



RAINBOW MOUNTAIN
Renewable Energy

RAINBOW MOUNTAIN RENEWABLE ENERGY

SITE MANAGEMENT PLAN

Operation of Anaerobic Thermal Reduction
(Pyrolysis) Processing Plant
Rainbow Mountain Resource Recovery Centre
216 State Highway 38, Waimangu

Version 1.0 – June 2023



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1. INTRODUCTION

1.1 PURPOSE

Rainbow Mountain Renewable Energy Limited (“**RMRE**”) has received resource consents to Bay of Plenty Regional Council (“**Regional Council**”) and Rotorua Lakes District Council (“**District Council**”) to authorise trials associated with resource recovery operations at 216 State Highway 38, Waimangu (“**the site**”). Specifically, resource consents have been granted in relation to the undertaking anaerobic-thermal-reduction (“**ATR**”) pyrolysis trials at the site (over a 6-month period).

This is a Site Management Plan (“**SMP**”) relating to the operational management procedures in relation to the pyrolysis activities, as proposed to be authorised under those lodged consent applications.

1.2 SCOPE

This SMP has been designed as a management tool that will provide principals that will guide the direction for the management and operation of the Anaerobic Thermal Reduction activities, as proposed. It outlines the processes and procedures to ensure the safe, environmentally sound and cost-efficient management of these activities.

Specific issues addressed in this SMP include:

- Dust management;
- Odour management;
- Noise management;
- Hazardous substances;
- Safety;
- Equipment utilised; and
- Roles and interactions of various organisations and individuals.

2. ROLES AND RESPONSIBILITIES

<i>ROLE</i>	<i>CONTACT PERSON</i>	<i>CONTACT DETAILS</i>
General Manager (RMRE)	[REDACTED]	[REDACTED]
Site Manager (RMRE)	TBC	TBC

Site Manager (Rainbow Mountain)	[REDACTED]	[REDACTED]
Operators	Various (TBC)	

2.1 RMRE MANAGEMENT STRUCTURE

RMRE will occupy a portion of the industrial premises at Rainbow Mountain. The management of this portion of the site is the responsibility of RMRE.

The company will provide a Site Manager with responsibility for the day to day operation of the site and its associated activities, including;

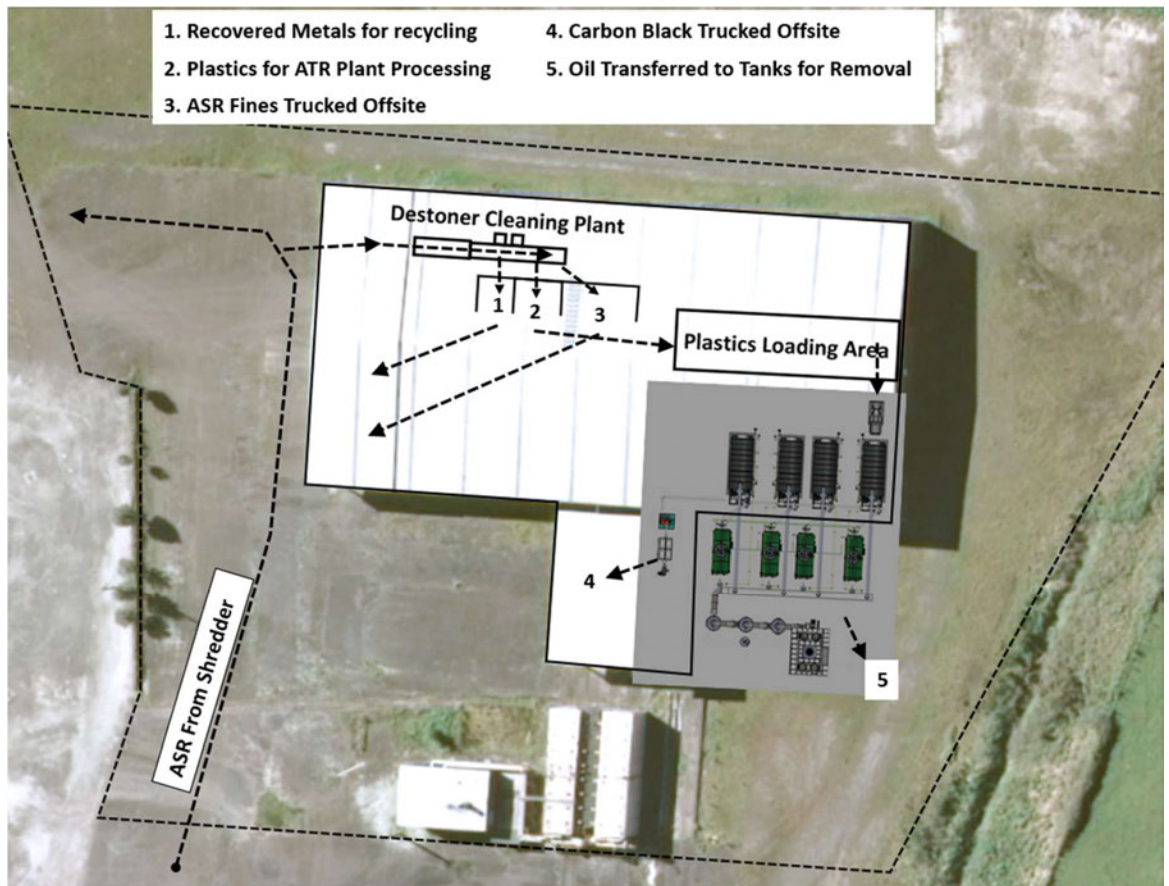
- Acceptance and Processing of inwards goods, primarily being Automotive Shred Residue (ASR) as well as other plastics feedstocks;
- Unloading of goods in designated impermeable and covered unloading areas;
- Undertaking operations in a manner that complies with the Stormwater Management Plan with particular regard to surface water drainage;
- Dust management;
- Operation of the ATR Plant in accordance with the Operating Procedures and Health & Safety Policy.
- The preparation, maintenance and operation of an occupational health and safety plan for all persons employed by this Contractor or who are visiting the site, offices and workshops.

The occupational health and safety plan shall be in accordance with the requirements of the Health and Safety in Employment Act (1992) and Regulations (1995). A copy of this plan is to be kept onsite and is freely available to all employees. As a new business and process, a Health & Safety Plan is to be prepared and finalised as part of the trial process.

Operators employed by RMRE are responsible for the sorting of the materials and loading / unloading of the plant on behalf of the General Manager of RMRE.



3. PROPOSED CONFIGURATION OF THE PLANT



3.1 PLANT REQUIREMENTS

Operation of the ATR Plant will require the following full time plant:

- General Kinematics Two Blade Air-knife Destoner (Cleaning Plant)
- Huayin Energy Multi-Reactor Mixed Plastics Pyrolysis Plant
- Three Wet Scrubbers for Exhaust Treatment
- Wet Electrostatic Precipitator for Exhaust Treatment
- Various machinery including (but not limited to) Loaders, Forklifts, Tankers.

4. MATERIAL PROCESSING

Feedstocks for the trial will primarily comprise a mix of ASR material from the Metalco Shredder operation, as well as single plastics feedstock sourced externally. ASR material is to be loaded in regularly and sorted through the Cleaning Plant which separates the ASR into mixed plastics / rubbers (ATR feedstock), metals (recycled back through Metalco) and ASR fines (landfill).

Externally sourced feedstock will be clean and free of contaminants on arrival and will not require any further processing before loading into the ATR Plant.

ATR feedstock is loaded into the plant and run through a pyrolysis process, chemically recycling the material into synthetic gas, oil and carbon black. Syn-gas is combusted back through the heating system, oil is collected in a series of tanks through condensing, and carbon black is captured through a sealed vacuum system to a baghouse. Oil and carbon black whilst being collected, are to be exported offsite, without any intention to store significant quantities.

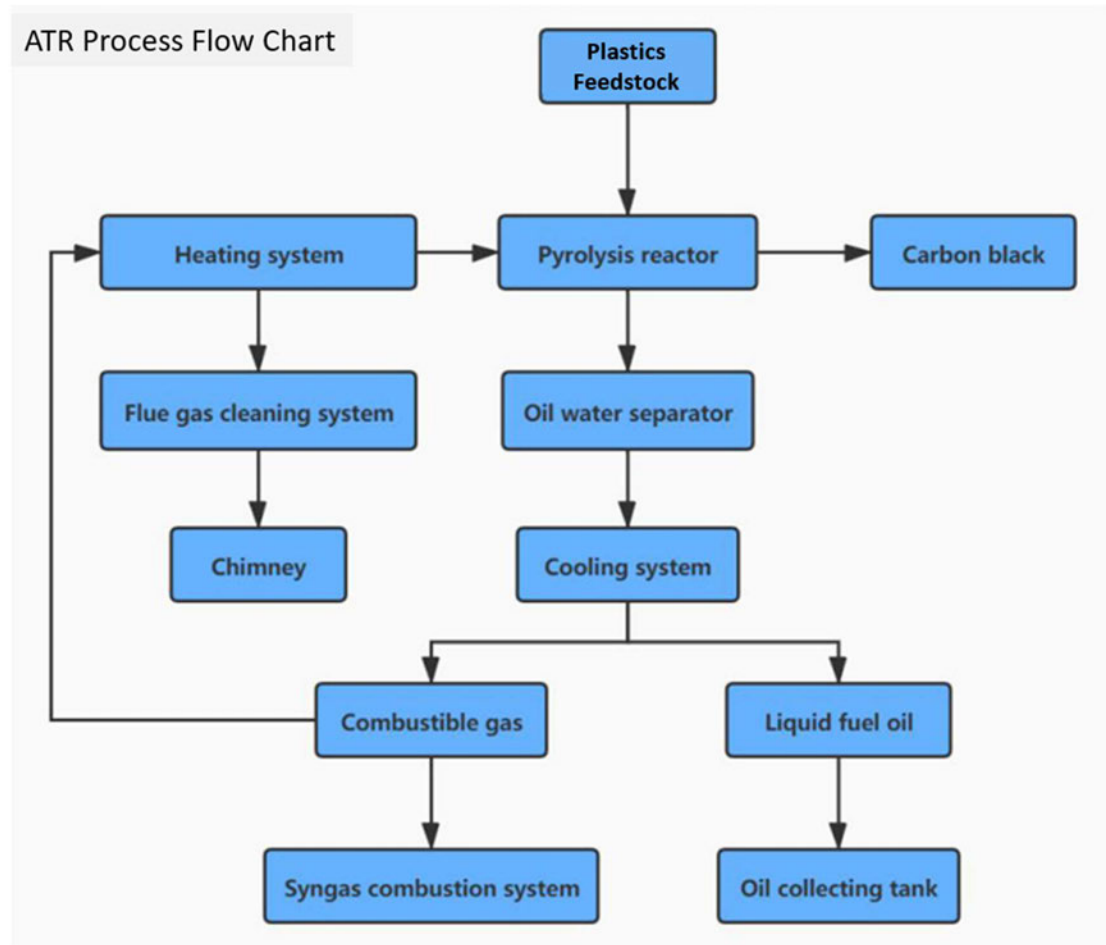


Figure 1: ATR Plant Process Flow Chart

5. OPERATIONAL MANAGEMENT

5.1 MATERIALS

Materials coming into the site will be derived from two sources, primarily being ASR loading directly from the adjoining Metalco Recycling Limited Shredder Operation. This material will be loaded into the covered processing area before being loaded into the Cleaning Plant where the ASR will be separated into mixed plastics for processing in the ASR plant, metals to be recycled back through Metalco Recyclers Limited, and ASR Fines for disposal to Landfill. As these materials will be processed on a daily basis, stockpiles will not be substantial.

Secondary materials may be brought onto site via the backroad and will comprise clean single source plastics for direct processing through the ATR Plant. These materials will be limited through the trial process and only brought onsite in smaller volumes (<40m³) as required for the trial process.

5.1.1 ACCEPTED MATERIALS

- Automotive Shred Residue (ASR)
- Clean Single Plastic Feedstock. Examples include packaging, fishing nets, silage wrap.

5.1.2 UNACCEPTED MATERIALS

- Any plastics feedstock that is not clean for direct input into the ATR Plant other than ASR. Any agreement with suppliers will include the requirement for feedstock to arrive onsite free of any contaminants with loads being inspected by operators on arrival.

5.2 HOURS OF OPERATION

Monday to Friday – 24 hours.

One complete ATR cycle takes 24 hours. It is therefore envisaged to operate shifts.

5.3 TRAINING

The General Manager of RMRE will ensure that all ATR Processing operations staff are familiar with the requirements of this SMP. In particular, operations staff will fully understand the methods of loading the ATR Plant, and monitoring systems throughout the process. Training will be broken down to focus on the following primary operating procedures:

- Handling of Feedstocks – In and out of Cleaning Plant and into ATR Plant.
- Loading & Operating of ATR Plant, understanding the various cycles of the process and how the fail safe mechanisms and operating controls function.
- Monitoring Plant during various stages of a cycle.
- Handling of output material including oil and carbon black.

All staff will be trained in matters outlined under the Health & Safety Plan and the Emergency Management Plan as attached as Appendices with this SMP.

5.4 SECURITY

The entire site boundary is fenced. Access to the site will be via the existing western entrance only. Only authorised vehicles will be able enter and exit the site with entrances having monitored security gates.

5.5 SIGNAGE

At Rainbow Mountain, the use of signage is a key method for communicating important information for the efficient operation of the Yard including;

- Contact information (address and phone numbers)
- Traffic Flow & Management
- Emergency response information
- Operational zones within the Yard
- Signage will be located at the entry points to the site and at key intersections and crossroads across the site

5.6 NOISE

The ATR Plant operation area is in excess of 200m from State Highway 38 and the neighbouring rural boundary. It is also a considerable distance from any current private residences. Noise generated from the site is minor and primarily relates to the operation of the ATR Plant through a series of electric motors, pumps and fans. Other minor noise will be generated by various heavy machinery / vehicles operating across the site. All machinery to be used by RMRE for the ATR Plant operations are maintained to ensure that noise levels comply with the Rotorua Lakes District Plan and do not create a nuisance.

Based on this, it can be concluded that the noise levels will be reasonable and that the effects of noise from the proposal will be no more than minor.

5.7 DUST / PARTICULATES

5.7.1 DUST / PARTICULATE MANAGEMENT ON SITE

The approach to the management of dust / particulates across the site is to implement measures that ensure that any such discharges will be retained within the boundary of the Rainbow Mountain site. This is to be achieved by:

- RMRE is to work alongside Rainbow Mountain Site Management on maintenance of access roads and haul roads on site. This includes the periodic metalling of the main access road

from the Western Access point to the ATR Plant. There is potential to chip seal this access road to further mitigate dust.

- This road is also graded periodically to ensure that the formation of ruts and potholes is kept to a minimum. A grader machine is kept onsite.
- The use of a water cart during dry weather to keep access and haul roads damp.
- The majority of the ATR feedstock handling will take place on covered impermeable hardstands. Dust generation is likely to be primarily from loading ASR material into the Cleaning Plant. The Plant itself will have extraction hoods and baghouse system to capture dust. The Carbon Black Handling System for the ATR plant is enclosed with fine material being captured through a baghouse system where dust will be contained. At the end of every shift, all operating staff are responsible for sweeping all areas to capture dust & particulate.
- Periodic usage of the street sweeping machine across the site.
- Areas outside of the primary ATR Plant Building will be periodically inspected for signs of any dust / particulate.
- Inspect and clear stormwater drains / catchpits on a weekly basis where EnviroPods (or similar) are to be installed to capture dust / particulate. Any captured material is to be collected and disposed off in accordance with the disposal of the ASR fines.
- Periodic inspection and clearing of the stormwater oil/grit interceptors, particularly following significant rainfall events.
- The capacity of the Cleaning Plant is significantly above the volume of ASR material being generated from the adjoining Metalco operation. Any stockpiling of material with potential to generate dust or particulate will be limited as this material is processed throughout a daily shift.
- Vehicle speed signs have been erected on the access roads and are strictly enforced. Haul roads are used by permanent staff and vehicle speeds are limited to below 30 km/hour for operational safety.
- The site is kept under continuous surveillance during operational hours and steps are taken by ordering the use of a water cart to ensure that dust nuisance does not occur.
- The equipment used is kept clean and maintained in first class operating condition.

5.7.2 DUST MONITORING AND REPORTING

The Site Manager will be responsible for ensuring that any discharges of dust / particulate is managed within the site and there are no discharges beyond the boundary. As necessary, and as operations develop and we become familiar with the site, consideration will be given to further dust management techniques to mitigate any dust / particulate.

5.8 ODOUR

5.8.1 ODOUR MANAGEMENT ON SITE

The ATR Plant involves processing stable plastic feedstocks with little to no odour. The oil that is an output of the ATR process will contain an odour similar to any hydrocarbon oil however the oils are captured in a closed system and transferred directly to tanks. Therefore, odour from this activity will not require any ongoing management.

Notwithstanding, the Site Manager will ensure FIDOL Assessments are undertaken by appropriately trained staff with records of each assessment being recorded onsite.

5.9 TRAFFIC

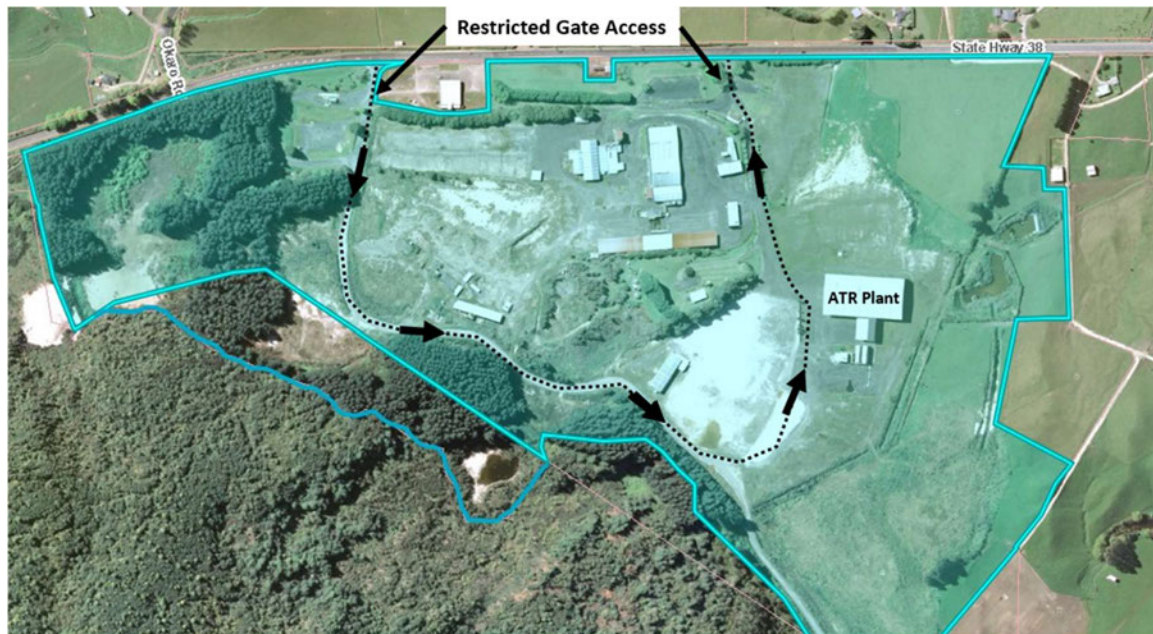
5.9.1 ACCESS ROADS

Primary access is from the Western Access point where the back road provides access to the ATR Plant Building. This road is currently in good condition comprising recently applied metal. Depending on how this road handles truck movements, Rainbow Mountain Site Management may look to lay chip seal to this road.

5.9.2 TRAFFIC MANAGEMENT ON SITE

The management of traffic on the subject property is achieved by:

- Limiting public access to the site solely to the main western access where access is controlled by security gates.
- Insistence that visitors report to the Site Office and sign in on every visit, before travelling to any other activity on site. The site is not open for general public access.
- Insistence that the speed limits set on site must be observed, with the exclusion of any repeated offenders from the Site.
- Insistence that speed limits within the back access road, which are set at 30 km/hr, are strictly observed by all staff.
- Requiring all vehicles travelling down gradient to give right of way to vehicles travelling up gradient.
- Requiring that all staff vehicles and heavy vehicles access the site only from the Western Access point. Gate access will be controlled to prevent any uninvited vehicles accessing the site.



5.10 FIRE

5.10.1 POTENTIAL FIRE SOURCES

The ATR process involves the heating of plastic feedstock in an enclosed environment free from oxygen. Notwithstanding, at operating temperatures the material in the reactor will be above flash point. The Huayin Pyrolysis system has been specifically designed with multiple fail safes including pressure relief valves, back fire prevention etc. to manage risk of fire. The reactors are also externally heated with gas / oil in a furnace which will comprise a contained and controlled heat source.

Accordingly, there is a risk of fire that needs to be managed thoroughly throughout operations. This section outlines the procedures to manage this risk.

5.10.2 FIRE MANAGEMENT ON SITE

Fire Management on site is primarily ensuring operating procedures are strictly adhered to at all times and regular monitoring and maintenance is undertaken. Fire management is the responsibility of all RMRE employees at all times.

The installation of the plant and subsequent trial process will allow fire management protocols to be fully developed. During the trials, a fire truck and water tankers are to be located and maintained onsite as a first point of action should a fire occur. Staff will be appropriately trained in applying fire fighting systems, however Health and Safety of the staff is paramount in the event of a fire. Should the situation be deemed too dangerous, RMRE employees will be instructed to

not engage in fire fighting activities, evacuate to designated zones and await emergency services.

5.10.3 EMERGENCY RESPONSE

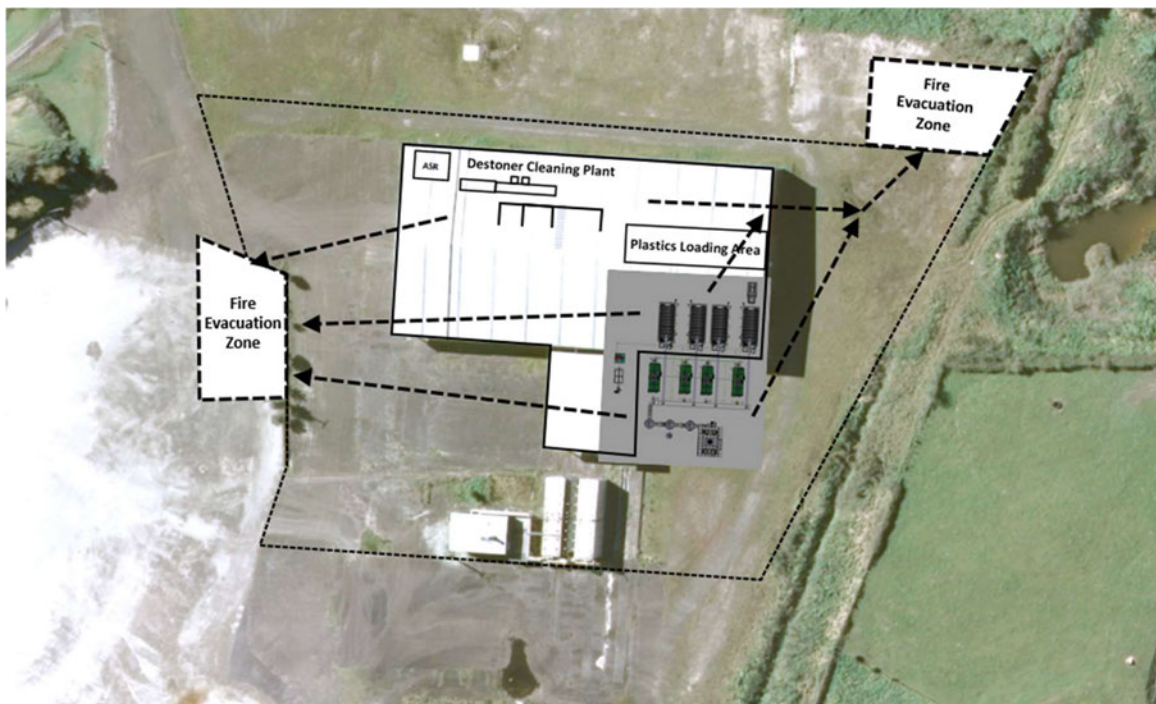
The following response will be initiated immediately on detection of a fire on this Site:

- (Site Manager/Operations Manager/Foreman) Call 111 and advise the Fire Communications Centre of the following details:
 - Location of fire (give directions and local reference points)
 - Material burning (tyres, coal, demolition material, scrub/gorse, grass, pine forest)
 - Size of fire:
 - Small- (car size)
 - Medium - (house size)
 - Large - (football field size)
- The following additional action (Operations Manager/Foreman) will be taken upon report of fire:
 - Warn any persons in the vicinity of the fire who may be affected including any adjoining activities operating onsite.
 - Ensure that appropriately trained employees on the site commence fire-fighting action if this is deemed safe and acceptable.
 - Advise the Timberlands Fire Service.
 - Advise Bay of Plenty Regional Council.
 - Advise Rotorua District Council.
- (Operations Manager) Advise all persons on the site of the fire and that a hazardous situation may exist.
- (Operations Manager/Foreman) Request that all RMRE employees commence their designated firefighting tasks, and that all other persons on the site leave immediately, leaving any plant or equipment that cannot be immediately removed.
- RMRE employees responding will proceed promptly and in a safe manner to the incident and commence their duties in limiting the spread of the fire in a safe manner.
- The immediate fire suppression action to be taken by RMRE employees will include:
 - Should a fire occur in part of the ATR Plant, terminate the process at the control board and enable any isolation controls. Engage in fire fighting if fire is of a small nature otherwise evacuate to the designated zones.

- Attempt to separate burning material from a material pile and use a fire extinguisher on the burning material and / or apply water and / or foam to minimise the spread of fire to the remainder of the material.
- Remove all liquid fuel sources (particularly mobile refuelling tankers) from the vicinity of the fire
- Mobilise Water Truck and delivery hose to most appropriate water point
- Deploy fire hoses and monitors and commence fire suppression action by the application of water to material immediately adjacent to that which is on fire as well as to the material on fire. (The purpose of wetting adjacent material is to raise the fuel moisture content and reduce the rate of fire spread.)
- Deploy excavators, loaders and other plant as required to isolate the area on fire and restrict the spread of fire (if safe to do so).
- Organise for direction of fire services to the fire site.

5.10.4 EVACUATION PLAN

The below site plan shows the evacuation zone for employees during a fire. A Fire Plan and Evacuation Procedures will be established and maintained prior to operations commencing onsite.



5.11 HAZARDOUS SUBSTANCES

The procedures associated with the management, handling and storage of hazardous substances onsite are set out in the Emergency Management Procedure document included as an appendix of this SMP.

6. PROCEDURES FOR REVIEW OF SITE MANAGEMENT PLAN

6.1 REVIEW PROVISIONS

The Site Management Plan can be reviewed every annually from the date of approval of this document.

The review process will include consideration of:

- The success of the operation over the previous three years in environmental terms
- The effectiveness of dust management and mitigation.
- Any substantial changes in layout or operations including application of new plant or machinery.

The proposed revisions will be submitted to Regional Council and District Council not less than three months prior to the review date.

A review of the SMP may also be initiated by the Regional Council and District Council in terms of matters defined under a condition of resource consent relating to s128 of the RMA 1991.

7. APPENDICES

- Emergency Management Plan
- Stormwater Management Plan