APPLICATION PACKET
FOR

UNDERGROUND STORAGE TANK INSTALLATION/MODIFICATION PLANS In the CITY OF OAKLAND

OAKLAND FIRE DEPARTMENT
Fire Prevention Bureau
250 Frank H. Ogawa Plaza, Suite 3341
Oakland, CA 94612

Phone (510) 238-3927
Fax (510) 238-6739

CITY OF OAKLAND
OFFICE OF THE FIRE MARSHAL

250 Frank Ogawa Plaza, Suite 3341, Oakland, CA 94612
FAX 510-238-6739

510-238-3851
Code Requirement Information

510-238-3927
Schedule Inspection Appointments

Permit #:		**FIRE PERMIT STATUS:**	
Address:		**Fire Permit Issued** **Permit Not Released-Resubmit**	
Facility:		**Occupancy:**	
Scope of Work:	Install...[DESCRIPTION]		
Permit Type:	Underground Storage Tank (UST) **INSTALLATION**		
Date Reviewed:		**Reviewed by:**	

Fire Department Permit Plan Check Requirements

Inspector Note	#	CONDITIONS / COMMENTS / CORRECTIVE ACTION NECESSARY
	1.	**Application** – Complete and submit attached application and pay the appropriate fees.
	2.	**Fire Department Inspections** Hazardous Materials Inspector shall inspect the UST System (tank, piping, sumps, dispensers, etc.) during installation activities. Hazardous Materials Inspector must be scheduled in advance (510)-238-3927. However, if an inspection is necessary and a desired appointment is not available, submit a letter requesting at least 3 hours of overtime for a Hazardous Materials Inspector. Note - An approved/stamped set of plans, Fire Department Plan Check Permit Comments, and Fire Department Permit Card shall be on-site at all times. Inspections will not be performed without the Hazardous Materials Inspector on-site.
	3.	**"Fire Department Permit Inspection Record" Card** - Must be posted in a conspicuous place near the work area with the Building Permit card.
	4.	**Installation Time Lines** – Submit schedule indicating projected start and completion dates.
	5.	**Other Permits** Check with other local agencies (e.g. Building and/or Public Works Departments) regarding requirements for additional permits (e.g. electrical, plumbing, excavation, compaction and grading, etc.) and any work impacting public streets, walkways, and rights-of-way.
	6.	**Groundwater Wells** - Being removed or destroyed require separate permit from the **The Alameda County Public Works Agency, Water Resources** (ACPWAWR) (510)670-5480. The ACPWAWR Well Destruction Application can be found at www.acgov.org/pwa/wells/index.shtml Provide copy of ACPWAWR permit to the Fire Department.
	7.	**Underground Service Alert** - Must be contacted at 800-642-2444 prior to the start of any excavation.
	8.	**Subsurface Contamination** - Ensure subsurface is not contaminated prior to beginning work.
	9.	**Site Security**

		If the excavation is to remain open after the contractor leaves the site, the site and/or excavation perimeter shall be fenced 6' high or posted with a 24-hour guard or other means to prevent unauthorized entry.
	10.	**Training** All personnel handling hazardous materials or hazardous waste and working at construction activity sites must be properly trained which may include excavation, shoring, confined space entry, hot work, hazardous waste management, hazardous communication, injury illness prevention, etc.
	11.	**Site Safety Plan** - Must be available on-site prior to the start of any work.
	12.	**Fire Extinguisher during Construction** Provide at least one 40BC-rated portable fire extinguisher onsite and readily accessible within 50 feet of work area for UST Systems. Hot work or spark-producing operations shall not be conducted if UST System previously contained flammable/combustible liquids unless UST System is decontaminated and free of hazardous vapors.
	13.	**Terminate and Lock Out All Electrical Service** - To UST System when necessary prior to starting work.
	14.	**Electrical** ❑ For flammable and combustible liquids, wiring within sumps shall be sealed within intrinsically safe Class I, Division 1 or 2, Group D mechanisms and conduit. ❑ Except for low voltage electrical, the first electrical connection mechanism and conduit inside sumps or under dispenser containment must be explosion proof. ❑ Must have 3 feet of rigid steel conduit outside sumps or under dispenser containment then can connect to PVC conduit. ❑ Electrical must be buried at least 24 inches below ground surface.
	15.	**Contractor's License** Provide copies of contractor's license.
	16.	**Manufacturers Installation Certifications** Provide copies of certifications from manufacturers that install contractors are trained and certified to install their equipment (USTs, piping, sumps, under dispenser containment, and monitoring systems). Install contractors must be re-certified as required by the equipment manufacturers or every 3 years.
	17.	**Certified CA UST System INSTALLER** Effective January 1, 2005, all UST installers must be certified by the International Code Council (ICC) by passing the "UST Installation/Retrofitting" exam. The certification is required to be re-certified every 24 months. Information regarding the ICC exams can be found at http://www.iccsafe.org/certification/ust.html or 866-422-3926.
	18.	**Certified CA UST System SERVICE TECHNICIANS** Effective July 1, 2005, all UST SERVICE TECHNICIANS must be certified by the International Code Council (ICC) by passing the "California UST Service Technician" exam. The certification is required to be re-certified every 24 months. Information regarding the ICC exams can be found at http://www.iccsafe.org/certification/ust.html or 866-422-3926.
	19.	**Certified CA DESIGNATED UST SYSTEM OPERATOR** Effective January 1, 2005, all operating UST facilities must have a "Designated UST Operator". Designated UST Operators must be certified by the International Code Council (ICC) by passing the "California UST System Operator" exam. Information regarding the ICC exams can be found at http://www.iccsafe.org/certification/ust.html or 866-422-3926. UST owner shall: ❑ Submit signed statement that the owner understands and is in compliance with all regulatory and, statutory UST requirements; AND ❑ Submit name of Designated UST System Operator for the site. Designated UST System Operators must conduct monthly visual inspections of the UST systems and may have numerous sites under their responsibility.
	20.	**UST Forms** Complete and submit the attached Unified Program Consolidated Forms for each UST to be

		installed or refer to http://www.unidocs.org/ust.html
	21.	**Scaled Drawing** - showing the location and details of all USTs, piping, monitoring system, sensors, fill pipes, overfill prevention, spill containment, pumps, sumps, anchoring, distances to the property lines, distance from buildings, distance from streets, etc.
	22.	**UST System Setback Distances** USTs and piping shall not be less than 3 feet from any basement wall, pit, cellar or property line.
	23.	**Equipment Specifications** Provide documentation that the equipment is approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use including tanks, piping, pumps, overfill prevention system, over spill containment system, foot valves, swiveling fill pipe adapters, swiveling vapor return pipe adapter, monitoring systems, leak sensors, tank gauges, and other devices. UST tanks and piping must bear appropriate markings. **Sumps and Under Dispenser Containment** Currently there is not an independent third party listing required for piping sumps and under dispenser containment (UDC). However, there are some sumps and UDCs that now carry voluntary independent third party listing. Monitoring equipment must be listed in the CA State Water Resources Control Board LG-113.
	24.	**Flammable or Combustible Product Conveying Piping** All underground piping conveying flammable or combustible liquids must be approved by an independent testing organization (e.g., UL 971 Standard and marked with "UL 971")
	25.	**Aboveground Piping** – for flammable or combustible liquids shall be metal, including the vent piping.
	26.	**Compatibility** Provide certification that materials of construction for USTs, piping, and secondary containment systems are compatible with the stored hazardous substances.
	27.	**Ethanol/Methanol Compatible** Submit certification whether UST Systems (UST, piping, pumps, materials, equipment, adhesives, etc.) can store ethanol or methanol-containing gasoline.
	28.	**Fiberglass Pipe Adhesive** Smith fiberglass piping 8,000-Series adhesive is alcohol compatible. Ameron fiberglass piping B-90 adhesive is alcohol compatible.
	29.	**Sump and Under Dispenser Containment (UDC) Penetration Sealants** ❑ Use sealants provided by the manufacturer for the equipment. ❑ All sump and UDC penetration pipe boots and sealants must be compatible with the hazardous substances being conveyed in the piping in case of a leak. ❑ Bostick is no longer approved as a sump penetration sealant sumps containing piping conveying flammable or combustible liquids. ❑ Polyurethane pipe boots sealants (e.g., Pices, Pellethane, Parasealant 626, etc.) may be more compatible flammable or combustible liquids.
	30.	**Corrosion Protection** USTs and underground piping shall be properly designed, installed and maintained, and protected from corrosion by cathodic protection and/or corrosion-resistant materials. All underground metal parts (including stainless steel) shall be liberally coated with a water sealant (resin, asphalt, etc.)
	31.	**UST Separation Distances** Distances between USTs must meet manufacturer installation guidelines, which is typically at least 1 foot between steel tanks and at least 1.5 feet between fiberglass tanks.
	32.	**UST Fill Locations** Ensure the placement of the USTs and dispensers allow enough room for tank truck fuel deliveries. All delivery tankers drop their fuel from the passenger side of the truck. Optimal

		turning radius of tanker truck is 50 feet.
	33.	**UST Foundation** USTs shall be set on firm foundations and surrounded with at least 6 inches of non-corrosive inert material such as clean sand or gravel well tamped in place or in accordance with manufacturer's installation instructions.
	34.	**UST Slope** All USTs shall be slowed in accordance with manufacturer requirements.
	35.	**Excavation, Shoring and Sloping** – Shall be conducted in accordance with the Site Safety Plan. ❑ Use excavation sloping, benching, sheet pile shoring, or trench jacks. ❑ Any excavation depth greater than 4 feet requires a CAL-OSHA Evacuation Permit prior to worker entering the excavation. ❑ During excavation all exposed soil surfaces shall be kept visibly moist by water spray.
	36.	**Excavation Size** The minimum distance between piping and stable soils and/or shored excavations must meet manufacturer installation guidelines, which is typically at least 6 inches. The minimum distances between adjacent piping in an excavation must meet manufacturer installation guidelines, which is typically at least twice the pipe diameter. The minimum distance from end to end and shell to shell between USTs and stable soils and/or shored excavations are according to manufacturer or as follows: ❑ >18 inches for fiberglass USTs; OR ❑ >6 inches for steel USTs; OR ❑ 1/2 tank diameter for unstable or unshored soils.
	37.	**UST Uplift Protection Exception** Provide a registered engineer's stamped certification that flooding will not occur and that groundwater conditions do not warrant additional engineering to counteract UST buoyancy included with application. As an alternative, provide a registered engineer's stamped certification and buoyancy calculations assuming worst case scenario (each UST is completely submerged in water.)
	38.	**UST Uplift Protection** Provide USTs with uplift protection as required by the manufacturer. If concrete dead mans are poured on-site, they take at least 21 days to cure before the UST can be attached. If deadmen are poured in place, all construction debris must be removed from the excavation.
	39.	**UST Tie-Downs** - Must be constructed of non-corrosive material or coated steel and wider than the strapping and placed where required by the manufacturer. Tie-down cable saddle clamps must be installed so every other one is facing the opposite direction for greater holding strength.
	40.	**UST (Tank) Monitoring** ❑ Double-walled tank with continuous monitoring using continuous vacuum, pressure, or hydrostatic brine monitoring of the double-wall annular space; AND ❑ Any leak shall initiate an audible and visual alarm that can immediately be detected by the UST operator; AND ❑ Secondary containment testing is required upon installation, but is not required every 3 years thereafter. Refer to SWRCB Local Guidance letter 162-1 (LG 162-1) at http://www.swrcb.ca.gov/ust/leak_prevention/lgs/index.html#160 and SWRCB "Summary Table of Underground Storage Tank (UST) Leak Prevention & Enforcement Provisions of Assembly Bill (AB) 2481 & AB 1702" at http://www.swrcb.ca.gov/ust/regulatory/docs/AB2481_AB1702_Revised_Sum_Table_12292003.pdf
	41.	**UST Piping Monitoring**

		If a new UST tank is installed (This DOES NOT apply to any piping upgrades WITHOUT a new UST tank), then all UST piping shall be double-walled with continuous monitoring of the secondary containment using continuous vacuum, pressure, or hydrostatic brine monitoring of the double-wall annular space as follows: ❑ Product conveying piping (continuous vacuum, pressure, or hydrostatic brine); AND ❑ Vent piping; (continuous vacuum, pressure, or hydrostatic brine); AND ❑ Vapor recovery piping; (continuous vacuum, pressure, or hydrostatic brine). ALSO: ❑ Any leak shall initiate an audible and visual alarm that can immediately be detected by the UST operator; AND Refer to SWRCB Local Guidance letter 162-1 (LG 162-1) at http://www.swrcb.ca.gov/ust/leak_prevention/lgs/index.html#160 and SWRCB "Summary Table of Underground Storage Tank (UST) Leak Prevention & Enforcement Provisions of Assembly Bill (AB) 2481 & AB 1702" at http://www.swrcb.ca.gov/ust/regulatory/docs/AB2481_AB1702_Revised_Sum_Table_12292003.pdf
	42.	**UST Sump Monitoring for Piping, Riser, and Manways** If a new UST tank is installed (This DOES NOT apply to any sump upgrades WITHOUT a new UST tank), then the UST sumps shall be continuously monitored by one of the following methods: ❑ Single-walled sump with single walled piping inside sumps (e.g., flex piping, fill piping, all riser piping, etc.). The interior sump space shall be continuously monitored for pipe joint leaks by using continuous vacuum or pressure; OR ❑ Single-walled sump with continuously monitored double-walled piping inside sumps using continuous vacuum, pressure, or hydrostatic brine monitoring of the double-walled piping (e.g., NO single-walled flex connections, fill piping, or riser piping); OR ❑ Double-walled sump continuously monitored by using continuous vacuum, pressure, or hydrostatic brine monitoring of the double-wall. Inside sump piping can be single walled (e.g., flex piping, fill piping, all riser piping, etc.). The internal sump space must have continuous liquid leak sensors for any piping joint leaks. ALSO: ❑ Any sumps must be installed on all UST riser piping and manways (e.g., fill pipes, tank openings, automatic tank gauging, etc.); AND ❑ A leak shall initiate an audible and visual alarm that can immediately be detected by the UST operator; AND ❑ All sumps must have water-tight lids. However, water-tight lids cannot be field tested for tightness (except vacuum space sumps). SWRCB has not approved a third party testing method, so must rely on manufacturer claims. ❑ Sumps must be installed as close as possible to the underside of the concrete pad, so it reduces a pathway for chemicals to enter the backfill. Refer to SWRCB Local Guidance letter 162-1 (LG 162-1) at http://www.swrcb.ca.gov/ust/leak_prevention/lgs/index.html#160 and SWRCB "Summary Table of Underground Storage Tank (UST) Leak Prevention & Enforcement Provisions of Assembly Bill (AB) 2481 & AB 1702" at http://www.swrcb.ca.gov/ust/regulatory/docs/AB2481_AB1702_Revised_Sum_Table_12292003.pdf
	43.	**UST Under Dispenser Containment (UDC) Monitoring** If a new UST tank is installed (This DOES NOT apply to UDC upgrades WITHOUT a new UST tank), then the UDC shall be continuously monitored by one of the following methods:

		❑ Single-walled UDC with continuously monitored double-walled piping inside UDC using continuous vacuum, pressure, or hydrostatic brine monitoring of the double-walled piping (no single-walled flex connections). The double-walled piping must extend all the way to the emergency shutoff impact valve (shear valve) WITHOUT the use of UFC flexible piping (although double wall flex piping may soon be developed). ❑ Double-walled UDC continuously monitored by using continuous vacuum, pressure, or hydrostatic brine monitoring of the double-wall. Inside UDC piping can be single walled (e.g., flex piping, etc.). The internal UDC space must have a continuous liquid leak sensors for any piping joint leaks, fuel filter, or other leaks within the UDC as follows: ❑ Liquid float sensor with audible and visual alarm display and positive shut down; OR ❑ Mechanical float connected to emergency shutoff impact valve (shear valve). ALSO: ❑ Any leak shall initiate an audible and visual alarm that can immediately be detected by the UST operator, except mechanical float shut off; AND ❑ UDCs must be installed as close as possible to the underside of the concrete pad, so it reduces a pathway for chemicals to enter the backfill. Refer to SWRCB Local Guidance letter 162-1 (LG 162-1) at http://www.swrcb.ca.gov/ust/leak_prevention/lgs/index.html#160 and SWRCB "Summary Table of Underground Storage Tank (UST) Leak Prevention & Enforcement Provisions of Assembly Bill (AB) 2481 & AB 1702" at http://www.swrcb.ca.gov/ust/regulatory/docs/AB2481_AB1702_Revised_Sum_Table_12292003.pdf
	44.	**Automatic Line Leak Detectors (LLDs) for Pressurized Piping** ALL pressurized piping must have automatic LLDs approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use. Must, at a minimum, detect release within 1 hour equivalent to 3.0 gph at 10 psi, with ≥95% probability of detection and ≤5% probability of false alarm. There are 2 types of LLDs, mechanical and electronic. LLDs must be tested every year. ❑ Manual Line Leak Detectors (MLLDs): ❑ Must be able to respond to simulated 3.0 gph leak annually; AND ❑ Must be able to restrict liquid flow, but not shut down pump, if it detects a leak. ❑ Electronic Line Leak Detectors (ELLDs): ❑ Normally connected to ATG control panels; AND ❑ Can be programmed to respond to simulated 0.2 gph leak monthly (10,000 pounds of gasoline/year); AND ❑ Can be programmed to respond to simulated 0.1 gph leak annually (5,000 pounds of gasoline/year); AND ❑ Must automatically shut off turbine pump if: ❑ Leak is detected; AND ❑ Any portion of monitoring system is disabled or disconnected; AND ❑ Any portion of monitoring system malfunctions or fails a test.
	45.	**Automatic Line Leak Detector Certification for Pressurized Piping** After testing, Certification must be submitted to the Fire Department and should show: ❑ Date of certification; AND ❑ Software version installed; AND ❑ Manufacturer, model, and serial numbers; AND ❑ Audible and visual alarms were operational, and if printable, a copy attached; and ❑ If alarms are relayed to remote monitoring station, must show all communications equipment (e.g. modem) were operational; AND ❑ Monitoring system set-up has proper settings, and if printable, a copy attached; and ❑ Testing apparatus properly calibrated; AND ❑ All equipment manufacturer's maintenance checklist are completed and attached; and

		❑ All LLDs were operational and accurate within regulatory requirements; AND ❑ If deficiencies were found, how and when they would be corrected; AND ❑ Certification signed by technician, and their certification/license number documented (company's name and certification/license number found in LG105).
	46.	**Piping** – All piping shall be installed in accordance with manufacturer's requirements.
	47.	**Piping Slopes** - Product, fill, vent, and vapor piping shall be sloped toward the UST with minimum ¼ inch slope per 1 foot of run.
	48.	**Vents** – Shall have at least 1.25-inch internal diameter and be sized to prevent excessive back pressure on the UST. This is different for manifold piping systems.
	49.	**Vent Outlets** ❑ Shall be located not less than 5 feet from building openings nor within 5 feet of a property line and 12 feet above the adjacent ground level and 2 feet above roofs or structural elements; AND ❑ Vent pipes outlets shall be approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use; AND ❑ Vent pipes shall be protected to minimize the possibility of blockage from weather, dirt, bird nests, or insect nests.
	50.	**Fill Pipe and Vapor Return Pipes** – Must be ❑ Sealed with a vapor-tight cap approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use; AND ❑ Equipped with swiveling-type adapters to reduce stress during fuel deliveries equipment is approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use; AND ❑ Labeled with name of hazardous substance stored in UST or "Vapor Return Pipe".
	51.	**Spill Prevention Containers** Each UST fill pipe opening must be equipped with spill prevention container for hose disconnect leakage: ❑ Minimum 5 gallon capacity; AND ❑ Approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use; AND ❑ Equipped with drain valve and secondarily contained pipe to allow spilled hazardous substances to be drained directly into the primary UST through the fill pipe; and ❑ If spill container does not have drain valve owner or operator will have to provide another way to keep spill container empty; AND ❑ If metal, the exterior wall shall have galvanic corrosion protection.
	52.	**Overfill Prevention Equipment** Each UST fill pipe opening must be equipped with fill tube positive shut-off flapper valve that: ❑ Provides 100% positive shut-off of flow to UST when UST is no more than 95% full; AND ❑ Provides 100% positive shut-off of flow to UST so that none of fittings located on top of UST are exposed to product due to overfilling; AND ❑ Equipment is approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use; AND ❑ Approved by Bay Area Air Quality Management District. Exception - USTs may be exempted from this requirement provided that: ❑ UST fill opening is located in observable area; AND ❑ Spill container is adequate to collect any overfill; AND ❑ UST system is filled by transfers ≤25 gallons at one time. Example – Used oil UST
	53.	**Dispenser Location** ❑ ≥10 feet from property line; AND ❑ ≥20 feet from fixed ignition source; AND ❑ ≥10 feet from combustible exterior walls; OR ❑ ≥10 feet from <1-hour rated non-combustible exterior walls.
	54.	**Dispenser Protection** - ❑ Dispensers shall be mounted on concrete islands ≥6 inches in height; AND ❑ Guard posts a minimum of 2 concrete filled steel posts, 6" in diameter, having a minimum 3 feet deep footing not less than 15" in diameter, and projecting above the grade a minimum of 3 feet and be located not less than 4 feet nor more than 5 feet from fuel dispensers or point-of-sale devices; AND

		❑ Allow for disabled people to access dispenser. (Government Code, Title 1, Ch. 7, Div. 5, Sec. 4450; and Fire Department Policy)
	55.	**Dispenser Hoses and Nozzles** ❑ Approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use; AND ❑ Hose length shall be ≤18 feet; AND ❑ When fully extended, hoses will be ≥5 feet from building openings; AND ❑ Hoses shall not be crimped or collapsed; AND ❑ Hoses shall be equipped with emergency breakaway devices located between hose nozzle and hose-retrieval mechanism point-of-attachment; AND ❑ Hoses shall be equipped with automatic-closing-type nozzle with integral latch-open; AND ❑ Nozzles shall be liquid tight.
	56.	**Dispenser Keys** – Must be maintained onsite.
	57.	**Dispenser Emergency Shutoff Impact Valve** (Shear Valve) ❑ Each pressurized motor vehicle fuel supply pipe within each dispenser shall be equipped with emergency shutoff impact valve incorporating fusible link designed to close automatically in event of severe impact or fire exposure; AND ❑ Emergency shutoff impact valve shall be approved by an independent testing organization (e.g., UL Listing, etc.) for its particular use.
	58.	**Dispenser Emergency Fuel Shutdown Devices** - Must: ❑ Shut down fuel pumps; AND ❑ Located between 20-100 feet from dispensers; AND ❑ Labeled "Emergency Fuel Shutdown Device"; AND ❑ Visible from all dispensing locations; AND ❑ Allow disabled people to access shutdown device. (Government Code, Title 1, Ch. 7, Div. 5, Sec. 4450; and Fire Department Policy)
	59.	**Unsupervised Dispensing of Motor Vehicle Fuels** - is allowed if: ❑ Owner or operator visits the business daily; AND ❑ Owner or operator conducts regular inspections and maintenance; AND ❑ Dispensers are programmed to only initially dispense ≤25 gallons at any one time; AND ❑ Provide fire alarm transmitting device; AND ❑ Provide non-coin operated phone; AND ❑ Post instruction for safe dispensing operations; AND ❑ Post telephone number of owner or operator; AND ❑ Post a sign that states: ❑ In Case of Fire, Spill, or Release; AND ❑ Use emergency pump shutoff; AND ❑ Report the accident; AND ❑ Fire Department Telephone – 911; AND ❑ Facility Address.
	60.	**Portable Fire Extinguishers** Motor vehicle fuel dispensers, fill-pipes, or turbine pumps shall have: ❑ At least one charged 2-A, 40-B:C portable fire extinguisher; AND ❑ Serviced within last 12 months; AND ❑ Hung ≤75 feet away; AND ❑ Labeled "Fire Extinguisher" or "Fire Extinguisher Inside; AND ❑ Visible from all dispensing, fill-pipe, and turbine pump locations.
	61.	**Signs** Motor vehicle dispensers shall have signs posted prohibiting: ❑ Smoking near dispensers; and ❑ Running vehicle engines during dispensing; and ❑ Dispensing into NON-Approved containers.
	62.	**UST Pre-Installation Testing Witnessed by Hazardous Materials Inspector** Prior to being placed in the excavation: ❑ All steel clad or fiberglass wrapped steel USTs will be holiday tested with 35,000 volts and low amps. Ground out after test; AND ❑ All NON-Steel USTs will be pressurized and soap tested; AND

		❑ Do not pressure test secondary containment tank directly. The primary tank should be pressurized first and then gradually vent/bleed the air into the secondary containment tank. Conduct all pressure testing with dual glycerin-filled gauges; AND ❑ If UST is damaged, it can only be repaired by the tank manufacturer.
	63.	**UST Enhanced Leak Detection (ELD) Testing Witnessed by Hazardous Materials Inspector** ❑ Effective July 1, 2003, if a new UST tank is installed (This DOES NOT apply to piping, sump, dispenser, and monitoring system upgrades without new UST tanks.), then after it is backfilled and the concrete is poured and prior to being put into service, the new UST system must be tested with Enhanced Leak Detection (ELD). ❑ UST operating permit will not be issued until the UST passes the ELD testing. ❑ UST secondary containment system must be tested separately using hydrostatic, pressure, or vacuum methods. ELD testing is to determine if there is a leak from the primary UST containment system into the backfill from sumps, fill piping, vent piping, vapor piping, and other riser connections to the tank. ELD testing is able to detect a leak at a 0.005 gallons liquid gasoline/hour. This equates to ~300 pounds liquid gasoline/year leaking from 0.0004 inch diameter hole, or ~15 pounds of liquid gasoline/year leaking as a vapor. Tracer Tight ELD detector is calibrated to part per trillion (ppt) concentration. Soap testing is only able to detect a leak at 0.1 gallon/hour. A 0.1 gallon/hour liquid leak equals ~6,000 pounds of liquid gasoline/year. Currently, Praxair Services, Inc. (800-394-9929) is the only company approved by the CA State Water Resources Control Board to perform the ELD testing with their proprietary ingredient (Tracer Tight ELD). Contractors performing the Tracer test must possess a California Testers License, be Tracer Certified, and have a designated onsite supervisor. Tracer test can be conducted with or without petroleum-derived fuels in the UST, but may not work in USTs containing other hazardous substances. According to Dr. Randy Golding of Praxair, Tracers are very volatile molecule and soluble in gasoline, but only slightly soluble in water (1-5,000 ppm). Tracer molecule is slightly larger than gasoline, so if the Tracer leaks, then a proportionate amount of gasoline is also leaking. Tracer vapors are biologically stable and safe for the environment. The test takes at least 10 days to complete and obtain the lab analyses. There are 2 types of Tracer sampling systems: ❑ The first type of sampling system is installed when the new UST tanks are installed and consists of a network of slotted pipe installed horizontally next to the UST tank and the associated piping. ❑ The second type of sampling system is installed after the new UST tank is installed, backfilled and concrete is poured. It requires drilling through the concrete around the UST system and installing at least 7 vapor extraction wells or one-time hydro-punch soil extraction wells. Also an ELD Pre-Test can be conducted before concrete is poured. UST installers may want to helium leak test the UST system before backfilling and conducting the ELD test. Helium testing has limitations due to equipment, saturation, and the natural occurrence in the atmosphere. The standard helium tester will detect to 100 ppm, while a more expensive tester will detect to 1 ppm. Natural atmospheric helium concentrations are approximately 5 ppm. Teflon-lined materials and flexible piping have a particularly high permeation rate for helium. Helium is slightly less 50% the size of gasoline molecule. Refer to SWRCB Local Guidance letter 161-2 (LG 161-2) and 162-1at http://www.swrcb.ca.gov/ust/leak_prevention/lgs/index.html#160
	64.	**UST Leak Testing Witnessed by Hazardous Materials Inspector** ❑ After installation, but prior to back filling, pneumatically test primary and secondary tanks according to manufacturer's specification. ❑ If not specified, test at 3- 5 psig for 30 minutes or perform a vacuum test for 30 minutes by soap testing all tank connections at the beginning and ending of the test time period. ❑ For fiberglass USTs, do not pressure test secondary containment tank directly. The

		primary tank should be pressurized first and then gradually vent/bleed the air into the secondary containment tank. ❑ Conduct all pressure testing with dual glycerin-filled gauges.
	65.	❑ Pipe Leak Testing Witnessed by **Hazardous Materials Inspector** ❑ After installation, but prior to backfilling, primary and secondary piping conveying flammable or combustible liquid; before being covered, enclosed or placed in use; shall be hydrostatically tested to 150 percent of the maximum anticipated of the system, or pneumatically tested to 110 percent of the maximum anticipated pressure of the system, but not less than 5 psig at the highest point of the system. ❑ There shall not be any leakage or permanent distortion for a minimum of 30 minutes. ❑ Care shall be exercised to ensure that these pressures are not applied to vented USTs. ❑ Such USTs shall be tested independently from the piping. This test shall include primary and secondary piping. ❑ Conduct all pressure testing with dual glycerin-filled gauges. ❑ Ameron primary and secondary piping is one unit, so secondary can be accidentally glued shut. Install glycerin-filled pressure gauges at dispenser and sump to ensure both read the same pressure.
	66.	**Sump Leak Testing Witnessed by Hazardous Materials Inspector** –
	67.	**Fill Bucket Leak Testing Witnessed by Hazardous Materials Inspector** –
	68.	**UST Monitoring System Testing Witnessed by Hazardous Materials Inspector** ❑ After installation, but prior to being put in service, demonstrate the operation of the UST Monitoring System and high level alarm system. ❑ Monitoring system must be protected from its surrounding environment. ❑ The system must be within sight and hearing distance of on-site personnel 24-hours each day or remotely monitored. ❑ The system must be hard-wired to a dedicated circuit.
	69.	**UST Dispenser Emergency Shut-Off Testing Witnessed by Hazardous Materials Inspector** After installation, demonstrate the operation of the emergency electrical shut-off of the dispenser
	70.	**Leak Sensor Location** – Must be positioned at the bottom of the lowest secondary containment point and accessible for inspection and testing.
	71.	**Concrete Cover** ❑ USTs and associated piping shall be protected by at least 3 feet of earth cover, or 18 inches of well-tamped earth plus 6 inches of reinforced concrete. ❑ The reinforced concrete paving shall extend at least 1 foot horizontally beyond the outline of the UST in all directions. ❑ Ensure piping near the USTs is buried under concrete slab. ❑ Concrete around man ways and openings must slope at least 1 inch/foot of run for proper storm water drainage.
	72.	**Bedding and Backfill** For fiberglass USTs: ❑ Pea gravel should be between 1/8 inch to ¾ inch in size. ❑ Crushed rock should be between 1/8 inch to ½ inch in size. Minimum bedding in a dry excavation should be: ❑ >12 inches under the USTs. ❑ >6 inches under the piping When USTs are installed in fine granular soils or high water tables it is required that a filter fiber liner be placed in the excavation to prevent backfill migration. The critical area for backfilling is the lower ¼ of the tank.

		For fiberglass USTs, the burial depth of the UST measured from the top of the tank to finish grade is based on manufacturer's requirements or maximum of 7 feet. Document tank vertical deflection measurements before and after backfilling.
	73.	**UST Owner vs Operator** Submit written agreement between the UST owner and the UST operator if different individuals.
	74.	**UST Financial Assurance** Submit UST Certification of Financial Responsibility forms for USTs storing motor vehicle fuels. Forms can be obtained from the Fire Department or refer to www.swrcb.ca.gov/cwphome/ustcf/fundhome.htm.
	75.	**Monitoring/Response Plan** Submit new or revised UST Monitoring and Response Plan forms. Forms can be obtained from the Fire Department or refer to www.unidocs.org Include the "Secondary Containment Leak Testing..." requirements discussed above.
	76.	**Hazardous Materials Management/Business Plan** Submit revised forms including "Business Owner/Operator Identification" form, "Business Activities" form, site map, and chemical inventories of UST(s). Chemical inventories can be entered electronically and the forms can be obtained from the Fire Department or refer to www.unidocs.org.
	77.	**Annual Business Fees** - will be re-assessed after installation is finaled. If new business, notify the Finance Management Office (510-238-3704) to obtain a business license.
	78.	**As-Builts** ❑ Submit copy of "AS BUILT" plans and drawings that accurately show final locations of all USTs, piping, dispensers, and any changes of materials and equipment used in the final construction; AND ❑ Submit manufacturer tank and piping checklists; AND ❑ Submit field tank and piping integrity testing results.
	79.	**Record Keeping for UST Owner and Operator** After the final Fire Department inspection, submit following documents to UST Owner: ❑ "AS BUILT" plans and drawings. ❑ Manufacturer tank and piping checklists; AND ❑ Warranties; AND ❑ Monitoring equipment calibration and maintenance records must be maintained on-site for at least 3 years; AND ❑ Manufacturers recommended maintenance schedules and written performance claims must be maintained on-site for at least 5 years; AND ❑ Cathodic Protection records must be maintained on-site at least 6.5 years.
	80.	End...