Mitigation Action Plan Annual Report Calendar Year 2016

Environmental Assessment for Expansion of Borrow Areas on the Hanford Site

DOE/EA-1934

February 2017

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

U.S. DEPARTMENT OF ENERGY | Richland Operations Office
P.O. Box 550
Richland, Washington 99352

APPROVALS

Kevin D. Leary — 1/17/17

K.D. Leary, Physical Scientist
Site Stewardship Division
U.S. Department of Energy
Richland Operations Office

Date

Diori L. Kreske — 1/19/17

D. L. Kreske, DOE NEPA Compliance Officer
Office of Chief Counsel
U.S. Department of Energy
Richland Operations Office

Date

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ACRONYMS

bcm	bank cubic meters
CEQ	Council on Environmental Quality
DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy–Headquarters
DOE-RL	U.S. Department of Energy – Richland Operations Office
EA	Environmental Assessment
MAP	Mitigation Action Plan
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
WCH	Washington Closure Hanford

Annual Mitigation Action Plan Report – Calendar Year 2016

DOE/EA-1934

"Environmental Assessment for Expansion of Borrow Areas on the Hanford Site"

1.0 INTRODUCTION

Hanford is undergoing extensive efforts to clean up contamination resulting from past nuclear defense production, waste management, and research and development missions dating back to World War II. Cleanup activities can result in large excavated areas needing to be backfilled and revegetated. The purpose of the proposed action in DOE/EA-1934, *Environmental Assessment for Expansion of Borrow Areas on the Hanford Site*, was to meet the U.S. Department of Energy (DOE) need for sand and gravel material (approximately 10,714,000 bank cubic meters [bcm][1]) to support environmental River Corridor cleanup projects in accordance with DOE/EA-1934 through the year 2023, as well as construction and maintenance activities across Hanford. DOE/EA-1934 did not address the need for fine-grained silt loam soil borrow pits to support construction of surface caps/covers associated with site closure activities.

Several preferred silt loam soil, sand, and gravel borrow pits have been identified and analyzed in other Hanford *National Environmental Policy Act* (NEPA) documents.[2] These documents address the use of 27 borrow pits and 2 rock quarries for sand and gravel. In addition, the potential 10% expansion of disturbed surface area at each borrow pit beyond current boundaries is discussed. Of the 27 borrow pits originally analyzed, only 11 (Pits F, H, N, 6, 9, 18, 21, 23, 24, 30, and 34) continue to provide sand and gravel fill material and construction aggregate. The 11 active borrow pits were the focus of the DOE/EA-1934 proposed action, with the goals of minimizing haul distances from borrow sources to remediation sites; minimizing greenhouse gas and other emissions; minimizing impacts to natural, biological, and cultural resources; and minimizing costs associated with excavating and transporting materials. In addition to these 11 borrow pits, DOE/EA-1934 proposed a new borrow pit in an area between the 100-K and 100-N Reactor Areas (i.e., Pit 36). During the *National Historic Preservation Act* (NHPA) Section 106 review, concerns were raised regarding the proposed new borrow pit (Pit 36)

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[1] A bank cubic meter refers to a volume of aggregate material in-place within the borrow pit area before it is disturbed; an assumption of 15% "swell" or increase in the volume is made due to soil disturbance upon removal. Soils have a native dry and wet bulk density (typically in units of g/cm^3). During excavation, the soil structures are soil porosity generally destroyed, and hence the bulk density of the soil is decreased and the soil occupies more volume (aka 15% swell). However, after the soil is emplaced at its point of use, it is "re-compacted" often back to its original bulk density. Soil bulk density can be defined as: "Bulk density is defined as the dry weight of soil per unit volume of soil. Bulk density considers both the solids and the pore space; whereas, particle density considers only the mineral solids." Also defined as: "Bulk density is an indicator of soil compaction. It is calculated as the dry weight of soil divided by its volume. This volume includes the volume of soil particles and the volume of pores among soil particles. Bulk density is typically expressed in g/cm3."

[2] DOE/EIS-0222, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement;* DOE/EA-1403, *Environmental Assessment for Use of Existing Borrow Areas, Hanford Site, Richland, Washington;* DOE/EA-1454, *Environmental Assessment for Reactivation and Use of Three Former Borrow Sites in the 100-F, 100-H, and 100-N Areas;* DOE/EIS-0391, *Tank Closure and Waste Management Environmental Impact Statement.*

due to potential impacts to the Traditional Cultural Property known as the *Mooli Mooli*. Because of these concerns and to allow for their resolution through continued consultation with Native American Tribes, DOE decided to defer a determination on the proposed Pit 36. Figure 1 depicts the locations of borrow pits at Hanford proposed for continued use and expansion.

2.0 MITIGATION ACTION PLAN

DOE Order 451.1B, Change 3, *National Environmental Policy Act Compliance Program*, establishes DOE internal requirements and responsibilities for implementing NEPA, the Council on Environmental Quality (CEQ) Regulations Implementing the Procedural Provisions of NEPA (40 CFR Parts 1500-1508), and the DOE NEPA Implementing Procedures (10 CFR Part 1021). In addition to requirements established in NEPA and the Regulations, Section 4.g of DOE Order 451.1B requires *"Tracking and annually reporting progress in implementing a commitment for environmental impact mitigation that is essential to render the impacts of a proposed action not significant, or that is made in a record of decision."*

WCH-561, Revision 0, *Expansion of Borrow Areas on the Hanford Site, Mitigation Action Plan for DOE/EA-1934* describes guidelines and requirements to be followed before, during, and after extraction of sand and gravel material from the expansion areas of existing borrow pits at Hanford. These guidelines and requirements are meant to mitigate effects to the environment by the proposed action of expanding the footprint of the borrow pits as analyzed in DOE/EA-1934.

3.0 MITIGATION ACTION PLAN SUMMARY

This annual report provides a summary of DOE/EA-1934 Mitigation Action Plan (MAP) implementation in calendar year 2016. To date, the expansion area of only one borrow pit (Pit 24) has been used. Table 1 lists the guidelines and requirements from the MAP for use of the expansion area at Pit 24. Table 1 is a summary, as many of the guidelines and requirements are repeated throughout the text and tables in the MAP. The Appendix provides a tabulation of all mitigation measures by resource area. The following paragraphs summarize highlights of implementing the MAP at Pit 24.

Pit 24 parallels Hanford Route 6 where it runs east/west about 0.5 miles northwest of the 100-B/C Reactor Areas (see Figure 1). Most of Pit 24 is located within 0.25 miles of the Columbia River, in the area designated as the Hanford Reach National Monument. The active western portion of the borrow pit is mostly non-vegetated gravel. The inactive eastern portion includes a wetted area of the pit that is dominated by willow, cattail, and invasive species including salt cedar and common reed. Following a pit expansion in the late-1990s, the eastern portion of Pit 24 was identified for potential wetland habitat improvement in an otherwise non-vegetated borrow pit, since the bottom of the pit was at the level of the regional groundwater table.

Figure 1. Location of Borrow Pits at Hanford Proposed for Continued Use and Expansion

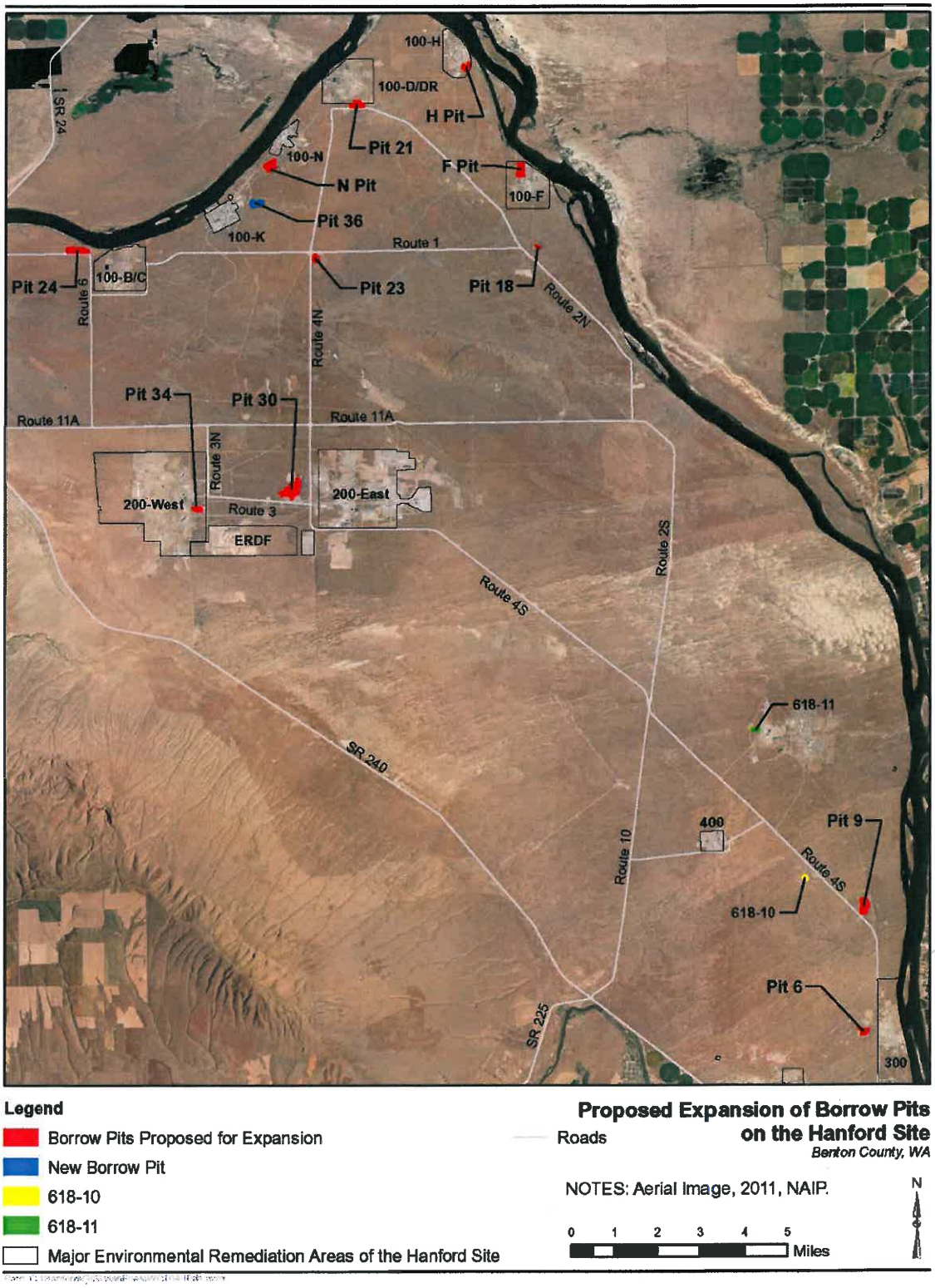

Table 1. Pit 24 Compliance with Guidelines and Requirements[3] (2 pages)

Guideline/Requirement from WCH-561	Pit 24 Compliance with Guideline/Requirement
Expansion of existing borrow areas will occur from the previously excavated areas outward rather than inward from the new boundary, whenever possible, to avoid a noncontiguous disturbance.	Condition met; borrow area expansion from previously excavated areas outward.
To ensure that borrow material is only removed from within approved areas, pit boundaries will be marked in the field.	Condition met; pit boundaries are marked with survey stakes.
Borrow material will only be excavated on an as-needed basis to ensure only the area needed for material is disturbed.	Condition met; material excavated as needed with new requests for material subject to an excavation permit.
Prior to any material being excavated for use as backfill, the top 30 cm. (12 in.) of topsoil will be stockpiled for redistribution across the disturbed area to facilitate successful revegetation.	Condition met; topsoil was removed and stockpiled to facilitate revegetation.
Measures will be implemented to minimize the production of weedy species within the operating pit and minimize surface disturbances outside of the operating area.	Condition met; no weedy species observed within operating pit; surface disturbances minimized outside operating area.
After borrow materials are exhausted within a particular pit, slopes will be recontoured to blend with adjacent areas and to support successful revegetation of native shrubs and grasses.	Condition met; eastern portion of pit recontoured and revegetated.
Use of dust suppression measures (e.g., water spraying) will be used during excavating, loading, unloading, and transporting of borrow pit materials, during transportation on unpaved haul roads, and on topsoil stockpiles as needed.	Condition met; dust suppression is contractually required of subcontractors (cf., Backfill Contract 0000X-SP-C0016, Rev 1, Exhibit E, Section 3.2).
Application of dust control water will be visually monitored to minimize ponding and thereby reduce infiltration to groundwater.	Condition met; ponding of dust control water was visually monitored and minimized.
In the unlikely event that groundwater is encountered in the bottom of a borrow pit, administrative controls will be used (such as markers or temporary fencing) to prevent contact between groundwater and equipment. Excavations should be limited to leave at least 9.9 ft. (3 m-4 m if possible as the maximum rooting depth at Hanford is around 10 to 15 ft.) in depth from the bottom of the pit to the typical groundwater elevation.	Condition met; contact between groundwater and equipment was prevented.

[3] WCH-591, *Expansion of Borrow Areas on the Hanford Site, Mitigation Action Plan for DOE-EA-1934, Washington Closure Hanford.*

Table 1. Pit 24 Compliance with Guidelines and Requirements[3] (2 pages)

Guideline/Requirement from WCH-561	Pit 24 Compliance with Guideline/Requirement
Implement spill prevention and response program to minimize the potential for spills of hazardous materials and keep spill prevention materials on site.	Condition met; spill prevention and response are requirements in WCH policy, procedures, and subcontracts.
Standard health and safety practices (e.g., use of appropriate PPE, specific training, and equipment safeguards) will be used.	Condition met; appropriate personal protective equipment, training, and equipment safeguards implemented.
Appropriate administrative controls such as warning signs and traffic markers will be used, as necessary, to mitigate occasional interference with the local traffic flow.	Condition met; traffic control plans are components of excavation permits (cf., DAN-3575, Rev 6).
While it will be practical to leave some slopes at a 4:1 ratio, it is the intent to create a sinuous appearance. Rectilinear topographic elements shall be avoided. Instead of straight planar slopes and right angles, final topography should have contours, small chutes or ravines and rolling mounds, especially in the toe of the excavation.	Condition met; eastern portion of pit recontoured with small chutes, ravines, and rolling mounds.
If boundaries allow, and the adjacent habitat is of poor quality, efforts shall be made to further reduce slope to a 10:1 ratio or beyond.	Not applicable at this time. Evaluation will occur when pit materials are exhausted and final recontouring and revegetation are performed.
Once borrow materials are exhausted within a particular pit, the slopes will be recontoured to blend with the natural surrounding landscape in a pattern that will support healthy and successful establishment of native shrubs and grasses.	Condition met; eastern portion of pit recontoured with small chutes, ravines, and rolling mounds to blend with natural surrounding landscape and promote establishment of native shrubs and grasses.
Upon borrow area closure, the soil berms will be spread across the borrow pits to assist with successful revegetation of the borrow areas in accordance with all current and applicable Hanford Site management plans.	Not applicable to entire borrow area at this time since portions remain active; soil berms were used to support recontouring, restoration, and revegetation of inactive/closed eastern portion of the pit.
A temporary boundary marker will be established to protect a nearby historic farmstead property and intermittent cultural resource monitoring will be performed.	Expansion area has been clearly staked providing protection for historic farmsteads to north of pit; intermittent monitoring is conducted during pit activity to confirm protection of cultural resources.

PPE= personal protective equipment

WCH= Washington Closure Hanford

The eastern portion of Pit 24 has been determined to be exhausted of borrow material. While not required by the MAP until the entire pit has been exhausted, reclamation of the eastern portion of Pit 24 was initiated in 2014 in a manner consistent with the MAP (see Figure 2). A Wetland Analysis should be prepared in the future to help determine how Pit 24 should be managed. A recontouring plan was developed for Pit 24 to blend it into the natural surroundings (see Figure 3). The active area and area proposed for expansion is located on the west side of Pit 24 within an old farm field (see Figure 4).

The expansion area of Pit 24 has been surveyed and clearly staked to protect adjacent ecological and cultural resources; including historic farmsteads to the north (see Figure 5). Expansion of the pit has occurred from the previously disturbed area outward. Fine grained surface soil has been stockpiled for use in reclaiming the pit once the borrow material is exhausted (see Figure 6). Only enough area has been grubbed and excavated to meet near-term needs to minimize unnecessary disturbance. Ecological resources are evaluated annually when the pit is in use in accordance with an Ecological Resources Review. Controls to protect ecological and cultural resources are communicated to field teams through the Ecological and Cultural Resources Review and Natural Resources Disturbance Checklist that are included in the excavation permit for use of the pit. Cultural Resource Monitoring was completed during pit activity by Washington Closure Hanford (WCH) in December of 2015 (HCRC#2011-100-057-M).

The recontouring plan included shaping the pit sides and bottom to match surrounding terrain more naturally and removing straight, planar slopes, replacing them with chutes, ravines, and rolling mounds. In the bottom of the pit, in areas periodically wetted by ground water, moats and ponds have been created around small islands. Large rocks have been scattered individually and placed in piles. The site has been revegetated with native grasses and shrubs. In many of the river corridor borrow pits, both elk and deer have been observed at the bottom of borrow pits seeking shelter, cover, and shade during the heat of the summer. This diversity in topography/wildlife habitat is a positive impact from the creation and restoration of borrow pits on an otherwise flat topographic area.

4.0 CONCLUSIONS

The evaluations in DOE/EA-1934 considered potential cumulative impacts that would result from the proposed action. Most aspects of potential effects from the proposed action would be temporary, such as effects to transportation, air quality, water quality, health and safety, and socioeconomic and environmental justice aspects. Land use for the purposes of obtaining borrow material under the proposed action is consistent with current land use decisions (i.e., DOE/EIS-0222-F, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*). Potential impacts associated with the proposed action and mitigation measures were identified in DOE/EA-1934 and WCH-561. The MAP includes all the integral elements and commitments made in the EA to mitigate any potential adverse environmental impacts resulting from implementation of the Proposed Action.

The U.S. Department of Energy, Richland Operations Office (DOE-RL) and its contractors are responsible for implementation of mitigation measures identified in the

MAP during the opening, operation, expansion, and closure of the borrow areas. These mitigation actions will be monitored and implemented through the Hanford Site Environmental Management System and be reported annually to U.S. Department of Energy-Headquarters (DOE-HQ) in accordance with the requirements of DOE Order 451.1B, Change 3, Section 4.g.

5.0 REFERENCES

DOE/EA-1934, 2013, *Environmental Assessment for Expansion of Borrow Areas on the Hanford Site*, Rev 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/EIS-0222-F, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, Rev 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE Order 451.1B, Change 3, *National Environmental Policy Act Compliance Program*, U.S. Department of Energy, Washington, DC.

National Environmental Policy Act of 1969, 42 U.S.C. 4321, et seq.

National Historic Preservation Act of 1966, 16 U.S.C. 470.

WCH-561, 2013, *Expansion of Borrow Areas on the Hanford Site, Mitigation Action Plan for DOE/EA-1934*, Rev 0, Washington Closure Hanford, Richland, Washington.

Figure 2. Eastern Portion of Pit 24 after Recontouring

Figure 3. Pit 24 Recontouring Plan for Eastern Portion

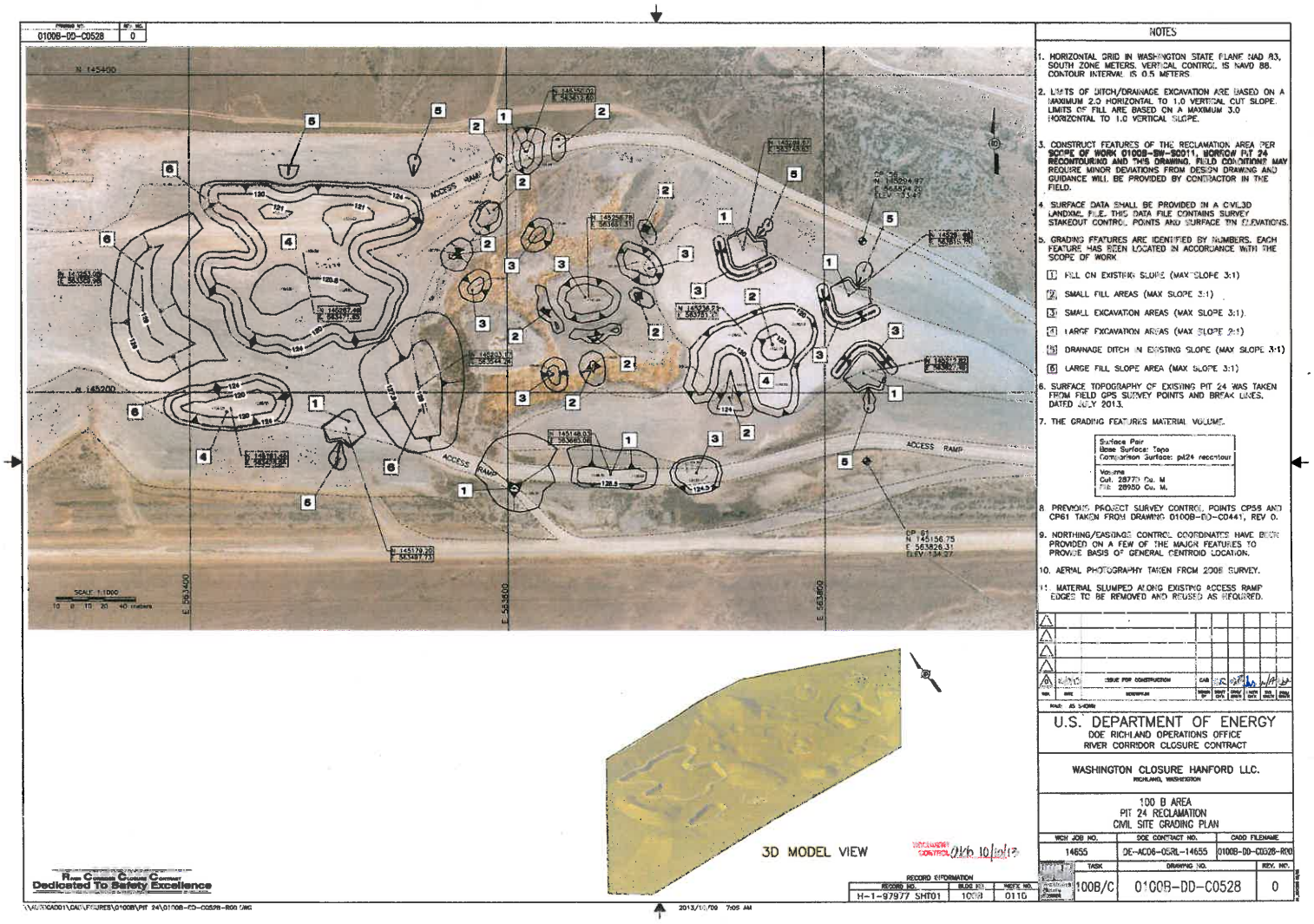

Figure 4. Looking Southwest across Pit 24 after Recontouring

Figure 5. Aerial View of Pit 24 and Proposed Expansion Area to the West

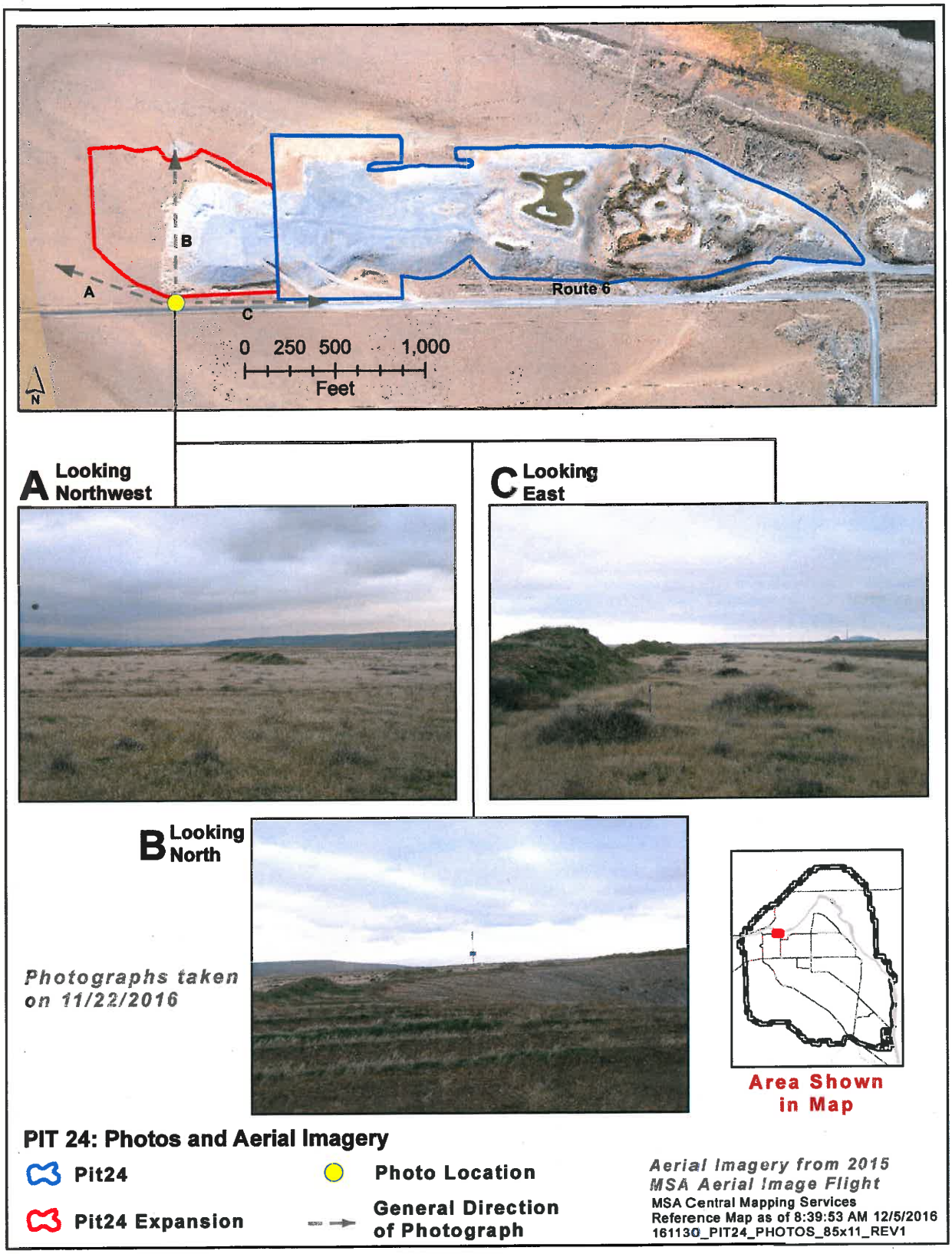

Figure 6. Pit 24 Survey Stakes Marking Pit Boundaries and Stock Pile of Fine Grained Material to be used for Pit Reclamation.

Appendix - Summary of Mitigation Measures by Resource Area[4] (2 pages)

Environmental Resource Area	Mitigation
Land Use	• Expansion of existing borrow areas will occur from the previously excavated areas outward rather than inward from the new boundary, whenever possible. • **To ensure that borrow material is only removed from within approved areas, pit boundaries will be marked in the field.** • Borrow material will only be excavated on an as-needed basis to ensure only the area needed for material is disturbed. • Recycling of clean or regulatory approved construction and demolition waste will be used to offset new sand and gravel volumes. • Borrow pit expansion is limited to the areas listed in Table 2, "Maximum Borrow Area Expansion and Excavation Depth," of the MAP (WCH-561). • Administrative controls shall be used in the event that groundwater is encountered to ensure that equipment contact with the groundwater is minimized. If groundwater were to remain for a sustained period, material would be placed in those areas to ensure they would not remain wetted.
Ecological Resources[5]	• Prior to any material being excavated for use as backfill, the top 30 cm. (12 in.) of topsoil will be stockpiled for redistribution across the disturbed area to facilitate successful revegetation. Dust suppression methods, such as application of water spray, would be implemented to control emissions of particulate matter. • Measures will be implemented to minimize the production of weedy species within the operating pit and minimize surface disturbances outside of the operating area. • Closure of borrow pits will include revegetation in accordance with current and applicable Hanford Site management plans. • At the 100-H and Pit 30 Borrow Areas, an evaluation of the pit area will be conducted each spring/summer until closure to determine presence of Piper's daisy *(Erigeron piperianus)*. If present, any impact to the species will be mitigated on a 1:1 per plant basis. • At the Pit 21 Borrow Area, compensatory sagebrush mitigation will be required on a 3:1 basis, by area, for a 1.1-ha (2.79-ac) island existing within the expansion area. • At the Pit 30 Borrow Area, compensatory sagebrush mitigation will be required on a 3:1 basis, by area, for the disturbed area.
Cultural Resources	• At the Pit 24 Borrow Area, a temporary boundary marker will be established to protect a nearby historic farmstead property and intermittent cultural resource monitoring will be performed. • At Pits N, 21, 23, and 36, visual resource impacts identified will be mitigated by staging available topsoil as a berm around the outside edges of the pits to minimize the visual impact. The 100-N Borrow Area will be bermed in the north, east, and south sides; Pit 21 will be bermed on the west side; Pit 23 will be bermed on the south side; Pit 36 will be bermed on the north side. • At Pit N, 21, 23, and 36, borrow pits will be shaped to the natural land contours during development and use. • If cultural materials are encountered during project activities, work in the vicinity of the discovery would stop until appropriate notifications and assessments are made and, if necessary, arrangements made for mitigation of the discovery.

[4] WCH-591, *Expansion of Borrow Areas on the Hanford Site, Mitigation Action Plan for DOE-EA-1934, Washington Closure Hanford.*

[5] Ecological Resource compensatory mitigation was required on a 3:1 basis in Pit 21 and Pit 30 per the *Hanford Site Biological Resources Management Plan* (BRMaP) (DOE/RL-96-32).

Environmental Resource Area	Mitigation
Visual Resources	• At Pits N, 21, 23, and 36 visual resource impacts identified will be mitigated by staging available topsoil as a berm around the outside edges of the pits to minimize the visual impact. The 100-N Borrow Area will be bermed in the north, east, and south sides; Pit 21 will be bermed on the west side; Pit 23 will be bermed on the South side; Pit 36 will be bermed on the north side. • After borrow material are exhausted within a particular pit, slopes will be recontoured to blend with adjacent areas and to support successful revegetation of native shrubs and grasses. • The N, 21, 23, and 36 borrow pits will be shaped to blend with natural land contours as much as possible during development and use.
Air Quality	• Use of dust suppression measures (e.g., water spraying) will be used during excavating, loading, unloading, and transporting of borrow pit materials, during transportation on unpaved haul roads and on topsoil stockpiles as needed. • Haul vehicles and excavators will use ultra-low sulfur fuels and be properly maintained to lessen potential impacts on air quality.
Water Quality	• Water will be used for dust suppression. This water will be obtained from the existing Hanford Site raw water and drinking water supply, which is already authorized for discharge to ground under permits issued by Ecology pursuant to WAC 173-216. Application of dust control water will be visually monitored to minimize ponding and thereby reduce infiltration to groundwater. • Excavations should be limited to leave at least 9.9 ft. (3 m-4 m if possible as the maximum rooting depth at Hanford is around 10 to 15 feet) in depth from the bottom of the pit to the typical groundwater elevation. Maximum excavation depth elevations for specific borrow areas are shown in Table 2 of the MAP (WCH-561). These depth restrictions are elevations above sea level; as such, upon occasional extreme flow seasons, there is a potential for groundwater to be encountered. These brief and infrequent periods should not sustain any vegetation. In the event that groundwater remains, actions shall be taken to place material back into the excavation. • In the unlikely event that groundwater is encountered, administrative controls, such as markers or a rope/stanchion barrier, would be used to eliminate the risk of equipment contacting groundwater. • Implement spill prevention and response program to minimize the potential for spills of hazardous materials and keep spill prevention materials on site. • At the Pit 30 Borrow Area, excavation activities will be conducted in accordance with the statewide *Sand and Gravel General Permit* (Ecology 2011) that sets discharge limits and requires monitoring, inspections, implementation of best management practices, spill control measures, and waste disposal practices.
Health and Safety	• Standard health and safety practices (e.g., use of appropriate PPE, specific training, and equipment safeguards) will be used.
Transportation	• Appropriate administrative controls such as warning signs and traffic markers will be used, as necessary, to mitigate occasional interference with the local traffic flow. • Haul roads used exclusively for project-related activities would continue to minimize interference with normal traffic flows because they would not use or intersect any primary Hanford Site routes.
	PPE= personal protective equipment WCH= Washington Closure Hanford MAP= Mitigation Action Plan