

Aboveground Storage Tank Operator Handbook

Second Edition



January 2003



*Alaska Department of
Environmental Conservation*

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Oil spills are ugly, costly and can damage our health and the environment. In Alaska, thousands of gallons of oil and oil products are spilled every year at Aboveground Storage Tank (AST) facilities. Most of these spills are caused by operator error, poor operation practices and inadequate maintenance. In order to reduce the number and size of spills at these facilities, operators should be trained in facility operations and maintenance, safety, spill preparedness, spill response, reporting, clean-up and government requirements.

This handbook is designed for AST operators and should be used as a guidebook as well as a reference manual.

In this handbook you will find:

- Facilities = Tank Farms
- Step by step procedures for maintaining and inspecting AST facilities, preventing oil spills, taking safety precautions, preparing for and responding to oil spills.
- Checklists for easy reference to inspect AST facilities, transfer fuel, prepare for and respond to spills.
- An explanation of government requirements relating to AST facilities.
- References and contacts for further information on AST facilities

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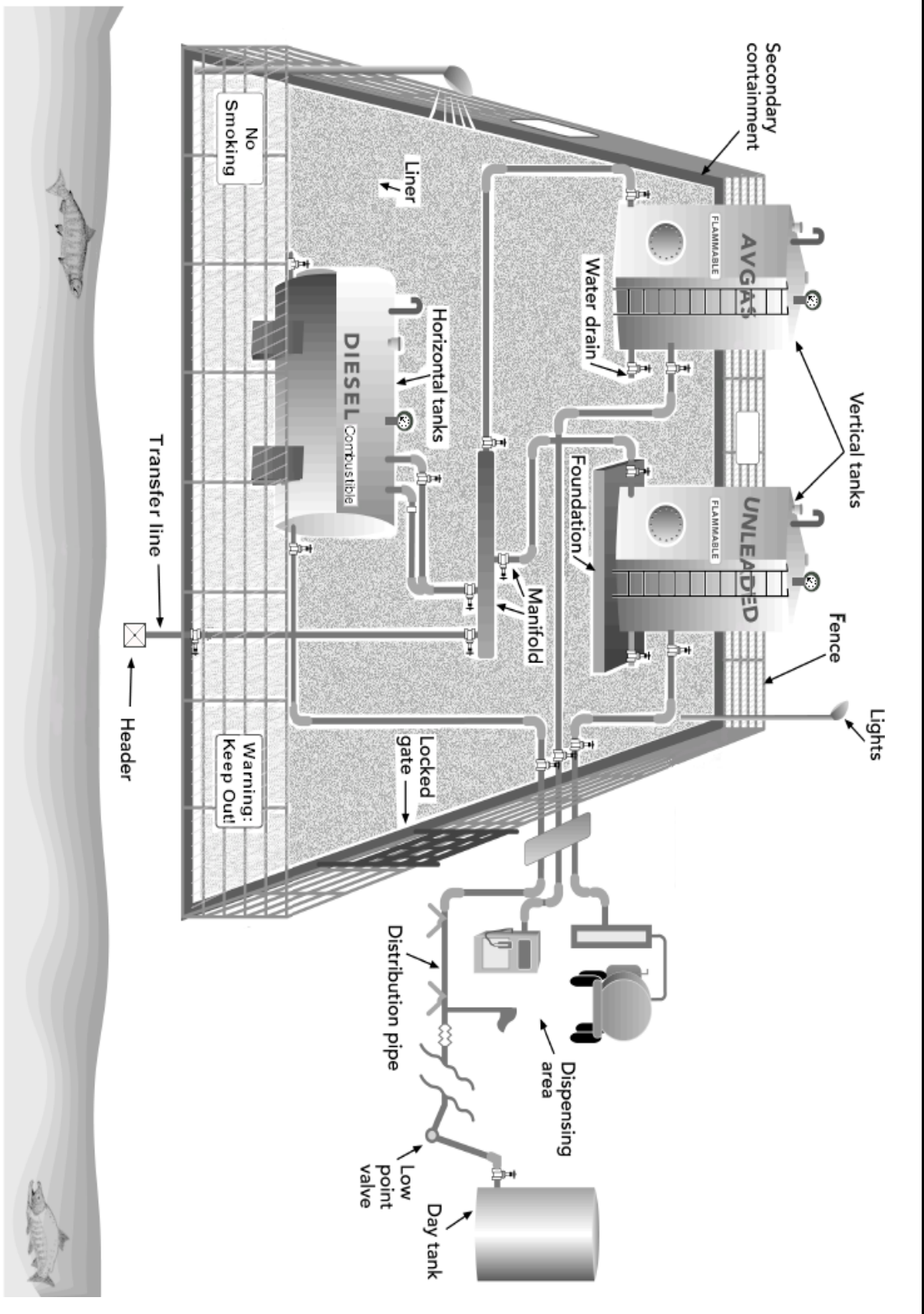
SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

ABOVEGROUND STORAGE TANK FACILITIES

An Aboveground Storage Tank (AST) Facility or tank farm consists of tanks (including day tanks), piping, secondary containment and ancillary equipment. These facilities are used to store fuel that will be dispensed at the site, delivered elsewhere, or transferred to other locations such as day tanks. This manual is directed toward AST facilities that are regulated by the Environmental Protection Agency (EPA) but not necessarily by the Alaska Department of Environmental Conservation (ADEC). EPA regulates facilities that have a storage capacity of 1,320 gallons or more and ADEC regulates facilities with a storage capacity of 420,000 gallons or more.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

ABOVEGROUND STORAGE TANK FACILITIES

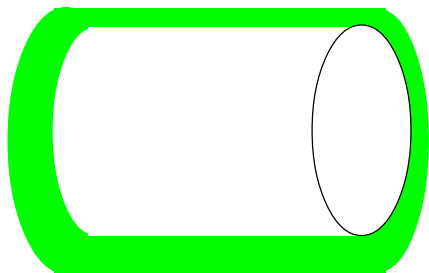


SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

ABOVEGROUND STORAGE TANKS

Aboveground Storage Tanks

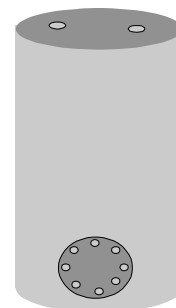
- Aboveground Storage Tanks (ASTs) come in many different sizes.
- Most ASTs have cylindrical sides or shells and flat tops and bottoms. They are set vertically (on end) or horizontally (on sides).
- Most ASTs are constructed out of steel. Older tanks have riveted or bolted seams and newer tanks are welded.
- Fuel storage tanks must be vented so fumes can escape, reducing the potential for ruptures and collapses.
- ASTs should have cathodic protection, such as sacrificial anodes, to reduce corrosion.
- To reduce the chances for corrosion, tanks should be placed on a pad, foundation or supports rather than directly on the ground.
- Tanks should be painted with a light color and rust free.
- Tanks should be labeled as to contents, size, last internal inspection, safe gauge height and year built.
- Tanks must be have overfill protection, this would be direct vision gauges, high liquid level alarms , flow restrictions or high liquid level shut-off devices.
- See Appendix A for additional technical information.



Double-walled AST



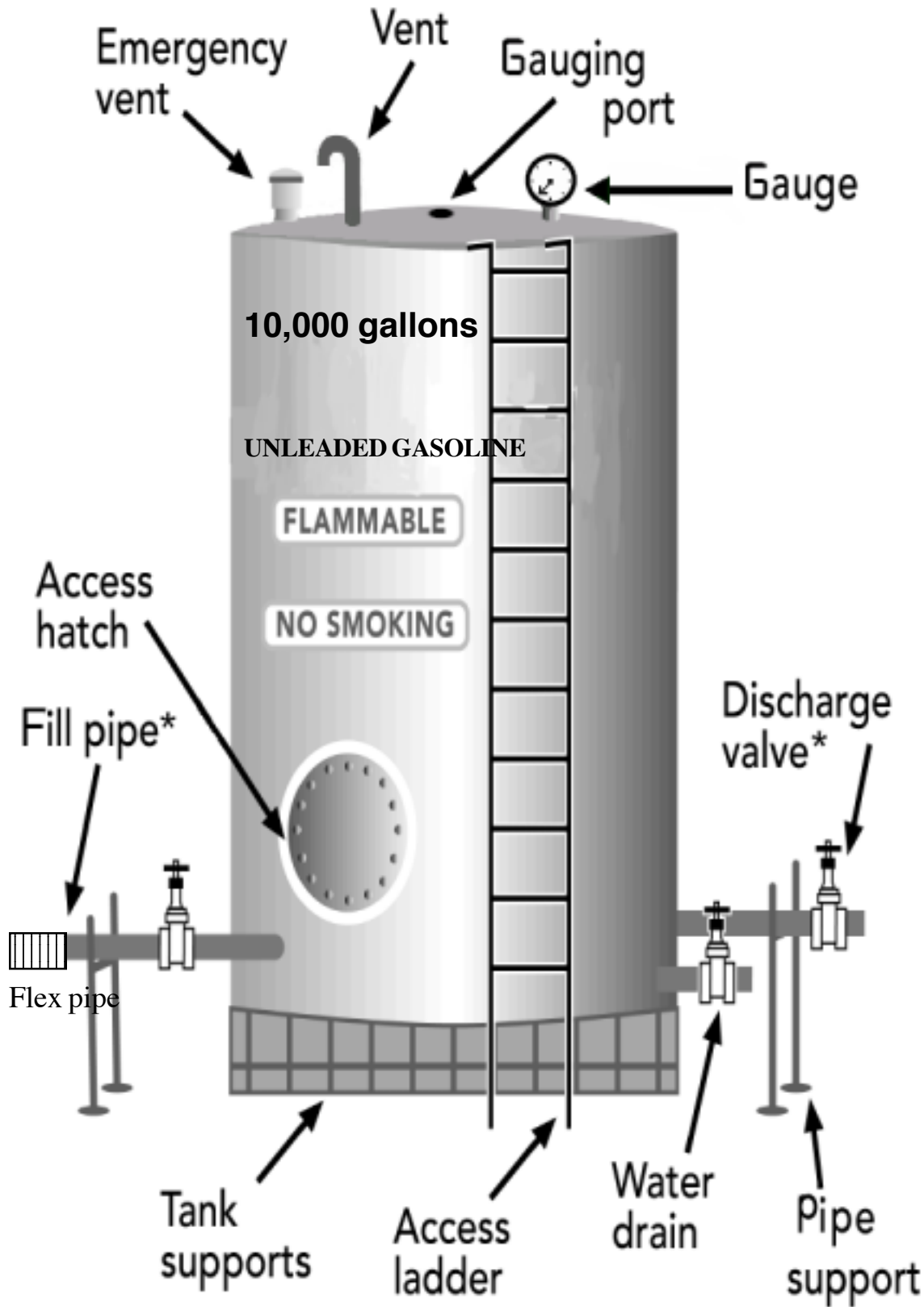
Horizontal AST



Vertical AST

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

Aboveground Storage Tanks - common features



ABOVEGROUND STORAGE TANKS

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST FACILITY PIPING

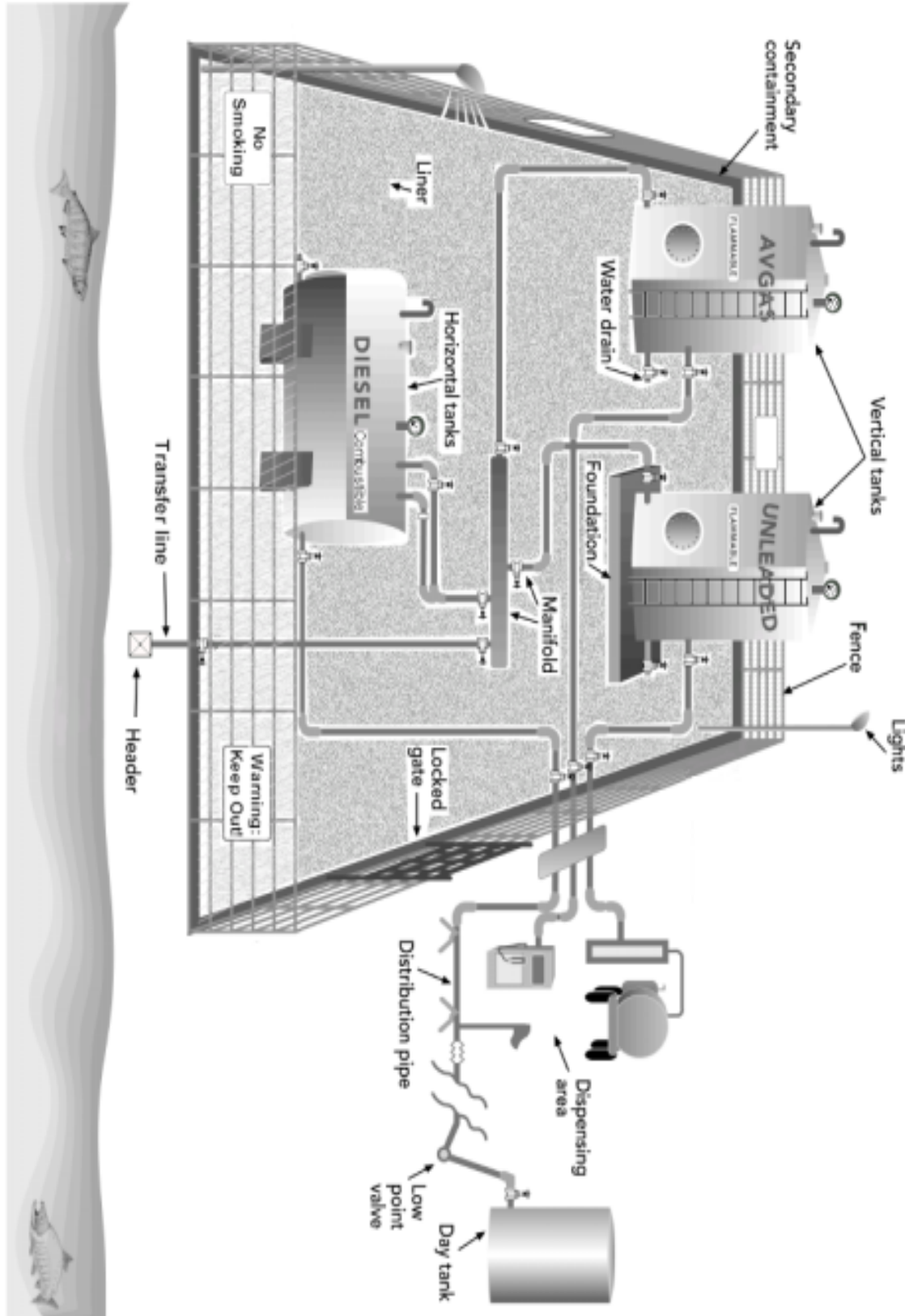
AST Facility Piping

Piping is used to transfer fuel from the delivery source, such as barges or trucks to the ASTs at the facility (*transfer or fill piping*), between tanks and dispensing pump (*manifold piping*), and from facility tanks to other associated tanks and other sources (*distribution piping*). Following is some basic information regarding facility piping:

- Pipes should be constructed out of steel and joints welded.
- Pipes are buried or aboveground. Aboveground piping should be supported up off the ground and protected from moving vehicles such as trucks and snowmobiles as well as falling snow and ice. Buried pipes must be wrapped or coated for corrosion protection.
- Valves control the flow of oil between tanks and other tanks, delivery barges and other sources. The most common type of valves are ball valves and gate valves.
- Using a single common transfer pipeline for different products is a common practice.
- The U.S. Coast Guard requires that transfer piping must be hydrostatically tested annually. Water should be used for this test at 1.5 times the allowable pressure. Since this is not always practical, product or air is often used. If product or air is used, the owner/operator must request (in writing) permission from the Captain of the Port.
- Appendix A contains additional technical information.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Piping



AST FACILITY PIPING

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

SECONDARY CONTAINMENT

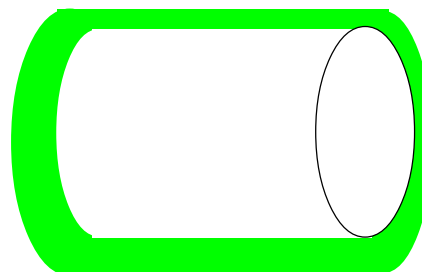
Secondary Containment

The purpose of secondary containment is to prevent petroleum products from flowing onto the land or into the water should there be a spill at an AST facility. Spill containment measures, including secondary containment are required by the Environmental Protection Agency (EPA) at AST facilities as well as in areas of fuel transfer from tank trucks. Secondary containment:

- Must be large, high and strong enough to hold the contents of the largest tank plus 10% for local precipitation.
- Must be constructed or lined with material that will hold petroleum products and prevent them from seeping into the ground.
- The liner should be covered with sand or gravel to prevent ripping and to provide protection from the weather.
- Double walled aboveground storage tanks are not required to be located within a secondary containment area provided they have a high liquid level alarm, and a flow restrictor or automatic shut off device
- References for additional technical information can be found in Appendix A.



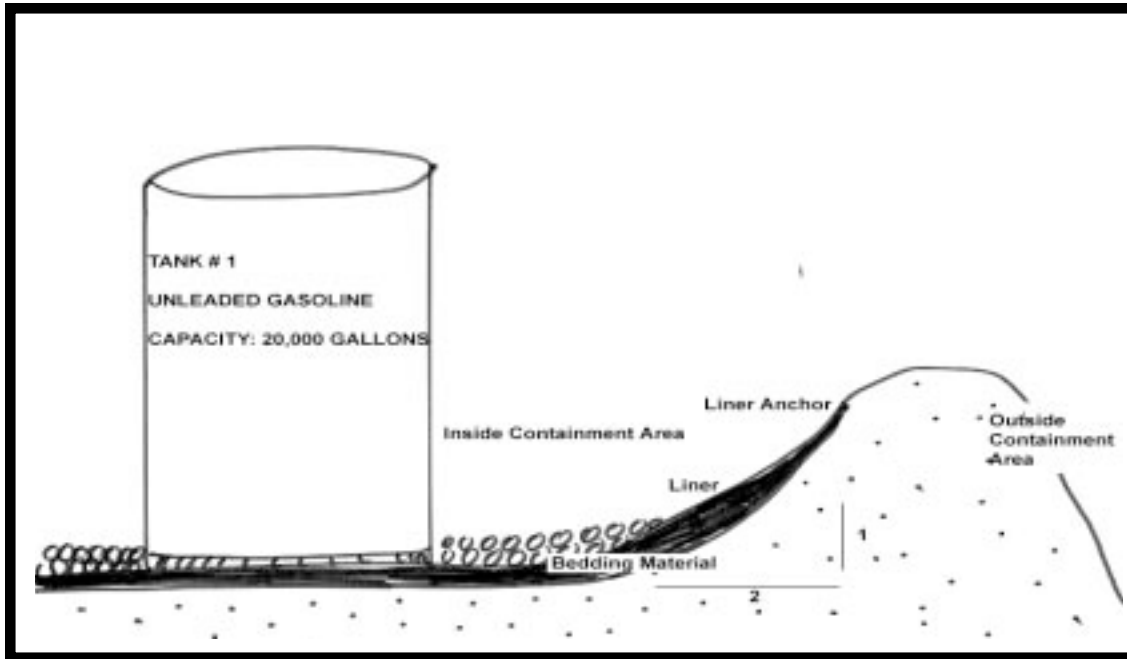
Self-diked tank



Double-walled tank

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

Secondary Containment



SECONDARY CONTAINMENT

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

ANCILLARY EQUIPMENT

ANCILLARY EQUIPMENT

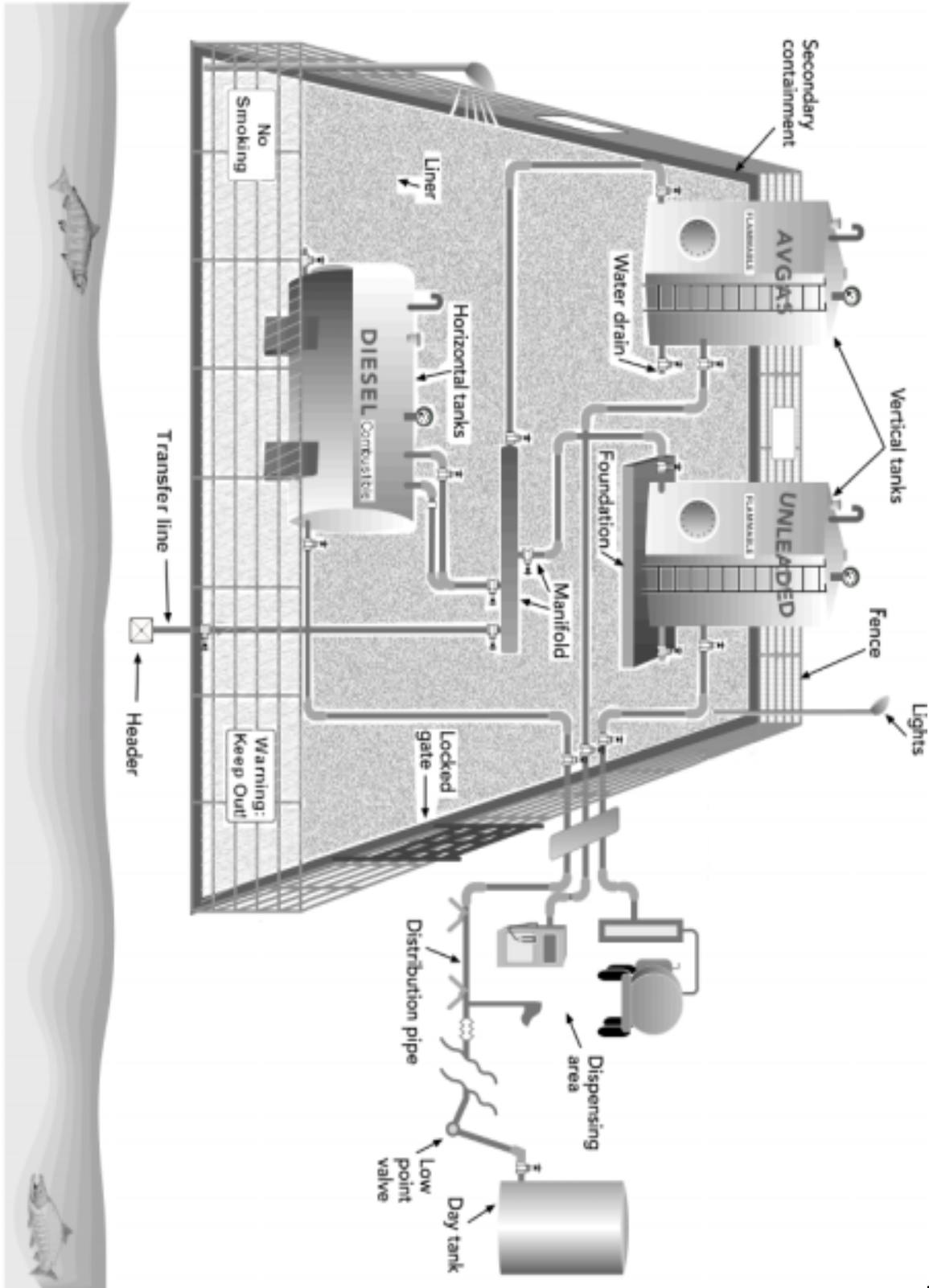
Aside from the major components of an Aboveground Storage Tank Facility, additional items and equipment are required. Following is a list of ancillary equipment:

- **Fencing:** AST facilities must have fences and gates that can be locked. The purpose of the fence is to keep unauthorized people, vandals and animals out.
- **Lighting:** AST facilities must have sufficient lighting to prevent vandalism and help detect spills at night.
- **Signs:** “No-smoking” signs must be posted around the facility so they can be seen from every side of the tank farm. Also “Danger”, “Warning” or “Authorized Personnel Only” signs must be posted to warn unauthorized individuals from entering the facility.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

ANCILLARY EQUIPMENT

ANCILLARY EQUIPMENT



SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

SPILL PREVENTION

Spill Prevention

There are many reasons for preventing oil from spilling or leaking onto the ground and into the waters of the state. Some basic reasons for preventing oil spills are:

- Reduces potential for health problems
- Reduces risks to the environment
- Saves money from lost product, fines and clean-up costs
- Saves reputations

Every drop of oil spilled has an impact on the environment and costs money. This is clearly demonstrated in the following table.

OIL LOSS BY DRIPS AND DROPS

RATE	GAL./YEAR	Cost @ \$2.00/gal	CONTAMINATED SOIL (tons)	CONTAMINATED SOIL (Cubic yards)
1 drop/10 second	40	\$80.00	150 tons	270 yd ³
1 drop/5 seconds	80	\$160.00	300 tons	540 yd ³
1 drop/second	410	\$820.00	1,500 tons	2,700 yd ³
3 drops/second	1,200	\$2,400.00	4,500 tons	8,100 yd ³
Stream - breaks into drips	8,600	\$17,200.00	32,000 tons	57,600 yd ³

1 drop = 11/64 inch diameter 1.8 tons per cubic yard

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE**Causes of Oil Spills at AST Facilities**

Spills and leaks happen at Aboveground Storage Tank (AST) facilities for several reasons. Some causes are:

Operator error

- Tanks overfilled
- Valves left open
- Poor transfer procedures
- Lack of product monitoring
- Potential problems not recognized
- Poor maintenance practices

Poorly designed or improperly installed facilities

- Inadequate security – vehicular traffic, children or vandals restricted area
- Facility located in flood zone or avalanche zone or any other area where natural disasters are likely to happen
- Falling snow and ice from tanks onto piping

Storage Tank Problems

- Tank design and construction
- Inadequate foundation or tanks setting directly on the ground
- Tank bottom and seams rusted, shell pitted, weeping or leaking
- Improper venting

CAUSES OF OIL SPILLS AT AST FACILITIES

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

CAUSES OF OIL SPILLS AT AST FACILITIES

Causes of Oil Spills at AST Facilities (continued)

Facility Piping Problems

- Piping installed without considering traffic area
- Threaded joints rather than welded
- Inadequate pipe support – sagging pipe is prone to cracking (threaded joints are particularly vulnerable)
- Valves not in good working order or corroded
- Pipe lying directly on ground – easily damaged
- Piping leaking or rusted from acidic soil
- No flex piping
- Pipes not hydrostatically tested annually

Secondary Containment Problems

- No dikes or secondary containment around tank farm
- Inadequate secondary containment – should be able to hold contents of largest tank plus 10% for local precipitation
- Containment unable to hold spilled product
- Holes or low areas in dikes
- Water pooled in secondary containment area
- Holes and rips in liners

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE**Prevention Measures**

Spill Prevention Measures - Oil spills at AST facilities can be prevented. Following are some basic prevention measures:

- *Note: “There is no such thing as a leak too small to fix”*
- *Train employees in correct operating procedures and spill prevention, preparedness and response*
- *Absolutely no alcohol or drugs at the facility*
- Adopt a product inventory program and reconcile product and inventory data on a regular basis
- Establish and adhere to regular maintenance schedules
- Conduct routine standardized inspections, record findings and take follow-up corrective actions
- Plan and design facility to industry standards (Appendix A)
- Take pride and responsibility in your AST facility

PREVENTION MEASURES

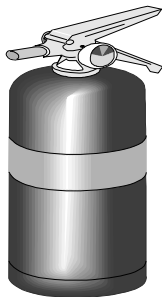
SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Maintenance

Routine inspections and maintenance are the two most important factors in preventing oil spills and leaks at AST facilities. Inspections are covered on pages 17-25.

General AST Facility maintenance should include the following:

1. **Good house keeping:** It is essential that the entire AST facility be kept clean and free of unnecessary items. An AST facility is designed to store petroleum products so only items that are directly related to the operation of the facility should be stored there.



2. **Safety:** Fire extinguishers must be kept pressurize and should be shaken every month. All other safety equipment must be in good working order.

3. **Security:** Any holes in fence, locks on gates and burned out light bulbs should be repaired or replaced as soon as the deficiency is noted.



4. **Aboveground Storage Tanks:** Keep ASTs in sound condition.
 - a. **Follow manufacturer instructions or industry standards** for maintaining vents, overfill devices, gauges, corrosion protection, water drains and other items associated with tanks.
 - b. **Keep tanks painted in a light color** to minimize fuel expansion and to reduce corrosion and tank disintegration.
 - c. **Repair tanks** as soon as problems are noted.
 - d. Make sure **signs** on tanks are visible and legible.
5. **Facility piping:** Piping must be maintained in sound condition.
 - a. Follow manufacturer instructions or industry standards for maintaining valves and corrosion protection devices.

AST FACILITY MAINTENANCE

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Maintenance (continued)

- b. **Change filters** on a regular basis using set procedures.
 - c. **Hydrostatically test transfer piping** yearly. Use water and hold it at 1.5 times the normal operating pressure. If using water is not feasible, approval from the U.S. Coast Guard to use product or air is required.
 - d. **Rewrap or repaint pipes** when coating, wrapping or paint is wearing through or chipping .
 - e. **Repair or replace valves and/or pipes** as soon as possible after problems are noted.
 - f. **Replace threaded pipe** with welded pipe whenever possible.
 - g. **Protect piping** from traffic as much as possible
6. **Secondary Containment:** Keep the secondary containment area clear of debris, unnecessary items, snow, ice and standing water.
- a. **Remove snow**, taking care not to tear the liner. If shoveling the entire area isn't feasible, keep area around piping clean.
 - b. **Remove water**, if a sheen is visible, put water through a fuel-water separator, not directly into the environment.
 - c. **Remove vegetation**, keep weeds, willows and trees out of secondary containment area.
 - d. **If tears in liner are noticed, repair** them as soon as possible.
7. **Spill Preparedness and Response:** Keep response equipment accessible and in good working condition.
- a. If **emergency pumps and/or skimmers** are kept at the site, start them up at least once a month.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

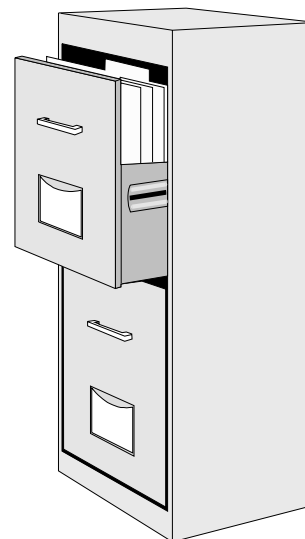
AST FACILITY MAINTENANCE

AST Facility Maintenance (continued)

b. **Response equipment and material** must be kept readily available, easy to get at and in good condition.

8. **Record Keeping** - Records of all activities pertaining to the facility should be kept on location, these include but are not limited to:

- Copies of Inspections
 - Operator inspections
 - Government Inspections
- Maintenance Records
 - Any major work done at the facility
 - Hydrostatic test results
 - As-built facility plans
- Operator training reports
- Reports of Oil Spills at the Facility
 - Where the spill occurred
 - When the spill occurred
 - Amount spilled
 - Clean up procedures used
- Fuel Inventory Records
- Government required documents, including:
 - Spill Prevention Control and Countermeasure (SPCC) Plans (EPA)
 - Facility Response Plans (EPA, USCG)
 - Letter of Intent to Operate (USCG)
 - Operation Manual (USCG)
 - Declaration of Inspection (USCG)
 - Spill Notification Placard (ADEC)



SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Inspections

An aboveground storage tank (AST) facility inspection is one of the best means of preventing oil spills from occurring and minimizing the size of a spill should one occur. Inspections should be conducted on a regular basis in a standardized fashion. At manned facilities, informal inspections should be done on a daily basis (noting overall facility condition) when the operator walks through to open and close the facility. A more formal and thorough inspection should be completed monthly.



Inspectors: Must be knowledgeable of facility components, operations, spill prevention, preparedness and response and government requirements.

How to Conduct Inspections: When conducting the more formal and thorough inspection, the inspector should use the following protocol:

- Use a checklist to make sure all important areas are covered. *An AST Facility Inspection Form, which may be copied for your use,* is included on pages 26-27. This form may be revised to meet the needs of individual AST facilities.
- Complete the inspection form, writing down findings and conditions and be sure to initial, date and sign the form where indicated.
- Follow up on findings
 - Fix deficiencies
 - Report significant problems to management

The inspection: Following is a detailed description of what to look for in routine, monthly AST facility inspections:

1. **Housekeeping:** Is the AST facility clean and clear of unnecessary items? It is important to keep facilities clean and free of unnecessary items because clutter would hinder clean-up in the event of a leak or spill; large items such as drums, lumber and other objects can break pipes, dent tanks and provide homes for unwanted animals. Poor

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

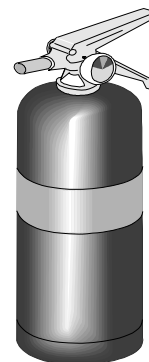
AST FACILITY INSPECTIONS

AST Facility Inspections (continued)

housekeeping is a sign of negligence and shows a lack of concern for the facility.

2. **Safety:** Is all safety equipment in place and all safety precautions followed? Safety at AST facilities is of utmost importance and can save lives, prevent injury and protect property and the environment.

- a. **Fire extinguishers:** There should be an adequate number of fire extinguishers in logical, appropriate locations. Fire extinguishers must be the proper type for the product stored. Extinguishers should be maintained in top notch condition, meaning they should be pressure charged and workable. OSHA requires them to be inspected monthly for charge. (Note: OSHA requires all facility operators to be trained on using them). It is a good idea to shake the extinguishers when conducting the monthly inspection. Prominent signs showing location of fire extinguishers should be posted.



- b. **No Smoking Signs:** “No Smoking Permitted” signs should be posted in strategic locations at facilities.

- c. **Danger and Warning Signs:** Individuals entering tank farms should be warned of potential dangers. Signs advertising this should be posted in visible locations.



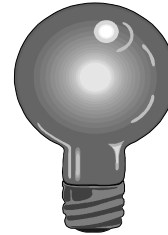
3. **Security:** AST facility owners and operators should employ sound security measures to prevent vandals, unwanted individuals and animals from entering the tank farm. Aside from damage unwanted individuals can cause, there are liability issues to think about.

- a. **Fencing:** Is there a fence around the facility? The fence must be intact and the gates must be locked when unattended.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

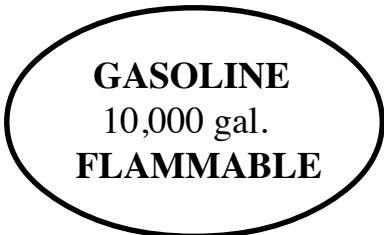
AST Facility Inspections (continued)

- b. Lighting:* Does the facility have a lighting system? Lighting is important so workers can see their way around the facility and to keep intruders out. Lights should provide adequate illumination and be in good working order.



- 4. Storage Tanks:** Aboveground storage tanks are the most important component of an AST facility. They should be maintained in good condition. This applies to all tanks, including “day tanks” as well as major storage tanks.

- a. Soundness:* Are there any visible leaks or drips from the tanks? Are there stains on the ground around the tank base? Check seams and welds and around bottom and shell seams. All leaks must be stopped and repairs made.
- b. Corrosion Protection:* Are there any signs of rust? Again, look around tank welds, shell seams, and bottom to side seams. If using sacrificial metals, make sure there is sufficient metal left. If using impressed current, make sure the proper amount of electricity is flowing.



- c. Tank Signs:* Each tanks should be labeled with the name or product stored (diesel or gasoline, etc.) and storage capacity (in gal lons). Also whether it is a flammable or combustible product.
- d. Vents:* Check to make sure vents are clear and that there is no debris or snow plugging them.
- e. Paint:* Paint protects the tank from exposure to the elements and reduces corrosion. Check for peeling, blistering or chipping.

AST FACILITY INSPECTIONS

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST FACILITY INSPECTIONS

AST Facility Inspections (continued)

- f. Foundation:* Is the foundation in good condition? If beams are used, are they cracked or rotten? If other materials are used to support the tanks, check for corrosion where the tank meets its foundation.
- g. Gauges and overflow devices:* Check to make sure gauges are working and test overflow alarms and shut-off devices.
- 5. Piping and Hoses:** Many leaks in tank farms come from piping; therefore it is important to maintain piping in good working condition.
 - a. Soundness:* Are there any drips, leaks or visible stains around the pipes or hoses? Look around valves, filters and connections.
 - b. Corrosion Protection:* Are there signs of rust on the piping? Look around valves, connections and fittings. If using sacrificial metals make sure there is sufficient metal and if using impressed current, make sure the proper amount of current is flowing.
 - c. Support:* Are pipe supports adequate and in good condition? Check for sagging and cracking pipes due to insufficient support and rusting or rotting pipe supports.
 - d. Nozzles:* Are there any signs of rust or leaks from the nozzles? Can they be turned on and off to completely stop product flow?
 - e. Valves:* Are there any signs of leaks from the valves? Can the valves be turned on and off completely to stop product flow? Are the valves protected from tampering, locked and secure?
 - f. Protection:* Are pipes protected from falling ice and snow, vehicles and foot traffic?
 - g. Coating, wrapping and paint:* If the pipes are coated, wrapped or painted, check for wear and tear and chipping.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Inspections (continued)

6. **Secondary Containment:** The purpose of secondary containment is to hold any product should there be a spill. It is important that this area be of sufficient size and have the ability to hold spilled oil.
- a. **Size:** Is the secondary containment area large enough to hold the capacity of the largest tank plus 10% for local precipitation?
 - b. **Clear of water, snow, ice and vegetation:** Is the secondary containment clear of standing water, snow and ice? If water or ice is in the containment area, there could be runover if a tank failed. Snow could hide leaked or spilled product and vegetation could hamper clean-up.
 - c. **Liner Soundness:** Is the secondary containment area lined with a synthetic liner? Is the liner in good condition or are there any rips, tears or nonessential holes in it? If the liner is not sound, it will not hold spilled product. (Note: If the liner is holding rainwater, it is probably is in good condition and needs to be drained.)
7. **Spill Prevention and Response:** It is important to be prepared should a spill occur. Quick response can reduce the amount of oil spilled, thus reducing health and environmental damage and saving money.
- a. **Response Plan:** Does the facility have a response plan and is it located at the facility? Each facility must have plans to deal with emergencies and all the facility operators and workers should be familiar with them.
 - b. **Response Equipment:** Is response equipment located at the site and is it in good working order? Do operators know how to use it? A minimum amount of oil spill response equipment should be located in specified areas of the facility and operators should know where it is and how to use it.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Inspections (continued)

AST FACILITY INSPECTIONS

8. Government Requirements: Various state and federal agencies have requirements pertaining to AST facilities. Owners and operators should be familiar with regulations that apply to their facilities.



a. The Alaska Department of Environmental Conservation: (ADEC) requires that a discharge notification placard provided by or approved by the department be displayed in conspicuous locations. These placards include ADEC phone numbers and where to report spills. When inspecting the facility make sure signs are posted.

b. The United State Environmental Protection Agency: (EPA) requires AST facilities to have Spill Prevention Control and Countermeasure (SPCC) plans and Facility Response Plans (FRP.) The plans contain specific information, certified by a registered Professional Engineer (SPCC) and must be signed by facility management, indicating acceptance and implementation. When inspecting the facility, check to see if a current copy of the plan is located there.



c. United States Coast Guard: The (USCG) requires facilities that receive oil from barges submit a Letter of Intent to Operate”, an “Operations Manual” and a “Facility Response Plan”. When conducting the facility inspection, check for copies of these documents. Also the USCG requires safety equipment, such as fire extinguishers “Smoking Prohibited Signs” and response equipment and material, be located at the facility.

9. Other: During the inspection, list any other abnormalities or deficiencies noticed. Save inspection reports and correct problems as soon as possible.



SECTION 1 - FACILITY OPERATIONS & MAINTENANCE**AST Facility Inspections (continued)****Internal Tank Inspections:**

Aside from the routine facility inspections, it is a good practice to inspect the inside of ASTs on a regular basis. The American Petroleum Institute has a standard (API 653) which is designed for certified inspectors to follow for comprehensive AST inspections. Facility operators are not expected to conduct such rigorous inspections. However, with training and certification for **“HAZWOPER”** and **“Entering Confined Spaces”**, operators can conduct cursory internal inspections. For these inspections, tanks should be emptied and cleaned and the inside examined for holes and corrosion. For practical purposes these inspections should be conducted every ten years unless there is evidence of leaks or other reasons why the operator believes an internal inspection is necessary. *Only trained and experienced persons should conduct internal inspections. Under no circumstances should anyone else enter the tanks.*

AST FACILITY INSPECTIONS

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Inspection Form

Facility Name:						
Inspector:					Date:	
No.	Item	Good	Fair	Poor	Comments	Initials
1	Housekeeping (facility clean, free of unnecessary items)					
2	Safety					
2a	Fire extinguishers adequate, accessible and charged					
2b	No Smoking Signs: posted and visible					
2c	Danger & Warning Signs: posted & visible					
3	Security					
3a	Fencing: fencing intact, gates locked					
3b	Lighting: adequate, lights functioning properly					
4	Aboveground Tanks - bulk fuel & day tanks					
4a	Soundness: no visible leaks, weeping or drips along seams or tank bottoms					
4b	Corrosion Protection: sacrificial metals sufficient, impressed currents functioning, signs of rust or corrosion					
4c	Tank Signs: product stored, storage capacity and fire hazard rating					
4d	Vents: clear,					
4e	Paint: no peeling, cracking or bleeding					
4f	Foundation: solid, no cracks or rotting					
4g	Gauges & Overfill devices: gauges working & test overfill alarms and automatic shutoff					
5	Piping & Hoses					
5a	Soundness: no visible leaks, drips or cracks especially at supports, joints, elbows and fittings.					

AST FACILITY INSPECTIONS

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

AST Facility Inspection Form

Facility Name:						
Inspector:				Date:		
No.	Item	Good	Fair	Poor	Comments	Initials
5b	Corrosion Protection: rust or corrosion, sacrificial anodes, impressed current					
5c	Support: adequate					
5d	Nozzles: no visible leaks and in good working condition					
5e	Valves: no visible leaks and in good working condition					
5f	Protection: from falling snow and ice & traffic					
5g	Coating, Wrapping and Paint: wear, tear, chipping					
6	Secondary Containment					
6a	Size: sufficient to hold contents of largest tank + 10%					
6b	Clear: no standing water, snow, ice buildup or vegetation					
6c	Liner Soundness: free of rips, tears and non-essential penetrations					
7	Spill Prevention & Response:					
7a	Response Plan: located at facility					
7b	Response equipment: Adequate, located at site and in good working order					
8	Government Requirements					
8a	(ADEC): spill notification placard mounted conspicuously					
8b	USEPA: Current, SPCC Plan onsite					
8c	USCG: Letter of intent to operate, Operations Manual and Response Plan					
9	Other					

AST FACILITY INSPECTIONS

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

TRANSFER PROCEDURES

Transfer Procedures

Transfer procedures are to be used when transferring fuel from a barge to a (AST) facility, from one tank to another or from a tank to a vehicle or something else. Spills often occur during transfers, especially if procedures aren't clear and followed. Although some transfer procedures are unique to each facility, there are some general procedures that should be followed.

1. Before beginning a transfer:

- a. **Check the fuel level** of the receiving tank to determine how much product it can take. It is important to determine a **SAFE GAUGE HEIGHT (SGH)**, that is, how much fuel the tank can safely hold, allowing for expansion due to temperature variations. (Rule of thumb, in summer months, the SGH is not over 90% and in winter the SGH is not more that 95% of the tank's total capacity.) In order to determine the SGH one must know the tank's storage capacity and how to properly gauge a tank. These topics are discussed in the inventory control part of this section.
- b. **Walk the pipeline or hose line** to check for visible leaks, cracks or damage in the line. Put drip pans under hose connections and under any drips or leaks along the transfer system.
- c. **Check valve position** at the manifold and at the tank. Make sure valves that should be closed are closed and valves that should be open are open. It is important to make sure valves are in the proper position so that product will only go to the targeted tank.



- d. **Have a pre-transfer meeting** with the barge operators and facility operators. The USCG requires this meeting and for the parties to go over and sign a **DECLARATION OF INSPECTION (DOI)**. Procedures that will

be used during the transfer are included in the DOI. An example DOI is included in this section.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE**Transfer Procedures (continued)**

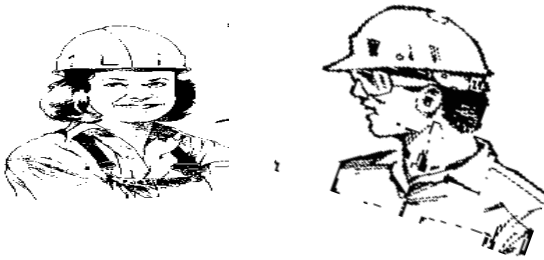
- e. Determine how much fuel is above the receiving pipe inside the tank.* If there is less than one foot of fuel above the receiving pipe, transfer fuel at a reduced rate until at least a foot of product is covering the pipe. This will reduce the potential for explosions caused by static electricity when fuel is pumped into the tank at a high rate.
2. **During the transfer:**
- a. Begin the transfer at a reduced rate* until you are sure that the product is being pumped into the correct tank and there are no major problems.
- b. DO NOT WALK AWAY DURING A TRANSFER.* Make sure an operator is at the site during the entire transfer. Several spills have occurred at AST facilities because the operator did not follow this rule. Since transfers occur at various rates, depending on equipment, operators must be patient.
- c. At all times, keep communications open* between the barge operators and facility operators. Use intrinsically safe hand held radios for communication.
- d. Check tank levels* at regular intervals.
- e. Reduce transfer rates* when nearing the SGH to avoid overfilling the tanks.
- f. Notify the barge tankerman when the transfer procedure is almost complete.* That way, the barge pumps can be shut down before shore facilities are. If tank valves are closed first, high pressure in the lines may cause a “hydraulic hammer” to occur, which could cause a spill to happen.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

Transfer Procedures (continued)

3. When transfer is complete:

- a. *Close the correct valves* at the manifold and tank.
- b. *Conduct a post-transfer meeting* between the barge and facility operators and sign off on the DOI.



- c. *Dip tanks*: Wait 6 - 24 hours then dip the tanks and check for water level at bottom of tanks. The reason for waiting to dip the tanks is so the fuel will have a chance to settle down. The reading will be more accurate.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE**Transfer Procedure Checklist****BEFORE THE TRANSFER BEGINS**

- Determine the Safe Gauge Height (SGH) and check product level in receiving tanks
- Walk pipeline, checking for damage or drips
- Put drip pans under hose connections and drips
- Check valve positions
- Meet with barge operator and go over DOI

DURING TRANSFER

- Begin transfer at reduced rate
- Remain at side during entire transfer and walk the transfer line
- Keep communications between operators on the barge and at the facility; use a hand-held radio or similar device
- Let barge operator know when transfer is almost complete
- Reduce transfer rate before completing transfer
- Turn off barge pumps before closing tank valves

AFTER TRANSFER

- Make sure valves are closed
- Meet with barge operator and sign off on the DOI
- Wait 6 -24 hours then dip tanks and check for water at bottom of tanks

TRANSFER PROCEDURE CHECKLIST

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

DECLARATION OF INSPECTION FORM

DECLARATION OF INSPECTION FORM

DATE	TIME	LOCATION	
RECEIVING UNIT			
DELIVERING UNIT			
Federal regulations require the following inspections and activities to be executed by the person in charge (PIC) of a fuel transfer.			
	Deliverer	Receiver	
1. RED WARNING SIGNS AND SIGNALS must be displayed and visible from all points around the vessel. At night, when transferring at anchor the red light will not be displayed.			
2. FIRES, FLAMES, SMOKING, AND MATCHES , if permitted, must be managed so vapors do not reach cargo. Smoking areas must be designated, inspected and safe.			
3. Repair Work - in the way of any cargo spaces must be approved by the PIC.			
4. VESSELS COMING AND/OR REMAINING ALONGSIDE must have the approval of the PICs during transfers.			
5. THE MOORING must ensure safety of the vessel and transfer device through all conditions of tide and weather.			
6. THE TRANSFER DEVICE must, when connected, be under no strain with the vessel the limits of its moor, be properly supported, be blanked when not used, and be connected to fixed piping or equipped with an automatic back pressure shutoff nozzle.			
7. THE TRANSFER SYSTEMS must be aligned to permit the flow of fuel and closed or blanked off when not in use.			
8. THE OVERBOARD DISCHARGES/SEA SUCTIONS must be closed, lashed, and sealed during the transfer.			
9. SCUPPERS AND DRAINS must be mechanically closed			
10. THE CONNECTIONS must be leak free, except packing glands providing the leakage does not exceed containment.			
11. DISCHARGE CONTAINMENT must be available or deployed, if applicable and drip pans or drain nubs will be placed appropriately.			
12. MONITORING DEVICES must be in place and operable.			
13. COMMUNICATIONS must be maintained throughout the transfer.			
14. THE EMERGENCY SHUTDOWN must be tested and operable prior to starting the transfer.			
15. THE PICS of both units must be at the transfer site, immediately available to oil transfer personnel, have readily available operations or procedures manuals and conduct the operations in a manner consistent with the documents.			

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

DECLARATION OF INSPECTION FORM

DECLARATION OF INSPECTION FORM

		Deliverer		Receiver	
16. SUFFICIENT PERSONNEL must be on duty and conduct the operation as instructed in the operations manual or transfer procedures.					
17. LANGUAGE USED must be common to both PICs or an interpret, who is fluent in both languages, available at the transfer site.					
18. AGREEMENT TO BEGIN TRANSFER must be reached by the PICs and both of them must sign both DOIs prior to beginning the transfer.					
19. LIGHTING must be available between sunset and sunrise.					
20. PRE-TRANSFER CONFERENCE must take place prior to the transfer and include discussion of:					
a.	The products to be transferred				
b.	Sequence of transfer operations				
c.	Name, title, location of persons taking part in the transfer				
d.	Critical details of each system				
e.	Critical stages of transfer operation				
f.	Federal, state and local regulations that apply to transfer				
g.	Emergency procedures for each system				
h.	Discharge containment procedures				
i.	Discharge reporting procedures				
j.	Watch and shift change arrangements				
k.	Transfer shutdown procedures				
PRODUCT TRANSFER SEQUENCE					
	PRODUCT	QUANTITY		PSI	
First					
Second					
Third					
	SIGNATURE	TITLE		TIME/DATE	
Delivering PIC					
Receiving PIC's					
SIGNATURES UPON COMPLETION OF TRANSFER OPERATION					
Delivering PIC					
Receiving PIC					

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

TRANSFER PROCEDURES

Transfer Procedures (continued)

When transferring fuel from an aircraft to a tank, from a tank to a truck or from one tank to another the same basic procedures used to transfer fuel from a barge to a tank farm are followed. That includes,

- Dip the receiving tank or tanker truck before beginning the transfer.
- Check all fittings and hose connections, putting drip pans or absorbent pads at hose connections.
- Use grounding cable when appropriate.
- Begin the transfer at a reduced rate.
- Stay at the site during the entire transfer.
- Measure the receiving tank when the transfer is complete.

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

Inventory Control

Safe Gauge Height - (SGH) Once the tank's storage capacity has been determined, the SGH should be determined and stenciled on the tank, usually near the gauging port.

- In summer the SGH is usually 90% of the tanks total storage capacity. This allows room for expansion due to heat and space for fuel that is blown through the lines when clearing them.
- In winter the SGH is usually 95% of the tanks total storage capacity to allow for fuel that is blown through the lines when clearing them as well as some room for expansion.
- Tanks should not be filled over the SGH

Tank Gauging -Gauging product levels in the tank is critical for keeping accurate material inventory.

- Each tank should be equipped with a roof mounted gauge hatch which should be vapor tight
- Manual gauge readings are taken using a tape and plumb bob.
 - Use dark tapes to measure clear liquids such diesel and light colored tapes to measure heavy fuels and crude oil.
 - Before taking measurements, check the tape for cracks and make sure printing is legible
 - Be sure to ground the tape before dropping the plumb bob into the tank and drop the plumb bob in slowly.
 - Always dip the tank until you get the same reading twice.
 - When dipping the tank, check the water level at the bottom of the tank.

INVENTORY CONTROL

SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

INVENTORY CONTROL

Inventory Control

Inventory control is important to make sure you are not losing any fuel from leaks in the system, to make sure you are getting the fuel you are purchasing and to make sure your customers are getting the fuel they purchase. Inventory figures that do not reconcile indicate a problem somewhere in the system. In large facilities inventory data is recorded daily and reconciled monthly. In smaller facilities this isn't practical but inventory data should be recorded and reconciled on a very regular basis. Always check tank levels before filling a tank to prevent overflow.

In order to monitor product inventory, you must know the storage capacity of your tanks and how many gallons per inch the tank can hold. When a tank is purchased from a manufacturer, you will be told the storage capacity. However, often the storage capacity of older tanks is not known so must be calculated. Following are the formulas for determining the storage capacity of storage tanks and an example of determining the capacity, using the formulas shown.

Calculating volume and storage capacities

r = radius (ft)

D = Diameter

H = Height (ft)

C = Circumference (ft)

A = Area or Base (ft²)

V = Volume (ft³)

ft = feet

ft² = square feet

ft³ = cubic

pi (π) = 3.14

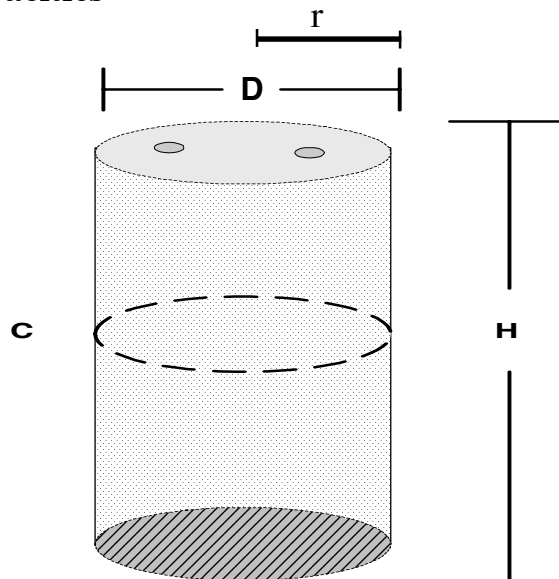
$$r = \frac{C}{2\pi}$$

$$A = \pi r^2$$

$$V = H \times A$$

Tank Capacity = Tank Volume x gallons/per ft³

Conversion factor: There are 7.48 gal /ft³



SECTION 1 - FACILITY OPERATIONS & MAINTENANCE

Inventory Control

Example: You have an AST and want to determine the **storage capacity** as well as how many gallons of **fuel per inch** the tank can hold.

First you measure the circumference (C) and the height (H) and find that;
 $C = 42 \text{ ft}$ and $H = 12 \text{ ft}$

Next determine the radius (r): $\frac{C}{2\pi}$ or $\frac{42 \text{ ft}}{2 \times 3.14} = 6.68 \text{ ft}$

Next find the base area (A): $A = \pi r^2$ or $3.14 \times (6.68 \text{ ft})^2 = 140.4 \text{ ft}^2$

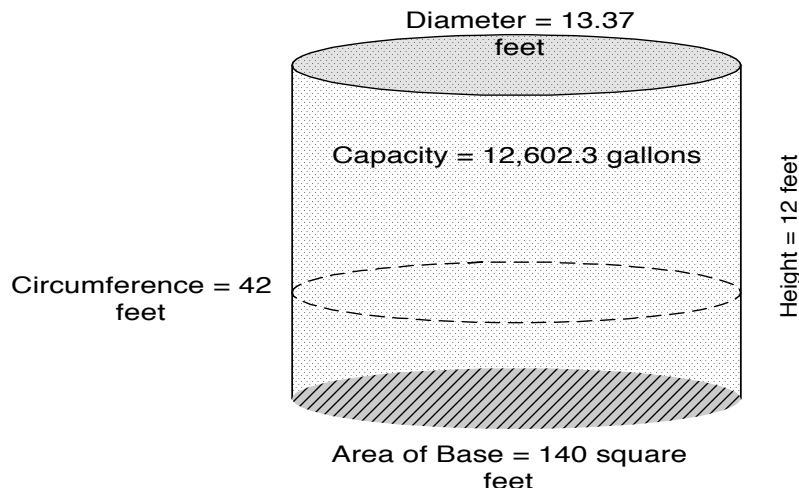
Next find the tank volume (V): $V = A \times H$ or $140.4 \text{ ft}^2 \times 12 \text{ ft} = 1684.8 \text{ ft}^3$

Now convert cubic feet to gallons:

$V \times \frac{\text{gal}}{\text{ft}^3}$ or $1684.8 \text{ ft}^3 \times \frac{7.48 \text{ gal}}{\text{ft}^3} = 12,602.3 \text{ gal.}$

Next find the gallons per foot = $\frac{\text{Capacity}}{H}$ or $\frac{12602.3 \text{ gal}}{12 \text{ ft}} = 1,050 \text{ gal/ft}$

Finally find the gallons per inch: $\frac{\text{Gallons/ft}}{12 \text{ in/ft}}$ or $\frac{1050 \text{ gal/ft}}{12 \text{ in/ft}} = 87.5 \text{ gal/in}$



INVENTORY CONTROL

SECTION TWO

SAFETY

SECTION TWO - SAFETY

SECTION 2 - SAFETY

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SECTION 2 - SAFETY

SAFETY

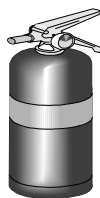
AST facilities have several potential hazards. Operators should know what safety measures to take to prevent accidents and injuries from these hazards. Examples of hazards and safety measures follow.

1. Fire and Explosions – petroleum products are flammable and some are explosive.



a. Fire protection

- **Design and build facilities** with safety in mind and in compliance with applicable fire and building codes. Facility plans should be reviewed and approved by the State Fire Marshal.



- Make sure **fire extinguishers** are the proper type and located in strategic places. Keep them in good working order and pressurized. Operators must be trained with their proper use.

- **No Smoking at AST facilities.** Post signs stating this rule.

- **No open flames** at AST facilities.

- **Do not store nonessential items and material** such as empty gas cans, jerry jugs, rags and other items that are can start or spread fires at the facility.

b. Material Safety Data Sheets (MSDS) for each product stored at the facility should be kept at the site. Examples of MSDSs are in Appendix B.

2. General Facility Safety

a. Clearly spell out operating and safety procedures.

b. Maintain open communication within facility and with local

SECTION 2 - SAFETY

emergency services.

b. **Maintain safety equipment in good working order.**

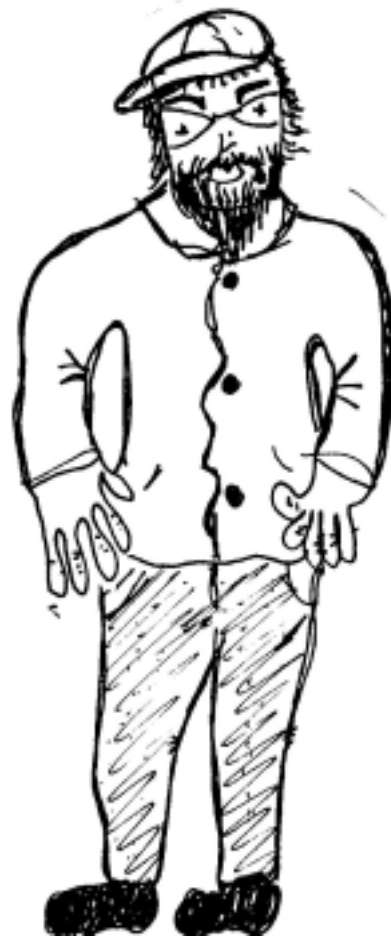
- Tank overflow protection and warning devices
- Emergency shut off switches
- Shut off valves

c. **Label each tank** with contents and storage capacity.

d. Do not permit **unauthorized people** i

3. **Personal Safety**

- Wear **safety-toed boots**
- Wear **eye protection** when appropriate
- Wear **gloves** when working in cold temperatures.
- **Keep walkways and stairs** free of **ice and debris** to avoid trips and falls
- **Do not enter storage tanks** unless you have had proper training



SAFETY

SECTION 2 - SAFETY

SAFETY

4. First Aid - quick response to accidents can save lives and prevent serious injuries therefore it is a good idea for AST operators to have basic first aid training.

a. First aid training should include basic emergency response and cardiopulmonary resuscitation (CPR).

b. Some basic first aid response for fuel related incidents include:

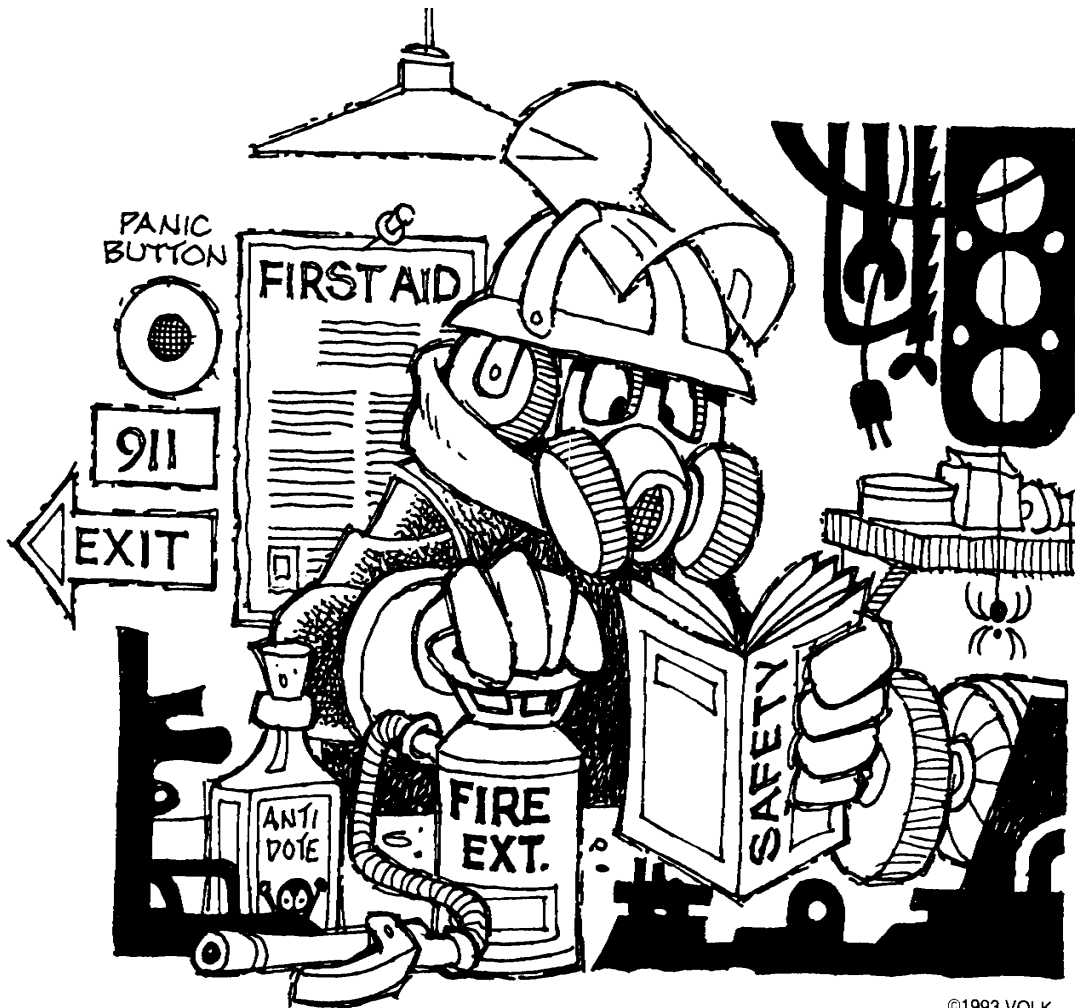
- Vapor inhalation - move to fresh air
- Skin contact with fuel - remove affected clothing and wash skin
- Eye contact with fuel - flush with water
- Ingestion of fuel- do not induce vomiting
- MSDSs for gasoline and diesel are in Appendix B.



SECTION 2 - SAFETY

**SAFETY
FIRST**

**KEEP THIS AREA
SAFE AND CLEAN**



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SAFETY

SECTION THREE

SPILL

PREPAREDNESS

SECTION THREE - SPILL PREPAREDNESS

SECTION 3 - SPILL PREPAREDNESS

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SECTION 3 - SPILL PREPAREDNESS

Facility Analysis and Inspection

Review your facility to identify areas and activities most likely to have a spill. Specific aspects of your facility to note include:

- amount and type of product stored,
- normal patterns of fuel usage (distribution, transfer, etc.),
- direction spilled oil would flow and,
- sensitive areas to protect in case of spill.



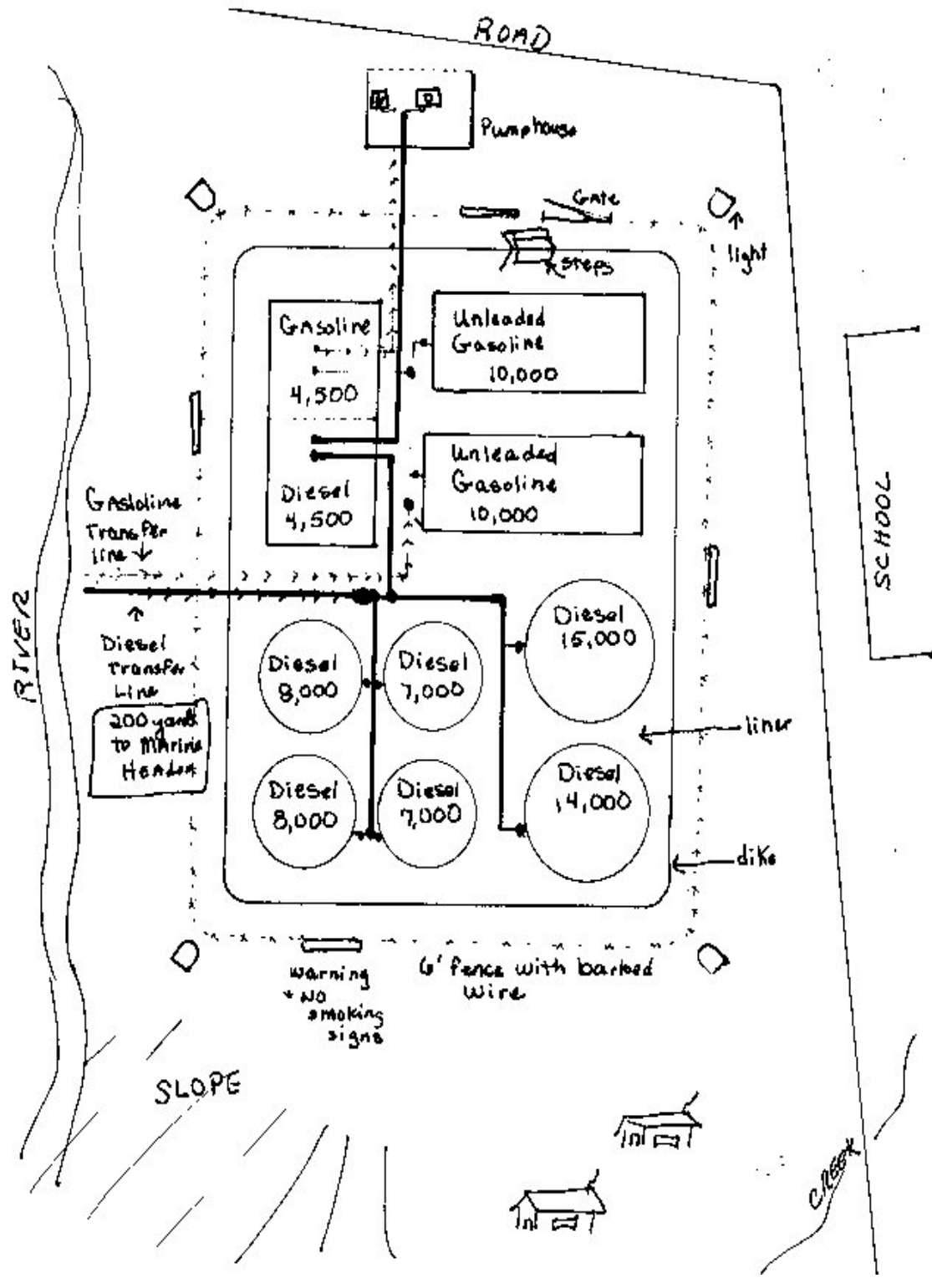
Make a labeled diagram identifying high-risk locations and areas where activities take place. The diagram should include but is not limited to (see diagram on next page):

- all tanks (bulk storage and day tanks)
- piping, including valves and headers,
- secondary containment,
- buildings, fences, lights
- dispensing
- environmentally sensitive areas

FACILITY ANALYSIS AND INSPECTION

SECTION 3 - SPILL PREPAREDNESS

Facility Analysis and Inspection



FACILITY ANALYSIS AND INSPECTION

SECTION 3 - SPILL PREPAREDNESS

SPILL RESPONSE EQUIPMENT AND MATERIALS

Spill Response Equipment and Materials

Your facility review will help you to prepare for spills. The size, location and type of spill (i.e. to land or water) that could occur at your facility will determine response materials and equipment to have on hand as well as spill response training necessary to respond to a spill.

Following are examples of materials to have on hand and measures to take to reduce the impact in the event that a spill should occur. Spill response materials and equipment should be placed in secure, yet readily accessible locations near potential spill areas.

<u>Spill type</u>	<u>Preparedness materials & measures</u>
Spills to land	sorbent pads/boom, picks and shovels
Spills to water	(skirted boom), boats, anchors and ropes, skimmers
Spills during fuel handling	catchment basins, boom and sorbents
Spills from leaks in system	sorbent pad, containment basins, repair and patch material

Spill Response Equipment and Material Checklists

- Lists of basic equipment and materials that should be kept readily available to respond to spills is included in this section.
- These lists are basic and may be modified for individual facilities.

All employees should know the location and how to use spill response equipment and materials.

SECTION 3 - SPILL PREPAREDNESS

Spill Response Equipment Checklist

Item	No. needed	Have	Order	Comment
Hand crank Wringer				
Transfer Pump				
Hand Held Radio (spare batteries and charger)				
Shovels (Non-sparking, aluminum or brass)				
Picks				
First Aid Kit				
Brooms				
Safety Glasses or Face Shield				
Hard Hats				
Rope				
Plastic Buckets				
Boat/Motor				
Anchor, Chain, Rope				
Buoys				
Tools				
Portable Generator				
Smart-ash Burner				
Tank or bladder for holding recovered product				
Rubber Boots				
Rain Gear				
Other				
Other				
Other				

SPILL RESPONSE EQUIPMENT CHECKLIST

SECTION 3 - SPILL PREPAREDNESS

SPILL RESPONSE MATERIALS CHECKLIST

Spill Response Materials Checklist

Item	No. Needed	Have	Order	Comments
Sorbent Pads				
Sorbent Boom				
Skirted Boom				
Visqueen (6 mil.)				
Overpack Drums, 85 gallons				
Garbage Bags (6 mil.)				
Neoprene Gloves				
Warm Gloves				
Duct Tape				
Color-Kut Water Paste				
Disposable Suits (ie. Kaplar)				
Other				
Other				
Other				

Masks
 plugs
 pans for cleaning
 scrub brushes

SECTION 3 - SPILL PREPAREDNESS

Operator Preparedness Training

The severity of spills can be minimized if operators are properly trained in spill response, including proper use of response equipment and materials. It is recommended that facilities develop written training plans for each of their operators.

Areas of spill preparedness training include:

- **Operations:** Operator must be qualified and competent for conducting normal routine operations.
- **Inspections:** Operators must be familiar with the facility and its operations. This will enable him/her to conduct regular inspections and be able to recognize problems.
- **Maintenance:** Operators must be qualified to perform regular preventative maintenance. When necessary, specialists need to be called in.
- **Spill preparedness:** Operators must be trained in procedures for storage, maintenance, inspection and periodic testing of oil spill response equipment and materials.
- **Spill response:** Operators must be trained in deployment of spill response equipment and materials, safety, first aid, spill reporting and response actions. They should participate in spill drills.
- **Hazardous Material Handling (HAZMAT):** Operators must be trained in safety, aware of potential hazards and proper fuel handling practices.
- **First Aid / Cardiopulmonary resuscitation (CPR):** Operators should have basic first aid training with emphasis on identifying and responding to health emergencies due to fuel exposure. It is also a good idea for operators to know CPR.

SECTION 3 - SPILL PREPAREDNESS

SPILL RESPONSE PLANS

Spill Response Plans

Facility spill response plans should be working documents. Operators and responders should be familiar with them. These plans should:

- List who to notify of a spill or call for help.
- Describe the actions to take in the event of a spill.
- Deployment strategies for spill response materials and equipment.
- Discuss protection of critical and sensitive areas.
- Describe recovery of spilled product.
- Describe proper management of recovered product and contaminated soil.

See Appendix D for an example Spill Response Plan.

SECTION 3 - SPILL PREPAREDNESS

Local Response Agreements

The Alaska Department of Environmental Conservation (ADEC) provides immediate response capability in many villages and communities in Alaska. This service is available because of partnership agreements with local communities, spill response cooperatives and response action contractors. The intent of the agreements is to give local communities and villages the ability for immediate spill response, which is necessary to contain and control releases to reduce the impact on public health and the environment. These agreements include stationing response packages in specified areas and providing training to local responders in equipment use.

Each response package is under control of the State On-Scene-Coordinator for the area in which it is located. Packages include spill response material and equipment for the types of hazards that exist in an area. An example of a response container inventory is included at the end of this section. In the event of a spill, the response equipment will be accessed and managed by ADEC area staff or by personnel responsible under a “Local Response Agreement”.

For more information on “Local Response Agreements”, call:

(907) 465-5220

SECTION 3 - SPILL PREPAREDNESS

Example Response Container Inventory

40 bdl.	Sorbent Pads (100 per bundle), 18" X 18"
25 bdl.	Sorbent Boom (4 sections per bundle), 5" X 10' sections
15 bdl.	Sorbent Sweeps (bundles), 18" X 20'
2 ea.	Lift Bags, 35" X 35" X 35", (Model 2000), w/2 galv. Snap Hooks
10 ea.	Lift Bag Poly Liners, 4 Mil. (72" X 132")
5 ea.	Cargo Strap, Ratchet Assembly, (2" wide X 12' long)
4 ea.	Cargo Strap, Ratchet Assembly, (2" wide X 16' long)
1 ea.	American Padlock, long neck, heavy duty, w/2 keys marked "LRC 05"
4 ea.	Concrete Pier Blocks
1 ea.	15" HIP Roof TUFF-E Tool Box, 15" L X 7" W X 6.5 " H, #20027006403
1 ea.	Craftsman, Socket Wrench Breaker Bar, Flex Head, 1/2" Drive, #44201
1 ea.	Craftsman, Ratchet Socket Wrench, 1/2" Drive, #44809
1 ea.	Craftsman, 15/16" - 12 point Deep Socket, 1/2" Drive, #47529
1 ea.	Craftsman Adjustable Pliers, #45381
1 ea.	Craftsman 10" Adjustable Crescent Wrench, #44604
1 ea.	16 oz. Ball Peen Hammer, Wood Handle, #2452-2013
1 ea.	8 lb. Sledge Hammer with 36" handle
Misc.	Spare bolts and pins for Kepner Boom, in tool box

EXAMPLE RESPONSE CONTAINER INVENTORY

**SECTION FOUR
SPILL RESPONSE
&
REPORTING**

SECTION FOUR - SPILL RESPONSE & REPORTING

SECTION 4 - SPILL RESPONSE, REPORTING

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SECTION 4 - SPILL RESPONSE, REPORTING

DETECTING OIL SPILLS:

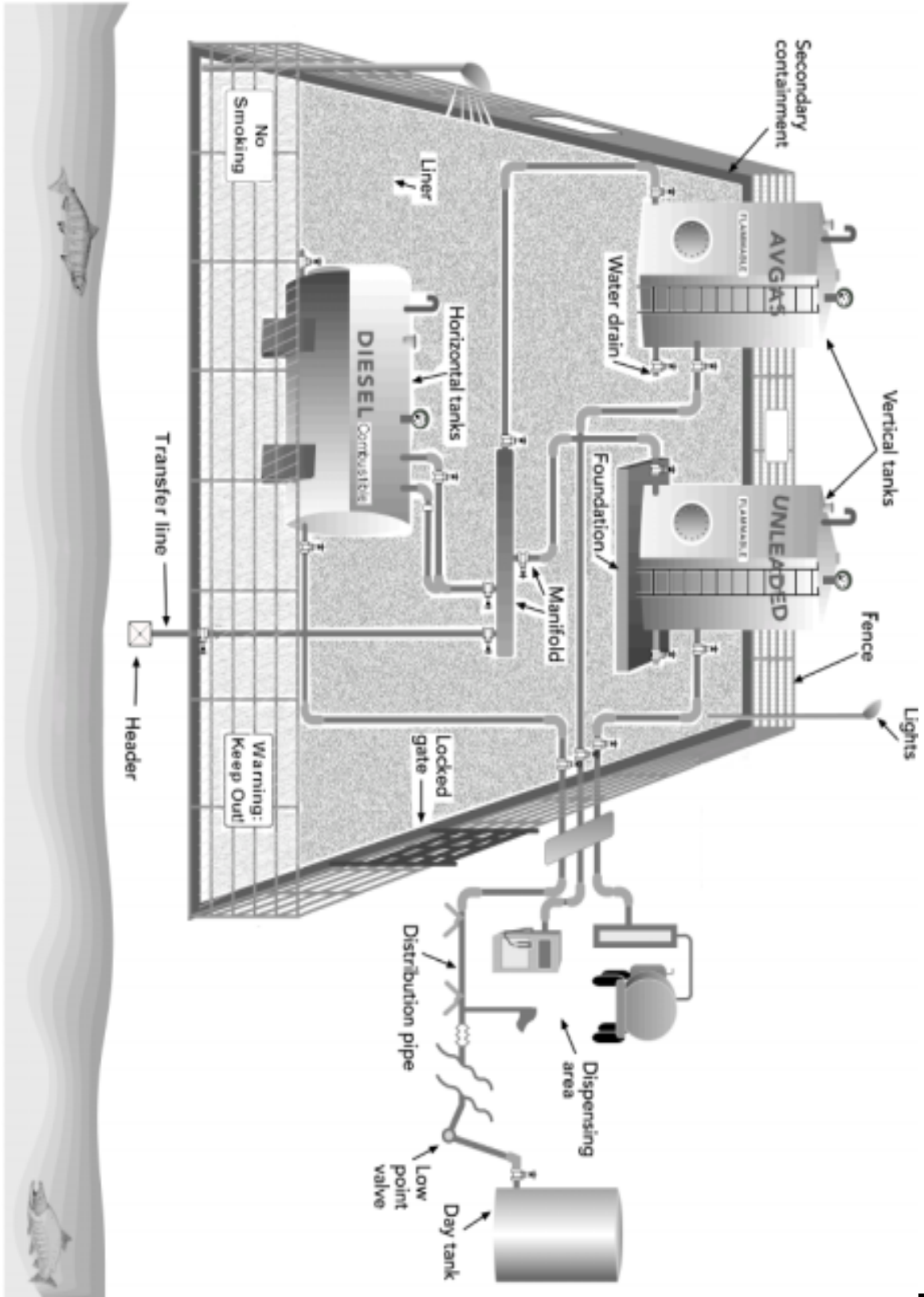
Detecting Oil Spills

Sometimes oil spills aren't as easy to detect as one would think. Following are some tips to help determine if you have spills or leaks at your facility:

- Visible spilled product on the ground
- Sheen on the water
- Smell of fuel in the air
- Inventory does not reconcile
- Dead or oiled fish, birds or small mammals
- Dead vegetation around facility
- Smell or taste in drinking water
- Sounds, such as spraying liquids, high pitch release from pressure vessels, etc.

SECTION 4 - SPILL RESPONSE, REPORTING

WHERE SPILLS ARE LIKELY TO HAPPEN



SECTION 4 - SPILL RESPONSE, REPORTING

SPILL RESPONSE

Spill Response

When you determine that you have a spill at your facility, immediate action must be taken. This section is a description of recommended steps to take and whom to notify. At the end of this section there is a **“Spill Response Checklist”** which is an abbreviated version of this section. The checklist may be copied, adjusted to fit your facility and used as you see fit.

Note: The procedures outlined should only be considered recommendations. Every spill is different and your response should be guided by your capabilities and limitations.

INITIAL DEFENSE ACTIONS

1. Survey Incident - from a safe distance. Using senses of sight, sound and smell, take note of:

- Source of release (tank, pipe, valve, drum, etc.)
- Material spilled look at labels and markings (gasoline, diesel,)
- Occupied buildings that may be threatened
- Public areas and environmentally sensitive areas that may be threatened.

2. Safety first – human lives and safety are most important.

- Call for help. Letting others know where you are, what you are doing and what they can do to help can save your life as well as reduce the impact from the spill. Call:
 - Facility Owner or Manager
 - Local Fire Department
 - Local Responders

SECTION 4 - SPILL RESPONSE, REPORTING

Spill Response (continued)

- Local Law Enforcement
- Local Medical Personnel

3. Analyze the Incident

- Collect hazard information on product spilled (refer to MSDS sheets)
- Predict the likely behavior of spilled material as well as the source container (flow direction, etc.)
- Estimate the extent of the spill and potential for harm

4. Protect the public

- Keep non-emergency and unauthorized personnel away from facility and spill area
- Evacuate areas downwind and stay upwind from spill– fumes can cause problems
- Control the scene and ribbon off spill area to keep the public away from the spill
- Know when to stay away (explosion hazard, etc.)

5. Plan a response - within the capabilities of available personnel, personal protection equipment and spill control equipment.

- Identify response objectives based on analysis.
- If needed, contact authorities for additional response equipment located in “Local Response Containers.”
- Conduct a safety briefing with responders.

SPILL RESPONSE

SECTION 4 - SPILL RESPONSE, REPORTING

SPILL RESPONSE

Spill Response (continued)

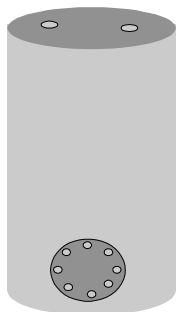
6. **Protect yourself** with appropriate personal protection gear:

- Hardhat
 - Rubber or safety-toed boots
 - Respirator
 - Disposable suit or Rain Gear
 - Eye Protection
 - Neoprene Gloves
- Watch out for symptoms of heat and cold stress.
 - Prepare for decontamination.



7. **Verify spill source** - determine where the spills coming from

- Tanks
 - Check vents for evidence of spilled product from overfill or heat expansion.
 - Look at tank shell seams for rupture, leaking welds, missing bolts or rivets, or any other damage or flaws.
 - Check the shell/bottom seam for corrosion, leaking welds or any other damage.



SECTION 4 - SPILL RESPONSE, REPORTING

Spill Response (continued)

- Piping
 - Check to see if any pipes are cracked or broken
 - See if valves are in the correct position - open or closed
 - Look for broken or leaky joints
- Other Sources - Look around to see if spilled oil could be coming from another source, such as a vehicle parked on the premises, or drums stored nearby facility.

PLANNED RESPONSE ACTIONS - USE THE "BUDDY SYSTEM"

8. CONTROL the spill:

- Stop transferring fuel immediately if spill occurs during transfer
- Know location of all emergency shut off equipment (electrical and mechanical)
- Close valves upstream of leak to stop the flow of product
- Place buckets or basins under leak from pipe or valve
- Apply temporary patch over leaky pipe or tank
- If spill is from a damaged tank, transfer remaining fuel to another tank

9.. CONTAIN the Spill as Soon as Possible – the quicker the spill is contained, the less the potential for human danger and impact to the environment

SPILL RESPONSE

SECTION 4 - SPILL RESPONSE, REPORTING

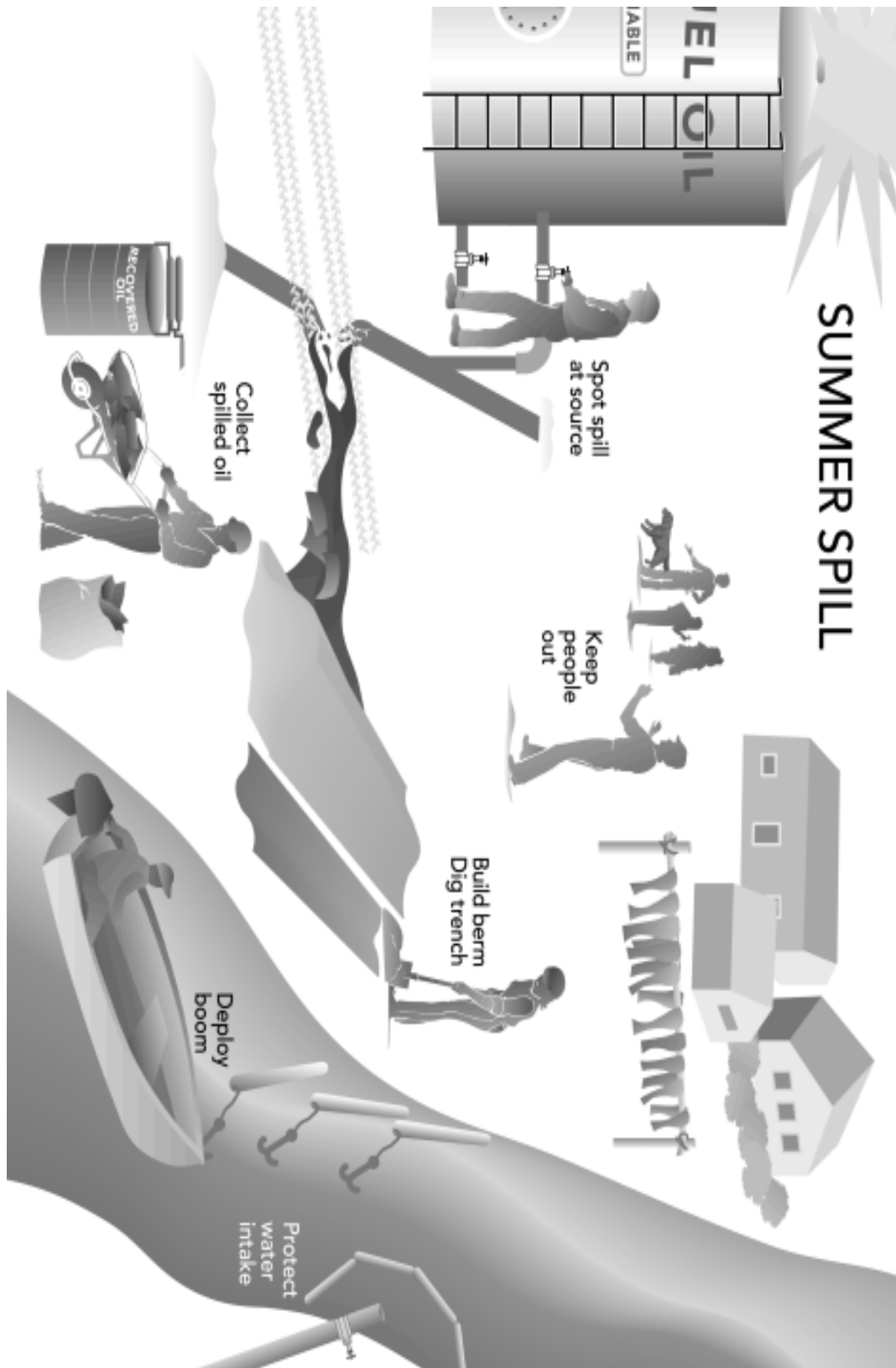
SPILL RESPONSE

Spill Response (continued)

- Use spill response tool kit – shovels, absorbent pads, etc.
 - Follow deployment strategies in Spill Response Plan
 - For winter spills – pile snow to form a dike around spilled product and dig ditches in ice to control the spill
 - For summer spills
 - Use dirt and mud to form an dike around spilled products
 - Dig a ditch to divert product from flowing into streams and other bodies of water
 - Pay particular attention to sensitive areas
 - Drinking water sources
 - Residential areas
 - Commercial areas
 - Fish and wildlife habitat
- 9. Recover and CLEAN up Spilled Product** - to reduce environmental damage, clean up as much product as possible.
- **Recover:** Recover captured product before it hits the water by pumping it or picking it up with skimmers or absorbent materials. Put the recovered product into tanks, drums or bladders.
 - **Report:** Report the spill to the nearest Alaska Department of Environmental Conservation office (during normal work hours) or call the 1-800-478-9300 after normal work hours.

SECTION 4 - SPILL RESPONSE, REPORTING

Spill Response (continued)



SPILL RESPONSE

SECTION 4 - SPILL RESPONSE, REPORTING

SPILL REPORTING

Spill Reporting

9. **Notify Owners and Authorities** - when a spill is noticed, call the following individuals and agencies immediately (fill in the correct numbers below):

- Facility Owner or Manager

- The Alaska Department of Environmental Conservation during normal business hours:

Outside normal business hours,

1-800-478-9300

- The National Response Center (EPA and USCG)

1-800-424-8802

Make sure signs with appropriate contact numbers are visibly posted in the facility. Also make sure notification signs are visible so others can see them in the event of a spill when the facility is closed.

SECTION 4 - SPILL RESPONSE, REPORTING

Spill Response Checklist

		FINDINGS
	1. SURVEY INCIDENT ○ Identify release source & Material spilled ○ Threatened building/public and sensitive areas	
	2. SAFETY FIRST – GET HELP ○ Facility Owner or Manager ○ Local Fire Department and Law Enforcement ○ Local Responders ○ Local Medical Personnel	
	3. ANALYSE THE INCIDENT ○ Review MSDS Sheet ○ Predict spill behavior ○ Estimate extent of spill	
INITIAL RESPONSE ACTION	4. PROTECT THE PUBLIC ○ Authorized personnel only/Ribbon off area ○ Evacuate areas downwind & Stay upwind ○ Know when to stay away	
	5. PLAN A RESPONSE ○ Identify response objectives ○ Get additional response material ○ Conduct safety briefing	
	6. PUT ON PERSONAL PROTECTION GEAR ○ Disposable suit or rain gear ○ Hardhat/Eye protection ○ Neoprene Gloves/Rubber or safety-toed boots	
	7. VERIFY SPILL SOURCE ○ Tanks ○ Pipes ○ Other sources	
PREVENTION	8. CONTROL THE SPILL ○ Stop the transfer and close valves upstream ○ Place catch bucket or basin under leak ○ Apply temporary patch	
	9. CONTAIN THE SPILL ○ Use response tool kit following deployment strategies ○ Pay attention to sensitive areas	
	10. RECOVER, CLEAN AND REPORT ○ Capture and recover product before it hits the water ○ Clean-up product ○ Call the nearest ADEC office and report spill	

SPILL RESPONSE CHECKLIST

SECTION FIVE

GOVERNMENT

REQUIREMENTS

SECTION FIVE - GOVERNMENT REQUIREMENTS

SECTION 5 - Government Requirements

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SECTION FIVE - TABLE OF CONTENTS

SECTION 5 - Government Requirements

STATE AND FEDERAL REGULATORY AGENCY OVERVIEW

State and Federal Regulatory Agency Overview

Federal Environmental Protection Agency (EPA) requirements



- A. Spill Prevention Control and Countermeasure (SPCC) and (RP) Response Plans
- B. Personnel training in the prevention, containment, removal and disposal of spilled oil
- C. Inspection and maintenance program
- D. Proper selection and construction of spill prevention systems which include dikes, liners, pumps, absorbent boom, etc.

United States Coast Guard (USCG) requirements



- A. Submission of a “Letter of Intent to Operate”
- B. Submission and approval of an “Operations Manual” and a “Facility Response Plan”
- C. Facility operations must include procedures and equipment for fuel delivery from vessel (barge), including:
 - Designated qualified person in charge of the fuel transfer operation
 - Personnel training and response drills
 - Safety requirements
 - Record keeping

SECTION 5 - Government Requirements

State and Federal Regulatory Agency Overview

Alaska Department of Public Safety (Fire Marshal) requirements



Facility plans are to be submitted for review and approval by the Fire Marshal prior to building a new facility, any repairs, alterations or changes that may affect fire safety of the storage tank facility.

Alaska Department of Environmental Conservation (ADEC) requirements

- Spill reporting
- Posting of spill notification information
- Cleanup and disposal of spill material



STATE AND FEDERAL REGULATORY AGENCY OVERVIEW

SECTION 5 - Government Requirements

ENVIRONMENTAL PROTECTION AGENCY

Environmental Protection Agency

Law: Clean Water Act

Regulation: 40 CFR 112: Oil Pollution Prevention

Applicability: Owners or operators of facilities engaged in drilling, producing, gathering, storing, processing, transferring or consuming oil or oil products, providing:



- The facility is non-transportation related.
- Aggregate Aboveground Storage capacity is 1,320 gallons and the minimum container size is 55 gallons.
- Facilities which, due to their location, could reasonably expect spilled oil to reach waters of the United States.

A. Spill Prevention, Control and Countermeasure (SPCC) Requirements: The SPCC regulation specifies several major spill control requirements:

- **Secondary Containment** (diking or other structural containment or their equivalent) must be provided. It must be large enough to hold the contents of the largest tank, plus allowance for precipitation (usually 10% of largest tank.) Diked areas must be sufficiently impermeable to contain spilled oil.
- **Tank Installations** must be fail-safe engineered to prevent spills. Tanks must have at least one of the following:
 - high liquid level alarms (audio or visual)
 - high level liquid cutoff device
 - direct audible or code signal communication between gauger and pump station
 - fast response system for determining fuel level, this would be a computerized system or direct vision gauges

SECTION 5 - Government Requirements

Environmental Protection Agency



ENVIRONMENTAL PROTECTION AGENCY

- **Tank Material and Construction** must be compatible with stored material and local conditions, such as temperature.
- **Fencing, Locks, and Lighting** - Oil storage facilities must be fenced and the gate locked or guarded when the facility is unattended. Facility type and location must be considered when selecting and installing lighting. It should prevent vandalism and help to detect spills at night.
- **Operation and Maintenance** - Aboveground tanks, foundations, and supports must have periodic integrity tests, using methods such as hydrostatic testing, visual inspection or non destructive shell thickness testing. Records of test results must be kept so they may be compared and any variances identified.
- **Piping Requirements** - Buried piping must have a protective coating and wrapping and must be cathodically protected. All aboveground valves and piping must be examined regularly and assessments made. Underground piping that becomes exposed must be inspected.
- **Training Requirements** - AST facility owners are responsible oil-handling personnel in operations and maintenance of equipment to prevent discharges and discharge procedures, protocol and Spill Prevention Control and Countermeasure Plans.
- Facility owners and operators are **liable for civil penalties** for SPCC violations.

B. SPCC Plans Requirements: AST facilities are required to

SECTION 5 - Government Requirements

Environmental Protection Agency

prepare SPCC Plans. These are procedural and contingency plans that play an important safety role for facility owners and operators. In case of a spill, it is necessary to have a well-thought out and systematic clean-up plan that can be implemented immediately.



ENVIRONMENTAL PROTECTION AGENCY

- SPCC plans must be written and implemented before beginning operations.
- Plans must be kept at the facility if it is in operation at least four hours a day and must be available for EPA.
- Plans must be prepared in accordance with good engineering and certified by a registered professional engineer.
- Plans must be reviewed and updated every five years.
- Plans must discuss spill prevention, staff training, inspections, security, spill reporting, equipment and operations.
- SPCC Plans must describe training, equipment testing and periodic unannounced drills. Also they must describe facility personnel response actions to be carried out under the plan to ensure facility safety and to mitigate or prevent a discharge or the substantial threat of discharge.
- Plans must provide for appropriate containment, drainage control structures or equipment at the facility to prevent discharged oil from reaching navigable waterways.

A copy of a checklist that EPA uses when reviewing SPCC Plans is included in Appendix C of this handbook.

C. Facility Response Plan: In addition to a SPCC Plan, certain facilities need to prepare a Facility Response Plan (FRP).

SECTION 5 - Government Requirements

Environmental Protection Agency

Applicability: Facility response plans must be prepared by owners or operators of non-transportation related facilities that, because of their location, could reasonably be expected to cause “substantial” harm to the environment by discharging oil into or on navigable waters or adjoining shore lines. EPA considers a facility to pose the potential for causing substantial harm if it *transfers oil over water to or from vessels and has a total storage capacity of greater than or equal to 42,000 gallons.*



ENVIRONMENTAL PROTECTION AGENCY

EPA has the authority to require a facility to prepare or revise a Facility Response Plan at their discretion. Factors that EPA considers when evaluating a facility include:

- Oil storage capacity
- Type of transfer operation
- Secondary containment
- Proximity of fish and wildlife and sensitive environments
- Proximity of drinking water intakes
- Spill history
- Age of oil storage tanks
- Other site-specific considerations determined relevant by EPA.
- Petitions from any person, including the general public, who believes your facility has the potential to cause substantial harm to the environment according to the above listed considerations.

SECTION 5 - Government Requirements

Environmental Protection Agency

Plan Requirements: A Facility Response Plan (FRP) describes preparations, procedures, training and actions for responding to oil discharges at a facility. FRP's must:



- Be submitted to EPA for review and approval
- Include an emergency action plan that describes personnel and procedures in place to respond to spills.
- Describe external response resources and arrangements for responding to a worst case discharge.
- Evaluate potential hazards to the environment posed by a discharge from the facility.
- Plan for worst case scenario.
- Provide details of plan implementation.
- Provide training, drill exercises and self-inspections to support Facility Response Plan Implementation.

D. Training: The facility owner or operator must develop and implement a training program. This must include evaluation procedures and drills and exercises for those personnel involved with oil spill response and clean-up activities.

ENVIRONMENTAL PROTECTION AGENCY

SECTION 5 - Government Requirements

United States Coast Guard

Law: Clean Water Act and Oil Pollution Act

Regulation: 33 CFR 154 Facilities Transferring Oil or Hazardous Material in Bulk
33 CFR 156 Oil and Hazardous Material Transfer Operations



General Applicability: This law requires fixed or mobile marine transportation related (MTR) facilities that are capable of transferring oil to or from vessels with a capacity of 10,500 gallons (250 barrels) or more.

These United States Coast Guard (USCG) regulations apply to Marine transportation related (MTR) facilities that:

- Are fixed facilities capable of transferring oil or hazardous material, in bulk, to or from a vessel with a capacity of 250 barrels or more.
- Are mobile facilities and are used, or intended to be used to transfer oil or hazardous material, in bulk, to or from a vessel with a capacity of 250 barrels or more.
- Have been notified, in writing, by the Captain of the Port that all or portions of 33 CFR 154.735 (Safety requirements) may apply to each facility that is capable of transferring oil or hazardous material, in bulk, only to or from a vessel with a capacity of less than 250 barrels.

Requirements: These bulk fuel transfer regulations require certain facilities to notify the USCG of their fuel-related activities and to prepare Operations Manuals and Facility Response Plans. Following is a summary of the USCG requirements:

- **Submit a “Letter of Intent to Operate”** to the Captain of the Port. The letter must include the name, address and telephone number of the operator as well as the name, address and

UNITED STATES COAST GUARD

SECTION 5 - Government Requirements

United States Coast Guard

geographic location of the facility.

- **Submit for review an “Operations Manual@.** The manual must describe how operating rules and equipment requirements will be met as well as responsibilities of personnel who conduct transfers.
- **Submit for review a “Facility Response Plan”** which imposes standards for response to discharges of various sizes. A copy of the check list the USCG uses to review Response Plans is included in Appendix D of this handbook.
- **Test and maintain transfer hoses and piping.** Transfer pipes and hoses must be hydrostatically tested at least once a year. Test records are to be kept at the facility.



UNITED STATES COAST GUARD

Owners or operators are liable for oil spill removal costs as well as civil and potentially criminal penalties.

Inspections: Coast Guard personnel conduct periodic inspections of MTR's. During these inspections they will look for:

- **Required documents**, including “Letter of Intent to Operate”, “Facility Operations Manual”, “Facility Response Plans”, copies of the Declaration of Inspection and results from hydrostatic tests done on transfer pipes.
- **Safety equipment** such as fire extinguishers, lighting, fencing and “No Smoking Signs.”
- **Spill response material and equipment**, making sure there is an adequate amount and noting where it is located.

SECTION 5 - Government Requirements

Alaska Department of Public Safety (Fire Marshal)

Law: AS18.70.080

Regulation: 13 AAC 50 Fire Prevention Codes and Standards from the International Fire Code (IFC) and International Building Code (IBC)



Applicability: The IFC and IBC apply to all persons without restriction, unless they are specifically excluded, that store, use, dispense, mix and handle flammable and combustible liquids.

Requirements: The state has adopted the National Fire Protection Agency standards to regulate all building types according to their use and occupancy. The UFC has been adopted to safeguard life and property from the hazards of fire and explosion arising from storing, handling and using hazardous substances, materials and devices and from other conditions hazardous to life and property.

Before beginning construction, alterations or repairs to a facility, specifications and plans must be submitted to the state fire marshal for review and approval.

ALASKA DEPARTMENT OF PUBLIC SAFETY (FIRE MARSHAL)

SECTION 5 - Government Requirements

Alaska Department of Environmental Conservation

Law: AS 46 Water, Air, Energy and Environmental Conservation

Regulation: 18 AAC 75 Article 3 Oil and Hazardous Substances Pollution Control, Discharge Reporting, Cleanup and Disposal



Applicability: The Alaska Department of Conservation (ADEC) regulations apply to all persons, without restriction, in charge of a facility or operation that has a discharge of a hazardous substance.

- A. Posting of Information** - A facility that has a total storage capacity of more than 1,000 gallons, either aboveground or underground, must post an ADEC approved discharge notification placard.
- B. Reporting Requirements** - Persons in charge of a facility or operation that has a release of a hazardous substance (including petroleum products) must report it to ADEC (notification information is on the required placard) according to the following criteria:
- If it is a discharge of a hazardous substance other than oil, a discharge of oil to water, or a discharge of oil to land in excess of 55 gallons (outside of any impermeable secondary containment), it must be reported as soon as the person has knowledge.
 - If the discharge is less than 55 but more than 10 gallons, or it is more than 55 gallons but into an impermeable secondary containment, it must be reported within 48 hours of the time the person has knowledge.


SECTION 5 - Government Requirements

Alaska Department of Environmental Conservation

- C. **Clean-up:** Immediately upon becoming aware of a hazardous substance discharge to the lands or waters of the state, any person responsible for that discharge shall contain, clean-up, and dispose of the material collected using methods that have been approved by ADEC.



ALASKA DEPARTMENT OF ENVIRONMENTAL CONSERVATION



Alaska Department of Environmental Conservation
Division of Spill Prevention and Response


MY 2008

REPORT ALL

OIL AND HAZARDOUS
SUBSTANCES SPILLS

During normal business hours
contact the nearest DEC Area Response Team office:

Central Alaska Response Team: ANCHORAGE	269-7500 <small>FAX 269-7648</small>
Northern Alaska Response Team: FAIRBANKS	451-2121 <small>FAX 451-2362</small>
Southeast Alaska Response Team: JUNEAU	465-5340 <small>FAX 465-2237</small>



Outside normal business hours, call: 1-800-478-9300
ALASKA LAW REQUIRES REPORTING OF ALL SPILLS

