DOE-EM/GJ1238

Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project Crescent Junction Site Storm Water Pollution Prevention Plan

Revision 5

May 2020

U.S. Department of Energy

Office of Environmental Management

Prepared by the Technical Assistance Contractor under contract number DE-EM0005014
and the Remedial Action Contractor under contract number DE-DT0011049
for the U.S. Department of Energy Office of Environmental Management, Grand Junction, Colorado.

Moab UMTRA Project
Crescent Junction Site Storm Water Pollution Prevention Plan

Revision 5

Review and Approval

5/26/2020

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Revision History

Revision	Date	Description
0	November 2010	Initial issue.
1	May 2011	Annual update.
2	January 2012	Annual update and response to December 2011 state inspection.
3	March 2015	Revision includes update of contact information, site drawing, and current permit.
4	October 2017	Revision includes updates to entire document.
5	May 2020	Revision includes extensive changes to entire document to meet requirements of the updated Permit and match the structure of the Moab site SWPPP, new site maps and features for inspection, and a revised corrective action procedure.

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Attachments

Attachments are included with the document on the SharePoint website.

Acronyms and Abbreviations

amsl	above mean sea level
bgs	below ground surface
BMP	Best Management Practice
CA	Contamination Area
CFR	Code of Federal Regulations
CGP	construction general permit
DOE	U.S. Department of Energy
DWQ	Utah Department of Water Quality
EPA	U.S. Environmental Protection Agency
ft	foot or feet
gal	gallon or gallons
I-70	Interstate 70
IDW	investigation-derived waste
MET	meteorological monitoring station
NOI	Notice of Intent
NRC	Nuclear Regulatory Commission
NRCS	U.S. Department of Agriculture Natural Resources Conservation Service
PPE	personal protective equipment
pCi/g	picocuries per gram
RAC	Remedial Action Contractor
RAP	Remedial Action Plan
RBA	Radiological Buffer Area
RRM	residual radioactive material
SWPPP	Storm Water Pollution Prevention Plan
TAC	Technical Assistance Contractor
UAC	Utah Administrative Code
UMTRA	Uranium Mill Tailings Remedial Action
UMTRCA	Uranium Mill Tailings Radiation Control Act
UPDES	Utah Pollutant Discharge Elimination System
URC	Uranium Reduction Company
US-191	U.S. Highway 191
USC	United States Code

1.0 Introduction

The state of Utah Pollutant Discharge Elimination System (UPDES) General Permit for Discharges from Construction Activities, UPDES Permit No. UTRC00000, referred to in this *Storm Water Pollution Prevention Plan* (SWPPP) as "the Permit," was designed to regulate and control pollutants from storm water discharges under the provisions of Title 33 United States Code Section 1251 (33 USC 1251), the Clean Water Act.

The Permit (see Attachment 1), applies to facilities that perform construction activities, including clearing, grading, and excavation, that result in a land disturbance of one or more acres. Coverage under the Permit is required for each facility, from the commencement of earth-disturbing activities until final stabilization. The intent of the requirements set forth in the Permit is to prevent erosion, sediment transport, and pollutants from disturbed areas at construction sites from entering receiving waters of the state. Typical storm water discharges associated with construction activities present a risk of carrying contaminants into receiving waters, including pollutants such as soil nutrients, heavy metals, pesticides and herbicides, oil and grease, fuels, trash, debris, treatment polymers, and other toxic chemicals.

Utah Administrative Code (UAC) Rule 317-8-3.9, "UPDES Storm Water Discharges," prohibits point source discharges of storm water from construction activities into a water body of the state without a UPDES Permit. The U.S. Department of Energy (DOE) filed a Notice of Intent (NOI) and was assigned the unique state of Utah identifier UPDES Permit No. UTR359187 for the Crescent Junction disposal site of the Moab Uranium Mill Tailings Remedial Action (UMTRA) Project (see Attachment 1).

1.1 Purpose

This SWPPP meets the Permit requirements for controlling erosion, preventing off-site movement of sediment, and controlling storm water discharges associated with construction and disposal activities at the Crescent Junction site. The ultimate goal of the SWPPP is to prevent adverse impacts to water quality downgradient of the site. In accordance with the Permit, a copy of this SWPPP is maintained on site and made available on request to the Executive Secretary (or authorized representative) of the Utah Water Quality Board, interested members of the public, and local government officials. This SWPPP is also posted on the Project's public website. This SWPPP identifies potential pollution problem areas associated with site features and describes the selected best management practices (BMPs) implemented by the Project to control storm water, erosion, and sediment transport from disturbed areas of the site related to construction and disposal activities. This SWPPP also describes those BMPs associated with pollution prevention measures.

Attachment 1 includes the Utah General Construction Permit UPDES Permit No. UTRC00000 and the Crescent Junction site NOI for storm water discharges associated with construction activities under the UPDES Permit No. UTR359187. Attachment 2 includes samples of the site inspection forms and corrective action log. Figure 1 depicts the general location of the Crescent Junction site, and Figure 2 shows major site features. All BMPs currently installed and maintained on the Crescent Junction site to control storm water run-on and runoff, minimize erosion, and control sediment, are depicted in the detail maps shown in Figures 3 through 8.

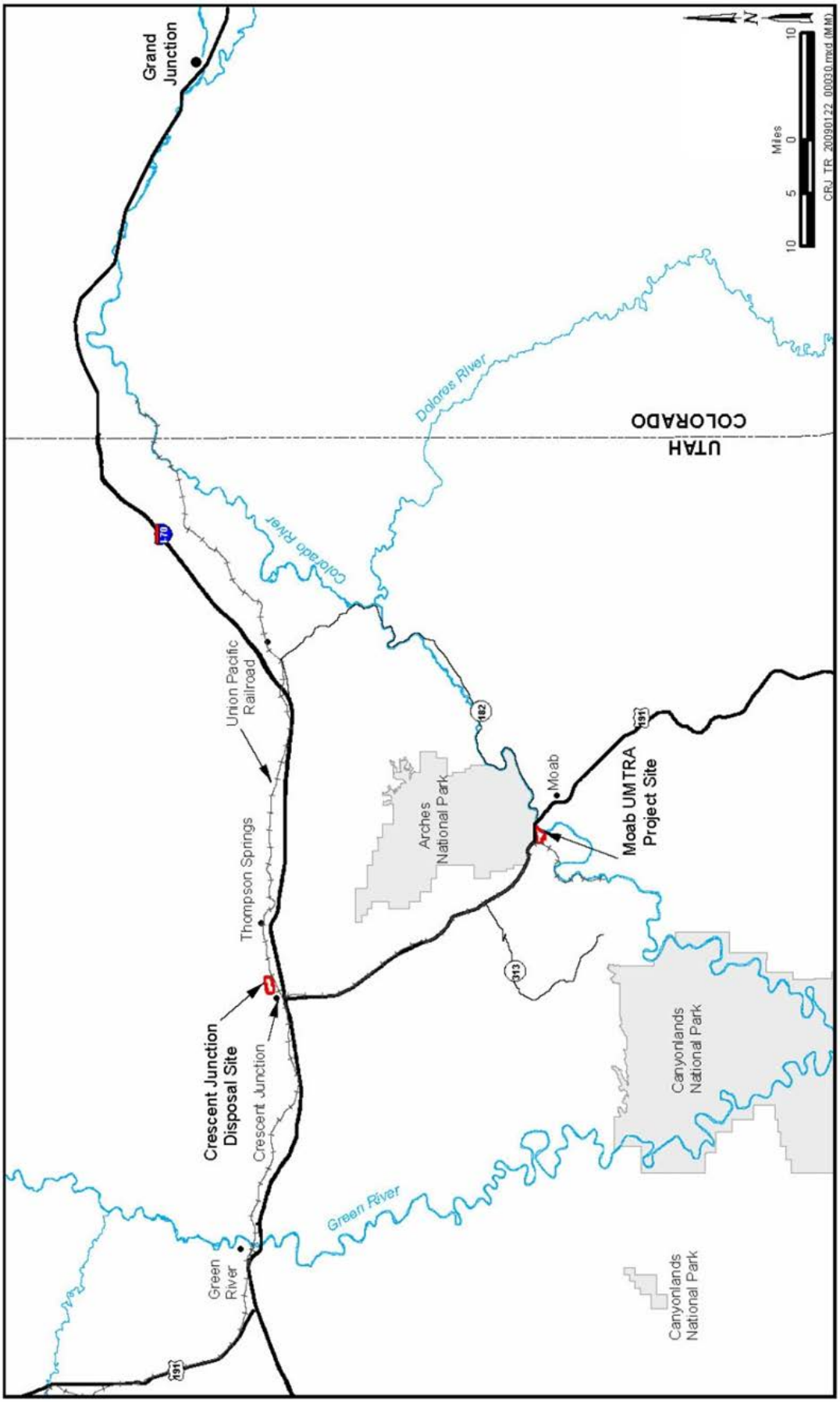


Figure 1. Location of the Crescent Junction and Moab Sites in Grand County, Utah

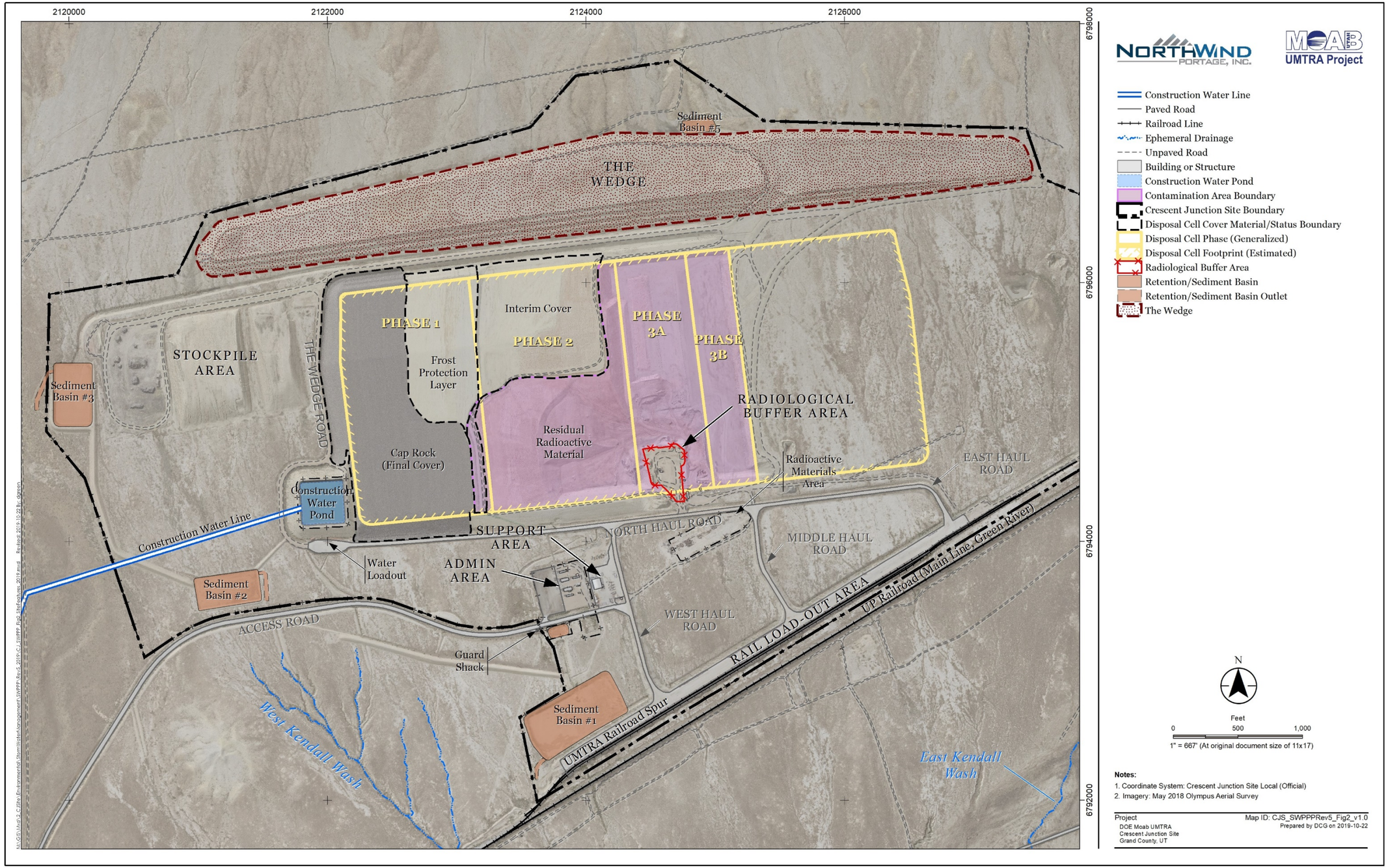


Figure 2. Crescent Junction Site Features

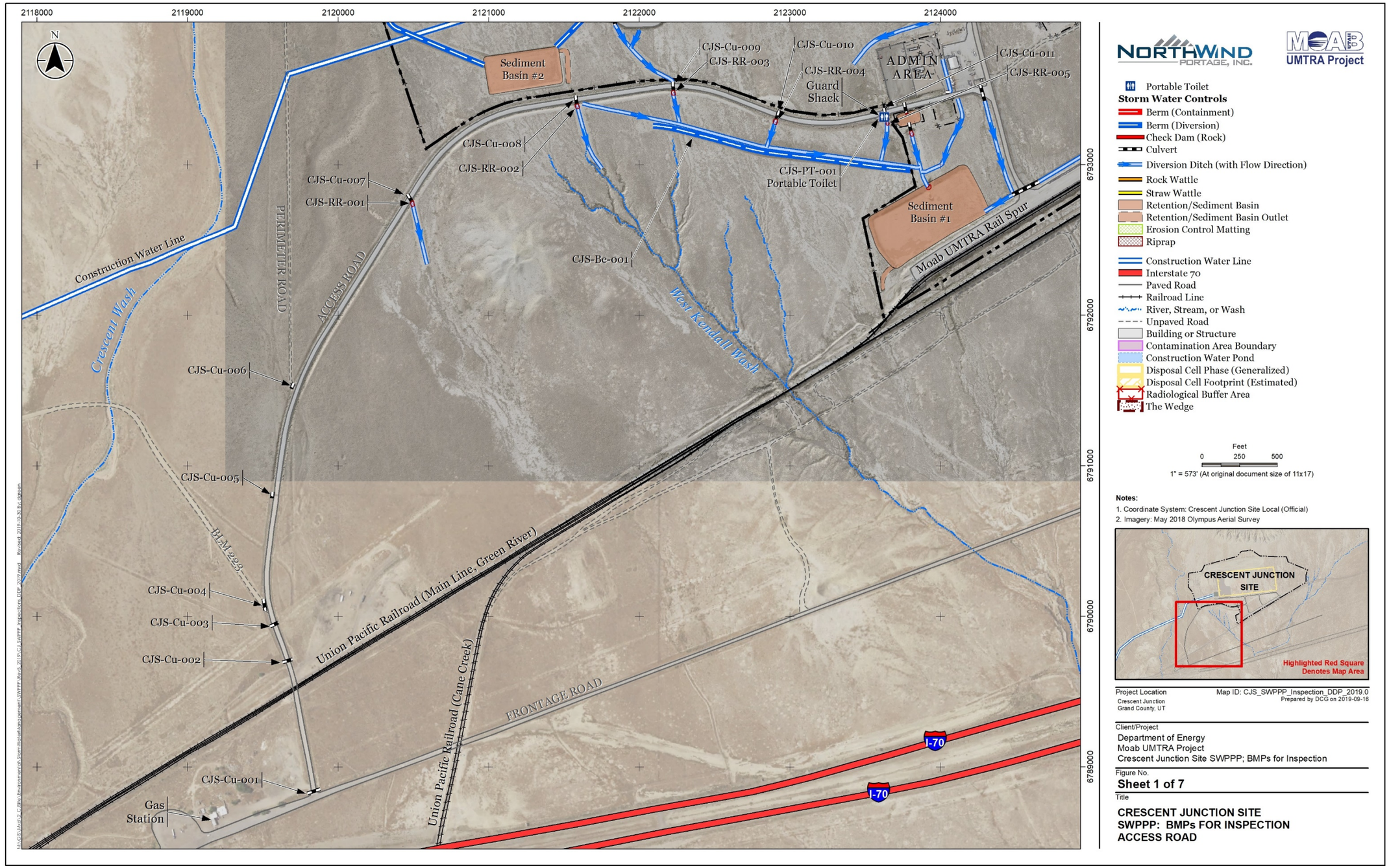
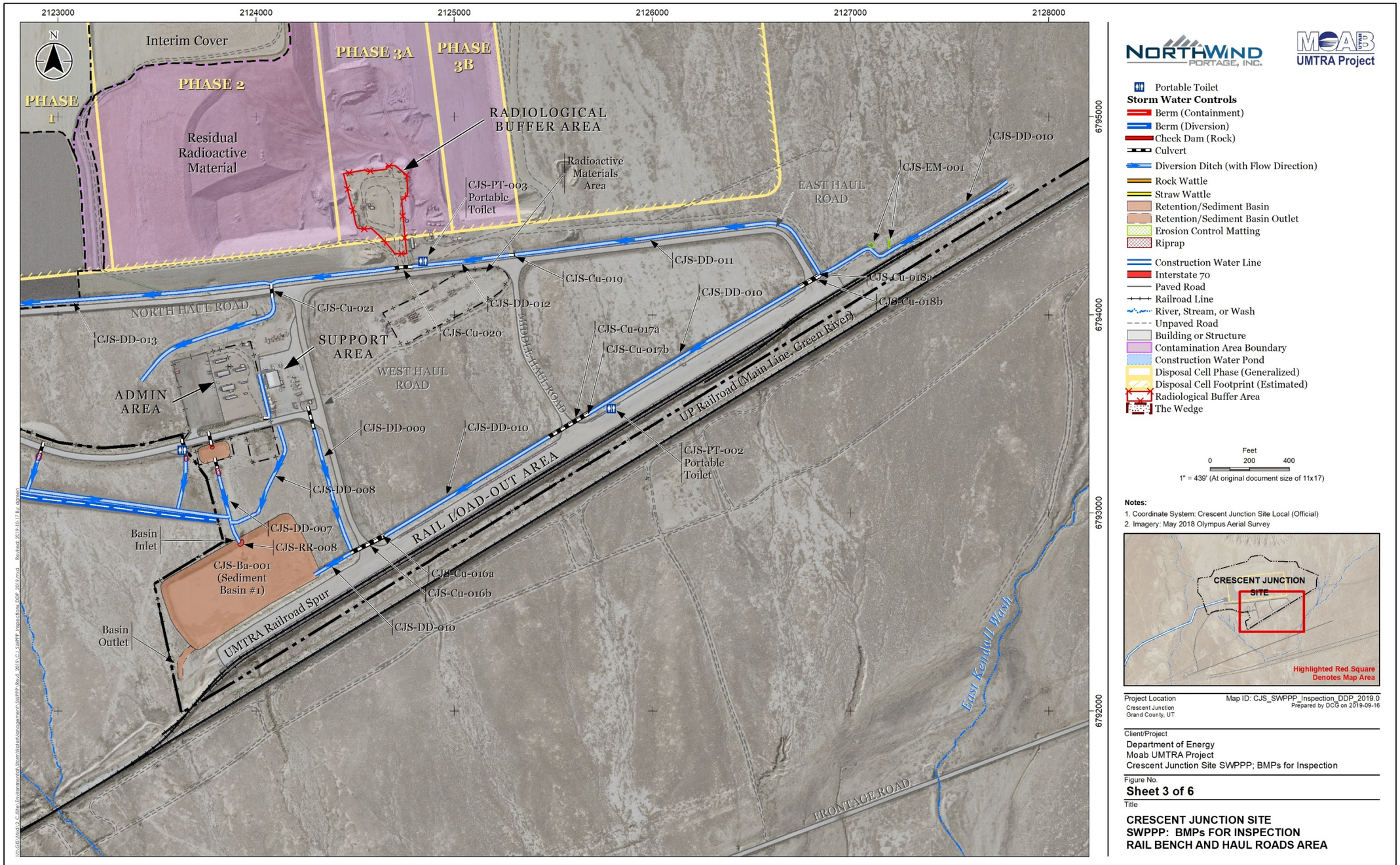


Figure 3. BMPs for Inspection, Access Road Area

Figure 4. BMPs for Inspection, Administrative Area and Support Area



NORTHWIND PORTAGE, INC.

MOAB UMTRA Project

- Portable Toilet

Storm Water Controls

- Berm (Containment)
- Berm (Diversion)
- Check Dam (Rock)
- Culvert
- Diversion Ditch (with Flow Direction)
- Rock Wattle
- Straw Wattle
- Retention/Sediment Basin
- Retention/Sediment Basin Outlet
- Erosion Control Matting
- Riprap
- Construction Water Line
- Interstate 70
- Paved Road
- Railroad Line
- River, Stream, or Wash
- Unpaved Road
- Building or Structure
- Contamination Area Boundary
- Construction Water Pond
- Disposal Cell Phase (Generalized)
- Disposal Cell Footprint (Estimated)
- Radiological Buffer Area
- The Wedge

Feet
0 200 400
1" = 439' (At original document size of 11x17)

Notes:

1. Coordinate System: Crescent Junction Site Local (Official)
2. Imagery: May 2018 Olympus Aerial Survey

Project Location
Crescent Junction
Grand County, UT

Map ID: CJS_SWPPP_Inspection_DDP_2019.0
Prepared by DCG on 2019-09-16

Client/Project
Department of Energy
Moab UMTRA Project
Crescent Junction Site SWPPP; BMPs for Inspection

Figure No.
Sheet 3 of 6

Title
CRESCENT JUNCTION SITE
SWPPP: BMPs FOR INSPECTION
RAIL BENCH AND HAUL ROADS AREA

Figure 5. BMPs for Inspection, Rail Bench and Haul Roads Area

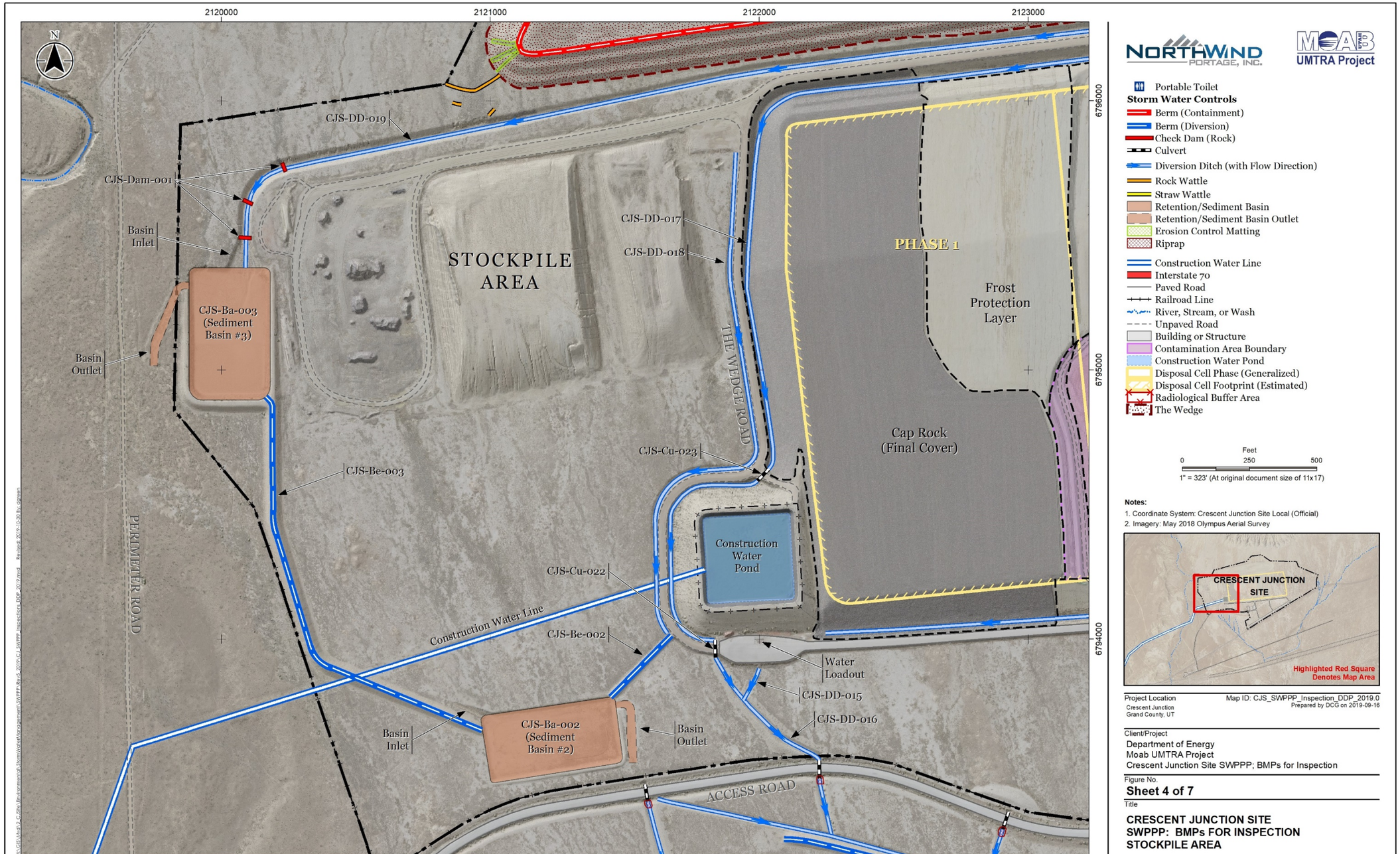


Figure 6. BMPs for Inspection, Stockpile Area

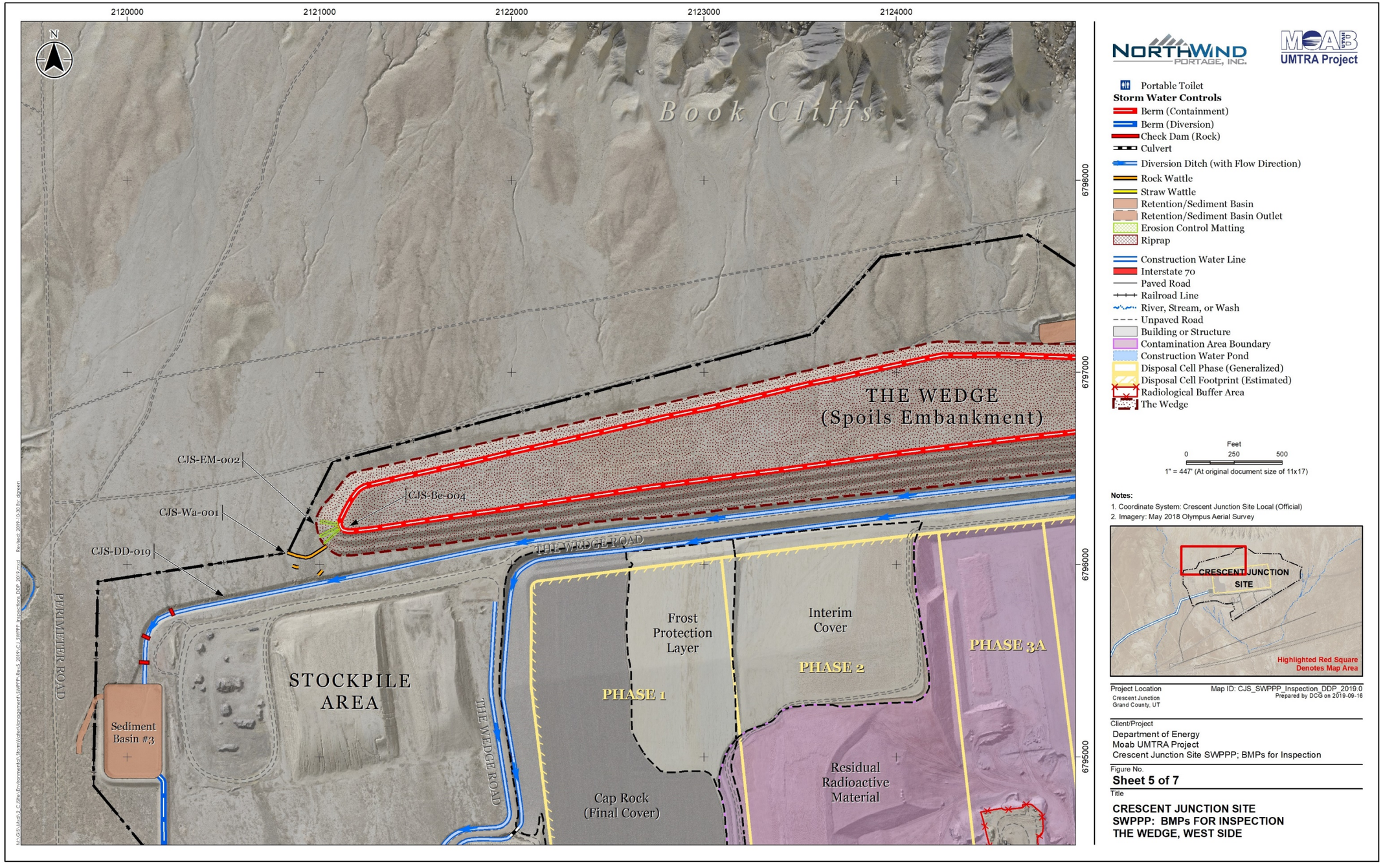


Figure 7. BMPs for Inspection, The Wedge, West Side

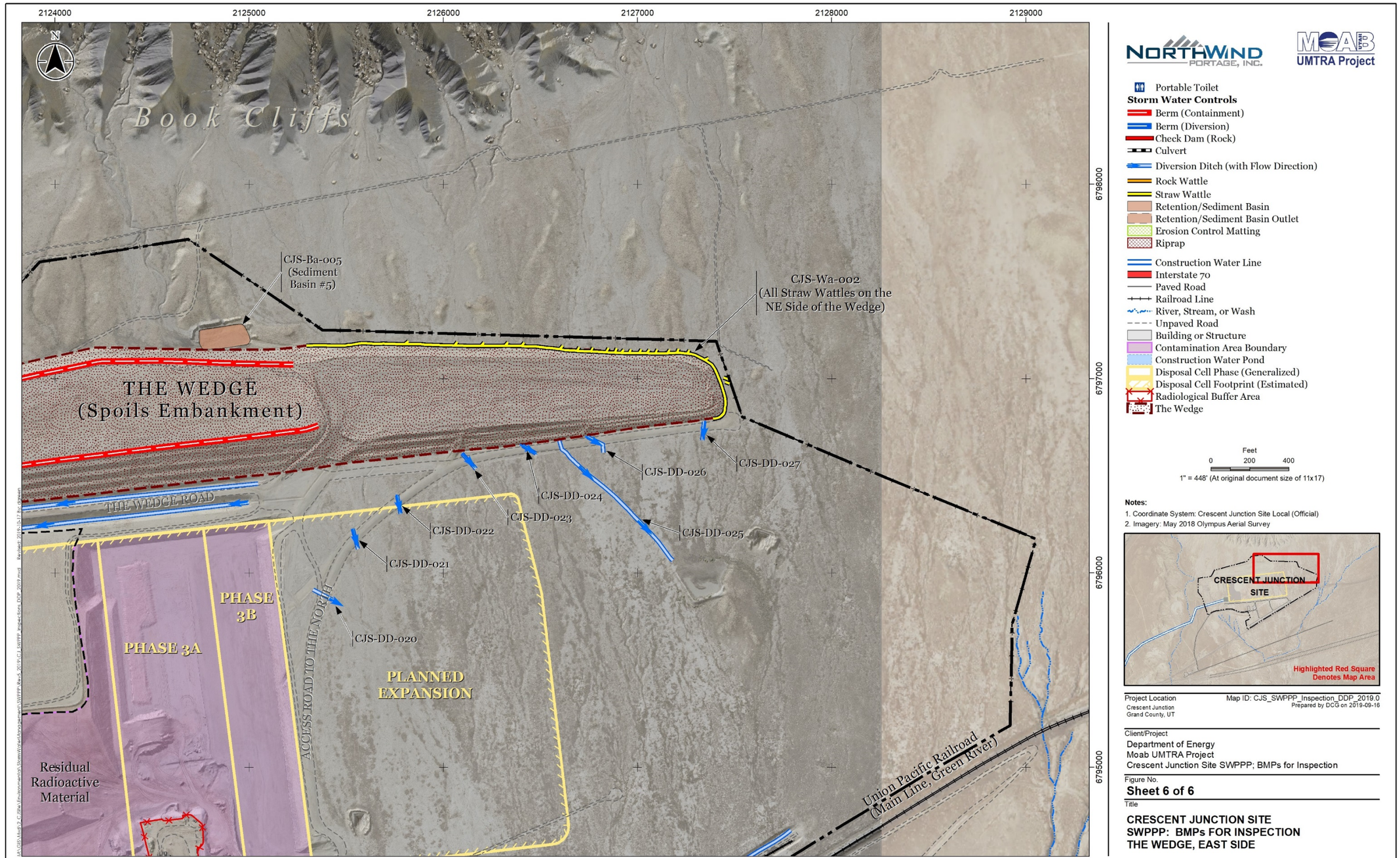


Figure 8. BMPs for Inspection, The Wedge, East Side

1.2 Project/Site Information

Name of Operation
Moab UMTRA Project: Crescent Junction Site
UPDES Project or Permit Tracking Number: UTR359187
Facility Type: Federal

Physical Address of Operation
0.15 County Road 223, Thompson Springs, UT 84540

Longitude/Latitude of Operation (Site Entrance)
Latitude: 38 º 57' 25" N (degrees, minutes, seconds)
Longitude: 109 º 48' 3" W (degrees, minutes, seconds)
Reference: Esri ArcGIS for Desktop, version 10.5

1.3 Contact Information/Responsible Parties

Owner
U.S. Department of Energy, Grand Junction office
200 Grand Avenue, Suite 500
Grand Junction, Colorado 81501
DOE Federal Cleanup Director: (970) 257-2115

Operations
Remedial Action Contractor (RAC)
North Wind Portage
200 Grand Avenue, Suite 319
Grand Junction, Colorado 81501
Project Manager: (970) 257-2117

North Wind Portage
0.15 County Road 223
Thompson Springs, Utah 84540
Crescent Junction Operations/Site Manager: (435) 564-3425 x1003
CJ Environmental/Quality Assurance (435) 564-3425 x1008

Technical Oversight
Technical Assistance Contractor (TAC)
S&K Logistics Services
200 Grand Avenue, Suite 500
Grand Junction, Colorado 81501
Senior Program Manager: (970) 257-2120
Environmental Compliance Manager: (435) 719-2809
Environmental Analyst: (435) 719-2815

Emergency 24-Hour Contact
On-call Manager: (970) 361-8335

1.4 Storm Water Team

The Crescent Junction site Storm Water Team is comprised of Project personnel from both Operations and Technical Oversight (see Table 1).

Table 1. Crescent Junction Site Storm Water Team

Organization	Title	Contact Information (Office Location)
Operations	Environmental Compliance	435-564-3425 x 1008 (Crescent Junction)
Operations	Operations Lead	435-564-3425 x1026 (Crescent Junction)
Operations	Laborer, Equipment Operator	435-564-3425 (Crescent Junction)
Technical Oversight	Quality Assurance Manager	970-257-2161 (Grand Junction)
Technical Oversight	Environmental Compliance Manager	435-719-2809 (Moab)
Technical Oversight	Environmental Analyst	435-719-2815 (Moab)

Each member of the Crescent Junction site Storm Water Team will have ready access to either an electronic or paper copy of the SWPPP and the Permit. The on-site paper copies are located in the Administrative Trailer of the Crescent Junction site.

Roles and Responsibilities

Operations Storm Water Team members are responsible for designing, installing, maintaining, inspecting, and repairing storm water, erosion, sediment, and pollution-prevention control BMPs at the Crescent Junction site. Operations responsibilities also include identifying and taking corrective actions in accordance with Part 5 of the Permit. The results of storm water and pollution prevention inspections are documented by Operations personnel on Form 1051, SWPPP Inspection Form – Crescent Junction Site. Corrective actions are documented by Operations personnel on Form 1063, Storm Water Controls Corrective Action Log (Remedial Action Contractor). See Attachment 2 for sample forms. Forms are available to Project personnel on the Project's SharePoint website.

Operations Support is responsible for filing the annual NOI (including payment of associated fees) to maintain the UPDES Permit for the Crescent Junction site and documenting field changes to be included in SWPPP modifications. These actions ensure that regulatory compliance is maintained throughout all phases of construction and disposal activities performed at the Crescent Junction site.

Technical Oversight Storm Water Team members are responsible for completing annual SWPPP modifications and conducting oversight of Operations' compliance with this SWPPP and the Permit. Technical oversight includes reviewing storm water inspection forms and corrective actions logs completed by Operations, performing periodic field inspections to ensure erosion and sediment controls are functioning as designed, and completing oversight reports.

Results of oversight storm water and pollution prevention field inspections conducted by Technical Oversight personnel are documented on TAC Storm Water Oversight Inspection Form 1050 (see Attachment 2) and incorporated into an oversight report.

1.5 Site Location

The Crescent Junction site, shown in Figure 1, is located in Grand County, Utah, approximately 30 miles north of the Moab site and just northeast of the junction of Interstate 70 (I-70) and United States Highway 191 (US-191). The site is situated between the Book Cliffs to the north, Crescent Wash to the west, East Kendall Wash to the east, and the Union Pacific Railroad to the south. Thompson Springs, Utah is approximately 5 miles east of the site.

1.6 Site History

Material shipped to the Crescent Junction disposal cell is derived from a former uranium ore-processing facility constructed in 1956 by the Uranium Reduction Company (URC) in Moab, Utah. URC operated the mill until 1962, at which point the assets were sold to the Atlas Minerals Corporation (Atlas). URC and Atlas processed uranium ore under a license issued by the Nuclear Regulatory Commission (NRC). Atlas ceased operations in 1984.

During the years of operation, uranium mill tailings (naturally radioactive residue) were generated from processing uranium ore. Uranium mill tailings consist of fine-grained, sand-like material that is highly susceptible to wind and water erosion. The tailings created by the milling process were pumped to an approximately 130-acre unlined impoundment (tailings pile) located on the southwestern portion of the Moab site.

In October 2000, Congress enacted the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398), amending Uranium Mill Tailings Radiation Control Act of 1978 (UMTRCA). In October 2001, remedial action responsibilities for the Moab site and nearby vicinity properties were transferred to DOE. Legislation stipulated that the Moab site undergo remediation, including groundwater restoration, in accordance with Title I of the UMTRCA under 42 USC 7901, “Uranium Mill Tailings Radiation Control, Congressional findings and purposes.”

In September 2005, DOE issued the Record of Decision, which detailed the selected alternative for surface remediation as removal of residual radioactive material (RRM) from the Moab milling site (and nearby off-site vicinity properties) and subsequent relocation to an off-site, engineered disposal cell to be constructed near Crescent Junction, Utah. Rail was selected as the primary mode of transportation for movement of RRM from the Moab site to the Crescent Junction disposal site.

DOE acquired the Crescent Junction site through a series of temporary withdrawals of public domain land and a permanent land transfer by the Department of the Interior. DOE currently owns 500 acres of land and has another 936 acres in a 20-year (beginning in 2009) withdrawal near Crescent Junction for the disposal cell and surrounding support areas.

In May 2009, the first shipment of RRM was transported by rail from the Moab site to the Crescent Junction disposal site. In addition to mill tailings, the Project has excavated and sorted a portion of the mill building debris that was buried in the southern end of the tailings pile. Some debris has been shipped in containers modified to carry this type of material.

1.7 Project Status

As of September 2019, a total of more than 10,000,000 tons of RRM have been excavated and transported by rail from the Moab site and placed inside the Crescent Junction disposal cell.

BMPs are implemented and actively managed at the Crescent Junction site to control access to contaminated areas, minimize worker and public exposures to contaminated materials, minimize the extent of surface disturbance, minimize off-site transport of windblown RRM from the disposal cell, prevent contamination of public waterways resulting from discharges of storm water runoff or suspended sediment from the Crescent Junction site, and reclaim and revegetate previously disturbed lands.

Storm water management at the Crescent Junction site complies with the Permit requirements to mitigate and control surface water run-on from off-site properties and on-site storm water runoff, utilizing erosion and sediment controls, pollution prevention measures, and BMPs.

1.8 Construction and Disposal Activity Sequence

The RAC sequences construction and disposal activities at the Crescent Junction site to meet objectives identified in the Project lifecycle baseline.

DOE continues to ensure that controls are in place and working as intended at the Crescent Junction site to protect human health and the environment. As the Project progresses, additional storm water and pollution prevention BMPs will be implemented as necessary to protect waters of the state from receiving contaminated storm water or sediment discharges.

2.0 Environmental Site Conditions

2.1 Climate

The semiarid desert climate of the Crescent Junction site is characterized by hot summers and mild winters. The average annual temperature is about 57ºF, demonstrating a fairly moderate climate. January is the coldest month of the year, with low temperatures averaging 30ºF. July is generally the warmest month, with high temperatures averaging 82ºF. Relative humidity is low, often less than 50 percent during daytime hours.

Average annual precipitation at the Crescent Junction site is 9 inches, distributed fairly equally among seasons. Evaporation greatly exceeds annual precipitation, thus contributing to the likelihood of fugitive dust. Thunderstorms occur about 40 days per year. Prevailing winds in the Crescent Junction region are from the west. Monthly precipitation averages are detailed in Table 2.

Table 2. Monthly Precipitation Averages at the Crescent Junction Site

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Precipitation (in)	0.72	0.70	0.51	0.55	1.01	0.33	0.71	0.50	0.88	1.21	0.58	0.92

Source: Crescent Junction Meteorological Monitoring Station

2.2 Geology

Geologic field investigations were conducted at the Crescent Junction site and included drilling of coreholes and geotechnical boreholes and excavation of test pits. In 2005, 10 coreholes were drilled to depths of approximately 300 ft into the Mancos Shale. Core samples were visually logged in the field using soil- and rock-classification procedures, and the coreholes were geophysically logged. In addition, a total of 100 geotechnical boreholes were drilled to depths less than or equal to 26 ft below ground surface (bgs). These boreholes were drilled through the surficial unconsolidated material into the shallow weathered Mancos Shale. Five test pits were dug with a track hoe to investigate subsurface conditions to depths ranging from 15 to 23 ft bgs (see RAP).

The majority of the Crescent Junction site is covered by unconsolidated Quaternary material. These deposits cover Mancos Shale (Blue Gate or Prairie Canyon Members) bedrock and typically range from about 10 to 12 ft thick. The most significant of the Quaternary deposits is gray alluvial mud, primarily consisting of silt and clayey silt that represents successive sheet wash deposits from erosion of Mancos Shale along the lower slopes of the Book Cliffs. A small amount of brown, sandy silt of eolian origin was observed in discontinuous layers in the alluvial mud. Sand to gravel to small boulder-sized material was also observed at the base of the alluvial mud in a few swales and washes that were cut into the Mancos Shale bedrock. One such swale, slightly more than 20 ft deep, was found just southeast of the disposal cell footprint. No evidence of ground water was observed in any of the bedrock swales or surface washes.

Surficial deposits have been mainly emplaced in a stable geologic environment by a slow accumulation of material transported during infrequent heavy rainfall episodes from the base and sides of the Book Cliffs along active sheet wash paths. There is no evidence of faulting or displacement of Quaternary material in the vicinity of the Crescent Junction site.

2.3 Native Soil Types

The soils at the Crescent Junction site are on the alluvial valley flats immediately south of the Book Cliffs. The United States Department of Agriculture Natural Resources Conservation Service (NRCS) conducted the *Soil Survey of Grand County, Utah, Central Part* of the central part of Grand County in September 2016. According to the NRCS, the Crescent Junction site is dominated by the Toddler-Ravola-Glenton families' association. A small area in the southwestern portion of the site is depicted as Chipeta complex.

The Toddler-Ravola-Glenton families' association soils were deposited at elevations ranging from 4,000 to 5,000 ft above mean sea level (amsl) in flood plains and drainages. The parent material for this soil class is alluvium, derived from sandstone and shale.

The soils are well-drained, slightly to strongly saline, with moderate water storage capacities, and moderate runoff potential. Depth to the water table is greater than 80 inches. These soils are prone to gully formation in areas where runoff is concentrated.

The Chipeta complex soils were deposited at elevations ranging from 4,200 to 6,100 ft amsl in cuestas or mesas. The parent material for this soil class is colluvium derived from shale and/or residuum weathered from shale. The soils are well-drained, non-saline to very slightly saline, with low storage capacities and high runoff potential.

2.4 Hydrology

2.4.1 Site Drainage Description

The surface area of the Crescent Junction site is on Crescent Flat, a gently south-sloping area between the base of the Book Cliffs to the north and I-70 to the south. The low-relief surface of Crescent Flat slopes gently southward for approximately two miles from an elevation of about 5,100 ft to the north to about 4,900 ft to the south. Topography is controlled by the Mancos Shale, which underlies the Mancos Shale Lowland as stated in the *Moab UMTRA Project Final Remedial Action Plan and Site Design for Stabilization of Moab Title I Uranium Mill Tailings at the Crescent Junction, Utah, Disposal Site* (RAP) (DOE-EM/GJ1547).

There are no streams, lakes, wetlands, or residential areas located within proximity of the Crescent Junction site; however, sediment from disturbed areas of the site, if uncontrolled, could potentially deposit in downgradient washes or, in the event of a catastrophic storm event, reach distant perennial waters. Multiple erosion gullies exist on the site. These features are more susceptible to erosion than the remainder of the site, and stabilization may be required to prevent loss of sediment loads leading to deepening of the gullies over time.

The majority of overland sheet flow off the Book Cliffs enters the Crescent Junction site from the north and drains southward across the site. Storm water runoff collects in gullies that converge and drain into the western and eastern branches of Kendall Wash (a slightly to moderately incised ephemeral stream), located south of the site. The western and eastern branches of Kendall Wash converge and flow through several large culverts located beneath County Road 175, the Union Pacific Railroad tracks, and I-70. Further south, Kendall Wash drains into the ephemeral Thompson Wash, which joins the ephemeral Tenmile Wash and eventually drains into the Green River, approximately 25 miles southwest of the disposal site.

A smaller percentage of sheet flow or storm water runoff from the westernmost portion of the site may potentially discharge into Crescent Wash, a large ephemeral stream. This wash roughly parallels the site's western boundary, and eventually discharges into the Green River.

2.4.2 Drainage Basins

Basin boundaries are based on topographic data from a Project-commissioned aerial survey performed in May 2018.

Basin delineation was performed using Arc Hydro, a watershed analysis tool applied as an extension of Esri ArcGIS, and considers the presence of constructed site features such as roads and berms in addition to surface topography. Descriptions of drainage patterns, major features, and storm water controls within each of the six basins (A, B, C, D, E, and F) are provided in the following sections.

Drainage Basin A
Drainage Basin A is located just outside the northwestern site boundary and is approximately 50 acres. Sheet flow from the Book Cliffs naturally drains into Crescent Wash within Drainage Basin A. There are currently no site operations or infrastructure within this basin, nor are there plans to conduct activities here in the future. As such, there are no storm water controls in Drainage Basin A.

Drainage Basin B
Drainage Basin B encompasses approximately 376 acres in the western portion of the site. This basin contains the western half of the wedge, Sediment Basin No. 3, and the perimeter road. The southern border of Drainage Basin B coincides with the access road.

The wedge was constructed to divert storm water runoff from the Book Cliffs and downslope alluvial fan around the disposal cell. Surface water run-on from this area flows westward around the wedge and is directed by a diversion ditch into Sediment Basin No. 3. The top of the wedge was revegetated with native grasses, forbs, and shrubs to stabilize soils and sediment. Water that collects directly atop of the wedge is captured by containment berms which prevent concentrated surface flows down the side slopes of the structure.

Runoff that flows down the southern apron of the wedge collects in the diversion ditch north of the wedge road and flows into Sediment Basin No. 3. Erosion control matting is in place along the far southwestern toe of the wedge to minimize erosion from runoff that overtops the containment berm above. Any overflow from Sediment Basin No. 3 is released at the designed basin outlet and dispersed off site as low-energy overland sheet flow.

Drainage Basin C
Drainage Basin C, at approximately 834 acres, is the largest of the basins and encompasses the majority of the Crescent Junction site, including the eastern portion of the wedge, disposal cell, stockpile area, construction water pond, construction water line (subsurface), water load-out, Sediment Basin No. 1, Sediment Basin No. 2, Support Area, and rail load-out area. Drainage Basin C also contains Sub-basin C1.

Runoff from the Book Cliffs on the western side of Drainage Basin C is diverted by natural drainages into Sediment Basin No. 5; this basin captures and holds a significant amount of the discharge volume from the area north of the site boundary. Storm water runoff east of Sediment Basin No. 5 progresses as sheet flow to the wedge, where it is diverted eastward and slowed by a series of straw wattles before reaching the far eastern end of the structure and dispersing once again as sheet flow across the eastern end of the drainage basin.

Overland flow in this portion of the basin typically infiltrates into the ground; however, runoff that concentrates is captured by the diversion ditch north of the rail load-out area, where it is directed to Sediment Basin No. 1.

Surface runoff from the Support Area drains through a small culvert before flowing overland into Sediment Basin No. 1. Storm water runoff collected in the Administrative Area flows south through one of three culverts; these culverts either drain into Sediment Basin No. 1 or Sediment Basin No. 4. Sediment Basin No. 4 has a drop inlet box which diverts any overflow into Sediment Basin No. 1.

Surface water runoff from the stockpile area runs south as sheet flow and drains into Sediment Basin No. 2. Sediment Basin No. 2 has an overflow structure that drains low-energy discharge through a culvert under the access road and into a riprapped outlet basin. Significant volumes of runoff potentially discharge from the outlet basin through an additional drainage ditch, and into West Kendall Wash.

Sub-Basin C1 encompasses much of the southern and eastern portions of the disposal cell, including the CA (the area of the disposal cell where RRM is actively placed). Due to the topography of the Sub-Basin C1, all storm water collects within the bottom of the cell for evaporation. The cover of the disposal cell in Phase 1 and Phase 2 has an east-west trending topographic crest.

Water on the south side of this divide within the final cover material infiltrates or flows into the diversion ditch adjacent to the north haul road; within the interim cover, water on the south side of this divide flows into the bottom of the CA. Water on the north side of the disposal cell crest, within both the final cover and interim cover, generally flows northward across the perimeter embankment and into the diversion ditch south of the wedge road. Water typically collects in the southern portion of Sub-basin C1.

Drainage Basin D
Drainage Basin D is a small basin located in the southwestern portion of the site, encompassing approximately 63 acres. Currently, no site operations take place in Drainage Basin D. Water that flows from the access road is controlled through a culvert with riprapped outlet basin and ultimately funneled into a drainage ditch that disperses runoff to overland flow.

Drainage Basin E
Drainage Basin E encompasses approximately 150 acres southeast of the site. Drainage Basin E is located off site, and no site operations take place in this area. Storm water that collects on or south of the southern edge of the Union Pacific Railroad Green River Main Line is transported south into either West Kendall Wash or East Kendall Wash.

Drainage Basin F
Drainage Basin F is located south of the site, encompassing approximately 63 acres. No site operations take place in Drainage Basin F. Storm water runoff from the southern edge of the Union Pacific Railroad Green River Main Line flows south directly into West Kendall Wash, or continues to the frontage road and then flows into West Kendall Wash.

2.5 Vegetative Cover

Low-growing desert grass and shrub communities are the predominant vegetation types on the Crescent Junction site, with an estimated cover of 50 percent (in accordance with the *Moab UMTRA Project Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah Final Environmental Impact Statement* (DOE/EIS-0355).

Low-density populations of desert grasses, forbs, and shrubs occur on the upland soils. Cheatgrass is the dominant species. Mat saltbush is also common, particularly in areas disturbed by prairie dog burrows. Budsage, spiny horsebrush, Gardner's saltbush, shadscale, heron's bill, globemallow, Sego lily, galleta grass, and broom snakeweed occur less frequently.

In areas that receive extensive amounts of overland sheet flow and sediment deposition, nearly pure stands of annual wheatgrass are found, with occasional rabbitbrush and bur buttercup. Sandier soils along the far western portion of the site support a shrub community dominated by greasewood and spiny hop sage, with an understory of native and exotic annuals and perennials.

3.0 Construction, Remediation, and Stabilization Activity Descriptions

3.1 Construction Activities

Buildout of the Crescent Junction site began with upgrades to the main site access road and construction of support structures (see Figure 2). A rail load-out and container staging area were also constructed. The main site access includes a portion of County Road 223 and is located at the southwestern corner of the site. All vehicles entering the site are limited to this access road, which is paved with asphalt to prevent tracking of sediment off site and onto County Road 223 or other public roadways.

To support Project activities, a domestic water pipeline was constructed from Thompson Springs, Utah, to the site. The pipeline is approximately 5.5 miles long and was installed in previously disturbed areas. A buried, 21-mile construction water supply pipeline was also installed from the Green River to the site to support Project operations. Water pumped from the Green River is stored in a construction water pond that was built adjacent to the southwest corner of the disposal cell. As construction of the pipeline involved traversing jurisdictional washes, appropriate Section 404 permits were obtained from United States Army Corps of Engineers, and all permit conditions were met.

Disposal Cell

Cell excavation is conducted in phases. Phases 1, 2, 3a, and 3b have been completed to date (see Figure 2). The cell excavation depth is about 25 ft bgs. Excavated material is placed to the north of the cell in a wedge structure to divert overland sheet flow off the Book Cliffs around the site and prevent it from entering the disposal cell (see Figure 2).

Placement of RRM began in April 2009 and will continue until all of the mill tailings and other contaminated material at the Moab site and associated vicinity properties have been relocated to the disposal cell. Through the end of September 2019, about 10,000,000 tons of RRM have been disposed in the cell.

The cover on the disposal cell consists of multiple layers of soil and rock (see). Interim cover is placed on portions of the cell once the final grade for RRM has been met. Final cover layers have been installed over portions of the interim cover. The rock for the infiltration and biointrusion barrier and the uppermost rock layer is being quarried to meet U.S. Nuclear Regulatory Commission specifications for durability and is being hauled from Fremont Junction, Utah. All other cover layers come from material excavated on site at Crescent Junction.

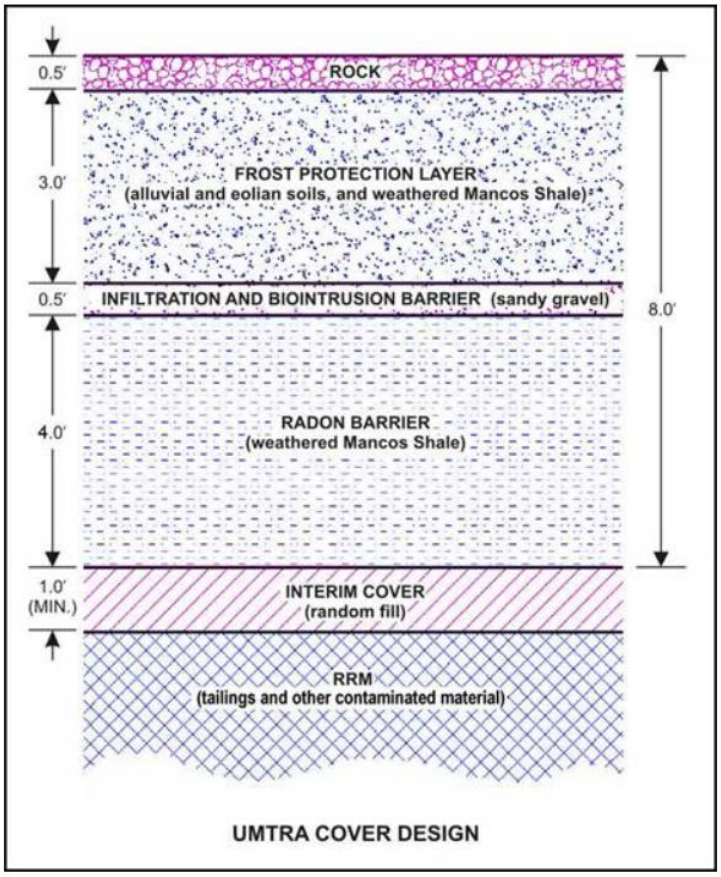


Figure 9. Diagram of Crescent Junction Disposal Cell Cover Layers

3.2 Remediation Activities

The Crescent Junction site does not actively conduct remediation activities at this time. Planned remediation activities include the cleanup of radiologically contaminated soils on site and vicinity properties. These areas will be remediated following removal of the tailings pile from the Moab site. Soil or sediment will be removed until the U.S. Environmental Protection Agency (EPA) cleanup standards codified in 40 CFR 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," of 5 picocuries per gram (pCi/g) above background in the top 15 centimeters of native soil is achieved or 15 pCi/g above background more than 15 centimeters in depth is achieved.

3.3 Stabilization Activities

3.3.1 Stabilization Requirements

Soil stabilization measures are initiated at the Crescent Junction site within 14 calendar days of permanent cessation of earth-disturbing activities to stabilize any exposed portions of the site. Earth-disturbing activities have permanently ceased when clearing and excavation within any area of the site have been completed. This stabilization deadline is required to limit sediment transport to within the boundaries of the Crescent Junction site for storms with intensities of 0.5-in. per hour or more precipitation. Stabilization tactics employed at the Crescent Junction site are demonstrated as effective at minimizing erosion and sediment transport.

Initial stabilization measures at the Crescent Junction site include either preparation of the exposed soils for vegetative stabilization (watering until fall or early spring) and/or non-vegetative stabilization. Non-vegetative stabilization techniques for exposed soils may include, but is not limited to, installation of sediment and erosion controls, such as containment structures (diversion ditches, dikes, sediment basins), and installation of temporary BMPs, such as straw wattles and erosion blankets or matting.

To meet Permit requirements, initial installation of one of the following BMPs is required.

1. Preparation for seeding and/or planting (during the fall or early spring season or with irrigation).
2. For steeper slopes (25 percent grade or more):
   - Geotextile blankets staked as necessary with or without seeding (possibly with mulch under the blanket), fiber rolls staked on the contours every 10 ft (or less) with mulch applied to the surface between.
3. For moderate slopes (15 percent to 25 percent:
   - Surface preparation and roughening, seeding with hydromulch or erosion blanket.
4. For shallower slopes (15 percent grade or less):
   - Cat tracking over straw mulch (moist).
   - Surface roughening in loose soil or cat tracking (depending on soil, mulch may have to be applied) with fiber rolls staked not more than 15 ft apart on the contours, on very shallow slopes and less distance apart for steep slopes (add mulch on the steep ends).
5. For flat areas:
   - At a minimum, loosened soil, surface roughening with larger depression areas to collect storm water, and peripheral controls. The surface is reworked if the soil becomes hardened or compacted.
6. Storm Water Conveyances:
   - Piped slope drains, check dams, riprap, geotextile channel protection, or other velocity control and channel protection for all storm water conveyances are deployed on a slope.

3.3.2 Final Stabilization

Vegetative Stabilization

Previously-used techniques for vegetative stabilization at the site include seeding and/or pole planting, watering, removal of noxious weeds, monitoring, and/or application of irrigation water. Disturbed areas at the Crescent Junction site were stabilized with a variety of native upland plant species including shadscale, fourwing saltbush, indian rice grass, alkali Sacaton, blue grama, rabbitbrush, Winterfat, sand dropseed, desert globemallow, and Utah Northern Sweetvetch.

Non-vegetative Stabilization

Techniques for non-vegetative stabilization of exposed soil at the Crescent Junction site include installation of erosion-control matting, natural or synthetic blankets, turf-reinforcement mats, and straw and rock wattles. Erosion-control matting and blankets provide improved microclimate conditions proven to enhance establishment of vegetation at the site.

Impervious areas include the site entrance road, Administrative Area parking lot, rail load-out bench, support area, and haul roads.

4.0 Erosion and Sediment Control Descriptions

DOE's primary objective in storm water pollution prevention is to contain all on-site storm water runoff and sediment and prevent discharges of contaminated materials and pollutants into waters of the state. Erosion and sediment control BMPs implemented at the Crescent Junction site to manage storm water are discussed in Sections 4.1 through 4.9. These controls are frequently inspected, maintained, and/or repaired as needed to ensure they are working as designed.

4.1 Clearing Limits

Before beginning earth-disturbing activities, including clearing and grading, all clearing limits, easements, setbacks, sensitive areas and their buffers, and drainage courses are marked to minimize disturbed areas and protect natural features.

Selected BMPs for clearing limits include:
- Material stockpiles or staging areas.
- Buffer zones.
- Preserving natural vegetation.
- Stake and rope fencing (if needed).

Material stockpiles and staging areas are located to minimize sedimentation potential. Buffer zones are inspected at limits of construction to ensure flagging is still in proper locations, and areas remain undisturbed. Disturbed areas must be stabilized. Stake and rope fencing (if needed) is placed in areas with high potential for unwanted vehicle or foot traffic access. If fencing is damaged, it is repaired or replaced.

4.2 Perimeter Controls

Perimeter controls are used at the Crescent Junction site to intercept surface water run-on from adjacent sloped areas and storm water runoff from areas of the site where earth-disturbing activities are performed. Perimeter controls remove sediment and other contaminants through ponding, settling, and physical filtration, preventing contaminants from leaving the Crescent Junction site, reducing flow velocity, and preventing downgradient erosion of sediment. Such controls, including diversion berms, containment berms, and ditches, are installed across the site boundary to direct flow into appropriately engineered sediment basins.

A large diversion berm referred to as "the wedge" was constructed immediately north of the disposal cell to divert storm water flow from the Book Cliffs around the disposal cell. Graded diversion ditches and diversion berms direct storm water into Sediment Basin Nos. 1 through 3, and Sediment Basin No. 5. These ditches follow the perimeter of the entire disturbed area of the site. As additional phases of the disposal cell are excavated, new perimeter controls are implemented as necessary.

Selected perimeter controls on the Crescent Junction site may include the following:
- Containment berm
- Diversion berm
- Diversion ditch
- Fiber logs

- Silt fence
- Straw bale barrier
- Straw or rock wattles

4.3 Sediment Basins

Five sediment basins (identified as Sediment Basin Nos. 1 through 5) were built at the Crescent Junction site. These control structures are located north of the far west end of the rail load-out area (Sediment Basin No. 1), southwest of the construction water pond (Sediment Basin No. 2), west of the stockpile area (Sediment Basin No. 3), south of the Administrative Area parking lot (Sediment Basin No. 4[1]), and north of The Wedge (Sediment Basin No. 5).

The sediment basins provide storage for water runoff from the construction areas and control peak flows during heavy precipitation events. In addition, the basins allow sediment to settle out and storm water to infiltrate or evaporate before either have an opportunity to discharge from the site.

The storage capacity of Sediment Basin Nos. 1 through 3 is based on a calculated volume of runoff for a 10-year, 24-hour storm run-off event, which includes the sediment from the disturbed areas upstream for a time period of one year.

The calculated total storage area for Sediment Basin Nos. 1 and 2 is based upon the assumption that these two basins would be cleaned out annually. The total storage area for Sediment Basin No. 3 is smaller than the required total storage area, requiring sediment cleanout approximately every 10 months (Jacobs Engineering Calculation Nos. C-06 and C-09, 2008). To ensure effective operating condition of all sediment basins, sediment is removed from a basin once it has accumulated to half of total basin capacity.

4.4 Sediment Track-out

BMPs are implemented at the Crescent Junction site to minimize track-out of sediment, RRM, and/or contaminated materials onto paved site roads or off-site public roadways due to movement of trucks, Project vehicles, or heavy equipment. Heavy equipment and Project or contractor vehicles utilized within the CA are washed at a decon pad located in the radiological buffer area (RBA) prior to release outside of radiological control areas to ensure no sediment or contaminants are tracked off site onto public roadways. All on-site traffic is restricted to specific designated roads. Traffic speed is also restricted to an appropriate level on all designated roads.

Selected BMPs for minimizing track-out of sediment, RRM, and/or contaminated materials across the Crescent Junction site or off site include the following:
- Decon pad
- Reduced speed limits
- Restricted off-road travel
- Road cleaning using water trucks or street sweepers

4.5 Control Discharges from Stockpiled Materials

[1] Sediment Basin No. 4 (CJS-Ba-004) is historically known to the Project as the "Storm Water Collection Pond." It has been renamed at Revision 5 of this SWPPP for consistency within the new storm water control naming convention.

Stockpiled materials, including road base, gravel, and concrete, are located to provide segregation from earth-disturbing activities and minimize erosion and sedimentation. Salt used to de-ice roadways during winter months is housed in a storage structure located in the northeast corner of the Administrative Area. In areas where berms are not utilized to control stockpiles, sediment barriers will be installed along all downgradient perimeter to control sediment discharge.

The primary site strategy for suppression of dust at stockpiled material locations is spraying or misting of the materials with water; water trucks apply water as needed to maintain adequate dust control. If emergency cover is required, Operations covers stockpiled materials with plastic sheeting.

4.6 Minimize Dust

To comply with the UAC Rule R307-205-8, "Emission Standards: Fugitive Emissions and Fugitive Dust, Tailings Piles and Ponds," DOE implements engineering and administrative controls to minimize fugitive dust resulting from grading, excavating, depositing, natural erosion, or other causes in association with site operations, as defined in the *Moab UMTRA Project Crescent Junction Site Fugitive Dust Control Plan* (DOE-EM/GJ1235).

Specific regulatory standards, action limits, and response actions for control of fugitive dust are detailed in the *Crescent Junction Site Fugitive Dust Control Plan*. All site workers are responsible to report fugitive dust during work activities to their supervisor, who directs dust-control measures. Personnel from both Operations and Technical Oversight maintain credentials as trained opacity subject matter experts and are available to the Project for dust control guidance and direction as needed.

Dust suppression is used to control emissions of fugitive dust and reduce the potential for airborne transport of RRM from the disposal cell to other areas of the Crescent Junction site or to off-site properties.

Spraying and misting water is the primary dust suppression method for the site. Water trucks apply water routinely and as needed to haul roads and stockpile areas to maintain adequate dust control. Operations installed sediment curtains in the construction water ponds at both ends of the construction water line to reduce the silt content of dust suppression water and thereby the potential frequency and magnitude of fugitive dust.

4.7 Storm Water Inlet and Outlet Protection

Storm water inlets and outlets are limited to basins and culvert pipes on the Crescent Junction site. Dispersion aprons have been installed at the outlets of site sediment basins to accommodate exceedance of designed containment volumes. These aprons reduce the erosion potential of discharge from the basins and prevent scouring of downgradient areas.

Outlet protection of culvert pipes routinely includes concrete, riprap, or gabions. Armoring of outlets with rock reduces the velocity and energy of concentrated flows of water, protecting receiving downgradient reaches and preventing erosion of soil and/or vegetation.

Where erosion potential is high, outlet protection is placed as soon as possible following earth-disturbing activities, before additional water is concentrated into the storm water system. Erosion control materials such as filter fabric may be placed between the riprap and the underlying soil surface to prevent soil movement into and through the riprap. Riprap consists of either graded or uniform aggregate rock. Riprap placed in drainage ditches or channels is installed in a U-shape to protect side slopes.

Culvert pipes are cleaned out when filled to one-third of their available storage (discharge) capacity.

Selected BMPs for storm water inlet and outlet protection include:

- Concrete.
- Culvert pipes.
- Dispersion aprons.
- Erosion control materials.
- Filter fabric.
- Riprap.
- Rock gabion.
- Straw or rock wattles.

4.8 Slope Protection

Cut-and-fill slopes, such as those adjacent to parking areas and haul roads, are designed and constructed to minimize erosion. Slope runoff velocities are reduced by shortening the length of a continuous slope with surface contouring, terracing, and/or surface roughening. Site drainage and surface water run-on are intercepted and diverted around construction or remediation areas. Stabilization of sloped areas may include the use of erosion-control materials.

Erosion-control matting or turf-reinforcement mat, natural or synthetic blankets, and straw or rock wattles are used to provide soil stabilization after disturbance. Matting and blankets also provide improved microclimate conditions to enhance establishment of vegetation.

As various on-site areas are remediated, native vegetation is planted to continue to stabilize and protect bare soil areas. Maintenance of vegetation (e.g., irrigation, fertilization) and noxious weed control is ongoing and will continue through Project completion.

A synthetic silt fence fabric is used whenever additional sediment and erosion controls are needed to augment existing controls, or wherever the above controls cannot be feasibly implemented.

Silt fencing is deployed along the toe of exterior slopes to filter storm water runoff. Silt fencing is a structural measure intended to complement and enhance soil-stabilization measures (erosion control) and reduce sediment discharges from storm water runoff.

Selected BMPs for slope protection may include:

- Erosion-control blankets or matting.
- Erosion logs.
- Mulch control netting.
- Revegetation.
- Riprap.
- Silt fencing.
- Straw bales.
- Straw or rock wattles.
- Surface contouring or terracing.
- Surface roughening.

4.9 Soil Stabilization

Soil stabilization techniques are implemented across the Crescent Junction site to minimize erosion and transport of sediment related to excavation of the disposal cell, construction activities, and/or storm events impacting the site. Soil stockpiles are located in areas that minimize erosion potential, and they are covered with plastic sheeting if an emergency cover is required. Dust generation is closely monitored, and suppression of dust with water is employed as needed. Short slopes, such as those adjacent to parking areas and access roads, employ surface roughening. These areas are inspected and repaired regularly, and they are re-seeded as practicable.

Long-term stabilization techniques include emplacement of a designed rock cover on the disposal cell; surfacing of roadways with asphalt, road base, gravel, and similar materials; revegetation; and the use of erosion control materials. Disturbed soil areas resulting from removal of controls or vegetation are permanently stabilized as soon as possible.

If soils are exposed for more than 21 days (for re-disturbed areas) or for more than 14 days (for stabilized areas), they are temporarily stabilized until final stabilization can be performed. Other disturbed areas are the access road, the haul roads, the Support Area, the Administrative Area, and the rail load-out area. These areas are surfaced with gravel or asphalt to prevent erosion.

Selected BMPs for soil stabilization include:

- Dust control with water.
- Erosion-control blankets, matting, or logs.
- Hydro mulch or hydro seeding.
- Material stockpiles and staging areas.
- Mulch control netting.
- Seeding/revegetation.
- Soil covering.
- Surface roughening, contouring or benching.
- Surfacing of roadways or work areas with asphalt, concrete, road base, or gravel.

5.0 Pollution Prevention

Pollution-prevention measures, including BMPs, engineering controls, and administrative controls, are in place at the Crescent Junction site to prevent the discharge of pollutants. BMPs and controls include, but are not limited to: double-walled tanks, secondary containment, spill kits, and covered chemical storage areas.

All pollution-prevention controls are maintained in operating condition and protected from activities that reduce their effectiveness. All pollutant-generating activities and pollution prevention controls are regularly inspected (see Section 6.1) to avoid situations that may result in leaks, spills, or other releases of pollutants in storm water discharges.

In accordance with Part 2.3.1 of the Permit, the Crescent Junction site is prohibited from discharging: wastewater from concrete work; fuel, oils, or other pollutants used in vehicle or equipment operation or maintenance; soaps, solvents, or detergents used in vehicle and equipment washing; and toxic or hazardous substances from a spill or other release.

5.1 Pollutant-generating Activities

In accordance with Part 2.3 of the Permit, the Crescent Junction site complies with pollution-prevention standards for the following on-site activities:

- Fueling and maintenance of equipment and vehicles
- Decontamination of equipment and vehicles
- Storage, handling, and disposal of construction products, materials, and wastes

5.1.1 Fueling and Maintenance of Equipment and Vehicles

The Crescent Junction site uses diesel fuel for tailings handling and placement equipment and gasoline for vehicles. Fuel, lubricants, and used oil are handled on site in above-ground containers in accordance with the *Moab UMTRA Site Spill Prevention, Control, and Countermeasure Plan* (SPCC) (DOE-EM/GJ1477). A large-volume fuel and lubricant service truck connects to a fixed fueling station with valves and hoses on the CA boundary to transfer product to equipment within the CA. Perimeter berms have been installed inside the CA to prevent releases outside the CA boundary.

The source of leaks that result in a loss of fuel, oil, or lubricants from container seams, gaskets, rivets, and bolts are promptly diagnosed and repaired. Leaked contaminants and any materials contaminated from such leaks are promptly removed. Spill response kits are available and used for minor spills outside secondary containment areas. If a spill occurs during transfer or in a manner that cannot be contained by secondary containment, absorbent pads and logs are used in a timely manner.

To maximize productivity, Operations houses dedicated equipment and vehicle maintenance areas both inside and outside of the CA. Maintenance activities conducted within the CA take place inside the mechanics shed, a fabric-covered shade structure near the RBA (see Figure 2). Emergency repairs are occasionally performed elsewhere in the CA when equipment cannot travel to the CA maintenance area. Equipment and vehicles utilized outside of the CA are serviced in the maintenance building, a fabric-covered structure located in the west end of the Support Area.

5.1.2 Decontamination of Equipment, Vehicles, and Lidded RRM Containers

Decontamination of equipment or vehicles is performed by Operations personnel on the decon pad, located in the RBA within the radiologically controlled area (see Figure 2). Decontamination operations are conducted in accordance with the Integrated Work Planning Job Safety Analysis No. MB-IWP/JSA-012, "Decontamination Operations."

Decontamination operations are performed away from any natural drainages or potential storm water discharges. Green River water is used to clean vehicles and equipment. Wash water from decontamination activities is directed into a lined catch basin for evaporation or appropriate reuse within the CA.

Washing of vehicles outside the CA is performed south of the maintenance building, without detergents or additives. Rinse water travels through a small culvert to a flat vegetated area within the confines of the storm water system and upgradient of Sediment Basin No. 1.

5.1.3 Storage, Handling, and Disposal of Building Products, Materials, and Wastes

Building Products

Building products used by Operations are stored inside the maintenance building, storage sheds, or storage containers to prevent these products from coming into contact with storm water.

Waste Containers

All waste containers have containment or cover to prevent blow-able or pollutant-producing waste from being transported.

Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

Pesticides, herbicides, insecticides, fertilizers, and landscape materials used by Project personnel to perform revegetation and weed-control activities at the Crescent Junction site are stored inside Maintenance Tent to prevent materials from contacting storm water. Currently, there are only a minimal amount of household pesticides on site which are stored in a maintenance closet. Any procurement of additional pesticides requiring long-term storage would warrant a dedicated storage area.

For application, handling, or disposal of herbicides, pesticides, insecticides, or fertilizers, Project personnel comply with application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer labels. In addition, personnel follow the requirements identified within the associated Safety Data Sheets and use proper personal protective equipment (PPE) for protection from identified hazards, in accordance with work planning and control procedures.

Diesel Fuel, Petroleum Products, Lubricants, and Used Oil

Diesel fuel, petroleum products, lubricants, and used oil are stored on site in above-ground containers in accordance with the SPCC.

The Crescent Junction site meets the EPA criteria stipulated in Title 40 Code of Federal Regulations Part 112 (40 CFR 112), "Oil Pollution Prevention;" which states:

> *A facility is subject to spill prevention, control, and countermeasure regulations if the total aboveground oil storage capacity exceeds 1,320 gallons (gal) in containers of 55 gal or more, or the underground oil storage capacity exceeds 42,000 gal, and if, due to its location, the facility could reasonably be expected to discharge oil into or on the navigable waters of the United States.*

As defined in 40 CFR 112, oil includes oil of any kind or in any form including, but not limited to, petroleum, petroleum-refined products, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil. Fuel, lubricants, and used oil are stored on the Crescent Junction site in aboveground tanks and containers as listed below in Table 3.

In accordance with the SPCC, secondary containment at the Crescent Junction site includes the following:

> *Oil storage containers whose containment collects rainfall are required to have 100 percent secondary containment plus precipitation. The 10-year, 24-hour precipitation event for the Crescent Junction area is 1.6 in. as reported in the National Oceanic and Atmospheric Administration Atlas 14 Point Precipitation Frequency Estimates. Several containers on site are double-walled to provide secondary containment. Those that are single-walled have been placed in containment basins. Containment dikes and basins were sized to contain the volume of the container or the largest container in the case where multiple containers were placed in a single containment structure, plus 2 in. of rainwater.*

Table 4. Oil Storage Containers and Containment Features

Storage Area Designation	Container Contents	Capacity (gal)	Locations	Containment Method
C1	Fuel (diesel)	10,000	East of maintenance building	Double walled tank
C2	Used oil	2,000	South of maintenance building	Double walled tank
C3	Lubricants	2 x 55	East of RBA trailer	HDPE pallet
C4	Used oil	330	East of RBA trailer	Polyvinyl chloride stock tank
C5	Lubricants	3 x 270	Compressor shed	Concrete containment structure
C6	Fuel (gasoline)	500	North of maintenance building	Polyvinyl chloride stock tank
C7	Used oil	150	Inside maintenance building	Floor drain to sump

5.1.4 Spill Response and Reporting

In the event of a spill or release of contaminated materials, the spilled materials are immediately contained and cleaned up according to emergency spill response actions outlined in the *Moab UMTRA Project Emergency/Incident Response Plan* (DOE-EM/GJ1520). Spill response kits containing absorbent pads, materials, and PPE needed for spill cleanup are available on site and are used for minor spills that occur outside secondary containment areas.

Project personnel report all spills more than 0.25 gallons (gal) to the Crescent Junction Operations/Site Manager and the RAC Environmental Compliance Manager. Spills more than 5 gal are reported to DOE.

As specified in 40 CFR 112.4, if either of the following thresholds is exceeded:

- The facility discharges more than 1,000 gal of oil into or on navigable waters of the United States or adjoining shorelines in a single event.
- The facility discharges more than 42 gal of oil (total) in two spill events within any 12-month period.

The Crescent Junction Operations/Site Manager or Technical Group/Field Manager, with DOE concurrence, will report the spill to the National Response Center and the UDEQ.

5.1.5 Fertilizer Discharge Restrictions

To minimize discharges of fertilizers containing nitrogen or phosphorus, Crescent Junction site personnel who apply fertilizers comply with the following requirements, as listed in Part 2.3.5 of the Permit:

- Apply the fertilizer at a rate and in amounts consistent with manufacturer's specifications or document departures from manufacturer specifications in a field logbook.
- Apply fertilizer during the early spring and summer or as closely as possible to the period of maximum vegetation uptake and growth.
- Avoid applying before heavy rains that could cause excess nutrients to be discharged.
- Never apply to frozen ground.
- Never apply to storm water conveyance channels with flowing water.
- Follow all other state and local requirements regarding fertilizer application.

5.2 Waste Management

The types of wastes that may be generated on the Crescent Junction site include RRM, non-RRM, investigation-derived waste (IDW), and universal waste. Handling, management, and disposal processes for these waste types are conducted in accordance with active Project plans and procedures, referenced below in Sections 5.2.1 and 5.2.2.

5.2.1 Management of RRM, Non-RRM, and Investigation-derived Waste

RRM, non-RRM, and IDW generated on the Crescent Junction site are managed in accordance with the *Moab UMTRA Project Waste Management Plan* (DOE-EM/GJ1633) and applicable federal, state, and local requirements.

RRM

RRM waste derives from the Moab site and consists of uranium mill tailings, radioactively contaminated soil, mill debris, and other process-related materials. RRM is handled using standard remediation and construction methods. Health and safety procedures for controlling radiological contamination are used to protect site workers, the public, and the environment. RRM that meets the NRC-approved waste acceptance criteria is transported from the Moab site by rail and placed inside the disposal cell at the Crescent Junction site for final disposition.

Reusable equipment contaminated with RRM may be decontaminated if warranted, feasible, and cost effective. If it is not feasible or cost effective to decontaminate reusable equipment or materials, they may be disposed of at the Crescent Junction disposal site. The *Moab UMTRA Project Radiological Release of Materials and Equipment Plan* (DOE-EM/GJRAC2091) contains procedures for decontaminating radioactively contaminated equipment and materials, including release limits for radioactivity.

Non-RRM

Non-RRM may be generated inside or outside of the Moab or Crescent Junction site CAs, and consists of construction and domestic waste. Non-RRM waste is managed in accordance with federal, state, and local requirements and regulations pertinent to the waste. These solid waste materials are accumulated using standard practices and disposed of at the local municipal landfill.

As a BMP, the Project strives to minimize the generation of non-RRM wastes and to recycle non-RRM wastes and materials per DOE Order 436.1, "Departmental Sustainability." Recycling bins for paper, aluminum, plastic, and flattened cardboard are provided in the Administrative Area, restrooms, and maintenance area.

Proper management of non-RRM waste also requires evaluation to determine if it contains hazardous or toxic components. Non-RRM waste that contains hazardous components may consist of used oil or other spent petroleum products generated from vehicle and equipment maintenance or repairs.

Non-RRM waste that contains hazardous or toxic components is managed in accordance with 40 CFR 261, "Identification and Listing of Hazardous Waste," 40 CFR 273, "Standards for Universal Waste Management," and the corresponding state of Utah hazardous waste and universal waste regulations at UAC R315. These management requirements encompass proper tracking, containerization, labeling, storage, treatment, transportation, disposal, and record keeping.

IDW

IDW generated in the field during site investigation and monitoring activities associated with groundwater or soils includes PPE, disposable sampling equipment, excess soil (e.g., well-drilling cuttings, trenching leftovers), excess groundwater (e.g., well development, purge water), or miscellaneous trash (e.g., empty containers, plastic, packaging materials). IDW is managed in accordance with the requirements of the *Moab UMTRA Project Waste Management Plan* for RRM and non-RRM waste.

5.2.2 Universal Waste

In accordance with the *Moab UMTRA Project Universal Waste Management Plan* (DOE-EM/GJRAC1920), hazardous waste from the Crescent Junction site handled as universal waste includes:

- Spent batteries found in many common items, including electronic equipment, hand tools, mobile telephones, cameras, computers, and emergency backup lighting. The battery chemistry determines its regulatory status. Lead acid (automotive), nickel cadmium, silver, mercury, or lithium batteries are regulated as universal waste and recycled. Storage is provided in boxes at maintenance sheds or in the box provided at the Crescent Junction Environmental Compliance office.

- Mercury-containing devices, including thermostats, thermometers, manometers, barometers, relays, and switches.
- Lighting wastes, including lamps, bulbs, or tubes with small amounts of mercury and possibly cadmium. Lamps regulated as universal waste can be fluorescent, high-intensity discharge, neon, mercury vapor, high-pressure sodium, and metal halide lamps.
- Unused pesticides that have been recalled or for which use has been suspended are universal wastes.

DOE manages universal waste at the Crescent Junction site as a "small quantity handler" which does not accumulate 5,000 kilograms (11,000 pounds) or more total universal wastes, calculated collectively, at any time. Small quantity handlers are prohibited from disposing universal waste and will ensure waste is recycled or delivered to a permitted facility. The small quantity handler facility is prohibited from diluting or treating universal wastes.

Universal waste stored on the Crescent Junction site is labeled or marked to identify the type of universal waste (e.g., "Universal Waste Batteries," "Universal Waste – Lamps"). Universal waste is managed in a way that prevents a release of any component of the waste. Containers must remain closed, structurally sound, compatible with contents, and show no evidence of leakage, spillage, or damage that could cause leakage. If stored outside, containers are covered to prevent precipitation from coming into contact with the waste. Universal waste stored on the Crescent Junction site can accumulate for no longer than 1 year from the date the waste is generated, unless accumulation activity is solely for the purpose of accumulating quantities sufficient to facilitate proper recycling or disposal.

Although small-quantity handlers of universal waste are not required to keep records of shipments of universal waste per UAC R315-16-2, "Standards for Small Quantity Handlers of Universal Waste," BMPs at the Crescent Junction site include maintaining the following records: (1) destination facility, (2) quantity of each type of universal waste, and (3) date of shipment. Mechanics, maintenance personnel, or responsible employees provide the required records or manifest information to Operations Environmental Compliance personnel for filing in the Project records system.

5.3 Approved Non-Storm Water Discharges

The following non-storm water discharges are pertinent to the Crescent Junction site and allowed under Section 1.2 of the Permit for construction activities:

- Properly managed landscape irrigation.
- Water used to wash vehicles and equipment, provided there is no discharge of soaps, solvents, or detergents used for such purposes.
- Water used to control dust.
- Discharges from emergency fire-fighting activities.
- Uncontaminated air conditioning or compressor condensate.
- Uncontaminated, non-turbid discharges of ground water.
- Potable water, including uncontaminated water line flushing.
- Pavement wash waters provided spills or leaks of toxic or hazardous materials have not occurred (unless all spill material has been removed) and where detergents (including biodegradable detergents) are not used. It is prohibited to direct pavement wash waters directly into any surface water, storm drain inlet, or storm water conveyance.

Comingling of the non-storm water discharges above with other permitted discharges is also authorized.

5.4 Prohibited Non-Storm Water Discharges

The following non-storm water discharges are pertinent to the Crescent Junction site and not allowed under Section 1.3 of the Permit for construction activities:

- Wastewater from washing tools and vehicles after pouring, prepping, or finishing concrete.
- Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance.
- Soaps, solvents, or detergents used in vehicle and equipment operation and maintenance.
- Toxic or hazardous substances from a spill or other release.

6.0 Inspections, Corrective Actions, SWPPP Modifications, and Training

In accordance with the Permit, site inspections and corrective actions are conducted and performed at the Crescent Junction site as listed below in Sections 6.1 and 6.2. To track precipitation events and help determine the occurrence of storm events that generate 0.5 in. or more rain, the Project operates one meteorological monitoring station (MET) at the Crescent Junction site. These stations enable DOE to monitor site-specific climatic conditions and events. Meteorological parameters monitored include air temperature, relative humidity, solar radiation, wind speed, wind direction, and precipitation.

6.1 Inspections

In accordance with Part 4.1 of the Permit, personnel who conduct inspections associated with storm water control and pollution prevention at the Crescent Junction site meet the below-listed definition of a "qualified person" and maintain current certification.

> *A "qualified person" is a person knowledgeable in the principles and practice of erosion and sediment controls and pollution prevention, who possesses the skills to assess conditions at the construction site that could impact storm water quality, and the skills to assess the effectiveness of any storm water controls selected and installed to meet the requirements of this Permit, such as but not limited to the following:*
>
> - *Utah Registered Storm Water Inspector*
> - *Certified Professional in Erosion and Sediment Control*
> - *Certified Professional in Storm Water Quality*
> - *Certified Erosion, Sediment, and Storm Water Inspector*
> - *Certified Inspector of Sediment and Erosion Control*
> - *National Institute for Certification in Engineering Technologies, Erosion and Sediment Control, Level 3*
> - *Utah Department of Transportation Erosion Control Supervisor*

In addition, Operations personnel conducting site inspections of storm water and pollution prevention BMPs are trained to Project-specific training requirements, as outlined in Section 6.4 of this SWPPP.

6.1.1 Inspection Frequency

In accordance with Section 4.4.2 of the Permit and Arid Climate Exemption in section 6.1.2 of this SWPPP, site inspections are conducted at the Crescent Junction site in accordance with the following schedule.

- Once every month.
- Within 24 hours of the occurrence of a storm event that produces 0.5 in. or more rain, or the occurrence of runoff from snowmelt sufficient to cause a discharge.

To determine if a storm event of 0.5 in. or more has occurred at the Crescent Junction site, Operations personnel monitor output from the on-site MET station, which houses a properly maintained rain gauge and both records and publishes continuous, real-time data for the site.

For any day when rainfall measures 0.5 in. or more, an inspection is conducted and the total rainfall measured for that day is recorded on Crescent Junction Site SWPPP Inspection Form 1051. If a storm event occurs at the Crescent Junction site for multiple days, and the storm produces 0.5 in. or more rain each day, an inspection is conducted within 24 hours of the first day of the storm and within 24 hours after the end of the storm.

Site inspections are required during the Project's normal work hours; however, if a rainfall event occurs after business hours on Thursday, the inspection does not have to be completed until Monday.

6.1.2 Inspection Frequency Reduction

In accordance with Part 4.4.1 of the Permit, three conditions exist that allow for a reduction in site inspection frequencies:

1. **Temporarily Stabilized Areas –** The inspection frequency may be reduced to once per month in any area of the Crescent Junction site where initial stabilization steps have been completed in accordance with Part 4.4.1a of the Permit. If construction activities resume at a later date in temporarily stabilized portions of the Crescent Junction site, the site inspection frequency will immediately increase to the schedule listed in Sections 6.1.1 of this SWPPP. Operations personnel conducting storm water and pollution-prevention inspections document the beginning and ending dates of this period and provide the documentation to Technical Oversight and to Project Records.
2. **Permanently Stabilized Areas –** Portions of the Crescent Junction site that are permanently stabilized no longer require inspections, except in the case of inlet protection for drainage received from surrounding non-stabilized areas.
3. **Arid Climate Exemption –** The Permit requires a standard inspection frequency of at least once every seven days or once every 14 calendar days and within 24 hours of a storm event of 0.5 in. or more. However, the Permit also allows for a reduced inspection frequency at arid or semi-arid sites. The Project has tracked monthly precipitation data from the Crescent Junction site MET station since 2008; the 11-year annual precipitation average is 8.36 inches, classifying the site as arid under the definition stipulated in the Permit (areas within an annual average rainfall of 0 to 10 inches). The Crescent Junction site qualifies for this inspection reduction per Part 4.4.2a of the Permit, and thus inspections are required once a month and within 24 hours of the occurrence of a storm event.

4. **Frozen Conditions –** Earth-disturbing activities continue at the Crescent Junction site during frozen conditions. Inspection frequency remains as scheduled under the existing criteria as listed above in Sections 6.1.1 and 6.1.2. If snow accumulates during frozen conditions in excess of 0.5 in. of water equivalent, any subsequent melt event that generates runoff triggers a 24-hour inspection by Operations personnel.

6.1.3 Areas Requiring Inspection

In accordance with Part 4.5 of the Permit, at a minimum, the following areas at the Crescent Junction site are inspected.

a. All areas that have been cleared, graded, or excavated and have not yet completed stabilization.
b. All storm-water controls (including pollution-prevention measures) installed at the Crescent Junction site to comply with the Permit.
c. Materials, waste, borrow, or equipment storage and maintenance areas covered by the Permit.
d. All portable toilets.
e. All areas where storm water typically flows within the Crescent Junction site, including drainage ways designed to divert, convey, and/or treat storm water.
f. All points of discharge from the Crescent Junction site.
g. All locations where stabilization measures have been implemented.

If on-site areas are not safe for entry by personnel either on foot, by vehicle, or via an alternative method, those areas need not be inspected until conditions once again become safe; should this scenario occur, a note is made on Crescent Junction Site SWPPP Inspection Form 1051 documenting the locations that cannot be inspected and describing the reason that conditions are unsafe.

6.1.4 Inspection Requirements

At a minimum, personnel conducting inspections at the Crescent Junction site:

a. Check whether all erosion and sediment controls and pollutant-prevention controls are installed, appear operational, and working as intended to minimize pollutant discharges.
b. Consider what has caused a BMP's failure if it is not operational.
c. Determine if any controls need to be replaced, repaired, or maintained.
d. Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the Crescent Junction site.
e. Identify any locations where new or modified storm water controls are necessary to meet effluent limitations applicable to all discharges from the construction site (including support activities), effluent limitations to meet applicable water quality standards, and discharge limitations for impaired waters as required in of Parts 2 and 3 of the Permit.
f. Check the point(s) of discharge and if applicable, the banks of any surface waters flowing within the Crescent Junction site boundary or immediately adjacent to the Crescent Junction site. Check for signs of visible erosion and sedimentation (i.e., sediment deposits) that have occurred and are attributable to discharges from the Crescent Junction site.
g. Identify any and all incidents of noncompliance observed.
h. If a discharge is occurring during the site inspection, Operations personnel:
    - Identify all points of the Crescent Junction site from which there is a discharge.
    - Observe and document the visual quality of the discharge and take note of the characteristics of the storm water discharge, including color, odor, floating, settled, or suspended solids, foam, oil sheen, and other obvious indicators of storm water pollutants (see Appendix J of the Permit).

- Document whether the storm water controls at the Crescent Junction site are operating effectively and describe any controls that are clearly not operating as intended or are in need of maintenance.

i. Based upon the results of the site inspection, Operations personnel initiate corrective action in accordance with Part 5 of the Permit and in accordance with Section 6.2 of this SWPPP.

6.1.5 Inspection Reports

Results of storm water and pollution-prevention inspections performed by Operations personnel are documented on Crescent Junction Site SWPPP Inspection Form 1051 (see Attachment 2). In accordance with the Permit, inspection reports are completed within 24 hours of the conclusion of any site inspection. Each inspection report includes, but is not limited to:

- The inspection date.
- The UPDES Construction General Permit (CGP) tracking number.
- Names and titles (or position) of personnel making the inspection.
- A summary of inspection findings, covering at a minimum the observations made in accordance with Section 6.1.4 of this SWPPP.
- If the inspection is completed due to a storm event totaling 0.5 in. or more rainfall, the applicable rain gauge or MET station readings that triggered the inspection are included.
- If it is unsafe to inspect a portion of the Crescent Junction site, descriptions of the location(s) of the site that cannot be inspected and the reason it is unsafe to enter.

Copies of current inspection reports are kept on site in hardcopy and electronic formats and made available at the time of an on-site inspection or upon request by Technical Oversight personnel or Utah Department of Water Quality (DWQ). Inspection reports are retained for at least 3 years from the date of final site stabilization and termination of the UPDES Permit.

6.1.6 Inspections by Utah Department of Water Quality

In accordance with Part 4.2 of the Permit, the Crescent Junction site allows authorized representatives of DWQ to access the site and conduct the following activities at reasonable times.

- Enter onto areas of the Crescent Junction site, including any construction support activity areas covered by the UPDES permit, and onto locations where records are kept for the storm water program.
- Access and copy any records that must be kept under the conditions of the Permit.
- Inspect the construction site, including any construction support activity areas covered by the Permit and any storm-water controls installed and maintained at the Crescent Junction site.
- Sample or monitor for the purpose of compliance.
- Take photographs, videos, measurements, or other documentation to ensure or document compliance (with consideration to the permittee for legitimate confidentiality concerns, and for security concerns, including national security issues).

If a permit violation is found during the site inspection, Operations personnel complete any corrective action as required by DWQ, within the specified deadline.

6.2 Corrective Actions

Corrective actions are any actions taken to comply with Part 5 of the Permit, as follows:

- Repair, modify, or replace any storm water, sediment, or erosion controls used at the Crescent Junction site.
- Clean up and properly dispose of spills, releases, or other deposits.
- Remedy a permit violation.

All temporary and permanent storm water, erosion, sediment, and pollution prevention controls are maintained and repaired as needed to ensure continued performance of their intended functions. Trapped sediment is removed and disposed of on site when the capacity of any sediment control device is reduced by 50 percent (e.g., sediment basins, culverts, rock check dams). Disturbed soil areas resulting from removal of temporary controls or vegetation are stabilized as soon as possible.

6.2.1 Conditions Triggering Corrective Actions

In accordance with Part 5.1 of the Permit, corrective actions are taken if:

- A storm water control needs repair or replacement (beyond routine maintenance).
- A new storm water control is necessary to comply with the requirements of the Permit.
- Discharges are causing an exceedance of applicable water quality standards.
- A prohibited discharge has occurred.

For any corrective action triggering conditions in Part 5.1 of the Permit, all reasonable steps will be taken to minimize or prevent the discharge of pollutants during the interim period in which a permanent solution is being designed and installed.

6.2.2 Corrective Action Tracking and Reporting

Corrective actions are tracked to maintain compliance with Part 5.4 of the Permit. Subsequent to each inspection or event that identifies the need for corrective action(s), Operations personnel generate a new Form 1063, Storm Water Controls Corrective Action Log (Remedial Action Contractor), populating the following fields at a minimum: “Corrective Action Item Number”; “BMP ID” (if available); “Specific Location”; “Cause of BMP failure”, “Description of Deficiency, Spill, or Permit Violation”; “Corrective Action or Maintenance Required”; “Identified by Party”; and “Date Issue Identified”.

The form is printed, signed, and dated, and an electronic version maintained. A hardcopy version is also maintained in the inspection logbook. Upon completion of all repairs on a given Form 1063, the remaining fields are populated, including the “Corrective Action Completed by Lead,” “Corrective Action Taken,” and “Date Corrective Action Completed” fields. The form is again printed, signed, and dated, and both electronic and hardcopy versions are filed appropriately.

Each erosion or sedimentation problem identified during field inspection, or corrective action taken (including BMP installation, removal, maintenance, or repair), is reported to the Crescent Junction Operations/Site Manager and documented on Form 1063 (see Attachment 2).

6.2.3 Corrective Action Deadlines

In accordance with Part 2.1.4 of the Permit, corrective actions are addressed immediately if practical, prior to anticipated weather or activities utilizing the control, or within seven business days, whichever comes first. In the interim period, all reasonable steps are made to minimize or prevent the discharge of pollutants until a permanent solution for the problem is implemented.

Corrective action reports are filed within 24 hours of identifying a corrective action condition. Resolution of a corrective action is documented within 24 hours of observation of completion; documentation includes actions taken to address the condition, date of resolution, and whether any SWPPP modifications were required. Copies of all corrective action reports are retained for at least three (3) years from the date that Permit coverage expires or is terminated.

6.3 SWPPP Modifications

In accordance with the Permit, the Project maintains the current Crescent Junction site SWPPP on site in both hard copy and digital format, and it is made readily available to site workers, Storm Water Team members, the Executive Secretary (or authorized representative) of the Utah Water Quality Board, interested members of the public, and local government officials.

The SWPPP, including site maps and forms, is periodically reviewed and is revised by Technical Oversight personnel if any of the following conditions occur.

- At the request of DOE.
- Issuance of a new Utah Construction General Permit (UPDES Permit No. UTRC00000, expires May 30, 2020).
- Issuance of new NOI.
- Changes to construction plans, storm water, erosion, or sediment control BMPs, pollution-prevention measures, or other activities or controls at the Crescent Junction site that are no longer accurately reflected in the SWPPP.
- Changes made in response to corrective actions required by the Utah DWQ due to a Permit violation found during a regulatory inspection.
- To reflect any revisions to applicable federal, state, or local requirements that affect the storm water measures implemented at the Crescent Junction site.

Revisions or modifications to the SWPPP are completed within 7 calendar days following any of the conditions listed above.

Document revisions are summarized in the front matter under Revision History (ii), and records of review are maintained to document changes from each reviewer.

6.4 Training

The Moab UMTRA Project maintains established training programs to help ensure personnel are adequately trained for the work they perform and for emergency preparedness. Personnel who regularly work on the Crescent Junction site receive the Project Site Pre-entry Briefing and are trained on the Emergency/Incident Response Plan. Operations personnel who perform storm water and pollution-prevention field inspections of the Crescent Junction site are qualified and certified storm water inspectors and are trained to this SWPPP and the current Utah CGP.

Operations and Technical Oversight personnel involved with the application and storage of chemicals are properly trained and follow manufacturer instructions.

Operations personnel who perform corrective actions (including installation, maintenance, or repairs) of storm water, erosion, or sediment control BMPs under the direction of Operations Support complete site-specific training as assigned by their line managers.

Training reports for Crescent Junction site Project personnel are maintained in the Training Information System Knowledge database on a central file server.

7.0 Records

All documentation created as a result of compliance with this SWPPP is considered a Project record and managed in accordance with the *Moab UMTRA Project Records Management Manual* (DOE-EM/GJ1545), which follows DOE orders, policies, and regulations for retention and maintenance of records.

Documentation may include, but is not limited to:

- Inspection forms.
- Photographs.
- Corrective action logs.
- General correspondence related to storm water discharges or permitting.

Copies of inspections are retained for at least 3 years from the date of final site stabilization and termination of the UPDES permit.

8.0 References

40 CFR 112 (U.S. Code of Federal Regulations), “Oil Pollution Prevention.”

40 CFR 192 (U.S. Code of Federal Regulations), “Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings.”

40 CFR 261 (U.S. Code of Federal Regulations), “Identification and Listing of Hazardous Waste.”

40 CFR 273 (U.S. Code of Federal Regulations), “Standards for Universal Waste Management.”

33 USC 1251 (United States Code), Clean Water Act.

42 USC 7901 (United States Code), Uranium Mill Tailings Radiation Control Act, Congressional findings and purposes.”

DOE (U.S. Department of Energy), *Moab UMTRA Project Emergency/Incident Response Plan* (DOE-EM/GJ1520).

DOE (U.S. Department of Energy), *Moab UMTRA Project Final Remedial Action Plan and Site Design for Stabilization of Moab Title I Uranium Mill Tailings at the Crescent Junction, Utah, Disposal Site* (DOE-EM/GJ1547).

DOE (U.S. Department of Energy), *Moab UMTRA Project Radiological Release of Materials and Equipment* (DOE-EM/GJRAC2091).

DOE (U.S. Department of Energy), *Moab UMTRA Project Records Management Manual* (DOE-EM/GJ1545).

DOE (U.S. Department of Energy), *Moab UMTRA Project Remediation of the Moab Uranium Mill Tailings, Grand and San Juan Counties, Utah Final Environmental Impact Statement* (DOE/EIS-0355).

DOE (U.S. Department of Energy), *Moab UMTRA Project Spill Prevention, Control, and Countermeasure Plan* (DOE-EM/GJRAC1477).

DOE (U.S. Department of Energy), *Moab UMTRA Project Tailings Pile Management Plan* (DOE-EM/GJRAC1891).

DOE (U.S. Department of Energy), *Moab UMTRA Project Universal Waste Management Plan* (DOE-EM/GJRAC1920).

DOE (U.S. Department of Energy), Moab UMTRA Project Waste Management Plan (DOE-EM/GJ1633).

DOE (U.S. Department of Energy), Order 436.1 "Departmental Sustainability."

Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Public Law 106-398).

Jacobs Engineering Group, Inc., 2008, *Calculation Nos. C-06 and C-09*.

Natural Resources Conservation Service, 2016, *Soil Survey of Grand County, Utah, Central Part,* U.S. Department of Agriculture.

UAC (Utah Administrative Code) R307-205-8, "Emission Standards: Fugitive Emissions and Fugitive Dust, Tailings Pile, and Ponds."

UAC (Utah Administrative Code) R315-16-2, "Standards for Small Quantity Handlers of Universal Waste."

UAC (Utah Administrative Code) R317-8-3.9, "UPDES Storm Water Discharges."