CO Dept of Labor & Employment – Division of Oil & Public Safety
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PERIODIC AST INSPECTIONS

All ASTs, connected piping, and secondary containment must be periodically inspected for proper operation, damage, leaks, and suitability for continued service. Beginning April 14, 2011, all steel ASTs must be inspected and maintained in accordance with STI SP001, *Standard for the Inspection of Aboveground Storage Tanks*, or API Standard 653, *Tank Inspection, Repair, Alteration, and Reconstruction*.

This guidance document outlines, **but does not replace**, the requirements of these inspection standards or the Petroleum Storage Tank Regulations.

Monthly Inspections:

- All ASTs must be visually inspected monthly by the owner's inspector or operating personnel who is knowledgeable of facility operations, the type of ASTs and associated equipment, and the characteristics of the products stored. The inspections must be documented on OPS-provided (or equivalent) forms, and kept for at least 3 years.
- Inspections are intended to identify leaks, and to monitor the condition of tanks, piping, secondary containment, and equipment.
- Monthly inspections have been a requirement for ASTs since 1995.

Annual Inspections:

- All ASTs must be visually inspected annually by the owner's inspector or operating personnel who is knowledgeable of facility operations, the type of ASTs and associated equipment, and the characteristics of the products stored. The inspections must be documented on OPS-provided (or equivalent) forms, and kept for at least 3 years.
- Inspections are intended to identify leaks, and to monitor the condition of tanks, piping, secondary containment, and equipment. This inspection is more thorough than, and is to be conducted in addition to the monthly inspection.
- Inspections must be conducted within 12 months after April 14, 2011,and during the same month in each year thereafter.

Formal External Inspections, Internal Inspections, and Leak Testing:

- ASTs must have formal external and internal inspections, and leak testing performed and documented according to the requirements of the inspection standard being followed. The frequency and type of inspections needed will be established by the standard and is based on specific criteria such as AST type, capacity, type of installation, corrosion rate, inspection history, etc.
- Inspections and testing are intended to determine the AST's suitability for continued service until the next scheduled inspection.
- Formal external and internal inspections must be conducted by certified inspectors that meet the qualifications established by the standard being followed. Findings must be documented in a final report that includes: field data, measurements, pictures, drawings, tables, etc.; an inspection summary that identifies unacceptable conditions and recommended corrective actions; determination of the suitability for continued service of the AST; the date of the next required formal external or internal inspection, and leak testing; the certified inspector's name and certification information. Reports must be kept for the life of the tank.

- Leak testing can be conducted by the owner's inspector or another qualified person. Testing is to be done in accordance with the tank manufacturer's requirements or NFPA 30 where none exist, and must include the interstitial space of double-wall tanks. The OPS guidance for AST tightness testing can be consulted for additional information and includes a form to document test results.
- All existing ASTs, and every new or used AST being installed must have their first formal inspections and leak testing completed according to Table 1:

TABLE 1		First External and Internal Inspections, and Leak Testing Due			
Type of AST		*Age of AST*	*Previous inspections conducted?*	*Re-inspection due date is exceeded ?*	*The inspection is due*
AST Installations	New	at the time of installation is **new**	No	N/A	when the age of the AST = the inspection frequency
AST Installations	Used	at the time of installation is ≤ the inspection frequency	Yes	Yes	before installation **
AST Installations	Used	at the time of installation is ≤ the inspection frequency	Yes **	No	re-inspect during same month in next inspection year
AST Installations	Used	at the time of installation is ≤ the inspection frequency	No	N/A	when the age of the AST = the inspection frequency
AST Installations	Used	at the time of installation is > the inspection frequency	Yes	Yes	before installation **
AST Installations	Used	at the time of installation is > the inspection frequency	Yes **	No	re-inspect during same month in next inspection year
AST Installations	Used	at the time of installation is > the inspection frequency	No	N/A	before installation **
Existing		on 10/14/2012 is ≤ the inspection frequency	Yes	Yes	before 10/14/2012
Existing		on 10/14/2012 is ≤ the inspection frequency	Yes	No	re-inspect during same month in next inspection year
Existing		on 10/14/2012 is ≤ the inspection frequency	No	N/A	when the age of the AST = the inspection frequency
Existing		on 10/14/2012 is > the inspection frequency	Yes	Yes	before 10/14/2012
Existing		on 10/14/2012 is > the inspection frequency	Yes	No	re-inspect during same month in next inspection year
Existing		on 10/14/2012 is > the inspection frequency	No	N/A	before 10/14/2012

****A copy of the inspection report must be included with the AST installation application.**

STI SP001 Inspection Schedule Information:

- **Spill control** is the means provided to control a catastrophic release and keep it from endangering adjacent structures, properties, and waterways. Methods of spill control include diking, impounding, double-wall tanks, etc.
- **CRDM** (Continuous release detection method) is a means of detecting a release of liquid through inherent design. Types of CRDM include double-wall or double-bottom ASTs that can be monitored, and containment barriers (release prevention barriers [RPB]) that are compatible with and sufficiently impervious to the liquid being stored, installed under the AST. Containment barriers must be able to divert leaks to a point where they can be easily detected, such as along the perimeter of the tank. Some examples of containment barriers are steel, concrete, and elastomeric liners. Where earthen materials such as compacted clay liners or native soil are intended to act as a containment barrier, it must be shown that the materials used and their installation provide sufficient resistance to diffusion and transport of hydrocarbon or other chemical substances so that a leak would be diverted to the perimeter of the tank for detection, and to prevent contamination of the environment until clean-up occurs. These determinations must be made by a qualified professional such as a Professional Engineer or Professional Geologist, and should include hydraulic conductivity readings of the containment barrier material.

- Shop-fabricated ASTs will be inspected according to the frequency listed in Table 2:
  - o **Category 1 ASTs** are those with spill control and with CRDM.
  - o **Category 2 ASTs** are those with spill control and without CRDM.
  - o **Category 3 ASTs** are those without spill control and without CRDM.

TABLE 2	**STI SP001 Inspection Frequency**		
Tank Capacity (gal)	Category 1	Category 2	Category 3
660 - 1,100	**M**; **A**	**M**; **A**	**M**; **A**; **E**(10); **L**(10)
1,101 – 5,000	**M**; **A**	**M**; **A**; **E**(10); **L**(10)	**M**; **A**; **E**(5); **L**(5); **I**(10) **or** **M**; **A**; **L**(2); **E**(5)
5,001 – 30,000	**M**; **A**; **E**(20)	**M**; **A**; **E**(10); **I**(20) **or** **M**; **A**; **E**(5); **L**(10)	**M**; **A**; **E**(5); **L**(5); **I**(10) **or** **M**; **A**; **L**(1); **E**(5)
30,001 – 39,999	**M**; **A**; **E**(20)	**M**; **A**; **E**(5); **L**(5); **I**(15)	**M**; **A**; **E**(5); **L**(5); **I**(10)
M = Monthly Inspection	**A** = Annual Inspection	**E** = External Inspection	
I = Internal Inspection	**L** = Leak Test	**(#)** = Inspection interval	
Example: E(5) indicates a formal external inspection every 5 years.			

- Additional information on the STI SP001 inspection standard, including a list of certified inspectors can be found on the Steel Tank Institute website at http://www.steeltank.com/.

API 653 Inspection Information:

- Inspection requirements, criteria, and frequencies differ from those contained in STI SP001. Consult the API 653 inspection standard for specific requirements. Certified inspectors can be found through yellow page and internet searches.

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AST Monthly Visual Inspection Checklist

OPS FacID#:	**Facility Name:**	**Inspection Date:**
Street Address:	**City:**	**Zip:**
# of Tanks Inspected:	**Tank IDs:**	

Any item marked "No" requires additional information to describe the condition and date the condition is corrected.

	ITEM	STATUS	COMMENTS / DATE CORRECTED
	PRIMARY TANK and PIPING		
1	Is tank exterior (roof, shell, ends, connections, fittings, valves, etc.) free of visible leaks? *Note: If "No", identify tank and describe leak.*	☐**Yes** ☐**No**	
2	Is aboveground piping (valves, fittings, connections, pumps, etc.) free of visible leaks? *Note: If "No", identify location and describe leak..*	☐**Yes** ☐**No**	
3	Are ladders/platforms/walkways secure with no sign of severe corrosion or damage?	☐**Yes** ☐**No** ☐**NA**	
4	Are all tank openings properly sealed (capped, plugged, covered, blind flanged, etc.)?	☐**Yes** ☐**No**	
5	Is the tank liquid level gauge readable and in good working condition?	☐**Yes** ☐**No** ☐**NA**	
6	Is overfill prevention equipment in good working condition (overfill valve, audible alarm, etc.)? *Note: Verify operation of audible alarms.*	☐**Yes** ☐**No** ☐**NA**	
7	Is the spill container (spill bucket) empty, free of visible leaks, and in good working condition?	☐**Yes** ☐**No** ☐**NA**	
8	Is the primary tank free of water?	☐**Yes** ☐**No**	
9	Is the area around the tank (concrete surfaces, ground, containment, etc.) free of visible signs of leakage?	☐**Yes** ☐**No**	
10	Cathodic protection system in operating condition and functional? *Note: Inspection required every 60 days only.*	☐**Yes** ☐**No** ☐**NA**	
11	Rectifier reading: Volts _____ Amps _____ *Note: Inspection required every 60 days only.*	☐**Yes** ☐**No** ☐**NA**	
	DOUBLE-WALL TANK		
12	For double-wall tanks, is interstice free of liquid?	☐**Yes** ☐**No** ☐**NA**	
13	For double-wall tanks, is interstitial monitoring equipment in good working condition?	☐**Yes** ☐**No** ☐**NA**	
	CONTAINMENT (Diking/Impounding)		
14	Is the containment free of liquid, debris, combustible materials, and empty or full drums/barrels?	☐**Yes** ☐**No** ☐**NA**	
15	Are dike drain valves closed and in good working condition?	☐**Yes** ☐**No** ☐**NA**	
16	Are containment egress pathways clear and any gates/doors operable?	☐**Yes** ☐**No** ☐**NA**	
	OTHER CONDITIONS		
17	Are there other conditions needing to be addressed for continued safe operation or that may affect the site SPCC Plan?	☐**Yes** ☐**No**	

INSPECTOR INFORMATION	
Printed Name:	**Signature:**

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AST Annual Visual Inspection Checklist

OPS FacID#:	**Facility Name:**	**Inspection Date:**
Street Address:	**City:**	**Zip:**
# of Tanks Inspected:	**Tank IDs:**	

Any item marked "No" requires additional information to describe the condition and date the condition is corrected.

	ITEM	STATUS	COMMENTS / DATE CORRECTED
	CONTAINMENT		
1	Containment structure in satisfactory condition (diking, impounding, double-wall tank, etc.)?	☐**Yes** ☐**No**	
2	Drainage pipes/valves in good working condition for continued service?	☐**Yes** ☐**No** ☐**NA**	
	TANK FOUNDATION / SUPPORTS		
3	Free of tank settlement or foundation washout?	☐**Yes** ☐**No**	
4	Concrete pad or ring wall free of cracking or spalling?	☐**Yes** ☐**No**	
5	Tank supports in satisfactory condition	☐**Yes** ☐**No**	
6	Water able to drain away from tank?	☐**Yes** ☐**No**	
7	Grounding strap between tank and foundation/supports in good condition?	☐**Yes** ☐**No** ☐**NA**	
	CATHODIC PROTECTION		
8	Cathodic protection system in operating condition and functional?	☐**Yes** ☐**No** ☐**NA**	
9	Rectifier reading: Volts _____ Amps _____	☐**Yes** ☐**No** ☐**NA**	
	TANK EXTERNAL COATING		
10	Free of visible signs of paint failure?	☐**Yes** ☐**No**	
	TANK SHELL / HEADS		
11	Free of noticeable shell/head distortions, buckling, denting, or bulging?	☐**Yes** ☐**No**	
12	Free of visible signs of shell/head corrosion or cracking?	☐**Yes** ☐**No**	
	TANK MANWAYS, PIPING, AND EQUIPMENT		
13	Flanged connection bolts tight and fully engaged with no sign of wear or corrosion?	☐**Yes** ☐**No** ☐**NA**	
	TANK ROOF		
14	Free of standing water on roof?	☐**Yes** ☐**No**	
15	Free of visible signs of coating cracking, crazing, peeling, or blistering?	☐**Yes** ☐**No**	
16	Free of holes?	☐**Yes** ☐**No**	
	VENTING		
17	Normal and emergency vents free of obstructions?	☐**Yes** ☐**No**	
18	Normal vent on tanks storing gasoline equipped with pressure/vacuum vent cap?	☐**Yes** ☐**No** ☐**NA**	
19	Emergency vent in good working condition and functional, and tested as required by manufacturer?	☐**Yes** ☐**No**	

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Any item marked "No" requires additional information to describe condition and date the condition is corrected.

	ITEM	STATUS	COMMENTS / DATE CORRECTED
		INSULATED TANKS	
20	Free of missing insulation?	☐**Yes** ☐**No** ☐**NA**	
21	Insulation free of noticeable areas of moisture?	☐**Yes** ☐**No** ☐**NA**	
22	Insulation free of mold?	☐**Yes** ☐**No** ☐**NA**	
23	Insulation free of visible signs of damage?	☐**Yes** ☐**No** ☐**NA**	
24	Insulation adequately protected from water intrusion?	☐**Yes** ☐**No** ☐**NA**	
		LEVEL AND OVERFILL PREVENTION EQUIPMENT	
25	Electronic or mechanical liquid level gauge tested for proper operation?	☐**Yes** ☐**No** ☐**NA**	
26	Electronic or mechanical liquid level gauge calibrated during the previous 12 months?	☐**Yes** ☐**No** ☐**NA**	
27	Is overfill prevention equipment in good working condition (overfill valve, audible alarm, etc.)?	☐**Yes** ☐**No** ☐**NA**	
28	Is tank ullage being determined and documented before filling the tank?	☐**Yes** ☐**No** ☐**NA**	
		ELECTRICAL EQUIPMENT	
29	Is tank/equipment grounding adequate and in good condition?	☐**Yes** ☐**No**	
30	Is electrical wiring for control boxes, lights, and other high voltage equipment in good condition?	☐**Yes** ☐**No** ☐**NA**	
		TANK / PIPING RELEASE DETECTION	
31	Is inventory control being performed and documented as required?	☐**Yes** ☐**No** ☐**NA**	
32	Is release detection being performed and documented on underground piping as required?	☐**Yes** ☐**No** ☐**NA**	

ADDITIONAL COMMENTS

INSPECTOR INFORMATION	
Printed Name:	**Signature:**