize the amount of time excavated areas are left open. In general, the excavated areas will be backfilled to pre-excavation grades. Minor modifications to the pre-excavation grades will be considered, if necessary, to improve drainage provided that the property owner concurs and such improvement can be accomplished without negatively affecting adjacent properties.

Backfill materials will be imported from off-site sources approved by the CPC and either staged in the Backfill Staging Area (BSA) prior to transport to a given property or direct-hauled from the source to the property. Samples of the proposed backfill materials will be collected and analyzed to verify that they meet the project requirements identified in the QAPP (GHD, 2024b) before the material sources are approved. Following source approval, QA/QC samples will be collected and analyzed on an ongoing basis to confirm that the backfill materials continue to meet the project requirements. Backfill or replacement soil will be selected to ensure that it is a suitable replacement for the excavated soil in characteristics, texture and structure of the project QA/QC verification testing of the backfill materials and review by ADEQ are described in the QAPP (GHD, 2024b).

Where access allows, dump trucks with backfill soil will drive onto the excavation areas and deposit loads while driving slowly to spread the soil. Where access is limited, the trucks will dump loads at an adjacent temporary stockpile from which the CC can transport the material. Written access will be obtained from the owner of any adjoining private property to be used for equipment or material staging during cleanup activities. If the use of the adjoining property entails only access, verbal permission may be obtained.

Some handwork using wheelbarrows and shovels may be necessary to backfill areas with difficult access. The backfill soil will be graded and shaped to the approximate original conditions. Compaction of the backfill material will generally be performed by tracking of construction equipment to prevent settlement. Material placed in driveways or alleyways will be compacted using a plate compactor, roller, hand tamping, or other suitable means.

The upper surface of the backfilled area will be refinished with restoration materials that are comparable to the pre-existing conditions (i.e., sod, landscape gravel, gravel parking areas or gravel driveways, etc.) unless otherwise agreed to by the owner. If sod installation application is required, the vegetated area will be watered by the CC as necessary during the first 60 days after installation to facilitate establishment of the vegetation. Property owners/tenants will be provided with instructions for care of the sod after the 60-day period. Excavated gravel driveways, parking areas, and other areas subject to vehicular traffic will be replaced with compacted clean soil and a minimum of 4 inches of clean gravel top surfacing.

Landscaping that is removed or destroyed as part of the cleanup activities will be replaced with comparable landscaping, if so requested by the owner. Landscaping includes, but is not limited to, trees, sod, and plantings. As an alternative, in order to reduce water usage, FMC is willing to consider installation of xeriscape landscaping in soil replacement areas if the property owner so desires. Replaced landscaping will be replanted if it does not survive within 60 days, provided that the property owner follows practices recommended by the plant supplier. Plants that have been designated by the owner as requiring replanting will be replanted; however, FMC cannot guarantee the survivability of replanted plants. The CC will also water replaced or replanted landscaping within the first 60 days. Watering frequency and timing will consider the time of year.

Finally, all materials such as fences that were moved by the CC to allow construction activities will be restored to their original location and any incidental damage to buried sprinkler systems, sidewalks, etc., will be repaired by the CC at that time.

3.1.11 Follow-Up Activities

Follow up- activities will be conducted by the CPC and the CC after cleanup construction activities are complete at a given property to verify that the work has been performed appropriately.

3.1.11.1 Photo Documentation

Photographs and/or video will be used to document post-construction conditions of properties, streets, and sidewalks. Photographs and videos will be taken by the CPC as soon as practicable after completion of landscaping.

3.1.11.2 Repair Work

Cleanup activities will be conducted to minimize damage to permanent features. Any damaged features, such as walkways or utilities, will be repaired or replaced upon discovery and determination that the damage was caused by

the cleanup construction activities. Structures such as buildings, sidewalks, and fences that are damaged during property cleanup will be repaired. If doubt exists as to whether damage was caused by the cleanup construction process, video and photographic documentation taken prior to construction will be reviewed on a case-by-case basis. The decision to repair disputed damage will be made by the FMC Project Manager.

3.1.11.3 Property Inspection

Once construction is completed and any necessary repairs are made, the CPC will inspect the property with the property owner and the CC. At this inspection, the property cleanup form will be finalized, and the property owner and CPC will sign off that the work performed is consistent with the signed property cleanup work plan. If the property owner fails to attend or declines to sign the property cleanup form, the CPC will inspect the property. If the property has been cleaned up in a manner that is consistent with the pre-construction inspection, the CPC will sign the property cleanup form and it will be included in the residential property completion report.

3.1.11.4 Reporting

Once cleanup activities are complete at a specific property, a Property Cleanup Completion Report (PCCR) will be prepared and submitted to the property owner. The PCCR will document the location of the excavated areas and the depth of the excavations.

3.2 Temporary Soil Stockpile Area

The ESSA is located within the Study Area on FMC mine property as shown on **Figure 2**. Excavated soils will be transported to the ESSA where they will be temporarily stockpiled and characterized prior to final management as further described in Section 3.3.

Activities at the ESSA are summarized below:

– Excavated soil will be stockpiled, sampled, and managed separately within the ESSA.
– Stockpiling will have a maximum volume of approximately 500 cubic yards. The soil stockpiles will be sampled and analyzed at a laboratory to determine whether the soils are suitable for final management on FMC mine property.
– Treatment of the materials, if necessary, to allow for final onsite management.
– Sampling and analysis to verify the success of any required treatment.

Excavated soil stockpiles will be sampled and analyzed separately using the Toxicity Characteristic Leaching Procedure (TCLP) to confirm that the concentrations of Pb and As are below the threshold concentrations for identifying a material as a Resource Conservation Recovery Act characteristic waste. The separated stockpile samples will also be analyzed using the Synthetic Precipitation Leaching Procedure (SPLP) to determine whether the excavated soils have the potential to generate leachate with metals concentrations in excess of Arizona Drinking Water Standards. Details for the TCLP and SPLP testing procedures are provided in the QAPP (GHD, 2024b). Any other testing that may be required by the final excavated soil management options will also be performed within the ESSA.

FMC may at its own discretion elect to treat the excavated soil stockpile as described in **Appendix B** if there is a history of untreated excavated soil stockpiles exceeding the TCLP and/or SPLP threshold concentrations. An excavated soil stockpile will not be placed permanently on mine property without confirming that the concentrations are below the threshold concentrations for TCLP and SPLP.

Operational and closure details for the ESSA are presented in **Appendix B** and stormwater management is addressed in **Appendix D**.

3.3 Final Excavated Soil Management

Soils that pass TCLP and SPLP analyses will be utilized by FMC mine operations as daily cover or similar needs for the Soil Repository located on FMC mine property as indicated in **Figure 2** and as approved by ADEQ.

Operational details for the Soil Repository are presented in **Appendix C**.

3.4 Soil Transportation

Excavated materials will be transported to the ESSA from the cleanup properties where the materials will be temporarily stockpiled and managed prior to final long-term management. Backfill materials will be hauled to the excavated properties either directly from the borrow source or the BSA.

Haul trucks will follow a direct route using major roadways and avoid neighborhood streets to the extent practicable when traveling between the BSA and cleanup properties. The haul routes for each property will be predetermined by the CC and/or the CPC. All truck drivers will be instructed as to the preferred routes between the property, backfill source, and ESSA prior to initiating hauling activities.

The loads of all haul trucks, whether hauling excavated materials or backfill, will be covered with a secured tarp or other device. Any materials spilled during transport will be cleaned up and removed as soon as practicable.

Hauling operations will be performed pursuant to an approved traffic control plan if required by a local municipality and will be conducted in such a manner as to minimize interference with local traffic on city streets to the extent practicable. Flag persons and signage will be used as necessary for public safety. At a minimum, warning signs such as "Construction Area" or "Workers Ahead" will be placed on the streets where cleanup is being performed and haul trucks are being loaded. "Trucks Entering" or "Trucks Turning" signs will be used at primary and secondary street intersections as necessary. Any other signage required by local or state regulations, laws, or ordinances will also be used to provide for public safety.

Haul trucks and drivers for delivery of material to the ESSA will be required to comply with all applicable federal, state, and local regulations. Drivers will be licensed to operate the equipment under their control and will be subject to safety record checks. The material excavated from the cleanup properties that is hauled to the ESSA will not involve the placement of hazardous waste because all activities will be conducted within the Area of Contamination; therefore, transporters of this material will not require licensing as hazardous waste transporters.

Haul trucks will pass all required safety, emission, and noise inspections. Trucks will be inspected by the CC for leaks of fluids and fuel and will be checked for potential fire hazards associated with loading equipment and haul trucks. Loaded trucks will not exceed applicable weight restrictions, and the selected transport routes will be checked for weight -restricted bridges or other load limits prior to initiating transport.

All truck drivers will be instructed that they must comply with all posted speed limits and other traffic controls on public roads and that failure to comply will be a basis for removal from the project.

Prior to any materials being transported, truck drivers will be briefed by the CC regarding the loading, inspection, and documentation requirements and any additional safety procedures specified in the CC's Health Safety and Environment Plan (HSEP). All haul trucks will contain guidelines regarding emergency procedures and motor vehicle accident report forms. Completed accident report forms will be submitted to FMC’s Safety Personnel and the FMC Project Manager.

4. Construction Management Considerations

This section describes the overall construction management considerations associated with implementing the cleanup, including specific sequences and inter-relationships of activities, logistical requirements of various aspects of the work, and health and safety considerations.

4.1 Scheduling of Cleanup Properties

Prioritizing the cleanup of properties will be based on a three-tiered approach, generally consistent with the EPA Superfund Lead-Contaminated Residential Sites Handbook, OSWER 9285.7-50 (EPA, 2003). The application of these guidelines for the soil cleanup activities takes into account the cleanup levels developed for the Study Area.

Tier I properties are residential properties with yard soil Pb concentrations greater than 1,200 milligrams per kilogram (mg/kg) and a sensitive population: either a child less than 7 years of age or a pregnant woman residing or frequently at the property (i.e., at the property for four or more days a week). Tier II properties are residential properties with yard soil Pb concentrations between the remediation level for Pb (400 mg/kg) and 1,200 mg/kg and a sensitive population or Pb soil concentrations above 1,200 mg/kg and no sensitive population. Tier III properties are residential properties with yard soil concentrations between 400 mg/kg and 1,200 mg/kg and no sensitive population.

Relevant information on the residents will be solicited during the cleanup access agreement process. This information will be combined with the results of the sampling to assign a Tier status to each property where cleanup is required. In general, properties will be scheduled for cleanup on a neighborhood-by-neighborhood basis considering the higher priority of Tier I and Tier II properties. Non-residential properties will have lower priority than residential and recreational properties.

4.2 Construction QA/QC

Construction QA/QC testing and inspection procedures will be implemented to ensure proper construction and compliance with the cleanup construction plans and specifications. Details of the construction QA/QC programs are provided in the QAPP (GHD, 2024b).

4.3 Health and Safety

The CC will prepare a construction HSEP that is protective of workers, the public, and the environment meeting all FMC and GHD policies and procedures related to health and safety. During all construction activities, the CC will have a designated Health and Safety Coordinator on site. The Contractor's Health and Safety Coordinator will have authority over all CC personnel to enforce the HSEP requirements.

5. Reporting

This section provides a summary of reporting procedures. Submittals to ADEQ will include an electronic version of all reports.

5.1 Cleanup Reporting

PCCRs will be prepared for each property where cleanup was performed. The PCCRs for properties that have been cleaned up will be forwarded to the property owner.

5.2 Data Reporting

Within 2 weeks of commencement of the soil remediation activities, monthly reports will be submitted to ADEQ. The monthly report will include base project statistics, including the compiled results of Weekly Documentation.

5.2.1 Weekly Documentation

The following documentation will be collected weekly.

– The week ending
– Total number of parcels in the Study Area
– Total number of parcels sampled and will include subdivisions such as:
  - Sampled and no exceedances
  - Sampled and contains exceedances
  - Not sampled
  - Percentage of parcels with completed sampling
  - Total number of parcels to be sampled
  - Total number of parcels with one or more use area impacted
  - Percentage of parcels with one or more use area impacted
  - Total number of parcels with no use area impacted
  - Total number of parcels with remediation in progress or complete
  - Percentage of total estimated parcels where remediation is in progress or complete
  - Total number of parcels declining remediation

5.2.2 Monthly Reporting

The Monthly Progress Report will describe the significant developments during the preceding period, including actions performed and problems encountered, the activities anticipated over the next month, schedule of anticipated actions, and anticipated problems and planned resolution of past or anticipated problems. Figures identifying the current status (i.e., sampled, remediation pending, remediation complete, etc.) of properties within the Study Area will be included with the Monthly Progress Report.

5.3 Final Report

After completion of all work, a final report summarizing the actions taken (soil sampling and cleanup activities) will be submitted to ADEQ. The public will be given the opportunity to comment on the final report.

6. References

EPA, 1997, Expanded Site Inspection / Remedial Investigation for the Phelps Dodge Douglas Reduction Works Site, Douglas, Arizona. April.

EPA, 2003. *Superfund Lead-Contaminated Residential Sites Handbook.* (OSWER Directive 9285.7-50).

GHD. April 2024a. Sampling and Analysis Plan, Douglas Reduction Works Soil Program. Douglas, Arizona.

GHD. April 2024b. Quality Assurance Project Plan, Douglas Reduction Works Soil Program. Douglas, Arizona.

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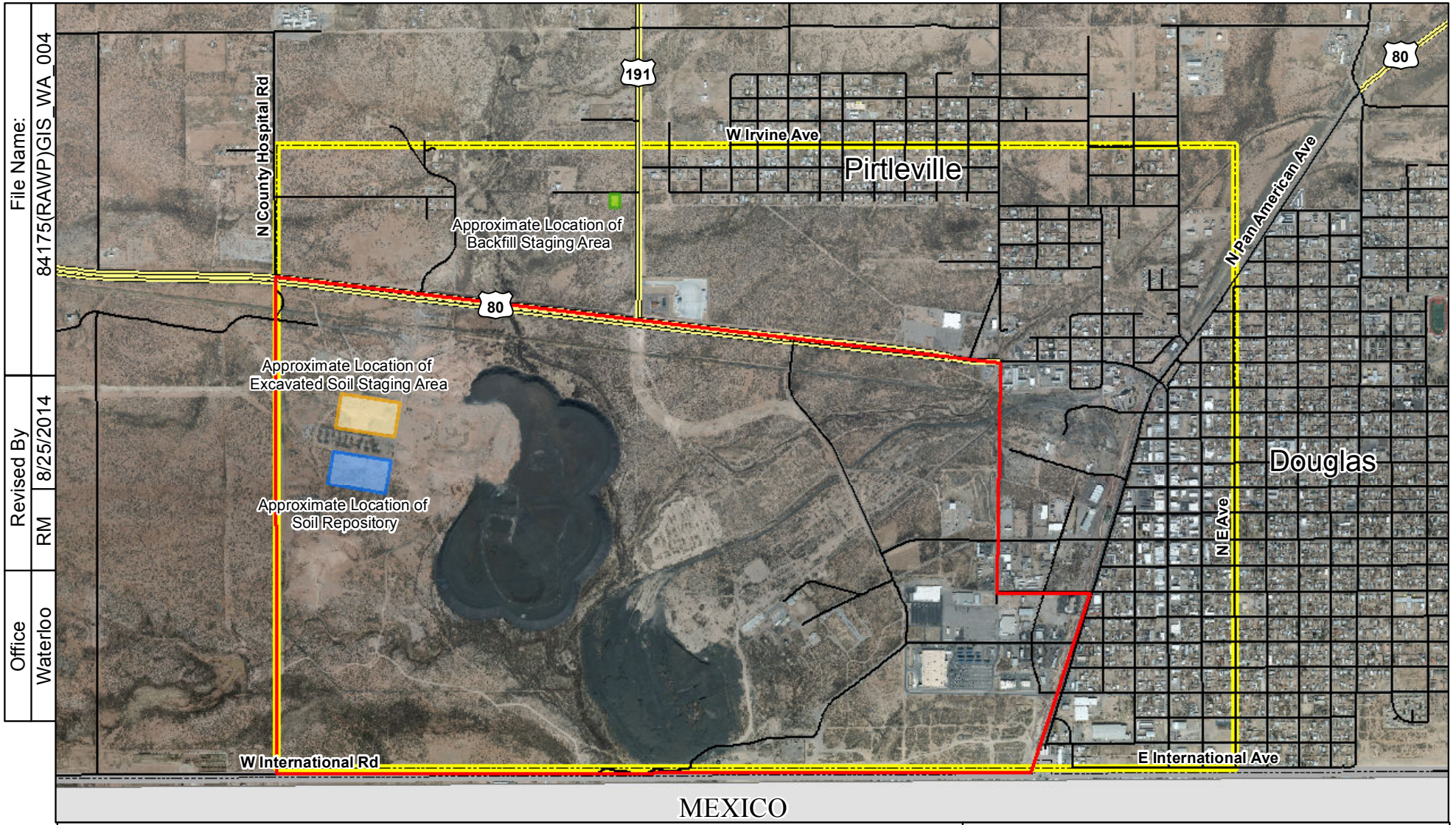
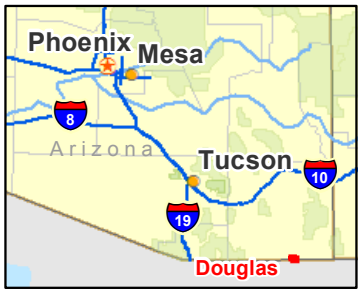


Legend

- Study Area
- DRW Facility Boundary
- Highway
- Road
- International Border
- Backfill Staging Area
- Excavated Soil Staging Area
- Soil Repository



DRW Soil Program

Figure 1

STUDY AREA LOCATION

REMEDIAL ACTION WORK PLAN

DOUGLAS, ARIZONA

File Name:	Revised By		Office
84175(RAWP)GIS_WA_002	RM	8/25/2014	Waterloo

Legend

- Study Area
- DRW Facility Boundary
- Highway
- Road
- International Border
- Excavated Soil Staging Area
- Soil Repository

DRW Soil Program

Figure 2

ESSA, BSA, AND SOIL REPOSITORY LOCATIONS

REMEDIAL ACTION WORK PLAN

DOUGLAS, ARIZONA

Appendices

Appendix A

Fugitive Dust Control Plan

Appendix A

Fugitive Dust Control Plan

→ The Power of Commitment

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1. Introduction

This document presents the Fugitive Dust Control Plan for the soil cleanup activities associated with the Douglas Reduction Works (DRW) site, located near the cities of Douglas and Pirtleville, Arizona. This plan establishes the procedures to be implemented in order to control potential worksite contaminants from impacting public and worker safety. This plan supports and is an appendix to the Remedial Action Work Plan.

During the course of cleanup activities, the operation of earth moving equipment and vehicles in work areas may cause the generation of dust, particularly in dry and windy weather conditions. Dust control measures will be implemented as a routine measure during the work activities to protect nearby residents and workers from unacceptable levels of dust and lead particulate. Upon visual observations of dust by the Construction Project Coordinator, the Construction Project Coordinator's designee, the Construction Contractor, or local municipalities additional dust control measures will be immediately implemented.

The effectiveness of dust control measures will also be confirmed as discussed in Section 3 of this document. The monitors directly measure total dust and metals, which can be compared to appropriate 8-hour time weighted average (TWA) Occupational Safety and Health Administration (OSHA) occupational exposure limits. Dust control measures may include wetting of soil, slowing work activities, and other designated methods specified in the Remedial Action Work Plan.

2. Dust Control Measures

This section outlines the dust control practices that will be followed during project activities. Controls will be implemented to minimize fugitive dust generation from excavation activities. Visual observations will be used to evaluate the effectiveness of the controls.

Dust control measures will be a high priority for project personnel. Dust control will be achieved primarily by watering down work areas and vehicle traffic routes. Either a dust palliative or water shall be used for the alleviation or prevention of dust. Use of reclaimed water for dust control is preferred.

The water source for dust suppression will be from a Freeport Minerals Corporation owned property or local municipal water source. Each water source will need to be sampled and analyzed for DRW target constituents per the Quality Assurance Project Plan (GHD, 2024) prior to use. Watering at properties undergoing soil excavation and at soil stockpiles and haul roads within the Excavated Soil Staging Area will be provided on an as needed basis, as follows:

– During soil excavation activities (by heavy equipment and by hand crews)
– During stockpiling and/or loading of soils for transport
– During soil backfill activities
– Wetting down truck loads to control visible emissions during transport (truck loads will also be covered when traveling public roads)

Additional dust control measures will be aggressively implemented under windy conditions (measured wind speed greater than 10 miles per hour), whenever dust plumes are observed leaving an active soil excavation or the Excavated Soil Staging Area, or as needed based on real time soil particulate measurements. Dust generating activities will be stopped when sustained wind speeds exceed 25 miles per hour.

Dust control actions will primarily include application of water sprays to restrict dust generation in vehicle traffic routes (via water truck spray bars) and work areas (via hose/spray system fed from a portable water tank). Soil stockpiles may be covered during non-work hours or will be moistened using the side bar sprayer on a water truck or hose/spray

system fed from a water truck. In instances where application of water spray is not sufficient to prevent generation of visible dust, other dust control measures that may be used are as follows:

– Increased frequency of water spray applications
– Regulation of vehicle speed
– Placement of additional clean gravel as a ground cover in high dust generation areas
– Application of surfactant
– Other appropriate measures

Care will be taken to avoid application of excessive amounts of water that may cause unacceptable working conditions or increase the possibility of surface water run-off. If additional dust control measures do not eliminate visible dust or result in action levels being met, construction activities will be temporarily suspended until additional dust control measures have been implemented, or until adverse weather conditions abate. Dust control alternatives may be re-evaluated on an as needed basis.

3. Personal Air Monitoring

Air sampling will be conducted to evaluate potential worker exposure to target constituents and fugitive dust during work activities. During each air monitoring event, at least one equipment operator and one ground worker should be outfitted with sample pumps positioned within their breathing zone during work activities. Additional sample pumps will be placed adjacent to active excavation areas, in upwind and downwind locations. Sample pumps (typically provided by the laboratory) should be calibrated prior to sample collection and the intake tubing placed at breathing level and set at the laboratory or manufacturer-recommended flow rate for 8-hour TWA analysis. Collected air samples will be shipped under chain-of-custody to the laboratory for analysis of a nine-metal profile (including cadmium, chromium, cobalt, copper, iron oxide, lead, manganese, nickel, and zinc oxide), arsenic, respirable crystalline silica, and total dust by National Institute for Occupational Safety and Health Methods 7303, 7500/0600 (modified), and 0500, respectively. Exposure to lead in construction is regulated by OSHA under 29 CFR 1926.62. The standard establishes an Action Level and Permissible Exposure Limit (PEL) of 0.03 and 0.05 milligrams per cubic meter, respectively. Both the Action Level and PEL are based on an 8-hour TWA and apply to worker exposure. Exposures are reported as TWA exposures during the time sampled, which encompassed all soil removal activities being performed. The OSHA PEL for respiratory dust is less than or equal to 5.0 milligrams per cubic meter over an 8-hour TWA for workplace exposures. Personal air monitoring will be conducted on a bi-weekly basis for the first 6 weeks of construction activity, then on a quarterly basis once dust control measures are demonstrated to be protective of worker health.

4. References

GHD, 2024, Quality Assurance Project Plan, Douglas Reduction Works Soil Program. Douglas, Arizona.

Appendix B

Excavated Soil Staging Area Operations Plan

Appendix B

Excavated Soil Staging Area Operations Plan

→ The Power of Commitment

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Figure B-1 ESSA, BSA and Soil Repository Location

List of Acronyms

ESSA	Excavated Soil Staging Area
FMC	Freeport Minerals Corporation
HDPE	High Density Polyethylene
RAWP	Remedial Action Work Plan
TCLP	Toxicity Characteristic Leaching Procedure

Introduction

This document presents the Excavated Soil Staging Area (ESSA) Operations Plan for the cleanup activities associated with the Douglas Reduction Works site, located near the cities of Douglas and Pirtleville, Arizona. The ESSA is located within the Study Area on Freeport Minerals Corporation (FMC) property as shown on Figure B-1.

This plan establishes the procedures to be implemented and documented to manage the receiving, placement, characterization, movement, and, if necessary, treatment of excavated soil and various debris (i.e., concrete, vegetation, etc.) within the ESSA. These materials will be generated as a result of property soil remediation activities that will be conducted as part of the Soil Program within the Study Area. This ESSA Operations Plan supports and is an appendix to the Remedial Action Work Plan (RAWP).

1. Site Work

The objective of the ESSA Operations Plan is to identify and describe the various features of the ESSA, along with a description of the procedures required for handling materials within the ESSA.

1.1 Preparing the ESSA

Prior to beginning operations within the ESSA, erosion control measures will be established consistent with FMC mine operations.

1.1.1 Clearing, Grubbing and Grading

Clearing and grubbing is not anticipated prior and only minor grading will be conducted prior to initiating construction and/or staging activities within the ESSA. Grading will consist of leveling and compacting soils to establish haul roads and to provide level working surfaces for earthmoving equipment.

1.1.2 Erosion Control

The objective of erosion control is to effectively implement erosion and stormwater management controls to minimize erosion of disturbed areas and the areal impact of any potential soil spills. Essential components of the erosion and sediment control methods will be installed and fully functional before commencement of any soil disturbance activities. Erosion control measures will be implemented within the ESSA for the duration of the Soil Program cleanup activities.

1.1.3 Dust Control

Water sprinklers or water trucks will be used to control dust during site activities as needed. The various soil stockpiles are moistened as necessary to control the generation of fugitive dust during material handling, placement, and storage. Appendix A of the RAWP provides additional details related to the dust control plan for this program.

1.1.4 Security

The ESSA will be located within the FMC property and included any as part of normal security operations. The ESSA will be manned by project personnel during working hours. No casual visitors or unauthorized personnel are permitted to enter the ESSA without prior approval.

1.2 ESSA Operations

The ESSA will be used for receiving and managing materials excavated from individual properties as part of the Soil Program cleanup activities. Primary features of the ESSA include the Soil Accumulation Area, Soil Treatment Area, Soil Consolidation Area, and a Debris Storage Area. General activities within each of these areas are described below. The erosion and stormwater management controls described in Section 2.1.2 apply to each of these four areas.

1.2.1 Movement of Material Within the ESSA

Entrance/exit ways into and out of the ESSA will be prepared and maintained using 6 inches of suitable aggregate placed on top of a geotextile fabric in order to reduce transport of mud by motor vehicles. Access ways shall extend from the access road to at least the exit point of the equipment decontamination pad.

1.2.2 Initial Material Segregation and Soil Characterization

Excavated soil and debris (concrete, vegetation, etc.) initially delivered to the ESSA will be managed separately. Management of debris will occur within the Debris Storage Area. Once a sufficient volume of debris is generated, this material will be transported to and disposed of at a nearby solid waste landfill.

Excavated soil from within the Study Area delivered to the Soil Accumulation Area will be placed separately as individual stockpiles up to 500 cubic yards. Stockpiles will be sampled separately for subsequent Toxicity Characteristic Leaching Procedure (TCLP) analysis at an Arizona Department of Environmental Quality certified laboratory. Additional soil brought into this area will be staged in separate stockpiles.

TCLP sampling and analysis of the soil stockpiles in the Soil Accumulation Area will be conducted as follows:

- For stockpiles of 500 cubic yards or less, a five-point grab sample will be collected from the stockpile.
- The grab samples will be composited to create one representative sample (composite sample) for the soil stockpile. Grab samples will be spaced equidistant to one another.
- The grab samples will be collected using a decontaminated shovel or trowel, placed into a mixing container where they will be homogenized (mixed with a decontaminated spoon or trowel), then placed into an appropriately labeled sample container, packaged, and shipped (using Chain of Custody procedures outlined in the Quality Assurance Project Plan) to the laboratory for analysis.
- Composite soil samples will undergo TCLP and Synthetic Precipitation Leaching Procedure analyses for lead and arsenic. The analyses will follow the procedures presented in the Quality Assurance Project Plan (GHD, 2024).
- Laboratory results will be obtained within seven days of sampling each soil stockpile.

1.2.3 Soil Management, Treatment and Storage

Depending on the results of TCLP analysis for a stockpile within the Soil Accumulation Area, the entire stockpile will be removed to the Soil Treatment Area or the FMC Soil Repository. The location of the Soil Repository is shown on Figure B-1.

If TCLP results for a given stockpile are below regulatory levels (both lead and arsenic have TCLP regulatory thresholds of 5 milligrams per liter, the entire weekly stockpile will be moved to the Soil Repository. FMC understands that management of excavated soil within the ESSA is on a temporary basis, and soil may only be managed at this location for a maximum of 1 year from the time the soil was first placed in the ESSA until the soils can be placed into the Soil Repository.

If TCLP results for a given stockpile exceed regulatory levels, the entire stockpile will be moved within 5 days of receiving the laboratory analytical results to the soil treatment pad at the Soil Treatment Area where the soils will be stabilized.

1.2.3.1 Soil Stabilization Process

The Soil Treatment Area will include a working pad surrounded by a berm to prevent stormwater run on/run off. The working pad will be constructed by compacting the sub grade soil, which will be overlain with a 30 mil High Density Polyethylene (HDPE) liner extending to the top of the surrounding stormwater diversion berms. The HDPE liner will then be overlain with 18 inches of compacted soil. Stabilization will occur in batches (soil stockpiles will be stabilized and subsequently sampled and analyzed individually). Soil will be stabilized with quicklime and sodium sulfide, or other suitable reagents, to chemically bind the metals and reduce the potential for leaching of metals. The reagents will be applied directly to the soil stockpiles by spreading the material evenly over the surface area of the stockpile and mixing with the bucket of an excavator. The excavator will knead the reagent into the soil stockpile working from the toe of the soil stockpile to the top until the reagent is mixed equally throughout the pile.

The reagent and soil will be thoroughly mixed within a backhoe bucket, pug mill, disc, or other suitable means.

After stabilization, each stockpile will be re sampled for TCLP analysis according to Section 2.2.2. Stabilized soil that continues to exceed the regulatory criteria will be re-stabilized and retested until the material does not exceed the criteria. Stabilized soils that do not exceed the regulatory criteria will be moved to the Soil Repository.

1.2.4 Equipment Decontamination

An equipment decontamination pad will be constructed, and all visible soil and other materials will be removed from vehicles and equipment prior to exiting the ESSA onto public roads. Decontamination shall first involve a brush down of equipment in a designated decontamination area to remove visible accumulations of soil from machinery, tires, and shovels, etc. Use of water shall be avoided whenever possible and shall only be used if visible amounts of soil are evident after dry brushing. In these cases, equipment shall be washed on the equipment decontamination pad to minimize the migration of mud and water to the streets. Material removed during equipment decontamination shall be contained and placed on the stockpile of soil being generated at that time within the Soil Accumulation Area. In addition, the bed of haul trucks used to transport excavated materials from the cleanup properties shall be decontaminated prior to use of the same haul truck for transport of backfill materials.

1.2.5 ESSA Decommissioning and Restoration

The ESSA will be decommissioned once the remediation activities within the Study Area are completed and all excavated soils have been sampled and moved from the ESSA per FMC mine operational protocols.

1.2.6 Material Tracking

The tracking of material testing for TCLP analysis and stabilization will be performed by assigning unique numbers and dates to material stockpiles.

1.3 Stormwater Management

Stormwater will be managed per the FMC mine operations protocol.

1.4 Air Monitoring and Dust Control

Air monitoring and dust control practices shall be followed at the ESSA during periods of material handling and placement. The Fugitive Dust Control Plan included in Appendix A of the RAWP presents the detailed procedures for dust control and monitoring.

1.5 Reporting

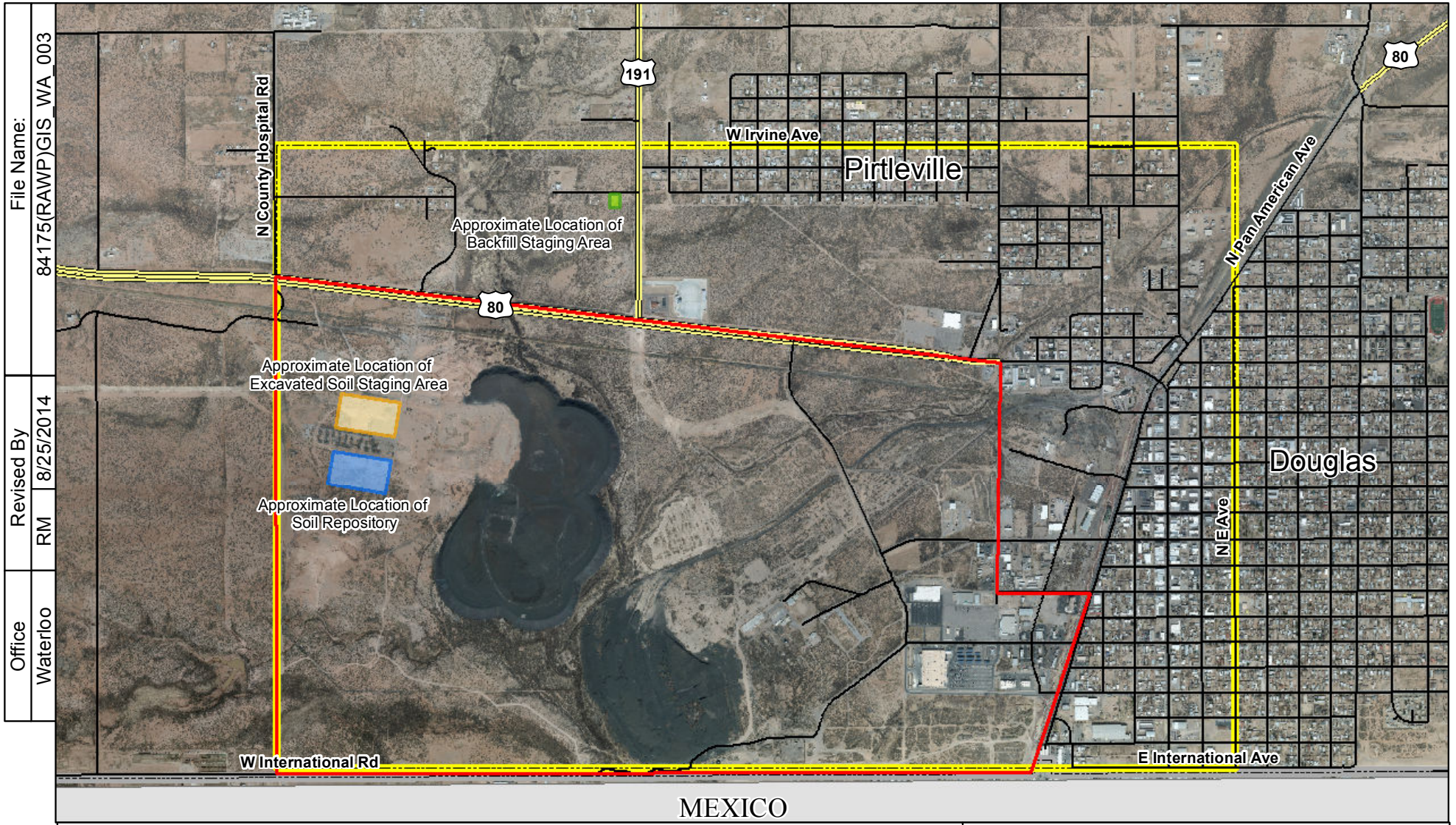
Reports documenting the soil moving activities will be prepared and submitted to the Arizona Department of Environmental Quality on a monthly basis. Reports will include at a minimum:

– Records of material tracking for the ESSA
– Records of TCLP results
– Inspection records

2. References

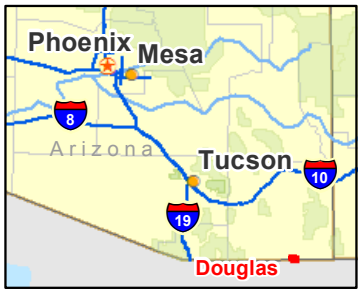
GHD, 2024, Quality Assurance Project Plan, Douglas Reduction Works Soil Program. Douglas, Arizona.

Figure



Legend

- Study Area
- DRW Facility Boundary
- Highway
- Road
- International Border
- Backfill Staging Area
- Excavated Soil Staging Area
- Soil Repository



DRW Soil Program

Figure B-1

STUDY AREA LOCATION

REMEDIAL ACTION WORK PLAN

DOUGLAS, ARIZONA

Appendix C

Soil Repository Operations Plan

Appendix C

Soil Repository Operations Plan

→ The Power of Commitment

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Figure C-1 ESSA, BSA and Soil Repository Location

1. Introduction

This document presents the Soil Repository Operations Plan for the cleanup activities associated with the Douglas Reduction Works site, located near the cities of Douglas and Pirtleville, Arizona. The Soil Repository is located within the Study Area on Freeport Minerals Corporation property as shown on Figure C-1.

This plan establishes the procedures to be implemented and documented to manage the movement and placement of soil from the Excavated Soil Staging Area (ESSA) to the Soil Repository. The soils placed in the Soil Repository will be from soil remediation activities being conducted as part of the Soil Program within the Study Area. This Soil Repository Operations Plan supports and is an appendix to the Remedial Action Work Plan (RAWP).

2. Site Work

The objective of the Soil Repository Operations Plan is to identify and describe the various features of the Soil Repository, along with a description of the procedures required for handling materials within the Soil Repository.

2.1 Preparing the Soil Repository

Prior to beginning operations within the Soil Repository, erosion control measures will be established consistent with Appendix D of the RAWP. The Soil Repository is located within the Study Area as shown on Figure C-1.

2.1.1 Clearing, Grubbing and Grading

Some clearing, grubbing, and/or grading will be conducted prior to initiating construction activities within the Soil Repository. Clearing will consist of cutting brush to ground level. Grubbing will consist of the removal of stumps, vegetation, and roots 3 inches in diameter or larger from below ground level. Grading will consist of leveling and compacting soils to establish haul roads and to provide level working surfaces for earthmoving equipment. All materials cleared and grubbed within the Soil Repository will be transported off site to an authorized disposal facility.

2.1.2 Erosion Control

The objective of erosion control is to effectively implement erosion and stormwater management controls to minimize erosion of disturbed areas. Essential components of the erosion and sediment control methods will be installed and will be fully functional before commencement of any soil disturbance activities. Erosion control measures will be implemented within the Soil Repository for the duration of the construction activities. Appendix D of the RAWP provides additional details related to erosion control requirements.

2.1.3 Dust Control

Water sprinklers or water trucks will be used to control dust during site activities as needed. The soils delivered from the ESSA into the Soil Repository will be moistened as necessary to control the generation of fugitive dust during material handling and placement. Appendix A of the RAWP provides additional details related to the dust control plan for this program.

2.1.4 Security

The Soil Repository lies within an area owned by Freeport Minerals Corporation and has a perimeter fence with a lockable entrance gate. The entrance gate is to remain locked after operating hours and during periods of inactivity to prevent unauthorized access. The Soil Repository will be manned by project personnel during working hours. No casual visitors or unauthorized personnel are permitted to enter the Soil Repository without prior approval.

2.2 Soil Repository Operations

The Soil Repository will serve as the final resting place for soils currently originating from the ESSA (Weekly Accumulation Area, Consolidation Area, and Soil Treatment Area) which have been tested and laboratory results indicate Toxicity Characteristic Leaching Procedure and Synthetic Precipitation Leaching Procedure results below regulatory levels. Soil testing is described in Appendix B of the RAWP. The erosion and stormwater management controls described in Section 2.1.2 applies to this area.

2.2.1 Movement of Material within the Soil Repository

Entrance/exit ways into and out of the Soil Repository will be prepared and maintained using 6 inches of suitable aggregate placed on top of a geotextile fabric in order to reduce transport of mud by motor vehicles. Access ways shall extend from the public access road to at least the exit point of the equipment decontamination pad.

2.2.2 Soil Placement

Soils from the ESSA with Toxicity Characteristic Leaching Procedure and Synthetic Precipitation Leaching Procedure results below regulatory levels will be moved to the Soil Repository by dump truck. The soils will be delivered to the Soil Repository, dumped, and then spread with a bulldozer. The soil will be installed in 1-foot lifts and will be compacted by the bulldozer. The soil will be graded to ensure positive drainage.

2.2.3 Equipment Decontamination

An equipment decontamination pad will be constructed, and all visible soil will be removed from vehicles and equipment prior to exiting the Soil Repository. Decontamination shall first involve a brush down of equipment in the designated decontamination area to remove visible accumulations of soil from machinery, tires, and shovels, etc. Use of water shall be avoided whenever possible and shall only be used if visible amounts of soil are evident after dry brushing. In these cases, equipment shall be washed on the equipment decontamination pad to minimize the migration of mud and water. Material removed during equipment decontamination shall be contained and placed in the Soil Repository.

2.2.4 Restoration

Restoration of the Soil Repository will include installation of a 2-foot-thick soil cap capable of supporting vegetation. The cap will be graded to ensure positive drainage, and a final topographic survey of the capped surface will be collected. Then, the capped surface will be hydroseeded with native grasses. The construction contractor will install stormwater erosion controls (diversion berms, ditches, silt fence, and/or hay bales) to prevent erosion, and will remove all remaining tools and equipment from the Soil Repository upon completion of the restoration.

2.3 Stormwater Management

A Stormwater Management Plan for the Soil Repository is provided in Appendix D of the RAWP. The plan will describe the engineering and operational controls that will be used throughout the duration of the soil placement activities for management of stormwater. Procedures are also described for inspection and maintenance of the stormwater controls.

2.4 Air Monitoring and Dust Control

Air monitoring and dust control practices shall be followed at the Soil Repository during periods of material handling and placement. The Fugitive Dust Control Plan included in Appendix A of the RAWP presents the detailed procedures for dust control and monitoring.

2.5 Reporting

Information related to the construction activities will be prepared and submitted with the final report as outlined in Section 5 of the RAWP. The information will include at a minimum:

– Records of the soil volume placed material tracking for the ESSA
– Initial and final topographic survey information
– Construction inspection records

2.6 Long-Term Operation and Maintenance

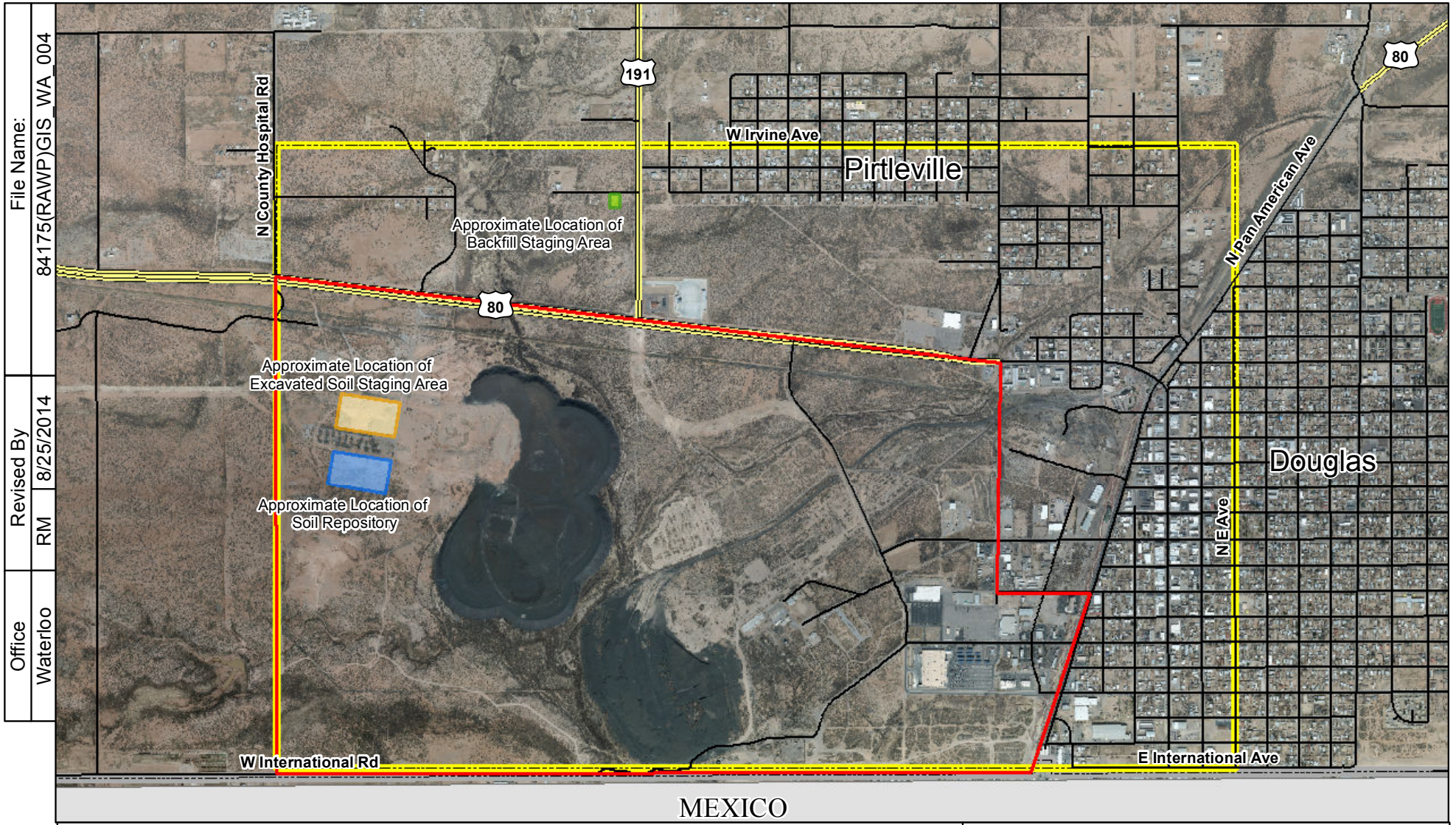
For a period of 10 years after restoration of the Soil Repository, it will be inspected annually by an individual with experience in evaluating capping systems, and, when appropriate, slope stability. The purpose of the inspection will be to determine whether the soil cap is functioning as intended. The inspector will identify the need for any repairs, changes in site use, or other significant information related to the soil cap that may have occurred in the previous 12 months. Examples of such conditions include cracks in the soil cap or sloped areas, soil movement, rivulets, erosions resulting from run-on and run-off, poor vegetation and presence of animal burrows. An inspection checklist will be generated prior to performing the first annual inspection. Upon completion of the inspection, the checklist will be reviewed and signed by the inspector. The inspection report will also include photographs to document the findings during the inspection.

The Annual Inspection Summary Report will be submitted to the Arizona Department of Environmental Quality within 60 days after completion of the annual inspection. In addition to the inspection, the letter report will include the following:

– Copy of the signed annual inspection checklist
– Summary of the findings from the annual inspection
– Description of actions taken since completion of the previous annual inspection, including:
    - Any repairs to the installed cap that were identified and carried out
    - Any other significant information that may relate to the installed engineering control or impact their function
    - Description of recommendations for inspection modifications
    - Recommendations concerning any repairs to the installed cap
    - Photographs depicting site conditions with brief identifying captions or descriptions
    - Conclusions regarding the ongoing effectiveness of the cap system.

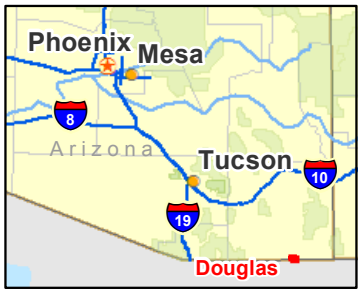
In addition, similar inspections will be conducted during or immediately following unplanned events, such as fires, floods and/or heavy rain, seismic events, etc. where the soil cap may be compromised, and underlying soils may be exposed. For the purposes of the inspection, a "heavy" rain event requiring immediate follow-up is defined as a rainfall event exceeding 4 inches in any 24-hour period. The inspector will document all inspections and required repairs or maintenance and incorporate such documents into the Annual Inspection Summary Report.

Figure



Legend

- Study Area
- DRW Facility Boundary
- Highway
- Road
- International Border
- Backfill Staging Area
- Excavated Soil Staging Area
- Soil Repository



DRW Soil Program

Figure C-1

STUDY AREA LOCATION

REMEDIAL ACTION WORK PLAN

DOUGLAS, ARIZONA

Appendix D

Stormwater Management Plan for the Excavated Soil Staging Area and Soil Repository

Appendix D

Stormwater Management Plan for the Excavated Soil Staging Area and Soil Repository

→ The Power of Commitment

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Figure D-1 Excavated Soil Staging Area Stormwater Management Plan Details

Attachments

Attachment 1 Stormwater Best Management Practices Inspection Form

1. Introduction

This Stormwater Management Plan (SWMP) describes the basis, procedures, and documentation to be used for stormwater management at the Excavated Soil Staging Area (ESSA) during soil remediation activities in Douglas, Arizona. This SWMP supports and is an appendix to the Remedial Action Work Plan.

2. Regulatory Basis

This SWMP was prepared in accordance with the requirements of the Arizona Department of Environmental Quality, Water Quality Division, Arizona Pollutant Discharge Elimination System General Permit for Discharge from Construction Activities to Waters of the United States, also known as the Construction General Permit, Permit Number AZG2020-001. This project will be permitted under the current Construction General Permit and will have an authorization number prior to beginning work.

This SWMP is consistent with all applicable federal, state, and local requirements for soil and erosion control and stormwater management. This SWMP was prepared in accordance with accepted engineering, hydrologic, and pollution control practices. Changes or additions may be required to address changes in conditions at the overall project or at individual residential property sites.

3. Best Management Practices and Erosion Control

3.1 Evaluation of Excavated Soil Staging Area and Soil Repository

Stormwater will be managed at the ESSA and Soil Repository to minimize transport of suspended sediment from work areas by implementing Best Management Practices (BMPs) and engineering controls consistent with the substantive requirements of applicable national pollutant discharge elimination system permits for stormwater described above. Planned physical engineering controls will include:

– Installing surface water diversion berms around the soil stockpiles and work areas to prevent stormwater run-on and to direct run-off to a natural low spot for detention. At a minimum, a silt fence shall be installed along the full downgradient perimeter of disturbed areas.
– Installing silt fences and hay bales to filter sediment from stormwater run-off.
– Placing hay bales and/or rock check dams at the surface water discharge point(s) to reduce stormwater flow velocities and further filter residual sediment in run-off and minimize erosion.
– Covering soil stockpiles at the end of each workday with plastic sheeting secured with weights or equivalent cover material.
– Constructing an equipment decontamination pad to remove soil from vehicles and equipment before they leave the soil disposal and staging areas.
– Defining work areas to reduce the area of disturbance. In addition, the following operational BMPs will be implemented:

- Good housekeeping practices, including removal of any soil spilled on the adjacent roads.
- Decontamination of soil handling equipment and trucks working within the excavated soils stockpile area.
- Control of traffic patterns within the soil disposal and staging areas.
- Minimization of site activities during rainy conditions.

3.2 Erosion Control Measures

The objective of erosion control is to effectively implement erosion and stormwater management controls, along with a phased construction sequence to minimize erosion of disturbed areas and minimize the impact of any potential spills. The specific types of erosion control devices to be installed will include silt fence, temporary diversion dike/berm, erosion control matting, revegetation, and rock riprap. The truck entrance, staging areas, and haul road will be installed and stabilized as needed. One or more types of erosion and sediment control devices will be employed at the ESSA and Soil Repository. Essential components of the erosion and sediment control methods will be fully functional before commencement of any soil disturbance activities. Erosion control measures will be implemented for the duration of the voluntary soil cleanup operations in the ESSA and Soil Repository. Figure D-1 provides typical installation details for erosion control measures.

Erosion control measures that will be implemented at the ESSA and Soil Repository are briefly described below.

3.2.1 Silt Fence

A silt fence consists of a geosynthetic fabric material, suspended between wooden or metal support posts properly anchored in the ground. To intercept run-off occurring as overland flow, the silt fence may be installed in the downslope/downstream side of soil excavation areas, temporary soil stockpile areas, the truck haul routes, and roadside ditch areas. The silt fence will be installed parallel to area contours and perpendicular to the direction of incoming flow. The lower edge of the fabric will be buried at least 4 inches below ground surface to prevent undercutting. The ends of the fence will be curved uphill to the extent necessary to prevent flow around the end of the fence.

3.2.2 Erosion Control Matting

Temporary erosion control matting will be used as a means of preventing erosion of the exposed areas between the time when they are seeded and when vegetative growth becomes established. The temporary erosion control mat/blanket may consist of either natural or synthetic materials, NAG C125BN or equivalent material, and will be employed for covering all exposed areas of soil. The erosion control mat/blanket will need to be able to handle a maximum flow velocity of 9 feet per second. Surface preparation and installation of the erosion control mat/blanket will follow the product manufacturer’s instructions.

3.2.3 Rock Riprap

In areas of high velocity water flow, riprap sized for the appropriate water velocity will be used to prevent erosion. A geotextile layer will be laid down on top of the slope or channel, with 6 inches of appropriately sized rock riprap placed by hand or with mechanical equipment to further protect the surface.

4. Inspection and Maintenance

Maintenance and inspection procedures will be performed to ensure effective implementation and maintenance of BMPs. All engineering control features will be inspected by the Construction Project Coordinator once per month and as soon as practicable following a rainfall of ¾ of an inch in 24 hours at the nearest rainfall monitoring station. An

example inspection form is provided in Attachment 1. To the extent practicable, defects or deficiencies will be promptly corrected within 72 hours. Inspections and any follow-up actions will be documented and provided to the Arizona Department of Environmental Quality on a periodic basis.

– Silt fences will be inspected for depth of sediment, for tears, to confirm that the fabric is securely attached to the fence posts, and to confirm that the fence posts are securely imbedded in the ground.
– Hay bales will be inspected for accumulation of sediment, for absence of gaps between the bales, to confirm the bales are firmly staked in the ground, and to determine the condition/integrity of individual bales.
– Interceptor dikes will be inspected to confirm their structural integrity.
– Stabilized entrance/exit ways will be inspected to confirm presence/maintenance of sufficient aggregate and possible exposure of underlying geotextile.
– The equipment decontamination pad will be inspected to confirm the structural integrity and the proper operation of the collection sump.
– The established monitoring point(s) will be inspected to determine if there is any presence/evidence of sediment run-off from the active work area.

5. Monitoring Program Review and Modification

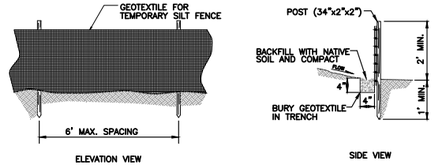
It is expected that stormwater discharge from the ESSA and Soil Repository will be infrequent; however, if such discharge occurs, the receiving stream will be sampled upgradient and downgradient of the discharge location. Sampling will occur at a minimum frequency of once every 6 months that discharge occurs, and samples will be analyzed for pH, total suspended solids, and total arsenic, cadmium, and lead.

Procedures for sample handling and analysis methods are specified in the Quality Assurance Project Plan (GHD, 2024).

6. References

GHD, 2024, Quality Assurance Project Plan, Douglas Reduction Works Soil Program. Douglas, Arizona.

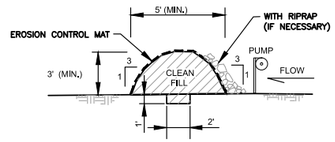
Figure



DETAIL A

SILT FENCE INSTALLATION

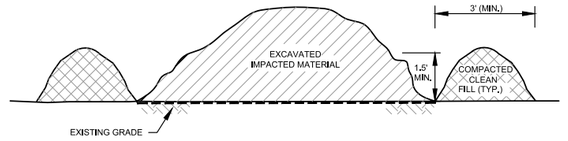
NOT TO SCALE



DETAIL C

TEMPORARY EARTHEN DIKE/BERM WITH EROSION MAT

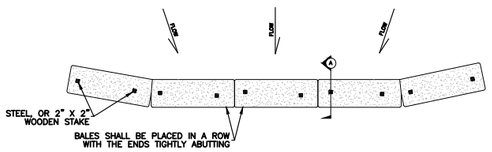
NOT TO SCALE

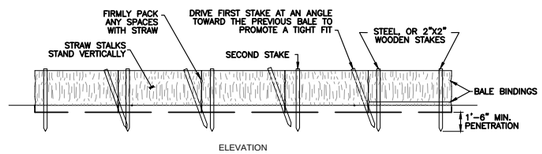


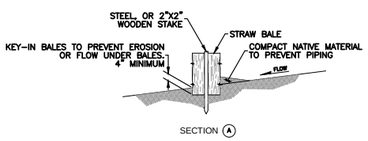
DETAIL E

TYPICAL SECTION OF TEMPORARY DIVERSION BERM ENCLOSING SOIL STOCKPILE

NOT TO SCALE



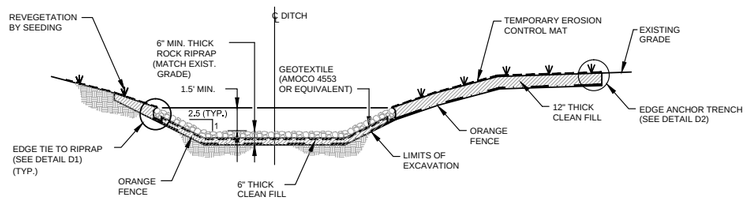




DETAIL B

STRAW HAY BALE INSTALLATION

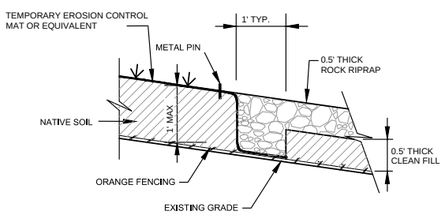
NOT TO SCALE



DETAIL D

TYPICAL CROSS-SECTION OF DRAINAGE DITCH

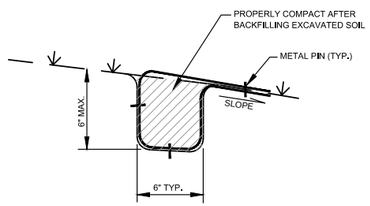
NOT TO SCALE



DETAIL D1

EDGE SECURE AND TIE TO RIPRAP (OR SOIL/ROCK MIXTURE)

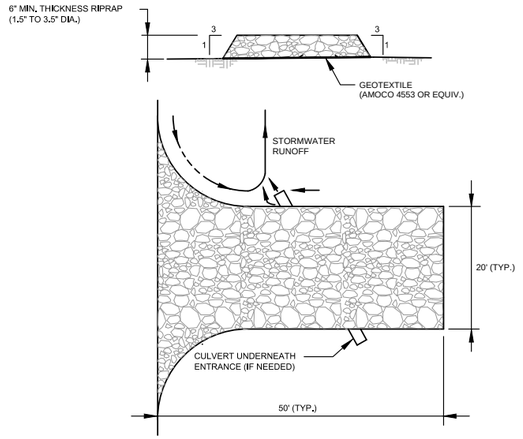
NOT TO SCALE



DETAIL D2

ANCHOR TRENCH

NOT TO SCALE



DETAIL F

STABILIZATION OF CONSTRUCTION ENTRANCE

NOT TO SCALE

NOTES:

1. EROSION CONTROL MEASURES TO BE INSTALLED PER SPECIFICATIONS.

Figure D-1

ESSA AND SOIL REPOSITORY STORMWATER MANAGEMENT PLAN DETAILS
VOLUNTARY REMEDIATION PROGRAM
DRW SOIL PROGRAM
Douglas, Arizona

Attachment 1

Stormwater Best Management Practices Inspection Form

Stormwater BMPs Inspection Form

Inspector Name: _____

Type of Inspection*: _____

Rainfall Amount (previous 24- hours): _____

Summary of Corrective Actions	
Actions	**Date Completed**

Summary of Corrective Actions	
Actions	**Date Completed**

Inspector Signature: _____

*Monthly or after significant rainfall event.

Date: _____

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The Power of Commitment