



Oyu Tolgoi LLC

Health, Safety and Environment Management System Procedures

Waste Management Centre Operating Procedure

Waste Management Centre Operating Procedure		
Effective Date: 2013.05.06	Document Number: OT-10-E7-PRC-0001-E	Version: 1.0

1. PURPOSE

To define the requirements for operating the Waste Management Centre in line with applicable legal obligations and other project standards, including Rio Tinto Standards and requirements of the Environmental and Social Impact Assessment (ESIA).

This procedure defines the key requirements for refuse and pollution control and the key responsibilities to ensure effective use, service and upkeep of the Waste Management Centre.

2. SCOPE

This Procedure is applicable to all work areas operated by or on behalf of Oyu Tolgoi LLC.

3. ROLES AND RESPONSIBILITIES

Roles	Accountabilities
General Manager HSE	<ul style="list-style-type: none"> • Provide the necessary management support and resources to implement the procedure • Approve and make this procedure available to all Oyu Tolgoi employees and contractors
Environment Manager	<ul style="list-style-type: none"> • Make available environmental expertise to monitor waste produced and advise staff and contractors on waste management
Department Managers	<ul style="list-style-type: none"> • Submit monthly reports for their respective Departments on waste generated and disposed to the Waste and Chemicals Coordinator
Superintendents/ Supervisors	<ul style="list-style-type: none"> • Place waste bins in strategic areas with signage, access and designated removal processes in place to collect the waste • Segregate waste and dispose of it in accordance with this procedure • Arrange for regular inspections of waste laydown areas • Communicate with the Waste and Chemicals Coordinator on appropriate waste disposal locations • Where economically and practicably feasible, purchase efficient products, minimise packaging, and maximise recycling and reuse of materials in the accountable work area in preference to disposing of materials to the waste management centre
Originator	<ul style="list-style-type: none"> • Follow through the process specified in this procedure for hazardous substance disposal, transport, handling, storage and disposal • Allow sufficient time for obtaining required regulatory permits
Environmental Officer- Permitting & Approvals	<ul style="list-style-type: none"> • Respond to hazardous substance approval and disposal requests • Liaise with regulatory agencies and obtain the required regulatory permits.

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	<ul style="list-style-type: none"> Request additional information for hazardous substance disposal
Waste and Chemicals Coordinator	<ul style="list-style-type: none"> Maintain the waste register Provide technical assistance to staff and contractors on the requirements of this plan and referred guidelines Arrange routine work area audits and inspections Approve hazardous waste disposal requests where applicable Communicate volumes, and performance against objectives and targets of waste Communicate changes to procedures for waste segregation to employees and contractors through contributions to communication forums, training sessions and communication materials (including posters)
Landfill Operational Staff	<ul style="list-style-type: none"> Comply with the requirements of these procedures and relevant regulations Store all hazardous materials at the Waste Management Centre to minimize the potential for spills, accidents, incidents or hazards
All employees and contractors	<ul style="list-style-type: none"> Store all waste materials in the designated storage areas or bins Participate in waste management training where requested by Superintendents or Supervisors
Training Manager	<ul style="list-style-type: none"> Define training requirements in relation to procedures for waste segregation to employees and contractors through inductions and other training programs

4. PROCEDURE

4.1. Waste Disposal

4.1.1. General

The general requirements of the waste management centre are as follows:

- a) Non-recyclable hazardous waste will be disposed of by appropriate and lawful means in accordance with guidelines outlined in the *General Waste Collection and Transfer Procedure*;
- b) All liquid hazardous and non-hazardous wastes will be collected for temporary storage and disposal from waste management centre, in accordance with the hierarchy of controls; and
- c) Non-liquid wastes which cannot be feasibly reused or recycled, will either be incinerated or sent to the landfill for disposal if evaluated as non-hazardous.

4.1.2. Landfill

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The key management requirements for the landfill are as follows:

- a) Wastes from the temporary waste facility will be transferred to the permanent Waste Management Centre once commissioned. The interim facility will be decontaminated if required and then closed. This process will be implemented in accordance with the Interim Landfill Closure Procedure;
- b) Operators will be trained in the recognition of hazardous wastes;
- c) Implementation of processes to prevent hazardous wastes being disposed off to the facility including:
 - training of facility management personnel to recognise hazardous wastes; and
 - inspections (including inspection records);
- d) Suitable soil cover material will be used for intermediate and final cover (minimum of 30 cm depth); and
- e) Adequate records of waste inventories, inspections and training shall be maintained by the operators.

4.1.3. Incinerator

The following are key compliance requirements of Oyu Tolgoi's incinerator:

- The Oyu Tolgoi incinerator complies with the requirements of *EU Directive 2000/76/EC* of 4th December 2000;
- Materials permitted for incineration include:
 - Oily rags, waste oil and lubricants;
 - Oil filters;
 - Medical waste: incineration process must be carried out with presence of medical staff; and
 - Hazardous wastes: hazardous waste that is combustible and allowed to be incinerated; and
- Materials not permitted to be incinerated are chlorinated solvents (due to the risk of dioxin generation unless a temperature of 1,100°C and a residency time of 2 seconds can be attained).

4.2. Landfill Operation

4.2.1. Daily cell construction/filling

Daily construction of a landfill cell consists of 5 main activities:

1. Inspection - after the refuse is dumped, the spotter will inspect the load to make sure it does not contain any hazardous waste or items that could damage the liner. If such items are found, the load should be pushed away from the active cell and the landfill supervisor notified to determine the path forward.
2. Pushing refuse – the dozer should move forward and backward in the cell as much as possible and keep severe/sharp turning to a minimum (it is more efficient to track back and forth rather than in a circular manner and it places less stress on the HDPE liner). The dozer

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picks up a load of refuse on its blade and pushes it into the cell. A typical load of refuse from a refuse truck should be able to be pushed into the cell with 3-4 pushes. Heavy or bulky loads may require 1-2 additional pushes.

3. Spreading refuse – as the dozer is pushing the refuse into the cell, the blade should be brought up as the refuse is pushed into the cell so it spills out underneath the blade and is distributed across the cell. The refuse should be pushed up to maintain 3:1 slopes. At the end of the day, refuse should be evenly distributed across the cell footprint.
4. Compacting refuse – the dozer should track across the refuse 4-5 times to compact it. If possible, the dozer should compact the refuse in several directions but it should make any sharp turns on the refuse and not on the gravel drainage layer. Although additional passes over the refuse can be done, the additional refuse compaction that is achieved from the additional passes will be relatively minor.
5. Placing daily cover – after the last load of refuse for the day has been delivered, tipped, spread and compacted, the cell needs to be covered with soil (i.e. daily cover). The last load of refuse should be delivered to the Waste Management Centre landfill no later than 1-2 hours before the end of daily operations. This will give the operator adequate time to deliver cover soil to the working face and to spread the soil to a uniform 10 cm thickness (minimum thickness required) and also to grade the working face to a 3:1 slope and to ‘tie’ into adjacent closed cells.

4.2.2. Coordination of waste deliveries

Given the size limitations of the landfill, the following two options (Option A and B) are available to operators to receive waste and dispose of waste.

- a) Option A – Operator pushes individual loads into the cell as they arrive to reduce the likelihood of windblown litter and reduce the operator’s ability to perform other duties. This method is most suited to windy weather conditions; or
- b) Option B – Operator requests several loads to be tipped at the working face. These loads are then cumulatively moved into a cell. This option allows the operator to perform other duties while the loads accumulate at the working face. However, it shall be avoided during adverse weather conditions.

4.2.3. Dust control

- a) Dust control at the Waste Management Centre will involve the use of water trucks; and
- b) Water trucks will water down the access roads, working face, access ramps, and other areas as needed to keep dust levels down.

4.2.4. Leachate management

Leachate cleanouts, located on the west side of the cells, need to be inspected on a periodic basis to make sure they are not clogged. Initially, they should be inspected every 6 months for deflection, collapse, deformation.

4.2.5. Litter

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- a) Litter control fences will be located adjacent to the working face or on the embankment to collect windblown trash from leaving the working area;
- b) Litter fences shall be sufficiently high to contain litter; and
- c) Litter that accumulates on the wind fence will need to be periodically removed.

5. DEFINITIONS

PPE - Personal Protective Equipment

General Refuse - general refuse (paper, cardboard, plastic, glass, and metals) that are not diverted or cannot be recycled produced at Oyu Tolgoi. It excludes mining derived wastes, which will not be disposed of at the landfill.

Kitchen waste - food scrapings from meals or refuse from kitchen operations that is diverted from the general refuse stream.

Construction/demolition debris - waste derived from construction or demolition activities. Typically it is large, bulky, woody, concrete, or similar.

Wastes not allowed - hazardous wastes and mining wastes should not be disposed of.

Compacted refuse - after refuse is placed in the cell it needs to be compacted to minimize the amount of airspace it occupies. Compaction occurs from shredding, or breaking up the refuse and passing over it several times with a dozer

Working Face - area where refuse is dumped and pushed by the dozer into a daily cell

Daily cell - refuse delivered in one day to the landfill is placed in a specific area.

Refuse lifts - mass of refuse that is compacted before additional refuse is placed on top.

Daily Cover - cover placed on refuse after the last load of refuse has been disposed and compacted. It reduces odors, vectors, litter, and the potential for landfill fires. It can be soil or an alternative daily cover (ADC).

Alternative Daily Cover (ADC) - ADCs are alternatives to using soil as a daily cover. They can vary from spray on foams, mineral based coatings, tarps, compost, chipped wood, ash, shredded tires, or others. They are typically used to preserve airspace capacity for refuse rather than soil.

Landfill cell - the landfill is divided into three smaller landfill cells (1, 2, and 3, from north to south). The difference between the cells is the leachate from each cell is diverted to a different leachate pond. Once refuse is placed above the berms between each cell, the cell designation will be less significant.

Landfill liner - the drain gravel is the top layer of a multi-component liner system composed of (top to bottom): 600 mm of drain gravel, non-woven geotextile, 1.5 mm of HDPE, 1000 mm compacted clay and a prepared subgrade. However, the 'liner' typically refers to the HDPE portion of the liner system

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Landfill gas - gas that is produced by the decomposition of organic refuse. It is the cause of the odor typically experienced at landfills.

HDPE (High Density Polyethylene) - barrier layer in the landfill is composed of HDPE, a thick black plastic that prevents the amount of leachate that can enter the groundwater from the landfill. The HDPE achieves the low permeability requirement of a subtitle D landfill

Litter - lightweight trash that is picked up by the wind and carried away from the working face.

Leachate - water that has come in contact with refuse and becomes contaminated. It may be moisture that comes out of the refuse or it may be precipitation that falls on to the refuse. It will flow under gravity through the refuse and through the drainage layer and into a perforated pipe. It penetrates the liner flows under gravity to one of the leachate evaporation ponds. The capacity of the leachate ponds is such that any leachate that enters the pond should evaporate or sublimate to the atmosphere.

6. REFERENCES AND RELATED DOCUMENTS

Mongolian law provides for the regulation of hazardous materials as follows:

- *The Mongolian Law on Household and Industrial Waste, 2004* which regulates the collection, transportation, storage, reuse and disposal to landfill of household and industrial waste
- *Law on Hazardous and Toxic Chemicals, 2006* which addresses the import, export, transportation, storage, use, and control of toxic chemicals. It imposes measures to prevent the impact of toxic and hazardous substances on human health and the environment
- *Government Resolution #135 of 2002* addresses the procedures of the classification, collection, packaging, transportation, treatment, storage, and disposal of the hazardous waste.
- *Joint resolution #A-320/305* of Ministry of Environment and Tourism and Ministry of Health of 2011 which address the procedures of the disposable of medical wastes;
- Ministry of Environment and Tourism *Resolution # 404* of 2006 which address the procedure of the disposal, landfill of the individual and legal entity and landfill and disposal of the waste.
- *Health, Safety and Environmental standards*

Several national health, safety and environmental standards set permissible levels of pollutants in air, soil and water. Any exceedances of these levels that are caused due to business operations are considered as *contamination*.

The above is considered to be pertinent legislation in force at the time of preparation of this procedure; for a full summary of the current legislation which may be applicable to this procedure please refer to the Oyu Tolgoi Environmental Legal Register

6.1. Other Requirements:

- *IFC EHS Guidelines for Mining, 2007*;
- *IFC General EHS Guidelines, 2007 (general construction wastes)*;
- *EU Directive 99/31/EC, 1999 (on the landfilling of waste)*;

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- *EU Directive 2000/76/EC of 4 December 2000 (on the incineration of waste);*
- *WHO Safe Healthcare Waste Management: Policy Paper and fact sheet No 281, (Health-care waste management);*
- *Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal Convention (the Basel Convention, ratified by Mongolia in 1997);*
- *USEPAUS EPA standards CFR 258 (Criteria for Municipal Solid Waste Landfills) adopted by the Project; and*
- *Rio Tinto Performance Standards: E7 Non mineral waste management standard, E5 Hazardous materials and contamination control standard, E9 Land use stewardship standard.*

These standards set requirements to plan for, establish and evaluate programmes/ management plan and implement control measures for non-mineral waste to prevent and minimize their potentially adverse health, safety and environmental effects.

	Name	Location
Legal and Other Requirements	Mongolian Law on Waste, 2012.	Legal register
	Government Resolution #135 of 2002 on classification, collection, packaging, transportation, treatment, storage, and disposal of the hazardous waste.	
	Joint resolution #A-320/305 of Ministry of Environment and Tourism and Ministry of Health of 2011 on procedures of the disposable of medical wastes	
	Ministry of Environment and Tourism Resolution # 404 of 2006 on disposal, landfill of the individual and legal entity and landfill and disposal of the waste.	
Oyu Tolgoi HSE Management System	Oyu Tolgoi HSE MS Legal Requirements Register	OT Portal
	Emergency Management Plan	
	Hazardous Substances and Contamination Control Waste Management Plan	
	HSE MS Risk Register	
	Oyu Tolgoi Environmental Protection Plan and Environmental Monitoring Program	
	Hazard identification and risk management procedure (OT-03-PRC-0001-E)	
	Nonconformance, incident and action management procedure (OT-14-PRC-0009-E)	

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	Performance assessment and auditing procedure (OT-16-PRC-0001-E)	
	Management of change procedure (OT-11-PRC-0001-E)	
	Spill Response procedure(s) (OT-10-E5-PRC-0002-E)	
Communication/ Training	Non Mineral Waste Management Awareness Training	OT Portal

7. DOCUMENT CONTROL

File Name	OT-10-E7-PRC-0001-E-Waste Management Centre Operating Procedure
Description	Environmental procedure
Original Author(s)	Susan Giles
Creation Date	2013.01.20
Approved By	Mark Newby, Environment Manager
Approval Date	2013.05.06
Change Record Number	##

Risk Ranking	Assessment Date	Risk Assessor	Review Schedule	Next Review Date
Moderate	2013.01.20	Dolgor Baasansuren	2 Yearly	2015.01.20

Version	Revision Date	Author(s)	Approved By	Revision Notes
1.0	2013.05.06	Susan Giles	Mark Newby	Approved version.