

Delaware Department of Natural Resources and Environmental Control

Pre-Approved Best Management Practices (BMP) for Delaware Agricultural/Farm Aboveground Storage Tanks Pursuant to Part A, §1.2.6 of the Delaware *Regulations Governing Aboveground Storage Tanks*

Site Name: _____

Address: _____

DNREC Facility ID#: _____

Tank ID#(s) _____

I, _____, hereby certify that
Print Name of AST Owner or Operator
_____ shall follow all the

Company Name
requirements of this BMP for all of the above referenced aboveground storage tanks. I understand that if the requirements of this BMP are not followed the applicable requirements of the Delaware *Regulations Governing Aboveground Storage Tanks* will take precedence. I understand that this BMP is in lieu of compliance only with Parts B and C of the Delaware *Regulations Governing Aboveground Storage Tanks*; the applicable requirements of Parts A, D and E must still be followed.

Documentation of compliance with all applicable portions of this BMP must be presented to the Delaware Department of Natural Resources and Environmental Control (DNREC) upon request. If documentation of compliance with this BMP is not presented to the DNREC, all applicable requirements of the Delaware *Regulations Governing Aboveground Storage Tanks* will be required. Failure to comply with either a BMP or the requirements of Parts B and C of the Delaware *Regulations Governing Aboveground Storage Tanks* may subject the tank owner and operator to enforcement including administrative penalties.

This document with an original signature must be submitted to the DNREC. A copy must be kept at the AST facility and presented to the DNREC upon request.

DNREC Facility ID# _____

I. Applicability

A. General Requirements

Agricultural/Farm ASTs 40,000 gallons or greater

a) Owners and Operators of Agricultural/Farm ASTs with a capacity of 40,000 gallons or greater, containing Regulated Substances such as urea ammonium nitrate must comply with all the applicable requirements of *The Delaware Regulations Governing Aboveground Storage Tanks* (the AST Regulations) adopted pursuant to 7 Del.C. Chapter 74A, *The Jeffrey Davis Aboveground Storage Tank Act*. Agricultural/Farm ASTs greater than 40,000 gallons are not eligible to apply a Best Management Practice in lieu of compliance with all applicable requirements of the AST Regulations.

Agricultural/Farm ASTs 12,499 gallons to less than 40,000 gallons

b) Owners and Operators of Agricultural/Farm ASTs with a capacity of 12,499 gallons to less than 40,000 gallons, containing Regulated Substances such as urea ammonium nitrate, used solely to facilitate the production of crops, turf grass, livestock or livestock products must comply with either Part B and Part C of *The Delaware Regulations Governing Aboveground Storage Tanks* (the AST Regulations) or a written Best Management Practice (BMP) approved by the Department. This document *is* a Best Management Practice (BMP) approved by the Department. An alternate BMP may be submitted to the Department for approval.

Agricultural/Farm ASTs greater than 250 gallons to less than 12,499 gallons

c) Owners and Operators of Agricultural/Farm ASTs with a capacity greater than 250 gallons to less than 12,499 gallons, containing Regulated Substances such as urea ammonium nitrate, must comply with all applicable parts of the Regulations including registration with no fee of ASTs as required by *The Jeffrey Davis Aboveground Storage Tank Act*.

d) Owners and Operators of Agricultural/Farm ASTs greater than or equal to 12,499 gallons are subject to annual registration fees as set forth in 7 Del.C. §7413A.

e) Owners and Operators of Agricultural/Farm ASTs greater than or equal to 12,499 gallons are subject to construction permit fees as set forth in 7 Del.C. §7414A. ASTs with a capacity of 12,499 gallons to less than 40,000 gallons are not subject to construction fees, if there is a DNREC approved BMP on file.

B. Definitions

“Aboveground Storage Tank” or “AST” means a single aboveground containment vessel. The term includes all ancillary aboveground pipes and Dispensing Systems up to the first point of isolation and all ancillary underground pipes and Dispensing Systems. Within this definition, the word “vessel” includes any container that can be partially visually inspected, from the exterior, in an underground area.

“Agricultural/Farm AST” means an AST less than 40,000 gallons containing a Regulated Substance, the contents of which are applied to the soil, crops, or livestock or ingested by livestock and used solely to directly facilitate the production of crops, livestock, livestock products, or golf course turf. Crops include fish hatcheries, rangeland, cropland and nurseries including turf grass growing operations. Agricultural/Farm ASTs do not include ASTs used to store substances used in a manufacturing process. A manufacturing process does not include Agricultural/Farm ASTs used to store and blend Regulated Substances for retail sales.

“Ancillary Piping” means all piping, including valves, elbows, joints, flanges, and flexible connectors, attached to an AST through which a Regulated Substance may flow.

“Department” means the Delaware Department of Natural Resources and Environmental Control.

“Dispensing System” means any device including, but not limited to, hoses (rigid or flexible), piping, fittings, fixtures, gauges, alarms, rupture disks, pressure release valves, flanges, or valves and pumps that are used to distribute, meter or control the flow of Regulated Substance to and from an AST.

“Existing Agricultural/Farm AST” means an AST for which substantial physical installation began prior to June 11, 2004. The term substantial physical installation includes, but is not limited to, a permit or contract for the installation.

“Experience Qualified Person” means an individual who has at least five (5) years experience in the inspection or repair of Agricultural/Farm ASTs or is an individual certified by the American Petroleum Institute (API) as a API 653 inspector or is an individual certified by the Steel Tank Institute (STI) as an STI SP001 inspector.

“Facility” means any location or part thereof containing or having contained one or more Agricultural/Farm ASTs.

“Fit For Service” means that an Experience Qualified Person has inspected an Existing Agricultural/Farm AST and has provided signed, written documentation that the Agricultural/Farm AST will function as a storage vessel for a Regulated Substance for ten (10) more years from the date of the inspection, without being an unacceptable risk to public health or welfare or the environment due to potential failure of the Agricultural/Farm AST to contain the Regulated Substance. The Fit For Service documentation needs to account for any immediate necessary repairs or maintenance and any future repairs or maintenance for the ten (10) years after the inspection.

“New Agricultural/Farm AST” means an AST for which substantial physical installation began on or after June 11, 2004.

“Operator” means a person who has responsibility for the care, custody, and control of the daily operation of an AST, including but not limited to responsibility conferred by lease, contract or other form of authorization agreement.

“Owner” means a person who has or has had a legal interest in a Facility or AST; or who has or has had an equitable interest in a Facility or AST except when a person holds an interest in a tank, as a security interest unless through foreclosure or other such action the holder has taken possession of or operated the tank.

“Regulated Substance” means a liquid or gas that:

- contains one percent (1%) or more of a hazardous substance as defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980 [42U.S.C. §9601(14)] and any amendments thereto; or
- contains 0.1 percent (.1%) or more of a carcinogen as defined by EPA in the Integrated Risk Information System (IRIS) April 2002 and as updated; or
- is a petroleum product, including crude oil or any fraction thereof, which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute); or
- is a substance determined by the Secretary through regulation to present a risk to public health or welfare or the environment if released into the environment.

“Regulations” means the Delaware *Regulations Governing Aboveground Storage Tanks* promulgated under the authority of Chapter 74A, The Jeffrey Davis Aboveground Storage Tank Act.

“Secondary Containment” means a containment system designed and constructed to retain any Regulated Substance that leaves the primary containment including an AST and Ancillary Piping and prevent any Regulated Substance from reaching the surface water, groundwater, or adjacent land before cleanup occurs. Included are structures/devices sufficiently impermeable to contain released Regulated Substances for a period of time sufficient for the cleanup and removal of captured material including;

- (1) dikes, berms or retaining walls;
- (2) curbing;
- (3) diversion ponds, holding tanks, sumps;
- (4) vaults;
- (5) double-walled tanks;
- (6) liners external to the tanks;
- (7) other means as approved by the Department.

II. BMP Requirements for Existing Agricultural/Farm ASTs with a capacity of 12,499 gallons to less than 40,000 gallons.

A. General Requirements

- a) All Agricultural/Farm ASTs shall be maintained so as to prevent the discharge of Regulated Substances.
- b) By June 11, 2007 all Agricultural/Farm ASTs shall be located within a Secondary Containment structure. A Secondary Containment structure shall consist of either diking, curbing, a vault, a double-walled Agricultural/Farm AST, or an external liner.
- c) By June 11, 2005 a liquid level gauging device, or other provision for establishing and measuring liquid levels or quantity of a Regulated Substance in the Agricultural/Farm AST (e.g., tape measure and tank outage tables) shall be installed and shall be maintained for all Agricultural/Farm ASTs. External sight gauges may be used and when used shall have a securable bottom valve.
- d) By June 11, 2007 all Agricultural/Farm ASTs shall be equipped, when necessary, with a vent or inverted opening.
- e) By June 11, 2005 all Agricultural/Farm ASTs, pipes and valves shall be protected (e.g., guard rails, pipes and cages with fittings supported to prevent sagging and breakage) against breakage or damage from operating personnel and moving vehicles.
- f) By July 11, 2004 when persons responsible for Agricultural/Farm ASTs are not present at the location, to protect against vandalism or unauthorized access, valves on ASTs including sight gauge valves shall be locked in the closed position or otherwise secured to prevent discharge.
- g) As of June 11, 2004, when an Agricultural/Farm AST is being filled, a person shall be present and in a location that allows visual observation of the level of the Regulated Substance in the AST. This will be done to prevent the overfilling of an AST.

B. Secondary Containment

- a) Secondary Containment structures and systems shall provide the following capacity:
 - 1) The containment shall have a minimum containment volume of 110% of the capacity of the largest Agricultural/Farm AST, plus the volume displaced by the bases of the other ASTs located within the Secondary Containment structure.
- b) The Secondary Containment structure shall be maintained in a condition that shall ensure it is capable of retaining any Regulated Substance that leaves the primary containment including an

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AST and Ancillary Piping and prevent any Regulated Substance from reaching the surface water, groundwater, or soil outside the Secondary Containment before cleanup occurs.

c) The Secondary Containment structure shall be maintained to withstand a full hydrostatic head of any contained liquid. The containment area shall not be equipped with a permanent pump unless the pump has only a manual mode of operation. The pump shall be maintained in the closed position unless the Secondary Containment area is being drained and the process is being actively monitored.

d) The Secondary Containment structure shall not have a discharge outlet or gravity drain through the wall or floor.

e) The walls of Secondary Containment structures shall meet each of the following criteria:

1) Walls shall be constructed of sturdy materials, including but not limited to, steel, reinforced concrete, solid masonry, or soil with compatible synthetic materials or liners.

2) No piping shall be installed through the wall.

3) Earthen walls used for Secondary Containment shall be protected against erosion (e.g., sodding and seeding). Side slopes shall not exceed a 3 to 1 ratio of horizontal to vertical. The top width of earthen walls shall not be less than 2 1/2 feet.

4) Floor: The base of a Secondary Containment structure shall be lined with compatible materials, including but not limited to, reinforced concrete, steel, clay or a synthetic liner.

C. Routine In-Service Inspection and Maintenance

a) Every Secondary Containment structure shall be visually inspected at least once a month during the routine in-service inspection and maintained in a condition that shall ensure it is capable of retaining any Regulated Substance that leaves the primary containment including an Agricultural/Farm AST and Ancillary Piping and prevent any Regulated Substance from reaching the surface water, groundwater, or soil outside the Secondary Containment before cleanup occurs.

b) Every Agricultural/Farm AST and appurtenances shall be visually inspected for leakage at least once a month during the routine in-service inspection to minimize the risk of a discharge.

c) The monthly routine in-service inspection shall at a minimum be completed in accordance with the attached checklist. The checklist shall be completed for each Agricultural/Farm AST and aboveground Ancillary Piping at each monthly routine in-service inspection.

d) The routine in-service inspection shall include close visual inspection from the ground.

e) Routine in-service inspections are not required when a Regulated Substance is not being stored.

f) The routine in-service inspection program shall be developed and implemented by December 11, 2004.

D. Internal Out-of-Service Inspection

a) By June 11, 2007 all Agricultural/Farm ASTs shall complete an internal out-of-service inspection, except those Agricultural/Farm ASTs that are in compliance with an established documented inspection schedule. During the internal out-of-service inspection the Agricultural/Farm AST shall be emptied of all Regulated Substance and shall be visually inspected by an Experience Qualified Person to determine if the welds, liner condition, internal and external tank condition, or coatings show any signs of breaks, cracks, defects, damage, and corrosion that require repair because the ability of the Agricultural/Farm AST to contain the Regulated Substance has been compromised. The Agricultural/Farm AST shall be repaired prior to placing the Agricultural/Farm AST back in service.

b) At least once every ten years an internal out-of-service inspection shall be performed.

E. Recordkeeping

a) Records of monthly routine in-service inspections of the Agricultural/Farm ASTs shall be retained at the Facility by the Owner and Operator for five (5) years after the routine in-service inspection and shall be made available for review at the Department's request. The records shall show that the Agricultural/Farm ASTs has been inspected for leaks, corrosion, and structural soundness.

b) Records of the internal out-of-service inspections shall be kept on file at the Facility for the life of the Agricultural/Farm AST and shall be made available for review at the Department's request. These inspection records shall include notes on the weld condition, coating condition, liner condition, and condition of the floor and the walls of the Agricultural/Farm AST.

III. BMP Requirements for New Agricultural/Farm ASTs with a capacity of 12,499 gallons to less than 40,000 gallons.

A. General Requirements

- a) Agricultural/Farm ASTs with a storage capacity of 12,499 gallons to less than 40,000 gallons containing a Regulated Substance shall be constructed, installed and maintained so as to prevent the discharge of a Regulated Substance and shall be constructed and installed to meet or exceed at least one of the following standards as appropriate, American Petroleum Institute (API) Recommended Practice 650, American Petroleum Institute (API) Recommended Practice 620, applicable Underwriter's Laboratory standards, applicable Steel Tank Institute standards and ASME RTP-1. Documentation of compliance with the appropriate referenced standard(s) must be kept on file for the life of the AST system and must be submitted to the DNREC upon request. If documentation of compliance with the applicable standard(s) is not available the AST is not eligible for a BMP and must comply with all the applicable requirements of the AST Regulations.
- b) The materials used in construction shall be resistant to corrosion, puncture, or cracking and shall be compatible with the Regulated Substance being stored.
- c) The materials used in construction and repair may not be of a type that reacts chemically or electrolytically with stored Regulated Substances in a way that may weaken the Agricultural/Farm AST or appurtenances.
- d) The metals used for valves, fittings, and repair on an Agricultural/Farm AST shall be compatible with the Agricultural/Farm AST and the metals used in the construction of the Agricultural/Farm AST so that the combination of metals does not cause or increase corrosion that may weaken the Agricultural/Farm AST or its appurtenances.
- e) Agricultural/Farm ASTs and appurtenances shall be designed to handle operating stresses, taking into account hydrostatic head, pressure buildup from pumps and compressors, and any other foreseeable mechanical stresses to which the Agricultural/Farm ASTs and appurtenances may be subject.
- f) Agricultural/Farm ASTs shall not be permitted to float or become instable in the event of a Regulated Substance discharge into the Secondary Containment structure.
- g) A liquid level gauging device, or other provision for establishing and measuring liquid levels, or quantity of a Regulated Substance in the Agricultural/Farm AST (e.g., tape measure and tank outage tables), shall be installed and maintained for all Agricultural/Farm ASTs. External sight gauges may be used and when used shall have a securable bottom valve.
- h) All Agricultural/Farm ASTs shall be equipped, when necessary, with a vent or inverted opening.

i) Agricultural/Farm ASTs, pipes and valves shall be protected (e.g., guard rails, pipes, cages and fittings supported to prevent sagging and breakage) against breakage or damage from operating personnel and moving vehicles.

j) When persons responsible for Agricultural/Farm ASTs are not present at the location, to protect against vandalism or unauthorized access, valves on Agricultural/Farm ASTs including sight gauge valves shall be locked in the closed position or otherwise secured to prevent discharge.

k) When an Agricultural/Farm AST is being filled, a person shall be present and in a location that allows visual observation of the level of the Regulated Substance in the Agricultural/Farm AST. This will be done to prevent the overfilling of an Agricultural/Farm AST.

B. Secondary Containment

a) All Agricultural/Farm ASTs shall be located within a Secondary Containment structure. A Secondary Containment structure shall consist of either diking, curbing, a vault, a double-walled Agricultural/Farm AST, or an external liner.

b) Secondary Containment structures and systems shall provide the following capacity:

1) The containment shall have a minimum containment volume of 110% of the capacity of the largest Agricultural/Farm AST, plus the volume displaced by the bases of the other ASTs located within the Secondary Containment structure.

c) The Secondary Containment structure shall be constructed and maintained in a condition that shall ensure it is capable of retaining any Regulated Substance that leaves the primary containment including an AST and Ancillary Piping and prevent any Regulated Substance from reaching the surface water, groundwater, or soil outside the Secondary Containment before cleanup occurs.

d) The Secondary Containment structure shall be designed and maintained to withstand a full hydrostatic head of any contained liquid. The containment area shall not be equipped with a permanent pump unless the pump has only a manual mode of operation. The pump shall be maintained in the closed position unless the Secondary Containment area is being drained and the process is being actively monitored.

e) The Secondary Containment structure shall not have a discharge outlet or gravity drain through the wall or floor.

f) The walls of Secondary Containment structures shall meet each of the following criteria:

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- 1) Walls shall be constructed of sturdy materials, including but not limited to, steel, reinforced concrete, solid masonry, or soil with compatible synthetic materials or liners.
 - 2) No piping shall be installed through the wall.
 - 3) Earthen walls used for Secondary Containment shall be protected against erosion (e.g., sodding and seeding). Side slopes shall not exceed a 3 to 1 ratio of horizontal to vertical. The top width of earthen walls shall not be less than 2 1/2 feet.
- g) Floor: The base of a Secondary Containment structure shall be lined with compatible materials, including but not limited to, reinforced concrete, steel, clay or a synthetic liner.

C. Routine In-Service Inspection and Maintenance

- a) Every Secondary Containment structure shall be visually inspected at least once a month during the routine in-service inspection and maintained in a condition that shall ensure it is capable of retaining any Regulated Substance that leaves the primary containment including an AST and Ancillary Piping and prevent any Regulated Substance from reaching the surface water, groundwater, or soil outside the Secondary Containment before cleanup occurs.
- b) Every Agricultural/Farm AST and appurtenances shall be visually inspected for leakage at least once a month during the routine in-service inspection to minimize the risk of a discharge.
- c) The monthly routine in-service inspection shall at a minimum be completed in accordance with the attached checklist. The checklist shall be completed for each Agricultural/Farm AST and aboveground Ancillary Piping at each monthly routine in-service inspection.
- d) The routine in-service inspection shall include close visual inspection from the ground.
- e) Routine in-service inspections are not required when a Regulated Substance is not being stored.

D. Internal Out-of-Service Inspection

- a) At least once every ten (10) years, the Agricultural/Farm AST shall be emptied of all Regulated Substance and shall be visually inspected by an Experience Qualified Person to determine if the welds, liner condition, internal and external tank condition, or coatings show any signs of breaks, cracks, defects, damage, and corrosion that require repair because the ability of the Agricultural/Farm AST to contain the Regulated Substance has been compromised. The Agricultural/Farm AST shall be repaired prior to placing the Agricultural/Farm AST back in service.

E. Recordkeeping

- a) Records of monthly routine in-service inspections of the Agricultural/Farm ASTs shall be retained at the Facility by the Owner and Operator for five (5) years after the routine in-service inspection and shall be made available for review at the Department's request. The records shall show that the Agricultural/Farm AST has been inspected for leaks, corrosion, and structural soundness.

- b) Records of the internal out-of-service inspections shall be kept on file at the Facility for the life of the Agricultural/Farm AST and shall be made available for review at the Department's request. These inspection records shall include notes on the weld condition, coating condition, liner condition, and condition of the floor and the walls of the Agricultural/Farm AST.

Tank ID _____

TANK IN-SERVICE INSPECTION CHECKLIST

	Item	Completed	Comments
1.0	Foundation		
	Measure foundation levelness and bottom elevation		
1.1	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 for indication of bottom leakag		
	c. Inspect for cavities under foundation and vegetation against bottom of tank		
	d. Check the runoff rainwater from the shell drains away from tank		
	e. Check for sediment around the perimeter of the tank		
1.2	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		
1.3	Oiled dirt or sand		
	Check for the settlement into the base which would direct runoff rainwater under the tank rather than away from it		
1.4	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		
1.5	Site Drainage		
	a. Check site for drainage away from the tank and associated piping and manifolds		
	b. Check operating condition of the drains		
1.6	Housekeeping		
	a. Inspect the area for buildup of trash, vegetation, and other inflammables build-up		
2.0	Shells		
2.1	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		

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2.2	Internal (Floating Roof Tank)		
	a. Visually inspect for grooving, corrosion, pitting, and coating failures		
2.3	Riveted Shell Inspection		
	a. Inspect external service for rivet 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		
	TANK IN-SERVICE INSPECTION CHECKLIST-Continued	Completed	Comments
	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		
2.4	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 supports welds to shell for pitting, especially on shell plates		
	c. Note whether supports have reinforcing pads welded to shell.		
3.0	Shell Appurtenances		
3.1	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 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 flanges cover thickness on mixer manways		
3.2	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 the 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 operations		
	g. Check for damage and test the accuracy of temperatures indicators		
	h. Check welds on shell-mounted davit clips above valves 6 in. and larger		
3.3	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)		

	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 in.)		
	g. On floating roof tanks, when the roof is in the lowest position, check that no more than two ft. of tape are exposed at the end of the tape guide		
	h. Inspect condition of board and legibility of board-type auto gauges		
	i. Test freedom of movement of marker and float		
3.4	Shell-Mounted Sample Station		
	a. Inspected sample lines for function of valves and plugging of lines, including drain or return-to-tank line		
	TANK IN-SERVICE INSPECTION CHECKLIST-Continued	Completed	Comments
	b. Check circulation for leaks and operating problems		
	c. Test bracing and supports for sample lines and equipment		
3.5	Heater (Shell Manway Mounted)		
	Inspect condensate drain for presence of oil indicating leakage		
3.6	Mixer		
	a. Inspect for proper mounting flange and support		
	b. Inspect for leakage		
	c. Inspect condition of power lines and connections to mixer		
3.7	Swing Lines: Winch Operations		
	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 line the proper direction: Floating swing line indicators show a lower level as cable is wound up on the winch		
3.8	Swing Lines: External Guide System		
	Check for leaks at threaded and flanged joints		
3.9	Swing Lines: Identify Ballast Varying Need		
	Check for significant difference in stock specific gravity		
3.10	Swing Lines: Cable Material and Condition		
	a. For nonstainless steel cable, check for corrosion over entire length		
	b. All cable: check for wear or fraying		
3.11	Swings Lines: Product Sample Comparison		
	Check for water or gravity differences that would indicate a leaking swing joint		
3.12	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		
4.0	ROOFS		
4.1	Deck plate Internal Corrosion		
	For safety, before accessing the roof, check with ultrasonic instrument or lightly used 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.)		

4.2	Deck Plate External Corrosion		
	Visually inspect for paint failures, holes, pitting and corrosion product on the roof deck		
4.3	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)		
4.4	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		
4.5	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 roof		
	TANK IN-SERVICE INSPECTION CHECKLIST-Continued	Completed	Comments
4.6	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		
4.7	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-ft 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		
	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		
5.0	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 pipe and recoil systems, inspect operation of recoil reel		
		g. Test operation of system		
		h. On ultra clean stocks check for presence and condition of protective coating or liner sample hatch (preventing rust from pipe getting into sample)		
	5.1	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		
		TANK IN-SERVICE INSPECTION CHECKLIST-Continued	Completed	Comments
	5.2	Fixed Roof Scaffold Support		
		Inspect scaffold support for corrosion, wear and structural soundness		
	5.3	Autogauge: Inspection Hatch and Guides (Fixed Roof)		
		a. Check the hatch for corrosion and missing bolts		
		b. Look for corrosion on the tape guide's and float guide's wire anchors		
	5.4	Autogauge: Float Well Cover		
		a. Inspect for corrosion		
		b. Check tape cable for wear or fraying caused by rubbing on the cover		
	5.5	Sample Hatch (Internal Floating Roof)		
		a. Check overall conditions		
		b. When equipped with fabric seal, check for automatic sealing after sampling		
		c. When equipped with a recoil reel opening device, check for proper operations		
	5.6	Roof-Mounted Vents (Internal Floating Roof)		
		Check condition of screens, locking and pivots pins		
	5.7	Gauging Platform Drip Ring		
		On fixed roof tanks with drip rings under the gauging platforms or sampling area, inspect for plugged drain return to the tank		
	5.8	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		
	5.9	Removable Roof Leg Racks		
		Check for leg racks on roof		
	5.10	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		

5.11	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		
5.12	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 locked-down devices for condition and operation.		
6.0	Access Structures		
6.1	Handrails		
	a. Identify and report type (steel pipe, galvanized pipe, square tube, angle) and size of handrails		
	b. Inspect for pitting and holes, paint failure		
	c. Inspect attachment welds		
	d. Identify cold joints and sharp edges. Inspect the handrails and midrails		
	e. Inspect safety drop bar (or safety chain) for corrosion, functioning, and length		
	f. Inspect the handrail between the rolling ladder and the gauging platform for a hazardous opening when the floating roof is at its lowest level		
6.2	Platform Frame		
	a. Inspect frame for corrosion and paint failure		
	b. Inspect the attachment of frame to supports and supports to tank for corrosion and weld failure		
	TANK IN-SERVICE INSPECTION CHECKLIST-Continued	Completed	Comments
	c. Check reinforcing pads where supports are attached to shell or roof		
	d. Inspect the surface that deck plate or grating rests on, for thinning and holes		
	e. Check that flat-surface-to-flat-surface junctures are seal-welded		
6.3	Deck Plate and Grating		
	a. Inspect deck plate for corrosion-caused thinning or holes (not drain holes) and paint failure		
	b. Inspect plate-to-frame weld for rust scale buildup		
	c. Inspect grating for corrosion-caused thinning of bars and failure of welds		
	d. Check grating tie down clips. Where grating has been retrofitted to replace plate, measure the rise of the step below and above the grating surface and compare with other risers on the stairway		
6.4	Stairway Stringers		
	a. Inspect spiral stairway stringers for corrosion, paint failure, and weld failure		
	b. Inspect attachment of stairway treads to stringer		
	c. Inspect stairway supports to shell welds and reinforcing pads		
	d. Inspect steel support attachment to concrete base for corrosion		
6.5	Rolling Ladder		
	a. Inspect rolling ladder stringers for corrosion		
	b. Identify and inspect ladder fixed rungs (square bar, round bar, angles) for weld attachment to stringers and corrosion, particularly where angle rungs are		

		welded to stringers		
		c. Check for wear and corrosion where rolling ladder attaches to gauging platform		
		d. Inspect pivot bar for wear and secureness		
		e. Inspect operation of self-leveling stairway treads		
		f. Inspect for corrosion and wear on moving parts		
		g. Inspect rolling ladder wheels for freedom of movement, flat spots, and wear on axle		
		h. Inspect alignment of rolling ladder with roof rack		
		i. Inspect top surface of rolling ladder track for wear by wheels to assure at least 18 in. of unworn track (track long enough)		
		j. Inspect rolling ladder track welds for corrosion		
		k. Inspect track supports on roof for reinforcing pads seal-welded to deck plate		
		l. Check by dimensioning, the maximum angle of the rolling ladder when the roof is on low legs Maximum angle _____.		
		m. If rolling ladder track extends to within 5 feet of the edge of the roof on the far side, check for a handrail on the top of the shell on that side		
7.0	External Piping			
7.1	Leaks			
		a. Process		
		b. Steam tracing		
		c. Existing clamps		
7.2	Misalignment			
		a. Piping misalignment and restricted movement		
		b. Expansion joint misalignment		
7.3	Vibration			
		a. Excessive overhung weight		
		b. Inadequate support		
		c. Thin, small-bore, or alloy piping		
		TANK IN-SERVICE INSPECTION CHECKLIST-Continued	Completed	Comments
		d. Threaded connections		
		e. Loose supports causing metal wear		
7.4	Supports			
		a. Shoes off support		
		b. Hanger distortion or breakage		
		c. Bottomed-out springs		
		d. Support corrosion		
		e. Brace distortion and breakage		
		f. Loose brackets		
		g. Slide plates and rollers		
		h. Counter balance condition		
7.5	Corrosion			
		a. Bolting support points under clamps		
		b. Coating and painting deterioration		

		c. Soil-to-air interface		
		d. Insulation interfaces		
		e. Biological growth		
	7.6	Insulation		
		Damage and penetrations		
		Missing jacketing and insulation		
		Sealing deterioration		
		Bulging		
		Banding broken and missing		
	8.0	Secondary Containment		
		Check for vegetation build-up and keep cleared		
		Check for trash and remove		
		Check for water that will compromise the secondary containment holding capacity. Remove and dispose of properly.		
		Inspect for cracks that would compromise secondary containment structure and holding capacity		
		Inspect for settlement		
		Check for evidence of leaks or releases		
		Notes:		