
ENVIRONMENTAL PROCEDURE MANUAL



Example

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Environmental Management and Protection Strategies



Key Principles

Ensure that compliance with environmental laws and regulations are upheld

- Report all spillages regardless of volume to Supervision immediately
- Effectively monitor the accumulation, storage and disposal of waste to minimise its impact on the environment.

1.1. Purpose and Scope

To provide guidance on the environmental aspects and impacts associated with the processes, operations, products and services at the Port Hedland Emulsion Manufacturing Plant, in compliance to legislation, regulation and best practice.

1.2. Operational Information

1.2.1. OVERVIEW

The business has implemented stringent environmental management practices and strategies to minimise the risk and impact of air, water and soil contamination of the surrounding environment as a direct or indirect result of their manufacturing processes at Port Hedland.

The environmental management practices and strategies imposed at Port Hedland include:

- Waste minimisation, segregation and disposal
- Chemical and hydrocarbon use, handling, storage, clean-up and containment
- Spill clean-up and containment
- Surface water management
- Noise management
- Air quality management
- Flora and fauna protection and weed management
- Sediment and erosion mitigation
- Housekeeping
- Sustainability

The following sections of this manual will provide more detailed information for the practices and strategies identified above.

1.2.2. ENVIRONMENTAL LEGISLATION AND LICENCE TO OPERATE

The Port Hedland site must adhere to the requirements of the Western Australia Environmental Protection Act 1986 and Environmental Protection Regulations 1987 with respect to all aspects of their operation and its impact or potential impact upon the environment.

As part of these legislative instruments the Western Australia Department of Environment and Conservation have issued the site with a licence to operate. This licence to operate is maintained on the basis that no harm is placed on the environment as a result of the actions or inactions of the business.

In an effort to ensure strict compliance with the legislative and licence requirements the site is required to follow and enact the practices and procedures outlined in the Port Hedland Emulsion Plant HSEQ Site Management Plan, Section 5: Environmental Management.

1.2.3. ENVIRONMENTAL INSPECTION AND AUDIT

The Port Hedland site shall undergo an audit and inspection of their environmental practices at least every 12 months to confirm their level of compliance with the Port Hedland Emulsion Plant HSEQ Site Management Plan, Section 5: Environmental Management.

The assessment process shall be conducted by appropriately qualified and competent personnel either from within the business or from an approved contractor and will include:

- Assessment of the actual or potential discharge of site substances to offsite storm water
- Evaluation of the existing storm water protection controls to identify whether they are in place, maintained and effective
- Identifying additional control measures as required
- Assessment of spill response equipment to ensure it is suitable, kits are complete, and is maintained
- Preparing a report summarising the scope of the inspection, personnel undertaking the inspection, the date/s of the inspection, major observations relating to the implementation of the Environmental Management Plan, actions taken and actions to be undertaken
- Updating the Environmental Management Plan in accordance with the findings and required actions identified in the inspection and audit

Compliance with environmental legislative requirements is assessed by the Environmental Management Team as follows:

- Periodic review of compliance monitoring results
- Periodic review of legislative and operating permit requirements
- Conducting a Health, Safety and Environmental (HSE) Management System audit every three years
- Investigating non-compliances and implementation of identified corrective / preventative actions

The Environmental Management Team will be responsible for providing Port Hedland with advice and corrective action plans to ensure they maintain compliance with the legislative requirements in areas where they observe or identify real or potential short comings.

1.2.4. REPORTING AND RECORDING

Internal Reporting and Recording

All emergencies and incidents that impact on, or have the potential to impact on, the environment must be reported to Supervision immediately. These events are then entered into the HSEQ Information / Incident Reporting System (SHAERS), investigated and control measures determined, actioned and reviewed.

Refer to the Incident Response, Reporting and Analysis Procedure for more information on the internal reporting requirements.



Important

All chemical spills must be reported to Supervision regardless of volume.

External Reporting and Recording

All spills which require or result in material leaving the bounds of the site either through accident or controlled removal by authorised third party contractors must be advised to the Department of Environment and Conservation (DEC) and the Department of Minerals and Petroleum as well as escalated within the business as per the Environmental Management Plan.

Section 72 of the Environmental Protection Act 1986 obligates the business to notify the Department of Environment and Conservation (DEC) as soon as practicable of incidents that have caused, or are likely to cause pollution, material environmental harm or serious environmental harm.

These include, but are not limited to:

- Incidents that occur as a result of an emergency, accident or malfunction
- Where a material has caused or is likely to cause pollution on or offsite, including impact on the public
- Where there is a potential breach of Environmental Protection Act licence conditions or works approval, including limits, threshold quantities or targets as defined in the licence conditions



Important

If notification to the DEC is required the Port Hedland Site Manager shall contact the Environmental Advisor and inform them of the nature of the emergency or incident.

The Environmental Advisor shall conduct an investigation into the event.

Annual Environmental Report

The business is required under its licence to operate to submit an Annual Audit Compliance Report (AACR) to the Department of Environment and Conservation detailing any occurrences of non-compliance with their licence conditions.

National Pollution Inventory (NPI) Reporting

An annual review of the NPI requirements and thresholds will be conducted by the Environmental team to determine if and where the Port Hedland operations have exceeded the pollution limits.

Based on this review the environmental team will develop and submit a report to the NPI as required under the site licence to operate.

1.3. Waste Minimisation, Segregation and Disposal

The Business is committed to practices of waste minimisation by following the hierarchy of elimination:

- Reduction
- Reuse and recycling
- Treatment
- Disposal

Reduction

The reduction of waste levels results in a lower volume of material going to landfill and is achieved by:

- Compaction of materials where possible
- Ordering of materials and goods sufficient only for the needs of the business
- Reusing and recycling materials for other purposes
- Treatment of onsite waste
- Sustainable and approved disposal practices



Figure 1. Bag compactor and waste bag storage container

Reuse and Recycling

Wherever possible materials and containers are to be reused or set aside for recycling.

Pallets are returned to the suppliers to be reused, while items such as paper, cans, plastics and scrap metal can all be sent to recycling centres to avoid them going into landfill.

Emulsion spills and left over emulsion from the laboratory is to be returned to the process stream at every opportunity to limit the volume disposed of offsite.

Flushing water used to clean the transfer lines back to the oxidiser tank is collected in an ullage tank beside the oxidiser area bund for blending back into the product stream.



Figure 2. Recycle

Treatment

The Port Hedland site has an onsite septic system to treat all grey waste and sewage.

As required these tanks will be serviced and emptied by approved and licenced contractors.



Figure 3. Septic tanks

An oily water pit on site collects liquids from the bund drains around the fuel blend and diesel bulk storage tanks. Water from vehicle wash downs, storm water in the area and any water used to clean the concrete pads in front of the emulsion storage tanks will also run into this pit.

The pit is split into three sections:

- ① - Bund drain collection
- ② - Oily water collection
- ③ - Clean water collection

The first section collects liquids from the drains where it naturally separates out based on density.

The lighter oily water will rise to the top of the dividing wall and flow into the second section.

If the water rises too quickly then heavier cleaner water below the oily surface water will also run into the second section.

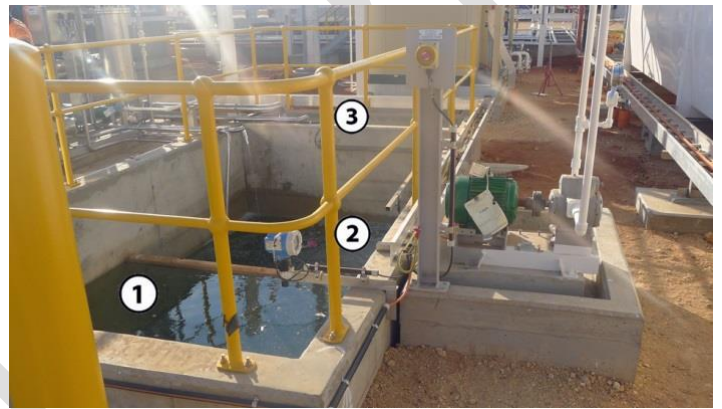


Figure 4. Oily water pit

In the second section the water will again separate out based on density.

A skimmer in section 2 draws off the lighter oily water from the very top.

The oily water is sucked in through the centre of the skimmer, up a transfer pipe and passed through a filter to remove foreign objects (bugs, litter, etc.).

The filtered liquid is then pumped into the oily water tank to await collection and disposal.

The skimmer is activated when a float switch in section 2 reaches a certain level.



Figure 5. Section 2 components

The heavy cleaner (less contaminated) water will sink to the bottom of section 2 and pass through a passage at the base of the dividing wall into section 3.

Water from section 3 is pumped up the large pipe and through a filter to remove foreign objects (bugs, litter, etc.).

The filtered water is then transferred into the water / oil separator.

An overflow pipe in section 3 sends water to the stormwater retention pond.



Figure 6. Section 3 pipework

The separator spins and centrifugal motion causes the lighter clean water to move to the outside from where it drops down to the outlet at the base of the separator.

The heavier oil / oily water is pulled into the centre of the separator where it drops down into a collection point and is pumped back up through the top and into the oily water tank.



Figure 7. Oily water tank

The outlet at the base of the separator drops immediately into a T-join ④. Some of the water then flows through pipe ⑤ back into the section 2 of the oily water pit, while the remaining water moves along to the next T-join which is controlled by a valve ③.

When the separator first starts off the valve is set to return all the water from the outlet back into section 3 of the oily water pit along pipe ②. The centrifuge recycles the water until the separator has run for a preset time to enable it to stabilise and properly separate the water and oil.

After the preset time has elapsed the valve swaps and sends the water along pipe ① and into a concrete soak tank buried in the ground. The cleaned water then slowly seeps back into the ground water.

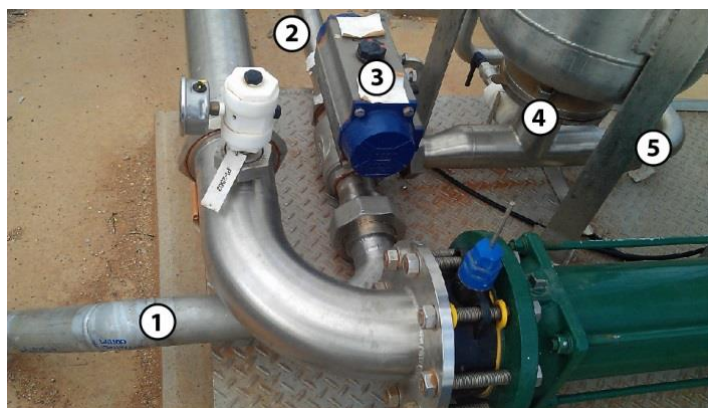


Figure 8. Water / oil separator pipework



Figure 9. Concrete soak tank

Disposal

Waste products generated onsite have the potential to adversely affect the environment by contaminating surrounding soil and water. Effective monitoring of accumulation, storage and disposal must be conducted to minimise its impact on the environment.

The implementation of specific waste storage areas enables effective segregation of different waste streams minimising cross-contamination to ensure effective disposal.

General waste, recyclable materials, hydrocarbons, pallets, ammonium nitrate and urea bags, hazardous chemicals and dangerous goods containers, used filters, dirty emulsion and scrap metal are all stored in their own demarcated areas whilst awaiting disposal.

Liquid wastes must be stored in bunded areas to prevent contamination of the surrounding soil in the event of an overflow or leak.



Figure 10. General waste bin

Liquid and water from the laboratory and crib room sinks are collected in ullage tanks located outside the relevant buildings.

These are emptied by an authorised third party environmental disposal contractor as required.



Figure 11. Ullage tank

All wastes removed from site must be recorded in the waste tracking register detailing the source, quantity, date and location of disposal. Waste tracking registers must be reported annually to the Environmental Department for review and development of continuous improvement strategies for sustainable practices.



Important

Any waste disposed of incorrectly or inappropriately must be reported and investigated as an environmental incident.

The use of authorised and licenced contractors to dispose of waste materials shall be enforced.



Caution

Caps on used drums and containers must be securely tightened to prevent the accidental release of any residues.

Any damaged containers or spillage shall be reported immediately and appropriate action taken.

1.4. Chemicals and Hydrocarbons

1.4.1. CHEMICAL AND HYDROCARBON MANAGEMENT

Chemicals and hydrocarbons present a significant threat of contamination to the environment if not correctly and carefully managed. The use, storage, handling, containment and clean-up requirements are covered by a variety of legislative instruments including, but not limited to:

- Occupational Safety and Health Act 1984
- Occupational Safety and Health Regulations 1986
- Environmental Protection Act 1986
- Environmental Protection Regulations 1987
- Australian Standard AS 1940–2004, The Storage and Handling of Flammable and Combustible Liquids
- Australian Standard AS 3780–2008, The Storage and Handling of Corrosive Substances
- Australian Standard AS 4326–2008, The Storage and Handling of Oxidizing Agents
- Australian / New Zealand Standard AS-NZS 2243.10–2004, Safety in Laboratories - Storage of Chemicals
- Safety data sheets



Important

Safety data sheets are supplied with all chemicals and hydrocarbons.

Personnel are expected to read and understand the potential hazards associated with the materials they are using and handling as well as the necessary storage, clean-up and containment measures.

Contact Supervision if you have any questions relating to chemicals and hydrocarbons before interacting with them.

Chemical and Hydrocarbon Use

Chemicals and hydrocarbons may only be used in accordance with their designated purpose. Improper use can result in accidental release or exposure to chemicals, hydrocarbons or their by-products resulting in contamination of the local environment and potential long term negative effects.

Storage and Handling

Different classes of chemicals must be stored in isolation from each other or with minimum separation distances to ensure dangerous chemical reactions do not occur in the event of an emergency. All chemicals must be labelled identifying their product name, safety and risk phrases and chemical class.

The business has set up designated storage locations for the chemicals and hydrocarbons on site. These must be used to store only the designated material.



Figure 12. Ammonium nitrate storage shed



Figure 13. Caustic soda and citric acid storage



Figure 14. Flammable goods cabinet



Figure 15. Bulk diesel and fuel blend storage

The transfer of chemicals is to be performed over concrete pads wherever possible to minimise the risk of contaminating the soil in the event of a container leak or accident.

All vehicles and auxiliary equipment such as forklifts are to be refuelled on concrete pads fitted with drains to collect any liquid spillage.



Caution

Solvents and chemicals must not be poured into general drains.

Store and stack packaged materials in such a manner and location that if they are ruptured or toppled, the contents will not spill outside the containment structure.

Tank Level Indicators and High Fill Alarms

All ammonium nitrate based production tanks are equipped with a level indicator connected to a high fill alarm to alert an operator of a tank high level.

The indicator will also trigger an auto shutoff of the filling line to prevent an overflow.

Diesel fuel bowsers are fitted with an auto shutoff mechanism to prevent fuel tanks from overflowing.

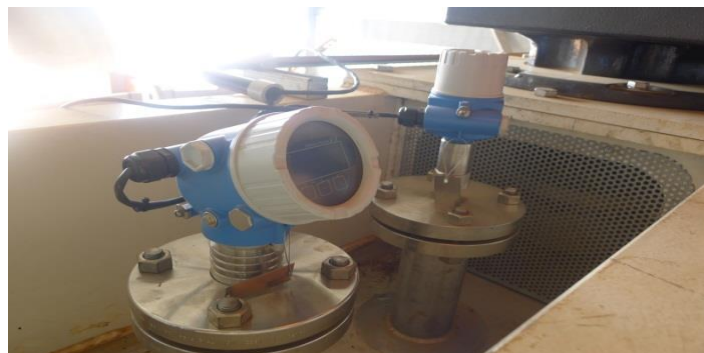


Figure 16. Oxidiser melt tank level indicator

Bunding

All liquid chemicals and hydrocarbons used in the manufacturing process are stored in designated banded areas or containers. Low pervious concrete walls are used to form the perimeters that surround the production tanks and designated banded areas.

Storage containers holding liquid materials are fitted with built-in bunds to prevent the accidental release of chemicals in the event of a container leak.



Figure 17. Concrete bunding and sump



Figure 18. Caustic soda banded container

Banded areas are designed with sufficient capacity to contain a full volume spill and provide a barrier to retain liquid, which could otherwise be discharged offsite into the surrounding environment. The bund flooring is graded to direct spillage or accumulated stormwater to a collection sump for easy removal.

Spill Management

Accidental release of chemicals and hydrocarbons can result in serious impact to the surrounding environment. In the event of a chemical spill an immediate response must be initiated.

All spills are to be managed using the three Cs - Control, Containment and Clean-up.

Control

The source of the leak or spill is to be identified and where it is safe to do it must be isolated to minimise the quantity of material in contact with the ground. Control the area in which the spill has occurred by using barricading to prevent unauthorised entry until it has been cleaned up and deemed safe.

Containment

Use the spill kit and apply absorbent materials and booms for small liquid spills. When using the spill kit, ensure all appropriate PPE is worn. Large liquid spills may require earth moving equipment to build earthen bunds to prevent the liquid from running offsite or into sensitive areas or waterways. The site stocks absorbent materials capable of being disposed of in a landfill.

Uncontaminated solid material spills are cleaned up using the appropriate cleaning equipment, collected in labelled recovery bags and recycled back into the process. In the event of contamination rendering the material not suitable for recovery, an authorised third party environmental disposal contractor is used to dispose the solid material in the appropriate manner.

Spillage involving oxidiser solution in the oxidiser preparation area is generally collected in the ullage tank and blended back into the process. Contaminated oxidiser not suitable for recycling is collected and incinerated by an authorised third party environmental disposal contractor.

Emulsion spills normally do not flow due to their viscosity. Wherever possible this material will be collected on site and if clean will be manually recovered by blending it back at the hopper in the emulsion area. Contaminated emulsion or spills too large to clean-up are to be collected by a third party authorised contractor and burnt.

Clean-up

Dispose of contaminated materials appropriately and remediate contaminated soil. Seek guidance from the Environmental Advisor. Operators involved in clean-up activities must wear appropriate PPE and be familiar with the clean-up methods in the safety data sheet for the relevant chemical or hydrocarbon.

Shovels and other various cleaning equipment such as brooms and dry absorbent materials are also available for handling spillages.

Spill kits are found in yellow wheelie bins around the facility and contain the equipment required to help minimise the spread of a spill and clean it up.



Figure 19. Spill kit



Important

The Environmental Protection Agency and the Department of Minerals and Petroleum must be notified of all spills which require or result in material leaving the bounds of the site either through accident or controlled removal by authorised third party contractors.

All spills are to be reported through SHAERS as Loss of Containment incidents.



Caution

Spent spill kits must be handled as hazardous waste.

1.5. Surface Water Management

Process waste water and water from potentially contaminated areas (process areas) is segregated from stormwater. Stormwater drains onsite channel stormwater to the stormwater retention pond for evaporation or dissipation. The retention pond has the capacity to hold approximately 700 m³ of water, which is equivalent to a once in a ten year rainfall event.

Under significant rainfall events the stormwater pond is designed to overflow and release clean stormwater to the area north of the site boundary. Water in the pond is regularly tested for nitrate contamination to ensure any overflow meets the site licence requirements.

To ensure the retention pond is capable of holding the necessary volume of water it will be regularly inspected, cleaned and have silt removed as required.



Figure 20. Stormwater drain



Figure 21. Stormwater retention pond

1.6. Air Quality Management

The business will take all reasonable measures to ensure that all potential emissions including chemical vapours, dust and odours comply with all statutory and approval requirements and generate no complaints from residences or the community.

Air borne dust may be caused by vehicle movement, loading and unloading operations, unvegetated areas with a loose soil composition and natural environmental factors (e.g. hot climate and wind).

Dust deposition has the potential to result in adverse impacts on surrounding flora, fauna and Aboriginal heritage values in the areas immediately adjacent to disturbance and operational areas. Dust suppression strategies such as watering unsealed roads and improving vegetation cover are in use to minimise the impact of air borne dust from the site.

Boiler exhaust stacks and tank breathers are installed on the diesel fired boiler to safely dissipate air emissions from stored chemicals.

Boiler room stack emissions are monitored every five weeks by O'Brien's and reported on quarterly basis to the relevant authorities to ensure the stack emissions targets are met.

Refer to the Port Hedland HSEQ Management Plan Section 5: Environmental Management for details.



Figure 22. Boiler



Important

Visual monitoring of dust and other emissions must be conducted daily.

Report any air quality concerns to the Site Manager for further investigation.

Use appropriate PPE if there are any air quality concerns or as instructed by Supervision.

1.7. Flora, Fauna and Weed Management

Plant operations have the potential to impact on local flora and fauna during land clearing and through the loss of habitat.

Large, dangerous or injured wildlife found within the facility boundaries are to be left alone and reported immediately to Supervision.

Supervision will arrange for a wildlife protection officer to attend the site and remove / relocate the wildlife.

Under no circumstances are site personnel to attempt to catch or chase off the wildlife. This is both dangerous to the individual and could cause further stress or injury to the animal.



Figure 23. Wildlife protection

There are many declared rare fauna species located in and around the Port Hedland site including the olive python, wedge tailed eagles and western pebbled mound mouse. Wilful or reckless injury to protected wildlife carries significant penalties including jail time.

Visually inspect the vegetation surrounding the site for impacts such as die-back. Weed species have the potential to spread in areas of disturbance and through the use of machinery. Weed species impact on native vegetation out-competing the local native plant species for water and soil nutrients.

Weed colonies on site must be reported to the Environmental Advisor for identification and development of appropriate management strategies.

1.8. Procedures

Nil

1.9. Supporting Documents

Nil

1.10. References

Port Hedland Emulsion Plant HSEQ Site Management Plan, Section 5: Environmental Management

HSEQ Information / Incident Reporting System (SHAERS)

Incident Response, Reporting and Analysis Procedure

Environmental Management Plan

Waste Tracking Register

Occupational Safety and Health Act 1984

Occupational Safety and Health Regulations 1986

Environmental Protection Act 1986

Environmental Protection Regulations 1987

Australian Standard AS 1940–2004, The Storage and Handling of Flammable and Combustible Liquids

Australian Standard AS 3780–2008, The Storage and Handling of Corrosive Substances

Australian Standard AS 4326–2008, The Storage and Handling of Oxidizing Agents

Australian / New Zealand Standard AS-NZS 2243.10–2004, Safety in Laboratories - Storage of Chemicals