

FACILITY PERMIT TO OPERATE KINDER MORGAN LIQUIDS TERMINALS, LLC

SECTION I: PLANS AND SCHEDULES

This section lists all plans approved by AQMD for the purposes of meeting the requirements of applicable AQMD rules specified below. The operator shall comply with all conditions specified in the approval of these plans.

Documents pertaining to the plan applications listed below are available for public review at AQMD Headquarters. Any changes to plan applications will require permit modification in accordance with Title V permit revision procedures.

List of approved plans:

Application	Rule
301523	463
429188	1178
531599	462
543659	463
546848	1166

NOTE: This section does not list compliance schedules pursuant to the requirements of Regulation XXX - Title V Permits; Rule 3004(a)(10)(C). For equipment subject to a variance, order for abatement, or alternative operating condition granted pursuant to Rule 518.2, equipment specific conditions are added to the equipment in Section D or H of the permit.

RULE 463 INSPECTION AND MAINTENANCE PLAN KINDER MORGAN LIQUID TERMINALS

ADMINISTRATIVE REQUIREMENTS

This facility shall be subject to the terms and conditions of this plan unless this plan is suspended, revoked, modified, reissued or denied. Failure to maintain a valid plan is a violation of Rule 463.

It is the responsibility of the facility to comply with other District Rules and Regulations and with all laws, ordinances and regulations of other government agencies which are applicable to the operation of the equipment.

This plan does not authorize the emission of air contaminants in excess of those allowed by Division 26 of the Health and Safety Code of the State of California or the Rules and Regulations of the AQMD. This plan cannot be considered as permission to violate existing laws, ordinances, regulation, or statutes of the other governmental agencies.

RULE 463 EQUIPMENT

Floating Roof Tanks as listed in submitted plan.

CONDITIONS

1. The operator shall conduct the operation of the storage equipment in compliance with all data and specifications submitted with the plan application under which this approval is granted.
2. Floating roof tank seals shall be properly installed and continuously maintained in good operating condition.



Kinder Morgan Liquids Terminals, LLC

**SCAQMD RULE 463 INSPECTION AND MAINTENANCE PLAN
FOR
Kinder Morgan Liquids Terminals, LLC
CARSON Terminal**

Submitted to:

South Coast Air Quality Management District
21865 E. Copley Drive
Diamond Bar, California 91765

Prepared by:

Kinder Morgan Liquids Terminals, LLC
Carson Terminal
Environmental Department
1100 Town and Country Road
Orange, CA 92868

October 2012



Kinder Morgan Liquids Terminals, LLC

October 5, 2012

VIA FEDERAL EXPRESS

South Coast Air Quality Management District
Attn: Permit/Plan Processing
21865 E. Copley Drive
Diamond Bar, CA 91765-4182

**Subject: Fee Payment for Rule 463 Tank Inspection and Maintenance Plan and Title V Permit Revision Application
Kinder Morgan Liquids Terminals, LLC - Carson Terminal (Facility ID 800057)**

Dear Sir or Madam:

Attached are the updated Rule 463 Compliance Plan and the Title V Permit Revision Application for Kinder Morgan Liquids Terminals, LLC (KMLT) in Carson, CA. KMLT is updating this compliance plan and revising the Title V permit for seven newly constructed tanks (CT-80084 – CT-80090). Also attached are check numbers 977604 (\$535.75 – Rule 463 Compliance Plan) and 979927 (\$894.55 – Title V Permit Revision Application) to cover the associated plan filing, evaluation and processing fees.

If you have any questions, please contact me at (714) 560-4627.

Sincerely,

A handwritten signature in black ink, appearing to read "Chris" followed by a flourish and the word "for".

Christopher Huy
Senior Specialist, EHS - Air Quality

Enclosures:
Rule 463 Compliance Plan
Title V Permit Revision Application
Checks Nos. 977604 and 979927

Rule 463 Inspection and Maintenance Plan Update Kinder Morgan Energy Partners, LLC

The South Coast Air Quality Management District (SCAQMD) has developed Rule 463¹ – Organic Liquid Storage, to regulate volatile organic compounds (VOC) emissions from aboveground storage tanks. This rule places specific standards for storage tank components, especially roofs and seals; tank emptying, degassing, and roof re-floating operations; tank emissions; and temporary tanks. Other requirements are also specified such as recordkeeping, reporting, and agency notifications. In addition, this rule requires submittal of a Tank Inspection and Maintenance Plan (TIMP) for procedures to inspect and maintain compliance with the standards for storage tanks per Rule 463. Kinder Morgan Energy Partners, L.P. (“Kinder Morgan”) has prepared this TIMP Update to provide current information for the following facility:

Kinder Morgan Liquids Terminals, LLC (“KMLT”) Carson Terminal (Facility ID 800057) –2000 E. Sepulveda Blvd., Carson, CA 90810

Rule Requirements

The following are the self inspection requirements for floating roofs:

1. On or before September 14, 1994, each owner or operator shall submit an Inspection and Maintenance Plan to the Executive Officer for his/her approval. After September 14, 1994, each owner or operator constructing tank(s) subject to this rule shall submit an Inspection and Maintenance Plan, or revision of its current Inspection and Maintenance Plan, to the Executive Officer prior to the completion of construction.
2. The Inspection and Maintenance Plan shall include an inventory of tanks subject to this rule, the proposed self-inspection schedule, the number of certified persons to be dedicated to the program, any self-inspection procedures proposed in addition to those required by the District, and a copy of the owner’s safety procedures used for floating roof tanks.

Tank Inventory

The current tank inventory for KMLT Carson Terminal is presented in the Table 1 of Attachment A. The table include basic information on the tanks including tank number, product type, year erected, tank diameter, and seal type.

Proposed Inspection Schedule

Tanks subject to this rule will be inspected twice a year at approximately six-month intervals, but at intervals not less than four months apart and no more than eight months

¹ SCAQMD Rule 463 – Organic Liquid Storage (Amended November 4, 2011).

by a SCAQMD certified inspector/auditor as set forth in Rule 463. Each tank will also require an inspection when it is emptied and degassed or after it is returned to service. The inspection frequency^a for KMLT Carson Terminal is scheduled for January and July.

^a Note: The proposed inspection schedule may fluctuate as much as three months ahead of schedule or up three months late, depending on the availability of each tank for inspection. However, it is Kinder Morgan's intention to meet Rule 463 inspection frequency under 463 (e)(3)(A), which is to inspect all tanks twice per year at 4 to 8 months intervals.

Certified Personnel

Kinder Morgan employs Rules 463/1178 certified contractors to perform inspection of floating roof tanks. Currently, Beacon Energy Services of Signal Hill, California has been providing certified inspection services to supplement Kinder Morgan personnel dedicated to the tank inspection program.

Self Inspection Procedures

Kinder Morgan follows the self inspection procedures required in Rule 463. Kinder Morgan's compliance checklist includes procedures required by Rule 463, Rule 1178 and its internal procedures. KMEP Pacific Region Specification 11.8, *In-service inspection of Steel Above-ground Storage Tanks* is attached to this plan for reference (see Attachment B).

Safety Procedures

The safety sections of *Tank Sampling and Gauging* and *Tank Cleaning and Entry in Operation and Maintenance Manual* for Kinder Morgan Liquids Terminals are applicable (see Attachment C). Kinder Morgan also maintains other related safety procedure that may be potentially applicable for tank inspection work including procedures for portable vapor detectors, PPE, safety permits, fall protection, and respiratory protection.

Attachments

Attachment A – Tank Inventory and Facility Diagram

Table 1 – Tank Inventory for KMLT Carson Terminal
Carson Terminal General Layout

Attachment B – Inspection Procedures

Specification 11.8 – In-Service Inspection of Steel Aboveground Storage Tanks
SCAQMD Rule 463 Attachment B

Attachment C – Safety Procedures

L-O&M Manual Procedure 190 – Safety, Tank Sampling and Gauging.
L-O&M Manual Procedure 191 – Safety, Tank Vessel Cleaning and Entry.

Attachment A – Tank Inventory and Site Diagram

TABLE 1

Tank Inventory, Carson Terminal (Revised 9-26-2012)

Tank Number	Roof Type	Tank Diameter	Tank Height	Construction Type	Year Erected	Nominal Capacity	Primary Seal Type	Secondary Seal Type	Type of Service	Safe Fill
CT-80008	ADDD	117'-2"	42'-10"	RVT	1923	70,340	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	66,745
CT-80010	ADDD	117'-0"	42'-10"	RVT	1923	70,188	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	62,417
CT-80019	ADDD	117'-2"	42'-10"	RVT	1923	70,796	Mech Shoe Seal	None	Crude Oil	68,476
CT-80023	ADDD	117'-2"	42'-10"	RVT	1927	70,070	Mech Shoe Seal	Rim Mount Comp	Crude Oil	66,731
CT-16034	ADDD	50'-0"	50'-6"	WLD	1956	17,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	14,384
CT-16041	ADDD	50'-0"	48'-0"	WLD	1956	14,866	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	14,222
CT-80007	ADPR	117'-2"	42'-10"	RVT	1923	70,472	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	62,670
CT-80009	ADPR	117'-2"	42'-10"	RVT	1923	72,258	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	64,529
CT-150050	APCR	150'-0"	50'-0"	WLD	1980	144,666	Mech Shoe Seal	None	Ref Petrol Prod	130,181
CT-150054	APCR	150'-0"	50'-0"	WLD	1980	143,959	Mech Shoe Seal	Rim Mounted Wiper	Ref Petrol Prod	141,715
CT-150055	APCR	150'-0"	50'-0"	WLD	1980	143,823	Mech Shoe Seal	Not Appropriate	Ref Petrol Prod	143,323
CT-150052	APCR	150'-0"	50'-0"	WLD	1980	150,000	Mech Shoe Seal	Not Appropriate	Ref Petrol Prod	144,583
CT-23570	APCR	65'-0"	40'-0"	WLD	1978	21,952	Mech Shoe Seal	Not Appropriate	Ref Petrol Prod	18,845
CT-10025	CR	55'-0"	24'-7"	UNK	1925	10,000	Unknown	Unknown	Water	9,500
CT-10042	CR	42'-6"	31'-10"	WLD	2003	10,000	Not Appropriate	Not Appropriate	Water	7,864
CT-9548	CR	48'-0"	29'-5"	WLD	1936	8,990	Not Appropriate	Not Appropriate	Ethanol	8,883
CT-178013	CR	176'-9"	42'-6"	RVT	1923	169,348	Not Appropriate	Not Appropriate	Crude Oil	171,424
CT-178014	CR	176'-9"	42'-6"	RVT	1923	166,283	Not Appropriate	Not Appropriate	Crude Oil	170,240
CT-178015	CR	176'-9"	42'-6"	RVT	1923	169,203	Not Appropriate	Not Appropriate	Crude Oil	170,647
CT-178016	CR	176'-9"	42'-6"	RVT	1923	170,105	Not Appropriate	Not Appropriate	Ref Petrol Prod	168,049
CT-80017	CRFP	112'-0"	50'-0"	WLD	1994	86,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	78,111
CT-80022	CRFP	112'-0"	50'-0"	WLD	1991	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	76,593
CT-80012	CRFP	112'-0"	50'-0"	WLD	1992	76,284	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	78,336
CT-80001	CRFP	126'-0"	40'-0"	WLD	1989	88,800	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	73,619
CT-80002	CRFP	112'-0"	48'-0"	WLD	1998	80,942	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,656
CT-80003	CRFP	100'-0"	50'-0"	WLD	1991	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	77,562
CT-80004	CRFP	112'-0"	50'-0"	WLD	1993	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	78,418
CT-80005	CRFP	117'-2"	42'-10"	WLD	1993	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	78,499
CT-80006	CRFP	117'-2"	42'-10"	WLD	1992	76,236	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	74,216
CT-150051	CRFP	150'-0"	50'-0"	WLD	1980	142,955	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	139,894
CT-100057	CRFP	125'-0"	50'-0"	WLD	1991	95,220	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	92,115
CT-100058	CRFP	125'-0"	50'-0"	WLD	1991	107,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	99,588
CT-100059	CRFP	125'-0"	50'-0"	WLD	1991	95,045	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	92,320
CT-150062	CRFP	150'-0"	52'-10"	WLD	1991	144,145	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	145,718
CT-100063	CRFP	125'-0"	50'-0"	WLD	1992	100,000	Mech Shoe Seal	Rim Mounted Wiper	Ref Petrol Prod	99,465
CT-100064	CRFP	125'-0"	50'-0"	WLD	1993	95,469	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	99,271
CT-80065	CRFP	112'-0"	50'-0"	WLD	1991	76,269	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	74,221
CT-60066	CRFP	100'-0"	50'-0"	WLD	1992	60,851	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	62,250

TABLE 1
Tank Inventory, Carson Terminal (Revised 9-26-2012)

Tank Number	Roof Type	Tank Diameter	Tank Height	Construction Type	Year Erected	Nominal Capacity	Primary Seal Type	Secondary Seal Type	Type of Service	Safe Fill
CT-60067	CRFP	100'-0"	50'-0"	WLD	1992	60,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	62,624
CT-60068	CRFP	100'-0"	50'-0"	WLD	1993	60,837	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	57,820
CT-80069	CRFP	112'-0"	50'-0"	WLD	1992	76,210	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	76,992
CT-150053	CRFP	150'-0"	50'-0"	WLD	1980	144,481	Mech Shoe Seal	Mesa Wiper	Ref Petrol Prod	141,459
CT-80071	CRFP	112'-0"	50'-0"	WLD	1993	76,247	Mech Shoe Seal	None	Ref Petrol Prod	79,877
CT-80072	CRFP	112'-0"	50'-0"	WLD	1992	76,289	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	79,898
CT-80073	CRFP	115'-0"	50'-10"	WLD	2005	92,191	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	79,997
CT-80074	CRFP	115'-0"	50'-10"	WLD	2005	92,191	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	79,988
CT-80075	CRFP	115'-0"	50'-10"	WLD	2006	92,191	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	79,997
CT-80076	CRFP	115'-0"	50'-10"	WLD	2006	92,191	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	79,997
CT-80077	CRFP	115'-0"	50'-0"	WLD	2009	92,191	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	83,324
CT-80078	CRFP	110'-0"	50'-0"	WLD	2010	80,000	Mech Shoe Seal	Rim Mounted Wiper	Ref Petrol Prod	75,012
CT-80079	CRFP	110'-0"	50'-0"	WLD	2010	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,052
CT-80080	CRFP	110'-0"	50'-0"	WLD	2010	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,148
CT-80081	CRFP	110'-0"	50'-0"	WLD	2010	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,040
CT-80082	CRFP	110'-0"	50'-0"	WLD	2010	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	74,884
CT-80083	CRFP	110'-0"	50'-0"	WLD	2010	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,001
CT-80084	CRFP	110'-0"	50'-0"	WLD	2012	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,643
CT-80085	CRFP	110'-0"	50'-0"	WLD	2012	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,661
CT-80086	CRFP	110'-0"	50'-0"	WLD	2012	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,262
CT-80087	CRFP	110'-0"	50'-0"	WLD	2012	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	74,975
CT-80088	CRFP	110'-0"	50'-0"	WLD	2012	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	Not Calculated
CT-80089	CRFP	110'-0"	50'-0"	WLD	2011	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,603
CT-80090	CRFP	110'-0"	50'-0"	WLD	2011	80,000	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	75,698
CT-100060	CRPT	125'-0"	50'-0"	WLD	1992	95,385	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	96,571
CT-100061	CRPT	125'-0"	50'-0"	WLD	1992	93,850	Mech Shoe Seal	Rim Mount Comp	Ref Petrol Prod	99,020
CT-80020	FRDD	117'-2"	42'-10"	RVT	1927	72,247	Mech Shoe Seal	Unknown	Unassigned	61,077
CT-25050	SPHE	75'-0"	50'-0"	SPH	1937	25,000	Not Appropriate	Not Appropriate	Ethanol	24,912
CT-VH-1	CR	30'	28.5"			15,700			Vapor	
CT-VH-2	CR	50'	50"			12,800			Vapor	
CT-VH-3	CR	30'	28.6"			15,700			Vapor	

Roof Types

ADDD - Aluminum Dome Double Deck

ADPT - Aluminum Dome Pontoon

CRFP - Cone Roof Floating Pan

CR - Cone Roof

Attachment B – Kinder Morgan Inspection Procedures

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APPENDIX A – MONTHLY TANK IN-SERVICE INSPECTION CHECKLIST

APPENDIX B – FIVE YEAR TANK IN-SERVICE INSPECTION CHECKLIST

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1.0 REFERENCE CODES AND STANDARDS

Except as amended by this specification, the latest approved editions of the following codes and standards shall form an integral part of this specification.

- American Petroleum Institute, API Std. 620: "Design and Construction of Large, Welded Low-Pressure Storage Tanks"
- American Petroleum Institute, API Std. 650: "Welded Steel Tanks for Oil Storage"
- American Petroleum Institute, API Std. 653: "Tank Inspection, Repair, Alteration and Reconstruction"
- American Society of Mechanical Engineers, ASME Boiler and Pressure Vessel Code, Section VIII

2.0 GENERAL

- 2.1 This specification covers in-service external inspection of carbon and low alloy steel tanks built to API Standard 650.

3.0 SAFE WORKING PRACTICES

- 3.1 An assessment shall be made of the potential hazards to which personnel may be exposed when conducting external tank inspections. Procedures shall be developed according to the guidelines given in API Publications 2015, 2015A, 2015B, 2207, and 2217 that will include safeguard for personnel health and safety, prevention of accidental fires and explosions, and the prevention of property damage.
- 3.2 Follow established confined space procedures for roof or seal inspection activities described in this standard. These procedures must comply with any federal or state confined space safety regulations or any other relevant provisions.

4.0 INSPECTOR QUALIFICATIONS

- 4.1 Periodic in-service inspection of tanks shall be performed by a Qualified Inspector. This Inspector is defined by the following:
- 4.1.1 Qualified inspectors shall have education and experience equal to at least one of the following:
- 4.1.1.1 A degree in engineering plus one year of experience in inspection of tanks, pressure vessels, or piping.
 - 4.1.1.2 A two-year certificate in engineering or technology from a technical college, and two years of experience in construction, repair, operation, or inspection, of which one year must be in inspection of tanks, pressure vessels, or piping.
 - 4.1.1.3 The equivalent of a high school education, and three years of experience in construction, repair, operation, or inspection, of which one year must be in inspection of tanks, pressure vessels, or piping.
 - 4.1.1.4 Five years of experience in the inspection of aboveground storage tanks in the petroleum or chemical industries.

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- 4.2 Inspectors shall have the necessary authority and organizational freedom to perform their duties. Authorized inspectors shall be certified by an agency as provided in API 653, Appendix D. This requirement will become effective 18 months after the date of issuance of the requirement.
- 4.3 Personnel performing nondestructive examinations shall meet the qualifications identified in API 650, but need not be in accordance with 4.1 & 4.2. The results of their work, however, must be considered in the evaluation of the tank by an inspector who is so certified.

5.0 INSPECTION TIME INTERVAL

- 5.1 The interval between inspections of a tanks (both external and internal) should be determined by its service history unless special reasons indicate that an earlier inspection be made. A history of the service of a given tank or a tank in similar service (preferably at the same site) should be available so that complete inspections can be scheduled with a frequency commensurate with the corrosion rate of the tank. On-stream, non-destructive methods of inspection shall be considered when establishing inspection frequencies.
- 5.2 Jurisdictional regulations, in some cases, control the frequency and interval of the inspections. These regulations may include vapor loss requirements, seal condition, leakage, proper diking, and repair procedures. Knowledge of such regulations is necessary to insure compliance with scheduling and inspection requirements.
- 5.3 The external condition of the tank shall be monitored by close visual inspection from the ground on a routine basis. The interval of such inspections shall be consistent with conditions at the particular site, but shall not exceed one month. This inspection shall include a visual inspection of the tank's exterior surface checking for: leaks; shell distortions; signs of settlement; corrosion; and condition of the foundation, paint coatings, insulation systems, and appurtenances. See Appendix A for the Monthly Check List.
- 5.4 All tanks shall be given a formal visual external inspection by an inspector at least every five years or at the quarter corrosion-rate life of the shell, whichever is less. Tanks may be in operation during this inspection. See Appendix B for the Five Year Check List.

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APPENDIX A

TANK NO.: _____ LOCATION: _____

REASON FOR INSPECTION: _____ PRODUCT SERVICE: _____

ITEM	COMPLETED ✓	COMMENTS
FOUNDATION		
Concrete Ring		
a. Inspect for broken concrete, spalling, and cracks, particularly under backup bars used in welding butt welded annular rings under the shell.		
b. Inspect drain openings in ring, back of waterdraw basins and top surface of ring for indications of bottom leakage.		
c. Inspect for cavities under foundation and vegetation against bottom of tank.		
d. Check that runoff rainwater from the shell drains away from tank.		
Asphalt		
a. Check for settling of tank into asphalt base which would direct runoff rain water under the tank instead of away from it.		
b. Look for areas where leaching of oil has left rock filler exposed, which indicates hydrocarbon leakage.		
Oiled Dirt or Sand		
a. Check for settlement into the base which could direct runoff rain water under the tank instead of away from it.		
Site Drainage		
a. Check site for drainage away from the tank and associated piping and manifolds.		
b. Check operating condition of the dike drains.		
Housekeeping		
Inspect the area for buildup of trash, vegetation, and other inflammable buildup.		
SHELLS		
External Visual Inspection		
a. Visually inspect for paint failures, pitting, and corrosion.		
Riveted Shell Inspection		
a. Inspect external surface for rivets and seam leaks.		
SHELL APPURTENANCES		
Manways and Nozzles		
c. Inspect for flange leaks and leaks around bolting.		
Tank Piping Manifolds		
a. Inspect manifold piping, flanges, and valves for leaks.		
b. Inspect fire fighting system components.		
e. Check operation of regulators for tanks with purge gas systems.		
f. Check sample connections for leaks and for proper valve operation.		
g. Inspect temperature indicators.		
Autogauge System		
a. Bump the checker on autogauge head for proper movement of tape.		

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APPENDIX A

ITEM	COMPLETED ✓	COMMENTS
b. Compare actual product level to the reading on the autogauge (maximum variation is 2 inches).		
Heater (Shell Manway Mounted)		
Inspect condensate drain for presence of oil indicating leakage.		
Mixer		
a. Inspect for leakage.		
Swing Lines: Winch Operation		
a. Nonfloating. Raise, then lower the swing line with the winch, and check for cable tightness to confirm that swing line lowered properly.		
b. Floating. With tank half full or more, lower the swing line, then let out cable and check if swing has pulled cable tight, indicating that the winch is operating properly.		
c. Indicator. Check that the indicator moves in the proper direction: Floating swing line indicators show a lower level as cable is wound up on the winch. Non-floating swing line indicators show the opposite.		
Swing Lines: External Guide System		
Check for leaks at threaded and flanged joints.		
Swing Lines: Cable Material and Condition		
a. Inspect cable.		
ROOFS		
Deck Plate External Corrosion		
Visually inspect for paint failure, holes, pitting, and corrosion product on the roof deck.		
Roof Deck Drainage		
Look for indication of standing water. (Significant sagging of fixed roof deck indicates potential rafter failure. Large standing water areas on a floating roof indicate inadequate drainage design or, if to one side, a nonlevel roof with possible leaking pontoons).		
Gas Test Internal Floating Roof		
Test for explosive gas on top of the internal floating roof.		
Roof Insulation		
a. Visually inspect for cracks or leaks in the insulation weather coat where runoff rain water could penetrate the insulation.		
Floating Roof Seal Systems		
a. Measure and record maximum seal-to-shell gaps.		
b. Inspect fabric for deterioration, holes, tears, and cracks.		
c. Pull both primary and secondary seal systems back all around the shell to check their operation.		
d. Inspect wedge-type wiper seals for flexibility, resilience, cracks, and tears.		
ROOF APPURTENANCES		
Sample Hatch		
a. Inspect condition and functioning of sample hatch cover.		
b. Check the condition of inside hatch cover seal.		
c. Inspect the thief and gauge hatch cover.		
d. Where sample hatch is used to reel gauge stock level, check for marker and tab staling hold off distance.		

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ITEM	COMPLETED ✓	COMMENTS
f. On floating roof sample hatch and recoil systems, inspect operation of recoil reel and condition of rope.		
Gauge Well		
a. Check for a hold off distance marker and tab with hold off distance (legible).		
b. On floating roofs, inspect condition of roof guide for gauge well, particularly the condition of the rollers for grooving.		
c. If tank has a gauge well washer, check valve for leakage and for presence of a bull plug or blind flange.		
Autogauge: Inspection Hatch and Guides (Fixed Roof)		
a. Check the hatch for corrosion, wear, and structural soundness.		
b. Look for corrosion on the tape guide's and float guide's wire anchors.		
Autogauge: Float Well Cover		
a. Inspect for corrosion.		
b. Check tape cable for wear or fraying caused by rubbing on the cover.		
Sample Hatch (Internal Floating Roof)		
a. Check overall conditions.		
b. When equipped with a fabric seal, check for automatic sealing after sampling.		
c. When equipped with a recoil reel opening device, check for proper operations.		
Gauging Platform Drip Ring		
On fixed roof tanks with drip rings under the gauging platform or sampling area, inspect for plugged drain return to the tank.		
Emergency Roof Drains		
Inspect vapor plugs for emergency drain: that seal fabric discs are slightly smaller than the pipe ID and that fabric seal is above the liquid level.		
Rim Vents		
a. Check condition of the screen on the rim vent cover.		
Pontoon Inspection Hatches		
a. Open pontoon inspection hatch covers and test for explosive gas (an indicator of vapor space leaks).		
b. Visually check inside for pontoon leakage.		
c. If pontoon hatches are equipped with locked down covers, check for vent tubes. Check that vent tubes are not plugged up. Inspect lock down devices for condition and operation.		
Notes:		

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APPENDIX B

REASON FOR INSPECTION: _____ PRODUCT SERVICE: _____

ITEM	COMPLETED ✓	COMMENTS
FOUNDATION		
Measure foundation levelness and bottom elevations (see Appendix B for extent of measurements).		
Concrete Ring		
a. Inspect for broken concrete, spalling, and cracks, particularly under backup bars used in welding butt welded annular rings under the shell.		
b. Inspect drain openings in ring, back of waterdraw basins and top surface of ring for indications of bottom leakage.		
c. Inspect for cavities under foundation and vegetation against bottom of tank.		
d. Check that runoff rainwater from the shell drains away from tank.		
e. Check for settlement around perimeter of tank.		
Asphalt		
a. Check for settling of tank into asphalt base which would direct runoff rain water under the tank instead of away from it.		
b. Look for areas where leaching of oil has left rock filler exposed, which indicates hydrocarbon leakage.		
Oiled Dirt or Sand		
Check for settlement into the base which would direct runoff rain water under the tank rather than away from it.		
Rock		
Presence of crushed rock under the steel bottom usually results in severe underside corrosion. Make a note to do additional bottom plate examination (ultrasonic, hammer testing, or turning of coupons) when the tank is out of service.		
Site Drainage		
a. Check site for drainage away from the tank and associated piping and manifolds.		
b. Check operating condition of the dike drains.		
Housekeeping		
Inspect the area for buildup of trash, vegetation, and other inflammable buildup.		
SHELLS		
External Visual Inspection		
a. Visually inspect for paint failures, pitting, and corrosion.		
b. Clean off the bottom angle area and inspect for corrosion and thinning on plate and weld.		
c. Inspect the bottom-to-foundation seal, if any.		
Internal (Floating Roof Tank)		
Visually inspect for grooving, corrosion, pitting, and coating failures.		

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ITEM	COMPLETED ✓	COMMENTS
Riveted Shell Inspection		
a. Inspect external surface for rivets and seam leaks.		
b. Locate leaks by sketch or photo (location will be lost when shell is abrasive cleaned for painting).		
c. Inspect rivets for corrosion loss and wear.		
d. Inspect vertical seams to see if they have been full fillet lap welded to increase joint efficiency.		
e. If no record exists of vertical riveted seams, dimension and sketch (or photograph) the rivet pattern: number of rows, rivet size, pitch length, and note whether the joint is butt riveted or lap riveted.		
Wind Girder (Floating Roof Tanks)		
a. Inspect wind girder and handrail for corrosion damage (paint failure, pitting, corrosion product buildup), especially where it occurs at tack welded junction, and for broken welds.		
b. Check support welds to shell for pitting, especially on shell plates.		
c. Note whether supports have reinforcing pads welded to shell.		
SHELL APPURTENANCES		
Manways and Nozzles		
a. Inspect for cracks or signs of leakage on weld joint at nozzles, manways and reinforcing plates.		
b. Inspect for shell plate dimpling around nozzles, caused by excessive pipe deflection.		
c. Inspect for flange leaks and leaks around bolting.		
d. Inspect sealing of insulation around manways and nozzles.		
e. Check for inadequate manway flange and cover thickness on mixer manways.		
Tank Piping Manifolds		
a. Inspect manifold piping, flanges, and valves for leaks.		
b. Inspect fire fighting system components.		
c. Check for anchored piping which would be hazardous to the tank shell or bottom connections during earth movement.		
d. Check for adequate thermal pressure relief of piping to the tank.		
e. Check operation of regulators for tanks with purge gas systems.		
f. Check sample connections for leaks and for proper valve operation.		
g. Check for damage and test the accuracy of temperature indicators.		
h. Check welds on shell-mounted davit clips above valves 6 inches and larger.		
Autogauge System		
a. Inspect autogauge tape guide and lower sheave housing (floating swings) for leaks.		
b. Inspect autogauge head for damage.		
c. Bump the checker on autogauge head for proper movement of tape.		
d. Identify size and construction material of autogauge tape guide (floating roof tanks).		

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ITEM	COMPLETED	COMMENTS
e. Ask operator if tape tends to hang up during tank roof movement (floating roof tanks).	✓	
f. Compare actual product level to the reading on the autogauge (maximum variation is 2 inches).		
g. On floating roof tanks, when the roof is in the lowest position, check that no more than two feet of tape are exposed at the end of the tape guide.		
h. Inspect condition of board and legibility of board-type autogauges.		
i. Test freedom of movement of marker and float.		
Shell-Mounted Sample Station		
a. Inspect sample lines for function of valves and plugging of lines, including drain or return-to-tank line.		
b. Check circulation pump for leaks and operating problems.		
c. Test bracing and supports for sample lines and equipment.		
Heater (Shell Manway Mounted)		
Inspect condensate drain for presence of oil indicating leakage.		
Mixer		
a. Inspect for proper mounting flange and support.		
b. Inspect for leakage.		
c. Inspect condition of power lines and connections to mixer.		
Swing Lines: Winch Operation		
a. Nonfloating. Raise, then lower the swing line with the winch, and check for cable tightness to confirm that swing line lowered properly.		
b. Floating. With tank half full or more, lower the swing line, then let out cable and check if swing has pulled cable tight, indicating that the winch is operating properly.		
c. Indicator. Check that the indicator moves in the proper direction: Floating swing line indicators show a lower level as cable is wound up on the winch. Non-floating swing line indicators show the opposite.		
Swing Lines: External Guide System		
Check for leaks at threaded and flanged joints.		
Swing Lines: Identify Ballast Varying Need		
Check for significant difference in stock specific gravity.		
Swing Lines: Cable Material and Condition		
a. For non-stainless steel cable, check for corrosion over entire length.		
b. All cable: check for wear or fraying.		
Swing Lines: Product Sample Comparison		
Check for water or gravity differences that would indicate a leaking swing joint.		
Swing Lines: Target		
Target should indicate direction of swing opening (up or down) and height above bottom where suction will be lost with swing on bottom support.		

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ITEM	COMPLETED	COMMENTS
ROOFS	✓	
Deck Plate Internal Corrosion		
For safety, before accessing the roof, check with ultrasonic instrument or lightly use a ball peen hammer to test the deck plate near the edge of the roof for thinning. (Corrosion normally attacks the deck plate at the edge of a fixed roof and at the rafters in the center of the roof first.)		
Deck Plate External Corrosion		
Visually inspect for paint failure, holes, pitting, and corrosion product on the roof deck.		
Roof Deck Drainage		
Look for indication of standing water. (Significant sagging of fixed roof deck indicates potential rafter failure. Large standing water areas on a floating roof indicate inadequate drainage design or, if to one side, a nonlevel roof with possible leaking pontoons).		
Level of Floating Roof		
At several locations, measure distance from roof rim to a horizontal weld seam above the roof. A variance in the readings indicates a nonlevel roof with possible shell out-of-round, out-of-plumb, leaking pontoons, or hang-up. On small diameter tanks, an unlevel condition can indicate unequal loading at that level.		
Gas Test Internal Floating Roof		
Test for explosive gas on top of the internal floating roof. Readings could indicate a leaking roof, leaking seal system, or inadequate ventilation of the area above the internal floating roof.		
Roof Insulation		
a. Visually inspect for cracks or leaks in the insulation weather coat where runoff rain water could penetrate the insulation.		
b. Inspect for wet insulation under the weather coat.		
c. Remove small test sections of insulation and check roof deck for corrosion and holes near the edge of the insulated area.		
Floating Roof Seal Systems		
a. Measure and record maximum seal-to-shell gaps at:		
1. Low pump out.		
2. Mid-shell.		
3. High liquid level.		
b. Measure and record annular space at 30 foot spacing (minimum of four quadrants) around roof and record. Measurements should be taken in directly opposite pairs.		
1. Opposite pair 1.		
2. Opposite pair 2.		
c. Check if seal fabric on primary shoe seals is pulling shoes away from shell (fabric not wide enough).		
d. Inspect fabric for deterioration, holes, tears, and cracks.		
e. Inspect visible metallic parts for corrosion and wear.		

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ITEM	COMPLETED	COMMENTS
f. Inspect for openings in seals that would permit vapor emissions.	✓	
g. Inspect for protruding bolt or rivet heads against the shell.		
h. Pull both primary and secondary seal systems back all around the shell to check their operation.		
i. Inspect secondary seals for signs of buckling or indications that their angle with the shell is too shallow.		
j. Inspect wedge-type wiper seals for flexibility, resilience, cracks, and tears.		
ROOF APPURTENANCES		
Sample Hatch		
a. Inspect condition and functioning of sample hatch cover.		
b. On tanks governed by Air Quality Monitoring District rules, check for the condition of seal inside hatch cover.		
c. Check for corrosion and plugging on thief and gauge hatch cover.		
d. Where sample hatch is used to reel gauge stock level, check for marker and tab stating hold off distance.		
e. Check for reinforcing pad where sample hatch pipe penetrates the roof deck.		
f. On floating roof sample hatch and recoil systems, inspect operation of recoil reel and condition of rope.		
g. Test operation of system.		
h. On ultra clean stocks such as JP4, check for presence and condition or protective coating or liner inside sample hatch (preventing rust from pipe getting into sample).		
Gauge Well		
a. Inspect visible portion of the gauge well for thinning, size of slots, and cover condition.		
b. Check for a hold off distance marker and tab with hold off distance (legible).		
c. On floating roofs, inspect condition of roof guide for gauge well, particularly the condition of the rollers for grooving.		
d. If accessible, check the distance from the gauge well pipe to the tank shell at different levels.		
e. If tank has a gauge well washer, check valve for leakage and for presence of a bull plug or blind flange.		
Fixed Roof Scaffold Support		
Inspect scaffold support for corrosion, wear, and structural soundness.		
Autogauge: Inspection Hatch and Guides (Fixed Roof)		
a. Check the hatch for corrosion, wear, and structural soundness.		
b. Look for corrosion on the tape guide's and float guide's wire anchors.		
Autogauge: Float Well Cover		
a. Inspect for corrosion.		
b. Check tape cable for wear or fraying caused by rubbing on the cover.		

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ITEM	COMPLETED	COMMENTS
Sample Hatch (Internal Floating Roof)	✓	
a. Check overall conditions.		
b. When equipped with a fabric seal, check for automatic sealing after sampling.		
c. When equipped with a recoil reel opening device, check for proper operations.		
Roof-mounted Vents (Internal Floating Roof)		
Check condition of screens, locking and pivot pins.		
Gauging Platform Drip Ring		
On fixed roof tanks with drip rings under the gauging platform or sampling area, inspect for plugged drain return to the tank.		
Emergency Roof Drains		
Inspect vapor plugs for emergency drain: that seal fabric discs are slightly smaller than the pipe ID and that fabric seal is above the liquid level.		
Removable Roof Leg Racks		
Check for leg racks on roof.		
Vacuum Breakers		
Report size, number, and type of vacuum breakers. Inspect vacuum breakers. If high legs are set, check for setting of mechanical breaker in high leg position.		
Rim Vents		
a. Check condition of the screen on the rim vent cover.		
b. Check for plating off or removal of rim vents where jurisdictional rules do not permit removal.		
Pontoon Inspection Hatches		
a. Open pontoon inspection hatch covers and visually check inside for pontoon leakage.		
b. Test for explosive gas (an indicator of vapor space leaks).		
c. If pontoon hatches are equipped with locked down covers, check for vent tubes. Check that vent tubes are not plugged up. Inspect lock down devices for condition and operation.		
Accessways		
See Tank Out-of-Service Inspection Checklist, API 653, Appendix C.		
Notes:		

ATTACHMENT B

INSPECTION PROCEDURES AND COMPLIANCE REPORT FORM

Equipment Needed:

Explosimeter (for internal floating roof tanks), liquid resistant measuring tape or device, tank probe (to measure gaps in tank seals - 1/8 inch, 1/2 inch, 1-1/2 inch), flashlight.

Inspection Procedures:

1. The findings of all tank self-inspections, whether completed or not, shall be recorded on the Rule 463 Compliance Report form prescribed by the Executive Officer and submitted to the District's Refinery Section in accordance with the rule's requirements. If an inspection is stopped before completion, indicate the reason for this action in the Comments section of the compliance report form.
2. During compliance inspection, the person(s) conducting the inspection must have a copy of the Permit to Operate or Permit to Construct pertinent to the tank being inspected. Any discrepancies between the permit equipment description and the existing tank or the permit conditions and the actual operating conditions of the tank as verified during inspection must be recorded in the Comments section of the compliance report form.
3. Inspect the ground level periphery of each tank for possible leaks in the tank shell. Complete the tank information section (D) on the report.
4. For floating roof tanks containing organic liquid not subject to the provisions of subdivision (c) of Rule 463, conduct only steps 1 through 3 of this attachment. For all other floating roof tanks, conduct steps 5 through 7 as applicable.
5. For external floating roof tanks:
 - o From the platform, conduct an overall visual inspection of the roof and check for obvious permit or rule violations. Record the information as shown under section F of the compliance report form.
 - o During visual inspection of the roof, check for unsealed roof legs, open hatches, open emergency roof drains or vacuum breakers and record the findings on the report accordingly. Indicate presence of any tears in the fabric of both seals.
 - o After the visual inspection, conduct an inspection of the entire secondary seal using the 1/8" and 1/2" probes. Record the gap data in section F(4) of the report.
 - o Conduct an inspection of the entire primary seal using the 1/8", 1/2", and 1 1/2" probes. Inspect the primary seal by holding back the secondary seal. Record the gap data in section F(5) of the report.

- o Record all cumulative gaps between 1/8 inch and 1/2 inch; between 1/2 inch and 1-1/2 inch; and in excess of 1-1/2 inches, for both primary and secondary seals in section G of the report. Secondary seal gaps greater than 1/2 inch should be measured for length and width, and recorded in Comments under section (J) of the report.
6. For internal floating roof tanks:
- o Using an explosimeter, measure the concentration of the vapor space above the internal floating roof in terms of lower explosive limit (LEL), and record the reading in section (E) of the report.
 - o Conduct a visual inspection of the roof openings and the secondary seal, if applicable, and record findings on the report.
7. Complete all necessary calculations and record all required data accordingly on the report.

Rule 463 (Cont.)

**ATTACHMENT B (Cont.)
(Amended November 4, 2011)**

**SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RULE 463 COMPLIANCE REPORT**

****PLEASE COMPLETE FORM LEGIBLY IN BLACK INK****

Tank No. _____ SCAQMD Permit No. _____ Inspection Date _____ Time _____
Is This a Follow-up Inspection? No Yes If yes, Date of Previous Inspection _____

A. COMPANY INFORMATION:

Company Name _____
Location Address _____ City _____ Zip _____
Mailing Address _____ City _____ Zip _____
Contact Person _____ Title _____
Phone _____

B. INSPECTION CONDUCTED BY:

Name _____ Title _____
Company Name _____ Phone _____
Mailing Address _____ City _____ Zip _____

C. TANK INFORMATION:

Capacity _____ (bbls) Installation Date _____ Tank Diameter _____ (ft) Tank Height _____ (ft)
Product Type _____ Product RVP _____
Type of Tank: Riveted Welded Other (describe) _____
Color of Shell _____ Color of Roof _____
Roof Type: Pontoon Double Deck Other(describe) _____
External floating roof Internal floating roof

D. GROUND LEVEL INSPECTION:

1) Product Temperature _____ ° F 2) Product level _____ (ft)
3) List type and location of leaks found in tank shell.

4) List any discrepancies between the existing equipment and the equipment description on the Permit.

5) Is tank in compliance with Permit conditions? No Yes If no, explain _____

E. INTERNAL FLOATING ROOF TANK:

1) Check vapor space between floating roof and fixed roof with explosimeter. _____ % LEL
2) Conduct visual inspection of roofs and secondary seals, if applicable.
3) Are all roof openings covered? No Yes If no, explain in Comments section (J) and proceed to part (H)(5).

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
RULE 463 COMPLIANCE REPORT

****PLEASE COMPLETE FORM LEGIBLY IN BLACK INK****

Tank No. _____ SCAQMD Permit No. _____

IF INTERNAL FLOATING ROOF TANK, PROCEED TO PART H(6).

G. CALCULATIONS - complete all applicable portions of the following:

Record dimensions of indicated gaps [from F(4)(d), F(5)(b), and F(5)(f)]. Record in feet and inches.

Gaps in primary seal between 1/8 and 1/2 inch: _____

Gaps in primary seal between 1/2 and 1-1/2 inch: _____

Gaps in primary seal greater than 1-1/2 inches: _____

Gaps in secondary seal between 1/8 and 1/2 inch: _____

Gaps in secondary seal greater than 1/2 inch: _____

Multiply diameter (ft) of tank to determine appropriate gap limits:

5% circumference = diameter X 0.157 = _____ 60% circ. = diam. X 1.88 = _____

10% circumference = diameter X 0.314 = _____ 90% circ. = diam. X 2.83 = _____

30% circumference = diameter X 0.942 = _____ 95% circ. = diam. X 2.98 = _____

H. DETERMINE COMPLIANCE STATUS OF TANK:

- | | | | |
|----|--------------------------------------------------------------------------------|-----------------------------|------------------------------|
| 1) | Were any openings found on the roof? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| 2) | Were any tears in the seals found: | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| 3) | Is the product level lower than the level at which the roof would be floating? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| 4) | Secondary Seal: | | |
| | Did 1/2" probe drop between shell and seal? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| | Did cumulative 1/8" - 1/2" gap exceed 95% circumference length? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| 5) | Primary Seal | | |
| | Shoe | | |
| | Did 1-1/2" probe drop between shell and seal? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| | Did cumulative 1/2" - 1-1/2" gap exceed 30% circumference length, and | | |
| | Did cumulative 1/8 - 1/2" gap exceed 60% circumference length? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| | Did any <u>single continuous</u> 1/8" - 1-1/2" gap exceed 10% circ. length? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| | Tube | | |
| | Did 1/2" probe drop between shell and seal | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| | Did cumulative 1/8" - 1/2" gap exceed 95% circumference length? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| 6) | Internal floating roof (installed before 6/1/84) did LEL exceed 50% | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| | (installed after 6/1/84) did LEL exceed 30%? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| 7) | Does tank have permit conditions? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |
| | Does tank comply with these conditions? | No <input type="checkbox"/> | Yes <input type="checkbox"/> |

I. IF INSPECTION WAS TERMINATED PRIOR TO COMPLETION FOR ANY REASON, PLEASE EXPLAIN:

Attachment C – Kinder Morgan Safety Procedures

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1. Applicability

- Crude
- Refined Products
- Highly Volatile Liquids (HVLs) High Vapour Pressure (HVPs)
- CO2

2. Scope

This procedure provides safety guidance and instruction for the activities of tank gauging and sampling which includes:

- Accessing tank roofs
- Safe work practices and guidelines
- Proper use of PPE and work equipment

The activities of gauging and sampling tanks may also expose employees to fall hazards and confined space entries. This procedure does not address those hazards. See L-O&M Procedure 118, Fall Protection and L-O&M Procedure 134, Confined Space Entry or L-O&M Procedure 134(CAN), Confined Space Entry for procedures to follow as they relate to those hazards. See L-O&M Procedure 1060, Tank Measurement and/or Business Unit Site Specific Procedures for technical instruction in performing tank gauging and sampling.

3. Core Information and Requirements

3.1 Accessing Tank Roofs

The following apply to all employees who perform tank gauging and sampling:

- Tanks may be gauged only when inactive.
- Gasoline tanks may be sampled only when inactive. Fuel tanks may be sampled while inactive or being emptied.
- Vapors may accumulate on tank roofs, particularly on damp, still days; therefore, vapors created when filling a tank must be allowed to dissipate. **UNDER NO CIRCUMSTANCES, is an employee allowed on the roof of a floating roof tank during filling.**

LIQUIDS O&M PROCEDURE

- When going up or down tank steps, step on each tread and keep at least one hand on the railing.
- Running up or down tank steps is prohibited.
- Before climbing the tank, static electricity must be discharged by grounding the bare hand and gauge tape to the stair rail or another metal tank fixture that is grounded to the earth. The brass gauging bob is not a sufficient grounding device.

3.1.1 Cone Roof/Hard Top Tanks

At least two persons should be on site whenever gauging or sampling a tank that has a fixed roof. "On site" means the other person (the one not gauging) is physically within the fence line at that location. The person performing the gauging/sampling should notify the other person prior to climbing each tank and after descending each tank. For single person locations or when another person is not available, the gauger/sampler may notify the Controller or Control Center Supervisor when going on a tank and coming off the tank. Under no circumstances is an employee allowed to descend on the roof of an internal floating roof tank. Approved, trained contractor personnel are to perform these entries.

3.1.2 External Floating Roof (Open Top) Tanks

The "buddy system" shall be used whenever descent is required onto an external floating roof (open-top). The "buddy system" requires an attendant to be stationed at the access ladder at the top of the tank to observe the gauger or sampler while on the floating roof. Continuous air monitoring for oxygen and combustible vapors (See L-O&M Procedure 101, Portable Gas Detectors) is required when descending and while on the floating roof. Acceptable limits include an atmospheric oxygen concentration between 19.5% and 23.5% (19.5% and 23% in Canada) and flammable gas content less than 10% LEL. If atmospheric testing shows concentrations outside these limits, employees are not permitted on the roof and/or should exit the roof immediately.

3.2 Gauging & Sampling Safety Practices

The following apply to all employees who perform tank gauging and sampling:

- Matches, cigarette lighters, and other sources of ignition are not allowed on persons when performing gauging/sampling.
- All loose objects must be removed from the breast pockets of shirts, coats, or jackets.
- All gauging and sampling equipment must be carried in a suitable container, or in such a manner that at least one hand remains free and no dangling pieces of equipment that could catch and cause the employee to lose balance. Vertical ladders are not considered safe for an employee to climb while carrying gauging equipment by hand. A canvas shoulder bag or equivalent shall be provided.
- Any hazards observed at the tank should be noted and immediately reported to the Local Manager/Supervisor.
- To avoid the rush of vapors when opening the gauging hatch, be sure your body is not directly over the hatch. After you open the hatch, it should be left open for a short period to

LIQUIDS O&M PROCEDURE

allow excessive vapors to escape. Avoid breathing vapors from the hatch. If possible stand up when gauging and on the upwind side.

- All roof hatch covers shall be closed when not in use, except when specific instructions have been given otherwise.
- When a gauge line is lowered or raised in a tank, it must contact the edge or side of the gauging hatch at all times in order that a firm ground will be constantly maintained.
- Never take a product sample, then pour it freely back into the gauge hatch or tank. A 50/50 ratio mixture of high sulfur diesel fuel and red dye may be poured into a gauge hatch provided that appropriate safety procedures are implemented.
- Use care in spooling or unspooling gauge line so that you do not cut your fingers.
- Extreme care must be taken while gauging or sampling tanks if it is raining or when ice, sleet or snow has the potential of collecting on stairways or tank roof. If ice, sleet, or snow has collected on stairways or roof, the task should be delayed until it has melted; if possible. If the tank must be accessed; the ice, sleet, or snow should be removed with spark resistant tools while ascending the stairs and the roof (or descending floating roof stairs)
- Tanks shall not be gauged or sampled during an electrical storm.
- Tanks shall not be gauged or sampled during hours of darkness unless adequate lighting is provided. This may be waived if the Operations Manager reviews and approves the exception for a specific timeframe.

3.3 PPE & Work Equipment

The following apply to all employees who perform tank gauging and sampling:

- Proper fitting clothing should be worn. Trouser legs should not be too long or fit so loosely that they might catch a heel and cause a fall. Shirt and coat sleeves should not fit so loosely that they might catch on tank appurtenances. Gloves shall be worn when performing gauging and sampling. Gloves and clothing shall be of the type listed on the **Facility Hazard Analysis and Personnel Protective Equipment Recommendations List (Attachment I, L-O&M 120, Personal Protective Equipment)**.
- All gauging and sampling equipment shall be on the "approved equipment" type listing maintained by Procurement. If Procurement does not maintain a listing of previously approved equipment, then consult with local EHS and/or measurement personnel prior to purchasing. This includes but is not limited to: flashlights (with appropriate Hazard Classification rating), gauging tapes, gauging bobs, gauge poles, etc.
- Cotton ropes or gauge tapes shall be used when obtaining product samples from a tank. Rayon and/or nylon rope shall not be used on the containers.
- Replace gauge lines that have nicks, burrs, or other defects.
- If petroleum product is splashed or spilled on clothing, the clothing must be changed upon descent from the tank.

LIQUIDS O&M PROCEDURE

- Shoes with hob nails or steel plates on the soles must not be worn on tank roofs.
- Vehicular or other equipment that could be a source of ignition will not be permitted without a safety permit inside product tank dikes at any time while a tank is in service without a safety permit.

4. Training

Train all employees who perform tank gauging and sampling on the contents of this procedure. Cover this procedure periodically in regularly scheduled safety meetings.

5. Documentation

N/A

6. References

NFPA 77, Recommended Practice of Static Electricity

API Publication 2026, Safe Access/Egress Involving Floating Roofs of Storage Tanks in Petroleum Service

- L-O&M Procedure 101, Portable Gas Detectors
- L-O&M Procedure 118, Fall Protection
- L-O&M Procedure 120, Personal Protective Equipment
- L-O&M Procedure 134, Confined Space Entry
- L-O&M Procedure 134(CAN), Confined Space Entry
- L-O&M Procedure 1060, Tank Measurement

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1. Applicability

- Crude
- Refined Products
- Highly Volatile Liquids (HVLs) ~~High Vapour Pressure (HVPs)~~
-
- CO2

2. Scope

This procedure provides safety guidance and instruction for tank/vessel cleaning and entry activity which includes:

- Aboveground Storage Tanks
- Sump and Separator Tanks
- Filter and Other In-line Vessels

The activities of cleaning, de-gassing, and entry may also expose employees to confined space, energized equipment, and hazardous atmosphere hazards. This procedure does not address those hazards in detail. See L-O&M Procedure 134, Confined Space Entry, or L-O&M Procedure 134(CAN), Confined Space Entry, L-O&M Procedure 152, Lockout Tagout, and L-O&M Procedure 101, Portable Gas Detectors as they relate to those hazards.

3. Core Information and Requirements**3.1 Aboveground Storage Tanks**

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Isolating, gas-freeing and cleaning of aboveground storage tanks in petroleum service is an activity which requires considerable pre-planning and strict adherence to established safety procedures and practices. Appendix A contains prescriptive instructions for isolating, gas-freeing and cleaning of aboveground storage tanks and should be referred to along with references in Section A.1.

The following additional safety procedures and practices that may not be included in Appendix A or the above referenced API documents should also be followed for cleaning, de-gassing, and entry activities:

- A tank must never be cleaned or worked on until the Local Supervisor or Manager has been fully informed of the work planned.
- Obtain required safety permits for the tasks to be performed (See L-O&M Procedure 103, Safety Permits.
- If tank cleaning and de-gassing operations are needed, approved, qualified contractor personnel (only) shall be utilized and confined space procedures followed (See L-O&M Procedure 134, Confined Space Entry or L O&M Procedure 134(CAN), Confined Space Entry).
- Approved, qualified contract personnel only are permitted to enter "hard-top" tanks (cone-roof tanks with floating pans) from the roof to change the position of the floating pan legs if:
 - the floating pan is within 10 feet (3 m) of the top of the tank, and
 - the tank is in a static condition
- Confined space entry procedures must be followed for tank roof entry (See L-O&M Procedure 134, Confined Space Entry or L O&M Procedure 134(CAN), Confined Space Entry).
- Ensure that proper LOTO procedures are utilized (See L-O&M Procedure 152, Lockout Tagout)
- Perform all regulatory notifications (if applicable) prior to de-gassing the tank and obtain any required regulatory approvals or permits. Employ an approved Air Emissions Control System for collecting and processing vapors (if required by local or state regulations)
- If vacuum trucks are utilized in the pump-out of the tank, refer to L-O&M Procedure 140, Vehicle & Equipment Safety API Publication 2219, Safe Operation of Vacuum Trucks in Petroleum Service for safe operating guidelines.

3.2 Sumps and Separators

The following apply to all employees and contractors who are involved in the cleaning and/or entry of sumps and separator:

- Obtain required safety permits for the tasks to be performed (See L-O&M Procedure 103, Safety Permits.

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- Perform all regulatory notifications (if applicable) prior to de-gassing the tank and obtain any required regulatory approvals or permits.
- If entry into a sump or separator is required, qualified contractor personnel shall be utilized and confined space procedures followed (See L-O&M Procedure 134, Confined Space Entry). or L O&M Procedure 134(CAN), Confined Space Entry).
- Pump tank to low gauge (or as far as possible), and remove from service.
- Ensure that proper LOTO procedures are utilized (See L-O&M Procedure 152, Lockout Tagout)
- If vacuum trucks are utilized in the pump-out of the sump or separator refer to L-O&M Procedure 140, Vehicle & Equipment Safety API Publication 2219, Safe Operation of Vacuum Trucks in Petroleum Service for safe operating guidelines.
- Although the company does not instruct the contractor how to perform the work (unless specified in the contract), the contractor should use spark-resistant tools, such as wooden bucket, shovel or scoop, bronze wire brush, manila rope and employ practices which minimize the risk of a spark or static discharge.
- Avoid spilling of products or scale on any person. Sludge and solids must be disposed of in accordance with company waste management policies and procedures.
- Keep all automotive equipment, gasoline or motor-driven pumping equipment, ventilating equipment or any other ignition sources on the windward side and a safe distance away.
- Only use approved air movers for ventilation.

3.3 Filter and Other In-line Vessels

The following apply to all employees and contractors who are involved in the cleaning, entry or maintenance of filters and other in-line vessels:

- Obtain required safety permits for the tasks to be performed (See L-O&M Procedure 103, Safety Permits)
- Ensure that pressure is relieved and the vessel is empty of product.
- Ensure that proper LOTO procedures are utilized (See L-O&M Procedure 152, Lockout Tagout)
- If entry into a vessel is required, qualified contractor personnel shall be utilized and confined space procedures followed (See L-O&M Procedure 134, Confined Space Entry). or L O&M Procedure 134(CAN), Confined Space Entry).
- Use only an extension wrench or air impact wrench in the proper manner to loosen head bolts.
- Keep clear of hoists and head/lid while lowering, raising, and loosening.

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- Every precaution must be taken to avoid creating a spark.
- Clear working area of head retaining bolts before removing brackets and elements with handling equipment.
- When automotive equipment is used to transport elements, the exhaust gas piping and muffler must be inspected to ascertain that they are in good condition. Keep automotive equipment at a safe distance from the filter area.
- Used/spent filters shall be stored and disposed of in accordance with company waste management policies and procedures.
- Be careful not to impregnate clothing with product or tank contents while removing sludge and scale from filter vessels or while washing down vessels.
- Remove sludge and scale with wooden or spark-resistant tools. Bonding cables shall be used to bond the body of the vessel to the drainage pan (if applicable).
- In moving or unloading filter elements, all safety precautions should be used to prevent fire and to prevent contact with exposed parts of body or clothing.
- Use all safety precautions while packing, transporting, and replacing filter elements.

4. Training

Train all employees who perform or participate in tank/vessel cleaning and entry activities on the contents of this procedure. Cover this procedure periodically in regularly scheduled safety meetings.

5. Documentation

N/A

6. References

NFPA 77, Recommended Practice of Static Electricity
API Standard 653: Tank Inspection, Repair, Alteration and Reconstruction
API Standard 2015, Requirements for Safe Entry and Cleaning of Petroleum Storage Tanks
API Recommended Practice 2016, Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
API Publication 2219, Safe Operation of Vacuum Trucks in Petroleum Service
API Standard 2610: Design, Construction, Operation, Maintenance & Inspection of Terminal and Tank Facilities

- L-O&M Procedure 101, Portable Gas Detectors
- L-O&M Procedure 103, Safety Permits
- L-O&M Procedure 120, Personal Protective Equipment
- L-O&M Procedure 134, Confined Space Entry
- L-O&M Procedure 134(CAN), Confined Space Entry
- L-O&M Procedure 140, Vehicle & Equipment Safety
- L-O&M Procedure 152, Lockout Tagout
- L-OM100-22, Safety Permit
- L-OM100-30, Contractor Pre-Job Safety Orientation Report

Appendix A – Isolating, Gas-Freeing and Cleaning Aboveground Storage Tanks**A.1 REFERENCE CODES AND STANDARDS**

Except as amended by this specification, the latest approved editions of the following codes and standards shall form an integral part of this specification.

- API Std. 653: "Tank Inspection, Repair, Alteration, and Reconstruction"
- API Std. 2610: "Design, Construction, Operation, Maintenance & Inspection of Terminal and Tank Facilities"
- API Std. 2015: "Safe Entry and Cleaning of Petroleum Storage Tanks"
- API Recommended Practice 2016, Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks
- API Publ. 2219: "Safe Operation of Vacuum Trucks"
- Occupational Safety and Health Administration (OSHA) Regulations

A.2 GENERAL SCOPE OF WORK**A.2.1 Isolating the Tank**

- A.2.1.1 CONTRACTOR shall review the tank configuration, piping and site layout prior to isolating the tank. Review all information concerning the product contained in the tank and surrounding tanks, including a review of applicable MSDS's.
- A.2.1.2 Isolating the tank shall be performed in accordance with (but not limited to) procedures established in API Standard 2015 "Safe Entry and Cleaning of Petroleum Storage Tanks", API Recommended Practice 2016 "Guidelines and Procedures for Entering and Cleaning Petroleum Storage Tanks" and company EHS Policies and Procedures. NOTE: Approved isolation methods include the use of slip-on skillet blinds or blind flanges on tank lines.
- A.2.1.3 Lockout/Tagout procedures shall be reviewed and followed in accordance with company requirements prior to isolating the tank.
- A.2.1.4 Operations (Local and Control Center) shall be apprised of and approve the proposed tank work.
- A.2.1.5 CONTRACTOR shall verify product level inside the tank prior to isolating the tank.
- A.2.1.6 CONTRACTOR shall furnish and apply sheets of plastic (6 mil thickness minimum), metal containers (drip pans) and absorbent pads beneath all related piping, flanges, valves, fittings, etc., requiring blinding prior to loosening.
- A.2.1.7 CONTRACTOR shall furnish proper tools and equipment required to isolate the tank from service (e.g. hammers, wrenches, flange spreaders, jacks, etc.).
- A.2.1.8 CONTRACTOR shall verify with the company onsite representative that the cathodic protection system has been shut off prior to beginning work.

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- A.2.1.9 CONTRACTOR shall provide, or request of the company onsite representative, a clean vacuum truck to remove liquids during the blinding of the tank. The vacuum truck and its operator shall comply and meet the requirements of all applicable federal and state regulations, API Publication 2219 "Safe Operation of Vacuum Trucks", and company procedures (L O&M Procedure 140, Vehicle & Equipment Safety).
- A.2.1.10 CONTRACTOR shall furnish and install a bond wire connecting the tank lines and tank prior to blinding the tank.
- A.2.1.11 CONTRACTOR shall isolate all related tank lines, nozzles and fittings by installing proper size blind flanges (150 lb. minimum). All threaded fittings shall be isolated using proper size forged steel caps and/or plugs. CONTRACTOR shall furnish and install new gaskets when installing blind flanges.
- A.2.1.12 CONTRACTOR shall verify with company representative onsite that all necessary energy sources (motors, pumps, valves and switches) have been properly locked and tagged in accordance with company policy.
- A.2.1.13 Upon isolating the tank and re-securing all flanges, nozzles and fittings, CONTRACTOR shall test each component for vapors and the perimeter of the tank. CONTRACTOR shall furnish a vapor analyzer capable of detecting and measuring the oxygen content (%) and flammable/toxic vapors (LEL%/ppm). The tank atmosphere and its related components shall be tested in accordance with the procedures established in API Standard 2015, Section 5-"Testing the Tank Atmosphere", Appendix F- "Oxygen and Flammable Vapor Analyzers" and requirements mandated in OSHA 29 CFR 1910.146. CONTRACTOR shall provide the company with the latest calibration records and procedures of the vapor analyzer. CONTRACTOR shall document the results of atmospheric testing, including time and signature of the person who performed the tests. CONTRACTOR shall furnish a copy of the test document to the company onsite representative.
- A.2.1.14 Remove all related manway covers on the tank shell, floating roof and fixed roof in preparation for vapor freeing the tank interior. This may require the use of fresh air equipment. Immediately after the removal of the manway covers, CONTRACTOR shall install heavy mil plastic over both manway entrances to insure a vapor tight condition (if required by local and/or state rules/regulations).
- A.2.2 Gas Freeing the Tank (If Required by Local/State Rules and Regulations)
- A.2.2.1 CONTRACTOR shall degas the tank interior using an approved emissions control system capable of collecting and processing gasoline vapors, in accordance with the local/state rules and regulations.
- A.2.2.2 CONTRACTOR shall submit to the company onsite representative, proper permit/approval documentation provided by local and/or state agencies, approving the proposed emissions control system capable of collecting and processing gasoline vapors.
- A.2.2.3 CONTRACTOR shall submit a copy of the degassing results and recorded information taken during the degassing process. All copies shall be submitted to the company onsite representative.
- A.2.3 Vapor Freeing the Tank

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- A.2.3.1 CONTRACTOR shall furnish and install the equipment required to vapor free the tank interior to an LEL level of 10% or less. CONTRACTOR shall make every effort to obtain zero LEL prior to entering the tank. CONTRACTOR shall NOT enter the tank under any circumstances if the LEL level of the tank atmosphere is GREATER than 10 percent.
- A.2.3.2 CONTRACTOR shall vapor free the tank in accordance with the procedures established in API Standard 2015, Section B- "Vapor Freeing the Tank".
- A.2.4 Cleaning and Entering the Tank
- A.2.4.1 CONTRACTOR shall furnish a vapor analyzer capable of detecting and measuring the oxygen content (%) and flammable/toxic vapors (LEL%/ppm). The atmosphere inside the tank shall be sampled in accordance with procedures established in API Standard 2015, Section 5- "Testing the Tank Atmosphere", Appendix F- "Oxygen and Flammable Vapor Analyzers" and requirements mandated in OSHA 29 CFR 1910.146.
- A.2.4.2 CONTRACTOR shall install proper ventilation, as necessary to minimize the build-up of toxic or flammable vapors.
- A.2.4.3 Prior to entering the tank, CONTRACTOR personnel shall be equipped with proper protective clothing and equipment as established in API Standard 2015, Section 7-"Personal Protective Equipment". This may include rain gear, poly coated Tyvek, rubber boots and gloves, respirators etc.
- A.2.4.4 CONTRACTOR shall provide (upon company request) proper training documentation of all personnel (assigned to enter the tank) who have successfully completed the Respiratory Protective Program in accordance with OSHA 29 CFR 1910.134 requirements.
- A.2.4.5 CONTRACTOR shall provide all required "Confined Space Attendant" personnel outside the primary point of entry. The assigned "Confined Space Attendants" shall meet the requirements of API Standard 2015, Section 8.3 "Attendant", OSHA 29 CFR 1910.146 and 29 CFR 1910.134. The assigned "Confined Space Attendants" shall document the results of atmospheric testing, the time of the testing, names and time of the personnel entering and exiting the tank, including the signature of the Attendant and person who performed the tests. CONTRACTOR shall provide (upon company request) training documentation of personnel that meet the OSHA requirements listed above.
- A.2.4.6 CONTRACTOR shall maintain and complete a Confined Space Entry permit (**L-OM100-22, Safety Permit**) in accordance with the requirements contained in 29 CFR 1910.146.
- A.2.4.7 CONTRACTOR shall remove all manway covers and pontoon or compartment covers on the floating roof for ventilation.
- A.2.4.8 CONTRACTOR shall provide, or request of the company onsite representative, a clean vacuum truck to remove liquids and solids from the tank during the cleaning process. The vacuum truck and its operator shall comply and meet the requirements of all applicable federal and state regulations, API Publication 2219 "Safe Operation of Vacuum Trucks", and company procedures. (**L-O&M Procedure 140, Vehicle & Equipment Safety**)

- A.2.4.9 CONTRACTOR shall pressure wash and clean the lower six-foot section of the tank shell, underside of the floating roof (if applicable), annular space between the floating roof and shell, and bottom plates to a gas, lead, benzene and scale free condition. CONTRACTOR shall flush out all internal piping free from liquids and/or vapors. CONTRACTOR shall disconnect any internal suction and fill lines, including roof drain hoses/piping at the flanges as required. For tanks equipped with internal pontoon suction lines, CONTRACTOR shall remove all drain plugs on each pontoon and inspect voids for liquid and/or vapors. Power washing and/or using scrapers may be necessary to remove loose scale. The bottom plates, weld seams, and related appurtenances shall be free of scale, solids and dirt prior to leaving the job site. CONTRACTOR shall NOT leave the job site until the cleaning of the tank has been approved by the company onsite representative.
- A.2.4.10 CONTRACTOR shall perform the cleaning in accordance with guidelines established in API Standard 2015, "Safe Entry and Cleaning of Petroleum Storage Tanks".
- A.2.4.11 For tanks equipped with a foam log primary seal, CONTRACTOR shall remove the foam log material from the primary seal envelope. Foam log material found to be saturated with petroleum product shall be rinsed thoroughly inside the tank. The foam material shall then be placed, compacted and sealed inside a DOT approved steel drum for future disposal. The drums shall be sealed, properly labeled (if necessary consult with local EHS Representative) and placed at an approved hazardous material/waste drum storage area. The company will be responsible for the recycling of the foam log material. CONTRACTOR shall furnish all DOT approved steel drums necessary to contain the foam log material. Labels shall be completed and installed by a trained designated company employee.
- A.2.4.12 CONTRACTOR shall provide the company with a Hazardous Waste Manifest for each truckload of liquids/sludge to be transported to a certified recycling facility. An authorized company representative will complete the sections of the manifest required to be filled out by the owner. The CONTRACTOR transporting the waste shall complete items applicable to the transporter.
- A.2.4.13 CONTRACTOR shall provide a gas-free, lead-free, benzene-free certificate for the tank. Certificate shall be certified by personnel qualified to make these determinations. Qualified personnel shall test the entire tank interior, including all internal piping, column and leg supports, pontoons, compartments, top of floating roof, etc. One copy of the certificate shall be posted at the tanks' main point of entry and the original copy shall be given to the company onsite representative.
- A.2.4.14 CONTRACTOR (maybe different from cleaning contractor) shall transport and dispose of the liquids/sludge generated during the cleaning process to a company approved recycling/disposal facility.

A.3 ADDITIONAL REQUIREMENTS