



## COMMONWEALTH of VIRGINIA

### DEPARTMENT OF ENVIRONMENTAL QUALITY

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Douglas W. Domenech  
Secretary of Natural Resources

David K. Paylor  
Director

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April 18, 2013

Mrs. Carolyn Turner  
Associate Chief, Medical and Environmental Management Division  
National Aeronautics and Space Administration  
Goddard Space Flight Center  
Wallops Flight Facility  
Mail Code 250, Building F-160  
Wallops Island, VA 23337-5099

**Re: Class 2 Permit Modification Request, dated February 8, 2013 – DEQ Approval  
Hazardous Waste Management Permit, Open Burn Area  
National Aeronautics and Space Administration (NASA)  
Goddard Space Flight Center (GSFC), Wallops Flight Facility (WFF)  
Wallops Island, Virginia  
EPA ID No. VA7800020888**

Dear Mrs. Turner:

The Department of Environmental Quality, Office of Waste Permitting and Compliance (DEQ) received a Class 2 modification request from the Wallops Flight Facility (WFF), located in Wallops Island, VA on February 8, 2013, via electronic mail (with a hard copy received on March 11, 2013). The Class 2 permit modification request was in regards to reinstating Subunit 3 at the Open Burn Area and included the revised pages to be inserted in the WFF Hazardous Waste Management Permit for Open Burn Area (Permit).

The letter explained that a previous modification request letter was for Subunit 3 to be removed from WFF's Permit. However, the facility has since determined that Subunit 3 is still required. No change to the structure of Subunit 3 has been made and still maintains its ability to protect the environment from the migration of hazardous constituents. The proposed permit modification pages include the following:

1. Module II, Attachment II.AA, Facility Description, pages 4 of 13, 4<sup>th</sup> paragraph – The 2<sup>nd</sup> sentence was revised to: “Two subunits, subunit 1 and subunit 3, are 0.6 meters (1.9 feet)

in diameter, stand 0.8 meters (2.6 feet) above the ground surface, and are embedded 2.3 meters (7.5 feet) below the ground.”

2. Module II, Attachment II.AA, Facility Description, page 4 of 13, 4<sup>th</sup> paragraph – The sentence: “Subunit 3 is identical to Subunit 1 and is scheduled to be removed and to undergo ‘closure’ upon installation of Subunit 4 in 2012.” was deleted.
3. Module II, Attachment II.AA, Facility Description, page 7 of 13, 4<sup>th</sup> paragraph – The last sentence was revised to: “Subunit 4 was installed in 2012.”
4. Module II, Attachment II.AA, Facility Description, Figure II.AA-4(b) Title Page – The Subtitle was revised to: “(Subunit 4 was installed in 2012.)”
5. Module II, Attachment II.BB, Waste Analysis Plan, page 1, 2<sup>nd</sup> paragraph – The 2<sup>nd</sup> sentence was revised to: “Two subunits, subunit 1 and subunit 3, are 0.6 meters (1.9 feet) in diameter, stand 0.8 meters (2.6 feet) above the ground surface, and are embedded 2.3 meters (7.5 feet) below the ground.”
6. Module II, Attachment II.BB, Waste Analysis Plan, page 1, 2<sup>nd</sup> paragraph – The sentence: “Subunit 3 is identical to Subunit 1 and is scheduled to be removed and to undergo ‘closure’ upon installation of Subunit 4 in 2012.” was deleted.
7. Module II, Attachment II.BB, Waste Analysis Plan, Appendix A, Maps and Drawings, Figure D-1 Title Page – The Subtitle: “Subunit 3 Scheduled for Removal in 2012” was deleted.
8. Open Burning Area Waste Analysis Plan, Appendix A, Maps and Drawings, Figure D-7 Title Page – The Subtitle: “Note: Subunit 3 Scheduled for Removal in 2012” was deleted.
9. Module II, Attachment II.CC, Inspection Schedule, Exhibit II.CC-2 – The Post Burn OB Area Inspection Log was revised to include all four (4) subunits.
10. Module II, Attachment II.GG, Closure Plan, page 5, 3<sup>rd</sup> paragraph – The last sentence was revised to: “Subunit 4 was installed in 2012.”
11. Module II, Attachment II.GG, Closure Plan, Exhibit II.GG-1, Closure Plan, Appendix A, Figures, Figure A-8 Title Page – The Subtitle: “Note: Subunit 3 Scheduled for Removal in 2012” was deleted.
12. Module II, Attachment II.HH, Plans and Specifications for Open Burn Units, page 2 of 15, 1<sup>st</sup> paragraph: The 3<sup>rd</sup> paragraph was revised to: Four subunits and one open burning pad assembly are used for open burning of the rocket motor propellants and igniters.”
13. Module II, Attachment II.HH, Plans and Specifications for Open Burn Units, page 2 of 15, 3<sup>rd</sup> paragraph – The last sentence: “(Subunit 3 is scheduled to be removed and undergo ‘closure’ in 2012.)” was deleted.
14. Module II, Attachment II.HH, Plans and Specifications for Open Burn Units, Figure II.HH-2(b) Title Page – The Subtitle: “(Note: Subunit 3 Scheduled for Removal in 2012.)” was deleted.

15. Module II, Attachment II.HH, Plans and Specifications for Open Burn Units Title Page – The Subtitle: “(Note: Subunit 3 Scheduled for Removal in 2012.)” was deleted.

16. Module II, Attachment II.HH, Figure II-HH-2d – Figure revised.

The public notice describing the Class 2 permit modification request was published in the *Eastern Shore News* on February 9, 2013. The public meeting regarding this permit modification request was held on Thursday, February 28, 2013, at the NASA Wallops Flight Facility Visitor Center, Route 175, Wallops Island, Virginia, 23337. Correspondence from the Permittee, dated March 15, 2013, documented that notices of the requested permit modification and public notice were sent to those on the facility’s mailing list and that the public meeting was held. A copy of the public meeting notice sign-in sheet was submitted. The affidavit or certification of the publication from the *Eastern Shore News* was also provided by the Permittee. The 60-day public comment period began on October 29, 2013 and ended on April 9, 2013. No comments were received during the public meeting or the public comment period. Furthermore, the required Class 2 modification permit fee in the amount of \$2400 was received by the DEQ on March 19, 2013.

Based on the information provided, the DEQ approves the Class 2 Modification of WFF’s Permit in accordance with the Virginia Hazardous Waste Management Regulations (VHWMR), under 9 VAC 20-60-270 and 40 CFR 270.42(b). A copy of the modified permit pages (with the modification date of 4/18/2012), as reflected by this administrative action, is enclosed. Please insert these modified permit pages into copies of your Permit and remove the obsolete pages, where applicable. Accordingly, the DEQ will notify all persons on the facility mailing list of this modification approval within 10 days in accordance with 40 CFR 270.42(f)(1). Evidence of this mailing will be forwarded to the facility when available.

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty (30) days from the date of service of this decision to initiate an appeal by filing a Notice of Appeal with:

David K. Paylor, Director  
Department of Environmental Quality  
629 East Main Street  
P.O. Box 1105  
Richmond VA 23218

In the event that this decision is served on you by mail, three (3) days are added to that period. Refer to Part 2A of the Rules of the Supreme Court of Virginia, which describes the required contents of the Notice of Appeal, including specification of the Circuit Court to which the appeal is taken, and additional requirements governing appeals from the decisions of administrative agencies.

If you should have any further questions regarding this matter, please contact Angela Alonso of my staff at (804) 698-4328 or by e-mail at [Angela.Alonso@deq.virginia.gov](mailto:Angela.Alonso@deq.virginia.gov). For

Mrs. Carolyn Turner  
NASA GSFC Wallops Island, VA  
April 18, 2013  
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other permit related matters, please contact Russell McAvoy at (804) 698-4194 or by email at [Russell.McAvoy@deq.virginia.gov](mailto:Russell.McAvoy@deq.virginia.gov).

Sincerely,



Leslie A. Romanchik  
Hazardous Waste Program Manager  
Office of Waste Permitting and Compliance

Enclosures:

Permit Modification Pages, dated 4/18/2013

cc: Andrea Barbieri – EPA Region III (3LC50)  
Milton Johnston, Lisa Silvia – DEQ TRO  
Angela Alonso, Russ McAvoy, Jutta Schneider, Laura Galli – DEQ CO  
Julia King-Collins, Cynthia Houchens – DEQ, CO  
CO Files

Mrs. Marianne Simko, Environmental Manager – NASA GSFC WFF

The Main Base is a land area of 902 hectares (2,230 acres), bordered on the east by 6 kilometers (4 miles) of marshland, which separates it from Chincoteague Island. This area contains Wallops Headquarters, Administrative Offices, some tracking facilities, a range control center, rocket and fuel storage depots, rocket vehicle inspection facilities, several support shops, an approved FAA Airport, military family housing units, and bachelor's quarters.

Wallops Island and Wallops Mainland jointly comprise a land area of 1740 hectares (4,300 acres), and are located approximately 11 kilometers (7 miles) southeast of the Main Base. Wallops Island is connected to Wallops Mainland by a causeway and bridge that cross 3 kilometers (2 miles) of salt marsh, which is interlaced with small creeks and is bisected by the Intracoastal waterway. Wallops Island is approximately 11 kilometers (7 miles) long and 0.8 kilometers (0.5 miles) in width at its widest point. Wallops Island borders the Atlantic Ocean on the east, and the Chincoteague inlet on the north. Wallops Island was joined with Assawoman Island to the south when the inlet between them was closed by a storm in 1986. The inlet was temporarily reopened in 1987 but has since filled in and remains closed today.

Wallops Island contains the OB area, launch sites, blockhouses, rocket storage buildings, assembly shops, dynamic balancing facilities, U. S. Navy facilities, tracking facilities, and other related service support facilities. In 2003, an Unmanned Aerial Vehicle (UAV) runway was built on the access road just north of the OB area. Wallops Mainland provides a site for long-range radar, communications, and optical tracking installations. The relative locations and area boundaries of these three land areas of the Wallops Flight Facility and the OB area are illustrated on Figure II.AA-2.

The OB area located on the shoulder of the dike road at the southwestern corner of Wallops Island, consists of three subunits (ground embedded cylinders) and one open burning pad assembly. Two subunits, subunit 1 and subunit 3, are 0.6 meters (1.9 feet) in diameter, stand 0.8 meters (2.6 feet) above the ground surface, and are embedded 2.3 meters (7.5 feet) below the ground. One cylinder, Subunit 2, is 0.4 meters (1.4 feet) in diameter, stands 1.1 meters (3.5 feet) above the ground surface, and is embedded 2.2 meters (7.1 feet) below the ground surface. Subunit 4 is 0.7 meters (2.4 feet) in diameter, stands 1.10 meters (3.6 feet) above the ground surface, and is embedded 3.1 meters (10.2) feet below the ground surface. The subunits are covered when not in use to prevent entry and accumulation of precipitation. The subunits also have concrete bases to prevent contact between constituents, subsurface soils, and groundwater.

The open burning pad assembly is a 4.6 meters (15 feet) square by 46 centimeters (18 inches) thick concrete pad with a steel plate in the center for motor head attachment. Four cable tie downs are used to stabilize the motors.

Any rocket motor treated at the OB area, follows guidelines and measures, which have been approved by the WFF Safety Office. These procedures are included in Attachment II-CC. Simply stated, rocket motor and igniter are placed inverted into a cylinder or attached to the pad motor head assembly. The igniter is set off by battery hook-up behind a protective barrier. The distance between the barrier and burning area is specified in a ground safety plan prepared for each type rocket motor. Burned motors and igniters are inspected for visible signs of untreated material. If untreated material is present in the motor, then the motor is reignited or the material removed and reignited on the burn pad.

Occasionally, propellant is removed from a motor(s) when modifications are required. Propellant (not in a motor casing), ash, residue, or ejected material, are placed on the burn pad in a burn pan, a squib igniter is fabricated, and the material is ignited. Any unburnable material is containerized, sampled for characterization, if necessary, and any hazardous waste is disposed of through WFF's hazardous waste disposal contractor.

#### II.AA.2. Topographic Map

The topographic map, (Figure II.AA-3) developed by the United States Geological Survey, is a 7.5 minute series topographic quadrangle of Wallops Island. The contour interval is 1.5 meters (5 feet) with a scale of 2.54 centimeters equals 8,572.5 meters (1 inch:28,125 feet). An additional topographical map was prepared on May 27, 2003, at a scale of 2.54 centimeters equals 61 meters (1 inch equals 200 feet) and a contour interval of 0.25 meters (Figure II.AA-4). Figure II.AA-4 shows the OB area and a distance of 305 meters (1000 feet) around it. The map also includes map date, 100-year floodplain area, surface waters, map orientation, legal boundaries, monitoring wells, structures, and hazardous waste management units within the 1305-meter (1000-foot) surrounding area. Figure II.AA-4(b), shows the location of the new OB Subunit 4 in relation to the original OB Subunits, 1, 2, and 3. Subunit 4 was installed in 2012.

Access control (Figure II.DD-1), buildings (Figure II.AA-7), sanitary sewers (Figures IV.JJ-1 thru IV.JJ-8), Fire Department, Building X-15 (Figure II.AA-7), flood control (Figure II.AA-6), and solid waste

**Figure II.AA-4(b), Open Burn Subunits 1, 2, 3, and 4, and Burn Pad**

(Subunit 4 was installed in 2012.)

## 1.0 INTRODUCTION

This Waste Analysis Plan is required as part of the Resource Conservation and Recovery Act (RCRA) Part B Permit for Thermal Treatment of rocket motor propellants and igniters at the National Aeronautics and Space Administration Goddard Space Flight Center's Wallops Flight Facility (NASA GSFC's WFF) located at Wallops Island, Virginia. At Wallops Island, NASA uses Open Burning (OB) as the preferred method of treatment for rocket propellants and igniters because of the highly reactive nature of these materials. This method is considered the safest treatment method and is conducted in a manner to minimize impacts to the environment. In addition to addressing the waste analysis requirements, specified under 40 Code of Federal Regulations (CFR) Parts 264 and 270, this document addresses the specific requirements of the Subpart X regulations for "Miscellaneous Units".

### 1.1 Facility Description

The OB area located on the shoulder of the dike road at the southwestern corner of Wallops Island, consists of three subunits (ground embedded cylinders) and one open burning pad assembly. Two subunits, subunit 1 and subunit 3, are 0.6 meters (1.9 feet) in diameter, stand 0.8 meters (2.6 feet) above the ground surface, and are embedded 2.3 meters (7.5 feet) below the ground. One cylinder, Subunit 2, is 0.4 meters (1.4 feet) in diameter, stands 1.1 meters (3.5 feet) above the ground surface, and is embedded 2.2 meters (7.1 feet) below the ground surface. Subunit 4 is 0.7 meters (2.4 feet) in diameter, stands 1.10 meters (3.6 feet) above the ground surface, and is embedded 3.1 meters (10.2) feet below the ground surface. The subunits are covered when not in use to prevent entry and accumulation of precipitation. They also have concrete bases to prevent contact between constituents and subsurface soils. Figure D-2, D-3, and D-7 (Appendix A) are subunit assembly drawings and burn pad assembly drawings, respectively. The OB pad assembly is 4.6 meters (15 feet) square by 46 centimeters (18 inches) thick concrete pad with a steel plate in the center for motor head attachment. Four cable tie downs are used to stabilize the motors.

### 1.2 Process Description

The rocket motor and igniter are placed inverted into a cylinder or attached to the pad motor head assembly. The igniter is set off by battery hook-up behind a protective barrier. The distance between the barrier and burn area is specified in a ground safety plan prepared for each type of rocket motor. Burned motors and igniters are inspected for visible signs of untreated material. If untreated material is present in the motor, then the motor is re-ignited or the material removed and re-ignited on the burn pad.

### 1.3 Quantity of Waste

The maximum amount of propellant to be disposed of per year is 68 metric tones (75 tons). To date, the maximum amount of propellant burned in a year has been 20 metric tones (22 tons). Operationally up to eight small motors, i.e. Super Arcas, or 4 medium size motors, e.g., Taurus or Black Brant, could be burned in one day.

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Attachment II.BB – Waste Analysis Plan  
Appendix A, Maps and Drawings

Figure D-1, OB Area, Showing Installation of Subunit 4 in 2012

Attachment II.BB – Waste Analysis Plan  
Appendix A, Maps and Drawings

Figure D-7, OB Area, Subunit 4 Side View – Installation in 2012

**POST BURN OB AREA INSPECTION LOG**

EQUIPMENT/FACILITY	CONDITION	CORRECTIVE ACTION	COMMENTS
<b>Subunits Integrity</b>			
<b>Subunit 1</b>			
Rain Cap			
<b>Subunit 2</b>			
Rain Cap			
<b>Subunit 3</b>			
Rain Cap			
<b>Subunit 4</b>			
Rain Cap			
<b>Pad Integrity</b>			
Concrete			
Tie-Down Cables			
Tie Down Anchors			
<b>Berm Integrity</b>			
Concrete			
<b>Pad Cover Integrity</b>			
Roof			
Structure			
<b>Pan Integrity</b>			
Steel			
<b>Residues</b>			

EQUIPMENT/FACILITY	CONDITION	CORRECTIVE ACTION	COMMENTS
<b>Soil Survey</b>			
<b>Pad Survey</b>			
<b>Other Miscellaneous</b>			

**REMARKS:**

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**OB OPERATIONS:**

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**INSPECTED BY:** \_\_\_\_\_ **TITLE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_ **TIME:** \_\_\_\_\_

The net result of these fluctuations in flow gradients causes lateral flow to the east and west with moderate flow to the north and south during peak high and low tides.

Seven monitoring wells were installed in September 1998. Data used to characterize the water table aquifer was collected from slug tests conducted on monitoring well 1. The test results indicated a hydraulic conductivity (K) of 30 meters per day (100 feet per day) and a transmissivity of 0.004 square meters per second (0.046 square feet per second). Groundwater flow is generally to the northeast.

## 4.2 Open Burning Area

Open Burning is considered the safest treatment method for hazardous waste rocket motors and igniters and is conducted in a manner to minimize impacts to the environment. The rocket motors and igniters are considered hazardous waste because they meet the characteristic of reactivity (D003). HCOCs are discussed in Section 6.0. The OB area (Appendix A, Figures A-4 and A-5), located on the shoulder of the dike road at the southwestern corner of Wallops Island, consists of three subunits (ground embedded cylinders) and one open burn pad assembly. Subunits 1 and 3 are vertical steel cylinders made from Taurus rocket motor casings (Appendix A, Figure A-6.). Subunits 1 and 3 are 0.6 meters (1.9 feet) in diameter, stand 0.8 meters (2.6 feet) above the ground surface, and are embedded 2.3 meters (7.5 feet) below the ground and filled with concrete as indicated in Appendix A, Figure A-6. Subunit 2 is a vertical steel cylinder made from a Nike rocket motor casing. Subunit 2 is 0.4 meters (1.4 feet) in diameter, stands 1.1 meters (3.5 feet) above the ground surface, and is embedded 2.2 meters (7.1 feet) below the ground surface. Subunit 2 also is filled with concrete as indicated in Appendix A, Figure A-6. . Subunit 4 (Figure A-8) is 0.7 meters (2.4 feet) in diameter, stands 1.10 meters (3.6 feet) above the ground surface, and is embedded 3.1 meters (10.2 feet) below the ground surface. The subunits 1, 2, and 3 were constructed around 1989. Subunit 4 was installed in 2012.

The open burn pad assembly (Appendix A, Figure A-7) is a 4.6 meters (15 feet) square by 46 centimeters (18 inches) thick concrete pad with a steel plate in the center for motor head attachment. The unit is equipped with a burn pad cover and is surrounded by a berm. Four cable tie downs are used to stabilize the motors. The pad was constructed around 1996.

The OB area is within the 100-year floodplain. The subunits are covered when not in use to prevent entry and accumulation of precipitation. The subunits also have concrete bases to prevent contact between constituents, subsurface soils, and groundwater. A berm and cover for the pad has been designed and will be in use prior to the permit approval. Runoff, which should not come in contact with contaminated media, is directed across the access road to the east and north and across vegetation to the south and west. Runoff is not collected and does not impact other drainage structures on the Island. Runoff from the OB area infiltrates into the sandy soil surrounding the units. Since the OB area will not have a point source or a storm water collection system, a Virginia Pollutant Discharge Elimination System (VPDES) Permit is not required.

Any rocket motor treated at the OB area, follows guidelines and measures, which have been approved by the WFF Safety Office. The rocket motor and igniter are placed inverted into a cylinder or attached to the pad motor head assembly. The igniter is set off by a battery hook-up

**Modification Date 4/18/2013**

Attachment II.GG. Exhibit II.GG-1, Closure Plan  
Appendix A – Figures

Figure A-8, Open Burn Area Subunit 4 – Side View  
Installation in 2012

## **ATTACHMENT II.HH – PLANS AND SPECIFICATIONS FOR OPEN BURN UNITS**

### II.HH-1. Physical Characteristics, Materials of Construction, and Dimensions

#### II.HH.1.1. General

Open burning of rocket motor propellants and igniters is performed at the southwestern corner of Wallops Island. The area is located on the shoulder of a 3.7 meters (12 foot) wide asphalt access road. Four subunits and one open burning pad assembly are used for open burning of the rocket motor propellants and igniters. The subunits and burn pad run roughly parallel to the roadway at a distance of 0.9 meters (3.0 feet) to 1.5 meters (5.0 feet) west of the road (Figure II.HH-1). Figure II.HH-2 is a subunit assembly drawing. Figure II.HH-3 is the burn pad assembly drawing. Figures II.HH-4 and II.HH-5 detail the burn pad berm and cover, respectively. Figure II.HH-6 is the burn pans.

#### II.HH.1.2 Subunits

The individual subunits are described as follows from north to south:

- The open burning pad assembly is a 4.6 meters (15 feet square) by 46 centimeters (18 inches) thick concrete pad with a 0.41 meter (16 inch) high berm and a steel plate in the center for motor head attachment. Four cable tie downs are used to stabilize the motor. Two 0.3 meter by 0.6 meter (12 inch by 24 inch) carbon steel burn pans are used for burning propellant trimmings or residue on the burn pad. The 4.6 meters (15 feet square) pad cover is attached to the berm with tie down straps and screw anchors. Lift eye bolts are attached to the roof and are used to remove the roof for OB operations.
- Subunit No. 1 and 3 are vertical steel cylinders made from Taurus rocket casings with an outside diameter (OD) of 56 centimeters (23 inches). The subunit is 78 centimeters (31 inches) above and 229 centimeters (90.2 inches) below the ground surface. The total length of Subunit No. 1 is 307 centimeters (121.2 inches).
- Subunit No. 2 is a vertical steel cylinder made from a Nike rocket casing with an outside diameter (OD) of 42 centimeters (16.5 inches). The subunit is 107 centimeters (42 inches) above and 191 centimeters (75.2 inches) below the ground surface. The total length of Subunit No. 2 is 323 centimeters (127.2 inches). The top

**ATTACHMENT II.HH**

**PLANS AND SPECIFICATIONS FOR OPEN BURN UNITS**

**Figure II.HH-2(b), Open Burning Subunit 4 - Side View  
Installation in 2012**



**ATTACHMENT II.HH**

**PLANS AND SPECIFICATIONS FOR OPEN BURN UNITS**

**Open Burning Subunit 4 Design Plans and Specifications  
Submittals dated January 25, 2012, Revision 1, April 27, 2012, and May 2, 2012  
Installation in 2012**

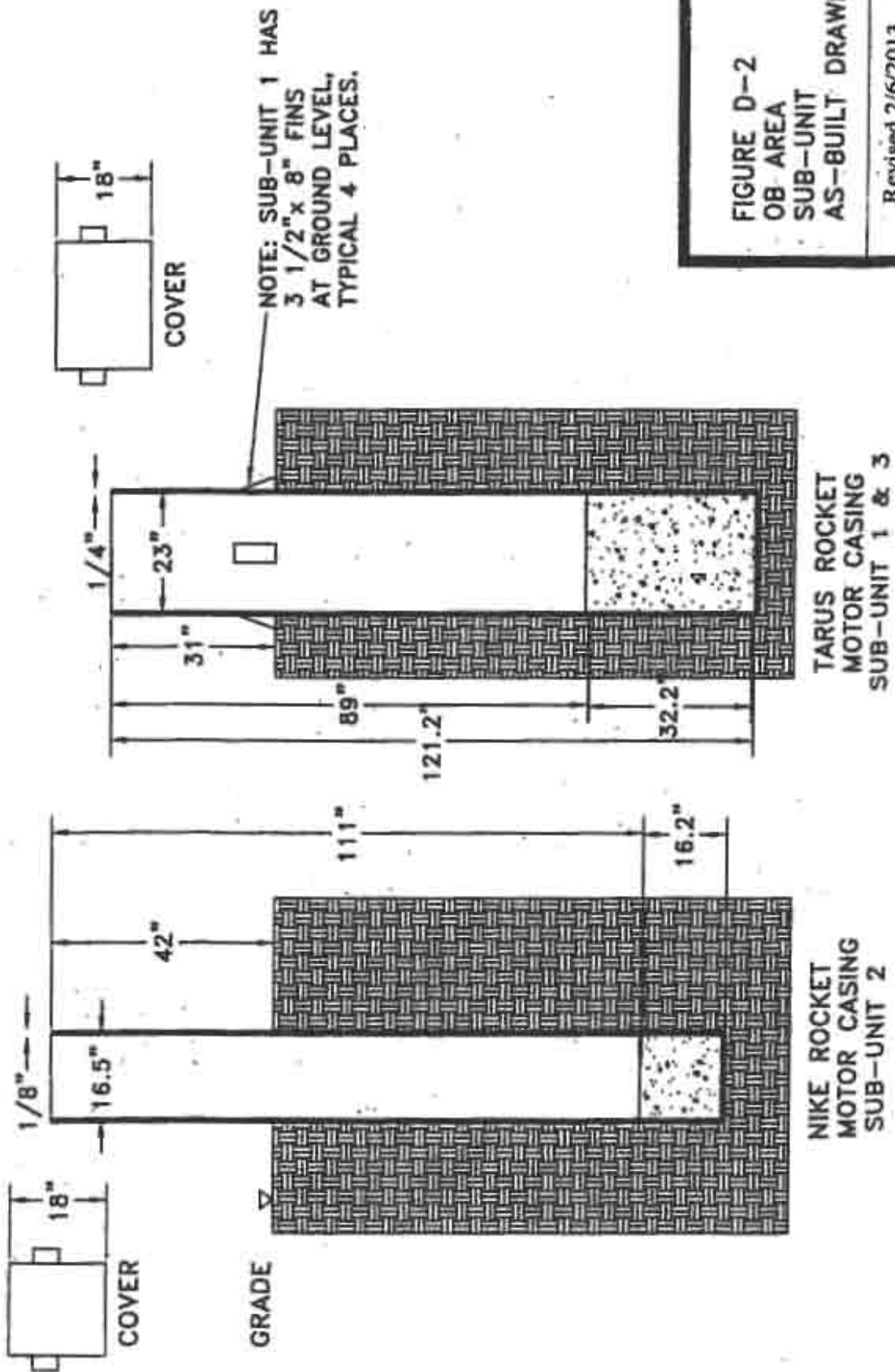


FIGURE D-2  
OB-AREA  
SUB-UNIT  
AS-BUILT DRAWINGS

Revised 2/6/2013

Figure II-4, H.2.4 Mobile Analysis Plan for Security in Post-Closure Plan

Figure II-4, H.2.4