



Timor
Resources

Operating Management System
Environmental Management Plan - Drilling Activity
PSC TL-OT-17-08
Appendix A - Waste Management Plan
Doc No: TR-HSE-PLN-005

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Timor
Resources

**ENVIRONMENTAL MANAGEMENT PLAN (EMP)
DRILLING ACTIVITY
PSC TL-OT-17-08**

APPENDIX A - WASTE MANAGEMENT PLAN

TR-HSE-PLN-00-000-005



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POSITION TITLE	NAME	SIGNATURE	DATE
Chief Executive Officer	Suellen Osborne		29/12/20
GM Exploration	Jan Hulse		29/12/20

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ACRONYMS

ANPM	Autoridade Nacional do Petróleo e Minerais
EMP	Environmental Management Plan
HSE	Health Safety Environment
OSCP	Oil Spill Contingency Plan
TR	Timor Resources

1 INTRODUCTION

Timor Resources is committed to achieving incident free operations through the provision of effective Health, Safety and Environmental (HSE) Management across all of its operations and worksites for the benefit of employees, contractors and the community, and waste management is an integral part of the commitment to prevent pollution and minimise hazards and impacts.

Waste generation is identified as a threat with a high potential for environmental damage and detrimental health effects if not properly managed.

1.1 PURPOSE

The purpose of the Waste Management Plan is to ensure that all wastes associated with activities will be appropriately stored, managed, disposed of and monitored in a comprehensive and environmentally responsible manner.

Timor Resources is responsible for ensuring that wastes are managed in a manner consistent with regulation and best practices.


Timor Resources strive to follow the universally accepted waste management hierarchy (in order of decreasing preference):

- Avoidance
- Reduction
- Re-use
- Recycling
- Treatment
- Disposal

Implementation of this Plan includes:

- Training of personnel and contractors.
- Communicating requirements of the plan to personnel, contractors and authorities, as required.
- Preparing and maintaining an inventory of waste arisings.
- Monitoring waste management performance.
- Reporting on compliance with the Plan.
- Developing continual improvement strategies.

Timor Resources will ensure all waste management facilities are suitable and authorised to receive the wastes assigned to them, which will include working with the Suai Municipality who have identified a designated area near Hermanu camp as a waste management area.

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All contractors engaged in the project are responsible for ensuring that wastes are managed in accordance with this Waste Management Plan including:

- Compliance with TR Policies, Standards, Procedures and Plans and all relevant legislative requirements.
- Separation and storage of waste in accordance with this Plan.
- Proper management and disposal of waste through provision of waste tracking data.
- Auditing of compliance against this Plan.
- Training of staff as required.

Wastes produced from accidental release of oil are covered under the Timor Resources Oil Spill Contingency Plan - TR-HSE-PLN-004 (OSCP).

1.2 SCOPE

This Plan relates to Timor Resources drilling operations conducted in PSC TL-OT-17-08 and TL-OT-17-09 only, and waste products derived from these operations will be disposed of as per regulations and as approved by Timor-Leste ANPM. This will be either locally at the Suai Municipality designated waste facility at Hermanu or transported to an alternative approved disposal facility/area. All waste will be categorised and segregated in a manner appropriate to the nature of the material.

2 ROLES AND RESPONSIBILITIES

Good waste management practice requires that responsibilities, procedures and documentation are defined and established for all stages of the waste stream, from source to disposal.

2.1 TIMOR RESOURCES

2.1.1 Operations Manager and Camp Boss

- Develop a waste inventory which identifies all wastes arising from operations or activities within sphere of control or which will potentially arise (from new activities) in terms of type, source, quantity, frequency, characteristics, classification, treatment methods or requirements, disposal methods or options.
- Generate MSDS for different waste types.
- Conduct waste review by assessing requirements to manage waste identified during the waste inventory. Include minimisation, elimination, reuse, recycling options. Identify preferred handling, segregation, packaging, labelling, transportation, treatment, and disposal options.
- Report waste review to HSE Officer.
- Develop and submit Departmental Waste Management Plan to HSE Officer.
- Allocate adequate budgetary provision for all aspects of waste management within sphere of control.

- Implement waste management programme for all aspects within sphere of control, and incorporate, as appropriate, into Departmental procedures.
- Delegate, as appropriate, clear responsibility for waste management at each operating site/camp facility.
- Define contractor waste management responsibilities and ensure contractor practices are audited before and after contract award. Department Managers, under whom contractors are retained, will be responsible for contractor's waste management programmes. See also Timor Resources Contractor and Purchasing Management Standard TR-GEN-STD-00-000-007_4.

2.1.2 HSE Officer

- Maintains an up to date register of waste legislation and regulations related to waste. Review annually.
- Compiles department waste plans into the Timor Resources Integrated Waste Management Programme.
- Conduct contractor evaluation regarding waste management practices.

2.2 CONTRACTORS


2.2.1 Local Waste Contractor

Timor Resources will retain a suitable and authorised contractor for collection and transport of wastes from the rig site and camp through to the assigned waste facility. TR will monitor the contractor to ensure compliance with the Waste Management Plan. TR is ultimately responsible for compliance with the laws of Timor-Leste.

2.2.2 Contractors

All contractors assigned to the drilling and support operations, such as the drilling contractor and transport contractor are responsible for the management of wastes at their facilities and operational areas and shall:

- Meet the requirements detailed in this Waste management Plan.
- Ensure that all chemicals that are delivered to the project have an associated MSDS and handling procedures.
- Ensure all site personnel are aware of the potential risks specific to hazardous waste
- Provide all necessary resources and equipment to comply with the plan.
- Maintain supplies of consumables required for handling, cleaning and disposal.
- Train and certify all relevant personnel.
- Implement and maintain waste tracking system and waste MSDS system.
- Monitor and record the waste volumes and disposal of wastes.
- Record and report any spills to TR within the specified timeline.
- Report to TR as per agreed schedule.

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3 WASTE MANAGEMENT PLAN

Wastes generated during normal drilling and operations activities are described here and the various waste streams will be managed as discussed below.

3.1 SUAI MUNICIPALITY FACILITY AND INCINERATOR

A site near to Haemanu camp has been assigned by the Suai Municipality for use as a waste reception facility and will be used for collection, sorting, storage and treatment of wastes arising from the rig and Haemanu camp, as appropriate. TR will work in concert with Suai Municipality in the preparation and operation of the facility, in particular, assisting in the commissioning of the Inciner8 general purpose incinerator currently at the Suai hospital, as well as assisting in the commissioning of the medical waste incinerator also at the hospital, noting that neither unit is commissioned or operating.

Incineration

Suai hospital has two incinerators: one an Australian made wood burning incinerator specifically for hospital wastes. The second is a general waste incinerator manufactured by a British company Inciner8 - see Appendix 3 for photographs.

Incineration uses combustion to convert wastes into less bulky materials. Incineration can refer to the practice of open burning of wastes in pits, although the degree of combustion achieved in commercial incinerators will be difficult to achieve in open burning. This is because commercial incinerators can control the residence time, temperature and turbulence within the incineration chamber to optimise combustion.

Disposal of solids remaining after incineration should be incorporated into the encapsulation process for the cuttings as described in Section 3.4.

3.2 WASTE MANAGEMENT PRINCIPLES

The following are in accordance with international best practices in waste management:

- Solid wastes are to be separated into streams: (i) putrescible, (ii) recyclable dry domestic wastes; (iii) industrial organic wastes and (iv) industrial inorganic wastes, note (ii) and (iii) may be classed as Hazardous Waste.
- plastics, recyclable (paper and cardboard only), other (non-hazardous, non-recyclable) and hazardous. Skip bins will be provided and clearly labelled for each of the four types of solid waste.
- A waste inventory will be maintained, detailing wastes generated and disposed of (per skip bin).
- Potential wastage and over-consumption will be identified where possible, to assist with waste minimisation principles.



- Solid waste skip bins will be stored within designated areas and covered (e.g. lidded bins). Skip bins will be located at the accommodation camps only. All rubbish generated during the day, that is not already within the accommodation area, is to be brought back to the camps at the end of each day. Skip bins for potentially hazardous materials are to be waterproofed and located within a bunded bay.
- Procedures for refuelling and maintenance of vehicles is to be strictly abided by and spill kits readily available, with staff trained in their use.
- Materials that can be recycled will be separated for appropriate disposal – at this stage only paper and cardboard can be recycled at Timor-Leste, but Timor Resources will look into recycling of other material such as plastics and will re-use as much as possible.
- Only the approved waste contractor will be engaged for the transfer of waste to the Suai Municipality waste facility.
- Potentially hazardous wastes will be identified and tracked from area of production to final disposal site (see Appendix 2 Hazardous Waste Manifest), to ensure traceability. Material Safety Data Sheets will be kept with clearly labelled hazardous waste containers/skip bins and spill kits will be located close-by. Transport of hazardous materials will only be undertaken by appropriately vetted and approved contractor.
- Putrescible waste will be disposed of at the Suai Municipality waste facility.
- Non-hazardous, non-recyclable wastes will be transferred to the Suai Municipality waste facility.
- The preferred method for drill cuttings is by natural (evaporative) dewatering and burial onsite.
- Any personnel involved in the storage, handling and/or disposal of wastes will be appropriately trained.
- Hygienic sanitation and disposal of grey and black water will be managed to ensure the protection of the general health of the workers and the general public.
- Fuel and other non-aqueous liquid storage areas will be bunded. The rig floor will be bunded and any waste collected in the bunds or cellar will be drained to a waste vessel and pumped back into the mud system or separated if heavily contaminated and removed from site for disposal. Excess Cement Unit Wash water will be collected in a bunded area.
- Any discharge of treated waste waters will be away from environmentally sensitive areas, areas likely to have a high-water table, wetlands, areas prone to flooding/inundation, and community areas (including water wells and vegetable / crop growing).

3.3 SEGREGATION AND STORAGE OF WASTE

The correct identification, segregation and storage of waste is fundamental to proper waste management practice and must be followed by the generator of the waste. Key in this regard is ensuring that waste is properly segregated to avoid the potential for chemical reactions which may cause explosion, fire or noxious gases to be released.

- Separate waste collection and containment will be provided for the following waste classes:

Putrescible Kitchen Waste	
Recyclable dry domestic waste	- Tin cans - Plastic bottles - All other burnable waste in "Green Bin"
Industrial Organic Wastes	- Waste oils - Oily rags - Non-metallic oil filters - Absorbent pads - Plastic wrapping and packaging materials - Sludges
Industrial Inorganic Wastes	- Drums and containers - Scrap metal - Dry cell batteries - Paint related waste - Solvents, cleaners, thinners - Aerosol containers
Other Hazardous Wastes	- Medical/Clinical - Asbestos-containing waste
Cuttings	
Sanitary Wastes	

- All waste materials are to be deposited in the appropriate waste collection containers which shall be clearly labelled. NO waste is to be thrown in to the surrounding areas of the facility.
- On no account may different classes of waste be mixed together.
- If in any doubt about the classification of any waste or which container to use, the HSE Officer should be consulted.
- All drums and containers must be clearly labelled as to their contents (in the case of empty drums their former contents).
- On no account must waste liquids be kept in drums previously used to contain materials incompatible with the new contents.
- All waste containers must be clearly labelled. If re-labelling of the containers is necessary, all previous labels must be removed or obliterated, and replaced with new labels describing the new material(s). All labels must provide details of the hazardous properties (if any) of the drum contents.
- All storage areas shall have clear signage with appropriate HAZCHEM warnings as to the waste's properties. Where appropriate laminated MSDS documents shall be displayed.

3.4 CUTTINGS AND WASTE MUD

The following list provides a summary of the drilling wastes:


- All Drilling Fluid chemicals and lubricants MSDS and other product data for are available on site and are pre-approved by ANPM.
- Rock cuttings, cement and associated chemicals removed by the drilling operation.
- Drilling fluid adhering to the rock / cement when it is separated from the drilling fluid.
- Unwanted or non-recyclable solids and fluids. These will normally be restricted to dewatering effluents, cement-related products, lost circulation materials that are incorporated into the drilling fluid, and clean-up fluids.
- Lubricants, these mainly consist of minute quantities of oil, grease and pipe dope (threading compound), which either leak into the mud system or are squeezed out of threads due to excess application. During tripping and casing operations the relative proportion of dope to cuttings increases but is still negligible in terms of total mud volume.
- Drilling operations generate swarf (fine particles of metal) from tubulars such as drill pipe and casing. It is standard practice to remove metal not screened out by the shakers with magnets placed at several points in the mud processing system. The metal screened out will end up as drilling waste, but quantities are negligible and non-toxic.
- Contaminated mud with dirt if it has spilled on site.

The Well Programme and Drilling Fluids Programme will be the master reference for specific composition of fluids. The project Drilling Fluids are composed of principally non-toxic additives in a water-based system. Solids control equipment will be optimised to ensure that quantities discharged are minimised.

Drill cuttings will be conveyed to the surface via the annulus to be treated in the solids control system, which consists of shaleshaker, desander, mud cleaner and centrifuge. A partially closed loop system is operated that reduces the need for multiple pits, hence the pits are smaller because the storage volumes are less. This, together with high efficiency solids control equipment, minimises the amount of residual fluid on drilled cuttings with the excess fluids discharged to the pit. The drill cuttings will then be disposed in the lined mud pit for evaporation before encapsulation on site.

Cuttings in the region of 250m³ - 300m³ are expected to arise from four the shallower wells, with cuttings expansion taken as x 2.5. Cuttings from the Lafaek well are estimated at approximately 500m³. Well depths are:

- Karau well with (1,087m) located in Suco Mata
- Kumbili well (1,470m) located in Suco Camanasa
- Lafaek (2,903m) located in Suco Labarai
- Laisapi (1,770m) located in Suco Tashilin.
- Raiketan (1,946m) located in Suco Belekasak/Labarai

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Waste mud in the region of 200m³ to 400 m³ will arise from each well.

Options for the disposal of drilled cuttings may include dewatering, encapsulation and burial in situ in the onsite mud pit; landspreading; landfill; use in subsequent road and well site construction works; or injection into the annular space of a well if the well is to be plugged and abandoned.

3.4.1 Dewatering and Encapsulation

Due to its simplicity, burial of wastes in small pits at drilling sites has been a standard means of cuttings waste disposal in the industry. However, with current awareness of pollutant migration pathways, the risks associated with open burial of wastes should be carefully considered. The preferred disposal option is to encapsulate and bury the dewatered cuttings in situ in the onsite pit, sealed with HDPE liner and covered with a minimum 1m of consolidated soil, this represents an environmental intensity of none (see **Error! Reference source not found.**).

3.4.2 Landspreading

Landspreading may be considered as an alternate to encapsulation for drilling fluids and cuttings with low levels of hydrocarbons and salts. The process involves the controlled and repeated application of cuttings on a soil surface with the area being periodically tilled to provide the necessary mixing with native soil and to aid oxygen transfer. Active landspreading may include the addition of water, nutrients and other materials to enhance the soil quality.


The characterisation and treatability of the cuttings should be assessed to determine whether landspreading may be effectively implemented. Site topography and hydrology, and the physical and chemical composition of the waste and resultant waste/soil mixture should be assessed, with salts most frequently limiting the application rate. Further the availability of land and the impact of changing land use should also be considered.

If landspreading is taken as the best option then monitoring should be conducted after landspreading to measure progress and determine whether there is a need for soil enhancement, e.g. fertiliser applications.

3.4.3 Landfill

Landfills are generally specially constructed and monitored facilities designed to accommodate burial of large volumes of wastes. There is an option to use landfill and burial for inert, non-hazardous and non-toxic wastes in remote areas. However, some landfills may become little more than open dumps, and great care must be exercised to understand future liabilities in their design, operation and eventual closure.

Basic design considerations for any landfill should include, as a minimum, an impermeable lining to contain the landfill contents. The designated Municipal waste area doesn't have a

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landfill per se but does have a series of concreted areas that could be used for temporary storage of waste.

As discussed above, the mud pits on each of the well sites are lined with impermeable HDPE liners, hence are good candidates for use as a landfill after the rig has moved offsite.

3.4.4 Road Construction

Cuttings can be dewatered and dried and removed from site to be used in subsequent road and well site construction works. Cuttings may also be used for brick manufacture as well as roadbed material.

3.4.5 Annular disposal

Annular injection is a disposal method where pumpable wastes (usually mud pit fluids) are injected into the surface casing or production casing annulus (or other casing or casing annulus). However, this practice should be managed so that the wastes do not enter underground sources of water.

Annular injection is usually a “one-time” option and should only be considered if the well is to be plugged and abandoned, it is not suitable for continuous disposal. However, there is a threat of corrosion of the surface pipe or other casing. If the surface pipe is breached by corrosion the injected fluids may enter usable water sources.

The initial planning process led to the following decisions:

- Recycling of re-usable drilling fluid and removal of solid drilling waste at the rig-site will be maximised by optimised operation of solids separation.
- Any fluid recycled on the rig site will be as make up for new mud provided it conforms to required properties for acceptable drilling. If deemed not required, fluid will be stored for use on the next well.

It is recognised that cuttings with non-toxic fluid do not pose an environmental risk, and methods of disposal can include burial on site or locally, or “land-spreading” (distributing and assimilating with the surface soil). Prior to land farming the cuttings and mud must be tested to confirm non-toxicity. The preferred method of disposal is encapsulation on site, which avoids impacts identified above.

3.5 SOLID WASTE

3.5.1 Putrescible and Dry domestic wastes

Typically comprise general hotel management type wastes from the camp such as paper, disposable cups, food waste, packaging etc. During the drilling project typical waste arising of 5 tonnes per week will occur.

This includes wood, plastics, paper, food waste, packaging materials, general garbage and inert construction and maintenance materials.



- All garbage – inert, solid materials from offices, accommodation, household sources will be placed in the general waste collection bins “Green Bins” located at various points around the site. All dry wastes that can’t be recycled will be incinerated.
- Separate bins will be provided for tin cans and plastic bottles. These will be recovered and recycled by pre-approved dealers.
- Kitchen waste will be placed in the kitchen waste collection bins located outside the kitchen facilities and distributed to local farms as feedstock and/or compost.
- It is the responsibility of ALL personnel to ensure that waste disposed of as “domestic for incineration” does not contain any other form of waste that may, when subjected to heat, become potentially dangerous to the environment or personnel.
- Waste designated “domestic for incineration” should not be stored for more than 24 hours. The waste should be collected on a ‘daily’ basis and transported to the incinerator for disposal.
- A functional incinerator will be installed at the waste facility in discussion with Suai Municipality.
- The designated area for the incinerator should be fenced with a lockable entrance gate, and include all necessary infrastructure for receiving, sorting segregating, and storing of wastes.
- Ash from the incinerator will be solidified/encapsulated at the Municipality waste site.
- Packaging wastes such as pallets, paper and plastic should be reduced by the use of bulk handling systems or reusable “big bags”. Similarly, bulk tote tanks for liquids should be used rather than drums and cans.

3.5.2 Industrial Organic Wastes


Include paper, wood, oily rags, non-metallic oil filters, absorbent pads, plastic wraps, packing materials, sludges and various small amounts of other flammable materials. All industrial organic wastes will be incinerated.

Small amounts of the solid industrial waste produced will require special care. Therefore, oily wastes, e.g. rags, absorbent materials etc. and hazardous material (chemicals) will be segregated at source for batch incineration - see 3.5 Hazardous Wastes.

Unused chemicals will be stored onsite for future use or returned to the vendors.

3.5.3 Industrial Inorganic Wastes

Arising from normal operations will include discarded wire, scrap metals, paint and thinner, rags, cans, plastics, spent filtration cartridges, chemical drums, metallic filters, glass items and batteries. Once again typical amounts that will require disposal will be small, less than a tonne for the full project. Industrial inorganic wastes will be disposed of via local facilities for scrap metals and special wastes (e.g. batteries, used drums etc.). Wastes will be segregated onsite before reclamation.

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3.5.4 Drums and Containers

Metal and plastic containers are used for a wide range of lubricants and chemicals and the accumulation and disposal of these can be problematic. Drums and containers inevitably contain variable quantities of residues.

- All chemical and oil drums and containers (empty or part full) will be stored at the materials yard in a designated storage area, outside, under shade canopies, within a sealed, impermeable bunded area.
- All drums and containers must be securely closed. All bungs, ring clamps or other means of sealing the drums and containers must be in place and securely fastened.
- All drums and containers must be correctly labelled as to their contents (previous contents if empty) and be externally clean of any residue. They must be inspected for mechanical damage, corrosion and external spillage. If the condition of the drum or container poses risk of spillage, it must be transferred to another container with precautions taken to leave adequate head space to mitigate any pressurisation effects due to heating, denting, etc.
- If transfer of materials is necessary, steps must be taken to ensure that the contents and their associated hazards have been identified correctly, Appropriate protective clothing must be worn and precautions taken to contain any spillage. An adequate supply of clean-up material must be available.
- All storage areas shall have clear signage with appropriate HAZCHEM warnings as to the waste's properties. Where appropriate laminated MSDS documents shall be displayed.
- Bulk transport and storage should be used for high volume consumption items.
- Containers should be refilled from bulk storage and reused.
- Non-refillable containers should be returned to the vendor for reuse or recycling.
- Procedures for handling transportation and destruction of non-refillable containers must be submitted for approval.


3.5.5 Scrap Metals

- All scrap metal will be placed in the designated area in the materials yard.
- "Scrap metals" should be segregated and stored according to value and sent for recycling.

3.6 HAZARDOUS WASTE

Hazardous Waste is defined as material that is explosive, poisonous or an irritant, flammable, toxic, carcinogenic or corrosive. Due to their hazardous properties, materials in this waste stream must be dealt with separately from other waste and in an approved manner.

Each operation, e.g. civils, drilling, transport, must clearly specify what type and how much hazardous waste will be generated, clearly specifying how such wastes are to be handled,

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collected, stored, transported and ultimately disposed. Procedures are to be clearly specified and approved by HSE Officer.

Hazardous waste receptacles must display correct and prominent signage. Hazardous wastes, such as fuels, oils, lubricants, batteries and chemicals, are to be contained within a bunded area until transported for disposal.

- Procedures for handling, collection, storage, transportation and destruction of each type of hazardous waste must be submitted for approval.
- All hazardous waste collection, storage and transportation will be supervised by the Materials Procurement Supervisor.
- A Hazardous Materials Manifest (see Appendix 2) must be completed for each hazardous waste arising.
- Adequate PPE must be worn while handling hazardous materials. Site shall specify in the Waste Management Plan the requirements for hazardous waste handling PPE.
- All storage areas shall have clear signage with appropriate HAZCHEM warnings as to the waste's properties. Where appropriate laminated MSDS documents shall be displayed.
- Ensure that different classes of waste are not mixed together during storage.
- Solid hazardous waste will be placed in appropriate, clearly labelled containers - "Red – Hazardous Waste Bins".
- Oily rags are to be placed in a metal container provided at each workspace. They must not be mixed with other combustible materials or stored in direct sunlight. Oily rags will be incinerated.
- Used oil filters are to be drained (into the waste oil container) placed in the collection bin marked 'Filters', and subsequently transferred to the materials yard for incineration.
- Oily filter containers must not be stored in direct sunlight as this could lead to overheating and cause combustion.
- All paint and thinners tins are to be sealed with their original lids prior to being placed in the designated clearly labelled "Red – Hazardous Waste Bin". Surplus lead-based paints are to be returned to the original supplier, together with empty containers. Note all "hazardous" paints should be supplied in reusable containers. Procedures for handling, collection, storage, transportation and destruction of "hazardous" paints and containers must be submitted for approval.
- Non-chlorinated solvents, cleaners and thinners only should be used, under no circumstances are chlorinated materials to be used. Wastes should be properly contained and labelled, segregated and stored in shaded area until incinerated.
- Asbestos containing waste (spiral wound gaskets, jointing materials etc.) must be bagged, and labelled. Site to specify the proposed disposal route for asbestos waste.
- Waste aerosol containers must be stored separate from other waste products. Aerosols must not be disposed of through incineration. Aerosol containers are to be

de-pressurised before being placed in the scrap metal waste containers. Site to specify the proposed method of safely de-pressurising containers. Note the use of aerosol containers should be avoided, and the use of alternate non-pressurised containers is preferable.

- All used batteries (both wet and dry) will be returned directly to the rig materials yard. Site is to specify the proposed disposal route for used batteries. Exhausted batteries must not be incinerated. Procedures for handling, collection, storage, transportation and disposal of used batteries must be submitted for approval.
- Wet cell batteries are to be drained prior to storage and transportation, and cell fluids are to be neutralised. Neutralised fluids may be disposed through the sewerage treatment system.
- Surplus chemicals will be returned to local suppliers/vendors.
- Any organic chemical wastes may be incinerated.

3.6.1 Medical Waste

Medical waste will be properly stored in bio-hazard medical waste containers and managed by the rig medic, arrangements have been made to dispose of the small levels of medical waste at Suai hospital. The hospital has two incinerators: one an Australian made wood burning incinerator specifically for hospital wastes. The second is a general waste incinerator manufactured by British company Inciner8.

- All medical or clinical waste shall be packaged for disposal so as not to cause hazard to persons disposing of the waste. This includes out of date medication, sharps, clinical, medical and biological wastes. It must be ensured that the waste cannot be tampered with or removed prior to disposal.
- Sharps, such as needles, syringes and scalpels, must be placed in a container. This container must be puncture resistant and be marked 'Danger Sharps'.
- All other medical waste must be put into plastic bags and sealed with adhesive tape. The bags must be labelled and put into the designated container to await disposal.
- All medical waste will be stored in special containers under the control of the Medic in the sick bay.
- All such medical wastes are to be incinerated at a minimum temperature of 1200°F. Ensure specification of incinerator meets requirements for medical waste destruction. Procedures for handling, collection, storage, transportation and destruction of medical wastes must be submitted for approval.

3.6.2 Waste Oils

Waste oils are classified as a hazardous waste and must be treated accordingly.

- Waste oil will be placed in a metal container provided at each workspace, and subsequently transferred to a bulk waste oil container at the materials yard. Waste oils must not be mixed with other combustible materials or stored in direct sunlight.



- Oil wastes may be mixed into the bitumen/asphalt process and applied as road surfacing material if available.
- Small amounts of waste oil may be incinerated.
- The site must specify the disposal route for all waste oils. Procedures for handling, collection, storage, transportation and destruction of waste oils must be submitted for approval.

3.7 LIQUID WASTES

3.7.1 Sanitary Waste

Sanitary waste will be collected and treated in a 3000L septic tank installed on rig site and the effluent discharged under the ground surface through a trickle feed weeping tile. The system is designed for the rig minicamp capacity of 15 people, at a flow rate of 150L/person/day.

Any resultant settled waste/sludge will be incinerated. Procedures for handling, collection, storage, transportation and incineration of septic sludges must be submitted for HSE approval.

3.7.2 Site Drainage

The rig incorporates an oily drain system to a sump which will be periodically emptied as required. Rainwater drains are in place around the perimeter of the site and drain through an interceptor oil trap which is inspected on each 12-hour tour.

3.7.3 Spillages

In the event of drilling fluid or cuttings spillage, the products will be cleaned up and waste will be disposed of as per category i.e. liquids to vessel and cuttings to the mud pit.

Spill kits are provided around the around the rig site and at the chemical storage yard to contain any spills. Allocated personnel will immediately remove spilled materials to appropriate bins and inform the HSE Officer and Rig Manager of the circumstances.

An Incident report will be prepared by the contractor and distributed to Timor Resources as soon as practicable after the event.

A verbal report will be given to ANPM as soon as possible, to conform with oral reporting requirements; 0-80 litres within 24 hours and >80 litres within 2 hours. The verbal report will be followed by a written report within 3 days of the event.

- Where small spillages of fuels, lubricating oil, liquid chemicals occur, the affected area should be cordoned off and free liquids should be recovered to the maximum extent possible. Once free liquids have been recovered, an absorbent such as sand should be spread liberally over the spillage. Once all the spillage has been absorbed the absorbent should be collected in suitable containers, labelled and disposed of as specified below.



- In the case of a chemical spillage, before attempting to handle the spillage the nature of the chemical should be checked in the MSDS and the guidelines followed. Protective clothing as directed in the MSDS must be provided. Once the chemical has been collected and stored, the disposal guidelines should be adhered to. A thorough washing of the area with clean water should be carried out once the clean-up has been completed.
- Oil contaminated soils may be landfarmed, or landspread off site in previously disturbed pre-approved areas.
- Small amounts of free hydrocarbon liquids may be incinerated, large amounts will be treated as for waste oils (see section 3.5.2 above).
- Stabilisation techniques may be applicable prior to disposal.

3.8 EMISSIONS

Emissions from equipment shall be minimised via filters and preventative maintenance schedules. Distribution of dust (including cement dust) will be prevented from blowing from site by the regular wetting down of the lease and work area. The rig and access roads will be watered and swept to reduce movement of dust, mud or debris off site on vehicle wheels.

Emissions to the atmosphere from the drilling programme will mainly arise from combustion products resulting from diesel engine exhaust, both the rig generators and service vehicles, and from hydrocarbon flaring if wells are tested. The major sources and typical emission gases arising are combustion products from burning of diesel fuel, mainly CO₂ and H₂O resulting from the oxidation of hydrocarbons. CO, CH₄, NO, NO₂ and N₂O gases will be emitted in the exhaust as well as unburnt hydrocarbons and particulates. Some sulphur may be released depending on the sulphur content of the diesel fuel.

Additional pollutants may include hydrogen sulphide (H₂S) although there is no evidence to suggest H₂S is present in the region; volatile organic compounds (VOC); glycols; and polycyclic aromatic hydrocarbons (PAHs), although 95%-99% PAH is destroyed in combustion in the engine/generator.

Construction and decommissioning activities may generate dust caused by a combination of on-site excavation and movement of earth materials, contact of construction machinery with bare soil, and exposure of bare soil and soil piles to wind. Vehicle movements along gravel access roads, where present, may raise dust during the operations phase. These activities are likely to generate air quality impacts related to dust and can be measured and monitored as Particulate Matter (PM).



4 MONITORING AND REPORTING

All waste will be recorded in a manifest, see Appendix 1, and tracked with the following recorded:

- Date
- Type
- Volume (individual and cumulative)
- Location
- Disposal method, destination and contractor details

4.1 REPORTING

- Waste Disposal records will be reported by contractor(s), Operations Department and Haemanu camp to TR HSE Officer on a daily basis.
- Waste Disposal data will be included in the Daily HSE or Drilling Report, as provided to ANPM.
- A monthly report will be prepared by TR HSE Officer to include statistics, any reportable incidents, and any non-compliance with the Plan.
- Reporting formats and times are to be as agreed between TR and Contractor and accepted by ANPM.



Timor
Resources

**Operating Management System
Environmental Management Plan - Drilling Activity
PSC TL-OT-17-08
Appendix A - Waste Management Plan
Doc No: TR-HSE-PLN-005**

**Revision: Rev 01
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APPENDIX 1 - WASTE MANAGEMENT MANIFEST - TRACKING SHEET



Waste Management Manifest - Record and Tracking Sheet

Site: _____

DATE: _____

Type of Waste	Area Generating	Quantity (Amount / Month)	Disposal Technique	By Whom (Agency)	Records of Disposal
Mud materials / Sacks					
Wooden pallets					
Waste Oils					
Steel scraps					
Domestic waste					
Casing protectors					
Plastic products					
Refrigeration gas					
Food Waste					
Tyres & rubber products					
Cuttings/mud					
Turkeys nest plastic					
Grey water sewage					
Batteries					
Metal drums					
Drilling line					
Well clean up fluid					



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APPENDIX 2 - HAZARDOUS WASTE MANIFEST



HAZARDOUS WASTE MANIFEST

Location: _____

Date: _____

Contact: _____

Waste for disposal: hazards, quantity and origin, description:
(Attach MSDS Sheets/Information on chemical composition)

Permission for disposal:

1. Site:

2. Preparation

(type of container, method of transport), disposal methods and precautions)

3. Confirmation of receipt of Hazardous Waste at disposal site

Signed : _____

HSE Officer

Disposal Site Manager



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APPENDIX 3 - SUAI HOSPITAL INCINERATORS



Figure 1 - Inciner8 incinerator at Suai Hospital
(note: medical waste incinerator to the left not commissioned)

