LAND-BASED STORAGE & TRANSFER

OBJECTIVE & STRATEGY

LST

The Land-based Storage and Transfer tactic is used to move recovered liquid oil and/or oily liquids that have been collected during recovery efforts into land-based storage devices. This transfer may be for final disposition or for intermediate storage. The general strategy is to:

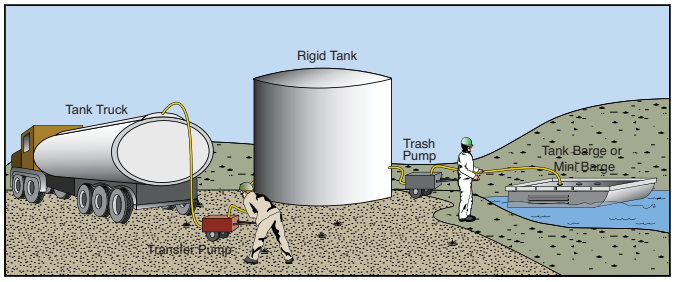

Figure LST-1. Transfer of recovered liquids using rigid tank, tank truck, and portable pumps.

1. Select a transfer site with adequate space that is easily accessed by field operations.
2. Determine the appropriate transfer and storage systems, based on oil type, site conditions, and available equipment.
3. Mobilize and deploy transfer and storage equipment to the site.
4. Transfer recovered wastes from one storage device to another.
5. Monitor transfer pumps and storage containers for leaks and breeches.

TACTIC DESCRIPTION

Adequate land-based storage and proper transfer of liquids is a critical link in recovery operations. Capacities for storage and transfer of oil need to be carefully selected to ensure adequate volume and movement of recovered oil and liquids through the waste stream. Improper or inadequate storage and transfer systems can disrupt the entire continuity of a response. Oil recovery may be disrupted if storage containers are unavailable or undersized. Selection of storage containers depends on the size of the spill, the expected recovery rate, and time that the waste will be stored before final disposal.

The equipment used in the storage and transfer should be adaptable to the specific site and fluid types being handled. Components include pumps, hoses, fittings, and storage systems. Storage containers may consist of rigid tanks, portable tanks, or lined pits. Site considerations include the operating environment and the distances and elevation the liquid has to be moved. Other considerations include explosive/flammability potential, debris content, and viscosity of the fluids. Components should be selected to maximize safety and efficiency. Transfers should be kept to a minimum to reduce the risk of secondary spills.

Land-based Storage and Transfer

Follow the requirements of the incident specific Waste Management Plan and review the Waste Management Checklist in Section A of this document. Waste considerations include explosive potential, debris content, and viscosity of the fluids.

Pumping Systems

Pumping systems should be configured to meet the requirements of the task. Consideration of the abilities and weaknesses of a pumping system and the site specific conditions will inform responders of the best pump for the job. Refer to the Pumping Oily Liquids tactic for further information on pump systems and procedures. Viscous oil pumping techniques may be necessary to move thick fluids.

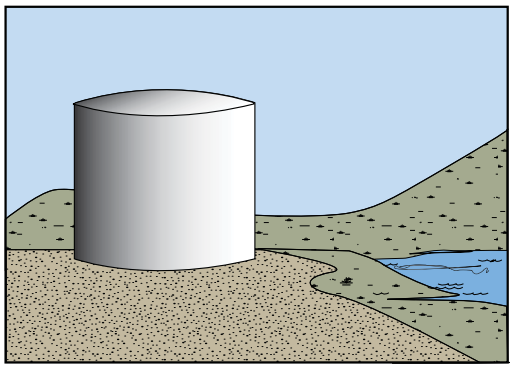

Figure LST-2. Rigid tank-of-opportunity used for intermediate or final storage of recovered fluids.

Storage Systems

Options for land-based storage are rigid tanks, portable tanks, and lined pits. A brief description of each follows:

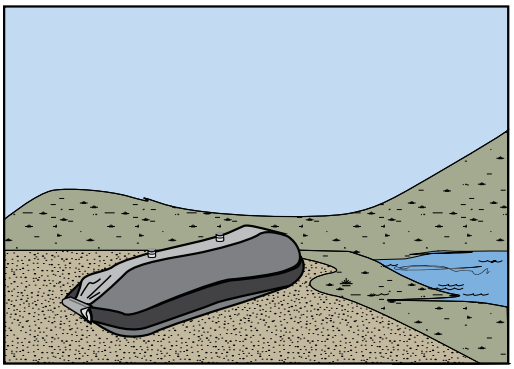

Figure LST-3. Pillow tank or bladder, an example of a portable tank used for intermediate storage of recovered fluids.

Rigid Tanks – Rigid tanks are constructed of steel, aluminum, or plastic and may include: tanks-of-opportunity located near the response site or tanks delivered to the transfer site. Rigid tanks are the preferred means of storage, especially if the storage is for a long period (Figure LST-2). Rigid tanks also include open-top lined dumpsters, ore bins, or similar resources. Rigid tanks should be inspected prior to use.

Portable Tanks – Portable tanks are constructed of fabric and may include: collapsible tanks, inflatable tanks, and pillow tanks (Figure LST-3). Collapsible "open pool" type tanks are made of a liner supported by a tubular frame that can be easily transported to a site and quickly erected to provide intermediate storage of liquids. Capacities range from 3 barrels to 130 barrels. Inflatable tanks use a liner supported by inflated tubes that form the frame of the tank. Inflatable tanks have capacities ranging from 3 to 300 barrels. Pillow tanks are closed, coated

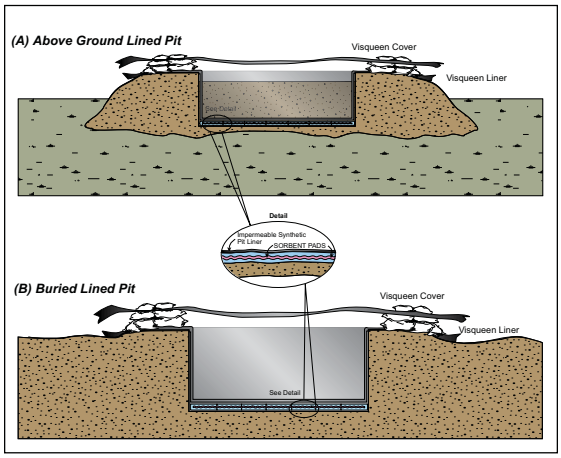

Figure LST-4. (A) Above ground lined pit used for intermediate storage of recovered fluids and debris. (B) Buried, lined pit used for intermediate storage of recovered fluids and debris.

bladder tanks with capacities from 1 to 4,800 barrels. All portable tanks are susceptible to abrasion and failure if not properly maintained and monitored.

Lined Pits – Lined pits, either excavated or built-up above ground, can be used for emergency storage of oily liquids, debris, and solid wastes (Figure LST-4). Built-up pits may be constructed by building a berm from sand bags, timbers, snow, soil, or gravel around the desired storage site. The resulting pit is lined (or double lined) with a continuous impermeable membrane material. The liner must be strong enough to prevent punctures. Excavated pits can also be used in some situations, but may result in more environmental damage. Pits should be covered to prevent accumulation of rain and snow and they should be inspected regularly for leaks. Lined pits should only be used for temporary storage; wastes should be removed as soon as possible. The pit must then be decontaminated or removed and disposed of according to the Waste Management Plan.

Operating Environments

Land-based Storage and Transfer of oily liquids may occur on all land-based environments where response activities take place, including: Marsh, Tundra, Other Land, and Solid Ice. Consideration should to be given to protect sensitive areas such as tundra and marsh environments.

Deployment Configurations

Deployment configurations for land-based storage and transfer will be largely dictated by site considerations and waste types. The placement of pumps will be determined by the head or suction needed, the transfer rates required and the receiving storage devices. For long distances, multiple pumps in a series may be required. The following figure is an example of one of the most common configurations used during response activities.

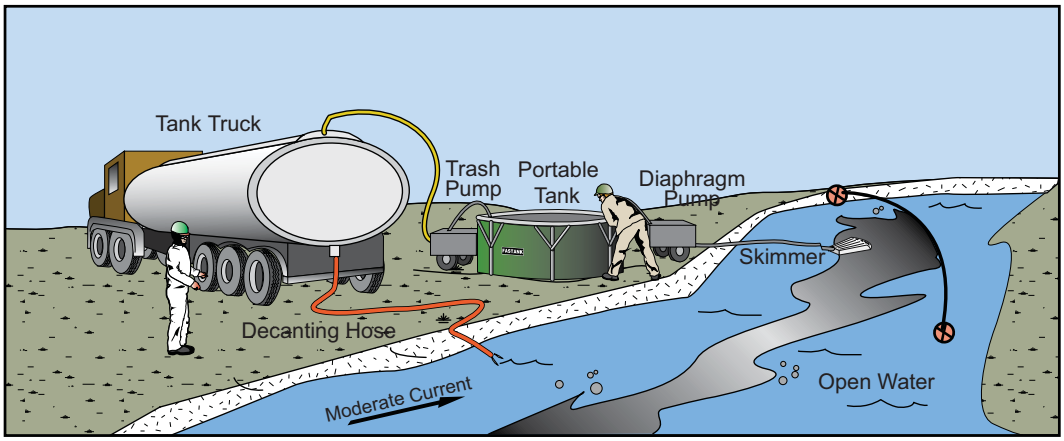

Figure LST-5. Transfer of recovered fluids from primary storage in a portable tank to a tank truck.

DEPLOYMENT CONSIDERATIONS AND LIMITATIONS

SAFETY

- Avoid free falling liquids, as static electricity may be produced.
- Ground vehicles and equipment to dissipate static and prevent explosions.
- Spotters should be present during heavy equipment operations.
- Storage devices must be vented.
- Transfer personnel must have PPE in accordance with the incident-specific Site Safety Plan.

DEPLOYMENT

- Open tanks and pits are best for liquid containing a lot of debris.
- Open tanks and pits will collect rain and snow and are susceptible to overflow if not monitored, decanted, and/or covered.
- Consider stability when placing tanks on soft soils or beaches.
- During liquid transfers, pump controls and valves must be manned to ensure rapid response to any leaks, overflows, or changing circumstances.
- All personnel participating in the transfer should have common two-way communications.
- Support and monitor hoses throughout the operation, to minimize stress or chaffing.
- Secondary spill response equipment and sorbent materials should be easily accessible.
- A 40 ft. warm-up container should be considered if operations are expected to maintain a 24 hour operation. Frozen hoses are not uncommon during a cleanup operation in sub-freezing temperatures.
- Prior to start of transfer, a tailgate meeting should be conducted to ensure the rapid response to any leaks, overflows, or changing circumstances.
- Consider placing drip-pans under hose connections.
- Tanks of opportunity should be inspected prior to use.
- If wildlife or historic properties are encountered, see Wildlife Checklist on page A-19 or Historic Properties Checklist on page A-20.

Land-based Storage and Transfer

REFERENCES TO OTHER TACTICS

Other tactics associated with Land-based Storage and Transfer include:

- PPE • Personal Protective Equipment
- POL • Pumping Oily Liquids
- MST • Marine-based Storage and Transfer
- PTS • Pits, Trenches, and Slots

EQUIPMENT AND PERSONNEL RESOURCES

Resources for the Land-based Storage and Transfer tactic include pumps, suction hose, discharge hose, storage devices, and response personnel.

Equipment	Function	Quantity	Notes
Pump	Moving oil or oily liquid	1 or more	Highly viscous oils may require an enhanced pumping system such as annular injection
Suction hose	Moving oil or oily liquid	Site-specific	
Discharge hose	Moving oil or oily liquid	Site-specific	
Storage device	Containment of transferred oil	Site-specific	
Personnel	**Function**	**Quantity**	**Notes**
Field Team Leader	Supervises operations	1	May not always be on-site
Skilled Technicians	Operate response equipment	1 to 2	Depending on number of pumps and configuration
General Technicians	Work under the direction of skilled technicians	As required	Depending on configuration

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