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Design Assessment for the Melton Valley Storage Tanks Capacity Increase at Oak Ridge National Laboratory under the Federal Facility Agreement, Oak Ridge, Tennessee

DISCLAIMER

DOE/OR/01-1424&D1

Energy Systems Environmental Restoration Program
ORNL Environmental Restoration Program

Design Assessment for the Melton Valley Storage Tanks Capacity Increase at Oak Ridge National Laboratory under the Federal Facility Agreement Oak Ridge, Tennessee

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LOCKHEED MARTIN ENERGY SYSTEMS, INC.
for the
U.S. DEPARTMENT OF ENERGY
under contract DE-AC05-84OR21400

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UNITED STATES DEPARTMENT OF ENERGY
OAK RIDGE OPERATIONS

PROJECT ORDER NO. 930047.01

FFA COMPLIANCE CERTIFICATION

FOR
THE MELTON VALLEY STORAGE TANKS
CAPACITY INCREASE

THIS DOCUMENT IS THE PROPERTY OF THE DEPARTMENT OF ENERGY, PREPARED BY FOSTER WHEELER ENVIRONMENTAL CORPORATION UNDER CONTRACT NO. DE-A05-91O421928 FOR EXECUTION OR REVIEW OF THE ENGINEERING AND CONSTRUCTION OF THE SUBJECT PROJECT.

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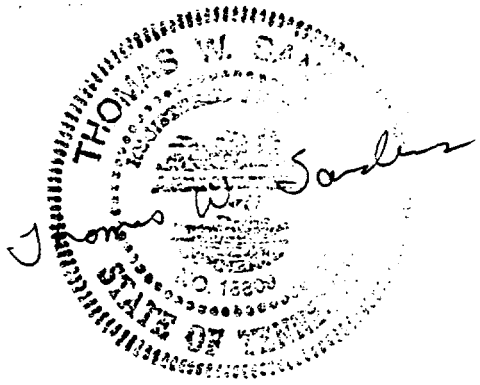

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FOSTER WHEELER ENVIRONMENTAL CORPORATION
FEDERAL FACILITY AGREEMENT
APPENDIX F—FY 1992
COMPLIANCE CERTIFICATION—MELTON VALLEY STORAGE TANKS CAPACITY INCREASE PROJECT, ORNL

PROJECT SUMMARY

This project will provide additional storage capacity for the liquid low-level waste (LLLW) system at the Oak Ridge National Laboratory (ORNL) and satisfy the Federal Facility Agreement (FFA) requirement for the transfer of LLLW from existing tank systems not in full FFA compliance.

Six tanks, each with a 100,000-gal nominal capacity, will be added to increase LLLW storage capacity. The tanks will be single wall, horizontal, constructed of 304L stainless steel and designed, fabricated, tested, inspected, and stamped in accordance with the ASME B&PV Code, Section VIII. Each of the six LLLW storage tanks will be housed in separate vaults that are reinforced concrete structures with walls and roofs. All pumps and process valves will be located in the Pump and Valve Vault (PVV). The PVV and the tank vaults will be lined with 11 gauge type 304L stainless steel to a sufficient height to contain the maximum volume of LLLW that could leak into that vault. The vault floors will be sloped to monitored, lined sumps. The PVV liner will be approximately 1 ft high and will hold at least 2,000 gal. The PVV sump will have an overflow designed to equally distribute excess fluids to the spare tank vault and the tank vault adjacent to the spare tank. The spare tank vault and the adjacent vault will have liner heights of 10 ft and will hold at least 55,000 gal each with liner height and capacity based on handling 110% of the worst case spill or 110,000 gal with empty tanks. The other four tank vaults will have liner heights of 10 ft designed to hold 110,000 gal each. This liner height and capacity are based on a large leak from a tank and the assumption that the final liquid height in the tank and vault are the same. All concrete walls above the liners will be epoxy coated to aid decontamination. Each liner will be tested for tightness after construction in accordance with the FFA requirements.

The primary-containment piping will be corrosion-evaluated, fully certified 304L stainless steel, schedule 40S pipe. Secondary-containment piping (the outer pipe of double-wall piping) will be certified 304L stainless steel, schedule 10S pipe. Double-wall pipe will be used for all underground LLLW lines. The annulus of the double-wall pipe will be pressurized with nitrogen for leak detection. Single-wall pipe will be used inside the stainless steel lined vaults. Vault penetrations will be sealed to prevent inleakage of rainwater or air.

Storm water management will be provided to ensure that precipitation is effectively conveyed away from the site. The vault roofs will be sloped for rainwater drainage and discharge into storm water ditches. Surface water runoff will be diverted away from the site and the site will be graded to provide positive drainage away from it.

The primary confinement system will maintain the LLLW tanks at a pressure ranging from negative 0.5 in. of water column to negative 4.0 in. of water column. The LLLW tanks will experience a sweep rate of 150 scfm to remove volatiles from the tanks. Tank inlet air will be filtered through a single prefilter and HEPA filter arrangement. Tank exhaust air will be filtered through a prefilter arrangement followed by dual HEPA filters in series. Redundant filter units will be provided for both tank inlet and outlet systems. The exhaust will be routed to a single stack along with the ventilation exhaust from the secondary confinement system.

The primary confinement ventilation system (inlet and exhaust) will be constructed of corrosion evaluated 304L stainless steel material.

The tank inlet and outlet ducts will be equipped with connections for nitrogen purge. Should the combustible gas monitors detect unacceptable levels of combustibles in the tank exhaust ducting, the tanks can be purged with nitrogen by connecting the purge piping to a nitrogen tank truck at the truck station. This action will purge the tank in question and will create an atmosphere incapable of sustaining combustion.

The secondary confinement ventilation system will maintain the tank vaults and PVV at a pressure ranging from negative 1.5 in. of water column to negative 3.0 in. of water column. The LLLW tank vaults will experience a sweep rate of 750 scfm per vault to provide adequate stratification of heated air and prevent LLLW pipes from freezing. The LLLW PVV will experience a sweep rate of 1500 scfm to provide adequate mixing of heated air and prevent LLLW pipes from freezing. Secondary confinement inlet air will be filtered through a roughing filter and prefilter. Secondary confinement exhaust air will be filtered through a prefilter followed by a HEPA filter. Redundant filter units will be provided for both vault inlet and outlet systems.

The secondary confinement inlet ventilation system will be constructed of 304L stainless steel material without corrosion evaluation. The secondary confinement exhaust ventilation system will be constructed of corrosion evaluated 304L stainless steel material.

B. REQUIRED FFA STANDARDS FOR DESIGN/INSTALLATION OF NEW OR REPLACEMENT TANK SYSTEMS

REQUIREMENT:

1(a) The design/installation assessment for each new or replacement tank system(s) design shall include, at a minimum, the design standards, including available as-built specifications, according to which tank(s) and or ancillary equipment are constructed.

ASSESSMENT:

COMPLIANT - The specifications associated with the equipment (valves, tanks, etc.) and piping furnished with this project have been reviewed and include all of the codes, standards, and design criteria necessary to meet the project requirements.

REQUIREMENT:

1(b) The design/installation assessment for each new or replacement tank system(s) design shall include, at a minimum, the hazardous characteristics of the hazardous and/or radioactive substance(s) to be handled (on a tank specific basis).

ASSESSMENT:

COMPLIANT - The characteristics of the LLLW fluid within the piping and tanks included on this project were assessed. The hazardous characteristics including corrosiveness and radioactivity were accounted for in the design. A listing of some of the fluid properties is included on the project

B. **REQUIRED FFA STANDARDS FOR DESIGN/INSTALLATION OF NEW OR REPLACEMENT TANK SYSTEMS** (Continued)

process flow diagrams. The materials of construction used on the project are acceptable for the application. The vault ceilings and walls concrete thicknesses are provided in accordance with the dictates of Health Physics.

REQUIREMENT:

1(c)i The design/installation assessment for each new or replacement tank system(s) design shall include, at a minimum, for new or replacement tank system(s) in which the external shell of a metal tank or any external metal component(s) of the tank system will be in contact with the soil, moisture, or other precipitation a determination by a corrosion expert of the factors affecting the potential for corrosion, including but not limited to:

(A) Soil moisture content;
(B) Soil pH;
(C) Soil sulfides;
(D) Soil resistivity;
(E) Structure to soil potential;
(F) Influence of nearby underground metal structures (e.g.,piping)
(G) Existence of stray electric currents
(H) Existing corrosion-protection measures (e.g., coating, cathodic protection)

ASSESSMENT:

COMPLIANT - Cathodic protection has been provided for the new piping systems that come in contact with the soil. The system has been designed by a corrosion expert. It is also specified that a corrosion expert will oversee the installation of the cathodic protection system to verify compliance with the design drawings.

REQUIREMENT:

1(c)ii The design/installation assessment for each new or replacement tank system(s) design shall include, at a minimum, the type and degree of external corrosion protection that are needed to ensure the integrity of the tank system(s) during the use of the system(s) consisting of one or more of the following:

(A) Corrosion-resistant materials of construction such as special alloys, fiberglass reinforced plastic, etc.;

B. **REQUIRED FFA STANDARDS FOR DESIGN/INSTALLATION OF NEW OR REPLACEMENT TANK SYSTEMS** (Continued)

(B) Corrosion-resistant coating (such as epoxy, fiberglass, etc.) with cathodic protection (e.g. impressed current or sacrificial anodes); and

(C) Electric isolation devices such as insulating joints, flanges, etc.

ASSESSMENT:

COMPLIANT - The tank vaults and the PVV are lined with 11 gauge 304L stainless steel plates on the floor and walls to a level above the capacity of 110% of the tanks or amounts of liquid transferred during one interval. The walls above the stainless steel liner are coated in accordance with the requirements of the vault finish schedules and the construction specification. The pipe in contact with the soil, carrying LLLW that penetrates a structure is provided with an insulating gasket as part of the overall corrosion protection system. Cathodic protection is also provided as described in the assessment for Section 1(c) above.

REQUIREMENT:

1(d) The design/installation assessment for each new or replacement tank system(s) design shall include, at a minimum, for underground tank system components that are likely to be adversely affected by vehicular traffic, a determination of design or operational measures that will protect the tank system against potential damage.

ASSESSMENT:

COMPLIANT - The underground double-wall piping included in the project will be provided by an installation contractor. The installation contractor is responsible for the analysis of the piping. The completed analysis will be a deliverable and must be performed and checked in accordance with the site procedures. All design criteria necessary for the installation contractor to perform the analysis of the various piping systems identified are included in the equipment specification. The design criteria complies with the requirements of this FFA action.

REQUIREMENT:

1(e) The design/installation assessment for each new or replacement tank system(s) design shall include, at a minimum, the design considerations to ensure that:

(i) Tank foundations will maintain the load of a full load;

B. **REQUIRED FFA STANDARDS FOR DESIGN/INSTALLATION OF NEW OR REPLACEMENT TANK SYSTEMS** (Continued)

(ii) Tank systems will be anchored to prevent flotation or dislodgement where the tank system is placed in a saturated zone, or is located within a seismic fault zone which has had displacement during the Holocene period; and

(iii) Tank systems will withstand the effects of frost heave.

ASSESSMENT:

COMPLIANT - Calculations were performed on the tank vault to verify that it is designed to satisfactorily accommodate the loading conditions identified in item (i). Equipment specifications require that the tank vendor supply calculations to include flotation and dislodgement considerations in the case that the vaults are flooded while the tank is empty. Item (iii) is not a consideration in this case.

REQUIREMENT:

2 The DOE shall ensure that proper handling procedures are adhered to in order to prevent damage to tank system(s) during installation. Prior to covering, enclosing, or placing a new tank system in use, a qualified installation inspector who is trained and experienced in the proper installation of tank systems or components, shall inspect the system for the presence of any of the following items:

(a) Weld Breaks;
(b) Punctures;
(c) Scrapes of protective coatings;
(d) Cracks;
(e) Corrosion;
(f) Other structural damage or inadequate construction or installation;

All such discrepancies shall be remedied before the tank system is covered, enclosed, or placed in use.

ASSESSMENT:

DOE OVERSIGHT RESPONSIBILITY. The construction specification requires the construcion contractor to provide inspection access to the DOE or DOE Contractor with regard to the items specified.

B. REQUIRED FFA STANDARDS FOR DESIGN/INSTALLATION OF NEW OR REPLACEMENT TANK SYSTEMS (Continued)

REQUIREMENT:

3 The DOE shall obtain and maintain copies of all inspection reports relating to the fabrication, construction, installation, and testing of tank system(s). These reports shall be completed by welding inspectors certified by the American Welding Society.

ASSESSMENT:

DOE OVERSIGHT RESPONSIBILITY. Welding inspection certification requirements are included in Division 18, of the Construction Specification.

REQUIREMENT:

4 New tank system(s) that are placed underground and that are back filled shall be provided with a backfill material that is a noncorrosive, porous, homogeneous substance and that is installed so that backfill is placed completely around the tank and compacted to ensure that the tank and piping are fully and uniformly supported.

ASSESSMENT:

COMPLIANT - Excavation, backfilling, and compaction for underground piping and foundations is adequately covered in the Construction Specification.

REQUIREMENT:

5 All new tanks and ancillary equipment shall be tested for tightness prior to being covered, enclosed or placed in use. If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) in the system shall be performed prior to the tank system being covered, enclosed, or placed into use.

ASSESSMENT:

COMPLIANT - The construction and equipment specifications require that all of the equipment and piping installed will be tested by the vendor or installation contractor for tightness upon completion of fabrication and/or installation and prior to start-up.

REQUIREMENT:

6 Ancillary equipment shall be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

B. **REQUIRED FFA STANDARDS FOR DESIGN/INSTALLATION OF NEW OR REPLACEMENT TANK SYSTEMS** (Continued)

ASSESSMENT:

COMPLIANT - The tanks and piping associated with this project are supported in accordance with the established design criteria to protect against damage due to thermal, deadweight, and seismic loading.

REQUIREMENT:

7 The DOE shall provide the type and degree of corrosion protection recommended by a qualified corrosion expert, based in the information provided under Subsection 1(c) above, or other corrosion protection if the EPA/TDEC determines other corrosion protection is necessary to ensure the integrity of the tank system during use of the tank system. The installation of a corrosion protection system that is field fabricated shall be inspected by a qualified DOE (or DOE-contractor) corrosion expert to ensure proper installation.

ASSESSMENT:

COMPLIANT - A corrosion expert designed the cathodic protection system. In addition, the construction specification identifies that a corrosion expert will overview the installation of the cathodic protection system to ensure that it is installed and tested correctly.

REQUIREMENT:

8 The DOE shall ensure that a qualified corrosion expert has provided design guidance during the design of the tank system(s). A qualified corrosion expert shall verify the use of this guidance before construction of the tank system(s) and prior to start-up of the tank system(s).

ASSESSMENT:

COMPLIANT - A corrosion expert designed the tank system. The corrosion expert's guidance was to provide a corrosion allowance for the tanks. The equipment specification identifies that the tank system be inspected prior to shipment by the DOE or DOE's contractor to ensure the corrosion allowance is provided.

B. REQUIRED FFA STANDARDS FOR DESIGN/INSTALLATION OF NEW OR REPLACEMENT TANK SYSTEMS (Continued)

REQUIREMENT:

9 The DOE shall maintain at its facility the information or written statements by those persons required to certify the design of the tank system(s) and review the installation of the tank system(s) in accordance with the requirements of B.1 through B.9 of this Subsection, that shows that the tank system(s) was properly designed and installed and that repairs, pursuant to B.2 and B.5 of this Subsection, were performed.

ASSESSMENT:

DOE REQUIREMENT - This document fulfills the project design certification requirements of this subsection.

C. STANDARDS FOR CONTAINMENT/RELEASE DETECTION

REQUIREMENT:

1(a) At a minimum, secondary containment system(s) shall be constructed of or lined with materials that are compatible with the waste(s) or substance(s) to be placed in the tank system and shall have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste(s) or substances to which it is exposed, climatic conditions and the stress of daily operation (including stresses from nearby vehicular traffic).

ASSESSMENT:

COMPLIANT - The vaults are lined with 11 gauge 304L stainless steel plates which have been judged by a corrosion expert to be compatible with the LLLW fluid. The pipe secondary containment is also 304L stainless steel. The vaults have been designed to withstand the static, hydrological, and seismic external forces. Compliance of the external, underground piping with the appropriate design criteria (e.g., static, vehicular, hydrological, and seismic loading) is the responsibility of the piping installation contractor. The double-wall piping specification complies with the requirements of this FFA section.

REQUIREMENT:

1(b) At a minimum, secondary containment system(s) shall be placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift.

C. STANDARDS FOR CONTAINMENT/RELEASE DETECTION (Continued)

ASSESSMENT:

COMPLIANT - The vaults were designed in accordance with foundation loading calculations that were performed. The criteria used for the calculations is sufficiently conservative. The construction specification provides satisfactory guidance for the preparation of the sub-foundation and the installation/erection of the foundation(s).

REQUIREMENT:

1(c) At a minimum, secondary containment system(s) shall be provided with a leak-detection system that is designed and operated so that it shall detect the failure of either the primary or secondary containment structure or the presence of any measurable release of hazardous or radioactive constituents, hazardous substances, or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practical time if the DOE can demonstrate that existing detection technologies or site conditions will not alloy detection of a release within 24 hours.

ASSESSMENT:

COMPLIANT - The vaults are provided with an adequate leak detection system that meets the requirements of this section. The double-walled LLLW transfer line is provided with a nitrogen pressurized annulus. The annulus of the double-walled piping is provided with instrumentation that will annunciate an alarm when the annulus pressure decays. The vault sumps are provided with instrumentation which annunciates an alarm if liquid is detected.

REQUIREMENT:

1(d) As a minimum, secondary containment system(s) shall be sloped or otherwise designed or operated to drain or remove liquids resulting from leaks, spills, or precipitation. Liquids may be allowed to accumulate in a secondary containment system sump for up to one week. Spilled or leaked substances and accumulated precipitation that exceed the capacity of the secondary containment system sump shall be removed from the secondary containment system within 24 hours, or in as timely a manner as is possible to prevent harm to human health and the environment, if the DOE can demonstrate that removal of the released substances or accumulated precipitation cannot be accomplished within 24 hours.

ASSESSMENT:

COMPLIANT - The piping within the scope of the project is sloped at a minimum of 1/8" per foot to either a LLLW tank or a station sump. The piping is provided with low point drains that are routed to the vault sumps. The vault floors are sloped to the vault sumps. The vault sumps

C. **STANDARDS FOR CONTAINMENT/RELEASE DETECTION** (Continued)

are provided with instrumentation which annunciates an alarm if a leak is detected. Leak detection is provided for all jacketed piping such that a loss of annulus pressure, indicating a leak in either the core or jacket piping, will annunciate an alarm. The alarms will alert the operator that a spill has occurred and that the liquid must be removed. A pump is provided to remove the liquid from the secondary containment sump. The pump is sized to remove the liquid within 24 hours.

REQUIREMENT:

1(e) At a minimum, secondary containment system(s) shall include one or more of the following devices:

(i) A liner (external to the tank);
(ii) A vault;
(iii) A double-walled tank;
(iv) An equivalent device approved by EPA.

ASSESSMENT:

COMPLIANT - The vaults are provided with 11 gauge 304L stainless steel liners which cover the floor and walls to an elevation which permits containment of a volume of liquid in excess of either the tank volume or the volume of liquid transferred at one time. The underground piping system which transfers LLLW is jacketed with stainless steel piping to provide secondary containment.

REQUIREMENT:

1(f)(i)(A) The external liner shall be designed or operated shall to contain 100 percent of the capacity of the largest tank within its boundary.

ASSESSMENT:

COMPLIANT - The lined portion of each tank vault is capable of containing a volume of liquid that is 110% of the capacity of the tank within its boundary.

REQUIREMENT:

1(f)(i)(B) The external liner shall also be designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. Such additional capacity shall be sufficient to contain precipitation from a 25-year, 24 hour rainfall event.

C. **STANDARDS FOR CONTAINMENT/RELEASE DETECTION** (Continued)

ASSESSMENT:

COMPLIANT - Construction joints, piping penetrations, valve stem penetrations, and roof plugs are designed to be sealed to prevent infiltration of precipitation. Storm water management will be provided to ensure that precipitation is effectively conveyed away from the site. The vault roofs will be sloped for rainwater drainage and discharge into stormwater ditches. Surface water runoff will be diverted away from the site and the site will be graded to provide positive drainage away from it.

REQUIREMENT:

1(f)(i)(C) The external liner shall be free of cracks or gaps.

ASSESSMENT:

COMPLIANT - The Construction Specifications require that the liners be inspected to ensure that they are free of cracks or gaps.

REQUIREMENT:

1(f)(i)(D) The external liner shall be designed and installed to surround the tank completely and to cover all surrounding earth likely to come into contact with the substances if the substances are released from the tank(s) (i.e., capable of preventing lateral as well as vertical migration of the substance(s).

ASSESSMENT:

COMPLIANT - The vault floor and walls surround the tank completely allowing no contact with the surrounding earth. The vault roofs are above grade. The vaults are provided with 11 gauge 304L stainless steel liners that cover the floors and extend up the walls of the vault to an elevation sufficient to contain either the respective tank capacity or the capacity of a single transfer of LLLW to the tank in the event of a leak or spill.

REQUIREMENT:

1(f)(ii)(A) The vault system shall be designed or operated to contain 100 percent of the capacity of the largest tank within its boundary.

C. STANDARDS FOR CONTAINMENT/RELEASE DETECTION (Continued)

ASSESSMENT:

COMPLIANT - The vaults are provided with 11 gauge 304L stainless steel liners that extend up the walls of the vault to an elevation sufficient to contain 110% of the capacity of the tank within its boundary.

REQUIREMENT:

1(f)(ii)(B)1 The vault system shall be designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. Such additional capacity shall be sufficient to contain precipitation from a 25 year, 24 hour rainfall event and be constructed with chemical-resistant water stops in place at all joints (if any).

ASSESSMENT:

COMPLIANT - The vaults associated with this project are only partially below grade and are enclosed. Exterior grades and the facility roof are designed to prevent runoff of precipitation into the facility. Subsurface construction joints, other construction joints above grade up to a level corresponding to the height of the vault liners, and the contraction joints in the roof are provided with chemical-resistant water stops designed to prevent precipitation in-leakage.

REQUIREMENT:

1(f)(ii)(B)2 The vault shall be provided with an impermeable interior coating or lining that is compatible with the stored waste and that will prevent migration of waste into the concrete.

ASSESSMENT:

COMPLIANT - The vaults are provided with 11 gauge 304L stainless steel liners that extend up the vault walls to an elevation sufficient to contain 110% of the capacity of the tanks. The vault walls above the liners are coated with an impermeable coating consisting of an epoxy primer and top coat which are compatible with the LLLW contained or transferred in the vault cells and will prevent migration of waste into the concrete.

REQUIREMENT:

1(f)(ii)(C)1 The vault system shall be provided with a means to protect against the formation of and ignition of vapors within the vault, if the substances being stored or treated meet the definition of ignitable waste under 40 CFR 262.21.

C. **STANDARDS FOR CONTAINMENT/RELEASE DETECTION** (Continued)

ASSESSMENT:

COMPLIANT - The tank and vault systems are provided with ventilation systems designed to remove any accumulation of ignitable vapors that might develop from the substances contained in the tanks. In addition, the temperature maintained inside the tanks is less than the lowest flash point of any substance in the tanks. The tank inlet and outlet ducts will be equipped with connections for nitrogen purge. Should the combustible gas monitors detect unacceptable levels of combustibles in the tank exhaust ducting, the tanks can be purged with nitrogen by connecting the purge piping to a nitrogen tank truck at the truck station. This action will purge the tank in question and will create an atmosphere incapable of sustaining combustion. There is no indication that any organic materials will be introduced into the tanks. A detonation involving the vapors from combustible liquids from either direct initiation or a transition from a deflagration to detonation is not considered credible.

REQUIREMENT:

1(f)(ii)(C)2 The vault system shall be provided with a means to protect against the formation of and ignition of vapors within the vault, if the substances being stored or treated meet the definition of reactive waste under 40 CFR 262.21, and may form an ignitable or explosive vapor.

ASSESSMENT:

COMPLIANT - The ventilation system is designed to provide sufficient circulation through the tanks and vaults to preclude the possibility of the accumulation and detonation of any explosive vapors such as hydrogen developed from radiolysis of LLLW within the tank. The tank inlet and outlet ducts will be equipped with connections for nitrogen purge. Should the combustible gas monitors detect unacceptable levels of combustibles in the tank exhaust ducting, the tanks can be purged with nitrogen by connecting the purge piping to a nitrogen tank truck at the truck station. This action will purge the tank in question and will create an atmosphere incapable of sustaining combustion.

REQUIREMENT:

1(f)(ii)(D) The vault system shall be provided with an exterior moisture barrier or be otherwise designed or operated to prevent migration of moisture into the vault if the tank vault is subject to hydraulic pressure.

C. **STANDARDS FOR CONTAINMENT/RELEASE DETECTION** (Continued)

ASSESSMENT:

COMPLIANT - The below grade portion of the vault system included within this project is provided with an external moisture barrier in accordance with the requirements of Division 7, Volume I of the Construction Specification. The membrane waterproofing system is consistent with good engineering practice.

REQUIREMENT:

1(f)(iii)(A) Double-walled tank requirements.

ASSESSMENT:

Not applicable to this project.

REQUIREMENT:

1(f)(iv) Ancillary equipment shall be provided with secondary containment (e.g., trench, jacketing, double-walled piping) that meets the requirements of this agreement.

ASSESSMENT:

COMPLIANT - The outside underground LLLW piping system included in the scope of this project is double-walled pipe to provide secondary containment. The pipe annulus is continuously pressurized with nitrogen gas higher than the operating pressure in that system. In addition, the pipe annulus is continuously monitored for any pressure decay, indicating a leak in either the core or external pipe wall.

B. SPECIFICATIONS

Note: Enclosed is a list of construction specifications. Complete copies of the specifications are available for review upon request. The design assessment packages submitted to EPA and TDEC included complete specifications.

MELTON VALLEY STORAGE TANK CAPACITY INCREASE

Building 7856
Construction Specification

Volume 1	-	Division 1,	Special Conditions, General Provisions, and General Conditions
Volume 2	-	Division 2,	Site Work
		Division 3,	Concrete
		Division 4,	Masonry
		Division 5,	Metals
		Division 7,	Thermal and Moisture Protection
		Division 8,	Doors
		Division 9,	Finishes
		Division 14,	Conveyance
Volume 3	-	Division 15,	Mechanical
		Division 16,	Electrical
		Division 17,	Instrument and Control
		Division 18,	Welding

C. DRAWINGS

Note: Enclosed is a list of drawings reviewed in the design assessment. Copies of the drawings are available upon request. The design assessment packages submitted to EPA and TDEC included a complete set of drawings.

CIVIL

C3E021485A004	ACCESS PLAN AND DRAWING INDEX, SHEET 1
C3E021485A005	DRAWING INDEX, SHEET 2
C3E021485A006	SITE LAYOUT PLAN
C3E021485A007	SITE GRADING PLAN
C3E021485A008	CONSTRUCTION DETAILS
C3E021485A009	CROSS-SECTIONS AND STORM DRAIN PIPE PROFILE

ARCHITECTURAL

A3E021485A001	ARCHITECTURAL FLOOR PLAN
A3E021485A002	ARCHITECTURAL ROOF PLAN
A3E021485A003	ARCHITECTURAL ELEVATIONS, DETAILS AND SECTIONS
A3E021485A004	ARCHITECTURAL PART PLAN, SECTIONS AND DETAILS
A3E021485A005	ARCHITECTURAL SECTIONS & DETAILS
A3E021485A006	ARCHITECTURAL DOOR & ROOM FINISH SCHEDULE

STRUCTURAL

S3E021485A003	BUILDING ROOF PLAN
S3E021485A004	BUILDING FLOOR PLAN
S3E021485A005	SECTIONS AND DETAILS
S3E021485A006	CONTROL & EQUIP ROOM, INLET & EXHAUST FILTER AREAS & TRUCK L/UNL STA
S3E021485A007	GENERAL NOTES MISCELLANEOUS SECTIONS & DETAILS
S3E021485A008	HATCH COVERS
S3E021485A009	MISCELLANEOUS STEEL STAIR PLAN SECTIONS AND DETAILS
S3E021485A010	MISCELLANEOUS STEEL
S3E021485A011	TANK AND PUMP VAULT LINER PLATE PLANS AND SECTIONS
S3E021485A012	TANK AND PUMP VAULT LINER PLATE PLANS AND SECTIONS
S3E021485A013	TANK AND PUMP VAULT LINER BASE PLATE SECTIONS AND DETAILS

S3E021485A014	PRECAST ROOF SLABS OVER TANK VAULT PLANS, SECTIONS & DETAILS
S3E021485A015	PRECAST ROOF SLAB OVER PUMP VAULT PLAN, SECTIONS & DETAILS
S3E021485A016	HVAC INLET FILTER SUPPORT PLANS, SECTIONS AND DETAILS
S3E021485A017	HVAC EXHAUST FILTER SUPPORT PLANS, SECTIONS AND DETAILS
S3E021485A018	PUMP AND VALVE VAULT PUMP PLATFORM & SUPPORT, MISC LINER PLATE & CONC.
S3E021485A019	WALL PENETRATIONS SECTIONS AND DETAILS
S3E021485A020	VALVE BOX, LINER PLATE & EMBEDMENTS PLAN, SECT AND DETAILS
S3E021485A021	HVAC OUTLET FILTER DUCT SUPPORT PLAN SECTIONS AND DETAILS
S3E021485A022	HVAC INLET FILTER DUCT SUPPORT PLAN SECTIONS AND DETAILS
S3E021485A023	HVAC INLET FILTER DUCT SUPPORT SECTIONS AND DETAILS
S3E021485A024	TANK VAULT PIPE SUPPORT DETAILS
S3E021485A025	TANK VAULT PIPE SUPPORT DETAILS
S3E021485A026	PUMP/VALVE VAULT PIPE SUPPORT DETAILS
S3E021485A027	PUMP/VALVE VAULT PIPE SUPPORT DETAILS
S3E021485A028	PUMP/VALVE VAULT PIPE SUPPORT DETAILS
S3E021485A029	PUMP/VALVE VAULT PIPE SUPPORT DETAILS
S3E021485A030	PUMP/VALVE VAULT PIPE SUPPORT DETAILS
S3E021485A031	PUMP/VALVE VAULT PIPE SUPPORT DETAILS
S3E021485A032	CONTROL ROOM & FILTER AREAS MISC FDNS, AND DETAILS
S3E021485A033	EQUIPMENT/CONTROL BLDG TRAY/DUCT SUPPORTS PLAN, SECTIONS & DETAIL
S3E021485A034	PUMP/VALVE VAULT PIPE SUPPORT DETAILS
S3E021485A035	PIPE SUPPORTS, OUTSIDE VAULT AREA
S3E021485A036	VALVE BOX PIPE SUPPORTS PLAN, SECTIONS AND DETAILS
S3E021485A037	TANK VAULT WALLS EMBEDDED PLATE LOCATIONS
S3E021485A038	PUMP VAULT SOUTH WALL EMBEDDED PLATE LOCATIONS
S3E021485A039	PRECAST ROOF SLAB OVER PUMP VAULT EMBEDDED PLATE LOCATIONS
S3E021485A040	PUMP VAULT CAST IN PLACE ROOF EMBEDDED PLATE LOCATIONS

MECHANICAL

J3E021485A001	PROCESS FLOW DIAGRAM SHEET 1
J3E021485A002	PROCESS FLOW DIAGRAM SHEET 2
J3E021485A003	PROCESS FLOW DIAGRAM SHEET 3
J3E021485A004	PROCESS & CONTROL DIAG LLLW & CHEM ADD SYSTEMS SHEET 1
J3E021485A005	PROCESS & CONTROL DIAG LLLW SYSTEM SHEET 2
J3E021485A006	PROCESS & CONTROL DIAG LLLW TANK W-32
J3E021485A007	PROCESS & CONTROL DIAG LLLW TANK W-33
J3E021485A008	PROCESS & CONTROL DIAG LLLW TANK W-34
J3E021485A009	PROCESS & CONTROL DIAG LLLW TANK W-35
J3E021485A010	PROCESS & CONTROL DIAG LLLW TANK W-36
J3E021485A011	PROCESS & CONTROL DIAG LLLW TANK W-37
J3E021485A012	PROCESS & CONTROL DIAG FP, SW AND PW SYSTEMS
J3E021485A013	PROCESS & CONTROL DIAG INSTR AIR AND NITROGEN
H3E021485A001	HVAC AIR FLOW SCHEMATIC
H3E021485A002	HVAC PROCESS & CONTROL DIAG SHEET 1
H3E021485A003	HVAC PROCESS & CONTROL DIAG SHEET 2
H3E021485A004	HVAC LAYOUT PLAN AT OUTLET FILTERS CONTROL ROOM PLAN
H3E021485A005	HVAC LAYOUT PUMP AND VALVE VAULT/TANK VAULT PARTIAL PLAN

H3E021485A006	HVAC LAYOUT PUMP AND VALVE VAULT/TANK VAULT PARTIAL PLAN
H3E021485A007	HVAC LAYOUT TANK/VAULT INLET FILTERS PARTIAL PLAN
H3E021485A008	HVAC LAYOUT TANK VAULT/INLET FILTER PARTIAL PLAN
H3E021485A009	HVAC LAYOUT OUTLET FILTER SECTIONS SHEET 1
H3E021485A010	HVAC LAYOUT PUMP AND VALVE VAULT & INLET FILTER SECTIONS
H3E021485A011	HVAC LAYOUT SECTIONS AND DETAILS
H3E021485A012	HVAC LAYOUT SECTIONS AND DETAILS
H3E021485A013	HVAC LAYOUT SECTIONS AND DETAILS
H3E021485A014	HVAC LAYOUT SECTIONS AND DETAILS
H3E021485A015	HVAC CONTROL DIAGRAM
H3E021485A016	HVAC CONTROL DIAGRAM
P3E021485A001	GENERAL NOTES, SYMBOLS AND ABBREVIATIONS
P3E021485A002	PIPING ARRANGEMENT LLLW TRANSFER LINE PLAN AND PROFILE
P3E021485A003	PIPING ARRANGEMENT LLLW TRANSFER LINE DETAILS
P3E021485A010	PIPING ARRANGEMENT TANK VAULT ROOF PLAN SHEET 1
P3E021485A011	PIPING ARRANGEMENT TANK VAULT ROOF PLAN SHEET 2
P3E021485A012	PIPING ARRANGEMENT WASTE TANK VAULTS PLAN SHEET 1

P3E021485A013	PIPING ARRANGEMENT WASTE TANK VAULTS PLAN SHEET 2
P3E021485A014	PIPING ARRANGEMENT DETAILS SHEET 1
P3E021485A015	PIPING ARRANGEMENT WASTE TANK VAULTS SECTIONS
P3E021485A016	PIPING ARRANGEMENT DETAILS SHEET 2
P3E021485A017	PIPING ARRANGEMENT DETAILS SHEET 3
P3E021485A018	PIPING ARRANGEMENT DETAILS SHEET 4
P3E021485A019	PIPING ARRANGEMENT DETAILS SHEET 5
P3E021485A020	PIPING ARRANGEMENT PUMP/VALVE VAULT ROOF PLAN SHEET 1
P3E021485A021	PIPING ARRANGEMENT PUMP/VALVE VAULT ROOF PLAN SHEET 2
P3E021485A022	PIPING ARRANGEMENT PUMP/VALVE VAULT UPPER PLAN SHEET 1
P3E021485A023	PIPING ARRANGEMENT PUMP/VALVE VAULT UPPER PLAN SHEET 2
P3E021485A024	PIPING ARRANGEMENT PUMP/VALVE VAULT LOWER PLAN SHEET 1
P3E021485A025	PIPING ARRANGEMENT PUMP/VALVE VAULT LOWER PLAN SHEET 2
P3E021485A026	PIPING ARRANGEMENT PUMP/VALVE VAULT SECTIONS
P3E021485A027	PIPING ARRANGEMENT PUMP/VALVE VAULT SECTIONS
P3E021485A028	PIPING ARRANGEMENT PUMP/VALVE VAULT SECTION L

P3E021485A029		PIPING ARRANGEMENT PUMP/VALVE VAULT SECTION M
P3E021485A030		PIPING ARRANGEMENT PUMP/VALVE VAULT SECTION N
P3E021485A031		PIPING ARRANGEMENT TRUCK LOADING/UNLOADING & OUTSIDE AREA PLAN
P3E021485A032		PIPING ARRANGEMENT EQUIPMENT RM/CONTROL RM/ OUTSIDE AREAS - SHEET 2
P3E021485A033		PIPING ARRANGEMENT EQUIP/CONTROL ROOM FIRE PROTECTION
P3E021485A034		PIPING ARRANGEMENT FLOOR AND EQUIPMENT DRAIN PLAN
P3E021485A035		PIPING ARRANGEMENT FLOOR AND EQUIP DRAIN SECTIONS
P3E021485A037		PIPING ARRANGEMENT VALVE BOX PLANS AND SECTIONS
P3E021485A038		PIPING ARRANGEMENT VALVE BOX AIR SUPPLY PLANS AND SECTIONS
P3E021485A039		PIPING ARRANGEMENT VALVE BOX DETAILS
P3E021485A040		PIPING ARRANGEMENT PLAN AND PROFILE SHEET 5 FIRE PROTECTION OSUG
P3E021485A041		PIPING ARRANGEMENT SUPPORT LOCATIONS TANK VAULT SHEET 1
P3E021485A042		PIPING ARRANGEMENT SUPPORT LOCATIONS TANK VAULT SHEET 2
P3E021485A043		PIPING/HVAC ARRANGEMENT SUPPORT LOCATIONS PUMP/VALVE VAULT
P3E021485A044		PIPING/HVAC ARRANGEMENT SUPPORT LOCATIONS PUMP/VALVE VAULT
P3E021485A045		PIPING/HVAC ARRANGEMENT SUPPORT LOCATIONS PUMP/VALVE VAULT
J3D20013E100	0	LLLW SYSTEM OVERALL BLOCKFLOW DIAGRAM

J3D20013E101	0	LLLW SYSTEM MELTON VALLEY COLLECTION BLOCKFLOW DIAGRAM
P-20013-YA-005-E	3	INTERCONNECTING PIPELINE PLAN & PROFILES SHEET 4
P-20013-YE-001-E	3	INTERCONNECTING PIPELINE PIPING FLOW DIAGRAM
P-21247-YC-007-E	2	WASTE STORAGE TANKS CONTROL HOUSE PLANS AND SECTIONS
P-21247-YE-028-E	2	WASTE STORAGE TANKS PIPING FLOW DIAGRAM SERVICE
P3E021485A006	0	PIPING ARRANGEMENT PLAN AND PROFILE SHEET FIRE PROTECTION OSUG (FOR REFERENCE ONLY)
P3E021485A007	0	PIPING ARRANGEMENT PIPING PLAN FIRE PROTECTION OSUG (FOR REFERENCE ONLY)
SK-M-011		ROOF SCHEMATIC SKETCH

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MELTON VALLEY STORAGE TANKS-CAPACITY INCREASE PROJECT
ELECTRICAL DRAWING LIST
TITLE II 90%

DRAWING NUMBER	DRAWING TITLE
E3E02148SA001 REV	CIP ELECTRICAL DRAWING LEAD/INDEX SHEET
E3E02148SA002 REV	SINGLELINE 480V MOTOR CONTROL CENTER
E3E02148SA003 REV	MCC-A 480V MOTOR CONTROL CENTER
E3E02148SA004 REV	UTILITY POLE LINE PLAN & DETAILS
E3E02148SA005 REV.	ELECTRICAL EQUIPMENT LAYOUT SH1 FLOOR PL
E3E02148SA006 REV.	ELECTRICAL EQUIPMENT LAYOUT SH2 FLOOR PL
E3E02148SA007 REV.	ELECTRICAL EQUIPMENT LAYOUT SH3 ROOF PL
E3E02148SA008 REV.	ELECTRICAL EQUIPMENT LAYOUT SH4 ROOF PL
E3E02148SA009 REV.	CABLE TRAY PLAN & DETAILS
E3E02148SA010 REV.	LIGHTING & RECEPTACLES SHEET-1 FLOOR PL
E3E02148SA011 REV.	LIGHTING & RECEPTACLES SHEET-2 FLOOR PL
E3E02148SA012 REV.	LIGHTING & RECEPTACLES SHEET-3 ROOF PLAN
E3E02148SA013 REV.	LIGHTING & RECEPTACLES SHEET-4 ROOF PLAN
E3E02148SA014 REV	LIGHTING & RECEPTACLES DETAILS SHEET-1
E3E02148SA015 REV	LIGHTING & RECEPTACLES DETAILS SHEET-2
E3E02148SA016 REV	FIRE ALARM SYSTEM-INTERCONNECTION DIAGRM
E3E02148SA017 REV	FIRE ALARM SYSTEM-SHEET 1 FLOOR PLAN
E3E02148SA018 REV	FIRE ALARM SYSTEM-SHEET 2 FLOOR PLAN
E3E02148SA019 REV	FIRE ALARM SYSTEM-DETAILS
E3E02148SA020 REV	GROUNDING PLAN SHEET-1 FLOOR PLAN
E3E02148SA021 REV	GROUNDING PLAN SHEET-2 FLOOR PLAN
E3E02148SA022 REV	GROUNDING PLAN SHEET-3 ROOF PLAN
E3E02148SA023 REV	GROUNDING PLAN SHEET-4 ROOF PLAN
E3E02148SA024 REV	GROUNDING DETAILS SHEET-1
E3E02148SA025 REV	GROUNDING DETAILS SHEET-2
E3E02148SA026 REV	POWER CONDUIT LAYOUT SHEET-1 FLOOR PLAN
E3E02148SA027 REV	POWER CONDUIT LAYOUT SHEET-2 FLOOR PLAN
E3E02148SA028 REV	POWER CONDUIT LAYOUT SHEET-3 ROOF PLAN
E3E02148SA029 REV	POWER CONDUIT LAYOUT SHEET-4 ROOF PLAN
E3E02148SA030 REV	I&C CONDUIT LAYOUT SHEET-1 FLOOR PLAN
E3E02148SA031 REV	I&C CONDUIT LAYOUT SHEET-2 FLOOR PLAN
E3E02148SA032 REV	I&C CONDUIT LAYOUT SHEET-3 ROOF PLAN
E3E02148SA033 REV	I&C CONDUIT LAYOUT SHEET-4 ROOF PLAN
E3E02148SA034 REV	CONDUIT DETAILS SHEET 1
E3E02148SA035 REV	CONDUIT DETAILS SHEET 2
E3E02148SA036 REV	CONDUIT DETAILS SHEET 3
E3E02148SA037 REV	POWER CONDUIT AND CABLE SCHEDULE SH-1
E3E02148SA038 REV	POWER CONDUIT AND CABLE SCHEDULE SH-2
E3E02148SA039 REV	POWER CONDUIT AND CABLE SCHEDULE SH-3
E3E02148SA040 REV	POWER CONDUIT AND CABLE SCHEDULE SH-4
E3E02148SA041 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 1
E3E02148SA042 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 2
E3E02148SA043 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 3
E3E02148SA044 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 4
E3E02148SA045 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 5
E3E02148SA046 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 6
E3E02148SA047 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 7
E3E02148SA048 REV	I&C CONDUIT AND CABLE SCHEDULE- SHEET 8
E3E02148SA049 REV	CONDUIT & CABLE SCHEDULE-FIRE ALARM SH-1
E3E02148SA050 REV	CONDUIT & CABLE SCHEDULE-FIRE ALARM SH-2
E3E02148SA051 REV	CONDUIT AND CABLE SCHEDULE-MISC & SPARES
E3E02148SA052 REV	HEAT TRACE PIPE FREEZE PROTECTION LOC PL
E3E02148SA053 REV	HEAT TRACE PIPE FREEZE PROTECTION
E3E02148SA054 REV	HEAT TRACE PIPE FREEZE PROTECTION DET
E3E0200319023 REV	CATHODIC PROTECTION INDEX SHEET
E3E0200319024 REV	CATHODIC PROTECTION TRANSF & SERVICE PPG
E3E0200319025 REV	CATHODIC PROTECTION PLAN & PROFILES
E3E0200319026 REV	CATHODIC PROTECTION PLAN & PROFILES

E3E02148SA001 REV A Fiber optic Installation Details
E3E 02148SA062 REV 0 Fiber Optic Cable Routing Plan
E3E 02148SA063 REV 0 Fiber Optic Cable Installation Detail
E3E 02148SA064 REV 0 BLDG. 785 Fiber Optic Installation Details

E3E02148SA057 CONDUIT DUCTBANK PLAN & DETAILS (REFERENCE - SITE PLAN)

INSTRUMENTATION

DRAWING NO.	REV.	PKG.	DRAWING TITLE
I3E021485A001		1.2	LEAD SHEET - DRAWING INDEX
I3E021485A002		1.2	INSTRUMENT SYMBOL SHEET
I3E021485A003		1	INSTRUMENT SYSTEM DIAGRAM - LLLW & CHEMICAL ADDITION SYS.
I3E021485A004		1	INSTRUMENT SYSTEM DIAGRAM - LLLW TANK W-32
I3E021485A005		1	INSTRUMENT SYSTEM DIAGRAM - LLLW TANK W-33
I3E021485A006		1	INSTRUMENT SYSTEM DIAGRAM - LLLW TANK W-34
I3E021485A007		1	INSTRUMENT SYSTEM DIAGRAM - LLLW TANK W-35
I3E021485A008		1	INSTRUMENT SYSTEM DIAGRAM - LLLW TANK W-36
I3E021485A009		1	INSTRUMENT SYSTEM DIAGRAM - LLLW TANK W-37
I3E021485A010		-	NOT USED
I3E021485A011		1	INSTRUMENT SYSTEM DIAGRAM - HVAC
I3E021485A012		1	INSTRUMENT SYSTEM DIAGRAM - HVAC
I3E021485A013		1	INSTRUMENT SYSTEM DIAGRAM - FP, SW, AND PW SYSTEMS
I3E021485A014		1	INSTRUMENT SYSTEM DIAGRAM - INSTRUMENT AIR
I3E021485A015		1	CONTROL LOGIC DIAGRAM SHEET 1 ROV-406 & ROV-407
I3E021485A016		1	CONTROL LOGIC DIAGRAM SHEET 2 HVAC
I3E021485A017		1	CONTROL LOGIC DIAGRAM SHEET 3 HVAC
I3E021485A018		-	NOT USED
I3E021485A019		-	NOT USED
I3E021485A020		1	INSTRUMENT LOCATION PLAN ROOF PLAN
I3E021485A021		1	INSTRUMENT LOCATION PLAN OUTLET FILTERS AND CONTROL ROOM
I3E021485A022		1	INSTRUMENT LOCATION PLAN TANK VAULT/INLET FILTERS
I3E021485A023		1	INSTRUMENT TUBING TANK VAULT ROOF PLAN
I3E021485A024		1	INSTRUMENT TUBING FLOOR PLAN NORTH SIDE
I3E021485A025		1	INSTRUMENT TUBING FLOOR PLAN SOUTH SIDE
I3E021485A026		1	INSTRUMENT TUBING PANELS KT32A THRU KT37A DETAILS
I3E021485A027		1	INSTRUMENT TUBING PANELS KH03 & KH04 DETAILS
I3E021485A028		1	INSTRUMENT TUBING PANELS KH01 & KH02 DETAILS
I3E021485A029		1	INSTRUMENT TUBING PANELS KC02 & KE01
I3E021485A030		1.2	PANEL KH01 - INLET FILTERS FT-1 & FT-2 FRONT LAYOUT
I3E021485A031		1.2	PANEL KH01 - INLET FILTERS FT-1 & FT-2 INTERNAL LAYOUT
I3E021485A032		1.2	PANEL KH02 - INLET FILTERS FT-3 & FT-4 FRONT LAYOUT
I3E021485A033		1.2	PANEL KH02 - INLET FILTERS FT-3 & FT-4 INTERNAL LAYOUT
I3E021485A034		1.2	PANEL KH03 - EXHAUST FILTERS FT-5 & FT-6 FRONT LAYOUT
I3E021485A035		1.2	PANEL KH03 - EXHAUST FILTERS FT-5 & FT-6 INTERNAL LAYOUT
I3E021485A036		1.2	PANEL KH04 - EXHAUST FILTERS FT-7 & FT-8 FRONT LAYOUT
I3E021485A037		1.2	PANEL KH04 - EXHAUST FILTERS FT-7 & FT-8 INTERNAL LAYOUT
I3E021485A038		2	TERMINAL BLOCK DETAIL - SHEET 1
I3E021485A039		2	TERMINAL BLOCK DETAIL - SHEET 2
I3E021485A040		1.2	PANEL KT32A - TANK W-32 INSTRUMENTS FRONT LAYOUT
I3E021485A041		1.2	PANEL KT32A - TANK W-32 INSTRUMENTS INTERNAL LAYOUT
I3E021485A042		1.2	PANEL KT33A - TANK W-33 INSTRUMENTS FRONT LAYOUT

DRAWING NO.	REV.	PKG.	DRAWING TITLE
I3E021485A043		1.2	PANEL KT33A - TANK W-33 INSTRUMENTS INTERNAL LAYOUT
I3E021485A044		1.2	PANEL KT34A - TANK W-34 INSTRUMENTS FRONT LAYOUT
I3E021485A045		1.2	PANEL KT34A - TANK W-34 INSTRUMENTS INTERNAL LAYOUT
I3E021485A046		1.2	PANEL KT35A - TANK W-35 INSTRUMENTS FRONT LAYOUT
I3E021485A047		1.2	PANEL KT35A - TANK W-35 INSTRUMENTS INTERNAL LAYOUT
I3E021485A048		1.2	PANEL KT36A - TANK W-36 INSTRUMENTS FRONT LAYOUT
I3E021485A049		1.2	PANEL KT36A - TANK W-36 INSTRUMENTS INTERNAL LAYOUT
I3E021485A050		1.2	PANEL KT37A - TANK W-37 INSTRUMENTS FRONT LAYOUT
I3E021485A051		1.2	PANEL KT37A - TANK W-37 INSTRUMENTS INTERNAL LAYOUT
I3E021485A052		2	TERMINAL BLOCK DETAIL - SHEET 3
I3E021485A053		2	TERMINAL BLOCK DETAIL - SHEET 4
I3E021485A054		1.2	PANEL KE01 - FRONT LAYOUT
I3E021485A055		1.2	PANEL KTS1 - INSTRUMENT FRONT & INTERNAL LAYOUT
I3E021485A056		1.2	PANEL KFT07/08A - INSTRUMENTS LAYOUT
I3E021485A057		1.2	PANEL KFT05/06 & KFT07/08B - INSTRUMENTS LAYOUT
I3E021485A058		1.2	ANNUNCIATOR PANEL KC01 - FRONT LAYOUT
I3E021485A059		1.2	ANNUNCIATOR PANEL KC01 - INTERNAL LAYOUT
I3E021485A060		1.2	PANEL KC02 - FRONT LAYOUT
I3E021485A061		1.2	PANEL KC02 - INTERNAL LAYOUT
I3E021485A062		1.2	PANEL KPV1 - PUMP/VALVE VAULT INSTRUMENT FRONT LAYOUT
I3E021485A063		1.2	PANEL KPV1 - PUMP/VALVE VAULT INSTRUMENT INTERNAL LAYOUT
I3E021485A064		1.2	PANEL KV01 - FRONT & INTERNAL LAYOUT
I3E021485A065		1.2	INTERCONNECTION DIAGRAM PANELS KT32A & KT33A
I3E021485A066		1.2	INTERCONNECTION DIAGRAM PANELS KT34A & KT35A
I3E021485A067		1.2	INTERCONNECTION DIAGRAM PANELS KT36A & KT37A
I3E021485A068		1.2	INTERCONNECTION DIAGRAM PANEL KC01 SHEET 1
I3E021485A069		1.2	INTERCONNECTION DIAGRAM PANEL KC01 SHEET 2
I3E021485A070		1.2	INTERCONNECTION DIAGRAM PANEL KC01 SHEET 3
I3E021485A071		1.2	INTERCONNECTION DIAGRAM PANEL KC01 SHEET 4
I3E021485A072		1.2	INTERCONNECTION DIAGRAM PANEL KC02
I3E021485A073		1.2	INTERCONNECTION DIAGRAM PANELS KH01 & KH02
I3E021485A074		1.2	INTERCONNECTION DIAGRAM PANELS KH03 & KH04
I3E021485A075		1.2	INTERCONNECTION DIAGRAM PANELS KPV1, KTS1 & KV01
I3E021485A076		1.2	PANEL KT32B - TANK W-32 INSTRUMENTS LAYOUT
I3E021485A077		1.2	PANEL KT33B - TANK W-33 INSTRUMENTS LAYOUT
I3E021485A078		1.2	PANEL KT34B - TANK W-34 INSTRUMENTS LAYOUT
I3E021485A079		1.2	PANEL KT35B - TANK W-35 INSTRUMENTS LAYOUT
I3E021485A080		1.2	PANEL KT36B - TANK W-36 INSTRUMENTS LAYOUT
I3E021485A081		1.2	PANEL KT37B - TANK W-37 INSTRUMENTS LAYOUT
I3E021485A082		1.2	INSTRUMENT DETAILS - SHEET 1
I3E021485A083		1.2	INSTRUMENT DETAILS - SHEET 2
I3E021485A084		1.2	INSTRUMENT DETAILS - SHEET 3

DRAWING NO.	REV.	PKG.	DRAWING TITLE
I3E021485A085		1.2	INSTRUMENT DETAILS - SHEET 4
I3E021485A086		1.2	INSTRUMENT DETAILS - SHEET 5
I3E021485A087		1.2	INSTRUMENT DETAILS - SHEET 6
I3E021485A088		1.2	INSTRUMENT DETAILS - SHEET 7
I3E021485A089		1.2	INSTRUMENT DETAILS - SHEET 8
I3E021485A090		1.2	INSTRUMENT DETAILS - SHEET 9
I3E021485A091		1.2	INSTRUMENT DETAILS - SHEET 10
I3E021485A092		1.2	INSTRUMENT DETAILS - SHEET 11
I3E021485A093		1.2	INSTRUMENT DETAILS - SHEET 12
I3E021485A094		1.2	INSTRUMENT DETAILS - SHEET 13
I3E021485A095		1.2	INSTRUMENT DETAILS - SHEET 14
I3E021485A096		1.2	INSTRUMENT DETAILS - SHEET 15
I3E021485A097		1.2	INSTRUMENT DETAILS - SHEET 16
I3E021485A098		1.2	INSTRUMENT DETAILS - SHEET 17
I3E021485A099		1.2	INTERCONNECTION DIAGRAM RACK KT32B THRU KT37B PANELS KZ01 THRU KZ06