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**PLN-080240-5510
Rev. 0**

**Backfill and Restoration Plan for the
Lucky Formerly Utilized Sites Remedial Action
Program Site Soils Operable Unit Remediation Project**

**U.S. Army Corps of Engineers
Buffalo District, Buffalo, New York**

Applicability: Lucky Formerly Utilized Sites Remedial Action Program Site Soils Operable Unit Remediation Project	Effective Date: 12/06/2021	A large black rectangular redaction box covering the right portion of the table.



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Completion of Independent Technical Review

This document has been produced within the framework of the North Wind Portage (NWP) quality management system. As such, an independent technical review (ITR), appropriate to the level of risk and complexity inherent in the project, has been conducted. This included review of assumptions (methods, procedures, and material used in analyses), alternatives evaluated; the appropriateness of data used and level of data obtained; and reasonableness of the results, including whether the product meets the project objectives. Comments and concerns resulting from review of the document have been addressed and corrected as necessary.

ITR performed by	[REDACTED]	
Signature:	[REDACTED]	Date: 12/06/2021

Additional Technical Review and direction was provided by Civil & Environmental Consultants, Inc., during the development and review of this document.



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History of Revisions

Revision	Issue Date	Action	Description
0	12/06/2021	New document	Initial issue.



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ACRONYMS

ASTM	American Society for Testing and Materials
BRP	backfill and restoration plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	constituent of concern
CRZ	contamination reduction zone
EZ	exclusion zone
FSS	final status survey
FUSRAP	Formerly Utilized Sites Remedial Action Program
GPS	Global Positioning System
ITR	independent technical review
NAD83	North American Datum of 1983
NAVD88	North American Vertical Datum of 1988
NEA	negative exposure assessment
NWP	North Wind Portage
PLS	professional land surveyor
PWS	Performance Work Statement
SWPPP	stormwater pollution prevention plan
SZ	support zone
USACE	United States Army Corps of Engineers



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1. INTRODUCTION

1.1 Purpose and Scope

This backfill and restoration plan (BRP) addresses activities to be performed after demonstration that remediation work areas have successfully met prescribed cleanup goals during environmental remediation at the Luckey Formerly Utilized Sites Remedial Action Program (FUSRAP) Site Soils Operable Unit Remediation Project. The United States Army Corps of Engineers (USACE), Buffalo District, has selected North Wind Portage (NWP), under Contract Number W912P421C0014, to remediate the Luckey Site. Remediation will take place under FUSRAP, which was established to identify, investigate, and clean up or control sites previously used by the Atomic Energy Commission (AEC) and its predecessor, the Manhattan Engineer District. The Luckey Site has been identified as having materials contaminated with FUSRAP-related constituents of concern (COCs), including beryllium, lead, radium-226, thorium-230, uranium-234, and uranium-238.

Backfill and restoration activities include placement of imported general fill materials, compaction of general fill materials, placement of imported topsoil, final grading activities, and final site restoration to a vegetated state. Site activities will be performed in phases. This BRP presents the means and methods NWP will follow to perform backfilling and restoration for this phase of work as required by the *Performance Work Statement, Remediation of Soils Operable Unit, Luckey Site* (PWS; USACE 2021a).

1.2 Site Background

Site history, preparation, remediation, and project schedule are discussed in detail in the *Site Operations Plan for the Luckey Formerly Utilized Sites Remedial Action Program Site Soils Operable Unit Remediation Project* (USACE 2021b). The Luckey FUSRAP Site covers approximately 40 acres, encompassing concrete pads where former buildings were located, two abandoned railroad spurs, and several smaller support buildings. The area surrounding the site to the west, north, and east is primarily residential farmland. From 1949 to the early 1960s, the Brush Beryllium Company, as a contractor to the AEC, used the Luckey Site for beryllium processing to support the national defense program. Beryllium production activities brought different types of source media or potential contaminants to the site. Primary source media at the Luckey Site included materials delivered for processing or reprocessing: beryl ore from Africa and South America, scrap beryllium, and radiologically contaminated scrap steel.

The USACE conducted a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial investigation of the Luckey Site under FUSRAP to characterize site conditions and to determine nature and extent of contamination, with the scope limited to



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addressing radioactivity, beryllium, and constituents related to the production of beryllium at the Luckey site (USACE 2000). Through the subsequent CERCLA feasibility study of the Luckey Site, cleanup goals were identified and remedial action alternatives evaluated for the Luckey site (USACE 2003).

USACE identified six AEC-related COCs in impacted soils posing unacceptable risk to human health: beryllium, lead, radium-226, thorium-230, uranium-234, and uranium-238. The selected remedial action, as identified in the *Luckey Site, Luckey, Ohio, Record of Decision for Soils Operable Unit, Final* (USACE 2006), includes the excavation of impacted soils to achieve established cleanup goals for these COCs. Excavated soils above cleanup goals will be shipped off-site for disposal at a licensed/permitted disposal facility. NWP is the remediation contractor for the selected alternative.

2. CIVIL SURVEYING

Civil surveys will be performed at distinct points in the remediation process, including: pre-excavation, weekly during active excavation activities, post-excavation, weekly during active backfilling activities, upon completion of import general fill placement and compaction, and upon completion of final site grading (topsoil placement).

Civil surveys will be subcontracted and performed under the supervision of a subcontractor employee who is a professional land surveyor (PLS) registered in the State of Ohio, when required by the PWS (USACE 2021a). Weekly excavation and backfill surveys will not be supervised by a PLS. The subcontractor will record location and elevation measurements in sufficient quantity to produce drawings with 1-foot contour intervals (minimum). Various means may be used to collect data including, Global Positioning System (GPS)-based survey systems, robotic total stations, and 3D laser scanning systems. Survey control points and monuments will be verified for accuracy prior to beginning each civil survey activity on-site.

Civil survey information will be provided electronically after each survey activity. The format will be dependent on the specific data and reporting requirements of that civil survey activity. Coordinates and elevations will be depicted using feet as the unit of measure and will reference North American Datum of 1983 (NAD83), Ohio State Plane Coordinate System North Zone (horizontal) and North American Vertical Datum of 1988 (NAVD88) (vertical). The civil surveying subcontractor will also be responsible for installation of necessary site control monuments and control points and maintenance of site monuments and control points to facilitate civil surveying efforts.



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2.1 Pre-excavation Civil Survey

Prior to beginning soil disturbance (i.e., remediation work activity) in a work area, a pre-excavation civil survey will be performed to document existing site conditions. This survey will include, at a minimum, site features such as topography, driveways, access roads, parking lots, sidewalks, buildings, fence lines, overhead utilities, manholes, valve boxes, and other utility appurtenances, drainage features, and property lines.

2.2 Weekly Excavation Surveys

Weekly excavation volume surveys will be conducted in active remediation work areas for the duration of the project. These surveys will be used to verify extents (vertical and horizontal) of the excavation area. These surveys will also be used for weekly quantity (production) tracking as well as verification and justification for additional excavation beyond scheduled and budgeted volumes. These surveys will be performed only in areas where excavation is actively occurring.

2.3 Post-excavation Civil Survey

Excavation will be guided by a combination of projected depth and footprint modeling, visual field observations, and biased sampling efforts to ensure that established cleanup goals are met. Upon completion of the initial projected excavation, Pre-Final Status Survey (FSS) samples will be collected to verify that established cleanup goals have been met. Upon receipt and review of satisfactory Pre-FSS sample results, the post-excavation civil survey will be performed.

The results of the post-excavation civil survey will be compared to the pre-excavation civil survey to determine the in-situ volume of material excavated. This volume will be used to calculate the necessary amount of import general fill materials and the amount of import topsoil materials for backfilling activities.

Excavations will be pumped dry, as practicable, before the post-excavation survey is performed, as well as at the start of backfilling. Water accumulated within an excavation (runon, groundwater, etc.) will be managed in accordance with the *Water Management Plan for the Luckey Formerly Utilized Sites Remedial Action Program Site Soils Operable Unit Remediation Project* (USACE 2021c).

2.4 Weekly Backfill Surveys

Weekly backfill volume surveys will be conducted in active remediation work areas for the duration of the project. These surveys will be used for weekly quantity (production) tracking. These surveys will be performed only in areas where backfill placement is actively occurring.



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2.5 Backfill Completion Survey

Upon completion of backfilling activities using imported general fill materials, a civil survey will be performed to determine the total quantity of import fill placed. The elevation and spatial information from this survey will be compared to the post-excavation civil survey in order to calculate the volume of general fill material imported and compacted.

2.6 Final Grade Survey

Upon completion of placement of imported topsoil materials and final grading activities, a civil survey will be performed to determine the total quantity of topsoil placed. This survey will be phased in order to allow revegetation of work areas in a timely manner to minimize erosion and sediment control concerns caused by bare earth. These phase drawings will be combined to create a final drawing upon completion of all remediation work activities under this phase of work.

3. BACKFILL ACTIVITIES

Backfill activities will be performed in phases as FSS samples verify that established cleanup goals have been met and USACE approval is received. It is anticipated that backfilling will subsequently occur prior to final approval of the FSS technical data package(s) in order to minimize the duration that the excavation work area is open and the amount of maintenance required for it. Additionally, this allows backfill activities to be performed concurrently with excavation activities to the extent practicable, shortening the overall duration of the project schedule and providing additional area for potential future uses.

3.1 Backfill Materials

Imported fill will be sampled, analyzed, and accepted by USACE in accordance with the *Uniform Federal Policy Quality Assurance Project Plan for the Luckey Formerly Utilized Sites Remedial Action Program Site Soils Operable Unit Remediation Project, Luckey, Ohio, Sampling and Analysis Plan* (USACE 2021d) and UFGS 02 61 13 (2/10, chg 1-02/21) from the PWS (USACE 2021a), before it is imported to the site. Additional tests will be performed when a change in material texture or color occurs. Backfill materials shall be free of roots and other organic material, trash, debris, snow, frozen materials, or other undesirable materials.

It is anticipated that two types of backfill materials will be utilized on the project site:

1. Imported general fill.
2. Imported topsoil.



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3.2 Backfill Material Staging

Backfill materials will be delivered to the site in dump trucks and stockpiled in designated areas. These areas will be within the support zone (SZ), areas downposted through an approved negative exposure assessment (NEA), or areas that have been previously backfilled with imported general fill materials. Stockpile erosion and sediment controls will be managed in accordance with the *Stormwater Pollution Prevention Plan, Luckey Formerly Utilized Sites Remedial Action Program Site Soils Operable Unit Remediation Project* (SWPPP; USACE 2021e). Backfill delivery vehicles will not be permitted to enter the contamination reduction zone (CRZ) or exclusion zone (EZ).

3.3 Imported General Fill Placement

Backfilling will begin with imported general fill materials. Materials from the stockpiles(s) will be loaded into an articulating dump truck and transported to the face of the excavation to be backfilled. The articulating dump truck will travel over an improved stone haul route constructed through areas that will be within the SZ, areas downposted through an approved NEA, or areas that have been previously backfilled with imported general fill materials.

Backfill materials will be dumped from the articulating dump truck and pushed into the excavation utilizing a dozer. The dozer will operate from the clean peninsula of imported general fill materials and work in an outward manner when placing the first lift of material into the excavation in order to prevent contact with the in-situ surface. The articulating dump truck will then be permitted to traverse the remaining lifts of imported general fill material to place material within the excavation. Placement of general imported fill materials will be guided utilizing a GPS-grade control system. Imported general fill materials will be placed to an elevation of 4 inches below final grade elevation. The import general fill materials will be worked with a disk in order to uniformly incorporate added water or to uniformly aerate the soil for drying, if deemed necessary by the compaction testing results.

Lifts of material will be placed at a maximum 8 inches of loose thickness and compacted to 90-percent of American Society for Testing and Materials (ASTM) D 698 maximum dry density utilizing a roller. A minimum of one density test will be performed on each lift of backfill placed per 10,000 feet² of area in accordance with the PWS (USACE 2021a). Field in-place dry density shall be determined in accordance with ASTM D6938. One in 10 tests will be checked using ASTM D1556 or ASTM D2167 in accordance with the PWS (USACE 2021a). Field compaction testing will be performed by a USACE Materials Testing Center validated company. NWP will utilize the Ohio Department of Transportation one-point proctor method and Ohio Typical Density Curves for each compaction test in order to establish the correct Proctor curve for compaction testing.



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3.4 Imported Topsoil Placement

Imported topsoil placement will commence upon completion of placement and compaction of imported general fill materials. In specific instances, placement of imported topsoil may be delayed to allow the backfilled area to be utilized for additional stockpiles. Placement of topsoil may also be delayed until favorable revegetation conditions occur and planting can occur immediately after topsoil placement. Imported topsoil will be transported from the stockpile location(s) in the same manner as imported general fill materials. Imported topsoil will be graded utilizing a dozer guided by GPS-grade control equipment in order to establish the final line and grade. Care will be taken to minimize compaction of the imported topsoil during placement in order to promote revegetation activities. Final grading will be completed to match the conditions identified in the pre-excavation survey.

3.5 Sediment and Erosion Controls

For the duration of the backfilling and restoration phase of work, NWP will maintain erosion and sediment controls in accordance with the approved SWPPP (USACE 2021e).

4. SITE RESTORATION

Following completion of imported topsoil placement, site restoration activities will commence. Site restoration activities include activities such as site preparation, seedbed preparation, seeding, mulching, and ongoing maintenance activities. These activities and their requirements will be performed in accordance with the permanent seeding requirements of the approved SWPPP (USACE 2021e). In cases where permanent seeding cannot occur, temporary seeding or other approved erosion and sediment control measures will be utilized in accordance with the approved SWPPP (USACE 2021e).

4.1 Emergent Wetlands

Should future remediation activities on the Luckey Site infringe upon any emergent wetlands, these wetlands will be restored to preexisting conditions.

4.2 Final Inspection

NWP will complete final inspection activities and closeout of the work area in accordance with the PWS (USACE 2021a). This plan represents a phase of work on the Luckey Site and full demobilization is not anticipated between phases; therefore, no additional site restoration activities are detailed within this plan.



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