1.4 Professional Engineer Certification

"112.3(d): Except as provided in §112.6, a licensed Professional Engineer must review and certify a Plan for it to be effective to satisfy the requirements of this part. (1) By means of this certification the Professional Engineer attests: (i) That he is familiar with the requirements of this part ; (ii) That he or his agent has visited and examined the facility; (iii) That the Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of this part; (iv) That procedures for required inspections and testing have been established; and (v) That the Plan is adequate for the facility. (vi) That, if applicable, for a produced water container subject to §112.9(c)(6), any procedure to minimize the amount of free-phase oil is designed to reduce the accumulation of free-phase oil and the procedures and frequency for required inspections, maintenance and testing have been established and are described in the Plan. (2) Such certification shall in no way relieve the owner or operator of a facility of his duty to prepare and fully implement such Plan in accordance with the requirements of this part."

In accordance with 40 CFR 112.3(d), I hereby certify that I or my agent has visited and examined the facility, and being familiar with the provisions of 40 CFR 112, attest that the Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of this part, the procedures for required inspections and testing have been established, and that the Plan is adequate for the facility.

This certification in no way relieves the owner or operator of the Facility of his or her duty to prepare and fully implement this Plan in accordance with the requirements of 40 CFR 112. This Plan is valid only to the extent that the Facility owner or operator maintains, tests, and inspects equipment, containment, and other devices as prescribed in this Plan.

Desiree S Halsor
Signature

35101
License Number

Desiree S Halsor
Name

24 June 2024
Date

SECTION 2

General Facility Information

Facility Owner/Operator:	U.S. Army
Facility Name:	Fort Knox
Address:	Garrison Commander Fort Knox 111 East Chaffee Avenue Fort Knox, Kentucky 40121
Telephone:	502-624-1000 (Operator)

2.1 Facility Description

"112.7(a)(3): Describe in your Plan the physical layout of the facility and include a facility diagram, which must mark the location and contents of each container. The facility diagram must include completely buried tanks that are otherwise exempted from the requirements of this part under §112.1(d)(4). The facility diagram must also include all transfer stations and connecting pipes."

Fort Knox is on a 109,000-acre plot about 35 miles southwest of Louisville, Kentucky. Fort Knox stretches into Bullitt, Meade, and Hardin Counties with the cantonment area located primarily in Hardin County. The towns of West Point, Radcliff, Vine Grove, and Lebanon Junction are in the immediate vicinity of the installation. The City of Muldraugh is within the installation boundaries and the City of Elizabethtown is 15 miles south of Fort Knox. The garrison is in central Kentucky which straddles the Mississippian (or Pennyroyal) Plateau and Blue Grass Regions. The Mississippian Plateau is characterized by karst topography, including rolling hills, caves, and natural springs. The Blue Grass Region is similar in characterization.

The electrical system at Fort Knox has been privatized and is owned, operated, and maintained by the Nolin Rural Electric Cooperative Corporation (or simply Nolin). Nolin has implemented an inspection, testing, and maintenance program for regulated ASTs under their control (including electrical transformers). Nolin follows Fort Knox's spill response procedures, is responsible for any spills or discharges originating from their equipment, and closely coordinates spill prevention and response activities with EMD.

There are two COCO fuel points on Fort Knox operated by Louis Berger Services, Inc.: 9th Calvary Regiment non-tactical retail terminal and the Frazier Road tactical bulk retail terminal. Louis Berger Services, Inc. maintains an SPCC Plan for these locations and is responsible for any spills or discharges originating from their equipment. Louis Berger Services, Inc. closely coordinates spill prevention and response activities with EMD.

There are multiple ASTs that serve emergency generators associated with telecommunications equipment. This equipment is owned by several different telecommunications companies who have established spill reporting policies posted on the exterior of their properties. Refer to Table 4-1 for a list of notifications for each telecommunication company. There are two GBTs that serve emergency generators located at the two Abound Credit Union buildings. EMD does not have access to this equipment and can only report observed discharges.

SPILL RESPONSE PROCEDURES

EXTREMELY IMPORTANT

CHEMICAL OR OIL SPILLS MUST BE KEPT FROM ENTERING DRAINAGE SYSTEMS OR WATERWAYS

STEP 1 If spill poses a significant safety, health or environmental hazard, evacuate the area and call 911. Wait for emergency response personnel to arrive.

STEP 2 Review the Safety Data Sheet (SDS) to select and wear the appropriate Personal Protection Equipment (PPE)

STEP 3 Shut off source of spill, if possible.

STEP 4 Contain spill with proper absorbents in assigned spill kit(s). Place boom(s) downstream if spill enters a waterway.

STEP 5 Report any spill larger than a minor housekeeping spill, to 911 and Environmental Management Division (EMD) 502-624-3629 immediately. Identify your location with specific building numbers and a street address.

STEP 6 Initiate cleanup and containerize contaminated material for proper disposal.

STEP 7 Decontaminate personnel and equipment if necessary.

STEP 8 Supervisor completes Spill Incident Report, FK1083 and provides a copy of the report to EMD:
usamy.knox.id-training.mbx.dpw-emd-info@army.mil

RANGE AND TRAINING AREA SPILL RESPONSE PROCEDURES

EXTREMELY IMPORTANT

CHEMICAL OR OIL SPILLS MUST BE KEPT FROM ENTERING DRAINAGE SYSTEMS OR WATERWAYS

STEP 1 ➤ **REPORT ALL SPILLS TO RANGE CONTROL AT 502-624-2145**
If spill poses a significant safety, health or environmental hazard, evacuate the area and call 911. Wait for emergency response personnel to arrive.

STEP 2 Review the Safety Data Sheet (SDS) to select and wear the appropriate Personal Protection Equipment (PPE)

STEP 3 Shut off source of spill, if possible.

STEP 4 Contain spill with proper absorbents in assigned spill kit(s). Place boom(s) downstream if spill enters a waterway.

STEP 5 Initiate cleanup and containerize contaminated material for proper disposal.

STEP 6 Decontaminate personnel and equipment if necessary.

STEP 7 Commander/Supervisor completes Spill Incident Report, FK1083 and provides a copy of the report to Environmental Management Division:
usamy.knox.id-training.mbx.dpw-emd-info@army.mil

The potential for a drum rupture is very low because the drums are not stored near vehicle traffic, do not stay outside long enough for corrosion to become significant, and are unlikely to be damaged during handling. The containment provided for DSAs (or individual drums) is of sufficient size to contain the standard 55-gallon drum, as required.

Filling or emptying a drum is a likely discharge scenario. Drums are stored in secondary containment or indoors, thus minimizing a release during an overfill situation. Absorbent materials are available at DSAs to address any release during filling operations.

4.2.4 Oil-Filled Operational Equipment

OFOE are considered low risk for potential spills based on their design, operation, and preventive maintenance program. Nolin's inspection program helps ensure that all equipment is maintained and monitored. Any identified leaks should be reported and corrected promptly. Nolin conducts regular inspections of electrical transformers which includes a preventive maintenance program. Refer to **Appendix A** for an inventory of regulated OFOE at the Fort Knox. Additional rationale for Fort Knox's ability to rely on spill response to satisfy this requirement is included below:

- There is no documented case of oil from an electrical transformer reaching navigable waters at Fort Knox. If an electrical transformer or other high-voltage electrical equipment were to fail, causing a leakage of oil, the affected electrical systems would be shut down. Thus, operating personnel would immediately know that transformer damage or oil leakage may have occurred and would react expeditiously to inspect the area and control any oil leaks.
- Secondary containment is not provided for outdoor high-voltage electrical equipment because it would represent a potential safety hazard for personnel who enter these areas. Standing rainwater, which is a common occurrence in diked areas, poses an unreasonable risk of electrical shock to maintenance employees.

Fort Knox is manned by law enforcement and fire and emergency services personnel, 24 hours per day, 365 days per year. Personnel are trained to make the proper notifications if an oil release is discovered (refer to **Section 4.1**). Fort Knox has an adequate spill response program for addressing such discoveries. Refer to **Section 4.1**, Fort Knox's RCRA Contingency Plan, and Fort Knox's SWGWPPP for more information pertaining to the manpower and resources available should there be a discharge from OFOE.

4.2.5 Piping

4.2.5.1 Aboveground Pipelines

There are typically two potential spill scenarios for aboveground pipelines (including container piping): rupture and corrosion. The potential for pipe failure depends upon the conditions at each site and the types of inspections performed. Pipeline inspections include monthly visual inspections. Refer to **Section 6** for details of these inspections. Most piping is in areas in where an AST and emergency electrical generator is located. These areas are provided with spill kits or stocked spill response material to provide active containment in accordance with §112.7(c). Details related to potential spill rate of flow and total quantity of oil which could be discharged are presented in **Appendix F**.

Pipe rupture from impact can result in a large spill quantity if the anti-siphon devices are damaged or not present at all. In this scenario, the size of the spill can be increased if the equipment is operating and fuel is being pumped through the breached return line.

A more likely scenario would be a pin-hole leak in the fuel supply or return line. This leak would be expected to drip fuel during equipment operation and leak the remaining contents left in the line after operation. Practices should include regular generator checks while equipment is in operation, thus mitigating the chance of a major discharge.

Pipe failure due to corrosion usually occurs at threaded or flanged connections or improperly welded joints. If the equipment is not being operated, the potential exists for the supply line quantity to drain from the equipment to the anti-siphon device. In the event the equipment is being operated at the time of the failure, the largest spill would occur when the return line fails causing the equipment to pump POL through the leaking piping until discovered, or the contents of the container are emptied. Corrosion failure is a likely occurrence if the maintenance is not performed as needed and usually results in a small spill rate.

DPW maintains procedures and contracted personnel to run regular generator checks during routine or emergency operations. These personnel and procedures are designed to ensure the equipment is properly operating, check for leaks, and ensure the equipment is in good shape. The operators performing these inspections will be equipped with spill kits and be trained on the appropriate response procedures. A combination of the pre-deployed on-site spill kits, and/or mobile spill kits will be used to control piping leaks which may occur. 40 CFR 112.7(c) applies to piping, and it requires either an active (spill response kit) or passive (structural) method of secondary containment, to address the typical failure mode, and the most likely quantity of oil that may be discharged. Refer to the assumptions and calculations in **Appendix F**.

4.2.5.2 Flexible Hoses

For ASTs with flexible piping and at fueling dispensers with flexible hoses, the two potential spill scenarios are the hose becoming disconnected, or the hose is leaking. ASTs that use fuel compatible hoses should utilize factory approved clamping systems to ensure tight connections from the AST to the generator.

The supply and return fuel lines or dispenser lines can be disconnected by a loose fitting or poorly applied clamping system. In this scenario, the greatest potential spill would result if the return line from the generator separated during operation. On ASTs that are equipped with a fuel dispenser, the flexible hose should be inspected prior to each use, to verify that it is not damaged, disconnected or leaking.

The supply and return fuel lines in the generator could start to leak due to cuts, cracks, or degradation of hose material. In this scenario, the greatest potential spill would result if the return line from the generator is leaking during operation.

Active spill control and containment measures are required for the various spill scenarios for piping and hoses associated with these remote containers. As stated in **Section 4.2.5.1**, DPW maintains procedures and personnel to inspect, run, and check emergency generators and associated ASTs for proper operation and leaks. The operators performing these inspections will

be equipped with spill kits and be trained on the appropriate response procedures. A combination of the pre-deployed on-site spill kits, and/or mobile spill kits on a refueler or maintenance truck, should be able to control the piping leaks which may occur. Refer to the assumptions and calculations in **Appendix F**.

4.3 Discharge or Drainage Controls

"112.7(a)(3)(iii): Describe in your Plan discharge or drainage controls such as secondary containment around containers and other structures, equipment, and procedures for the control of a discharge;"

"112.8(c)(10): Promptly correct visible discharges which result in loss of oil from the container, including but not limited to seams, gaskets, piping, pumps, valves, rivets, and bolts. You must promptly remove any accumulations of oil in diked areas."

Refer to **Table 2-2** and **Appendix B** for a description of containment, location, diversionary structures, discharge, and/or drainage controls. Generally, if an AST or transfer area is equipped with a containment dike, drainage is restricted by using a ball valve or post-indicator valve (or similar) that is maintained in the "closed" position. The valve is opened when there is no observed sheen and accumulated water is being released. In transfer areas, the post indicator valve (PIV) may be maintained open if the area drains to an OWS. The PIV is closed when fuel transfers are occurring. **Section 5** contains information on secondary containment for ASTs, fuel transfer areas, DSAs, piping, mobile refueler parking, and OFOE.

Procedures have been established for users to inspect diked areas for signs of petroleum contamination (e.g., odor, sheen) on a periodic basis (e.g., prior to draining the containment area or within one week of rainfall event). See **Appendix C** for sample checklists that may be used for secondary containment drainage. In addition, procedures are in place to repair leaking valves, bolts, or other components to prevent a spill or a discharge to navigable waters.

Fort Knox has multiple spill kits for a rapid response to mitigate and clean up small discharges only. For more information, refer to **Section 4.1** and the Fort Knox RCRA Contingency Plan and SWGWPPP. Fort Knox practices stringent discharge prevention protocols during transfer operations in accordance with local fuel procedures. These procedures are maintained by EMD.

All contractors providing service to Fort Knox that are regulated by this SPCC Plan will adhere to the minimum spill prevention practices during transfer operations as outlined in **Section 9.2.**

4.4 Disposal of Recovered Materials

"112.7(a)(3)(v): Describe in your Plan methods of disposal of recovered materials in accordance applicable legal requirements;"

The methods of disposal of recovered spill materials are outlined in the **Fort Knox RCRA Contingency Plan**.

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SECTION 5

Secondary Containment

5.1 Requirements

112.7(c): Provide appropriate containment and/or diversionary structures or equipment to prevent a discharge as described in §112.1(b). The entire containment system, including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system, such as a tank, will not escape the containment system before cleanup occurs. In determining the method, design, and capacity for secondary containment, you need only to address the typical failure mode, and the most likely quantity of oil that would be discharged. Secondary containment may be either active or passive in design. At a minimum, you must use one of the following prevention systems or its equivalent:

(1) For onshore facilities:
(i) Dikes, berms, or retaining walls sufficiently impervious to contain oil;
(ii) Curbing;
(iii) Culverting, gutters, or other drainage systems;
(iv) Weirs, booms, or other barriers;
(v) Spill diversion ponds;
(vi) Retention ponds; or
(vii) Sorbent materials."

There are four sections of 40 CFR 112 which specify requirements for secondary containment. 40 CFR 112.7(c) is the general containment requirement, with no specific size or capacity limits, which applies to all ASTs, equipment, and systems on a facility where a discharge could occur. This rule also applies to fuel piping, flexible hoses, fill pipes, fueling stations and other fuel transfer areas without a loading rack, mobile refuelers and their parking areas. Either an active or passive means of containment may be used to control the most likely quantity of oil that may be discharged. Active means the facility has a process or procedure, with trained personnel and spill response equipment available, which can be used for spill cleanup. Passive means the facility has a dike, berm, or other structure to contain the container, piping, or fuel transfer area. This general rule is supplemented by additional specific size containment requirements, which apply to certain types of containers and equipment as follows.

40 CFR 112.8(c)(2) is a containment requirement specifically for stationary ASTs (but NOT piping), which must include the maximum capacity of a AST, plus sufficient freeboard for precipitation (if the containment is exposed to rainfall). You must ensure that diked areas are sufficiently impervious to contain discharged oil. See **Section 5.2**.

40 CFR 112.8(c)(11) is a containment requirement specifically for portable oil storage containers (but NOT mobile refueler trucks), applicable to the 55-gallon DSAs and used cooking oil containers, which must include the capacity of the largest container in the area, plus sufficient freeboard for precipitation (if the containment is exposed to rainfall). See **Section 5.3**.

40 CFR 112.7(h)(1) is a containment requirement specifically for loading / unloading racks (as defined in 40 CFR 112.2), which must include the capacity of the largest mobile refueler truck but does NOT include freeboard for precipitation. See **Section 5.4**.

Secondary containment for fuel transfer piping and fuel transfer areas are addressed in **Section 5.5.** Secondary containment for OFOE is addressed in **Section 5.6**. Impracticability of Secondary Containment is discussed in **Section 5.7**.

5.2 Secondary Containment for ASTs

"112.8(c)(2) Construct all bulk storage tank installations (except mobile refuelers and other non-transportation-related tank trucks) so that you provide a secondary means of containment for the entire capacity of the largest single container and sufficient freeboard to contain precipitation. You must ensure that diked areas are sufficiently impervious to contain discharged oil. Dikes, containment curbs, and pits are commonly employed for this purpose. You may also use an alternative system consisting of a drainage trench enclosure that must be arranged so that any discharge will terminate and be safely confined in a facility catchment basin or holding pond."

5.2.1 Freeboard for Precipitation

Secondary containment must be sized to contain the entire contents (maximum shell capacity) of the largest AST, plus adequate freeboard to collect precipitation, for those open containment areas located outdoors. The SPCC Guidance for Regional Inspectors (GRI), Section 4.3.2 (2013 version), allows the certifying P.E. to consider either 110 percent of container capacity, or the inclusion of calculations relative to a 25-year, 24-hour storm as the defining volume required. Freeboard is measured as vertical inches of rainfall allowance within an open containment. For this Plan, the precipitation event has been chosen as the most conservative method of determining freeboard. The 25-year, 24-hour storm event for Fort Knox, Kentucky, is 5.58 inches, or 0.47 feet (https://hdsc.nws.noaa.gov/hdsc/pfds/index.html).

Table 5-1 provides freeboard volume calculations for open secondary containments for single-walled ASTs only.

Stormwater that may accumulate in the containment area must be inspected for contamination prior to discharge and documented on the log form in **Appendix C**.

5.2.2 Sufficiently Impervious

40 CFR 112.8(c)(2) states that diked areas must be sufficiently impervious to contain discharged oil. Materials used for making the containment should themselves not be impervious but must be made impervious to contain discharged oil. Double-walled ASTs have integral containments, which are assumed to be sufficiently impervious, unless external leaks or structural damage is found. The sufficiently impervious requirement is evaluated during monthly visual inspections by looking for leaks and by considering the ability of the containment material to retain oil so that a discharge will not escape the containment system before cleanup occurs. If the material is not impervious to oil, then an additional layer of spill protection must be added, such as oil proof membrane on top of natural earth berms. If concrete is used for containment, interior separated cracks or inadequately sealed joints, should be repaired with sealant as needed to retain oil. Excessive growth of weeds and vegetation in containment joints and cracks should be removed.

5.2.3 Shop-fabricated Tanks

Fort Knox utilizes various types of secondary containment for ASTs. The types of secondary containment include open berms and dikes, integral closed top dikes, double-walled ASTs with sealed containments, and single-walled ASTs with open containments. In cases where ASTs have sealed interstitial spaces, leak detection probes monitor the space for fuel or water. **Table 5-1** provides volume calculations for open secondary containments, for fixed position single-walled ASTs only. For ASTs located inside a building, mechanical room, or other walled enclosure, having adequate freeboard in the containment to collect precipitation is not applicable (N/A) if the AST is not exposed to rainfall. This table does not apply to mobile or portable containers, or used cooking oil containers, which are listed on **Table 5-2** or **Table 5-3**. Out of service and permanently closed ASTs are not listed for containment evaluation.

Double-walled ASTs are listed on **Table 2-2** and are manufactured such that the secondary containment wall or barrier is sufficiently impervious to hold leaked oil, and it will hold at least 110 percent of the primary container capacity. Double-walled ASTs are manufactured with an interstitial containment space, which is normally not accessible to be measured for volume. If the interstice is properly contained, having adequate freeboard to collect precipitation is not a factor to consider. ASTs with closed, steel containment dikes are assumed to be double-walled.

TABLE 5-1: Secondary Containment Volumes

AST Number	Volume[1]	Freeboard Volume[2,3,4]	Total Volume Required Including Freeboard	Total Existing Berm Volume[5]	Remarks
869-T1	200	N/A	200	332	Inside of a building
869-T2	200	N/A	200	332	Inside of a building
2942-T1	120	N/A	120	146	Inside of a building
5242-T3-T6	15,000 ea.	1,502 ea.	16,502 ea.	16,673 ea.	Meets 25-year, 24-hour storm event
7207-T2	250	N/A	250	300	Inside of a building
7422-T1	3,000	532	3,532	3,443	Meets 110 percent of shell capacity; does not meet 25-year, 24-hour storm event
9359-T3	500	N/A	500	591	Inside of a building.
9359-T4	275	N/A	275	546	Inside of a building.
9359-T5	275	N/A	275	546	Inside of a building.
9387-T1	10,000	1,519	11,519	11,848	Covered area, susceptible to rainwater accumulation
9387-T2	10,000	1,519	11,519	11,848	Covered area, susceptible to rainwater accumulation

Notes: All volume quantities in gallons. Calculations are provided in Appendix F.

1. Information on this page was gathered from the site visit in March 2020.
2. Required Freeboard Volume for a 25-year, 24-hour storm event based on NOAA's Precipitation Frequency Da Server http://hdsc.nws.noaa.gov/hdsc/pfds/index.html.
3. N/A = not applicable as AST is under cover

Equations Used:

4. (Length) × (Width) × (Freeboard Volume of 0.47) × 7.48 gallons per cubic feet (gal/ft^3)
5. (Length)*(Width)*(Height)*7.48 gal/ft^3

Below is an example of the containment volume calculations for 7422-T1.

Required Freeboard Volume (Vol) for Precipitation

Equation Example: (Length × Width × Freeboard × 7.48)

Vol = 18.9 ft × 8 ft × 0.47 ft ×7.48 gal/ft^3

Vol = 532 gallons

Total Existing Berm Volume

Equation Example: (Length × Width × Height × 7.48) – Foundation Obstruction Volume

Vol = 18.92 ft × 8 ft × 3.04 ft × 7.48 gal/ft^3

Vol = 3,442 gallons

Total Required Volume w/Freeboard Volume

Vol = Volume (3,000) + Freeboard Volume (532)

Vol = 3,532 gallons

As shown in **Table 5-1**, 7422-T1 does not have adequate secondary containment volume to meet the expected rainfall associated with a 25-year, 24-hour storm event. It meets the 110 percent storage capacity allowed by the SPCC GRI. As a short-term corrective action, a spill kit has been placed in the vicinity of this AST. Long term corrective action would be to replace the AST when funding is available. All the remaining single-walled ASTs have satisfactory sized containments.

Industry Standard Considerations

(National Fire Protection Association [NFPA] 30 2012) 22.11.4 Secondary Containment–Type ASTs. Where a secondary containment–type tank is used to provide spill control, the tank will meet all the requirements of 22.11.4.1 through 22.11.4.10.

The capacity of the listed primary tank will not exceed the capacities given in the chart.

- All piping connections to the tank will be made above the maximum liquid level.
- Means will be provided to prevent the release of liquid from the tank by siphon flow.
- Means will be provided for determining the level of liquid in the tank. This means will be accessible to the delivery operator.
- Means will be provided to prevent overfilling by sounding an alarm when the liquid level in

Maximum Capacities for Secondary Containment-Type ASTs		
Liquid Classification	Capacity	
	Gallons	Liters
I	12,000	45,424
II and IIIA	20,000	75,708

the tank reaches 90 percent of capacity and by automatically stopping delivery of liquid to the tank when the liquid level in the tank reaches 95 percent of capacity.

- In no case will these provisions restrict or interfere with the functioning of the normal vent or the emergency vent.
- Spacing between adjacent tanks will be not less than 3 feet (0.9 meter).
- The tank will be capable of resisting the damage from the impact of a motor vehicle, or collision barriers will be provided.
- Where the means of secondary containment is enclosed, it will be provided with emergency venting in accordance with NFPA 30 2012, Section 22.7.
- Means will be provided to establish the integrity of the secondary containment, in accordance with Chapter 21 of NFPA 30 2012.
- The secondary containment will be designed to withstand the hydrostatic head resulting from a leak from the primary tank of the maximum amount of liquid that can be stored in the primary tank.

5.3 Secondary Containment for Mobile and Portable Containers

"112.8(c)(11) Position or locate mobile or portable oil storage containers to prevent a discharge as described in 112.1(b). Except for mobile refuelers and other non-transportation-related tank trucks, you must furnish a secondary means of containment, such as a dike or catchment basin, sufficient to contain the capacity of the largest single compartment or container with sufficient freeboard to contain precipitation."

5.3.1 Portable Generators and Tanks

There is one portable AST located at Fort Knox. Diesel Trailer, no container number is portable, double-walled and situated on top of a trailer. This AST is stored inside of a concrete containment berm at the Godman Army Airfield. The capacity is 995 gallons. Refer to the Fort Knox GIS and **Table 2-2** for more information.

5.3.2 Mobile Refueler Trucks

40 CFR 112.7(c) is the general containment requirement with no specific size or capacity limits, which applies to all mobile refuelers while parked in their normal storage areas. Either an active or passive means of containment may be used to address the typical failure mode and to control the most likely quantity of oil that may be discharged. There is no freeboard for precipitation requirement. At Fort Knox, there are three areas where mobile refuelers are parked: Godman Army Airfield, Kentucky Maneuver Area Training Equipment Site (MATES), and the Mansfield Maintenance Complex.

At Godman Army Airfield, two mobile refuelers are parked at the covered and bermed fuel transfer area between Buildings 5220 and 5222. The mobile refuelers are 3,000 gallons in capacity and contain F-24. This is also the location of the Godman Army Airfield Fuel Farm.

Drainage from the area is contained within the secondary containment berm and then directed through an OWS before entering the stormwater drainage system and discharging to Otter Creek. Drainage of the containment area is controlled by nearby PIVs that are kept in the closed position. Emergency shut-offs and spill kits are available at the Godman Army Airfield Fuel Farm.

Other types of mobile refuelers (e.g., tactical refueler vehicles) are located at Kentucky MATES and Mansfield Maintenance Complex. Refer to **Appendix B** and the Fort Knox GIS for location-specific information about storage arrangements within each complex. The total number of tactical refuelers may change based on the operational tempo and training requirements of units at Fort Knox. Tactical refuelers are typically parked empty in paved lots where drainage is directed to on-site OWS. In instances where tactical refuelers are parked full, they are located inside pop-up containment dikes which do not have drain valves or on-top of steel, drive-on containment dikes, which do have drain valves.

Liquid level and overfill protection are further described in **Section 6.4.3**. When filling or emptying the contents of mobile and portable containers, the transfer process should be in accordance with **Section 9.2.**

Stormwater that accumulates in containment areas must be inspected for contamination prior to discharge and documented on the log form in **Appendix C**.

TABLE 5-2: Secondary Containment Volumes Mobile or Portable Containers

Area	Container Volume[1]	Freeboard Volume[2,3]	Total Volume Required Including Freeboard	Total Existing Volume[4]	Remarks
Godman Army Airfield Fuel Farm (Storage)	995	N/A	995	13,392	Adequate containment
Godman Army Airfield Fuel Farm (Transfer)	3,000	N/A	400[5]	8,984	Adequate containment
Kentucky MATES & Mansfield Maintenance Complex	2,500	N/A	2,500	≥ 2,500	Adequate containment

Notes: All volume quantities in gallons

1. Information on this page was gathered from the site visit in March 2020.
2. Required Freeboard Volume for a 25-year, 24-hour storm event based on NOAA's Precipitation Frequency Data Server http://hdsc.nws.noaa.gov/hdsc/pfds/index.html.

Equations Used:

3. For mobile refueler parking, freeboard volume is N/A.
4. (Length)*(Width)*(Height)*7.48 gal/ft^3
5. General secondary containment for the most likely quantity of oil spilled is required for mobile refuelers. This is calculated in **Appendix F**.

5.3.3 DSAs and Used Cooking Oil Containers

40 CFR 112.8(c)(11) is a containment requirement specifically for portable oil storage containers, including DSAs and used cooking oil containers. Secondary containment must include the capacity of largest container present, plus sufficient freeboard for precipitation (if the containment is exposed to rainfall). **Appendix A** contains a listing of DSAs as well as used cooking oil containers at Fort Knox.

Drums at Fort Knox are stored in a variety of configurations, such as indoors in containment dikes or on top of spill containment pallets or outdoors in covered containment areas or hazardous material sheds. Drums are 55 to 65 gallons in capacity and single-walled. Each storage area provides enough containment capacity for the single largest container. Outdoors storage areas are either enclosed or covered with enough capacity for minor rainwater accumulation. DSAs are permanently established at specific buildings or work centers at Fort Knox.

Used cooking oil containers are 300 gallons in capacity and double-walled. Used cooking oil containers are mobile and can be relocated, depending on the need and time of year.

5.4 Secondary Containment for Loading and Unloading Racks

"112.7(h)(1) Where loading/unloading rack drainage does not flow into a catchment basin or treatment facility designed to handle discharges, use a quick drainage system for tank car or tank truck loading/unloading racks. You must design any containment system to hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility."

This section does not apply at Fort Knox, as there are no loading and unloading racks on site. See **Section 9.1** for EPA definition of a loading/unloading rack.

5.5 Secondary Containment for Piping and Fuel Transfer Areas

40 CFR 112.7(c) is the general containment requirement with no specific size or capacity limits, which applies to all fuel piping, flexible hoses, fill pipes, gas stations, and other fuel transfer areas without a mechanical loading rack. Either an active or passive means of containment may be used to address the typical failure mode and to control the most likely quantity of oil that may be discharged. There is no freeboard for precipitation requirement.

Various sections of aboveground single-walled pipe exist at areas that are not contained within passive secondary containment. Areas that have aboveground piping or flexible hoses without complete passive containment require active countermeasures for secondary containment. Major fuel transfer locations at Fort Knox include the AAFES Stations, Godman Army Airfield Fuel Farm, and the Energy Security locations, as shown in the facility diagrams in **Appendix B**.

At the AAFES Stations, fuel is transferred via double-walled underground piping to standard commercial fuel dispensers. At AAFES Wilson Road, the UST fill ports are set within a concrete slab. A release in this area would gradually flow south and east until it entered Wilson Road and

any nearby stormwater culverts or inlets. Surface flow would discharge into an unnamed tributary of Mill Creek. At AAFES West Chaffee Ave., the AST fill ports are in an elevated spill control box in front of the ASTs. A release at this area would spread radially and move into an unnamed tributary of Dry Branch (west) and east towards the fuel dispensers and Chaffee Avenue. The maximum potential spill volume of the for both AAFES Stations is up to 500 gallons, depending on the reaction time of personnel overseeing fuel deliveries. Both locations have ample spill kits and response supplies. Active spill control measures (such as using the fuel truck spill kit) must be used to respond to any spills, in compliance with 40 CFR 112.7(c).

At Godman Army Airfield, there are currently 4 ASTs in active service (5242-T3, T4, T5 and T6). Transfer piping is either located within the bermed transfer area (refer to **Section 5.3.2**) or in the concrete containment berm that surrounds the ASTs. The concrete containment berm is sized to provide 8,984 gallons of containment capacity. Drainage from these bermed areas is controlled via PIV to a nearby OWS. A release in this area would migrate into stormwater drains and eventually discharge into an unnamed tributary of Otter Creek. The maximum potential spill volume in this area is between 150 and 600 gallons, depending on the reaction time of personnel overseeing fuel deliveries. The Godman Army Airfield Fuel Farm is equipped with both passive (bermed areas) and active (spill kits) spill control measures in compliance with §112.7(c).

Fuel transfer activities at the Energy Security locations are conducted via elevated single-walled, elevated piping. There is transfer piping from the loading port into large ASTs and then from large ASTs into day tanks located inside of each facility. Releases in these areas would be largely captured in the gravel covered areas. Releases outside of the gravel covered areas would migrate via natural flow into nearby stormwater features. The maximum potential spill volume in these areas is from loading the ASTs, and ranges between 240 and 20 gallons, depending on the reaction time of personnel overseeing fuel deliveries. All locations have spill kits and response supplies. Active spill control measures (such as using the fuel truck spill kit) must be used to respond to any spills, in compliance with 40 CFR 112.7(c).

For the remaining ASTs, fuel piping is outside of passive containment, and so active countermeasures would be needed for spill control. Active measures include the transfer procedures outlined in **Section 9.2,** for all fuel transfers to or from an AST or UST to minimize fuel spills; along with a combination of pre-deployed and/or mobile spill kits, in the event a spill occurs at locations where piping is not protected by passive measures.

Most AST locations do not have a passive method of containment for mobile refuelers. These fuel transfer areas may be on a concrete or asphalt surface without any berms, or they may be on a grass or dirt surface. Therefore, an active spill response procedure will be needed in case of a spill. As listed in **Table 2-2**, many ASTs have a fill port spill bucket and/or OPV that will contain or prevent an overfill during fuel transfer. If neither of these devices are present, then an active method of containment will be needed, such as a small spill kit on a mobile refueler, a large spill kit placed in the immediate vicinity, or covers for nearby stormwater drains.

Most fuel transfers are manned and visually observed to reduce the likelihood of an undetected release in accordance with **Section 9.2**. In addition, spill kits are located near fuel dispensing ASTs

with secondary containment. Mobile refuelers and contractor maintenance trucks are equipped with limited spill clean-up supplies should a minor leak or spill occur.

The only transfers that are not typically manned are automatic emergency generator startup operations. ASTs associated with emergency generators utilize single-walled piping or flexible hose fittings to transfer oil to and from the generator, and these ASTs require active countermeasures for secondary containment. ASTs that are located inside of containment berms provide passive containment measures for piping, provided any remote fill piping does not extend beyond the containment. Active spill control and containment measures are required for the various failure scenarios for piping and hoses associated with these generators. Fort Knox should ensure that all generators be manned and observed at the start of operation and during operation to ensure equipment is operating properly, with special attention to the return line of each generator. The operators performing these activities will be equipped with spill kits and be trained on the appropriate response procedures.

5.6 Oil-Filled Operational Equipment

"112.7(k): The owner or operator of a facility with oil-filled operational equipment that meets the qualification criteria in paragraph (k)(1) of this sub-section may choose to implement for this qualified oil-filled operational equipment the alternate requirements as described in paragraph (k)(2) of this sub-section in lieu of general secondary containment required in paragraph (c) of this section.

112.7(k)(2): Alternate Requirements to General Secondary Containment. If secondary containment is not provided to qualified oil-filled operational equipment pursuant to paragraph (c) of this section, the owner or operator of a facility with qualified oil-filled operational equipment must: (i) Establish and document the facility procedures for inspections or a monitoring program to detect equipment failure and/or a discharge;"

OFOE includes electrical equipment such as oil cooled transformers, as well as any hydraulic equipment that utilizes oil as an operating fluid, such as elevator hydraulic reservoirs. Fort Knox has oil-filled transformers and hydraulic oil elevator containers.

40 CFR 112.7(k)(1) allows the garrison to set alternate requirements in lieu of general secondary containment for qualified OFOE. These requirements have been met by Fort Knox by having no reportable discharges from OFOE within any 12-month period for the previous three (3) years; Nolin has a written procedure for inspecting the equipment; and Fort Knox maintains contingency procedures in this SPCC Plan (and Fort Knox's RCRA Contingency Plan) as a written commitment of manpower and resources, to mitigate any discharge from OFOE that may occur.

EPA allows flexibility in managing stormwater runoff from undiked OFOE containers. Their minimum criterion is to prevent oil from being released from the facility. This can be done by installation of drainage barriers and other diversionary structures. However, it can also be done using spill response equipment and procedures. Fort Knox has a monitoring program of external inspections, operational checks, and preventive maintenance to ensure that all OFOE is monitored for leaks. Nolin maintains electrical transformers and off-site contractors maintain elevator systems in a satisfactory state of repair to ensure equipment functions properly. Drainage near OFOE is to be monitored closely, and spill equipment should be readily available in the event of a leak.

Nearly all hydraulic oil containers are enclosed in buildings and have passive secondary containment provided by concrete floors. The most likely spill would occur when the container is initially filled with hydraulic oil, or if an oil connection leaks during operation. Unless severe damage occurs, hydraulic equipment should not have to be refilled with oil during normal operation. Hydraulic oil containers are considered a low risk for spills based on the location (typically in maintenance closets with no outlet for discharge) and recurrence of inspection activities. This program helps ensure that all hydraulic oil containers are maintained and monitored. Any identified leaks would be reported and corrected promptly. Fort Knox enlists off-site contractors to conduct routine equipment inspections (or as problems are identified) and has an inventory of all hydraulic oil containers which includes oil capacity (refer to the Fort Knox GIS and **Appendix A**).

Transformers are considered low risk for potential spills based on their design, operation, and preventive maintenance program completed by Nolin. This program helps ensure that all electrical equipment is maintained and monitored. Any identified leaks would be reported and corrected promptly. Nolin conducts routine equipment inspections (or as problems are identified) and has an inventory of all transformers which includes oil capacity (refer to the Fort Knox GIS and **Appendix A**). Refer to **Section 4.2.4** for additional information.

5.7 Impracticability of Secondary Containment

"112.7(d): Provided your Plan is certified by a licensed Professional Engineer under §112.3(d), or, in the case of a qualified facility that meets the criteria in §112.3(g), the relevant sections of your Plan are certified by a licensed Professional Engineer under §112.6(d), if you determine that the installation of any of the structures or pieces of equipment listed in paragraphs (c) and (h)(1) of this section, and §§112.8(c)(2), 112.8(c)(11), 112.9(c)(2), 112.10(c), 112.12(c)(2), and 112.12(c)(11) to prevent a discharge as described in §112.1(b) from any onshore or offshore facility is not practicable, you must clearly explain in your Plan why such measures are not practicable; for bulk storage containers, conduct both periodic integrity testing of the containers and periodic integrity and leak testing of the valves and piping; and, unless you have submitted a response plan under §112.20, provide in your Plan the following:

(1) An oil spill contingency plan following the provisions of part 109 of this chapter.

(2) A written commitment of manpower, equipment, and materials required to expeditiously control and remove any quantity of oil discharged that may be harmful."

There are no bulk storage containers at Fort Knox where this provision of 40 CFR 112.7 has been applied.

SECTION 6

Inspections and Testing

6.1 Inspection Schedule and Recordkeeping

"112.7(e): Conduct inspections and tests required by this part in accordance with written procedures that you or the certifying engineer develop for the facility. You must keep these written procedures and a record of the inspections and tests, signed by the appropriate supervisor or inspector, with the SPCC Plan for a period of three years. Records of inspections and tests kept under usual and customary business practices will suffice for purposes of this paragraph.

112.8(c)(6): Test or inspect each aboveground container for integrity on a regular schedule and whenever you make material repairs. You must determine, in accordance with industry standards, the appropriate qualifications for personnel performing tests and inspections, the frequency and type of testing and inspections, which take into account container size, configuration, and design (such as containers that are: shop-built, field-erected, skid-mounted, elevated, equipped with a liner, double-walled, or partially buried). Examples of these integrity tests include, but are not limited to: visual inspection, hydrostatic testing, radiographic testing, ultrasonic testing, acoustic emissions testing, or other systems of non-destructive testing. You must keep comparison records and you must also inspect the container's supports and foundations. In addition, you must frequently inspect the outside of the container for signs of deterioration, discharges, or accumulation of oil inside diked areas. Records of inspections and tests kept under usual and customary business practices satisfy the recordkeeping requirements of this paragraph."

Fort Knox is required to conduct periodic inspections and testing of ASTs, mobile and portable containers, liquid level sensing devices, aboveground and underground piping, containment dikes, OWS, and OFOE. The subsequent sections, and **Table 6-1**, outline the inspection and testing schedule for the regulated equipment at Fort Knox. Integrity testing requirements must also be met, depending on the AST construction, and depending on whether they have ground contact, are single-walled or double-walled, have cathodic protection, and alternative secondary containment. **Table 6-2** provides the AST category and inspection requirements for each AST at Fort Knox and **Table 6-3** outlines the periodic integrity testing requirements defined by STI SP001. Inspections and testing may be conducted by EMD, on-site units and tenants, on-site contractors, or off-site contractors. Records are required to be maintained for a period of three years, unless otherwise noted in **Table 6-1**. Records can be maintained by EMD, DPW, or the on-post organization that conducts the inspection.

The EPA's recognized inspection standard for ASTs, mobile and portable containers, and aboveground piping is STI SP001 which Fort Knox has used to develop the schedule of periodic inspections and testing. If STI SP001 cannot be used to determine the inspection schedule, then manufacturer's instructions or other industry standards are used. **Appendix C** contains recommended, sample forms that may be used for monthly and annual inspections of ASTs and monthly inspections of mobile and portable containers. STI allows their monthly and annual checklists to be used as models as long as the locally developed checklist is "substantially equivalent." Fort Knox has multiple on-post organizations and contractors that have developed their own monthly inspection checklists. Those forms are acceptable for use and are not provided in **Appendix C**. To ensure continuity of inspections and testing, it is recommended that EMD review and approve sample inspection forms prior to use by any unit, tenant, or organization.

This Plan provides guidance on inspection actions and retention criteria that Fort Knox must perform to comply with the SPCC rule; see **Table 6-1** for additional information.

- Complete all inspections as outlined in the Inspection and Recordkeeping procedures using the inspection checklists included in **Appendix C**.
- Perform preventive maintenance of equipment, secondary containment systems, and discharge prevention systems described in this Plan, as needed, to maintain proper operating conditions.
- Conduct initial and annual employee training as outlined in the personnel training and spill prevention procedures section of this Plan and document.

TABLE 6-1: Inspection Schedule

Type of Inspection[1]	Frequency	Inspection Performed By[1]	Regulatory Driver	Inspection Form	Record Retention
Product Piping					
External Visual (routine)	Monthly [2]	EMD or designee	40 CFR 112	Appendix C	3 years
Pressure Testing (Underground Piping)	5-year	Qualified contractor	UFC 3-460-03	Contractor-provided	Indefinite
Secondary Containment					
External Visual (non-routine)	Recommended within 7 days of rain event	EMD or designee	40 CFR 112	Appendix C	3 years
External Visual (routine)	Monthly [2]	EMD or designee	40 CFR 112	Appendix C	3 years
Fuel Transfer Areas					
External Visual (non-routine)	As needed (based on weather and/or oil release)	Contractor and/or organizational user	40 CFR 112	Refer to locally generated form	3 years
External Visual (routine)	Monthly	Contractor and/or organizational user	40 CFR 112	Refer to locally generated form	3 years
ASTs					
External Visual	Monthly [2,3]	EMD or designee	40 CFR 112	Appendix C	3 years
External Visual	Annual	EMD or contractor	40 CFR 112	Appendix C	3 years

Type of Inspection[1]	Frequency	Inspection Performed By[1]	Regulatory Driver	Inspection Form	Record Retention
Integrity Testing and Formal Inspections (STI)	Refer to Table 6-2	Qualified Inspector	40 CFR 112	Contractor-provided	3 years
Operations Check (generators only)	Monthly	DPW Contractor	40 CFR 112	Refer to locally generated form	3 years
Liquid Level Sensing Device	Annually or per manufacturer instructions	EMD or Contractor	40 CFR 112	Contractor-provided	3 years
UST Containment Sumps					
External Visual (routine)	During fuel transfers	AAFES Wilson Road Station Manager	40 CFR 112	Appendix C	3 years
OFOE					
Transformer External Visual (routine)	Annually	Nolin	40 CFR 112	Refer to locally generated form	3 years
Elevator Container External Visual (routine)	Annually	Contractor	40 CFR 112	Contractor-provided	3 years
Drums (Portable Containers)					
External Visual (routine)	Monthly	Organizational user	40 CFR 112	Appendix C	3 years
Used Cooking Oil Containers					
Examination	Monthly	Operator	40 CFR 112	Appendix C	3 years

Notes:

1. While various facility personnel or contracted professionals perform the inspections, it is Fort Knox's responsibility to ensure all inspections are scheduled and performed in accordance with this Plan.
2. It is recommended that a period of no more than 35 days passes between inspections.
3. Inspections may be conducted quarterly if ASTs are monitored during normal daily operations.

6.2 Stationary Storage Container Inspections

6.2.1 Shop-fabricated Tanks

To effectively minimize the risk of AST failure, monthly and annual visual inspections must be performed to satisfy the regulatory requirements of 40 CFR 112 and the periodic inspection requirements of STI SP001, which is the applicable industry standard recognized by EPA for

inspection of ASTs. These inspections include externally examining the AST and inspecting ground surfaces for signs of leakage, spillage, or stains. Indicators for additional investigation of the primary container include, but are not limited to, impact damage, corrosion and structural damage to the primary containers, cracking, calcareous deposits on the outer container, regulated oil or water in the interstice, etc. **Appendix C** contains three forms that Fort Knox can use to satisfy the monthly and annual inspection requirements:

- STI SP001 Monthly Inspection Checklist
- Monthly Tank Inspection Checklist Record (condensed form based off STI SP001's Monthly Inspection Checklist.
- STI SP001 Annual Inspection Checklist

STI SP001 allows organizations the independence to utilize STI's formal checklists as a model. Fort Knox may use these forms or any other organization-derived form if each form is substantially equivalent to the STI SP001 Monthly or Annual Inspection Checklists. Monthly and annual inspections are conducted by the AST's owning organization, EMD, or authorized contractor and records of monthly and annual inspections are maintained by EMD.

Prior and post transfer, it is recommended that the organizational user or designated contractor perform a brief spot check to ensure there have been no incidental spills of POL. These checks do not need to be documented on an inspection form.

In addition to the inspections listed in **Table 6-1**, additional periodic inspection and testing of ASTs may be conducted in accordance with STI SP001 and at the discretion of EMD. **Table 6-2** outlines the STI SP001 AST category (i.e., 1, 2, or 3) which determines the inspection and integrity testing schedule or frequency. Note that permanently closed ASTs are not listed for inspection and integrity testing requirements. STI classifies ASTs based on the presence of spill control and a continuous release detection method (CRDM):

- Category 1: ASTs with spill control and continuous release detection method (CRDM).
- Category 2: ASTs with spill control, and without CRDM.
- Category 3: ASTs without spill control.

According to STI SP001, if an AST is equipped with spill control, it is considered to have "a means of preventing a release of liquid to the environment, including adjoining property and waterways." Further, if an ASTs is equipped with CRDM, it is considered to have "a means of detecting a release of liquid through inherent design. CRDM is passive because it does not require sensors or power to operate. Liquid releases are visually detected by facility operators."

TABLE 6-2: Shop Fabricated Tank Category and Inspection Requirements

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
17.G1	Unknown	77	DW w/overfill prevention	DW	1	M & A	N/A
18.G2	Unknown	214	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
121-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
136-T1	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
136-T2	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
136-T3	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
136-T4	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
136-T5	2013	385	DW w/overfill prevention	DW	1	M	N/A, portable container
136-T6	2013	500	DW w/overfill prevention	DW	1	M & A	N/A
203.G1	2006	145	DW w/overfill prevention	DW	1	M & A	N/A
612-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
612-T2	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A
860-T1	Unknown	12,000	DW w/overfill prevention	DW	1	M & A	E(20)
860.G2	Unknown	200	DW w/overfill prevention	DW	1	M & A	N/A
862-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
862-T2	2013	385	DW w/overfill prevention	DW	1	M	N/A, portable container
869-T2	Unknown	200	Open top steel diked AST	Steel dike AST	1	M & A	N/A
869-T4	2023	2,000	DW w/overfill prevention	DW	1	M & A	N/A
1002.G1	Unknown	280	DW w/overfill prevention	DW	1	M & A	N/A
1006-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
1054-T1	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A
1227-T1	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A
1227-T2	2019	75	DW w/overfill prevention	DW	1	M & A	N/A
1307.G1	Unknown	1,500	DW w/overfill prevention	DW	1	M & A	N/A
1307.G2	Unknown	1,500	DW w/overfill prevention	DW	1	M & A	N/A
1308.G1	2009	875	DW w/overfill prevention	DW	1	M & A	N/A
1467.G1	Unknown	693	DW w/overfill prevention	DW	1	M & A	N/A
1722-T1	Unknown	187	DW w/overfill prevention	DW	1	M & A	N/A
1730.G1	Unknown	77	DW w/overfill prevention	DW	1	M & A	N/A
1730.G2	Unknown	290	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
2021.G1	2016	516	DW w/overfill prevention	DW	1	M & A	N/A
2190-T1	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
2190-T2	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
2190-T3	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
2190-T4	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
2190-T5	2013	385	DW w/overfill prevention	DW	1	M	N/A, portable container
2341.G1	Unknown	785	DW w/overfill prevention	DW	1	M & A	N/A
2370.G1	2009	331	DW w/overfill prevention	DW	1	M & A	N/A
2389.G1	Unknown	1,200	DW w/overfill prevention	DW	1	M & A	N/A
2730-T1	1999	660	DW w/overfill prevention	DW	1	M & A	N/A
2741-T1	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
2741-T2	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
2741-T3	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
2741-T4	2013	300	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
2741-T5	2013	285	DW w/overfill prevention	DW	1	M	N/A, portable container
2767-T1	1996	660	DW w/overfill prevention	DW	1	M & A	N/A
2770-T3	2018	660	DW w/overfill prevention	DW	1	M & A	N/A
2770-T4	2003	660	DW w/overfill prevention	DW	1	M & A	N/A
2770-T5	Unknown	2,000	DW w/overfill prevention	DW	1	M & A	N/A
2807-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
2807-T2	2018	660	DW w/overfill prevention	DW	1	M & A	N/A
2807-T7	2018	660	DW w/overfill prevention	DW	1	M & A	N/A
2807-T8	2020	660	DW w/overfill prevention	DW	1	M & A	N/A
2835.G1	Unknown	2,000	DW w/overfill prevention	DW	1	M & A	N/A
2862-T1	2013	120	DW w/overfill prevention	DW	1	M & A	N/A
2862-T2	2013	120	DW w/overfill prevention	DW	1	M & A	N/A
2942-T1	Unknown	120	Secondary containment dike/berm	Elevated AST, with release prevention barrier	1	M & A	N/A
2942-T2	2004	528	DW w/overfill prevention	DW	1	M & A	N/A
2943-T1	2005	660	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
2944-T1	1996	528	DW w/overfill prevention	DW	1	M & A	N/A
2944-T2	1996	528	DW w/overfill prevention	DW	1	M & A	N/A
2944-T3	2018	660	DW w/overfill prevention	DW	1	M & A	N/A
2952-T8	Unknown	Out of Service	DW w/overfill prevention	DW	1	M & A	N/A
2954-T1	Unknown	650	DW w/overfill prevention	DW	1	M & A	N/A
2954-T4	1999	660	DW w/overfill prevention	DW	1	M & A	N/A
2954-T5	1999	660	DW w/overfill prevention	DW	1	M & A	N/A
2954-T6	1999	660	DW w/overfill prevention	DW	1	M & A	N/A
2954-T8	2023	528	DW w/overfill prevention	DW	1	M & A	N/A
2958-T1	2004	660	DW w/overfill prevention	DW	1	M & A	N/A
3008-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
3075-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
4012-T1	Unknown	2,000	DW w/overfill prevention	DW	1	M & A	N/A
4012-T2	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
4210.G1	Unknown	472	DW w/overfill prevention	DW	1	M & A	N/A
4249.G1	2010	1,700	DW w/overfill prevention	DW	1	M & A	N/A
4250.G1	2009	1,700	DW w/overfill prevention	DW	1	M & A	N/A
4995-T1	Unknown	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
4995-T2	Unknown	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
4995-T3	Unknown	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
4997-T1	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
4997-T2	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
4997-T3	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
4997-T4	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
4997-T5	2013	285	DW w/overfill prevention	DW	1	M	N/A, portable container
4997-T6	2013	500	DW w/overfill prevention	DW	1	M & A	N/A
5220.G2	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
5220-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
5222-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
5222-T2	Unknown	500	CE-AST with overfill prevention	CE-AST with an integral secondary containment and interstitial monitoring opening	1	M & A	N/A
5231-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
5232-T1	Unknown	572	DW w/overfill prevention	DW	1	M & A	N/A
5232-T2	Unknown	572	DW w/overfill prevention	DW	1	M & A	N/A
5242-T3	Unknown	15,000	Open top steel diked AST	Steel dike AST	1	M & A	E(20)
5242-T4	Unknown	15,000	Open top steel diked AST	Steel dike AST	1	M & A	E(20)
5242-T5	Unknown	15,000	Open top steel diked AST	Steel dike AST	1	M & A	E(20)
5242-T6	Unknown	15,000	Open top steel diked AST	Steel dike AST	1	M & A	E(20)
Trailer	Unknown	995	Open top steel diked AST	DW	1	M	N/A, portable container
5259.G1	Unknown	336	DW w/overfill prevention	DW	1	M & A	N/A
5592.G1	Unknown	194	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
5917.G1	Unknown	278	DW w/overfill prevention	DW	1	M & A	N/A
5931.G1	2009	331	DW w/overfill prevention	DW	1	M & A	N/A
6433-T1	2008	10,000	CE-AST with overfill prevention	CE-AST with an integral secondary containment and interstitial monitoring opening	1	M & A	E(20)
6434.G6	Unknown	2,350	DW w/overfill prevention	DW	1	M & A	N/A
6434.G7	Unknown	2,350	DW w/overfill prevention	DW	1	M & A	N/A
6434.G8	Unknown	2,350	DW w/overfill prevention	DW	1	M & A	N/A
6434.G9	Unknown	2,350	DW w/overfill prevention	DW	1	M & A	N/A
6434.G10	Unknown	2,350	DW w/overfill prevention	DW	1	M & A	N/A
6434.G11	Unknown	2,750	DW w/overfill prevention	DW	1	M & A	N/A
6434.G12	Unknown	944	DW w/overfill prevention	DW	1	M & A	N/A
6434.G13	2023	5,200	DW w/overfill prevention	DW	1	M & A	E(20)
6434-T1	Unknown	175	DW w/overfill prevention	DW	1	M & A	N/A
6434-T2	Unknown	175	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
6434-T3	Unknown	175	DW w/overfill prevention	DW	1	M & A	N/A
6434-T4	Unknown	175	DW w/overfill prevention	DW	1	M & A	N/A
6435.G1	Unknown	875	DW w/overfill prevention	DW	1	M & A	N/A
6576-T1	1999	660	DW w/overfill prevention	DW	1	M & A	N/A
6605-T1	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
6605-T2	2013	10,000	DW w/overfill prevention	DW	1	M & A	E(20)
6605-T3	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
6605-T4	2013	300	DW w/overfill prevention	DW	1	M & A	N/A
6605-T5	2013	385	DW w/overfill prevention	DW	1	M	N/A, portable container
6605-T6	2013	500	DW w/overfill prevention	DW	1	M & A	N/A
7102.G1	Unknown	130	DW w/overfill prevention	DW	1	M & A	N/A
7102.G2	Unknown	278	DW w/overfill prevention	DW	1	M & A	N/A
7207-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
7207-T2	Unknown	275	Secondary containment dike/berm	Release prevention barrier	1	M & A	N/A
7226.G1	Unknown	100	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
7331-T1	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A
7331-T2	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A
7331-T3	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
7422-T1	Unknown	3,000	Open top steel diked AST	Steel dike AST	1	M & A	N/A
7501.G1	Unknown	200	DW w/overfill prevention	DW	1	M & A	N/A
8057.G1	2016	2,183	DW w/overfill prevention	DW	1	M & A	N/A
8928-T1	Unknown	500	DW w/overfill prevention	DW	1	M & A	N/A
8928.G2	Unknown	245	DW w/overfill prevention	DW	1	M & A	N/A
9066.G1	Unknown	200	DW w/overfill prevention	DW	1	M & A	N/A
9066.G2	Unknown	214	DW w/overfill prevention	DW	1	M & A	N/A
9101.G1	Unknown	113	DW w/overfill prevention	DW	1	M & A	N/A
9309.G1	Unknown	100	DW w/overfill prevention	DW	1	M & A	N/A
9357-T1	2021	500	DW w/overfill protection	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
9359-T3	Unknown	500	Open top steel diked AST	Steel dike AST	1	M & A	N/A
9359-T4	Unknown	275	Open top steel diked AST	Steel dike AST	1	M & A	N/A
9359-T5	Unknown	275	Open top steel diked AST	Steel dike AST	1	M & A	N/A
9385.G1	Unknown	100	DW w/overfill prevention	DW	1	M & A	N/A
9387-T1	2005	10,000	Open top steel diked AST	Steel dike AST	1	M & A	E(20)
9387-T2	2005	10,000	Open top steel diked AST	Steel dike AST	1	M & A	E(20)
9387-T3	1996	480	DW w/overfill prevention	DW	1	M & A	N/A
9387-T4	Unknown	480	DW w/overfill prevention	DW	1	M & A	N/A
9387-T5	Unknown	480	DW w/overfill prevention	DW	1	M & A	N/A
9387-T6	1996	480	DW w/overfill prevention	DW	1	M & A	N/A
9387-T7	Unknown	480	DW w/overfill prevention	DW	1	M & A	N/A
9387-T8	Unknown	480	DW w/overfill prevention	DW	1	M & A	N/A
9399.G1	2018	132	DW w/overfill prevention	DW	1	M & A	N/A
9555-T1	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A
9717-T1	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A
9779-T1	Unknown	1,000	DW w/overfill prevention	DW	1	M & A	N/A

AST ID	Year Installed	Capacity	Spill Control	CRDM	STI Category	Inspection Required[1]	Formal Inspection Date[2, 3]
9816.G1	Unknown	170	DW w/overfill prevention	DW	1	M & A	N/A
9829-T1	2005	660	DW w/overfill prevention	DW	1	M & A	N/A
9845-T1	Unknown	3,000	DW w/overfill prevention	DW	1	M & A	N/A
9855-T1	Unknown	1,500	DW w/overfill prevention	DW	1	M & A	N/A
9996.G1	Unknown	210	DW w/overfill prevention	DW	1	M & A	N/A

1. Inspection Required Abbreviations: M=Monthly, A=Annual, E= Formal External inspection by STI certified inspector, (Yr.) interval of the leak test.
2. As shown in Table 6-3, For Category 1 shop-built tanks, with less than or equal to 5,000-gallon capacity, no STI certified formal External inspection is required.
3. As shown in Table 6-3, For Category 1 shop-built tanks, with greater than 5,000-gallon capacity, an STI certified Formal External inspection is required every 20 years, plus a baseline inspection should be performed following installation.

Table 6-3 outlines the different types of STI AST categories, as defined by STI, as well as the periodic and formal inspection schedule recommended by STI. This information is replicated from Section 5 of STI SP001.

TABLE 6-3: STI SP001 Periodic Testing Requirements

Size (gallons)	Category 1	Category 2	Category 3
0 – 1,100	P	P	P, E&L(10)
1,101 – 5,000	P	P, E&L(10)	[P, E&L(5), I(10)] or [P, E(5) & L(2)]
5,001 – 30,000	P, E(20)	[P, E(10)& I(20)] or [P, E(5) & L(10)]	[P, E&L(5), I(10)]or [P, E(5) & L(1)]
30,001 – 50,000	P, E(20)	P, E&L(5), I(15)	P, E&L(5), I(10)
Portable containers	P	P	P **

Notes:
P = Periodic inspection (monthly and/or annual)
E = Formal external inspector by certified inspector
I = Formal Internal inspection by certified inspector
L = Leak test by owner or owner's designee
( ) = maximum inspection interval, in years
** Containers must be tested to DOT requirements every 12 years (steel) or 7 years (plastic)

Following any recurring inspection, if deficiencies are noted that related to the integrity of the primary AST or its containment, it is recommended that Fort Knox perform manufacturer-

specified pressure testing, testing in accordance with Section 9.1.1 of STI SP001, or a vacuum test specifically developed and certified for testing small ASTs.

6.2.2 Industry Standard Considerations

The criteria for the STI SP001 inspection schedule are based on the AST capacity, known dates of installation, and known standard of construction. The requirement for integrity testing of each of the containers should be based upon the following criteria.

A. If installation date is known and the AST has a manufacturer's label, testing date is scheduled based upon the STI Category and corresponding schedule.

B. If manufacturer information is unavailable and the AST is not labeled to standard conformance, inspection is to be performed as soon as possible following SPCC Plan approval. The stringent testing date is based on the lack of sufficient knowledge that exists for the construction procedures and materials used in the assembly of the container. The level of risk for discharges associated with AST constructed with no known standard can be high and require the immediate evaluation of AST construction and material properties to ensure industry standards are being implemented as required by the rule.

For any new ASTs that may be installed in the future, Fort Knox will obtain certification of integrity testing from the manufacturer or installer prior to placing the AST into service.

Fort Knox will recommend new ASTs be installed in accordance with manufacturer instructions, or STI Standard R912 (Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable or Combustible Liquids).

Fort Knox will recommend all ASTs be repaired in accordance with manufacturer instructions or STI SP031 (Standard for Repair of Shop-Fabricated Aboveground Tanks for Storage of Flammable or Combustible Liquids). If there is a material repair of the AST, in particular inner/outer shell, top/bottom, or AST supports, the integrity must be tested by an appropriate method before the AST is returned to service.

Section 4.1 of STI SP001 requires that an AST be taken out-of-service within 24 hours if a leak is found. The AST must then be repaired or replaced as required.

If the AST has been exposed to a fire or other means which could cause possible damage, it must be inspected by a certified inspector for serviceability and leaks prior to being put into service. Consult with the manufacturer prior to making any alterations or repairs of leaks.

Upon discovery of fuel in the interstice of a double-wall AST, performance of primary container pressure testing should be considered in accordance with the 9.1.1 of STI SP001, and STI R912, or manufacturer's recommendations.

6.3 Mobile and Portable Container Inspections

There are numerous storage areas throughout Fort Knox that contain mobile and portable containers such as mobile refuelers, drums of new and used POLs, and used cooking oil containers. Like ASTs, monthly inspections must be performed to satisfy the regulatory

requirements of 40 CFR 112 and the periodic inspection requirements of STI SP001. There is not an annual inspection requirement for mobile and portable containers. Inspections must verify that there are no signs of leaks or obvious damage, that fill and discharge connections are properly operating, and that mobile and portable containers are in good condition. Any secondary containment must be visually inspected to verify it is in good condition, can contain a spill, and does not actively contain POL.

Fort Knox has developed Fort Knox Form 5058 as the inspection form for all mobile and portable containers equal or greater than 55 gallons in capacity. Fort Knox may also use the STI SP001 Portable Container Monthly Inspection Checklist or any other locally developed forms as long as the form is substantially equivalent to SP001's Portable Container Monthly Inspection Checklist. One inspection form is sufficient for each storage area, regardless of how many mobile or portable containers are present. Refer to **Appendix C** for sample forms.

Inspections are conducted by the organization that owns or manages the mobile or portable containers. These organizations are also responsible for maintaining records of the monthly inspections. EMD can obtain inspection records from on-post organizations, when necessary.

Prior and post transfer, it is recommended that the organizational user or designated contractor perform a brief spot check to ensure there have been no incidental spills of POL. These checks do not need to be documented on an inspection form.

6.4 Liquid Level Sensing Device Inspections

"112.8(c)(8): You must engineer or update each container installation in accordance with good engineering practice to avoid discharges. You must provide at least one of the following devices:

(i) High liquid level alarms with an audible or visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice.
(ii) High liquid level pump cutoff devices set to stop flow at a predetermined container content level.
(iii) Direct audible or code signal communication between the container gauger and the pumping station.
(iv) A fast response system for determining the liquid level of each bulk storage container such as digital computers, telepulse, or direct vision gauges. If you use this alternative, a person must be present to monitor gauges and the overall filling of bulk storage containers.
(v) You must regularly test liquid level sensing devices to ensure proper operation."

6.4.1 Shop-fabricated Tanks

The ASTs on Fort Knox utilize manual, mechanical, and automatic methods for determining liquid levels.

The manual method involves using a measured dipping stick to determine the level of liquid in the container. If this method is used, the ullage level or available capacity should be determined before transfer of product into the container is initiated.

The mechanical methods use various types of direct vision liquid level gauges, which can be monitored at the site during the filling operations.

The automatic methods use various types of liquid level sensing devices, which are electrically connected from the AST to a remote reading instrument panel, such as the Veeder-Root system.

During monthly or annual AST inspections, the liquid level sensing device may be validated by manually gauging the AST and comparing the results with the indicated liquid level. If the liquid level shows significant variance, Fort Knox can choose to further test the device following the manufacturer's specification.

6.4.2 Mobile Refueler Trucks

Contractors use mobile refuelers to perform fuel transfers to fill ASTs at Fort Knox. A contractor also operates the Godman Army Airfield Fuel Farm and uses mobile refuelers to perform fuel transfers to fill aircraft and helicopters or ASTs in range areas. Military personnel use HEMTTs to perform fuel transfers to fill tactical equipment in the range areas.

Contractor operated mobile refuelers from the Godman Army Airfield Fuel Farm use an automatic system known as the Scully Intellitrol System that offers layered spill prevention. The system is equipped with a dead man switch and internal sensors to automatically shut off the flow of fuel. The dead man switch must be held and squeezed for fuel to flow. In an emergency, fuel flow stops once the operator releases the dead man switch. The Scully System's internal sensors operate separately from the dead man switch and will shut off fuel flow in the event of a system fault or if the high level on the refueler truck detects fuel moisture. If the operator were unable to release the handle, the high-level sensor would still prevent overfill of the mobile refueler's tank. The system is maintained by the contractor who operates the fuel farm and an operational check is performed every time the refueler truck is filled. The emergency cut-off procedures in place for refueler truck fueling are the following:

- Release trigger on nozzle
- Close valve on refueler truck
- Disengage pump
- Close valve handle "T" on refueler truck

Contractor operated mobile refuelers that fill ASTs are equipped with a quick connect hose or a fuel nozzle that must be held for fuel to flow. The type of fueling arrangement depends on the connection on each individual AST. In either case, before delivery, the volume of fuel to be delivered and the available capacity are verified using one of the methods in **Section 6.4.1**. Fuel transfers from tactical refuelers into tactical equipment is conducted in the same manner. In an emergency, personnel would release a dead man switch or release the fuel nozzle and fueling would stop.

6.4.3 Industry Standard Considerations

Fort Knox personnel should be cognizant of following the overfill protection guidelines outlined in American Petroleum Institute (API) 2350 Section 2.2.2:

- If an electrical or mechanical failure occurs that affects the level detectors, product receipt will stop and not recommence until the detectors are functioning properly or manual operations and procedures are implemented.

- When only one detector is used, this high-high level detector will be located at or above the safe fill levels and will alarm/signal to provide sufficient time to shut off or divert product flow before the overfill is reached.
- When used for overfill protection, the high-high level detector will be independent of the ATG system to provide greater reliability and to comply with the requirements of NFPA 30 (Section 2-10).
- If a tank is to be filled above its normal fill level (normal capacity) up to its safe fill level (tank rated capacity), a trained and qualified person will be assigned by the operator to be present at the tank. It is not recommended to routinely fill a tank above the safe fill level due to the increase in overfill risk.

Any shutdown or diversion procedures should be compatible with the transporter's operations to prevent consequential damage such as hydraulic shock or over-pressuring the piping system.

6.5 Aboveground Piping Inspections

"112.8(d)(4): Regularly inspect all aboveground valves, piping, and appurtenances. During the inspection you must assess the general condition of items, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, locking of valves, and metal surfaces. You must also conduct integrity and leak testing of buried piping at the time of installation, modification, construction, relocation, or replacement."

Aboveground piping, valves, and appurtenances at Fort Knox are regularly inspected by organizational users, contractors, and EMD. Records of the inspections are required to be documented and are maintained by EMD.

In accordance with STI SP001, frequencies include monthly and annual inspection periods. The general condition of fixtures, such as flange joints, expansion joints, valve glands and bodies, catch pans, pipeline supports, valve locks, and metal surfaces are assessed during these periodic inspections by qualified personnel.

Some organizational users may institute daily walkthroughs to observe for leaks around valves, joints, and fittings as well as during/after transfer operations. These observations check for piping misalignment, sagging, and to ensure that external coatings are in good shape. These walkthroughs may documented on locally maintained forms if the custodian chooses to do so.

Aboveground piping connected to ASTs will be inspected monthly and annually in accordance with STI SP001. All exposed piping, valves, and associated equipment must be inspected for corrosion, leakage, or failure. All surfaces demonstrating active corrosion must be cleaned and repainted.

6.6 Containment Dike Inspections

"112.8(b)(1): Restrain drainage from diked storage areas by valves to prevent a discharge into the drainage system or facility effluent treatment system, except where facility systems are designed to control such discharge. You may empty diked areas by pumps or ejectors; however, you must manually activate these pumps or ejectors and must inspect the condition of the accumulation before starting, to ensure no oil will be discharged."

"112.8(b)(2): Use valves of manual, open-and-closed design, for the drainage of diked areas. You may not use flapper-type drain valves to drain diked areas. If your facility drainage drains directly into a watercourse and not into

an on-site wastewater treatment plant, you must inspect and may drain uncontaminated retained storm water, as provided in 112.8(c)(3)(ii), (iii), and (iv)."

"112.8(c)(3): Not allow drainage of uncontaminated rainwater from the diked area into a storm drain or discharge of an effluent into an open watercourse, lake, or pond, bypassing the facility treatment system unless you:

(i) Normally keep the bypass valve sealed closed.
(ii) Inspect the retained rainwater to ensure that its presence will not cause a discharge as described in 112.1(b).
(iii) Open the bypass valve and reseal it following drainage under responsible supervision; and
(iv) Keep adequate records of such events, for example, any records required under permits issued in accordance with 122.41(j)(2) and 122.41(m)(3)of this chapter."

Diked areas are provided with manual ball-valves, manual drain valves, or PIVs that can be locked in the closed position to prevent accidental and unauthorized drainage. No flapper-type drain valves are utilized at Fort Knox. If diked areas are not equipped with a valve (containment has no drainage outlet), then qualified personnel or a contractor shall pump or vacuum out the water for disposal.

Personnel are to utilize local drainage log forms located in **Appendix C** when draining water. Water must be checked for oil sheen and remain in the immediate area when draining water. Refer to **Tables 5-1** and **5-2** for a list of containment areas susceptible to rainwater accumulation.

Secondary containment drainage valves at fuel transfer areas are kept in the closed position. Where equipped, secondary containment drainage valves at containment dikes are also kept in the closed position. They may be equipped with locks or located within secure, locked areas.

Stormwater retained in secondary containment structures is inspected for the presence of oil sheen or residual POL prior to discharge. Within one week following a precipitation event, the containment should be inspected. If a sheen is not observed, the containment drain valve is opened and water can be drained. If a sheen is present, EMD is notified and the facility operator must mitigate the contamination by either vacuuming out the oily water or using absorbent pads and booms to remove the POL. If containment structures or areas are equipped with an OWS, the water can be filtered prior to discharge to the stormwater system.

The integrity of containment dikes around fuel transfer areas receive the same type and frequency of inspections as those described for ASTs. Berms or diked areas are checked for excessive water accumulation and to ensure drain valves are secure. Personnel conduct regular inspections of valves, inlets, leak detection equipment, and outlet piping and flanges for leaks. Drainage of rainwater from diked areas into the stormwater system may be acceptable if:

- The bypass valve is normally maintained closed.
- Inspection of the run-off rainwater ensures compliance with applicable water quality standards and will not cause a harmful discharge as defined in 40 CFR 110.
- The bypass valve is opened and resealed following drainage under a responsible supervisor.
- Adequate records are kept of each discharge event.

6.7 Underground Piping Inspections

Underground piping at Fort Knox includes small-diameter piping at the AAFES Stations from the USTs and ASTs to vehicle fuel dispensers and from ASTs into nearby boilers and generators.

Underground piping is double-walled to contain leakage and is made of fiberglass / plastic to prevent corrosion. If piping is not made of fiberglass / plastic, it should be protected from corrosion.

Double-walled piping at the AAFES Stations is monitored via continuous leak detection and interstitial monitoring through on-site Veeder-Root systems. The piping is also pressure tested on an annual basis.

Several ASTs have short, small diameter runs of piping from the AST into a building or generator. As part of the monthly AST inspection process, surface conditions over and adjacent to where the pipeline runs underground are evaluated for indications of leaks. Indications of leaks include change in the surface contour of the ground, discoloration of the soil, softening of asphalt, pool formation, bubbling water puddles, or noticeable odor.

6.8 Oil-Water Separator Inspections

DPW conducts periodic inspections of OWS. Inspections may also be conducted when an OWS is cleaned. Cleaning is conducted by DPW Utility Maintenance personnel or its sub-contractor and the sub-contractor is responsible for disposal of any wastewater or sludge that is generated. Refer to the Fort Knox SWGWPPP for more information on OWS inspections.

6.9 OFOE Inspections

Nolin maintains a robust inspection, maintenance, and recordkeeping program for electrical transformers throughout Fort Knox. This program includes preventive maintenance checks, observation for signs of leakage, replacement of faulty transformers, and prompt maintenance when necessary. Records of inspection and maintenance activities are kept by Nolin and are available to EMD upon request to PWD.

Qualified contractors perform preventive maintenance checks of elevator hydraulic oil containers at Fort Knox. American Society of Mechanical Engineers (ASME) A17.1 (Safety Code for Elevators and Escalators) is the inspection and maintenance code utilized for these inspections. During inspections, elevator hydraulic oil containers are checked for signs of leakage. If an elevator needs repair or retrofit, it is taken out of service while repairs are completed. Records of inspections of elevator hydraulic oil containers are available to EMD upon request to DPW.

SECTION 7

Oil-Handling Personnel Training

There are two different training requirements for oil-handling personnel, as outlined in the following sections. Initial SPCC Training and Annual Discharge Prevention Briefings are required for all oil-handling personnel.

7.1 Initial SPCC Training

"112.7(f)(1): At a minimum, train your oil-handling personnel in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; applicable pollution control laws, rules, and regulations; general facility operations; and, the contents of the facility SPCC Plan."

At Fort Knox, staff who are designated as Environmental Officers (EO) receive an initial course covering various environmental topics. SPCC training is included as a module within the three-day EO course. EOs perform spill training for personnel within their unit or organization. Contractors who are responsible for operation, maintenance, delivery, or oversight of POL equipment will be provided spill training (i.e., prevention, awareness, and response) by their employer. SPCC training topics include:

- Discussion of applicable pollution control laws, rules, and regulations.
- Operation and maintenance of equipment to prevent discharges of oil.
- Purpose and overview of SPCC Plan.
- Review of chemical and physical properties of materials transferred.
- Review of potential spill areas and drainage routes.
- Review of emergency response procedures.
- Review of locations and use of spill cleanup equipment.

A copy of the "Record of Initial Training and Annual Discharge Prevention Briefings" is in **Appendix D** or alternately, a local training attendance sheet may be used. EMD maintains records of initial SPCC training (via initial EO courses) and EOs maintain records of initial SPCC training for their staff. Records shall be maintained for three years.

7.2 Annual Discharge Prevention Briefings

"112.7(f)(3): Schedule and conduct discharge prevention briefings for your oil-handling personnel at least once a year to assure adequate understanding of the SPCC Plan for that facility. Such briefings must highlight and describe known discharges as described in §112.1(b) or failures, malfunctioning components, and any recently developed precautionary measures."

Once initially trained, EO's receive an annual one-day refresher on the same topics covered in the initial EO course, including discharge prevention. EOs update their personnel on any changes to Fort Knox's policy and procedures to ensure an adequate understanding of the Plan. At a minimum, the discharge prevention briefing subject matter will include:

- Known discharges as described in 40 CFR 112.1(b).
- Known failures or malfunctioning components.

- Recently developed spill prevention precautionary measures.
- Any changes or modifications to Plan or methods in the past year.

Organizational users are responsible for scheduling, designating, and instructing personnel in the proper operation and maintenance of ASTs and equipment related to their operations. Training will include review of applicable pollution control laws, rules, regulations, and changes to regulations. EMD maintains records of annual discharge prevention briefings (via annual one-day EO refreshers) and EOs maintain records of annual discharge prevention briefings/training for their staff. Records shall be maintained for three years.

SECTION 8

Security

"112.7(g): Describe in your Plan how you secure and control access to the oil handling, processing and storage areas; secure master flow and drain valves; prevent unauthorized access to starter controls on oil pumps; secure out-of-service and loading/unloading connections of oil pipelines; and address the appropriateness of security lighting to both prevent acts of vandalism and assist in the discovery of oil discharge."

At Fort Knox, military and civilian security personnel are present at the facility 24 hours per day, 365 days per year. Both types of security personnel are trained in First Responder – Awareness level per 29 CFR 1910.120(q)(6)(i). The perimeter fencing is monitored by law enforcement personnel to reduce unauthorized entry onto the facility.

8.1 Site Access and Fencing

Where possible, Fort Knox is fully fenced, thus all containers described in this Plan are secured within a locked-gate compound. The garrison has controlled access through each gate and conforms to the industry standard outlined for fencing and security, Section 11.3.6 of API 2610. Entrance to the various locked areas inside of Fort Knox are only accessible to employees and/or visitors who have been cleared by security.

Access to Fort Knox is controlled through the Main Gate, the Brandenburg Gate, and the Wilson Gate. The Visitor Control Center is located at the Main Gate. Each gate requires personnel to show government-issued identification prior to entry, and visitors must obtain and display temporary visitor identification and vehicle passes. Additional gates can be opened in the event of an emergency. Fort Knox is patrolled by military and civilian security forces 24 hours a day, 7 days a week.

8.2 Master Flow and Drain Valves

All drainage valves on secondary containment structures are manual gate or ball valves that are required by 40 CFR 112.8(c)(3)(i) to be normally closed except during secondary containment draining events.

Flapper-type drain valves are not used for secondary containment structures at Fort Knox. All accumulated rainwater is inspected in accordance with **Section 6.6** prior to discharge. All secondary containment drain valves are inspected in accordance with the STI monthly inspections in **Table 6-1**; see **Appendix C** for the checklists.

The master flow valve, fill ports, and containment drain valves are maintained in a closed position and should be locked when on non-operating or non-standby status. Access to master flow and drain valves is limited to authorized personnel only.

Master flow and drain valves that permit direct discharge of container contents must have adequate security to prevent unauthorized operation of valves. Valves controlling discharges must be directly locked at the open/close valve mechanism.

8.3 Starter Controls

The starter controls for oil pumps are maintained in an off position and locked. Access to starter controls is limited to authorized personnel only. Starter controls are in secure areas of specific facilities, usually within a locked facility or building (e.g., fueling operations at Godman Army Airfield, AAFES Station offices, etc.) adjacent to the AST or UST. Similarly, integrated generator sets usually require a key to open panels to commence operation. Only authorized personnel have access to keys to the pump houses and starter controls.

In cases where starter controls are not located inside of locked buildings (e.g., fueling ASTs on various ranges), the AST and associated fuel dispensing equipment is inside of a locked cage. Keys must be checked out or access coordinated with organizational users for access to starter controls and pumps.

8.4 Pipeline Loading and Unloading Connections

Oil pipeline loading and unloading connections are to be securely capped or blank-flanged when not in service or on standby service. Designated personnel who observe fuel loading and unloading activities verify that these connections are properly capped following each loading and unloading event.

8.5 Lighting

Various types of security lighting are provided throughout Fort Knox. Sufficient lighting is provided at primary fuel loading and unloading areas and oil storage structures to identify a release at night, should one occur. In addition, most fuel transfers from military refuelers or commercial tanker trucks are conducted during daylight. Some areas, for safety reasons, may not have adequate lighting. In these cases, and if fuel transfers are required during darkness security, site personnel, and contractors have additional lighting (flashlights and vehicle-mounted spotlights). The additional lighting is adequate to prevent spills, monitor for leaks, prevent vandalism, and enhance safety during transfer operations.

Adequate overhead lighting is provided throughout Fort Knox at most buildings and along all major roadways and thoroughfares. This extensive lighting grid assists night-time security operations and surveillance personnel whom should be trained to report discharges if they are observed. Manned security gates are illuminated by moderate- and high-intensity discharge security lighting. Where lighting is not permanently fixed, all on-site delivery vehicles have spotlights and all on-site and off-site contracted delivery personnel have flashlights in the event delivery must be made in the hours of darkness.

SECTION 9

Procedures for Fuel Transfers

9.1 Transfer Procedures for Loading/Unloading Racks

"112.2: Loading/unloading rack means a fixed structure (such as a platform, gangway) necessary for loading or unloading a tank truck or tank car, which is located at a facility subject to the requirements of this part. A loading/unloading rack includes a loading or unloading arm and may include any combination of the following: piping assemblages, valves, pumps, shut-off devices, overfill sensors, or personnel safety devices."

"112.7(h): Facility Tank car and tank truck loading/unloading rack (excluding offshore facilities).

(h)(1): Where loading/unloading rack drainage does not flow into a catchment basin or treatment facility designed to handle discharges, use a quick drainage system for tank car or truck loading/unloading racks. You must design any containment system to hold at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded at the facility."
(h)(2): Provide an interlocked warning light or physical barrier system, warning signs, wheel chocks or vehicle brake interlock system in the area adjacent to a loading/unloading rack, to prevent vehicles from departing before complete disconnection of flexible or fixed oil transfer lines.
(h)(3): Prior to filling and departure of any tank or car or tank truck, closely inspect for discharges the lowermost drain and all outlets of such vehicles, and if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit."

Fort Knox does not have any loading/unloading racks at any location on the facility.

9.2 Transfer Procedures other than Loading and Unloading Racks

"112.7(a)(3)(ii): You must also address in your Plan Discharge prevention measures including procedures for routine handling of products (loading, unloading, and facility transfers, etc.);"

It is recommended that personnel who conduct POL loading, unloading and transfers follow minimum discharge prevention measures. Procedures include proper use of hoses equipped with cam-lock quick connects and spill buckets to capture drips or leaks from the transfer hose. While some fuel delivery vehicles do not utilize the "Scully Single Point Overfill Prevention Controls" for delivery, they are equipped with a "dead man" control to transfer fuel to various containers. The "dead man" switch must be held and squeezed for fuel to flow. In the event of an emergency, the operator releases the "dead man" and the fuel flow stops.

All transporters of POL to and from Fort Knox must meet the minimum requirements and regulations established by the United Stated Department of Transportation (DOT). Loading and unloading of hazardous materials at this facility (fuels), as defined in 49 CFR 172, are to meet the requirements of 49 CFR 177, Subpart B. Transporters who load and/or unload hazardous material at this facility must comply with the following requirements:

- Always provide a qualified person in attendance when a cargo tank is loaded and/or unloaded.
- The attendant must be awake, have an unobstructed view of the cargo tank, and be within 25 feet of the cargo tank throughout the event.

- The attendant must be aware of the nature of the material to be loaded and/or unloaded, trained on the procedures to be followed in emergencies, authorized to move the cargo tank, and have a means to move the cargo tank.
- Manholes and valves must be closed and secured during transfer.
- All loading and unloading areas must be empty of any volume of rainwater or other liquids prior to beginning transfer operation.
- No loading and unloading can take place during extreme weather events to prevent overflow of containment areas during a storm.

The following additional requirements apply when the transporter is loading and unloading materials with flash points below 140 degrees Fahrenheit. These materials meet the DOT definition of a Class 3 flammable liquid. Combustible materials with flash points between 140 and 200 degrees Fahrenheit are not subject to these requirements.

- Unless the engine of the cargo tank motor vehicle is to be used to operate a pump, the engine will not be running during loading and unloading of the material.
- Bonding and grounding procedures for cargo tanks and containers during the transfer of material are to be implemented according to 49 CFR 177.837 (b) and (c). The current process for loading and unloading at Fort Knox meets these requirements.

The following are the minimum procedures for on-site and off-site staff and contractors to follow for handling of fuel. These procedures are to be used to help prevent discharges at Fort Knox.

9.2.1 General Transfer Operations

This section is applicable to all fuel transfer operations. It is recommended that contractors (on- and off-site) transferring POL to ASTs, mobile containers, and USTs are monitored by Fort Knox (or contractor) personnel. Extreme caution is taken to prevent spills from trucks due to faulty connections or hose ruptures.

- Load or unload only in approved areas.
- Establish communications between the pumping and receiving stations.
- Verify that the available volume of the receiving container is greater than the volume of oil to be transferred
- Continuously monitor the entire oil transfer
- Properly close all drainage valves for any secondary containment
- Visually inspect all valves for leakage when transfer is complete
- Exercise extra precautions and diligence for deliveries during rainy weather. Fuel migration rates increase in water-filled ditches and rain saturated-soil, and a reduced spill response time exists to prevent a spill from reaching waterways or sensitive ecological areas.
- Storm drains in the immediate vicinity of the fueling operation should be covered with a flexible mat during fueling operations.
- Spill containment equipment will be readily accessible and prepared for deployment during fueling operations.

- All used sorbent material will be disposed of promptly and should not be allowed to remain on the ground or other surface where it could cause further contamination. Used sorbent material will be drummed and properly disposed in accordance with the FRP.
- Bonding and grounding procedures for tanks trucks and containers during the transfer of material are to be implemented according to 49 CFR 177.837 (b) and (c). The current process for loading and unloading meets these requirements. Additional requirements apply when the transporter is loading and unloading materials with flash points below 140 degrees Fahrenheit. These materials meet the DOT definition of a Class 3 flammable liquid. Combustible materials with flash points from 140 to 200 degrees Fahrenheit are not subject to these requirements.

9.2.2 Tank Truck to Container Transfer Operations (including USTs)

Before Transfer Procedures

- Use a spotter when backing the vehicle.
- Set the parking brake of the vehicle.
- The vehicle will not be left running unless required for transfer operations.
- Validate ullage of the receiving container with the expected delivery amount.
- While extending the hose to the container, do not drag the nozzle or capped hose.
- Ensure the correct container valves are open prior to transfer.
- Extend the nozzle/hose to the fill port/inside spill bucket, where applicable.
- For “Open Port” transfer operations:
  - Do not prop the nozzle in the open position.
- For “Closed Port” transfer operations:
  - Ensure valve/cam-lock fitting is completely locked shut on the fill port.

During Transfer Procedures

- Use the “dead man” switch, if equipped on truck.
- Monitor operation for leaks. Shutdown the operation if leaks are detected.
- Monitor the level gauge.
- Do not fill USTs over 90 percent capacity (Unified Facilities Criteria [UFC] 3-460-1 Chapter 8).
- Do not fill ASTs over 95 percent capacity (UFC 3-460-1 Chapter 8).
- If the level gauge is not visible from the fill port/spill bucket, stop filling, verify ullage and restart the transfer operation.

After Transfer Procedures

- When transfer operations are completed, ensure the nozzle/hose is capped and carried back to the truck. Do not drag the nozzle/capped hose end across the ground.
- Secure capped nozzle/hose in compartment box or hose reel to prevent damage or spills.
- Remove and store bonding cable.
- Closely inspect the lowermost drain and all outlets of the vehicle for discharges; and, if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit.

9.2.3 Hand Pour into Container (Used Cooking Oil / Used Engine Oils) Transfer Operations

Before Transfer Procedures

- Depending on the height of the container, use the appropriate stepladder in accordance with 29 CFR 1910.25(b)(2).
- Validate ullage of the receiving container with the expected amount of oil to be drained.
- Do not fill the used oil container to capacity. Ensure weight of the container is not too heavy to allow for safe transfer while standing on the stepladder.

During Transfer Procedures

- Gradually pour the oil into the used cooking oil container.
- Monitor operation for leaks. Shutdown the operation if leaks are detected.
- Do not fill ASTs over 95 percent capacity (UFC 3-460-1 Chapter 8).
- If the level gauge is not visible from the spill bucket, stop filling, verify ullage, and restart the transfer operation.

After Transfer Procedures

- Secure used cooking oil container cap.

9.2.4 Vacuum Truck from Container (Used Cooking Oil / Used Engine Oils) Transfer Operations

Before Transfer Procedures

- Use a spotter when backing the vehicle.
- Set the parking brake of the vehicle.
- The vehicle will not be left running unless required for transfer operations.
- Validate ullage of the truck with the expected amount to be removed from the used cooking oil container.
- While extending the hose to the container, do not drag the nozzle or capped hose.
- Ensure the correct truck valves are open prior to transfer.
- Extend the nozzle/hose to the fill port/ inside spill bucket, where applicable.
  - For “Open Port” transfer operations:
- Do not prop the nozzle in the open position.
  - For “Closed Port” transfer operations:
- Ensure valve/cam-lock fitting is completely locked shut on fill port

During Transfer Procedures

- Use the “dead man” switch, if equipped on truck.
- Monitor the truck level gauge.
- If the level gauge is not visible from the fill port/spill bucket, stop filling, verify ullage, and restart the transfer operation.
- Monitor operation for leaks. Shutdown the operation if leaks are detected.

After Transfer Procedures

- When transfer operations are completed, ensure the nozzle/hose is capped and carried back to the truck. Do not drag the nozzle/capped hose end across the ground.
- Secure capped nozzle/hose in compartment box or hose reel to prevent damage or spills. If the container is equipped with a spill bucket, drain any residual fuel into the spill bucket before capping the nozzle.
- Closely inspect the lowermost drain and all outlets of the vehicle for discharges; and, if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit.

9.2.5 Tank Truck to and from Aircraft

Before Transfer Procedures

- Pre-position wheel chock and use a spotter when backing toward the aircraft.
- Refueling or defueling of aircraft requires two (2) personnel (fuel truck vehicle operator and aircraft operator). Fire watch person is also required for open port fuel transfers.
- Position fuel truck vehicle for servicing of aircraft.
- Ensure the fuel truck is electrically bonded to aircraft.
- Ensure the fuel nozzle is extended with the cap on, and the aircraft operator removes the cap, when ready to begin fuel transfer.
- The aircraft operator will connect the single point fuel nozzle to the aircraft and will ensure the strainer coupling quick disconnect locking device is properly seated, and that the nozzle is in secure position.

During Transfer Procedures

- The fuel truck vehicle operator will begin the pumping operation, upon direction of aircraft operator, and ensure the pump revolutions per minute (RPM) are slowly increased.
- “Dead man” fuel control must be held, and not propped open.
- Closely monitor the control panel during operation, and do not exceed the recommended nozzle pressure for the aircraft being serviced.
- When defueling an aircraft, to prevent over-riding the high-level shutoff on the fuel truck vehicle, do not exceed the recommended gallons per minute.
- Closely monitor the fuel truck and aircraft for signs of leaks.

After Transfer Procedures

- When transfer operations are completed, ensure the fuel nozzle is capped, and carried back to the truck. Do not drag the nozzle/capped hose end across the ground.
- Secure capped nozzle/hose in compartment box or hose reel to prevent damage or spills. If possible, drain any residual fuel into the spill bucket before capping the nozzle.
- Closely inspect for fuel discharges, the lower most drain and all outlets of the vehicle; and if necessary, ensure that they are tightened, adjusted, or replaced to prevent fuel discharge while in transit.

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SECTION 10

Brittle Fracture Evaluation

"112.7(i): If a field-constructed aboveground container undergoes a repair, alteration, reconstruction, or a change in service that might affect the risk of a discharge or failure due to brittle fracture or other catastrophe, or has discharged oil or failed due to brittle fracture failure or other catastrophe, evaluate the container for risk of discharge or failure due to brittle fracture or other catastrophe, and as necessary, take appropriate action."

There are no field-constructed ASTs at Fort Knox, thus, the brittle fracture requirements of 40 CFR 112.7(i) do not apply. The only containers in place at Fort Knox are shop-constructed ASTs, mobile/portable containers, and OFOE.

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SECTION 11

Conformance with State and Local Applicable Requirements

11.1 State Regulatory Standards

"112.7(j): In addition to the minimal prevention standards listed under this section, include in your Plan a complete discussion of conformance with the applicable requirements and other effective discharge prevention and containment procedures listed in this part or any applicable more stringent State rules, regulations, and guidelines."

The Commonwealth of Kentucky does not have separate AST regulations. Kentucky Revised Statutes (KRS) 224.1-400(11) addresses the reporting requirements for discharges and is more stringent than Federal requirements.

Requirements for USTs are documented in Title 401, Kentucky Administrative Regulations (KAR), and Chapter 42. As USTs are not subject to SPCC requirements, a general overview of the regulations is provided in this section. As the Commonwealth of Kentucky does not have a state promulgated UST program, owners/operators of USTs must adhere to 40 CFR 280 and Title 401, KAR, Chapter 42.

11.1.1 Spill Reporting

For discharges into the environment (or into secondary containment), the following must be immediately reported, once observed, to the KDEP ERB (800-928-2380 or 502-564-2380):

- 25 gallons or more of petroleum or petroleum product in a 24-hour period.
- 75 gallons or more of diesel fuel in a 24-hour period.
- Any amount that creates a visible sheen on surface waters.

The location of the release, material released, and the approximate quantity or concentration of the release must be disclosed when notifying the KDEP ERB. If the primary AST and the secondary containment area are located inside a building that would not reach the outside environment, then the spill is not reportable to the ERB.

11.2 Other Relevant Standards

Table 11-1 is a general list of the primary SOPs, military standards, Army instructions, and applicable industry standard guidance that should be used at Fort Knox. Please note that for industry standards and guidance, not all listed may be required for current equipment and conditions at Fort Knox. This list serves as a reference for DPW and EMD staff that should be considered when addressing container and fuel facility design, inspection, maintenance, and management.

TABLE 11-1: Relevant Military and Industry Standards

Department of Defense	
UFC 3-460-01	UFC: Design: Petroleum Fuel Facilities
UFC 3-460-03	UFC: Operation and Maintenance of Petroleum Systems
UFC 3-570-06	UFC: Operation and Maintenance of Cathodic Protection Systems
Tech Manual 37A12-25-1	Technical Manual Operation and Maintenance Instructions with Illustrated Parts Breakdown: Tank, Trailer Mounted Recoverable Aviation Turbine Fuel: 200, 400, And 600 Gallon
Army Instructions	
AR 200-1	Environmental Quality – Environmental Protection and Enhancement
Fort Knox Compliance Plans & SOPs	
Response Plan	Fort Knox RCRA Contingency Plan
Discharge Prevention and Mitigation	Fort Knox SWGWPPP
Storage Tank Management	POL & HazMat & HazWaste Tank Numbering
API Standards	
API 570	Piping Inspection Code (Inspection, Repair, Alteration, and Rerating of In-Service Piping Systems)
API 653	Tank Inspection, Repair, Alteration, and Reconstruction
API RP 574	Inspection of Piping System Components
API RP 579	Fitness-for-Service
API RP 651	Cathodic Protection of Petroleum ASTs
API RP 652	Lining of Petroleum AST Bottoms
API 912	Installation Instructions for Shop-fabricated Stationary ASTs for Flammable, Combustible Liquids
API 2610	Design, Construction, Operation, Maintenance, and Inspection of Terminal and Tank Facilities
API RP 2350	Overfill Protection for Storage Tanks in Petroleum Facilities
API Bulletin D16	Suggested Procedure for Development of SPCCs
STI Standards	
STI SP001-06	Standard for Inspection of In-Service Shop-Fabricated ASTs for Storage of Combustible and Flammable Liquids

STI SP031	Standard for Repair of Shop-Fabricated Aboveground Tanks for Storage of Flammable, Combustible Liquids
STI F911	Standard for Diked Aboveground Steel Tanks
STI R912	Installation Instructions for Shop Fabricated Stationary Aboveground Storage Tanks for Flammable, Combustible Liquids
STI Publication R931	Double-Wall AST Installation and Testing Instruction
UL Standards	
UL Std. 58	Standard for Steel USTs for Flammable and Combustible Liquids
UL Std. 142	Standard for Steel ASTs for Flammable and Combustible Liquids
UL Std. 1316	Standard for Glass-Fiber-Reinforced Plastic USTs for Petroleum Products
UL Std. 2085	Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids
Other Standards	
NFPA 30	Flammable and Combustible Liquids Code
NFPA 30A	Code for Motor Fuel Dispensing Facilities and Repair Garages
DD Form 1391	Military Construction Project Data
MIL-STD 161-F	Identification Methods for Bulk Petroleum Products Systems Including Hydrocarbon Missile Fuels
MIL Handbook 1022A	Petroleum Fuel Facilities
PEI RP 200	Recommended Practices for Installation of Aboveground Storage Systems for Motor Vehicle Fueling
ASME B 31.3	Process Piping
ASME B31.4	Transportation Systems for Hydrocarbons, Liquid Petroleum Gas, Anhydrous Ammonia, and Alcohols

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SECTION 12

Other SPCC Requirements

12.1 Container Construction

"112.8(c)(1): You must not use a container for the storage of oil unless its material and construction are compatible with the material stored and conditions of storage such as pressure and temperature."

ASTs and other containers included in this Plan are constructed of steel, concrete, polyethylene, and polyurethane. Most ASTs at Fort Knox are constructed to UL 142 (Steel Aboveground Tanks for Flammable and Combustible Liquids) or UL 2085 (Standard for Protected Aboveground Tanks for Flammable and Combustible Liquids).

In instances where a construction standard cannot be determined, it is recommended that an engineering assessment be conducted to determine if the container meets material and construction criteria for the type of oil stored and conditions of storage. As an alternative, the containers may be replaced with ones of known construction standard.

12.2 Corrosion Protection for Buried, Partially Buried and Bunkered Storage Tanks

"112.8(c)(4): You must protect any completely buried metallic storage tank installed on or after January 10, 1974 from corrosion by coatings or cathodic protection compatible with local soil conditions. You must regularly leak test such completely buried metallic storage tanks."

"112.8(c)(5) Not use partially buried or bunkered metallic tanks for the storage of oil, unless you protect the buried section of the tank from corrosion. You must protect partially buried and bunkered tanks from corrosion by coatings or cathodic protection compatible with local soil conditions.

There are no partially buried or completely buried bare metallic-tanks for the storage of oil in service at Fort Knox. The USTs at AAFES Wilson Road are constructed of fiberglass reinforced plastic.

12.3 Corrosion Protection for Buried Piping

"112.8(d)(1): Provide buried piping that is installed or replaced on or after August 16, 2002, with a protective wrapping and coating. You must also cathodically protect such buried piping installations or otherwise satisfy the corrosion protection standards for piping in part 280 of this chapter or a State program approved under part 281 of this chapter. If a section of buried line is exposed for any reason, you must carefully inspect it for deterioration. If you find corrosion damage, you must undertake additional examination and corrective action as indicated by the magnitude of the damage."

Underground piping in place after August 16, 2002, is required to be wrapped, coated, and cathodically protected according to 40 CFR 280 and 281.

There are two fiberglass reinforced plastic USTs at AAFES Wilson Road. These USTs are equipped with buried, double-walled fiberglass reinforced plastic piping to the fuel dispensing pumps. The USTs are equipped with a Veeder-Root ATG that provides automatic line leak detection. There

are three double-walled ASTs at AAFES West Chaffee Ave. These ASTs are equipped with double-walled fiberglass reinforced plastic piping to the fuel dispensing pumps. These ASTs are equipped with a Veeder-Root ATG that provides automatic line leak detection.

In most instances, piping from external ASTs to internal generators, day tanks, or boilers is single-walled and located inside of short piping runs or channels to the associated equipment. These piping runs and channels provide some corrosion prevention and spill protection. In instances where short runs of single-walled piping travel from ASTs to interior equipment, it must be carefully examined for deterioration when (or if) the subsurface piping becomes exposed. Corrective action shall be taken as indicated by the magnitude of the damage. If the buried piping is replaced, the new piping must be either aboveground or underground and equipped with cathodic protection or encapsulated in casing pipe. Integrity and leak testing of buried piping is conducted at the time of installation, modification, construction, relocation, or replacement in accordance with UFC 3-460-03.

There is no known cathodically protected piping at Fort Knox; however, all piping in contact with soil is either painted, double-walled fiberglass, or enclosed with corrosion-resistant wrappings.

12.4 Heating Coils

"112.8(c)(7) Control leakage through defective internal heating coils by monitoring the steam return and exhaust lines for contamination from internal heating coils that discharge into an open watercourse, or pass the steam return or exhaust lines through a settling tank, skimmer, or other separation or retention system."

No containers equipped with internal heating coils exist at Fort Knox.

12.5 Overfill Prevention

"112.8(c)(8): You must engineer or update each container installation in accordance with good engineering practice to avoid discharges. You must provide at least one of the following devices:
(i) High liquid level alarms with an audible or visual signal at a constantly attended operation or surveillance station. In smaller facilities an audible air vent may suffice.
(ii) High liquid level pump cutoff devices set to stop flow at a predetermined container content level.
(iii) Direct audible or code signal communication between the container gauger and the pumping station.
(iv) A fast response system for determining the liquid level of each bulk storage container such as digital computers, telepulse, or direct vision gauges. If you use this alternative, a person must be present to monitor gauges and the overall filling of bulk storage containers.
(v) You must regularly test liquid level sensing devices to ensure proper operation."

As indicated in **Table 2-2**, liquid level sensing devices have been installed to prevent overfills. The following devices are used at Fort Knox:

- ATS Systems
- Automated Fuel Handling Equipment System
- High Level Alarms
- System Shut Off
- Mechanical Level Gauge
- Overfill Prevention Valve

Containers associated with the AAFES Stations are equipped with Veeder-Root systems that allow personnel to monitor liquid levels and alarm systems to prevent overfill. When loading the ASTs and USTs, audible and visual alarms can sound outdoors and inside of the AAFES Station offices. Both AAFES Stations run an automated inventory management system that provide daily tracking of fuel levels in each individual container.

At the Energy Security locations, each bulk storage AST is connected to a Franklin Fueling System that allows personnel to monitor liquid levels and alarm system to prevent overfill. Audible and visual alarms sound outdoors where fueling into the ASTs occurs.

A level gauge device must be installed on all regulated containers, except for low risk ones such as used cooking oil containers, and 55-gallon oil drums, in which the level is easy to see. The level gauge device can be an ATG system, which has an electronic sensor inside the AST that is connected to a remote reading display in an adjacent building, or a quick-read gauge.

If the level gauge is installed in a position such that the level amount is not visible to the person who is controlling the fuel flow into the container, then the facility must implement a 2-person fill procedure with "direct audible or signal communication between the container gauger and the pumping station". This is a fill procedure which requires two people on site: the first person operates the fuel pump, and the second person monitors the level gauge device.

A portable measuring stick may be used to check liquid levels during static (no flow) conditions. However, a measuring stick is not an acceptable method of level gauging, during a high flow rate or pressurized fill process, because it does not meet the 40 CFR 112.8(c)(8)(iv) requirement for a "fast response system" of gauging. Fort Knox personnel and contractors must inspect monthly, and test annually, the liquid level sensing devices and alarms, per manufacturer recommendations.

12.6 Effluent Treatment Facility

"112.8(c)(9): You must observe effluent treatment facilities frequently enough to detect possible system upsets that could cause a discharge as described in §112.1(b)."

There is one wastewater treatment facility at Fort Knox. It is operated and staffed by Hardin County Water District No. 1 personnel. In the event of a discharge that may reach wastewater sewer lines, notification to the wastewater treatment plant (WWTP) should follow procedures outlined in **Section 4.1**.

Effluent is monitored at OWSs for oil and grease limits, as well as other pollutant limitations. OWS are monitored on a regular basis by personnel from DPW as well as the using organization. Operational personnel are trained and instructed to notify the EMD if unsatisfactory conditions in OWSs are observed.

Fort Knox's Kentucky Pollutant Discharge Elimination System (KPDES) stormwater permit requires quarterly sampling of outfalls. High-risk outfalls are inspected for signs of petroleum contamination (e.g., odor, sheen) at time of sampling or whenever receiving waters could be impacted by an illicit discharge. Damaged or leading valves, bolts, or other components must be

repaired as soon as possible to prevent a spill or a discharge to navigable waters. If observed, oil is promptly removed and disposed of in accordance with local procedures.

12.7 Terminal Connections

"112.8(d)(2): Cap or blank-flange the terminal connection at the transfer point and mark it as to origin when piping is not in service or is in standby service for an extended time."

Any piping associated with bulk fuel storage that is removed for inspection or is in standby status, is capped or blank-flanged and marked in accordance with UFC 3-460-03, Section 1, or physically removed from the fuel system altogether. Small-diameter piping systems are also capped when not in service or in standby status.

12.8 Pipe Supports

"112.8(d)(3): Properly design pipe supports to minimize abrasion and corrosion and allow for expansion and contraction."

Based on visual inspections only, the majority of the pipe supports at Fort Knox appear to have been designed and constructed in accordance with good engineering practice as outlined in UFC 3-460-01, Chapter 9, as well as American National Standards Institute (ANSI)/Manufacturers Standardization Society SP-58 (2009). All pipe supports must be designed in a manner that minimizes the potential for abrasion and corrosion and allows for expansion and contraction of the piping while providing for adequate support during operations, including the potential for vibration and hammer effects. Proper materials must also be used for pipe supports. Examples of poor or inadequate pipe supports would include:

- Wooden blocks
- Broken supports or anchors
- Supports that do not allow for pipe movement
- Supports that trap moisture against the pipe leading to corrosion
- Improper spacing

12.9 Vehicle Warning

"112.8(d)(5): Warn all vehicles entering the facility to be sure that no vehicle will endanger aboveground piping or other oil transfer operations."

Aboveground fuel piping is protected from vehicular collision or damage through a variety of methods. Fencing, secured areas, concrete posts (bollards), secondary containment, and distance from traffic areas are all employed to protect aboveground piping at all site operations.

Roads, parking areas, and driveways are clearly marked to control vehicular traffic in and around these spill risk areas. Base security regularly enforces site specific traffic regulations to ensure compliance with warning signs.

12.10 Facility Drainage: Design and Equipment

"112.8(b)(3): Design facility drainage systems from undiked areas with a potential for a discharge (such as where piping is located outside containment walls or where tank truck discharges may occur outside the loading rack) to flow into ponds, lagoons, or catchment basins designed to retain oil or return it to the facility. You must not locate catchment basins in areas subject to periodic flooding."

"112.8(b)(4): If facility drainage is not engineered as in 112.8(b)(3), equip the final discharge of all ditches inside the facility with a diversion system that would, in the event of an uncontrolled discharge, retain oil in the facility."

The GRI, 40 CFR 112.8(b)(3), and 112.8(b)(4), specifies performance requirements for systems used to drain undiked areas with the potential for a discharge. These two provisions apply only when the Fort Knox chooses to use a facility wide drainage system to meet general secondary containment requirements under §112.7(c) or a more specific requirement under §112.8(c).

For the containers included in this Plan, Fort Knox has chosen to meet the applicable secondary containment requirements under 40 CFR 112.7(c) and 40 CFR 112.8(c) as discussed in previous sections of this Plan. Therefore, as discussed in the GRI excerpt previously noted, sections 40 CFR 112.8(b)(3) and 40 CFR 112.8(b)(4) do not apply to the containers included in this Plan.

If there is a discharge from any piping system or fuel transfer area, which is located outside of containment walls or berms, then active discharge response controls are required, and must be implemented in accordance **Section 4.1** and Fort Knox's RCRA Contingency Plan.

12.11 Facility Drainage: Pump Transfer

"112.8(b)(5): Where drainage waters are treated in more than one treatment unit and such treatment is continuous, and pump transfer is needed, provide two "lift" pumps and permanently install at least one of the pumps. Whatever techniques you use, you must engineer facility drainage systems to prevent a discharge as described in §112.1(b) in case there is an equipment failure or human error at the facility."

The requirements of 112.8(b)(5) are not applicable to the containers included in this Plan because drainage system treatment units are not used to treat drainage area stormwater.

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