Waste Specific Guidelines

As stated in Section 1.0, the waste management philosophy focuses on waste minimization. In order to minimize the generation of unnecessary hazardous wastes, the use of certain chemicals and substances listed in Table 2.0.1-1 will be restricted. If a Contractor feels that reasonable alternatives do not exist for certain applications, Contractor may petition for a deviation from this requirement. Such deviations, if approved, will address subsequent waste handling and disposal.

For the wastes that are expected to be generated, waste specific guidelines have been developed. Each waste specific guideline contains:

- A definition of the waste type, typical waste examples, and sources of waste generation;
- Safety considerations that are specific to the waste. [Note - it is required that all “standard” Project safety procedures be followed (e.g., the use of hardhats, safety glasses, steel-toe shoes, etc., where required, familiarity with MSDSs for materials involved, etc.) during the handling of any waste stream. These requirements are not reiterated within each guideline.]
- Waste minimization options; and
- Preferred waste management methods.

Selection of the waste management option to be used at a specific site will depend on site conditions and availability of the option. For example, Contractors in the early construction phase will not have access to Project landfills until built and may have very small quantities of inert materials such as ash and construction debris that could be buried on-site without adverse effects.

The preferred waste management options flow chart for each waste includes special allowances for disposal of small quantities of wastes, if appropriate. The flowchart follows the thought process that should be considered by persons managing waste; however, other issues or options may be appropriate and can be included in the site-specific waste management plans subject to approval.

Creating a Quick Reference Summary

As part of an individual facility's Site-Specific Plan, waste management summary tables may be created to record the options selected to reduce, treat and/or dispose each waste stream each time it is generated. This table could include a "Comments" column to capture special considerations such as safety concerns or reporting requirements. Preparation of a "quick reference" table can facilitate the handling of routine or frequently generated wastes and help improve consistency of handling. As stated, this Plan will be revised or expanded periodically and each site should review these changes carefully to assess whether a change to the site-specific plan is warranted. An example format for a quick reference table is provided in Table 2.2.2-1 (at the end of Topic 2.2.2).

Index of Waste Streams

Table 2.0.1-2 provides a listing of waste stream specific management guidelines.

TABLE 2.0.1-1

Chemicals and Substances Not to be Used

Substance to Avoid	Alternatives
Polychlorinated Biphenyls (PCBs)	Silicones, esters, cast resin.
Friable asbestos	Alternatives are readily available for insulation and roofing uses. There are no clearly superior alternatives for some uses such as brake pads for trucks.
Pentachlorophenol (PCP) and formaldehyde (biocides)	Glutaraldehyde, Isothlazolin (or other low toxicity biocide).
Chlorofluorocarbons (CFCs)	Depends on use. USEPA has published lists of USEPA-accepted alternatives for various uses [1,2].
Leaded paints	Unleaded paints. Also, water based or low volatility solvent formulations can reduce potential health effects of oil based paints.
Chlorinated solvents (e.g., carbon tetrachloride, trichloroethylene).	Non-chlorinated hydrocarbon-based solvents, steam cleaning.
Heavy metals (reverse emulsion breakers)	Polymer (non-latex) based formulations.
Mercury (in pressure-measuring devices/instrumentation)	Differential pressure cells/transmitters, pneumatic or electric instrumentation.
Lead naphthenate (lubricant)	Lead-free lubricants.
Leaded thread compound	Lead-free thread compounds such as Bestolife 2000 (for tubing and casing).
Chromate corrosion inhibitors	Sulfite or organic phosphate corrosion inhibitors, especially those with reduced toxicity amine function.
Chrome lignosulfonate (as fluid loss controlling agent) - all right in small amounts for rheology control	Carboxymethyl starches for fluid loss control. Improved mud control to minimize fluid loss. If used (for rheology), keep dose small and use formulations with trivalent form complexed in lignin structure.

1. United States Federal Register, Volume 59, No. 53, (59 FR 13044), Office of the Federal Register, National Archives and Records Administration, Washington, D. C., March 18, 1994.

2. U. S. Environmental Protection Agency, “Acceptable Substitute Refrigerants Under SNAP,” EPA-430-F-94-014, April, 1994.

Note: If reasonable alternatives do not exist for certain applications, a petition for a deviation from this requirement may be reviewed. Such deviations, if approved, will address subsequent waste handling and disposal.

TABLE 2.0.1-2

Index of Waste Streams

Waste Streams	Topic No.
Acid/Caustic Solutions	2.1.1
Ash	2.1.2
Barrels, Drums, Containers and Gas Cylinders (Empty)	2.1.3
Batteries	2.1.4
Cement and Concrete Wastes (including Cement-Contaminated Soil)	2.1.5
Cement-Contaminated Drilling Mud	2.1.6
Completion and Workover Fluids	2.1.7
Construction Debris	2.1.8
Contaminated Soil (Hydrocarbon)	2.1.9
Contaminated Soil (Water-Based Drilling Fluids)	2.1.10
Domestic Waste/Trash	2.1.11
Drill Solids/Cuttings (Fresh Water Gel and PHPA Mud)	2.1.12
Drill Solids/Cuttings (Oil-Based)	2.1.13
Glycol and Antifreeze	2.1.14
Hydrotest Fluid	2.1.15
Injection Water Filter Cartridges	2.1.16
Lube Oil /Motor Oil (Used)	2.1.17
Medical Waste/Trash	2.1.18
Oil Filters and Oil Filter Sludge	2.1.19
Oily Debris	2.1.20
Paint (and Other Coating) Waste	2.1.21
Produced Water	2.1.22
Scrubber Wastes	2.1.23
Separator/Vessel Sludges and Pigging Wastes	2.1.24
Slop Oil	2.1.25
Solvents	2.1.26
Tires	2.1.27
Unused, Spent, Expired, and Waste Chemicals and Additives	2.1.28
Vegetation Debris	2.1.29
Wastewater (Domestic) / Sewage	2.1.30
Wastewater (Oily)	2.1.31
Water Treatment Sludge	2.1.32
Whole Mud (Fresh Water Gel and PHPA Mud)	2.1.33
Whole Mud (Oil-Based)	2.1.34
Other Miscellaneous Wastes	2.1.35
Asbestos Containing Material	2.1.36
Scrap Metal	2.1.37
Glass	2.1.38
Plastic and Rubber	2.1.39
Pyrotechnics	2.1.40
Drum Rinse	2.1.41

Introduction

Although reasonable efforts will be made to reduce the quantity of waste generated, waste streams will be generated. During the period after the waste is generated and before the waste is sent for disposal or recycle, the waste should be properly managed in containers, tanks, bulk pads or other approved unit in a manner that reduces the potential for impact to human health and the environment.

Typically, wastes should not be stored for any longer than necessary. During construction or some other early phases of the Project, it is realized that appropriate landfills, incinerators, or other facilities may not be available and that a waste may need to be stored onsite for some period of time until approved facilities are available. During later phases of the Project when the landfills, incinerators or other facilities are available, then wastes should be sent for disposal or recycle in a timely manner so as to limit the total quantity of waste onsite at any given time and the potential for accidental releases.

To facilitate the proper management of wastes, there are some specific waste management steps that should be followed regardless of which phase the Project is in (e.g., construction, drilling, operation), which site is generating the waste stream or which waste stream is involved. Rather than repeat these common requirements in the guidelines for each of the specific wastes in Section 2.1, the common requirements are specified below.

Waste Sampling

Prior to sending a waste for disposal or recycle/reclaim, it is important to know certain information about the waste such as whether it is a solid or liquid, an organic or inorganic, a hazardous or non-hazardous waste and similar information. In some cases, the generator may know the needed information either based on knowledge of how the waste was generated or from data obtained during previous generation events. If sufficient data is not available to be able to decide on the proper disposal or recycle/reclaim option, it may be necessary to collect and analyze a sample of the waste to obtain the needed data. If it is necessary to obtain a sample of a waste, the sampling should be conducted following the procedures in Section 4.0.

Sampling Records

Whenever a sample is collected, a "Chain-of-Custody" form must be completed to document the sample collection and handling. In addition, a "Sample Identification/Analysis Request" (SIR) form should be completed (see Section 4.0).

Analytical Testing	Samples should be analyzed only by "certified" analytical laboratories that have been approved for use (See Section 4.0).
Lab Data Review	When samples are submitted, the laboratory should be instructed to provide the results to the person who will assess the data and make the decision on how to dispose or recycle/reclaim the waste.
Waste Accumulation	During the period when the waste is generated and the waste is sent for disposal or recycle/reclaim, the waste should be properly managed in containers, tanks, bulk pads or other approved unit (see below). Typically wastes should not be stored for any longer than necessary. During construction or some other early phases of the overall Project, it is realized that appropriate landfills, incinerators, or other facilities may not be available and that the waste may need to be held onsite for some period of time until such facilities were constructed. During later phases of the Project when the landfills, incinerators or other facilities are available, then wastes should be sent for disposal or recycle/reclaim in a timely manner so as to limit the total quantity of waste onsite at any given time and the potential for accidental releases.
Waste Transport	Hazardous waste should be transported using approved hazardous waste transporters.
Waste Disposal	Both hazardous and non-hazardous waste may only be disposed of at approved sites unless other arrangements have been approved in advance on a case-by-case basis (see Section 3.0).
Waste Manifest	A completed Waste Manifest Form should accompany all wastes transported for disposal or recycle/reclaim. This includes both hazardous and non-hazardous waste regardless of the ownership or location of the receiving facility (see Section 4.0). A copy of the fully completed (i.e., signed by the generator, transporter and receiving facility) form should be forwarded to the waste tracking system database manager (see Section 4.0).
Burial Records	Under certain circumstances, specific types and/or quantities of waste may be buried at or near the location where they are generated. For each burial location, a Waste Burial Record should be completed and a copy of the record should be forwarded to the waste tracking system database manager (see Section 4.0).

Recordkeeping

A copy of all waste management-related documents (e.g., Chain-of-Custody, SIR, laboratory analyses, manifests, burial record, etc.) associated with each waste shipment or burial event should be maintained by the generator and a copy should be submitted to the waste tracking system database manager.

Repetitive Wastes

If a waste to be managed has been generated before and prior experience, knowledge, and/or testing has shown the waste to be hazardous or non-hazardous, the current waste may be classified based on this prior experience, knowledge, and/or testing, provided that the current waste is "essentially the same" as the previously generated waste. Essentially the same means that the wastes are generated using the same process, procedures, chemicals, etc. and in the same environment such that the properties and compositions of the wastes may reasonably be expected to be nearly identical.

Section 2.1 Waste Specific Guidance	Topic 2.1.1 Acid/Caustic Solutions

Definition

Waste acids/caustics, which are generated from the use of an acid or caustic cleaner or from workover operations. These wastes should be handled as hazardous (corrosive) wastes if their pH is less than 2.0 or greater than 12.5.

Typical Wastes in This Category

- Caustic (NaOH)
- Fracturing acids
- Cleaning acids
- Vessel cleaners
- Engine block flushing agents or cleaners
- Neutralized acids
- Completion and workover fluids

Typical Waste Sources

- Drilling operations
- Completion/workover operations
- Equipment maintenance / cleaning

Safety Considerations

Refer to original MSDS. Avoid skin contact or ingestion. Wear protective clothing and glasses when handling. These solutions should be neutralized prior to disposal. Safe practices need to be implemented to minimize risk while combining solutions.

Waste Minimization Options

<u>People/Procedures</u>

- Judicious use of products and chemicals.
- Evaluate preventative maintenance schedule/program elements.
- Reuse until spent or neutral.
- Product substitution (less toxic or recyclable).
- Inventory control/proper storage.
- Use inhibitors to prevent scale build-up and vessel cleaning requirements.

<u>Equipment/Facilities</u>

- Material upgrades.

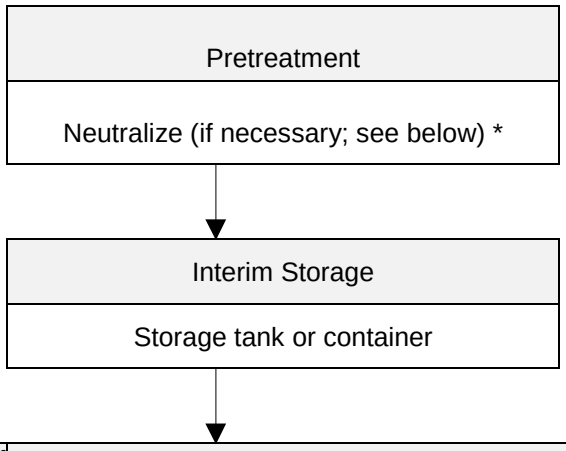
<u>Process</u>

- Modify process to reduce scale and sediment.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Aqueous solutions may be bled into water treatment system as long as significant pH change to the treatment system does not occur *
2	Injection with produced water at a rate where resulting pH is compatible with equipment and operations

* Acids/caustics may be chemically neutralized or diluted with water such that the resulting pH is in the target range of 6-8. As appropriate, check with wastewater treatment system operator before discharge.

Section 2.1 Waste Specific Guidance	Topic 2.1.2 Ash

Definition

Residual matter remaining after combustion. If the material combusted contained hazardous components, the ash may need to be tested for these components to determine the appropriate disposal location.

If a refuse/camp incinerator only receives food, paper, and other non-hazardous refuse (and no plastics), the resulting ash may be treated as non-hazardous.

Ash from an industrial incinerator (e.g., one burning oily wastes, medical wastes, etc.) should be treated as hazardous unless testing is performed to show that it is not hazardous.

Typical Wastes in This Category

- Incinerator ash
- Burn pit ash
- Oily waste
- Medical waste (excluding sharps)

Typical Waste Sources

- Combustion/incineration of organic wastes (e.g., wood, paper, food wastes, medical wastes, etc.)

Safety Considerations

Steps should be taken to reduce airborne ash while handling. PPE may be appropriate.

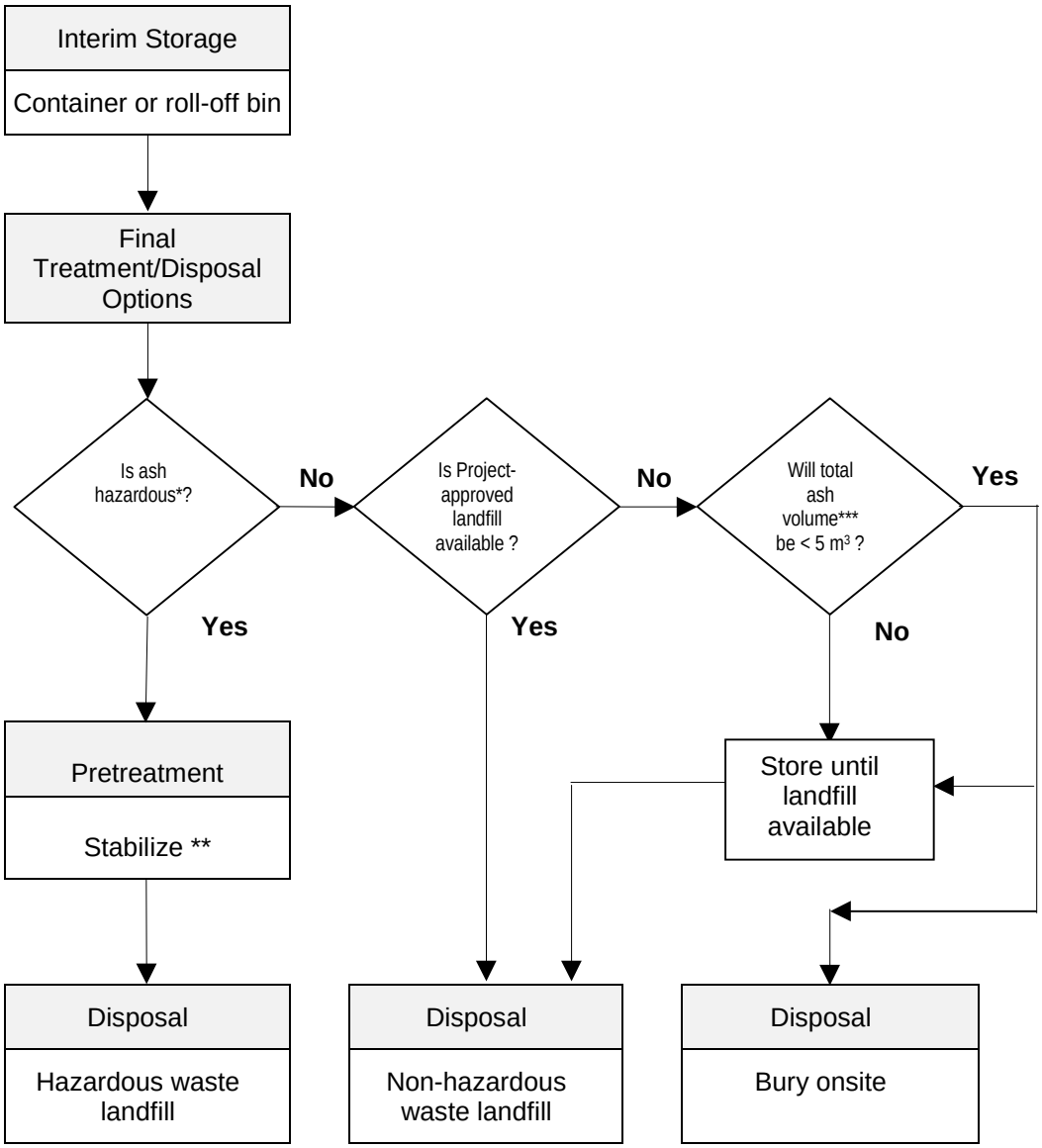
Waste Minimization Options

- Recycle wastes when feasible.
- Optimize incinerator process to maximize combustion.
- Segregate non-hazardous and hazardous industrial wastes and burn separately in batch mode to ensure that hazardous ash may be collected and handled separately.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



* If leachable metals are present at levels of concern, see **Section 4.0**, **Topic 4.0.3 (Sampling and Classifying Wastes)**.

** Landfill may stabilize material for generator.

*** Refers to total ash volume for entire time on site.

Note: Residual ash associated with vegetation burning during site clearing addressed in the "Vegetation Debris" specific waste topic.

Section 2.1 Waste Specific Guidance	Topic 2.1.3 Barrels, Drums, Containers, and Gas Cylinders (Empty)

Definition

A container is empty if all material has been removed that can be removed using practices commonly employed to remove the material from that type of container (e.g., pouring, pumping, aspirating). To the extent possible, the empty container should be dry. However, under no circumstances can an empty container have more than one inch of residue remaining at the bottom, or more than 3% by weight of the total capacity, whichever is less.

Containers that are not empty must be managed based on the characteristics of the contained material.

Other Handling Considerations

Containers which contain acutely hazardous waste must be triple rinsed using a solvent capable of removing the contents. The rinsate must then be disposed of as a hazardous waste or used for the chemical's intended purpose. The container is then considered non-hazardous. Contact the site's *Environmental Representative* for assistance in determining if you have an acutely hazardous waste

Aerosol cans are considered empty when the pressure in the can approaches atmospheric.

Typical Waste in this Category

- Barrels and Drums
- Pails and cans
- Compressed gas cylinders and aerosol cans
- Other chemical containers

Source of Waste

- Construction
- Drilling operations
- Completion/workover operations
- Operations

Safety Considerations

Avoid physical contact with residue in empty containers, especially, if unsure of original contents. If some liquid has spilled on the outside surfaces of the container, be sure to wear protective gloves and clothing prior to handling. Consult MSDS for the original contents.

Waste Minimization Options

People/Procedures

- Return the container to the original supplier.
  - No cleaning of drums is necessary when drums are being returned to the supplier.
- Establish a "network inventory" within operational areas to reduce the number of containers.

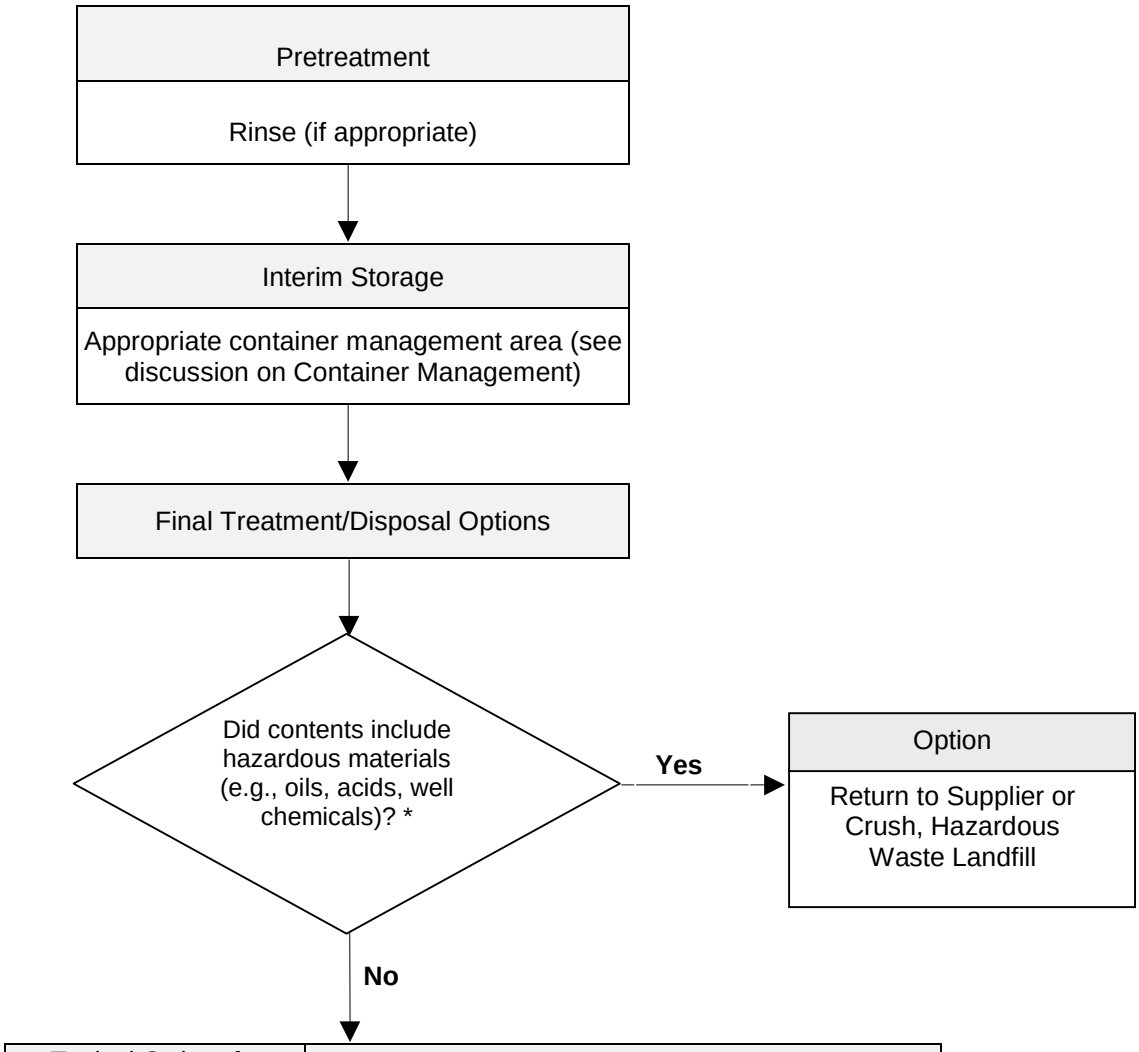
Equipment/Facilities

- Use bulk tanks or storage tanks and buy product in bulk.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Option
1	Send to drum reconditioner
2	Crush, sell for scrap
3	Crush, non-hazardous waste landfill

* Empty paint containers, regardless of size, are not considered to be hazardous waste provided that all of the following conditions are met:

1. The containers have been drained so that only a thin film of paint remains in them.
2. They are completely dried so that they contain only solidified paint.
3. They contain no toxic or ignitable vapors arising from paint or solvent thinners.
4. They contain no other extraneous hazardous materials (e.g. paints with heavy metals).

Section 2.1 Waste Specific Guidance	Topic 2.1.4 Batteries

Definition

Batteries used in various field and plant operations: spent nickel-cadmium, lithium, mercury-cell, and lead-acid batteries.

Typical Wastes in This Category

- Spent or damaged vehicle or equipment batteries

Typical Waste Sources

- Oil and gas production facilities
- Vehicles, engines, emergency power systems
- Instruments/small equipment

Safety Considerations

Wear protective gloves when handling batteries. Do not damage or crack batteries; the contents may be hazardous.

Waste Minimization Options

People/Procedures

- Evaluate change-out frequency.

Equipment /Facilities

- Use rechargeable batteries, where practical.
- Use low power switches.
- Use solar power.
- Use batteries made of less hazardous materials.

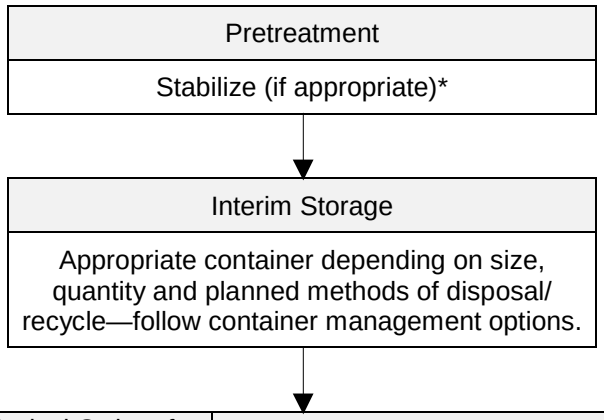
Process

- Evaluate need for battery versus generator back-up.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle (authorized recycler only)
2	Hazardous waste landfill

* If battery is cracked/damaged and leaking.

Section 2.1 Waste Specific Guidance	Topic 2.1.5 Cement and Concrete Wastes (Including Cement-Contaminated Soil)

Definition

Excess liquid cement that was not used during well cementing operations, loose fragments of solidified cement dislodged by the bit while drilling out casing cement jobs, concrete debris from construction operations, and soil containing cement.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Construction
- Drilling operations
- Completions/workover operations

Safety Considerations

Avoid ingestion or physical contact with liquid. Wear protective gloves when handling the waste. Consult original MSDS for details.

Waste Minimization Options

People/Procedures

- Where possible, order less cement to reduce excess.
- Use excess cement for other applications/jobs.
- Consider using liquid additives to avoid discarding unused pre-blended bulk cement.
- Improve storage and handling procedure to avoid contaminating dry cement.
- Crush and use for fill, road base, or erosion control material.
- Use to stabilize/solidify other waste streams.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage	
Solids	Liquids
Bulk pad (cover if leachable product is present)	Tank or container

Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle/reuse
2	Onsite burial
3	Non-hazardous waste landfill

Section 2.1 Waste Specific Guidance	Topic 2.1.6 Cement-Contaminated Drilling Mud

Definition

Drilling fluid (mud) contaminated with cement during cementing operations.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Drilling operations
- Completions/workover operations

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves when handling the waste. Consult original MSDS for details.

Waste Minimization Options

<u>People/Procedures</u>

- It may be possible to treat cement-contaminated mud with bicarbonate and continue to use.
- Consider using cement-contaminated mud in a mud to cement program.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Storage tank, mud tank, or drilling pit

Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle (e.g., dry and use for landfill cover)
2	Onsite burial

Section 2.1 Waste Specific Guidance	Topic 2.1.7 Completion and Workover Fluids

Definition

Fluids used during well completions and workovers. These fluids may include used or unused materials.

Typical Wastes in This Category

- Cement-contaminated mud
- Acid returns
- Solvents

Typical Waste Sources

- Well completions and well workovers

Safety Considerations

Avoid physical contact with or ingestion of the waste. Wear protective eye gear and protective clothing when handling. Consult the MSDS for the original materials.

Waste Minimization Options

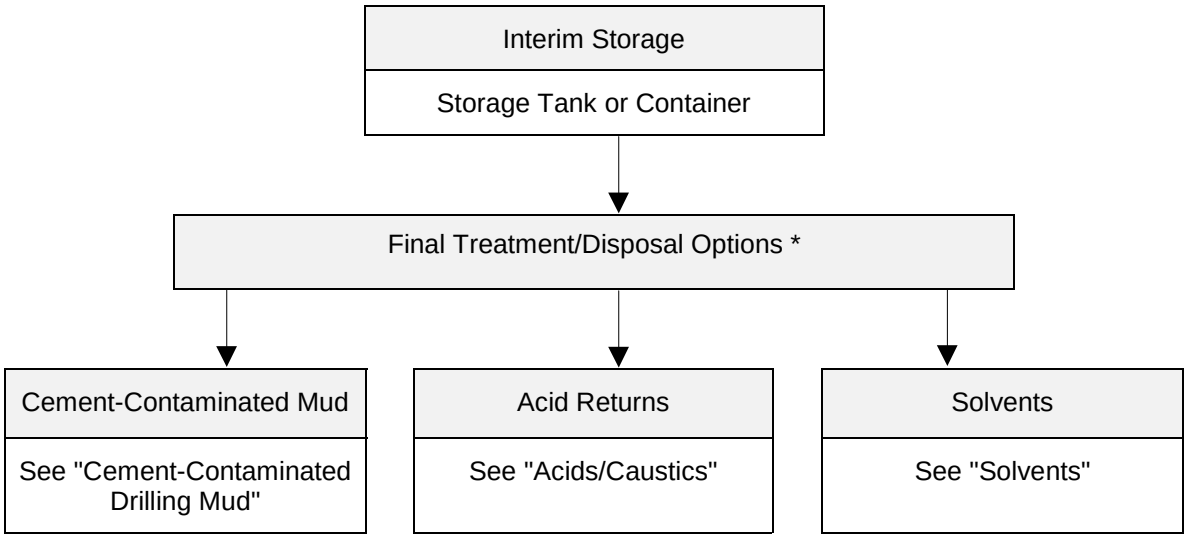
People/Procedures

- Substitute raw materials (less toxic or more recyclable).
- Use excess fluids on next job.
- Reuse fluids until spent or neutral.
- Dewater fluids to reduce volume.
- Evaluate workover frequency/well maintenance schedule.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



***** In general, if these workover/completion fluids are well segregated, they can be handled as indicated above. If, however, there are mixtures, multi-step management processes may be required. For example, an acid return with xylene or ethylene glycol monobutyl ether content might be neutralized to a moderate pH prior to managing the waste for the solvent.

Section 2.1 Waste Specific Guidance	Topic 2.1.8 Construction Debris

Definition

Concrete waste, wood, metal, glass, and other scraps or by products of construction activities. Most of these wastes tend to be inert.

Typical Wastes in This Category

- Pallets and other wood debris
- Scrap metal
- Site clearing (vegetation debris)
- Cement and concrete wastes (including cement-contaminated soil)
- Glass

Typical Waste Sources

- Activities associated with site clearing and construction of facilities, buildings, pipelines, roads, etc.

Safety Considerations

Wear proper protective clothing for the type of waste. Scrap metal, pallets and other wastes may have sharp edges or protrusions.

Waste Minimization Options

People/Procedures

- Order items in bulk.
- Recycle/reuse pallets, containers (on site and in community).
- Take steps to avoid/minimize rework.
- Evaluate needs for site clearing and methods available.
- Chip wood and plant debris for soil additive or erosion control contaminated soil (hydrocarbon).
- Segregate waste prior to disposal.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Roll-off bin or stockpile (keep site tidy; no special containment requirements for inert materials)

Final Treatment/Disposal Options	
Vegetation Debris	See waste specific topic
Cement and Concrete Wastes	See waste specific topic
Cement-Contaminated Soil	See "Cement and Concrete Wastes"
Paint (and Other Coating) Waste	See waste specific topic
Oil Contaminated Soil	See "Contaminated Soil (Hydrocarbon)"
Pallets and other wood debris	See "Vegetation Debris"
Scrap Metal	See waste specific topic
Glass	See waste specific topic

***** If the metal is a container that has been in contact with organic liquids or toxic chemicals, it will be rinsed and crushed.

** Large pieces of metal (e.g., wrecked vehicles, engine blocks, etc.) will not be buried.

Section 2.1 Waste Specific Guidance	Topic 2.1.9 Contaminated Soil (Hydrocarbon)

Definition

Soil impacted by hydrocarbons (oil) during the course of routine operation and maintenance or as a result of accidental releases.

Typical Wastes in This Category

- Crude-contaminated soil
- Fuel-contaminated soil
- Hydrocarbon-based solvents or well chemicals-contaminated soil
- Vehicle/equipment fluids-contaminated soil

Typical Waste Sources

- Spills or leaks located near pumps, pumping units, headers, manifolds, well test units, storage tanks, tank loading racks, well cellars, gathering lines, material storage/injection facilities and vehicle maintenance

Safety Considerations

Avoid ingestion of the waste. Wear protective equipment to minimize or prevent contact with the waste. Consult the MSDS for the original materials.

Waste Minimization Options

People/Procedures

- Use for berms or roadmix (if non-hazardous).
- Minimize oil releases and recover oil as a liquid (for reprocessing) when possible.

Equipment/Facilities

- Use drip pans and sorbents to catch drips and small leaks.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Container (drum, roll-off bin)
On bulk pad or plastic sheeting

Typical Order of Preference	Final Treatment/Disposal Options
1	In situ land treatment (bioremediation) *
2	Composting *
3	Non-hazardous waste landfill **

* The typical target for treatment of oil-contaminated soil is 1 weight percent (or less) total petroleum hydrocarbon (per USEPA Method 418.1 or equivalent) remaining. Higher or lower concentrations may be appropriate on a case-by-case basis. Small amounts of contaminated soil at drilling sites may be disposed of in the lined reserve pit.

** If hydrocarbon is hazardous, then impacted soils should go to the incinerator or the hazardous waste landfill.

Section 2.1 Waste Specific Guidance	Topic 2.1.10 Contaminated Soil (Water-Based Drilling Fluids)

Definition

Soil impacted by water-based drilling fluids (muds) during the course of routine drilling and workover operations or impacted as a results of accidental releases.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Spills or leaks located near pumps, storage tanks, solids control equipment, etc.

Safety Considerations

Avoid ingestion of the waste. Wear protective equipment to minimize or prevent contact with the waste. Consult the MSDS for the original materials.

Waste Minimization Options

People/Procedures

- Use for berms or roadmix (if non-hazardous).
- Maintain good housekeeping practices (e.g., minimize drips and leaks; use drip pans; etc.).

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
None required

Typical Order of Preference	Final Treatment/Disposal Options
1	Leave in place/bury
2	Non-hazardous waste landfill/cover

* If the water based drilling fluid contains additives of environmental concern or high salt (e.g. chlorides) concentrations, send the material to appropriate landfill. As appropriate, the material may be used for landfill cover.

Section 2.1 Waste Specific Guidance	Topic 2.1.11 Domestic Waste/Trash

Definition

Discarded items from the kitchen, bathroom, laundry, warehouse, offices, etc. Many of these items may be biodegradable; others will be inert.

Typical Wastes in This Category

- Food wastes (e.g., scraps, glass jars, aluminum and tin cans)
- Paper, envelopes, and other office supplies
- Cardboard and other packaging materials
- Disposable plates, cups, utensils
- Light bulbs (non-fluorescent)

Typical Waste Sources

- See above

Safety Considerations

Handling practices should be appropriate for the types of waste collected.

Waste Minimization Options

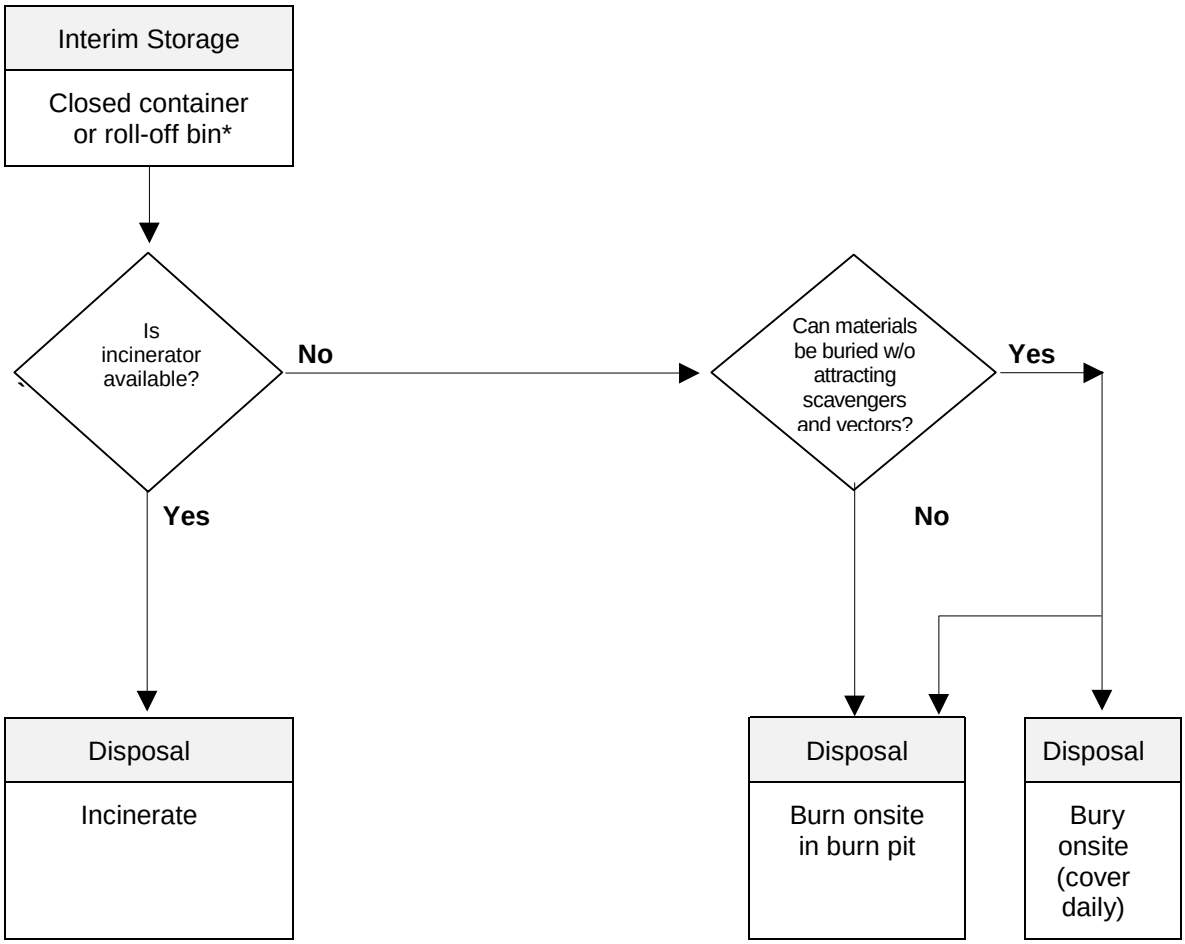
People/Procedures

- Segregate reusable materials for community reuse programs.
- Order items in bulk to reduce packaging.
- Use reusable rather than disposable items.
- Prepare food only for the number of people expected.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



* Segregate food waste and other types of waste where possible.

Section 2.1 Waste Specific Guidance	Topic 2.1.12 Drill Solids/Cuttings (Fresh Water Gel and PHPA Mud)

Definition

Fragments of rocks dislodged by the bit and brought to the surface in the drilling mud. May be coated with drilling mud, including additives, such as barite, that may settle out. These materials may contain organics or heavy metals.

If an oil or solvent based pill is added during drilling, associated cuttings should be segregated and treated as oily wastes.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Drilling operations
- Completions/workover operations

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves when handling the waste. Consult original MSDS for details about constituents.

Waste Minimization Options

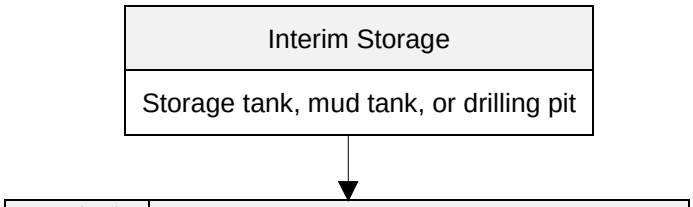
People/Procedures

- Use alternative mud systems to minimize hole sloughing.
- Optimize drilling mud additive usage to minimize hole sloughing.
- Substitute additives with less toxic alternatives.
- Reuse cuttings for road base, cement, etc.
- Optimize shale shaker operation to recover mud.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal *
1	Onsite burial
2	Dry and use for landfill cover
3	Land application
4	Non-hazardous waste landfill

* Drilling muds and fluids that contain only approved additives will be non-hazardous, provided they do not contain substantial concentrations of toxic substances from other sources (e.g., metals from geologic deposits encountered during drilling operations). Materials determined to be hazardous should be sent to the hazardous waste landfill and may require stabilization prior to disposal.

Section 2.1 Waste Specific Guidance	Topic 2.1.13 Drill Solids/Cuttings (Oil-Based)

Definition

Fragments of rocks dislodged by the bit and brought to the surface in the oil-based drilling fluid (mud) (e.g., diesel, mineral oil). May be coated with drilling fluid, including additives, such as barite, that may settle out.

Typical Wastes in This Category

- Diesel and mineral oil-based drilling fluids ("muds")
- Water-based cuttings from the oil producing zone
- Cuttings generated after introduction of an oil-based pill

Typical Waste Sources

- Drilling operations
- Completions/workover operations

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves when handling the waste. Consult original MSDS for details about constituents.

Waste Minimization Options

People/Procedures

- Segregate oil-based cuttings from water-based cuttings.
- Use low toxicity fluid as a substitute for diesel (e.g., mineral oil-based mud).
- Select low toxicity additives where practical.
- Optimize shale shaker operation to recover mud.

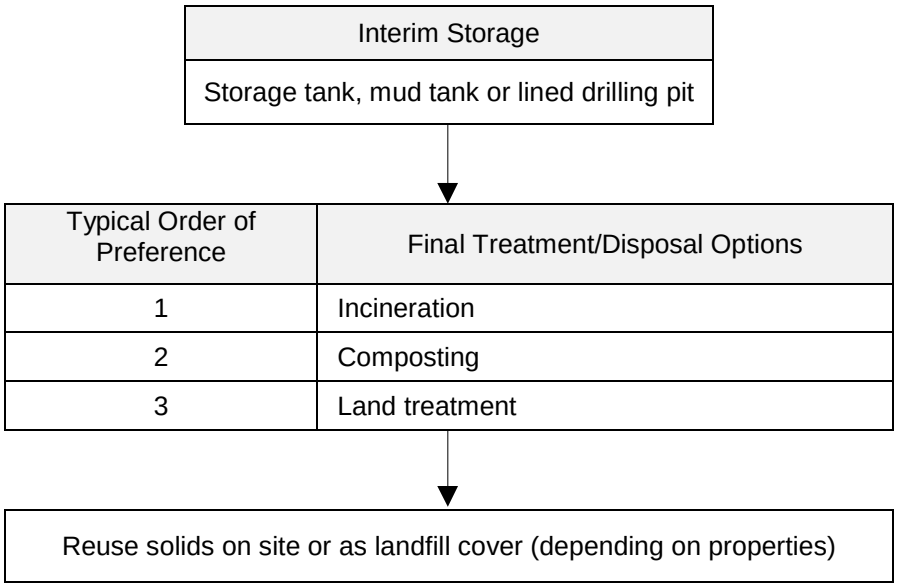
Process

- Reuse cuttings in cement manufacture process.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Note: Oily drill solids/cuttings that have been stabilized and where the oil contamination is 1 weight percent (or less) total petroleum hydrocarbon may also be buried in a lined pit and sealed in plastic to isolate the solids from the environment.

Section 2.1 Waste Specific Guidance	Topic 2.1.14 Glycol and Antifreeze

Definition

This guideline applies to waste glycol (e.g., ethylene glycol) or waste fluids or solids that contain glycol (e.g., filters, contaminated soil, etc.).

Typical Wastes in This Category

- Antifreeze, coolants, deicing and heat transfer fluid
- Soils contaminated with these fluids
- Glycol filters

Typical Waste Sources

- Vehicles
- Liquid-cooled engines
- Dehydrators

Safety Considerations

Avoid physical contact with or ingestion of the waste. Consult the MSDS for the original materials. Note: some glycol solutions may be toxic to humans or animals if orally ingested.

Waste Minimization Options

People/Procedures

- Substitute raw materials.
- Use material until completely spent.
- Equipment maintenance to prevent fluid contamination.

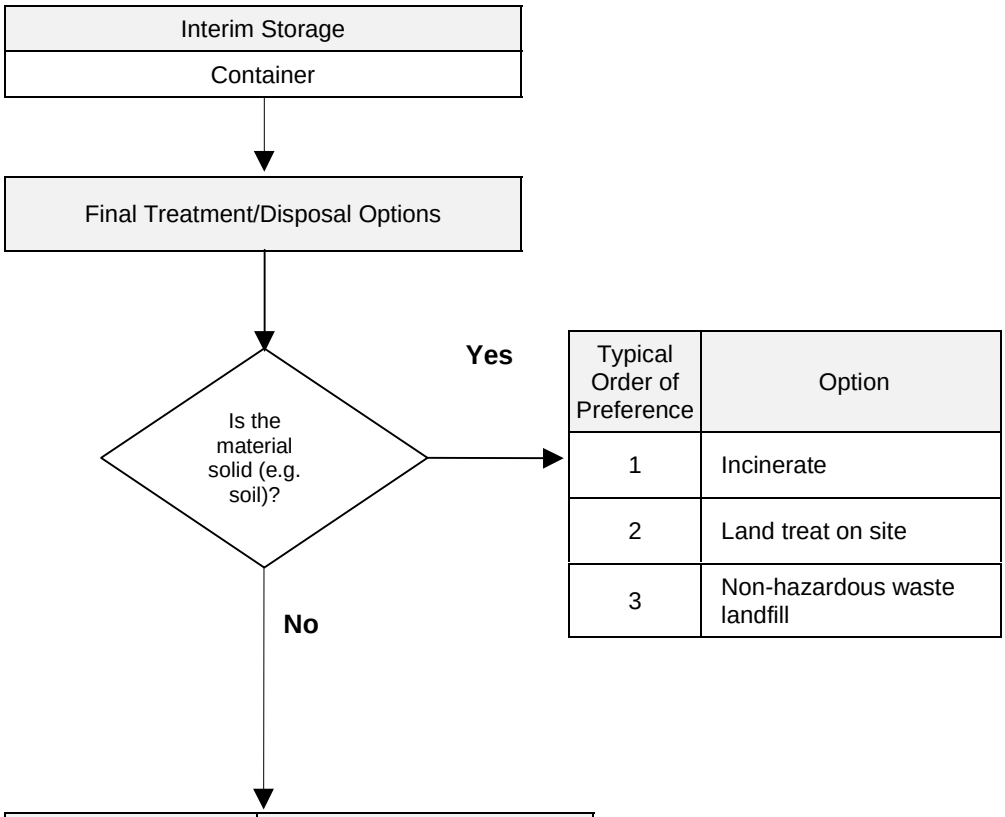
Process

- Send off site for recycle/treatment rather than disposal.
- Filter, strengthen and reuse in equipment.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Option
1	Incinerate
2	Land treat on site
3	Non-hazardous waste landfill

Typical Order of Preference	Option
1	Recycle/Reclaim
2	Incinerate

Section 2.1 Waste Specific Guidance	Topic 2.1.15 Hydrotest Fluid

Definition

Water used to test piping and vessels for integrity prior to placing them in service. May contain biocides, corrosion inhibitors, or other additives and may pick up oil or grease from the unit being tested.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Pipeline integrity testing
- Vessel and tank integrity tests

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves when handling the waste. Consult MSDS sheets for additives, if present.

Waste Minimization Options

People/Procedures

- Reuse fluids to test other pieces of equipment or other segments of pipeline.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Equipment tested
Tank

Typical Order of Preference	Final Treatment/Disposal Options
1	Surface discharge *
2	Inject with produced water

* Pretreatment and/or testing may be necessary prior to discharge. All discharges must be in accordance with the Environmental Management Plan.

Section 2.1 Waste Specific Guidance	Topic 2.1.16 Injection Water Filter Cartridges

Definition

Solid, spent injection-water filter cartridges used to remove solids and hydrocarbons from produced water prior to reinjection (for disposal or waterflood).

Typical Wastes in This Category

- Spent injection water filter cartridges containing solids (e.g., sand, scale, etc.) and trace hydrocarbon

Typical Waste Sources

- Filters on injection water systems

Safety Considerations

Avoid ingestion of the waste. Wear gloves, as appropriate.

Waste Minimization Options

- Use backwash filters or use different filtration system.
- Completely spend cartridges before disposal.
- Minimize oil content.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Container
Roll-off bin

Typical Order of Preference	Final Treatment/Disposal Options
1	Non-hazardous waste landfill *
2	Incinerate

* If filter cartridge tests as hazardous waste (e.g., because of hydrocarbon, metal, etc.) it may need to be disposed of in a hazardous waste landfill.

Section 2.1 Waste Specific Guidance	Topic 2.1.17 Lube Oil/Motor Oil (Used)

Definition

Petroleum-based lubricating greases and motor oils, as well as synthetic oils used for these same purposes. These oils may be contaminated by impurities (e.g. metals) as a result of their use.

Typical Wastes in This Category

- Waste lube oil and other lubricating greases
- Waste motor oil
- Transmission oil

Typical Waste Sources

- Equipment and vehicle maintenance and repair (e.g. of internal-combustion engines, pumps, compressors, etc.)

Safety Considerations

Avoid physical contact or ingestion. Handle with care to avoid spills and contamination.

Waste Minimization Options

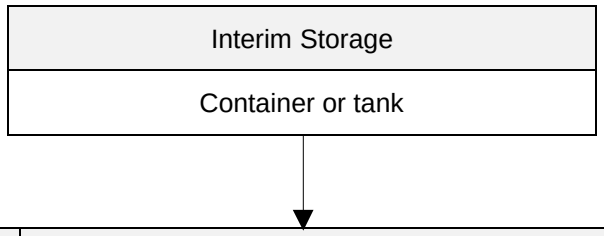
<u>People/Procedures</u>

- Evaluate changeout frequency.
- Use higher-grade oils with longer life.
- Periodic equipment maintenance to minimize leaks.
- Change filters more often to extend oil life.
- Reduce volumes required for well operations.
- Segregate – try not to blend with dissimilar wastes.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle to crude stream
2	Recycle/reclaim offsite at commercial reclaimer or refinery
3	Incinerate

Section 2.1 Waste Specific Guidance	Topic 2.1.18 Medical Waste/Trash

Definition

Wastes generated by medical procedures. Many of these may be potentially biohazardous materials.

Typical Wastes in This Category

- Bandages, gauze and other materials contaminated by body fluids
- Specimens, lab cultures, etc.
- Plastic syringes, tubing, etc.
- Needles, glass and other “sharps”

Typical Waste Sources

- First aid
- Routine clinical procedures

Safety Considerations

Proper PPE should be worn at all times to minimize exposure to infectious/biohazardous materials. Needles and other sharp objects should be contained in "sharps" disposal containers, and all potentially biohazardous wastes should be stored and transported in biohazard bags.

Waste Minimization Options

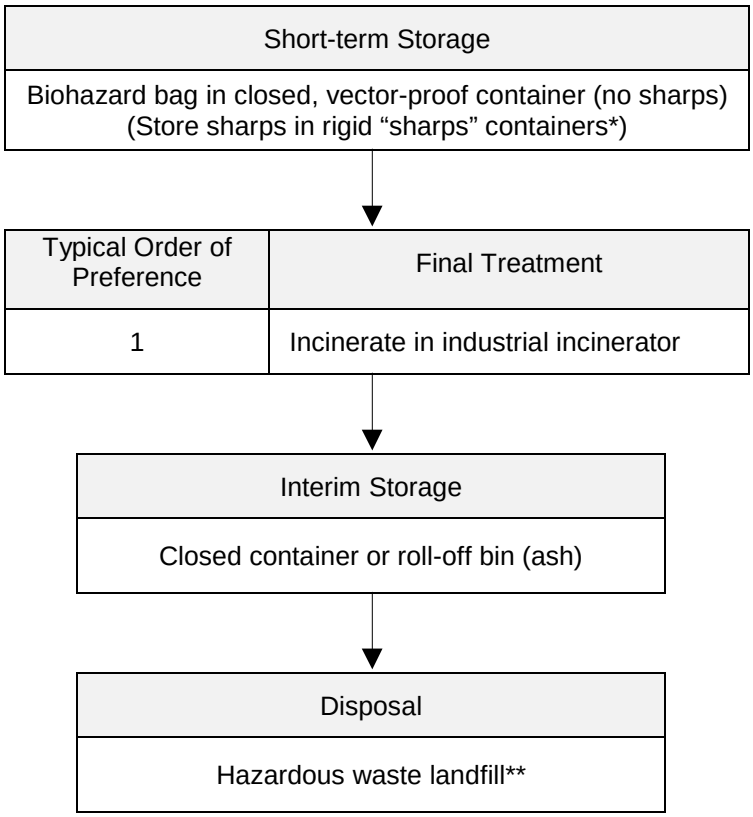
People/Procedures

- Segregate non-biohazardous items.
- Use equipment that can be sterilized and reused rather than disposal items, where appropriate.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



* Sharps should be processed to remove the infectious (biohazard) characteristic and to limit the potential for personal contact (e.g., buried in a hazardous waste landfill in the sharps container).

** As appropriate, stabilize prior to disposal if leachable metals are present at levels of concern, see **Topic 4.0.3 (Sampling and Classifying Wastes)**.

Section 2.1 Waste Specific Guidance	Topic 2.1.19 Oil Filters and Oil Filter Sludge

Definition

Contaminants collected on filters may be hazardous materials; thus additional testing may need to be performed on them to determine if they are hazardous wastes prior to disposal. If the contaminants in the filters are determined to be hazardous, the filters must be disposed of as hazardous wastes.

The filters may be sock, cartridge, or canister type filters. If the material of which the filter and filter housing is made (e.g., a lead alloy) is determined to be hazardous, the filter must be disposed of as a hazardous waste.

Typical Wastes in This Category

- Fuel filters
- Oil filters

Typical Waste Sources

- Construction
- Drilling operations
- Completions/workover operations
- Vehicle/equipment engines

Safety Considerations

Avoid physical contact. Wear protective gloves when handling. Minimize handling: store in a closed container.

Waste Minimization Options

People/Procedures

- Evaluate changeout frequency.
- Identify and address causes for filter changeout.
- Use higher-grade oil with longer life.

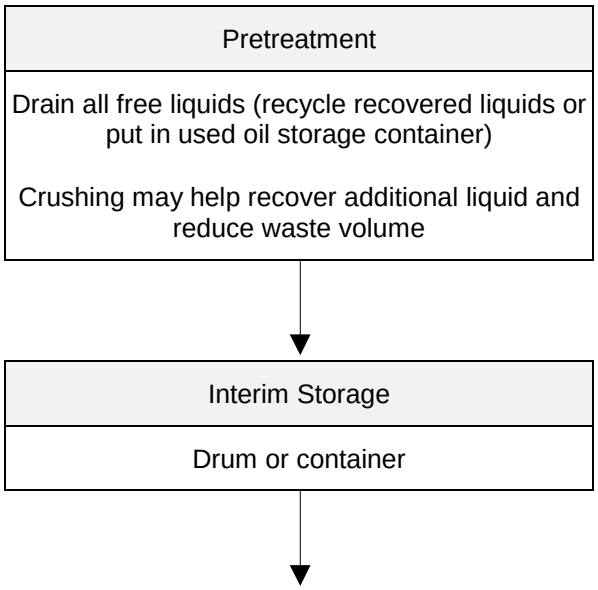
Equipment/Facilities

- Use recyclable metal filters instead of disposable filters.
- Use backwash filters or use different filtration system.
- Evaluate the use of cyclone (centrifugal) filtering system.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Incinerate
2	Non-hazardous waste landfill *

* If filter cartridge is made of a hazardous material or if the oil tests above criteria for maximum metals content, then the filter may need to be disposed of in a hazardous waste landfill.

Section 2.1 Waste Specific Guidance	Topic 2.1.20 Oily Debris

Definition

Oil-stained debris generated during routine operations, maintenance activities and oil spills that is not contaminated with hazardous constituents other than those typically found in petroleum (i.e., no solvents, pesticides, etc.).

Typical Wastes in This Category

- Oily rags, clothing, gloves, pump packing, pipe, wood hoes, rakes shovels, etc.

Typical Waste Sources

- Routine maintenance and operation
- Oil spill clean-up activities

Safety Considerations

Avoid physical contact with or ingestion. Consult the MSDS for the original materials. Consider potential that waste may be flammable, when appropriate.

Waste Minimization Options

People/Procedures

- Use washable protective equipment.
- Use washable tools/equipment.
- Minimize oil spills.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Pre-Treatment

Separate any free oil (recycle oil or place in waste container)

↓

Interim Storage

Container or roll-off bin (no free or dripping oil)

↓

Final Treatment/Disposal Options

Note: If the waste stream is covered by another Guideline (e.g., oily scrap metal) refer to the other guideline.

↓

Is debris saturated with oil or likely to be classified as hazardous waste?

Yes →

Typical Order of Preference	Option
1	Incinerate
2	Hazardous waste landfill

No ↓

Typical Order of Preference	Option
1	Recycle (liquid, etc.)
2	Incinerate
3	Non-hazardous waste landfill

Section 2.1 Waste Specific Guidance	Topic 2.1.21 Paint (and Other Coating) Waste

Definition

Liquid and semi-liquid paint (and other coating) wastes generated in field and plant maintenance operations and spent abrasive blast media.

Excluded from this category are dried, empty paint cans, paint brushes, can liners, and water-based paints which, by definition, are non-hazardous.

Typical Wastes in This Category

- Unused or contaminated paint (and other coatings)
- Abrasive blasting media containing coating chips and potentially metal from the vessel being cleaned for coating.

Typical Waste Sources

- Construction
- Equipment and facilities maintenance

Safety Considerations

Avoid physical contact, ingestion, or breathing solvent vapors and blast media dust. Wear protective clothing when handling. Consult original MSDS. Consider the potential for the waste to be flammable, when appropriate.

Waste Minimization Options

People/Procedures

- Use product in its entirety/order only amount needed.
- Properly store materials/keep labeled.
- Evaluate paint schedule/limit types and colors.
- More durable coatings over properly prepared surfaces.
- Use water-based coatings instead of oil based coatings.
- Use solvent still to recover paint thinner, etc.
- Blast in central area where media can be reused.
- Use blast media that does not contain metals, silica, etc.

Equipment/Facilities

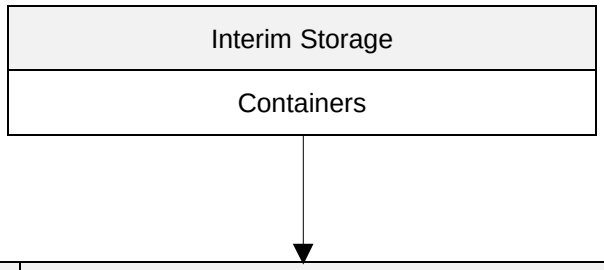
- Try not to use heavy metal (e.g., lead, chrome) paints.

Use paint pot liners and throw-away brushes, rollers, etc. to minimize the need for cleanup solvents, thinners, etc.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle/Reclaim (liquids only)
2	Incinerate (liquid or solid)
3	Hazardous or non-hazardous waste landfill (solid only)*

* Liquids must be solidified prior to disposal in a landfill.

Section 2.1 Waste Specific Guidance	Topic 2.1.22 Produced Water

Definition

Water produced in association with oil and gas. This waste may contain salts (e.g., chlorides); hydrocarbons; well treatment, oil separation and produced water treatment chemicals (corrosion inhibitors, biocides, oxygen scavengers, demulsifiers, clarifiers, etc.).

Typical Wastes in This Category

- Produced water from separators and other process equipment

Typical Waste Sources

- Well testing
- Crude oil and gas production

Safety Considerations

Avoid ingestion and physical contact. Wear protective gloves when handling the waste. See MSDS for treatment chemicals.

Waste Minimization Options

People/Procedures

- Use produced water in lieu of other fluids for completion fluids.

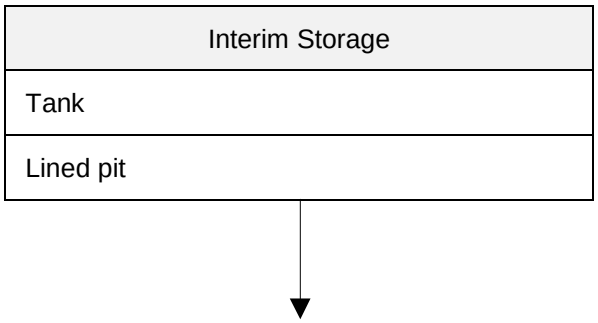
Process

- Install down-hole zone isolation, and selective perforation to reduce volume of produced water produced.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Injection *

* Treatment may be required prior to injection.

Section 2.1 Waste Specific Guidance	Topic 2.1.23 Scrubber Wastes

Definition

Caustic or non-caustic soda or soda ash liquid solutions generated by scrubbing systems. Aqueous sodium hydroxide or sodium carbonate scrubber waste solutions from crude oil-burning steam generation units are typically non-hazardous. Wastes are typically caustic, but could be acidic if not enough caustic is used.

Typical Wastes in This Category

- Caustic soda and soda ash scrubbing solutions
- Non-caustic soda and soda ash streams

Typical Waste Sources

- Steam generation units
- Gas/oil cleanup units
- Air pollution control or sulfur dioxide scrubber waste from flue gas emission control in combustion of fossil fuels

Safety Considerations

Avoid physical contact with or ingestion of the waste. Wear protective clothing. Consult the MSDS for the original materials. May be corrosive and/or reactive.

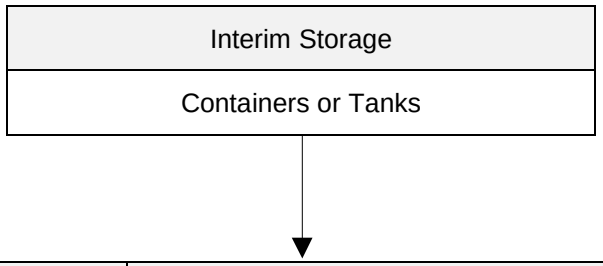
Waste Minimization Options

- Substitute raw materials.
- Completely spend material before disposal.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Inject into produced water stream for reinjection
2	Inject into waste water stream

Section 2.1 Waste Specific Guidance	Topic 2.1.24 Separator/Vessel Sludges and Pigging Wastes

Definition

Separator/vessel sludges consist of produced solids that accumulate in production vessels and equipment and that are typically recovered when performing maintenance on these vessels. These sludges are often called tank bottoms.

This waste category includes pigging waste from pipelines.

Typical Wastes in This Category

- Scrubber sludge
- Scraper trap/sludges from production gathering lines
- Mixtures of oily sand, silt, rust and scale
- Parrafins

Typical Waste Sources

- Separators, clarifiers, product storage tanks, slop oil tanks, slop oil skimmers, produced water treatment pits/ponds
- Pigging wastes

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves, clothing and possibly breathing apparatus if necessary when handling the waste. Consult MSDS for crude oil.

Waste Minimization Options

People/Procedures

- Use emulsion breakers to recover oil from sludges.
- Perform downhole diagnostics to ensure gravel packing is intact.
- Minimize downhole corrosion.

Process

- Reduce sand production by gravel packing wells, installing slotted liners, and selective perforating.
- Filter out solids to recover oil and water.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Tank or Container

Typical Order of Preference	Final Treatment/Disposal Options
1	Incinerate
2	Compost
3	Landfill (hazardous or non-hazardous)

Section 2.1 Waste Specific Guidance	Topic 2.1.25 Slop Oil

Definition

Slop oil consists of crude oil recovered after a spill or process upset. Slop oil may also include off-specification crude oil. It is generally collected in a sump and returned to the system for reprocessing.

Typical Wastes in This Category

- Slop oil
- Off-specification crude oil

Typical Waste Sources

- Drilling and completion activities
- Operations activities

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves (and clothing as appropriate) when handling.

Waste Minimization Options

People/Procedures

- Implement a spill reduction program.

Equipment/Facilities

- Replace/repair leaking components (e.g., valves, flanges, pump packing, etc.), when necessary.

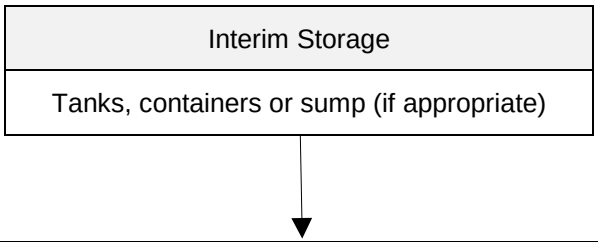
Process

- Implement process modifications to capture slop oil and return it to the production system.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle to crude stream
2	Use as fuel
3	Incinerate in industrial incinerator

Section 2.1 Waste Specific Guidance	Topic 2.1.26 Solvents

Definition

Petroleum-based waste solvents such as kerosene, Varsol, paint thinner or stripper, gasoline, toluene and xylene used in cleaning operations.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Routine operation and maintenance activities

Safety Considerations

Avoid physical contact and ingestion. Consult original MSDS.

Waste Minimization Options

People/Procedures

- Use proper inventory control.
- Use water-based solvents.
- Evaluate cleaning schedule.
- Use product in its entirety.
- Reuse product until it is spent.
- Avoid using halogenated solvents.

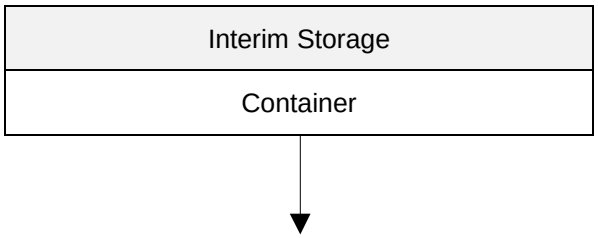
Equipment/Facilities

- Eliminate equipment leaks to minimize cleaning requirements.
- Reprocess for reuse (e.g., filter or gravity settle to separate solids).

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle to crude stream (hydrocarbon-based solvents)
2	Recycle/reclaim
3	Incinerate in industrial incinerator

Section 2.1 Waste Specific Guidance	Topic 2.1.27 Tires

Definition

Tires used on automobiles, trucks, carts, and heavy equipment until worn or damaged.

Typical Wastes in This Category

- See above

Typical Waste Sources

- See above

Safety Considerations

Depending on activity, wearing PPE such as leather gloves may be appropriate.

Waste Minimization Options

People/Procedures

- Check pressures and wheel alignments to reduce wear/prolong tire life.
- Use as packing material or as protection in materials storage yards.
- Provide to local population for use in manufacturing shoes, etc.
- Use in upgrading local roads (pavement amendment).

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
As practical with provisions for vector control *

Typical Order of Preference	Final Treatment/Disposal Options
1	Send to tire recycler
2	Reuse for erosion control, grind for use in road materials (e.g., asphalt amendment) or other purpose.
3	Non-hazardous waste landfill **
4	On site burial **

* Steps must be taken to ensure that the tires do not collect water and form a habitat for mosquitoes and other vectors.

** If buried, measures should be taken to prevent tires from floating to the surface over time.

Section 2.1 Waste Specific Guidance	Topic 2.1.28 Unused, Spent, Expired, and Waste Chemicals and Additives

Definition

Chemicals and additives that may no longer be used for their intended purpose because of contamination, degradation, or change in process. Note: some materials may be covered in other guidelines.

Typical Wastes in This Category

- Drilling fluid additives
- Treatment chemicals (corrosion inhibitor, anti-foulants, biocides, water treatment, etc.)
- Laboratory chemicals (e.g., ferric oxide, titration colorimetric indicators, salts, etc.)
- Medical clinic and laboratory chemicals

Typical Waste Sources

- Drilling and production operations
- Wastewater treatment system
- Water treatment and product oil quality control laboratories
- Medical clinic

Safety Considerations

Avoid physical contact or ingestion of the waste. Consult MSDS for individual chemicals and additives. Wastes may be corrosive, ignitable, reactive, or toxic.

Special Handling Requirements

In some cases, the appropriate disposal option may involve packaging the waste in another container prior to disposal in a hazardous waste landfill or being sent offsite. The practice of putting multiple small containers into a larger container is referred to as a “Lab Pack”. The larger, outer container is the “Overpack” container. Wastes to be put into Lab Packs should be containerized and managed as follows:

1. The inside containers should be securely sealed, non-leaking, and be constructed of a material that does not react dangerously with, be decomposed by, or be ignited by the waste contained therein.

2. The inside containers should be the original material or equivalent compatible material.

3. The inside containers should be overpacked in an open head metal or plastic shipping container of no more than 110-gallon capacity.

4. The inside containers should be surrounded by a sufficient quantity of absorbent material capable of completely absorbing all of the liquid contents inside the

smaller containers: the absorbent material should not be capable of reacting with, being decomposed by, or being ignited by the contents of the inside containers.

5. The metal outer container (overpack) should be full after packing with inside containers and absorbent material.

6. Incompatible waste should not be placed in the same outer container (overpack). Try not to mix hazardous and non-hazardous wastes in the same container.

7. Reactive waste should be rendered non-reactive prior to packaging. Cyanide and sulfide bearing wastes (with cyanide concentration less than 1,000 mg/l) that generate toxic gases when exposed to pH conditions between 2 and 12.5 do not need to be rendered non-reactive prior to packaging.

8. Sufficient absorbent should be used so that inside containers are packed in such a manner so that they do not come in contact with one another.

9. The overpack container must have appropriate labels to alert persons to the containers contents and the potential hazards.

Waste Minimization Options

People/Procedures

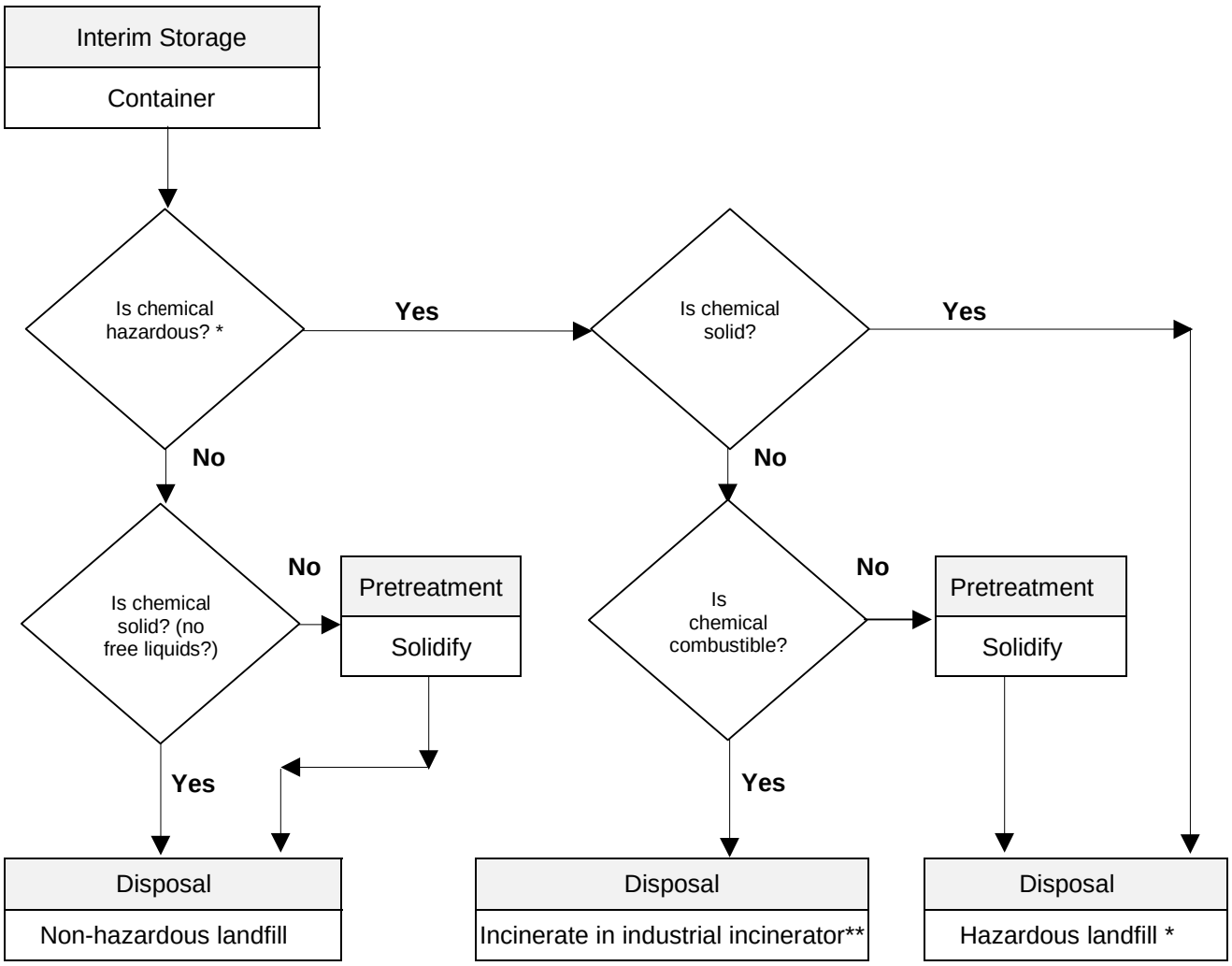
- Use chemical until it is spent or consumed.
- Order smaller quantities of degradable chemicals to avoid expiration.
- Recycle chemicals if practical (e.g., chemicals that are normally put into, or become entrained in, the crude or produced water may be able to slowly be blended into these streams).
- Reuse in less critical application if practical.
- Substitute raw materials.
- Return excess (unopened) chemical to supplier.
- Keep containers closed to prevent potential contamination by rain, dust, etc.
- Store raw materials where they are not exposed to the environment (e.g., rain, wind, sunlight, etc.).
- Keep all containers properly labeled.
- Follow proper storage and dispensing procedures – dispense only the amount needed and do not return “contaminated” material to the raw material.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

If the chemical can be found in another waste category discussed in this section, consult the topic for that waste category for additional information. However, note that options given for another waste stream may not apply to the waste chemical because of differences in chemical concentration (e.g., between pure chemical and the concentration found in a treated water or drilling mud).

WASTE MANAGEMENT OPTION FLOWCHART



* Consult MSDS and **Topic 4.0.3 (Sampling and Classifying Wastes)**.

** Liquid chemicals sent to incinerator should not be explosive, halogenated, high in metals content, or otherwise present a potential for unsafe operations or toxic air emissions.

Section 2.1 Waste Specific Guidance	Topic 2.1.29 Vegetation Debris

Definition

Non-commercially valuable vegetation that is cut/cleared from a site for the purposes of construction or site maintenance.

Typical Wastes in This Category

- Small trees and brush
- Grasses, vines, and other ground cover clippings
- Large trees without commercial value

Typical Waste Sources

- Site clearing/preparation
- Site maintenance

Safety Considerations

Wear appropriate PPE. Debris may have sharp protrusions. Some species of plants may cause skin irritation.

Waste Minimization Options

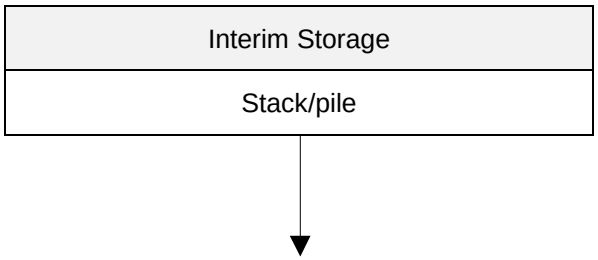
People/Procedures

- Only clear the area required for safe operations.
- Only grub when necessary.
- Make material available to the local population for building materials and fuel.
- Chip small trees and brush and use as soil amendment, as bulking agent for composting, or for erosion mitigation over areas to be reclaimed.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Use to create natural barriers in areas to be reclaimed
2	Use for site stabilization/erosion mitigation
3	Leave on site *
4	Burn**

* Material must be left in a manner that does not promote wildfires or create habitat for vectors. Wood left for use by local inhabitants must be cut up and neatly stacked in manageable pieces (not requiring more than two people to carry).

** Care must be taken to ensure that the resulting fire does not get out of hand. Burning should be done in designated areas only when wind direction is away from camps, villages, and other locations where people would be affected. Written procedures to burn vegetation will be implemented and will include a number of protective measures, including but not limited to: firefighting resources on hand, no/minimal fuel used to assist the combustion process, fire attended at all times, pre-approved residual ash handling procedures, etc.

Section 2.1 Waste Specific Guidance	Topic 2.1.30 Wastewater (Domestic) /Sewage

Definition

Water containing sewage, detergents (e.g., soap, shampoo, laundry detergent, etc.) and materials washed off of people, their clothes, dishware and utensils, kitchen facilities, etc. during cleaning activities.

Typical Wastes in This Category

- Shower water
- Laundry water
- Toilet water
- Kitchen water

Typical Waste Sources

- Camps, laundry, toilets, showers, sinks, dishwashers (see above)

Safety Considerations

Avoid ingestion and contact with waste. Wear appropriate PPE for potentially infectious materials.

Waste Minimization Options

People/Procedures

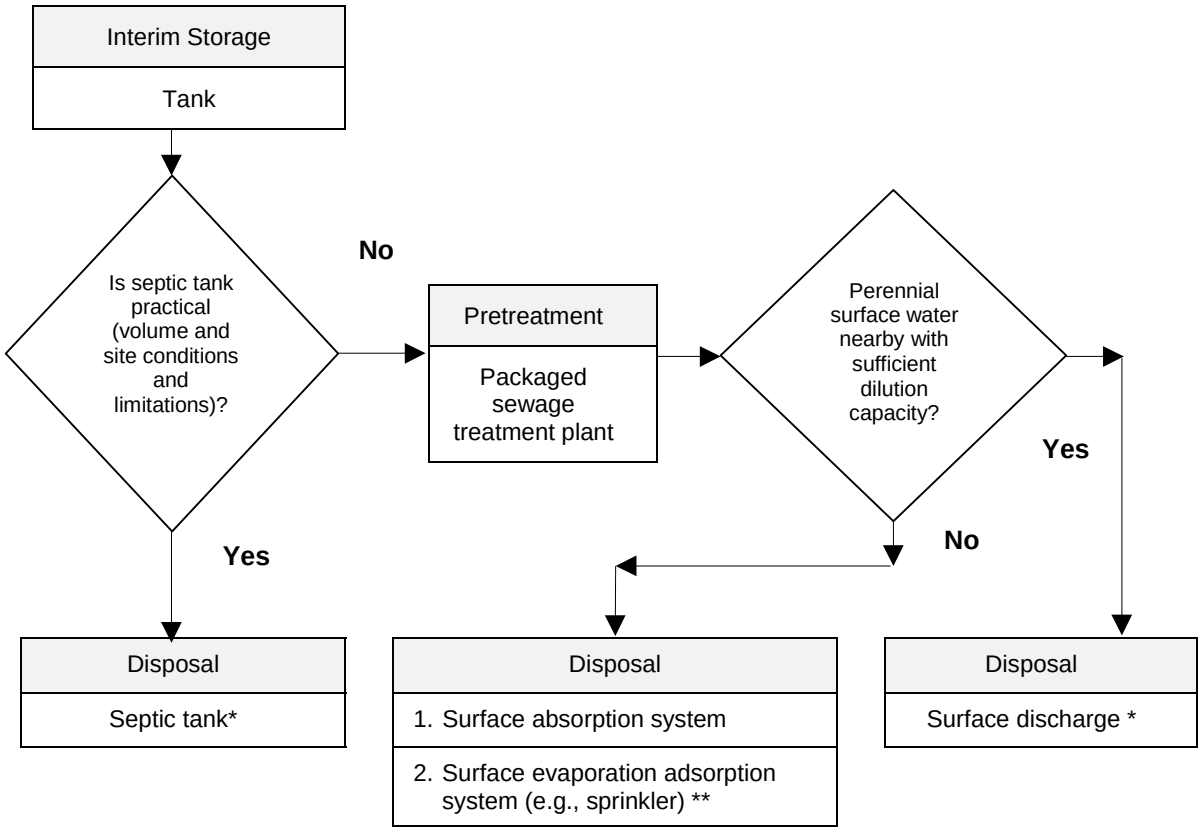
- Use low flow toilets and showers.
- Reuse wash water for other washing applications (moving from less dirty to more dirty applications).

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

The following is an example of the types of wastewater systems that may be used in different phases of the Project or in different locations. The actual methods used will depend on site-specific considerations. Separate protocols for wastewater management may be developed outside the coverage of this plan (e.g., sanitary wastewater treatment systems for “permanent” camps).

WASTE MANAGEMENT OPTION FLOWCHART



* Includes soak pits, septic tanks, leaching fields and/or infiltration systems as required for site conditions.

** Must be pre-approved and performed in manner that avoids soil erosion.

Section 2.1 Waste Specific Guidance	Topic 2.1.31 Wastewater (Oily)

Definition

Water containing small amounts of oil from contact with oily equipment or soil or from oil spill recovery activities

Typical Wastes in This Category

- Rainfall runoff from under/around equipment
- Vehicle and equipment oily wash water
- Water with oil and emulsions recovered during oil spill recovery or clean-up activities

Typical Waste Sources

- See above

Safety Considerations

Avoid ingestion and contact with waste. Wear appropriate PPE for potential oil contact.

Waste Minimization Options

People/Procedures

- Maintain good housekeeping practices to minimize the amount of spilled, dripped, and leaked oil.
- Reuse wash water for other washing applications (moving from less dirty to more dirty applications), as practical.

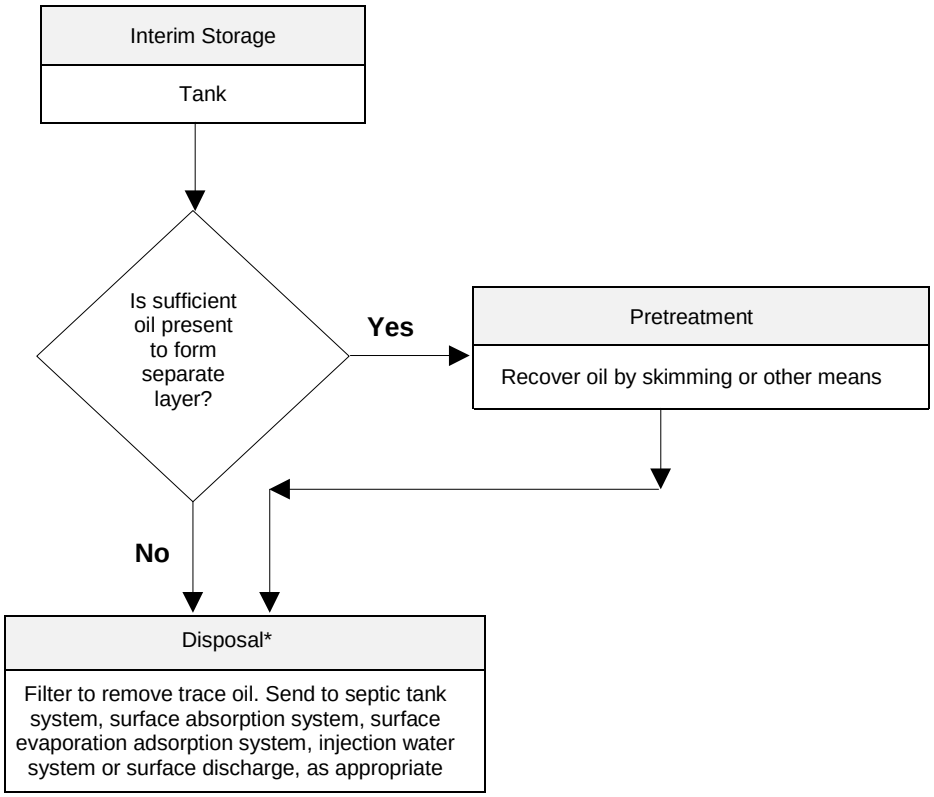
Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

The following is an example of the types of oily wastewater systems that may be used in different phases of the Project or in different locations. The actual methods used will depend on site-specific considerations. Separate protocols for oily wastewater management may be developed outside the coverage of this plan (e.g., produced water treatment).

Note that if oily wastewater is generated near the field facilities, the water may be treated for injection with the produced water if properties are compatible.

WASTE MANAGEMENT OPTION FLOWCHART



*Note: Must be pre-approved. Testing may be required.

Section 2.1 Waste Specific Guidance	Topic 2.1.32 Water Treatment Sludge

Definition

Solids remaining after treatment of domestic wastewater and sewage. These solids are often separated out of the wastewater stream in flocculation, settling, or clarification tanks after disinfection.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Water treatment units

Safety Considerations

Do not ingest or inhale waste. Avoid physical contact. Wear appropriate PPE.

Waste Minimization Options

People/Procedures

- Incorporate anaerobic digester into treatment process.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Sludge drying bed
Tank

Typical Order of Preference	Final Treatment/Disposal Options
1	Landspread and incorporate into surface soil *
2	Dry and landfill

* Avoid clearing land for this purpose (e.g., spread solids over areas that will be revegetated after site abandonment). If land needs to be cleared, leave trees and other large plants in place and spread solids around them.

Section 2.1 Waste Specific Guidance	Topic 2.1.33 Whole Mud (Fresh Water Gel and PHPA Fluids)

Definition

A liquid mixture composed of water, inert solids (barite), reactive solids (clays, bentonite) and additives (lignite, etc.) used to drill wells and perform workovers. May be fresh or saline with a density ranging from 9 to 19 lbs. per gallon.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Drilling operations
- Completions/workover operations

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves when handling the waste. Consult original MSDS for details.

Waste Minimization Options

People/Procedures

- Recover weighting agents (e.g., hematite, barite).
- Reuse spud mud instead of discarding, if possible.
- Store mud for use on next well.
- Minimize volume of mud discarded by preventing contamination with cement returns, where possible.
- Return to vendor (depends on market conditions).

Equipment/Facilities

- Install better solids control equipment.
- Optimize pit size.
- Ensure solids control equipment is running as specified by manufacturer.

Process

- Install and operate closed loop mud systems and/or a central mud plant, where appropriate.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Storage tank, mud tank or drilling pit

↓

Typical Order of Preference	Final Treatment/Disposal Options
1	Landspread
2	Onsite Burial
3	Dry and use for landfill cover

Section 2.1 Waste Specific Guidance	Topic 2.1.34 Whole Mud, (Oil-Based)

Definition

A liquid mixture composed of oil, inert solids (barite) emulsifiers and other additives used to drill wells and perform workovers. Density ranges from 9 to 19 lbs. per gallon. May have high salt concentration in water phase of the emulsion.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Drilling operations
- Completions/workover operations

Safety Considerations

Avoid ingestion or physical contact. Wear protective gloves when handling the waste. Consult original MSDS for details.

Waste Minimization Options

People/Procedures

- Return to vendor or resell.
- Store mud for use on next well.
- Avoid using oil-based muds, when possible.
- Minimize volume of mud discarded by preventing contamination with cement returns, where practical.

Equipment/Facilities

- Install better solids control equipment.
- Optimize pit size.
- Ensure solids control equipment is running as specified by manufacturer.

Process

- Install and operate closed loop mud systems, where practical.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Storage tank, mud tank or lined drilling pit

Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle to crude stream
2	Recycle/reclaim (fuels blending)
3	Incinerate
4	Landfill (non-hazardous, typically)

Section 2.1 Waste Specific Guidance	Topic 2.1.35 Other Miscellaneous Wastes

Definition

Miscellaneous wastes that are not covered by one of the other guidelines in this Section. Typically, these wastes will be generated infrequently or on a one-time basis.

Typical Wastes in This Category

- Miscellaneous

Typical Waste Sources

- Routine production, exploration, drilling, maintenance and related support activities

Safety Considerations

Avoid physical contact with or ingestion of the waste. Wear protective clothing. Consult MSDS for the original materials.

Waste Minimization Options

- Substitute raw materials.
- Reuse or recycle materials.
- Do not mix unknown wastes.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown below.

Waste Identification and Classification

The field guidelines in this manual should first be reviewed to identify if the waste falls into a category that is covered by another guideline. If so, then waste identification and classification procedures in that guideline should be followed.

If the waste does not fall into a category covered by another guideline, then an attempt should be made to classify the waste, using knowledge of how the waste was generated. That is, if the waste has been generated previously and prior experience, knowledge and/or testing has shown the previously generated waste to be hazardous or non-hazardous, the waste may be classified based on this experience. If there is insufficient information to classify the waste, it should be sampled to establish the proper classification.

Waste Characteristics

If the waste is not covered by another guideline and is required to be tested for classification, an attempt should be made to identify the source of the waste and the constituents that make up the waste in order to identify the appropriate tests to be run and the appropriate treatment and disposal options. If there are questions, contact the *Environmental Representative*.

Section 2.1 Waste Specific Guidance	Topic 2.1.36 Asbestos Containing Material

Definition

In general, steps should be taken to avoid the use of asbestos containing materials (ACM); however, it is realized that appropriate alternatives for some applications may not be readily available.

Typical Wastes in This Category

- Asbestos brake pads, gaskets, pump packing, etc.

Typical Waste Sources

- Repair/maintenance of items containing asbestos such as those listed above

Safety Considerations

Wear proper protective equipment. Avoid creating and inhaling asbestos containing dusts. When possible, keep friable asbestos containing materials moist with water and/or in sealed containers to reduce the potential for dust generation.

Waste Minimization Options

People/Procedures

- Use non-asbestos containing materials, when practicable.
- Maximize useful life of ACM items.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART

Interim Storage
Container (drum, roll-off bin), try to keep moistened with water and/or sealed in plastic bags if friable

Typical Order of Preference	Final Treatment/Disposal Options
1	Non-hazardous waste landfill
2	Onsite burial*

***** Bury in a manner that reduces the potential for airborne emissions of asbestos fibers.

Section 2.1 Waste Specific Guidance	Topic 2.1.37 Scrap Metal

Definition

Scrap metal may include sheet metal, piping, tubing, wire, empty drums/containers, pump housings, valves, fittings, and vehicle/equipment parts. To be managed as "scrap metal", the metal should not be contaminated by significant quantities of other materials (e.g., chemical residues in a drum) or contain free-flowing materials (e.g., oil in a valve). If such materials are present, then the metal may need to be "decontaminated" or else managed in accordance with the guideline for the material present.

Typical Wastes in This Category

- See above

Typical Waste Sources

- Construction
- Equipment repair or replacement

Safety Considerations

Wear proper protective clothing for the type of waste. Scrap metal may have sharp edges or protrusions. Wear appropriate protective equipment if the metal is contaminated by other materials.

Waste Minimization Options

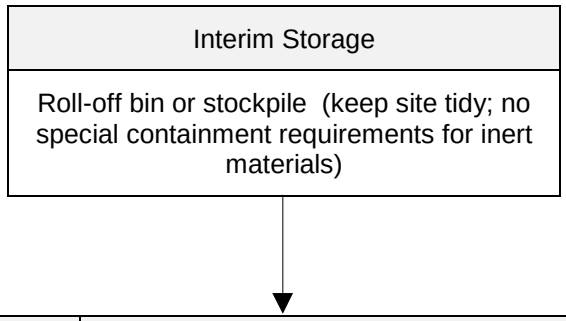
<u>People/Procedures</u>

- Order/cut wire, pipe, etc. in length needed.
- Recycle/reuse (onsite and in community).
- Take steps to avoid/minimize rework.
- Repair, rather than replace, equipment, when possible.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Sell to scrap yard for recycling*
2	Onsite burial **
3	Non-hazardous waste landfill

***** If the metal is a container that has been in contact with hazardous materials, see guideline for "Drums, Containers and Gas Cylinders (Empty)".

** Large pieces of metal (e.g., wrecked vehicles, engine blocks, etc.) should not be buried.

Section 2.1 Waste Specific Guidance	Topic 2.1.38 Glass

Definition

Some glass waste may be generated during various phases of the Project.

Typical Wastes in This Category

- Plate glass from housing and vehicle windows
- Bottles, jars, etc.

Typical Waste Sources

- Buildings and vehicles
- Human consumables and “household products”

Safety Considerations

Wear proper protective clothing for the type of waste. Broken glass may have sharp edges.

Waste Minimization Options

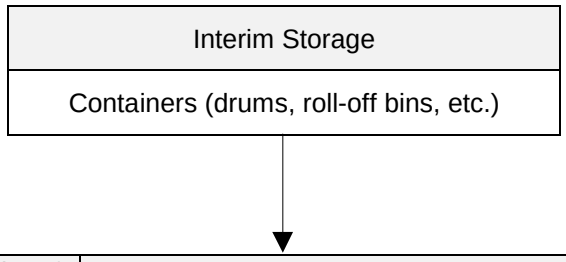
People/Procedures

- Recycle/reuse (on site and in community).
- Avoid breakage requiring replacement.
- Crush glass and use as aggregate in concrete items.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Sell to scrap yard for recycling
2	Non-hazardous waste landfill
3	Onsite burial

Section 2.1 Waste Specific Guidance	Topic 2.1.39 Plastic and Rubber

Definition

Plastic, rubber and related materials/wastes may be generated during various phases of the Project.

Typical Wastes in This Category

- Packaging materials
- Plastic drums and containers
- Gaskets
- Pipeline epoxy-coating material

Typical Waste Sources

- Raw material
- Repair/replacement of rubber or plastic parts

Safety Considerations

Wear proper protective clothing for the type of waste.

Waste Minimization Options

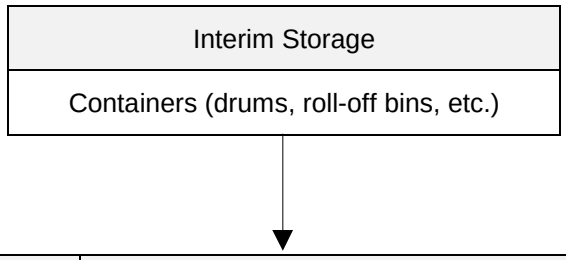
People/Procedures

- Order items in bulk (if less packaging).
- Recycle/reuse (on site and in community).
- Take steps to avoid/minimize rework.
- Segregate waste prior to disposal.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Sell to scrap yard for recycling
2	Non-hazardous waste landfill
3	Onsite burial
4	Incineration*

***** Incineration is not typically preferred if there are large quantities to be managed due to potential air emissions concerns. Incineration of plastics must be pre-approved, with appropriate segregation of plastics in place to identify which plastics can and cannot be incinerated without toxic air emissions conserns.

Section 2.1 Waste Specific Guidance	Topic 2.1.40 Pyrotechnics

Definition

Some waste pyrotechnics may be generated during various phases of the Project.

Typical Wastes in This Category

- Signal flares
- Smoke canisters
- Firing caps
- Explosives

Typical Waste Sources

- Outdated materials
- Damaged materials

Safety Considerations

Wear proper protective clothing for the type of waste. Use caution when handling.

Waste Minimization Options

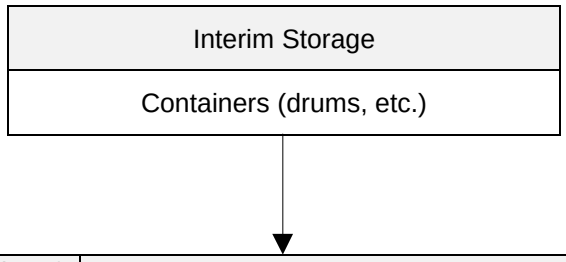
People/Procedures

- Purchase in limited quantities/only amount expected to be used.
- Use before expiration date.
- Manage to avoid damage/loss of integrity (e.g., store in a cool, dry place).
- Recycle to community for appropriate use.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Detonation (under written safety guidelines)
2	Incinerate (if safe to do so)
3	Hazardous waste landfill

Section 2.1 Waste Specific Guidance	Topic 2.1.41 Drum Rinse

Definition

In some cases, it may be necessary or otherwise appropriate to rinse drums or other "empty" containers to facilitate management of the empty containers.

Typical Wastes in This Category

- Aqueous/inorganic drum rinse containing hazardous material constituents (e.g., acid, caustic, ammonia, or other water-soluble materials)
- Non-aqueous/organic drum rinse containing hazardous material constituents (e.g., oil or other hydrocarbons)

Typical Waste Sources

- Drum and container rinsing

Safety Considerations

Wear proper protective clothing for the type of waste. Consult MSDS for original material. Avoid mixing incompatible rinsates in same container.

Waste Minimization Options

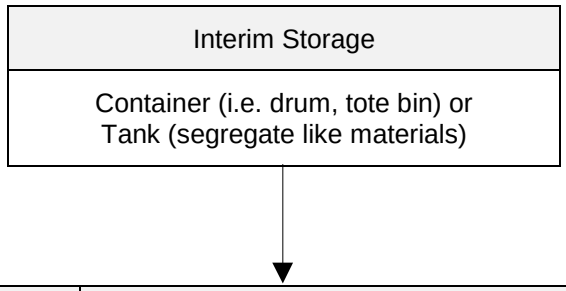
People/Procedures

- Recycle/reuse material in the manner the original material was used. For example, if "new" acid was diluted with water prior and put in process "x", then rinse drum with water and put rinsate in process "x".
- If the water/solvent used to rinse the drums does not adversely affect the process that the raw material was added to (or becomes entrained in during processing), put the rinsate in the process (e.g., corrosion inhibitor in well, lube oil in crude stream, etc.).
- Segregate waste prior to disposal.

Preferred Management Methods

After candidate waste minimization options have been employed where appropriate, the typical sequence of waste management options to use is shown in the flowchart below.

WASTE MANAGEMENT OPTION FLOWCHART



Typical Order of Preference	Final Treatment/Disposal Options
1	Recycle into wastewater treatment system or crude oil treating system or as “otherwise used”
2	Incinerate
3	Solidify and landfill

Introduction

Each site should prepare a waste management plan that summarizes the specific decisions that were made regarding treatment and disposal of waste streams generated at that site. The information in this Waste Management Plan should be used as a basis for these decisions. Any special circumstances for the site should be noted.

A Quick Reference chart may be prepared for the site. This chart would convey the key information a site worker would need to know in order to dispose of the waste in the approved manner. An example of a Quick Reference chart is shown in Table 2.2.2-1 in Topic 2.2.2.

Elements of Site Specific Plans

The purpose of a site-specific plan is to allow site personnel to capture information specific to their waste streams in a format that is easy to reference and that facilitates consistent management of a particular waste stream each time it is generated.

To prepare a site-specific plan, site personnel should review this Plan to assess which waste streams are likely to be generated and select appropriate management, testing, and disposal/recycle options. When documented, the site-specific plan essentially becomes a condensed version of this Plan.

The site-specific plan should be designed to be revised or amended as new waste streams are added, as management procedures change, or as otherwise needed.

Table 2.2.2-1

Example Format for a Quick Reference Chart

Waste Stream	Approved Waste Mgmt. Method(s)	Interim Storage	Approved Disposal Site	Approved /Hauler	Comments
Medical waste	*Incineration*	*Biohazard bags inside rigid drum*	*Incinerator at Storage Yard Construction Camp*	*ABC Transport*	*Do not send sharps to an incinerator*

Note The site-specific plan only needs to include those waste streams that are generated at the site. An example is shown in the table above in italics.