

- 3.* — The volume of secondary containment is adequate. See 40 CFR 265.193(d) and 22 CCR Section 66265.193(d). ["Adequate" means that secondary containment can hold 100% of tank volume for single tank, 100% of largest tank if multiple tanks are contained within the same secondary containment structure, 150% of largest tank if a UST, or 10% of total volume if greater, plus the volume from a 25-year, 24-hour storm (approximately 4 inches) if exposed to rainfall.]
- 4.* — Tanks storing incompatible liquids are not located in the same secondary containment area.
5. — Tank systems are properly vented and evaluated for air permitting or abatement if the expected waste stream will contain volatile organic compounds or could emit ignitable or explosive vapors.
- 6.* — The secondary containment will prevent both vertical and lateral migration of wastes into the environment.
- 7.* — Secondary containment is designed such that it prevents infiltration of groundwater or runoff from entering the secondary containment. Vaults are tar-coated on exterior and sealed on the inside, if necessary to prevent groundwater or rainwater infiltration.
8. — Water stops have been placed at all joints in the secondary containment structure, if any. (Applies to concrete vaults or tanks.)
- 9.* — The secondary containment is sloped to a collection point, and a means to remove any accumulated liquid is provided, e.g., submersible pump, drain pipe, access for vacuum hose, etc.
10. — The primary and secondary containments are leak-tight and completely impervious to the contained substance for the intended life of the structure.
11. — All outlets (berm drains, sanitary sewer connections, and hose connections) have locking valves, locking caps, or the equivalent.

C. Leak detection

- 1.* — The system has some method of leak detection. Automatic leak detection monitoring with alarm notification surveyed at least once every 24 hours is preferred; otherwise, use visual inspection every 24 hours that a tank system is in use.

- 2.* ——— For secondarily contained systems, a flow path is provided for leaks to be detected by automatic or visual detection (e.g., sloped to a sump, no obstructions to prevent flow, etc.).

D. Documentation

- 1.* ——— Drawings showing the actual location and orientation of the system, and the associated ancillary equipment, are provided in the form of as-built drawings.
2. ——— A piping and instrumentation diagram (P&ID) is provided, showing the direction of flow; identifying all valves, pumps, indicators, and controls with a number; and showing all connections and flanges.
3. ——— A diagram is provided showing the control panel layout and an elementary wiring schematic.
4. ——— An Operational Plan is provided for the system, including a system description, operator training requirements, operating procedures, system schematic, sampling instructions, inspection and monitoring instructions, emergency response procedures, and other information (as required).
- 5.* ——— A Monitoring Program that describes the monitoring requirements and procedures and leak response actions is provided. (This requirement applies only to California-regulated USTs, and it shall be approved by Alameda County for the Livermore site, or San Joaquin County for Site 300.)
6. ——— Two sets of the completed drawings and diagrams and one set of the construction specifications have been submitted to WGMG for that group's permanent files.
7. ——— A maintenance plan, including a list of components with their respective maintenance actions and schedule, has been provided to the tank system operator and WGMG.
8. ——— A complete list of the components being used has been compiled, indicating the manufacture's name, component name, and part number. (Verification of material compatibility is required; refer to checklist item G.1.)

9. ——— Vendor literature for tanks, level sensors, pumps, etc., including design standards, specification sheets, operating, maintenance, and installation instructions, and other general information, has been retained for future reference. (This is usually retained by Plant Engineering.)
10. ——— Copies of specification sheets for all materials of construction in contact with the waste are obtained from the respective manufacturers.

E. Construction certifications

- 1.* ——— **Installation Inspection:** Installation of the tanks has been inspected by a qualified, independent tank installation inspector or a similarly qualified professional engineer; and a signed certification statement has been provided.
- 2.* ——— **Corrosion Protection:** Components that are subject to corrosion are designed (for California-regulated USTs), inspected, and any field installation or fabrication of corrosion-resistant materials is supervised by an independent, certified corrosion expert, and the signed certification of proper installation of the corrosion protection system is provided.
- 3.* ——— **Leak Test:** All components of the tank system (e.g., tanks, piping, secondary containment, etc.) have been tested for leak-tightness prior to placing the system in service, and a certification is provided stating that the system is leak-tight.
- 4.* ——— **Proper UST Installation:** Certification by the owner or owner's agent that the UST was installed properly by qualified personnel and that the system was inspected before being placed into use. (This requirement applies only to California-regulated USTs; certification shall be provided to the local regulatory agency on Form C from the State Water Resources Control Board.)
5. ——— All of the signed certification statements listed above have been retained in a permanent file, and copies of the certification statements have been submitted to WGMG for that group's permanent files.

F. Seismic analysis

- 1.* ——— Plant Engineering, or a contractor, has completed a seismic analysis in accordance with Design and Evaluation Guidelines for Department of Energy Facilities Subjected to Natural Phenomena Hazards. Ensure that appropriate factors have been used, e.g., category (General Use, Low Hazard, etc.), accelerations, and seismic zone (Zone 4 for LLNL).

G. Material compatibility

- 1.* ——— The compatibility of all materials (tanks, coatings, liners, piping, pumps, valves, gaskets, O-rings, etc.) in contact with the substance(s) to be contained has been verified, or in-house tests have been performed to verify compatibility.
2. ——— Test documentation has been retained in permanent files.

H. Overfill and spill prevention

- 1.* ——— Spill prevention and removal capabilities are provided.
- 2.* ——— The system is provided with overfill protection (e.g., check valves, automatic shutoff, automatic bypass, level indication, high-level alarms, etc.).

I. Corrosion protection

- 1.* ——— Potential corrosion is addressed per 40 CFR 265.192 (a)(3) and 22 CCR Section 66265.192(a)(3). If metal is in contact with soil or water, a corrosion analysis by a corrosion expert shall be performed in accordance with regulations.
2. ——— Corrosion-resistant materials have been used and/or corrosion-resistant materials installed.
3. ——— All metal surfaces are painted or coated.
4. ——— Any plastic (e.g., PVC, fiberglass, etc.) piping or components are painted or coated for ultraviolet protection.
- 5.* ——— Field installation of corrosion protection system was supervised by and certification provided by a corrosion expert.

J. General design considerations

The design, at a minimum, has considered the following items:

- 1.* — Settlement, compression, and uplift. (Pad area is sufficient for load, "dead-man," or other device used for underground tanks, etc.)
- 2.* — Wind loading. (Appropriate tank holddown straps, bolts, cables, etc., were used.)
- 3.* — Venting. (Check size of vents versus expected flow rates from pumps or drains, height of vents to avoid spillage from overfilling, float-check valves if necessary, explosion relief vents for petroleum tanks, etc.)
- 4.* — Sufficient anchoring and supports are provided for piping, pumps, and tanks. (Tanks in vaults or berms shall be properly anchored to resist seismic or buoyant forces.)
- 5.* — Soil conditions (e.g., settling and erosion potential).
- 6.* — Freeze protection has been provided in the form of insulation, heat tape, or other means for piping, tanks, and other equipment that may be susceptible to freezing.
7. — Adequate access is provided for ease of maintenance, sampling, operation, and inspections.
8. — Vehicular traffic. (Access is provided for emergency vehicles; barricades are in place to protect equipment from vehicles, etc.)
- 9.* — All components of the tank system meet or exceed the applicable design and safety standards (DOE, Uniform Building Code, American Society for Testing and Materials, Underwriters Laboratory, etc.). Design standards used shall be clearly referenced on the drawings or in the construction specifications.
- 10.* — Backfill material is noncorrosive, porous, and homogeneous, and it has been carefully installed and uniformly compacted such that it supports the tank(s) and piping uniformly.
- 11.* — The proper depth of cover for all underground components has been provided to prevent damage from surface vehicular traffic.

12. ——— Dual storage tanks are provided to allow for sampling and analysis prior to disposal. Tank sizes are such that they ensure adequate capacity for expected flow rates and for four weeks of analysis turnaround time.
13. ——— System has mixing capability. Mechanical mixing or air sparging is recommended. If pump recirculation is used, adequate mixing intensity shall be provided (0.5 to 2.0 horsepower, or greater, depending on the tank geometry). An EPD air permits specialist shall evaluate sparging operations for possible permitting requirements.
14. ——— Flexible couplings or joints are provided where necessary. Long, straight runs of pipe terminating at a tank or other fixed object have been avoided.
15. ——— The tank system has had an operational test to verify that system controls and alarms operate as designed.

K. Labeling

1. ——— A permanent identification tag displaying the ID number of the tank assigned by WGMG is clearly visible and is affixed to the tank(s).
- 2.* ——— A permanent label describing the contents (e.g., hazardous waste, laboratory waste, toxic, radioactive, flammable, etc.) of the tank system is affixed to the tank(s).
- 3.* ——— If the tank(s) stores hazardous or mixed waste, a label is attached to each tank with a date entered for when the storage of hazardous or mixed waste began.