# TRENCH 13

# SURFACE-WATER RUN-ON AND RUN-OFF CONTROL DEMONSTRATION

**US Ecology Nevada, Inc.**
**Hazardous Waste Management Facility**
**Beatty, Nevada**

USEPA ID #NVT330010000
Nevada Hazardous Waste Treatment, Storage and Disposal
Permit NEV HW0025

**Prepared for**

**Prepared by**

**with Assistance from**

**Revision 0: October 2015**

**Revision 1: March 2016**

# CERTIFICATION

## SURFACE-WATER RUN-ON AND RUN-OFF DEMONSTRATION
## REVISION 1

**US Ecology Nevada, Inc.**
**Hazardous Waste Management Facility**
**Beatty, Nevada**

I certify under penalty of law that this document and all appendices were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to be the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

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**Date:** April 5, 2016

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5 APR 2016

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# 1. INTRODUCTION

This Surface-Water Run-On and Run-Off Control Demonstration (The Demonstration) addresses management of run-on and run-off at the US Ecology Nevada (USEN) facility located in Beatty, Nevada with regard to the development and operation of Hazardous Waste Management Landfill Trench 13. The Demonstration was prepared in compliance with the terms and conditions of the Resource Conservation and Recovery Act (RCRA) Permit NEVHW0025 (RCRA Permit) Section 7.2.7, RCRA landfill design and operating requirements set forth in 40 CFR 264.301(g) and (h), and Toxic Substances Control Act (TSCA) chemical waste landfill requirements set forth in 40 CFR 761.75(b)(4). Surface-water management is required for control of maximum run-on and run-off volumes during the peak discharge resulting from a 25-year, 24-hour precipitation event. In addition, this Demonstration has considered the flows from a 100-year, 24-hour precipitation event. The purpose of The Demonstration is to describe the surface-water features that will manage the design storm precipitation and protect the hazardous waste management facilities at the USEN facility.

Each element of The Demonstration will be revised as necessary to maintain accuracy if there are changes in design or construction of the project or if any aspect of The Demonstration is found to be insufficient for its intended purpose. Nevada Department of Environmental Protection (NDEP) and/or the U.S. Environmental Protection Agency (USEPA), as lead regulatory agencies for certain aspects of RCRA and TSCA Permit compliance for the facility, may require modifications to the Demonstration within a specified time frame.

The Demonstration is available upon request to Federal, State, or local agencies. The Demonstration is kept on-site and will be available for review at the time of any on-site inspection by the agencies.

## 1.1 FACILITY IDENTIFICATION

| | |
|---|---|
| Facility Name: | US Ecology Nevada |
| Location: | Highway 95, 11 miles South of Beatty, Beatty, NV 89003 |
| Mailing Address: | PO Box 578, Beatty, NV 89003 |
| Contact Information: | Compliance Manager (775) 553-2203 |

## 1.2 FACILITY INFORMATION

USEN operates a hazardous waste management facility in Nye County, Nevada, approximately 11 miles south of Beatty, in the Amargosa Desert under Hazardous Waste Management Permit NEVHW0025 (July 2015 RCRA Permit) and is permitted to manage wastes regulated under the Resource Conservation and Recovery Act (RCRA) and Toxic Substances Control Act (TSCA). The facility is owned by the State of Nevada and is leased by USEN, who operates it.

At the time of preparation of The Demonstration, the active waste disposal unit at USEN is Trench 12. Trench 13 is planned as the next waste disposal unit and will include approximately 47.3 acres of landfill disposal footprint. At the time of Trench 13 construction, USEN will operate on 480 acres of State Land leased to USEN for hazardous waste treatment and disposal operations. The land surrounding the 480 acres is owned and administered by the U.S. Bureau of Land Management (BLM) as rangeland. The facility is not located on or adjacent to Indian Lands.

## 1.3 FEMA FLOOD ZONE DESIGNATION

The USEN facility is located on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Map Number 32023C7975E, Panel 7579E and dated February 17, 2010. The southwestern corner of the 480-acre property leased from the State of Nevada is located in an area determined to be inside the “one percent annual chance flood event” (or 100-year flood zone), also known as the base flood, and in Zone A, an area where no base flood elevation has been determined. The remainder of the 480 acres, including all areas of current and planned hazardous waste management activities are located outside flood areas identified and designated by FEMA. The USEN facility location and hazardous waste management areas are depicted on the Flood Insurance Rate Map included as **Appendix A**.

# 2. SURFACE-WATER RUN-OFF MODELING METHODOLOGY

The USDA Technical Release-55 modeling software was used for analysis of peak flow conditions at the USEN Facility. Surface-water management systems for the USEN facility are designed to manage precipitation from the 25-year, 24-hour design storm event. The design storm is estimated to yield 2.26 inches of precipitation as determined by the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Version 5 at the Amargosa Farms Garey Station (Station I.D. 26-0150). The Amargosa Farms Garey Station is located approximately 18 miles southeast from the facility and is the NOAA monitoring station located nearest to the facility and having the most comparable climate. Features providing run-on protection and final cover erosion protection have been designed to a 100-year, 24-hour precipitation event of 3.13 inches.

To estimate run-off from storm rainfall, TR-55 uses the run-off curve number method. The curve number method is based on the soil type and vegetation characteristics of the site surface materials. For the USEN site, curve numbers for both native materials and landfill covers were identified, including consideration of hydrologic soil group and hydrologic condition. This determination was based on geotechnical information provided by previous site investigations, along with native soil types consistent to the area of interest. Specific native soil properties and Hydrological Soil Groups (HGS) were obtained from the Natural Resource Conservation Service (NCRS) Web Soil Survey and NCRS Soil Data Mart.

Surface-water basins were delineated using topographic information provided by Great West Surveys (survey performed in June 2014), and included recent USEN facility features and vicinity property topography. The survey information and current topography were analyzed using AutoCAD Civil 3D 2012 to determine drainage basins and pathways at and surrounding the USEN properties boundaries, and natural drainage pathways contributing to surface-water run-on.

Based on basin areas, soil types, slopes, vegetation coverage, and calculated times of travel, the TR-55 modeling software was used to determine estimated peak flows. Peak flows were evaluated under current site drainage conditions and in determining drainages necessary for future surface-water management features.

Surface-water management feature channel geometry and carrying capacities were evaluated using Manning's equation for open channel flow. Specific details for energy dissipation, Manning's number, and flow conditions are presented in the Calculation included as **Appendix C**.

# 3. TRENCH 13 DEVELOPMENT AND SURFACE-WATER MANAGEMENT CONDITIONS

## 3.1 EXISTING CONDITIONS

Precipitation falling within the property boundary or from off-site sources is collected in and directed by multiple ditches culverts, or berms until it is released off-site at the southern property boundary. The drainages leaving USEN's current operations cross areas to be used as Trench 13 disposal areas, as shown in **Appendix B**.

## 3.2 DISCUSSION OF PROPOSED CONDITIONS

The proposed drainage design features consider the off-site and on-site land use and drainage patterns as they apply to the design and construction of proposed hazardous waste disposal area, Trench 13. The drainage basins contributing to the USEN Facility and to the proposed location of Trench 13, were determined to include approximately 250 acres, as measured from their origins to their final discharge points on the southern boundary of the 480-acre property as shown on drainage basin drawings included in **Appendix B** and **Appendix C**. The 250 acres includes surrounding areas that drain onto the USEN Facility. The Trench 13 Landfill Design Report addresses existing surface-water mitigation features (primarily in the southeast corner of the current 80-acre facility) as well as the implementation of new features as they pertain to the development of Trench 13.

The acquisition of land and subsequent development of Trench 13 will shift the current southern property boundary 1,320 feet to the south. The Landfill Engineering Report and Trench 13 design propose rerouting upstream surface water, currently leaving USEN's 80-acrea operations as overland flow in natural drainages, and directing that flow around areas to be developed as Trench 13 in two primary drainage channels to be constructed as part of Trench 13 construction. Additional features, such as roadways, temporary berms, and ancillary ditches assist in directing surface-water to these primary drainage channels. The primary drainage channels also act to intercept inflow and prevent run-on to the Trench 13 area. The primary drainage channels leave the 480-acre property in existing natural drainages located along the new southern property boundary.

The general concept for The Demonstration is to limit post-development peak flow rates, and return flow to the downstream location in the same manner as pre-development conditions, in accordance with State of Nevada implementation of the National Pollutant Discharge Elimination System (NPDES) Program.

## 3.3 BASIN DELINEATION

The potential on-site and off-site surface-water flows and necessary management features for protection of proposed Trench 13 during its development, operation, and closure are evaluated in the calculations included as **Appendix C**. Basins first were delineated individually and then grouped according to geographic position and the means of run-off management in relation to Trench 13 and their final discharge from the property. Basins requiring management in relation to current and proposed USEN facility features include eight basin groups: North (N), East (E), Southeast (SE), South Central (SC), Southwest (SW), Eastern Edge (EE), and Trench 13 Basins. The basins were evaluated using USDA TR-55 Modeling Software and anticipated flow from each basin resulting from a 25-year, 24-hour and a 100-year, 24-hour precipitation event. The proposed location of Trench 13 is in the flow path of many converging basins; therefore, diversionary features were incorporated into the surface-water management design. The table below summarizes the findings of the TR-55 Model and provides surface-water flow rates requiring management in relation to Trench 13.

**TABLE 3-1 BASIN CONTRIBUTIONS TO BE MANAGED IN RELATION TO TRENCH 13**

| BASIN | N | E | SE | SC | SW | EE |
|---|---|---|---|---|---|---|
| 25-yr 24-hour precipitation event | 7.2 | 2.5 | 0.77 | 2.6 | 3.7 | 6.8 |
| 100-year 24-hour precipitation event | 43 | 11 | 3.5 | 14 | 20 | 36 |

Flows are in cubic feet per second (CFS)

## 3.4 OUTFALLS AND REACHES

As previously stated, the development of Trench 13 will require modification to the location where surface water leaves the USEN Facility. For the purposes of this Demonstration and the

Calculation, outfall locations refer to points of basin discharge as determined for the purposes of the calculation included as **Appendix C** and are not intended to identify permitted discharge locations. Basins and outfalls are illustrated on the Basin Delineation Map included in **Appendix B** and **Appendix C**. The basin delineations result in six outfalls: outfalls 1, 2, 3, and 5 are basin collection points within the USEN Facility boundary and do not represent points of discharge from the facility. Outfalls 4 and 6 are located at the southern property boundary and will discharge surface-water off-site. Outfalls 4 and 6 will be located south of the current release point for surface-water run-off, but discharge flow into the same natural drainage paths as previous discharges from the Facility.

The volumes of surface-water discharged at outfalls 4 and 6, under design storm conditions, are expected to be greater than current flow, primarily as a condition of the added land area contributing to run-off. Flow rates could be slightly less than current discharge (per contributing acre) during large precipitation events, depending on the developmental stage of Trench 13 and when the design storm event occurs. If active filing in a cell is occurring below-grade and the adjacent cell is under construction, some precipitation will be managed with the active disposal cell and run-off flow rates at some outfalls could be less than anticipated.

**Table 3-2** summarizes expected flow conditions at outfalls. This evaluation assumes the final cover of Trench 13 has been placed, maximizing run-off and flow at basin outfalls fed by the trench cover, including outfalls 4 and 6. These flow rates were used to determine the appropriate carrying capacity of ditches, berms, and channels, necessary to manage surface water at the USEN Facility, specifically as they relate to Trench 13.

**TABLE 3-2 SUMMARY OF PEAK FLOW CONDITIONS AT OUTFALLS**

| **OUTFALL (BASIN)** | **1 (N)** | **2 (N+E)** | **3 (N+E+SE+T1)** | **4 (N+E+SE+T1+EE+T2+T3)** | **5 (SC)** | **6 (SC+SW+T4)** |
|---|---|---|---|---|---|---|
| 25-yr 24-hour precipitation event | 7.2 | 9.6 | 11 | **24** | 2.6 | **7.0** |
| 100-yr 24-hour precipitation event | 43 | 54 | 61 | **124** | 14 | **37** |

Outfall numbering and locations are specific to this Demonstration and do not reflect outfalls identified on an NPDES Permit.
Flows are in cubic feet per second (CFS)
**Bold** = sum of flows at property boundary

As shown in **Table 3-2**, the peak rate of discharge at the southern property boundary during the 24-hour, 25-year design storm is 24 CFS at outfall 4 and 7.0 CFS at outfall 6 and during the 100-hour, 25-year is 124 CFS at Outfall 4 and 37 CFS at Outfall 6. These peak discharge values were used to determine if Trench 13 surface water management features were sized appropriately.

## 3.5 SURFACE-WATER MANAGEMENT FEATURES

The Trench 13 design incorporates a surface-water diversion channel located east of Trench 13 and the option of a surface-water diversion channel or berm on the west side of Trench 13. These surface water control features are designed to convey run-off from large precipitation events to Outfalls 4 and 6 located on the southern property boundary of USEN Facility, where these outfalls enter existing natural drainage paths. These two features will receive the majority[1] of run-off from the USEN Facility, including the area of current operations and contributions from the area to be developed as Trench 13. Details regarding control feature dimensions and coordinates are presented in **Appendix C** and in design drawing included in the Landfill Engineering Design Report for Trench 13.

Along with these two surface-water control features, ancillary roadside ditches, culverts, and berms will be used, along with natural topography, to collect and convey surface-water away from hazardous waste disposal cells. These features work in conjunction with the two primary channels to effectively mitigate heavy rainfall events. Major surface-water features are presented in the Landfill Engineering Report for Trench 13. Smaller features such as ditches and temporary berms will be evaluated and constructed depending on the construction sequencing and the placement of internal roads, prior to initiating excavation activities of Trench 13. Typical ditch and berm dimensions are included on the Trench 13 Design Drawings.

Surface-water management features, up-gradient of Trench 13 also are capable of managing surface water in the event of a 25-year, 1-hour event. A detention pond, located on the southeast corner of the current 80-acres occupied by USEN, has been added as a Facility surface-water management feature. The detention pond manages run-off prior to discharge through two 24-inch culverts and convey run-off to the channel around the eastern portion of Trench 13. In the

[1] Other portions of the 480-acre property either runs off as sheet flow or is channelized, but does not include impacts from current or proposed operations and is in areas not currently planned for development.

event of a 25-year, 1-hour storm and failure (i.e., plugging) of one or both of these culverts, the access road along the eastern side of USEN's current 80-acres has been designed to allow surface-water to flow over the roadway and into the eastern channel and around Trench 13.

# 4. TRENCH 13 SURFACE-WATER MANAGEMENT RUN-ON/RUN-OFF CONTROL SYSTEMS

## 4.1 CONSTRUCTION SURFACE-WATER CONTROLS

Trench 13 construction includes excavation, transport, and stockpiling of native soil materials; screening of soil materials to achieve specified grain-size specification; recompaction of perimeter unconsolidated soil materials; and liner and leachate collection/detection system installation. Landfill closure, using an alternative final cover, will include use of either native soil material from direct excavation or stockpiled soil material as final cover.

No surface-water run-off is expected to leave the excavated Trench 13 areas during construction. Incident precipitation within the excavated trench, but outside active disposal areas, will be collected and managed in accordance with USEN operational procedures for non-contact water. Incident precipitation falling or collected within active disposal areas will be managed in accordance with USEN operational procedures for contact water (i.e., leachate). Excavation and construction work will follow the Permit requirements defined in Storm Water Permit NVR100000.

## 4.2 CONTROL OF SURFACE-WATER IN THE DISPOSAL AREA

### 4.2.1 Contact Water

Surface-water from precipitation that has fallen on placed waste or within the active/lined portion of the Trench will be managed following appropriate site protocols for contact water. Placed waste will be graded so that collected surface-water is directed to interior holding locations from which removal for proper management can be performed.

The 25-year, 24-hour design storm event is expected to result in approximately 600,000 gallons of liquid within the footprint of each Trench 13 development phase. This volume represents incident design storm precipitation within the footprint of Phases A and E. The surface water volumes within the smaller footprints of Phases B, C, and D would be somewhat less. Based on past observations, this liquid primarily infiltrates into disposed waste and either is held within waste until evaporated back into the atmosphere or infiltrates as leachate to the leachate collection and

recovery system (LCRS). Leachate captured in the LCRS is managed as described in the Landfill Engineering Report, Section 6.

If contact surface-water collects within the Trench prior to infiltration into waste, liquid removal might be necessary. Appropriate liquid holding containers will be used by USEN. These containers will be emptied and the contact water appropriately managed after storms to maintain the design capacity of the contact-water management system.

Once above-grade landfill filling commences, perimeter dikes, interim cover, or internal grading will be used to prevent surface-water run-off from the Trenches. The need for further engineered features, such as sediment basins and velocity dissipation devices, is not foreseen, as the site is located in an area where annular rainfall is minimal. Areas affected by construction activities will be evaluated periodically to ascertain whether additional engineered controls are need to reduce erosion and sediment flows. The need for additional controls will be documented on the weekly inspection reports.

### 4.2.2 Non-Contact Water

Surface-water from precipitation that has fallen on the 0.5H:1V cell sidewalls will not contact waste. This surface-water can be managed separately from that which has contacted waste. If cell sidewall surface-water is captured with a sidewall "rain gutter" (or similar) system, it can be diverted for discharge and/or evaporation together with other clean surface-water. A “rain gutter” system could readily be affixed to the sacrificial FML which overlies the sidewall liner system. However, if this water is allowed to contact water or commingle with surface-water that has contacted waste, the cell sidewall surface-water will be managed following appropriate site protocols for contact water.

Surface-water from areas separated from waste management areas by means of berms or other features will not contact waste. This surface-water can be managed separately from water that which has contacted waste.

## 4.3 RUN-ON CONTROL

Run-on control at Trench 13 is required during the period that disposal operations are occurring below grade. The requirement during that period will be to prevent rainfall outside of the Trench area from entering into the excavation and potentially being exposed to the waste disposal operations. This is accomplished by: (1) maintaining an adequate slope (minimum 2 percent) away from the lined excavation (2) installation of one foot high, or greater, anchor trench backfill above grade, (3) construction of two feet high, or greater, temporary berms during below grade operations, and (4) keeping existing drainage paths away from Trench 13 in an open condition so that flow can occur.

Subgrade construction and operations will require excavation into adjacent Phases to allow for vehicular access and future development of the subsequent disposal Phase. These areas, outside the "Phase line", or horizontal limits for the active Phase, are considered non-contact areas and surface-water flow from these areas must be prevented from comingling with surface-water within the active Phase. The landfill operational procedures of the Phases includes a setback from the active Phase line to provide storage for non-contact surface-water run-off.

Run-on control will not be necessary when the disposal operations extend above the existing grade.

## 4.4 FINAL COVER RUN-OFF CONTROL

The Trench 13 final cover system includes a series of drainage features designed to limit sheet flow to distances that prevent against rill and inter-rill erosion. Run-off control from the final cover slopes, at closure, will be provided by the following features:

- Lateral drainages integrated into the sideslopes of the final cover to limit the length of slopes exposed to sheet flow;
- Upper deck berms used to limit the length of sideslopes exposed to sheet flow;
- Flumes spaced along the cover slopes to discharge upper deck and lateral drain run-off to the perimeter of Trench 13;
- Access road drainages to convey water off the sideslopes; and

- Perimeter ditches to convey flow from the flumes, bottom portions of the cover slopes, and immediately adjacent areas to the overall Facility drainage system.

Lateral drains are located on Trench 13 sideslopes to limit slope erosion to less than two tons per acre-year[2]. Calculations demonstrate that this requirement is satisfied with sideslope sheet flow runs limited to 100 feet. Lateral drains include sufficient capacity to provide at least 1.0 foot of freeboard when considering the 100-year, 24-hour precipitation event. Lateral drains are sloped at two percent and include a four foot wide outer ridge. The maximum calculated lateral drain flow for the system is estimated at 0.84 cubic feet per second (cfs). Each sideslope lateral will include protective armoring for erosion and scour protection.

Upper deck berms are located on the Trench 13 20H:1V upper deck. These berms have been included to limit rill and inter-rill erosion and to decrease sheet flow lengths. The upper deck berms channelize and direct flow to the flumes for removal off of the Trench 13 final cover. Upper deck drains include sufficient capacity to provide at least 1.0 foot of freeboard when considering the 100-year, 24-hour precipitation event. Upper deck berms are sloped at one percent. Each upper deck berm will include protective armoring for erosion and scour protection.

The sideslope lateral drains and the upper deck berms discharge into flumes. The flumes are four feet in width and include sufficient capacity to provide at least 1.0 foot of freeboard when considering the 100-year, 24 hour precipitation event. Flumes on the upper deck are sloped at 20H:1V. Flumes on the sideslope primarily are sloped at 3H:1V, but include short sections at lesser slopes where sideslope laterals intersect. The maximum calculated upper deck flume flow for the system is estimated at 3.2 cfs and the maximum calculated sideslope flume flow for the system is estimated at 5.0 cfs. Each flume will include protective armoring for erosion and scour protection.

Access road drainages channelize and direct flow from east and west sideslope areas for removal off of the Trench 13 final cover. The drainages follow the road's grade at five and 10 percent and, are back-graded into the sideslope at five percent. The maximum calculated access drainage flow

[2] USEPA. Design and Construction of RCRA/CERCLA Final Covers, EPA/625/4-91/025. 1991

for the system is estimated at 1.5 cfs. Each access road drainage will include protective armoring for erosion and scour protection.

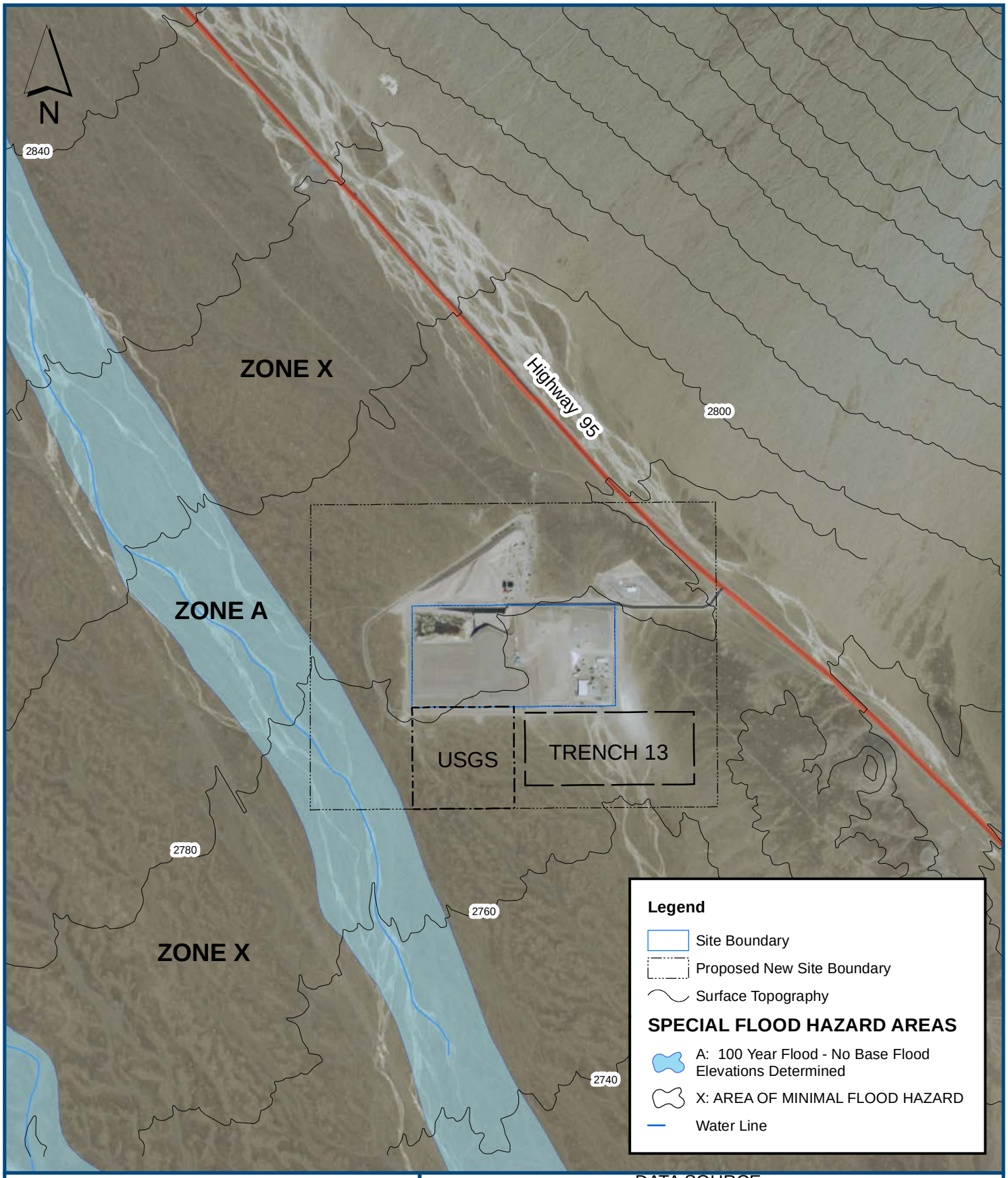
Energy dissipation and scour protection will be provided at the bottom of flumes, where needed. Perimeter ditches transport run-off to Facility drainages.

# 5. CONCLUSION

The design features presented in The Demonstration provide a means of run-on/run-off control that is consistent with conditions of the Resource Conservation and Recovery Act (RCRA) Permit NEVHW0025 (RCRA Permit) Section 7.2.7, RCRA landfill design and operating requirements set forth in 40 CFR 264.301(g) and (h), and Toxic Substances Control Act (TSCA) chemical waste landfill requirements set forth in 40 CFR 761.75(b)(4). Surface-water management is required for control of maximum run-on and run-off volumes during the peak discharge resulting from a 25-year, 24-hour precipitation event. In addition, this Demonstration has considered the impacts of a 100-year, 24-hour precipitation event. Methods and design specifications in this report are supported by calculations provided in the Engineering Design Report for Trench 13 and attached to The Demonstration as **Appendix C**. This Demonstration presents the features and measures necessary to prevent surface-water flow onto or away from active hazardous waste disposal areas of Trench 13. This Demonstration finds that the designed surface water management features are capable of preventing run-on and run-off as a result of the 100-year, 24-hour precipitation event.

In addition to the requirements satisfied by The Demonstration, the USEN facility will address the requirements of the NDEP Storm Water Permit NVR100000, effective September 16, 2007 and covering surface-water associated with large construction activities and Storm Water Permit NVR050000 effective September 22, 2008 and covering surface-water activities associated with industrial activities. Specifically, Condition I.A.5.b(iv) covers Hazardous Waste Treatment, Storage, or Disposal facilities. Also, the USEN facility will provide updates to the facility Storm Water Pollution Prevention Plan (SWPPP). The details and requirements of these permits and the SWPPP are not covered in this Demonstration.

# APPENDIX A
# FEMA FLOOD INSURANCE MAP




0 1,000 2,000 3,000 4,000 Feet

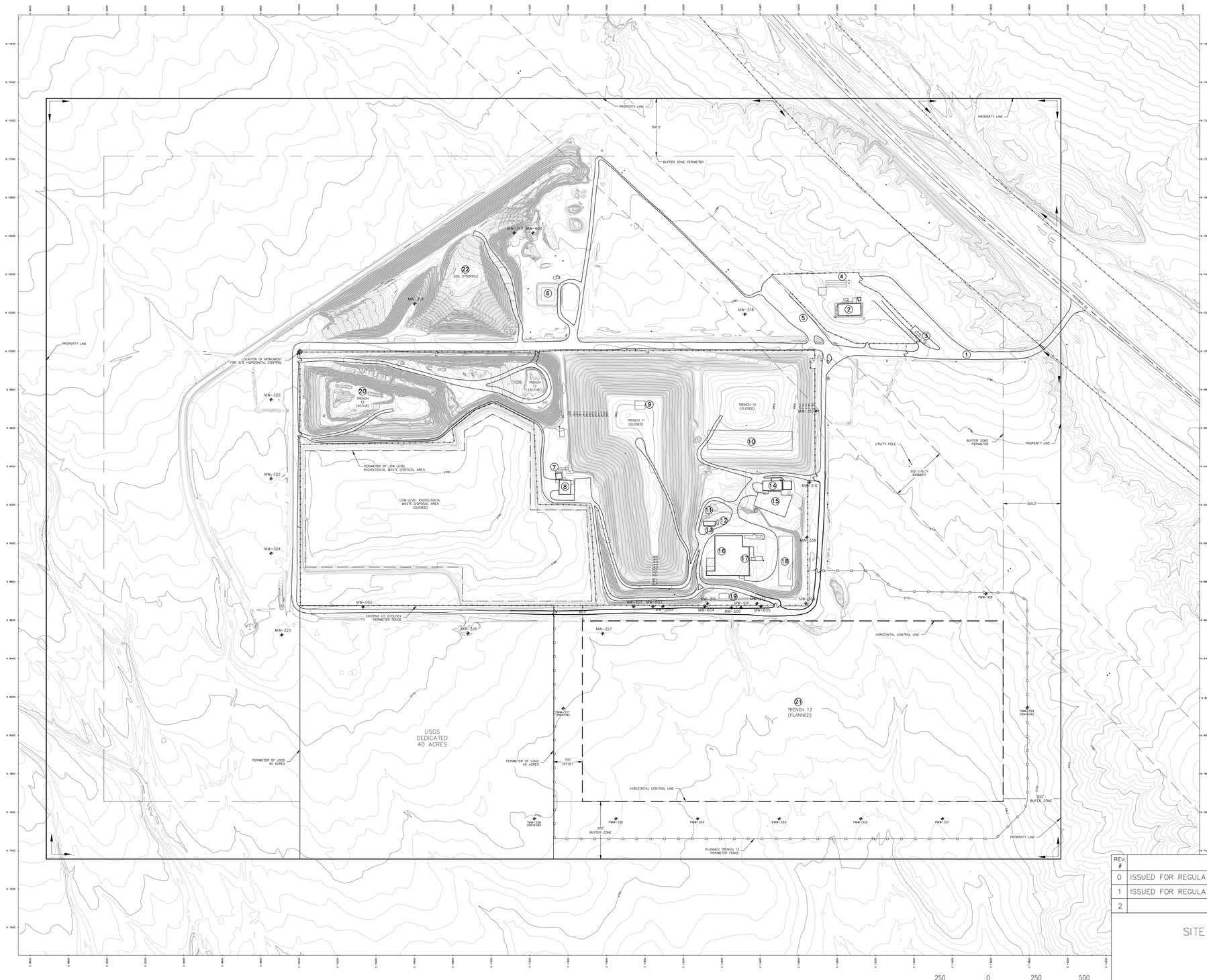
DATA SOURCE:
http://fema.maps.arcgis.com/home/webmap; Accessed: 09/28/2015
Source Citation: 32023C_BASE1

AquAeTer

CLIENT: US Ecology Nevada, Inc.
LOCATION: Beatty, Nevada
PROJECT FILE: 143418

FIGURE X - X
FEMA - Flood Hazard Map

# APPENDIX B
# CURRENT SITE CONDITIONS




1. MAIN SITE ENTRANCE
2. ADMINISTRATION OFFICE AND LABORATORY
3. SECURITY AND DRIVERS TRAILER
4. INBOUND AND OUTBOUND SCALES
5. PROFILING STATION
6. WATER STORAGE
7. FUEL STORAGE
8. MAINTENANCE SHOP
9. WEATHER STATION AND TRENCH 11 LYSIMETER
10. DRY HAZARDOUS WASTE STORAGE AREA 3
11. OUTDOOR TREATMENT PANS
12. REAGENT STORAGE SILOS
13. OPERATIONS OFFICE
14. PCB PROCESSING AREA AND STORAGE/PCB TANK FARM
15. REAGENT SOLIDS STORAGE
16. CONTAINER MANAGEMENT AND STORAGE BUILDING
17. INDOOR TREATMENT PANS
18. DRY HAZARDOUS WASTE STORAGE AREA 2
19. EVAPORATION TANK (TRUCK WASH PAD)
20. TRENCH 12 (ACTIVE)
21. TRENCH 13 (PLANNED)
22. SOIL STOCKPILE (SEE NOTE 6)

MW-316 EXISTING MONITORING WELL LOCATION
PMW-328 PLANNED MONITORING WELL LOCATION
TMW-328 TENTATIVELY PLANNED MONITORING WELL LOCATION
APPROXIMATE RADIOLOGICAL WASTE DISPOSAL PERIMETER
BUFFER ZONE PERIMETER
PROPERTY LINE
EXISTING FENCE
INTERNAL ROADWAYS
GATE
TRENCH 13 HORIZONTAL CONTROL LINE (LIMIT OF WASTE, SEE NOTE 5)
PLANNED TRENCH 13 PERIMETER FENCE
UTILITY POLE
TORTOISE FENCE FOLLOWS PROPERTY LINE OR US HIGHWAY 95 R.O.W. FENCE LINE BETWEEN DESIGNATED SYMBOLS

NOTES:
1. DATE OF AERIAL TOPOGRAPHY: 2014
2. HORIZONTAL CONTROL: SITE CORRDINATE SYSTEM
3. MONUMENT COORDINATES: 10,000 N – 10,000 E
4. ELEVATION: FEET (NORTH AMERICAN VERTICAL DATUM 1988)
5. THE HORIZONTAL CONTROL LINE IS THE FINAL HORIZONTAL LIMIT OF WASTE PLACEMENT FOR ALL PHASES OF TRENCH 13.
6. ADDITIONAL STOCKPILE LOCATIONS SHALL BE PROPOSED TO NDEP PRIOR TO EACH OF PHASE OF LANDFILL DEVELOPMENT

| REV. # | DESCRIPTION | DATE |
|---|---|---|
| 0 | ISSUED FOR REGULATORY REVIEW | 10/19/15 |
| 1 | ISSUED FOR REGULATORY REVIEW | 3/29/16 |
| 2 | | |

SITE PLAN

PROFESSIONAL ENGINEER-STATE OF NEVADA
STEPHEN WAMPLER
Exp. 6/30/16
CIVIL
No. 013641

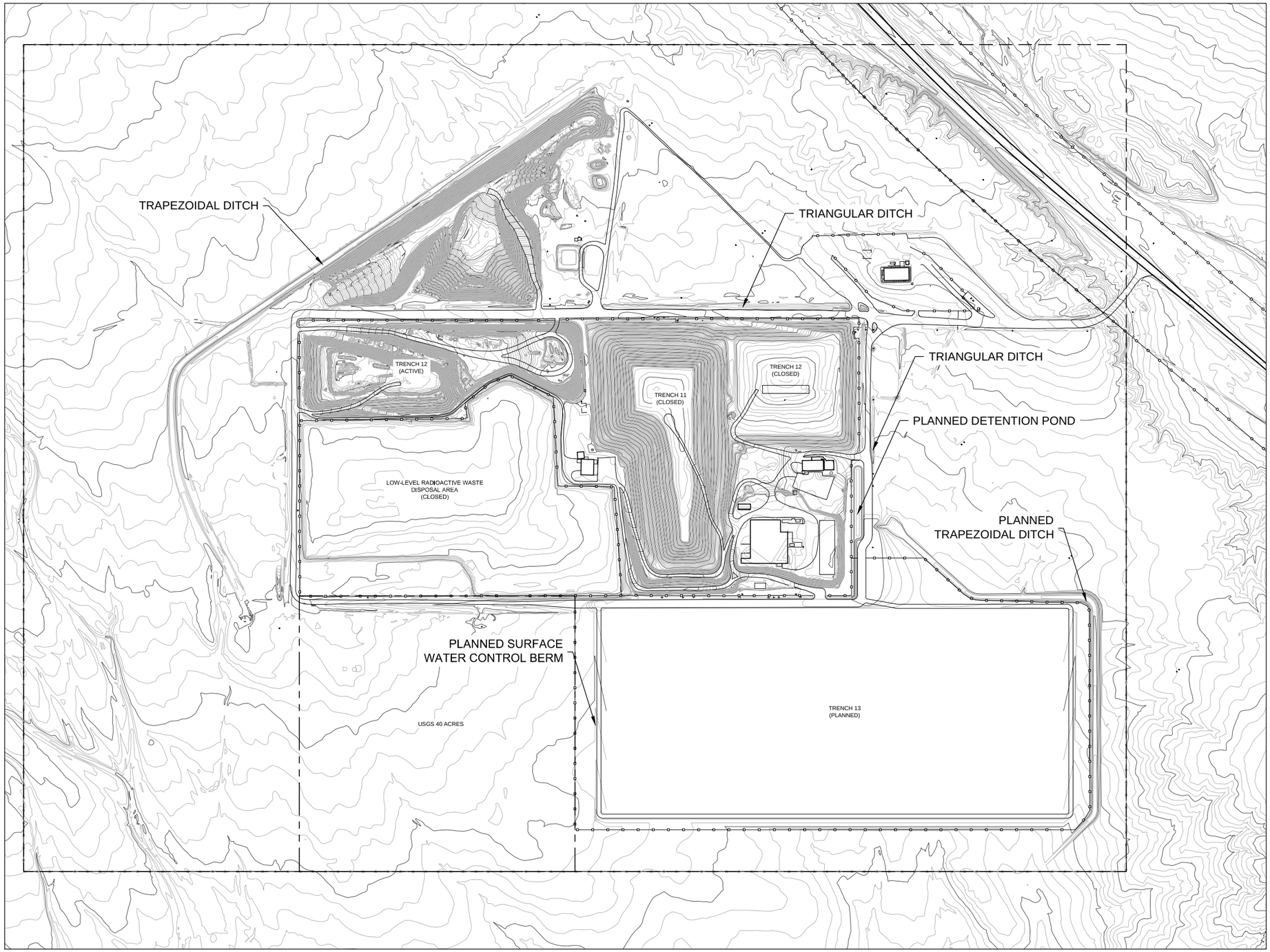
US ecology

BEATTY NEVADA
HAZARDOUS WASTE
MANAGEMENT FACILITY

PROJECT NUMBER: 143418

AquAeTer
optimizing resources | water, air, earth

| DRWN. BY | DATE | CHKD. BY | DATE | APRVD. BY | DATE | SCALE: | DRAWING NO: |
|---|---|---|---|---|---|---|---|
| CWK | 1/27/15 | CAB | 3/25/15 | SLW | 10/12/15 | 1" = 250' | NV13-15-002 |




US ecology

LOCATION: BEATTY, NV 89003

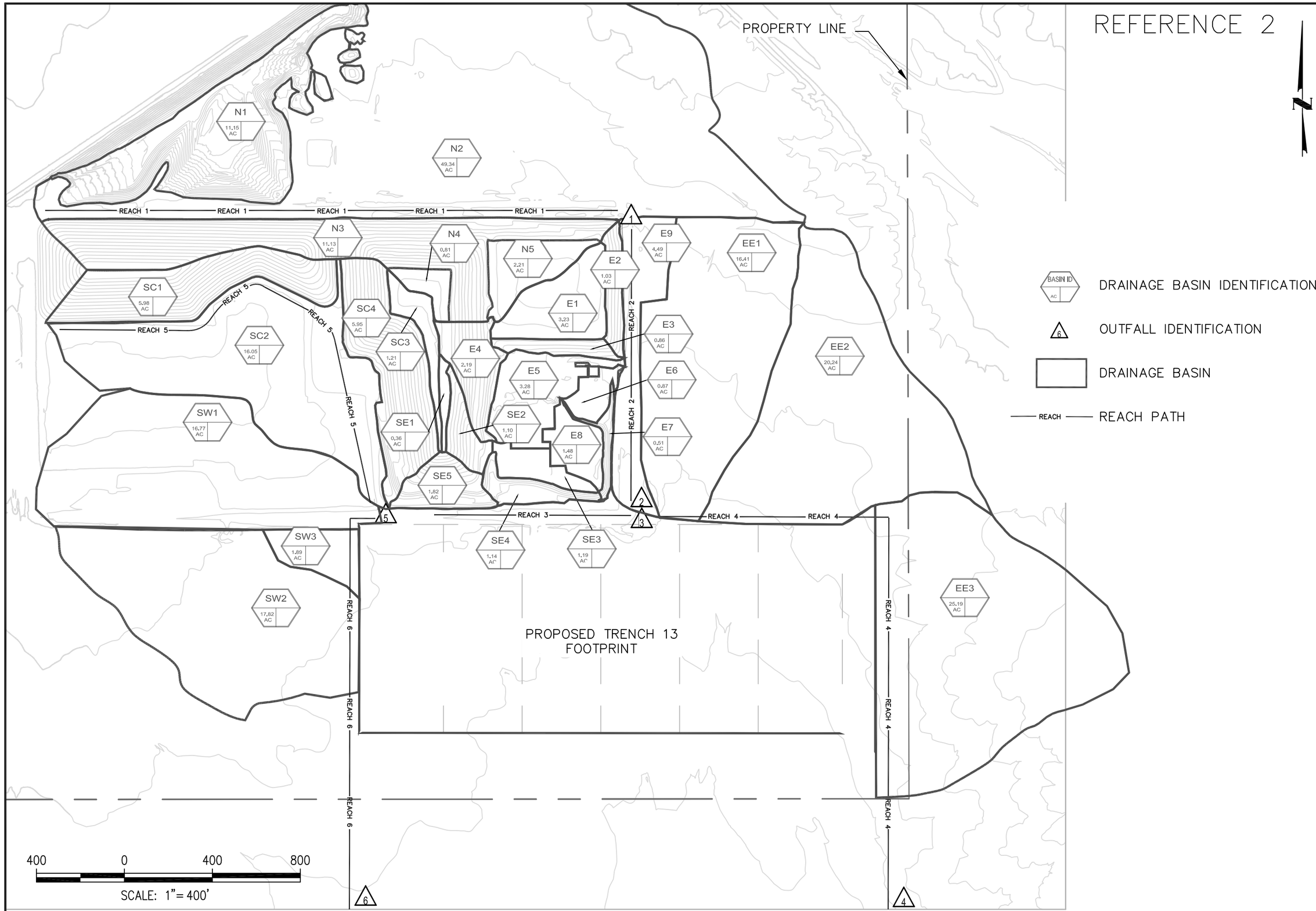
DATE: OCTOBER 2015

HAZARDOUS WASTE MANAGEMENT FACILITY

# FLOOD RUN-OFF CONTROL

500 0 500 1000

SCALE: 1"= 500'

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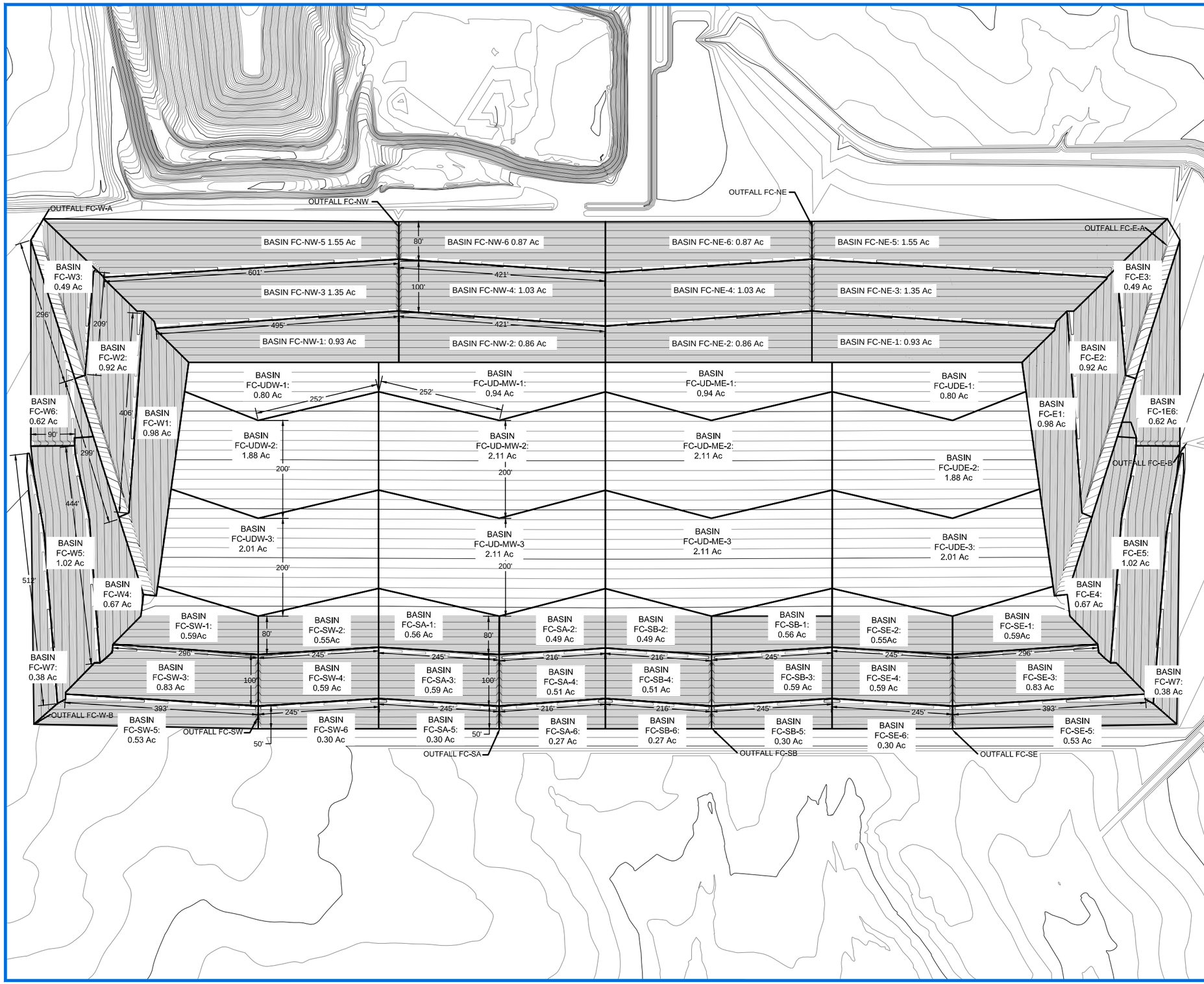
| DATE | REVISION COMMENTS |
|---|---|
| | |

US ecology

STORMWATER MANAGEMENT BASIN DELINEATION




TRENCH 13 FINAL COVER

BASIN IDENTIFICATION

CLIENT: US ECOLOGY

LOCATION: BEATTY, NV

PROJECT NUMBER: 143418

DATE: 3/4/16

DRAWN BY: CWK

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# APPENDIX C
# SURFACE-WATER MANAGEMENT CALCULATION

**See Landfill Engineering Report, Appendix 2**

**Calculation C.01: Surface Water Management**

**Calculation C.12: Final Cover Erosion by Water**