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<b>Contract No:</b>	ICB: SAA/ICBW/S-A15.4	 <small>Health &amp; Safety AS/NZS 4801</small>
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<b>Comment on this Issue:</b> Reviewed throughout to reflect current policies, processes, practices and relationships to NZS 4804/ 4801 and the requirements of ACC's Workplace Safety Management Practices (Partnership Programme) to TERTIARY level. This includes Protection of Persons and Property section 5.7 of NZS 3910:2003 Conditions of Contract for Building and Engineering Construction.		
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## 1 Introduction

This Quarry Management Plan (QMP) applies to the proposed operation of the existing basalt rock quarry known as Olo Quarry (“the quarry”), which is located approximately 4.9 kilometres to the south west of the main entrance to Faleolo International Airport, Samoa.

This QMP was originally written to support the application for a Development Consent (DC) for the operation of the quarry from the Ministry of Natural Resources and Energy, Government of Samoa.

A DC has now been granted and the quarry site cleared of vegetation allowing a survey to be undertaken and a topographical plan prepared.

This revision (Rev 6) of the QMP incorporates;

- Conditions to which DC (ref DCA No. 047/18) is subject
- Requirements of Samoa’s Code of Environmental Practice or COEP 8 – Quarry Development and Operations and the Quarry Management Plan Guideline given in App G of the PESMP.
- Quarry Layout, Site Facilities, Erosion & Sediment Control Plan and Development Plan based on the completed topographic survey

The Table in Appendix A shows how the DC conditions are incorporated in this QMP.

The Table in Appendix B shows how the requirements of COEP 8 are incorporated in this QMP.

## 2 Associated Plans, Ambit and Application

### 2.1 Associated Management Plans

This QMP is one of a series of Management Plans prepared for the Faleolo Airport Project and is a sub-plan of the Contractor’s Environmental and Social Management Plan (CESMP). A Traffic Management Plan has also been prepared to document how traffic on the quarry access roads and the aggregate haulage route to the Contractor’s Compound at Faleolo Airport will be managed.

The full suite of Management Plans is;

- Contractor’s Environmental & Social Managements Plan, with sub-plans;
  - Quarry Management Plan
  - Traffic Management Plan
  - Occupational Health & Safety Plan
  - Solid Waste Management Plan
- Quality Management Plan
- Method of Works Plan (MOWP - for all work within an operational airfield)

The location and coverage of the CESMP, QMP, TMP & MOWP is shown by the following graphic.

### 2.2 Ambit

This plan establishes the principles and procedures to be followed for the operation of the quarry and to document all matters relevant to its operation.

### 2.3 Application

This plan applies to all persons working within or visiting the quarry and incorporates details of quarry opening activities, quarry extraction operations and quarry closing activities, including potential environmental effects and how these will be managed.

It is intended that the principles of Worksafe New Zealand’s guidance on health and safety in quarries (<http://tinyurl.com/quarry-guide>) be generally followed and the associated pocket guide (<http://tinyurl.com/quarry-pocket-guide>) be available to workers.

## Olo Quarry and Environs.

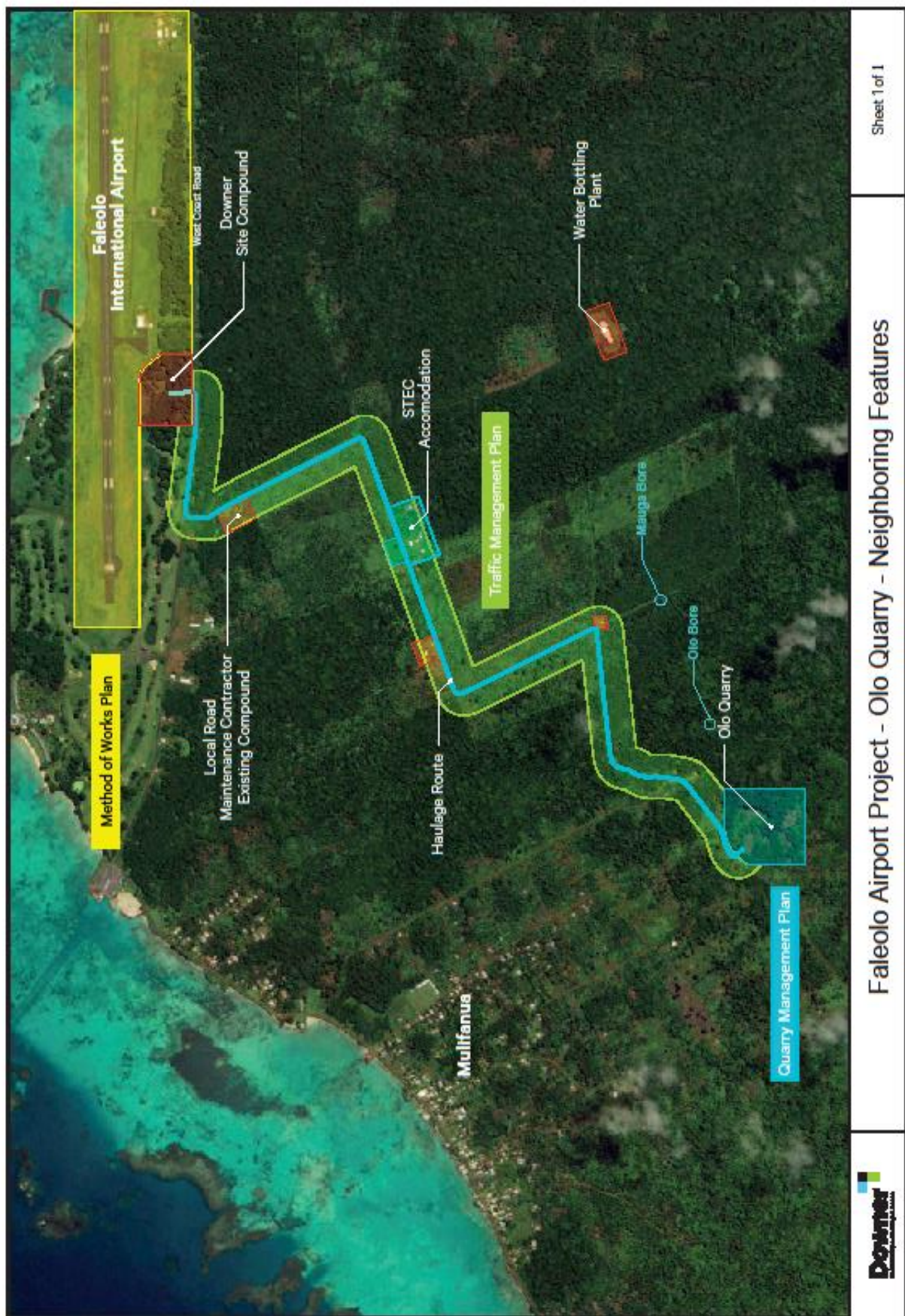


Diagram showing the neighbouring features of Olo Quarry &amp; access route from quarry to airport.

### **3 Responsibilities**

#### **3.1 Process Management**

Downer have engaged subcontractor Southern Screenworks Ltd of Christchurch NZ to manage the quarry operation and undertake the physical work required. Screenworks are experienced in working in remote and sensitive environments.

The appointed Quarry Manager, who is responsible for the proper performance, safety and general management of the quarry operation is:

Mr Brett Swain – mobile phone +64 27 435 3979

Mr Swain holds an A Grade Quarry Manager Certificate issued by Worksafe NZ. A copy is provided in App C).

In his absence, the Acting Quarry Manager will be:

Mr Bryan McConkey – mobile phone +64 27 442 1472

When extraction commences the Shot Firer will be Mr Daniel Skilton. He holds an Approved Handler Certificate issued by ICS. A copy is provided in App C.

#### **3.2 Process Implementation**

All quarry staff are responsible to ensure that this plan is maintained and correctly implemented to ensure safe and effective quarry management.

The Quarry Manager has the authority to review this procedure.

#### **3.3 Licences / Permits**

The original version of this QMP was formulated for inclusion with the application for a Development Consent (DC) for the operation of the quarry from the Ministry of Natural Resources and Energy, Government of Samoa.

This QMP has now been reviewed and amended to incorporate the conditions imposed following the issuance of the DC.

This plan has been compiled following agreement with the land owning authority for the quarry site, Samoa Trust Estates Corporation (STEC), to extract and process rock from the site for the Faleolo Airport project.

#### **3.4 Community Consultation**

Two public consultation sessions were held with the support of the Ministry of Women, Community and Social Development. Issues raised included length of project, traffic management, road damage, blasting impacts and timing of blasting, water supply protection and potential employment opportunities.

Where appropriate these are dealt with through the sections of this QMP or in constituent Faleolo Airport Project management plans (ie Traffic Management Plan, Occupational Health & Safety Plan, Solid Waste Management Plan, Contractor's Environment and Social Management Plan).

Ongoing communication and disclosure with surrounding communities will take place as part of monitoring throughout the project to ensure that community concerns are dealt with quickly and appropriately.

Copies of the consultation material – including feedback record, are included in Appendix K.

#### **3.5 Environmental Monitoring**

The Contractor is responsible for monitoring in accordance with this QMP and general compliance with the Contractors Environmental and Social Management Plan (CESMP). The Downer Safeguards Specialist, Craig Smart is responsible for the CESMP and overview of the environmental aspects of the QMP.

## 4 Documents Referenced in this QMP

While this QMP is intended to contain all the information required to manage Olo Quarry, it makes reference to a number of other documents. These documents are located as follows;

Documents appended to this QMP

- Olo Development Consent (ref DCA No. 047/18) – Appendix A
- Requirements for a QMP as Given by COEP 8 – Appendix B
- Significant Hazard Control Plans – Appendix H

Documents contained in the CESMP and CESMP Sub-plans

- EIA (provided as an Annexure to the CESMP)
- Code of Conduct for Gender Based Violence and Violence Against Children.
- Code of Conduct for Workers in regard to Environmental, Social, Health and Safety.
- .Traffic Management Plan.
- Waste Management Plan

Separate Management Plan

- Contract Quality Management Plan.
- Safety Management Plan (aka Occupational Health and Safety Plan)

## 5 Site Description

The site is inland from Faleolo International Airport in a southwest direction from the main access road to the airport terminal at a direct distance of 4,900m. At its closest point the coast is approximately 3,500m due west of the quarry.

The quarry site consists of an existing rock face that has previously been quarried. It is understood that the last major extraction of rock from this site occurred for the resurfacing of the Faleolo runway in 1999/2000. The rock face is approximately 15m high and extends for 450m in an approximate north – south direction. To the west of the face, previous quarrying has created a level quarry “floor” that appears to extend over a large area of approximately 40,000m<sup>2</sup>. Low vegetation and regrowth covers most of this quarry floor area and the rock face and original ground contour on top of the face is completely covered in medium sized trees 2m to 8m in height including significant regrowth on the face.



*A panorama looking east showing the tree covered rock face and low vegetation on quarry “floor” in foreground.*

## 6 Quarry Layout

### 6.1 Outline

The facilities to be developed at Olo Quarry include working faces and benches, processing and stockpiling areas, a hardstand area for the storage of plant, equipment and fuel tank, and office/rest amenities for use by workers during working hours. The quarry development will overlay and extend the working area of the previous quarry operations.

Once the quarry site has been stripped of vegetation, a physical survey will be undertaken, and a topographical plan will be prepared showing the existing contours of the site. This will serve as the basis for a Site Layout Plan detailing where the various facilities and sediment controls will be located, and a Development Plan showing the planned location of faces and benches formed as extraction proceeds. Copies of these plans are attached to this revision of the QMP and a copy will

be submitted to the DC issuing authority for approval prior to quarry extraction activities commencing.

## **6.2 Access**

Currently the quarry site can be accessed via a series of roads commencing on the south side of the Main Coast Road near the west end of the Faleolo runway and heading south then west in a number of short stretches of access road.

Alternatively, the site can be accessed more directly from the Main Coast Road just south of the Mulifanea Wharf. However, this later route is not preferred as it traverses a coastal community and requires quarry traffic to negotiate the wharf intersection which can be busy during the arrival and departure of interisland shipping.

The slightly longer but preferred route commencing opposite the west end of the runway will be cleared and widened to improve visibility. The pavement will be strengthened where required and corners widened to allow quarry trucks hauling the processed rock products to the airport to safely pass each other. Traffic signs will be erected in accordance with the Traffic Management Plan on the Main Coast Road and quarry access route to warn traffic approaching from either direction of heavy vehicles exiting/entering the roadway.

Vehicle and personnel access to the quarry floor and stockpile area will be controlled by physical barriers and security personnel. Vegetation and spoil produced during the initial clearing and development of the site will be windrowed along the boundary of the processing and stockpiling area to provide a physical barrier. A locked chain will be strung across the quarry entrance to prevent unauthorised vehicular access during out of work hours.

## **6.3 Infrastructure**

No permanent infrastructure will be constructed on the site; however, the following temporary facilities will be erected and remain for the operational life of the quarry:

- Demountable site office & workers facilities,
- Storage containers (for minor equipment, spare parts, oil and lubricants),
- Self-bunded bulk fuel storage tank,
- Water storage tank for domestic use,
- Securely locked magazines for explosive detonators and boosters,
- Suitably located and screened temporary toilet with storage tank to be regularly emptied and disposed of in approved waste water facility,
- Materials stockpiles (for each of the products produced at the quarry),
- Plant, equipment, parking and storage area including generator,
- Tally hut and security guard shelter.

## **6.4 Fuel Storage**

Bulk fuel, oils and lubricants will be stored in selected areas on site. The bulk fuel storage tank is a double skinned or self-bunded tank to prevent accidental puncturing and leakage to ground water.

## **6.5 Explosives**

Explosives will be required in the quarrying process and ammonium nitrate emulsion which is rated as an oxidising agent (UN rating 5.1) will be employed.

Packaged explosives (UN rating 5.1D) will not be used.

“Emulsion” is a liquid form of ammonium nitrate dissolved in water and is not an explosive until mixed with sensitising chemicals. These chemicals are added/mixed during pumping the emulsion into the drilled blast area. Once in ground, the chemicals react and the emulsion is sensitised to become an explosive, which can be initiated with detonators and boosters.

Non-electric detonators called Nonels and booster (150 grams) will be used to initiate the blast. All explosives will be provided by the New Zealand Company, “Prime Explosives”.

The booster and detonators will be stored in separate, secure magazines located in an appropriate area of the quarry to be shown on the Site Layout Plan. There are no storage or safety issues with emulsion.

## **6.6 Waste Management & Disposal**

Any waste from the site will be stored in a suitably protected area on the site and disposal will be as detailed in the Waste Management Plan (WMP).

In a nutshell this means that;

- A septic tanker truck will pump stored waste from the site toilet holding tank and take it to the Tafaigata Landfill for disposal.
- Hazardous waste eg waste oil, will either be disposed of as permitted at Tafaigata or shipped to NZ.
- Domestic waste from site office and worker facilities will be subject to recycling as per the WMP with any refuse taken to Tafaigata.
- Cleared vegetation, surplus spoil, processing by-pass etc will stay on site and be incorporated in the rehabilitation and closure works.

## **7 Operations**

### **7.1 Clearing and Stripping**

Clearing of the vegetation currently covering the access routes and the base of previous quarrying activities will allow for the processing and stockpiling of extracted rock. The area required for this activity is approximately 25,000m<sup>2</sup>. The exact location of the cleared area will be selected to minimise the distance from the quarry face to the processing plant that crushes and screens the rock creating aggregate stockpiles.

Clearing will be conducted so that a vegetation screen is maintained around the working area, coupled with the site topography, this means that the new works are not expected to be visible from adjacent access roads or settled areas.

Processing and stockpiling activities will be located so that any runoff will drain to sediment retention ponds that are lined with an impervious material to prevent soakage into the ground. These ponds will be designed to allow runoff from rainfall to settle before slowly outflowing to the existing open drains that currently take rain runoff from the area. An accurate level survey of the entire quarry site will be undertaken before works commence to record the existing ground levels including all existing water courses.

### **7.2 Site Development**

Following the removal of vegetation and the ground level survey of the quarry, access to the top of the rock face for an excavator and bulldozer will be constructed. This will start at the existing quarry floor entrance at low point at the south-east end of the rock face, and follow the top edge of the rock face tracking north-west for approximately 500m. Working away from the edge of the rock face, the bulldozer will push the topsoil up into heaps, and the excavator will stockpile for later remediation of the quarry site. The extent of clearing on top of the rock face is expected to be approximately 7500m<sup>2</sup> or 150m x 50 m including a safety margin from the edge of the final rock face.

The access road to be used for the cartage of processed aggregate products will follow existing tracks that travel north-west from the quarry location to exit on the Main Coast Road opposite the west end of Faleolo Airport. The use of this route will avoid community or village housing areas and the Main Road intersection at the Mulifanua Wharf, minimising social impact and avoiding road safety issues. The access route to be used will be graded and shaped to eliminate existing pot holes and a new layer of crushed road base will be applied to improve the surface characteristics. A speed limit of 30 mph will apply to all trucks hauling aggregate products along

the access route to minimise noise and avoid dust generation, reducing to 20 mph adjacent to STEC houses. Full details are included in the project's Traffic Management Plan (TMP).

### 7.3 Drilling

The drilling of holes to receive explosive materials will be undertaken from the top of the rock face. It is proposed to drill the holes approximately 12m deep from the cleared rock surface.

The depth and diameter of drill holes determines the amount of explosive used to loosen the rock for excavation. We propose that the bottom of the drill hole that will receive explosives is always above the level of the adjacent quarry floor formed during previous extraction works at the quarry. Based on an estimated existing rock face height of 15m we propose drilling only 12m deep. This will allow us to minimise the amount of explosive materials to achieve a satisfactory quantity of rock for excavation without adverse impact on the integrity of the rock below the existing quarry floor.

This depth conforms with the undertaking Downer have given to protect the Olo aquifer, that new extraction will stop at a level 2m above the low point of the existing quarry floor. The Topographic Map, prepared after vegetation clearing, and included as Appendix C, shows the low point on the old floor is 43.88m, meaning that all new extraction will be above RL 45.88m.

This method of working means that there will only be a working face without intermediate benches. The single face will maintain the safe slope of the current face and steadily recede as material is blasted and extracted for processing through the crushers and screens.

### 7.4 Blasting

The vibration that results from an explosion is related to the amount of explosive charge used. The measure used to determine how damaging the vibration resulting from an explosion is called Peak Particle Velocity (PPV). Experience has shown us that when working with solid basalt rock like that at Olo Quarry, minimal damage occurs at PPV of 200mm/second or less. The chosen explosive has a low PPV to reduce noise and vibration when compared with more commonly used explosives.

The explosive to be used is a recognised safe material: emulsified liquid form ammonia nitrate, an oxidising agent rated with the UN rating 5.1.

The liquid emulsion ammonia nitrate is not an explosive until it is mixed with a sensitising agent and initiated with non-electric detonators. The mixing is carried out in a special purpose plant mounted on a 4x4 truck that mixes and pumps the explosive into the drill hole in a single procedure. Limited amounts of residues from the explosives are expected and will be inert nitrates.

The choice of an emulsion avoids the use of packaged explosive that carries a UN rating 5.1D and can be dangerous to handle.

Once plant arrives and has been set up on site, blasting is expected to occur at a regular time mid to late afternoon every second day (except Sunday's). In line with community preferences stated in public consultation, the warning siren and loud speaker will give a ten minute warning then a 30 second warning prior to each blast. The loud speaker will give an all clear after the blast.

In conjunction with community consultation and site development, a programmed trial of the warning system will be held prior to any blasting occurring. At least twenty four hours notice of the commencement of blasting will be given to all adjoining neighbours. Blasting schedules will also be distributed to local communities. Check points will stop traffic on the quarry access route prior to each blast until the all clear has sounded.

### 7.5 Extraction & Processing

The rock that is won following the drill and blast operation will be processed in a series of mobile crushers and screens. The large particles of rock initially removed from the rock face by excavators will enter a "processing train" consisting of primary, secondary and tertiary crusher

units that, combined with the screening plant, create the products required for the project. The process does not use water.

Most of the rock will be used to manufacture an AP40 basecourse and Mix 14 and Mix 20 asphalt with initial processes rock used to make spot improvements to the access route.

Tracked excavators and wheeled loaders will be used to load the crushers and create stockpiles of finished aggregate products. These stockpiles will be constructed on compacted aggregated bases with cut off and perimeter drains intercepting any storm water flowing from the area (refer plan attached). The finer aggregate product stockpiles will be covered with large tarpaulins to minimise water ingress and avoid dust.

The crushing plant and associated equipment will be regularly maintained and operated in accordance with the manufacturer's instructions. Only trained personnel shall operate the plant with an experienced designated supervisor on site whenever the plant is running. Operators will be provided with dust protection as required.

In the case of any dust or noise complaints (whether written or verbal) arising from operation of the crusher, immediate and reasonable steps will be taken to rectify the situation. A water truck will be deployed at the quarry for use in the quarry and along the access route.

The products will be transported to the Faleolo site in road trucks using the access route described above. The quantity of material to be extracted from the site will be in the order of 95,000 tonnes over a time frame of 12 months.

## 7.6 Operating Hours

Hours for quarry extraction and processing operations are:

Monday to Friday 0700 hours to 1800 hours

Saturday 0700 hours to 1600 hours

Sunday No quarry operations at all, unless there is prior approval from the Planning Board to undertake emergency repairs to plant & equipment that could not be undertaken during normal quarry operating hours.

## 7.7 Noise

The DC provides the following noise limits;

"Noise Source" (Average dBA, L <sub>10mins</sub> )	"Receiving Property" (LAeq, 10 minutes)											
	Residential Use			Commercial Use			Religious Use			Industrial Use		
	Day	Even <sup>n</sup>	Night	Day	Even <sup>n</sup>	Night	Day	Even <sup>n</sup>	Night	Day	Even <sup>n</sup>	Night
Industrial use	65	60	55	70	65	60	70	65	60	75	70	65

The quarry is surrounded by vegetation and isolated from houses or villages and will not be operating during evenings or at night, in addition the mitigation measures outlined in the 'Noise' Significant Hazard Control Plan (see Appendix H) mean that the noise audible on any receiving property will be minor. On site personnel will be issued with and wear PPE (ear plugs or muffs) as working conditions require.

## 7.8 Sensitive Receptors and Community Liaison

The quarry will operate in the same location as previous quarrying activities. The quarry perimeter is located within a larger land estate that provides a buffer from sensitive receptors. Water pumping and reticulation infrastructure operated by Samoa Water Authority is the closest feature, and mitigation measures have been agreed with the Authority during consultation for the Quarry Development Consent.

The closest housing community or village is at Mulifunua which is approximately 3 kilometres from the quarry. In regard to community liaison, contact person is:

### Safeguards Specialist – Craig Smart

As part of the quarry development and in advance of major operations at the quarry commencing, consultation has been undertaken with the two nearby communities, within potential hearing distance of the quarry, that make up Mulifanua Village.

In addition to discussing the intended traffic management measures, the key message was providing details of the proposed system warning of when blasting is about to occur and the need to stay clear of the quarry area. Feedback received during the consultation resulted in a slight change being made to the warning system (10 minute warning instead of the 5 minutes originally proposed).

Separate consultation was held with the STEC workers in conjunction with STEC management.

The material presented during the consultation sessions, the attendance register and the record of issues raised and Downers response to them is contained in Appendix F.

## **7.9 Truck Loading**

Trucks will be loaded out of stockpiles at the quarry using loaders fitted with scales (“Loadrite” or similar) that record how much aggregate is loaded into each truck and ensure that trucks are not overloaded. At the quarry gate all aggregate trucks will pass through a load check to ensure the load is free of loose material that could dislodge during transport and that the load is contained within the body of the truck. Any dust generating material will be covered or dampened.

## **7.10 Environmental Controls and Monitoring**

The quarry must operate with minimal impact on the surrounding environment. Key environmental issues that need to be managed are:

- Protection of the water supply infrastructure installed and operating in the general area of the quarry,
- Physical controls to avoid the risk from spills of liquids such as fuel including the use of spill mats when refuelling mobile plant.
- Control of stormwater runoff such that silt contaminated water does not enter natural water courses or penetrate sub surface rock,
- Control noise and dust generated from truck movements in the quarry area and on access roads.

The Quarry Manager will do a daily inspection to check environmental controls are operating effectively and take immediate corrective action where required. This inspection will be recorded and available for inspection by the authorities.

## **7.11 Health & Safety**

This quarry forms part of the Faleolo International Airport Design and Construct Pavement, Drainage and Services Infrastructure Contract and as such will operate under cover of the Contractor’s Occupational Health and Safety Plan.

A Hazard Register/Hazard ID sheet for project hazards and mitigations including the quarry operations will be prepared. Workers at the quarry will have a weekly toolbox meeting to review work procedures and the Hazard ID sheet. Any new hazards will be added to the Hazard ID sheet as identified.

Significant Hazard Sheets referenced in this QMP or the Hazard Register/Hazard ID sheet will be attached to this plan.

A construction site warning sign written in English will be posted prominently at the entry to the quarry detailing the site name, the safety equipment and procedures required to be used on site and general messages advising authorised visitors to report to the Site Supervisor and warning the general public against unauthorised entry.

A well equipped first-aid box will be provided with the contents checked regularly and any used supplies replaced by the Quarry Manager. A suitable stretcher will also be provided. A person trained in first-aid will also be available when the quarry is operating.

### **7.12 Traffic Management**

The Quarry Manager will be responsible for quarry traffic on the quarry access route and a Traffic Management Plan (TMP) has been prepared to show how the route will be improved and traffic managed to mitigate anticipated impacts of its use. This TMP details the working hours of the aggregate haulage trucks, the warning signs, pavement improvements and maintenance intended for the access route etc. The Quarry Manager has authority to adapt this TMP to better address specific or changed circumstances.

Signs (Trucks Crossing and Speed Restriction) will be erected on the Main Coast Road on either side of its intersection with the quarry access haul road and the airport construction access road, warning approaching traffic of heavy vehicles exiting/entering the public road.

## **8 Sediment and Water Management**

Storm water runoff will be managed to prevent sediment laden water discharging into natural watercourses or ponding on pervious ground that may allow the runoff to percolate into subsurface aquifers. The site has been previously worked as a quarry to supply materials for the current Faleolo Airport runway.

Storm water falling within the site will be captured by bunds or catch drains and directed to a settlement pond(s) constructed at the low point(s) on the site as shown on the Erosion and Sediment Control Plan (attached). The catch drains and perimeter bunds will generally have slight grades to slow runoff and avoid scouring. Grit traps constructed from cleared vegetation and rock rip-rap may also be installed along these drains to allow for the initial settlement of sediment.

The settlement pond will have an impervious floor, a silt curtain on the outlet and, if flow velocities require, a protected (ie geotextile lined) spillway will be installed. The impervious floor is likely to be constructed from concrete, designed such that an excavator positioned adjacent to the pond can excavate accumulated silt on a regular basis for disposal in an area within the quarry where it will be protected from future storm water runoff. The measures intended to control water runoff and mitigate sediment generation are shown on the quarry specific Erosion and Sediment Control Plan (ESCP) included in Appendix D.

The facilities and stockpile area will be bunded and silt curtains will be constructed where necessary to channel the overland flow to the settlement pond. Grit traps will be installed on the longer drains.

## **9 Air Discharges**

In the event of dust becoming an issue the Contractor's water cart will be used to spray water over the site to mitigate the problem.

Water will be drawn from approved water sources or retained rainfall.

Dust from the screening plant and mechanical crusher could pose a safety hazard in the area immediately surrounding the plant and staff will be issued with PPE (masks/respirators).

## **10 Accidental Discovery**

The site has been previously quarried but should the new quarrying work encounter any artefact or archaeological evidence the following procedure should be followed;

Stop work and withdraw from the scene, delineate the area of interest so that the discovery is not further disturbed and notify PUMA of the situation.

## 11 Rehabilitation and Closure

The Quarry Agreement with the landowner, Samoa Trust Estates Corporation, requires that “Upon completion of the Quarry Operations rehabilitate the Quarry site as agreed with the Landowner to at least the condition of the land surface (excluding vegetation) prior to commencement of the Quarry Operation”. The rehabilitation will also follow the requirements of conditions 47-52 namely that the work will follow promptly after closure and removal of all quarry plant, equipment and wastes. Rehabilitation will have a particular emphasis on landscaping areas visible from surrounding roads (Condition 49).

The general approach to rehabilitation starts with the design of the active face which shall be in the form of an extended bay along the eastern side of the quarry approximately 7,500 m<sup>2</sup> in extent. The current top of the quarry will be cleared to allow for the rock to be quarried underneath. Materials removed will be primarily stockpiled inside the quarry (refer plan) with some being retained as a perimeter bund to reduce risk of erosion. The actual quarry perimeter is expected to extend to 5 metres of the bund.

A detailed quarry rehabilitation plan will be developed for approval by the Planning Board (condition 52). In line with best practice, removed vegetation will windrowed so it can be spread over the rehabilitated site to allow for reseedling from seedbank in the materials and stockpiled topsoil.

The final contouring of the site will be designed to avoid drainage problems including both the pooling of water. To avoid erosion of slopes, all slopes will be gently battered and contoured to avoid sharp edges or steeper slopes.

While subject to consultation at the time of closure, it is anticipated that this will be given effect by the following measures:

- Remove all plant, equipment and temporary structures from the site.
- Remove all non organic rubbish and waste material from the site (and properly dispose of off site).
- Leave any surplus processed product in a stockpile near the site entrance to enable easy access and allow for undisturbed rehabilitation of the quarry floor.
- Active face shall be shaped to smoothly transition into adjacent areas without angular or linear features and no hollows that retain water.
- Spread stripped topsoils and overburden material from the initial clearing and stripping work over those parts of the site that are to be rehabilitated while leaving those parts which the landowner wants to retain access (after consultation with the landowner).
- A detailed rehabilitation plan will be submitted for Planning Board approval one month prior to closure of the quarry (ie once the Faleolo Airport Contract requirements for aggregate are fulfilled).
- Any disturbed areas no longer required for quarry operations may be progressively restored with any highly visible areas given priority.

The rehabilitation and closure work will be subject to review and the satisfaction of the Employer's Engineer & PUMA.

## **12 Monitoring and Reporting**

### **12.1 Dust**

Dust from the screening plant, mechanical crusher and plant moving within the quarry may impact the area immediately surrounding the plant and staff will be issued with PPE (masks/respirators).

### **12.2 Inspections and Maintenance**

Each day the Quarry Manager will carry out a number of checks and inspections of the quarry equipment and the quarry site.

These will include:

- Integrity of the site.
- Prestart plant checks.
- Plant and equipment operating hours.
- Health & safety issues eg PPE, proper access & storage of hazardous substances etc
- Potential environmental effects eg noise, dust, water and sediment controls.

The plant related information will be recorded on a standard plant sheet while the other inspections will be recorded on the Daily Monitoring Record. The Quarry Manager should take corrective action upon identifying an issue and record the action taken (or still required to be taken) on the form. This form is available for inspection on a weekly basis.

In addition the quarry will be included in the weekly schedule of site compliance inspections and any exceptions included in the weekly report.

### **12.3 SWA Water Bores**

After discussion with SWA, Downer have undertaken to inspect the bores with a submersible camera and test the water quality prior to blasting commencing. If any contamination or damage is detected Downer will stop work and rectify the situation.

The quarry face will not progress towards the Olo Bore to the north east of the site but instead the face is to the south east, further reducing risk of damage to the bore.

## **13 Emergency Procedures**

The Emergency Assembly Point for emergencies occurring within the quarry will be at a prominent sign posted location at or near the quarry entrance. Safe evacuation paths are via the internal and external roads shown on the Site Layout Plan.

The Emergency Contact List, Spill Response and standard Emergency Procedures contained in the Occupational Health & Safety Plan are replicated as Appendix J and placed at the extreme end of this document for speed of access.

## **14 Appendices**

- A. Olo Development Consent - Conditions Cross Referenced to this QMP
- B. COEP 8 – Requirements for a QMP – Cross Referenced to this QMP
- C. Topographic Plan
- D. Site Layout and Erosion & Sediment Control Plan
- E. Site Facilities Plan
- F. Consultation - Programme, Material & Responses – Olo Quarry & Access Road
- G. Daily Monitoring Record
- H. Significant Hazard Control Plans
  - Plant and Machinery
  - Dust
  - Noise
  - Working in the Sun

- Hazardous Substances
  - Electrical
  - Quarry
- I. Quarry Staff Qualification
- Quarry Manager: Brett Swain
  - Shot Firer: Daniel Skilton
- J. Recommended Emergency Procedures (inc Spill Response)
- K. Consultation Record

**Appendix A: Olo Development Consent - Conditions Cross Referenced to this QMP**

Government of Samoa

**MINISTRY OF NATURAL RESOURCES AND  
ENVIRONMENT***Matagaluega o Puna'oa Faalenatura ma Siosiomaga*

Level 3, Tui Atua Tupua Tamasese Efi Building (TATTE),  
Sogi., P.O Private Bag, Apia, SAMOA Website : <http://www.mnre.gov.ws/>

Telephone: (+685) 67200  
Fax: (+685) 23176  
Email : [info@mnre.gov.ws](mailto:info@mnre.gov.ws)

*Please address all correspondence to the Chief  
Executive Officer, Private Bag , Apia, Samoa .  
Faamolemole faatuatausi uma mai fesootaigo  
uma i le Ofisa Sili*

14 February 2018

General Manager Downer NZ  
Ltd **FALEOLO**

Afioga e,

**Notice of Decision for Development Consent Application to extract aggregates for the airport runway development and undertake crushing activities, Olo Mulifanua (our ref: DCA 047/18)**

We hereby advise that your application for development consent to extract aggregates for the airport runway development and undertake crushing activities at Olo Mulifanua has been approved subject to conditions by the Planning and Urban Management Board. (see attached).

Please ensure that you comply with all conditions of the consent as per attached document. The conditions aim to prevent and minimize adverse environmental impacts and set standards for acceptable environmental management of the project.

As a legal document, it is important that the development consent is kept for your record. For further information, please contact the undersigned or Ms. Ferila Brown on telephone 67200.

Sincerely,



Toleafoa Fetoloai Yandall-Alama  
**Administrative Head/ACEO**  
Planning and Urban Management Agency For:  
Chief Executive Officer

Encl  
Notice of Decision

# MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT

## *Matiigaluega o Puna'oa Faalenatura ma Siosiomaga*

Level 3, Tui Atua Tupua Tamasese Efi Building (TATTE),  
Sogi., P.O Private Bag, Apia, SAMOA Website: <http://www.mnre.gov.ws/>

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*Please address all correspondence to the Chief Executive Officer, Private Bag, Apia, Samoa. Faamolemole faatutausi uma mai fesootaiga uma i le Ofisa Sili*

### SUSTAINABLE DEVELOPMENT

### NOTICE OF DECISION

**Application Reference: DCA N2: 047/18**

**DECISION DATE:** 8 February 2018

<b><u>Applicant:</u> Site</b>	Downer NZ Ltd
<b><u>Location:</u></b>	Olo Mulifanua, Aiga i le Tai District
<b><u>Proposal:</u></b>	To extract aggregates for the airport runway development and undertake crushing activities
<b><u>Legal Description:</u></b>	Government Land: Survey Plan NQ 3 200; Lot 178; Size Area 92,952m <sup>2</sup>
<b><u>DCA Received:</u></b>	18 January 2018
<b><u>Supporting Documentation:</u></b>	<ol style="list-style-type: none"> <li>1. Environmental Impact Assessment (EIA) report prepared by Downer New Zealand Limited and dated January 2018, submitted 18 January 2018</li> <li>2. Quarry Management Plan prepared by Downer New Zealand Limited, dated January 2018, submitted 18 January 2018</li> <li>3. Copy of the Survey Plan, submitted 18 January 2018</li> <li>4. Written Consent from Samoa Trust Estate Corporation (STEC), dated 09 January 2018, submitted 18 January 2018</li> <li>5. Revised EIA report prepared by Downer New Zealand Limited, dated January 2018, submitted 01 February 2018</li> <li>6. Site Plan, submitted 01 February 2018</li> <li>7. Written Confirmation from Samoa Water Authority and dated 30 January 2018, submitted 01 February 2018</li> <li>8. Written Confirmation from Downer NZ Ltd &amp; Samoa Airport Authority to fully fund any damaged boreholes, dated 31 January 2018, submitted 01 February 2018</li> </ol>

**Other Considerations:**

1. The development application is currently being notified in the Samoa Observer Newspaper. The timeframe for February 2018.

**THE DECISION**

The Planning and Urban Management Agency, under delegated authority from the Board, pursuant to sections 34(2), 47, 48, 50 of the Planning and Urban Management Act 2004, grant development consent, to the above application, subject to the following conditions:

**Conditions****General:**

#	Development Consent Condition	QMP Ref
1	The proposed activity shall be carried out in accordance with the plans and all information submitted as part of the application DCA 047/18, being:	The underlying purpose of this document.
	a) Report titled, <i>"Environmental Impact Assessment Report for The Proposed Land Use of the Olo Properties for Quarry Works"</i> , prepared by Downer New Zealand Limited, dated January 2018, submitted on 01 February 2018.	This is provided as an Annexure to the CESMP
	b) Report titled, <i>"Contract Quality Management Plan for Olo Quarry Samoa, Quarry Management Plan"</i> , prepared by Downer New Zealand Limited, dated January, submitted 01 February 2018.	This QMP is an updated revision of the QMP submitted with the DC Application
2	Any other development works not included in this development consent application (including construction of building(s) or other structures on site), requires a separate development consent application.	All site facilities are either demountable, shipping containers or otherwise temporary structures. No buildings intended.
3	<b>15 The quarrying operations, including extraction of rock and aggregate processing, storage and loading, shall not exceed a period of 3 years. This period shall commence following the start date of aggregate extraction activities for the airport runway development.</b>	16 Sec 7.5 (final para) 17 Intended duration is 12 months.
4	<b>In the event that any of the existing nearby boreholes is contaminated or damaged from the proposed activities, the consent holder shall immediately cease all works on site and inform the Planning and Urban Management Agency ("the Agency").</b>	Sec 12.3 SWA Water Bores
5	<b>The consent conditions may be amended by the Planning and Urban Management Board ("the Planning Board") upon completion of the notification period on 19 February 2018.</b>	No amendments advised by end Feb 18
6	The consent holder shall provide and operate plant and equipment for maintaining all surfaces in a damp condition to minimise the generation of dust. All haul roads shall be kept continually damp and appropriate water spray (such as water trucks) shall be available to dampen crushing and screening operations and stockpiled material as appropriate.	Sec 9 Air Discharges
7	The consent holder shall develop/put in place	Sec 10

	procedures to address and respond to all encounters with archaeological evidence or artefacts during the construction works. When an artefact is discovered work shall stop, delineate the area of interest and notify the Agency.	Accidental Discovery
8	All run-off from working areas, which contains sediment shall be collected in settling ponds before being discharged from the premises. Water from washing facilities shall be treated in a like manner.	Sec 8 Sediment & Water Management
9	The consent holder shall obtain a permit from the Land Management Division of the Ministry for extracting of aggregates.	Required for extraction from marine areas. Not applicable to Olo
10	The proposed activity shall not have an undue detrimental environmental impact on the environmental quality of the site or land adjoining the site and likely future development.	Sec 3.2 Process Implementation, Sec 3.4 Environmental Monitor & Sec 11 Rehabilitation & Closure
11	The consent holder shall ensure that all workers on site shall wear appropriate safety gears for safety which shall be in accordance with the <i>Occupational Safety and Health Act 2002</i> .	Sec 7.11 Health & Safety
12	The use and development shall be managed so that the amenity of the area is not compromised, by excessive noise, excessive dust, visually offensive signage, poor airspace, excessive traffic generation, smell, fumes and waste materials.	Sec 3.2 Environmental Monitor Sec 6/6 Waste Disposal Sec 7.7 Noise Sec 9 Air Discharges Also TMP & WMP

**Operation:**

13	That all earthworks shall be in accordance with the <i>Code of Environmental Practice for Earthworks and Quarry Development and Operations 2007</i> .	Sec 7 Operations
14	During development and operation of the quarry the consent holder shall progressively reinstate areas of the quarry.	Sec11 Rehabilitation & Closure
15	The consent holder shall take all practicable measures to avoid spills of fuel or any other contaminants stored or used during construction and within the site.	Sec 7 Operations
16	The consent holder shall ensure that in the event of any spill of fuel or any other contaminant, the spill shall be cleaned up as soon as practicable and take measures to prevent reoccurrence.	Sec 6.6 Waste Disposal Appendix J Spill Response
17	The consent holder shall ensure that all person(s) engaged in the operation of the quarry shall be adequately supervised.	Sec 3.1 & App E Personal Qualifications
18	The consent holder shall ensure that the toe of all batters and intermediate bench shall be drained and such drains discharged to a silt retention pond.	Sec 7.3 Drilling
19	The consent holder shall ensure that the overburden or tops of the quarry, and all loose ground or material, shall be cleared far enough back from the edge of the quarry to prevent the persons employed.	Sec 7.1 Clearing & Stripping
20	As soon as practicable after completion of overburden all exposed batters shall be protected from the effects of surface erosion.	Sec 11 Rehabilitation & Closure
21	The consent holder shall ensure that soil erosion (and	Sec 8

	any other material) shall be limited by rapidly vegetating exposed areas, planting the surfaces of overburden and topsoil mounds, progressively restoring worked-out areas (where practicable) and limiting the topsoil/overburden stripping exposed at any one time.	Sediment & Erosion Control Sec 11 Rehabilitation & Closure
22	All erosion and sediment controls shall be installed prior to commencement of extraction activities and maintained in an effective capacity at all times during operation works.	Sec 8 Sediment & Water Management
23	The consent holder shall ensure that trucks shall be loaded and covered to prevent spillage and no mud shall be carried out onto the public road. In the case that deposition of dirt/mud on road occurs, the consent holder shall ensure that it is cleaned forthwith.	Sec 7.9 Truck Loading
24	The loading and unloading of all vehicles and stockpiling of materials and equipments associated with the development shall take place within the site boundaries of the application.	Appendix D Layout Plan
25	The consent holder shall ensure that the quarry site is enclosed with warning signs .e.g. Authorised personnel only.	Sec 7.11 Health & Safety
26	The hours of operation shall be limited to between the hours of 7:00am and 6:00pm on Mondays to Saturdays and no activities shall be carried out on Sundays or public holidays unless there is a written agreement with the Planning Board.	Sec 7.3 Opening Hours

**Benching:**

27	Orientation of benches shall take into account the underlying geology and vantage points from which the quarry is visible.	Sec 7.3 & Sec 8 Drilling and Sediment & Water Management
28	All benches shall be self-draining. Each bench shall act as a table drain, carrying water along the bench to a suitable discharge point or settling pond.	Sec 7.3 Drilling
29	Benches shall not overhang and batters shall be constructed at a safe angle. Quarrying activity shall generally not extend 10 meters of a boundary.	Sec 7.3 Drilling
30	For rehabilitation, benches shall be irregularly shaped and the top of the quarry face scalloped to blend in with the surrounding landscape.	Sec 11 Rehabilitation & Closure

**Blasting**

31	The consent holder shall ensure that at least 24 hours' notice is provided to adjoining neighbours and nearby families in advance of any blasting operations.	Sec 7.4 Blasting
32	The consent holder shall ensure that blasting operations shall be conducted in a manner that will not cause danger to life or property.	Sec 7.4 Blasting
33	The consent holder shall ensure that blasting operations are carried out within 500 metres of any road and shall be stationed thereon with warning notices to warn travellers of danger and to prevent access to the danger area.	Sec 7.4 Blasting

**Noise:**

34	The consent holder shall ensure that noise from the quarry plant shall be controlled to ensure compliance with noise levels in the Agency's <i>Noise Policy 2012</i> .	Sec 7.7 Noise
35	Noise levels from any activity occurring on site shall be in accordance with the Agency's <i>Noise Policy 2012</i> and shall not exceed the following limits:	Sec 7.7 Noise

Noise source" Average BA, L10mins)	" Receiving Property" (LAeq, 10 minutes)											
	Residential Use			Commercial Use			ReligiousUse			Industrial Use		
	Day	Even"	Night	Day	Even"	Night	Day	Even"	Night	Day	Even"	Night
Industrial use	65	60	55	70	65	60	70	65	60	75	70	65

**Rock Crushing Activities:**

36	The consent holder shall ensure that the crusher operator cabs will be properly sealed with dust filters.	Sec 7.5 Extraction & Processing
37	The consent holder shall ensure that proper maintenance of the crusher should be carried out to prevent excessive noise and other problems.	Sec 7.5 Extraction & Processing
38	The consent holder shall ensure that waste oil and other residues from machinery maintenance are stored in proper containers or cemented pits to avoid seepage to ground water and surrounding soil.	Sec 6.6 Waste Management & Disposal
39	The consent holder shall ensure that trucks carrying crusher products to development sites should properly cover the material to prevent wind whipping.	Sec 7.9 Truck Loading
40	The consent holder shall ensure that material loaded into the trucks should be below the body level encapsulated	Sec 7.9 Truck Loading
41	Once the consent holder is made aware of any noise and dust complaints as a result of operation of the crusher whether written or verbal, the consent holder shall take all immediate and reasonable steps to remedy the situation.	Sec 7.5 Extraction & Processing
42	The consent holder shall ensure that all stockpiling on site shall not be less than 5 meters from the nearest property.	Appendix D Site Layout Plan
43	All crusher operations shall be carried out with properly set management chart, indicating the individual responsibilities.	Sec 7.5 Extraction & Processing
44	During crusher operations, at least one competent engineer or manager should be present at the site at all time.	Sec 7.5 Extraction & Processing

**Waste Management:**

45	Hazardous materials shall only be disposed of at an approved hazardous waste disposal facility. The consent holder shall seek approval from the Agency and the Division of Environment and Conservation of the Ministry of Natural Resources and Environment to dispose of any hazardous waste.	Sec 6.6 Waste Management & Disposal
46	On completion of works, all debris, rubbish and any other waste material brought on site during construction shall be removed from the site and disposed of at the Tafaigata Landfill	Sec 6.6 Waste Management & Disposal

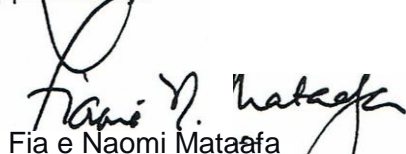
**Rehabilitation:**

47	The consent holder shall comply with the Rehabilitation Plan submitted as part of this development application.	Sec 11 Rehabilitation & Closure
48	The consent holder shall ensure that the quarry is fully rehabilitated in accordance with the following timeframes:	Sec 11 Rehabilitation & Closure
	a) Within 6 months of the final extraction of materials from the site; or	Sec 11 Rehabilitation & Closure
	b) Within 6 months before the expiration of the term of consent, whichever is the earlier.	Sec 11 Rehabilitation & Closure
49	Sections of the quarry that will be highly visible from frequently used roads or vantage points shall be given high rehabilitation priority.	Sec 11 Rehabilitation & Closure
50	The consent holder shall ensure that all proposed extractive development proposals shall be accompanied by detailed restoration.	Sec 11 Rehabilitation & Closure
51	Plans for removal and disposal of wastes and any hazardous or contaminated materials (fuel drums, soil contaminated by leaked fuel or oil, and weed infested soil) shall be described in the Quarry Management Plan, as appropriate for the scale of the operation.	Sec 6.6 Waste Management & Disposal
52	Upon completion of activities, all areas which were disturbed by the development must be stabilized to the satisfaction of the Planning Board so that accelerated erosion or sedimentation or both will be prevented.	Sec 11 Rehabilitation & Closure

**Advisory notes:**

- 1      *The Agency has considered all submitted information as accurate, if proven otherwise, this consent may be revoked.*
- 2      *The Agency or any employee is not liable for any damage, or loss resulting from any act, omission, or default in the exercise of the development consent function.*
- 3      *A copy of this consent should be held on site at all times during the construction.*
- 4      *The consent holder is responsible for ensuring that all contractors carrying out works under this consent are made aware of the relevant consent conditions, plans and associated documents.*
- 5      *Non-compliance with this development consent may result in enforcement and legal proceedings under the Planning and Urban Management Act 2004.*
- 6      *The consent shall lapse two (2) years after the date on which it was granted unless it has been given effect before the end of that period.*

approved by:



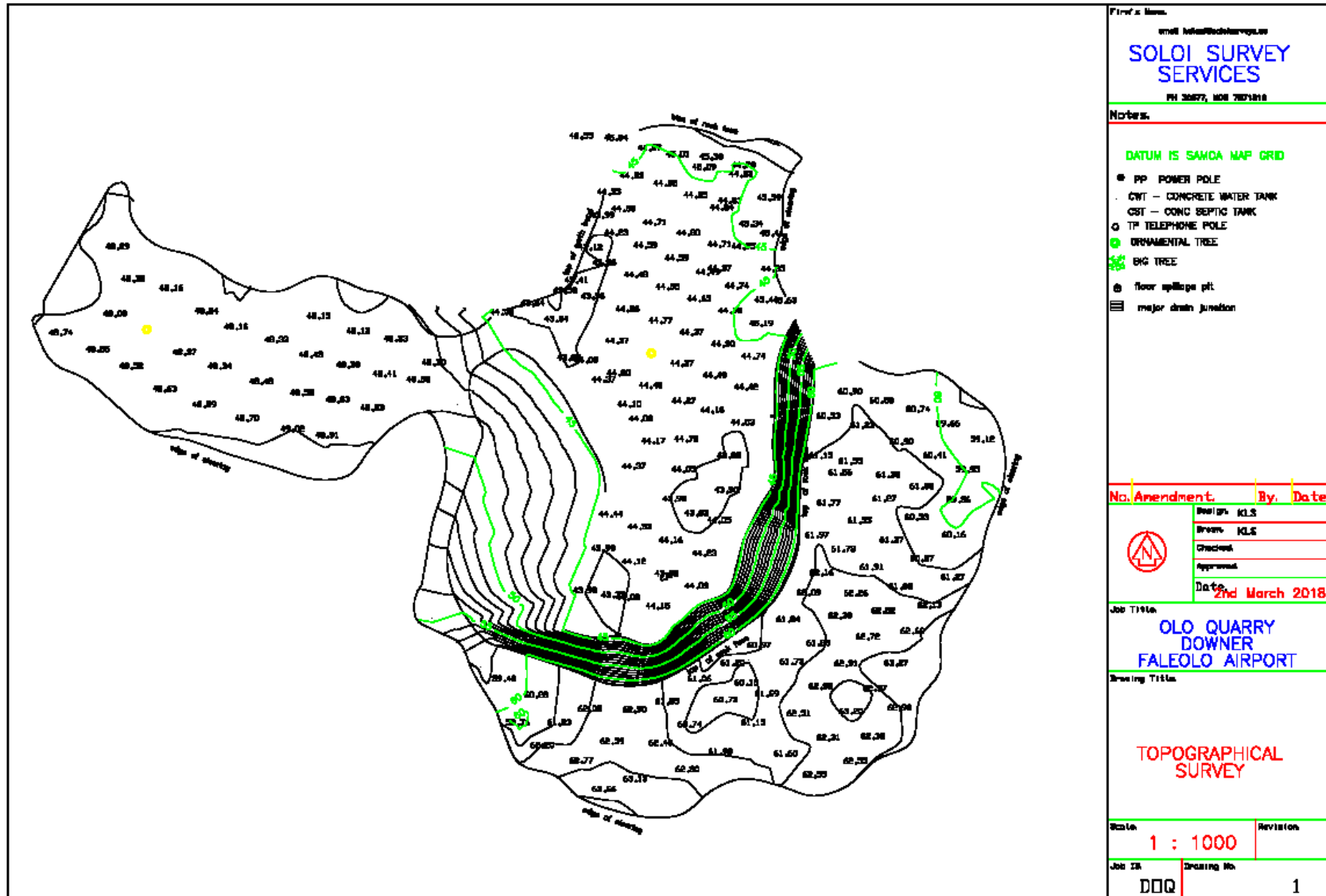
Fia e Naomi Mataafa

**Chairperson, Planning n Urban Management Board**

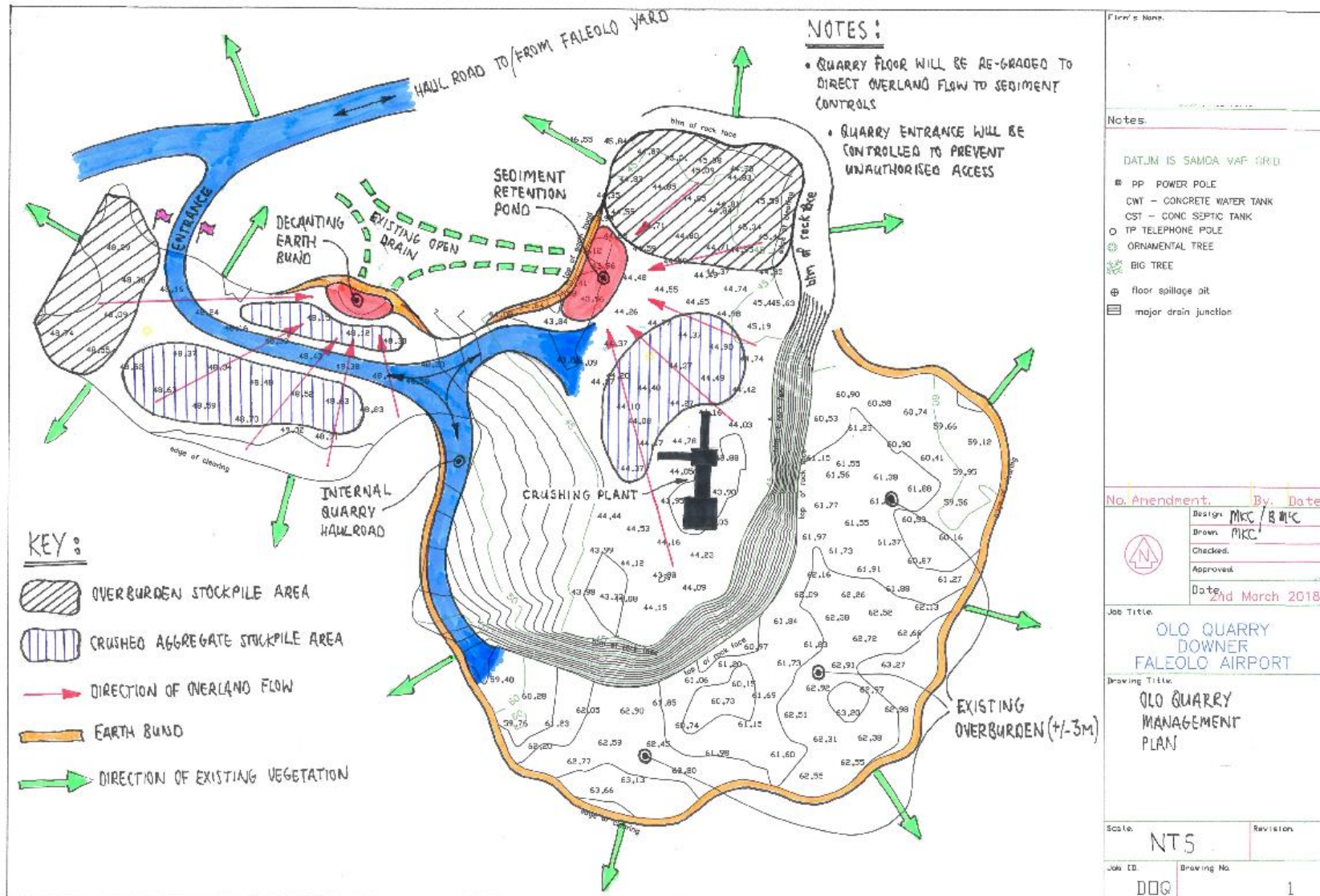
**Appendix B: Requirements for a QMP (from COEP 8): Cross Referenced to this QMP**

#	COEP 8 (Sec 8.3.1): Required Contents of a QMP	Where Located in this QMP
1	All operations shall comply with the laws of Samoa.	3.3 Licences / Permits
2	Show the extent of overburden stripping and the stockpiling of same for later site restoration.	7.1 Clearing and Stripping. Appendix D - Site Layout & Facilities Plans
3	Show the details and location of surface water drainage from the quarry site and the silt retention pond that will be constructed to settle silt and soil contaminated water prior to its discharge to a natural water course.	7.1 Clearing and Stripping 8.0 Sediment and Water Management. Appendix D Erosion & Sediment Control Plan
4	State details of pond maintenance and the method of loading and transporting settled material to a waste soil disposal site as COEP6.	8.0 Sediment and Water Management. Appendix D Erosion & Sediment Control Plan
5	Show details of catch drains installed to intercept overland flow of surface water to prevent its discharge into the quarry area. Details of catch drains shall be as COEP 6.	8.0 Sediment and Water Management. Appendix D Erosion & Sediment Control Plan
6	State safety precautions to be implemented.	7.6 Health and Safety
7	Show facilities such as guardhouse, amenities block and other facilities to be constructed.	6.3 Infrastructure. Appendix E Site Facilities Plan
8	Show location of aggregate stockpiles.	7.2 Material Extraction and Processing. Appendix D Layout Plan (also ESCP)
9	List plant and equipment to be used in the development and operation of the quarry.	7.2 Material Extraction and Processing *Site Layout and Development Plans
10	Show the site of the proposed magazine for the storage of explosives.	6.5 Explosives & Appendix E Site Facilities Plan
11	Show sensitive environmental receptors (vegetation, waterways, neighbouring land uses)	7.4 Sensitive Receptors and Community Liaison
12	Community engagement strategy – how the community will be consulted, warned of blasting, traffic will be controlled, site safety maintained.	7.4 Sensitive Receptors and Community Liaison. Appendix F Outline Consultation Plan
13	Other relevant environmental controls based on an environmental impact assessment	7.2 Materials Extraction & Processing (drill hole depth re quarry floor)
14	Basic rehabilitation plan	10 Rehabilitation and Closure Plan
15	Copies of all relevant licences (environmental permits, mining licences)	Appendix A, Development Consent – Olo Quarry, issued by PUMA

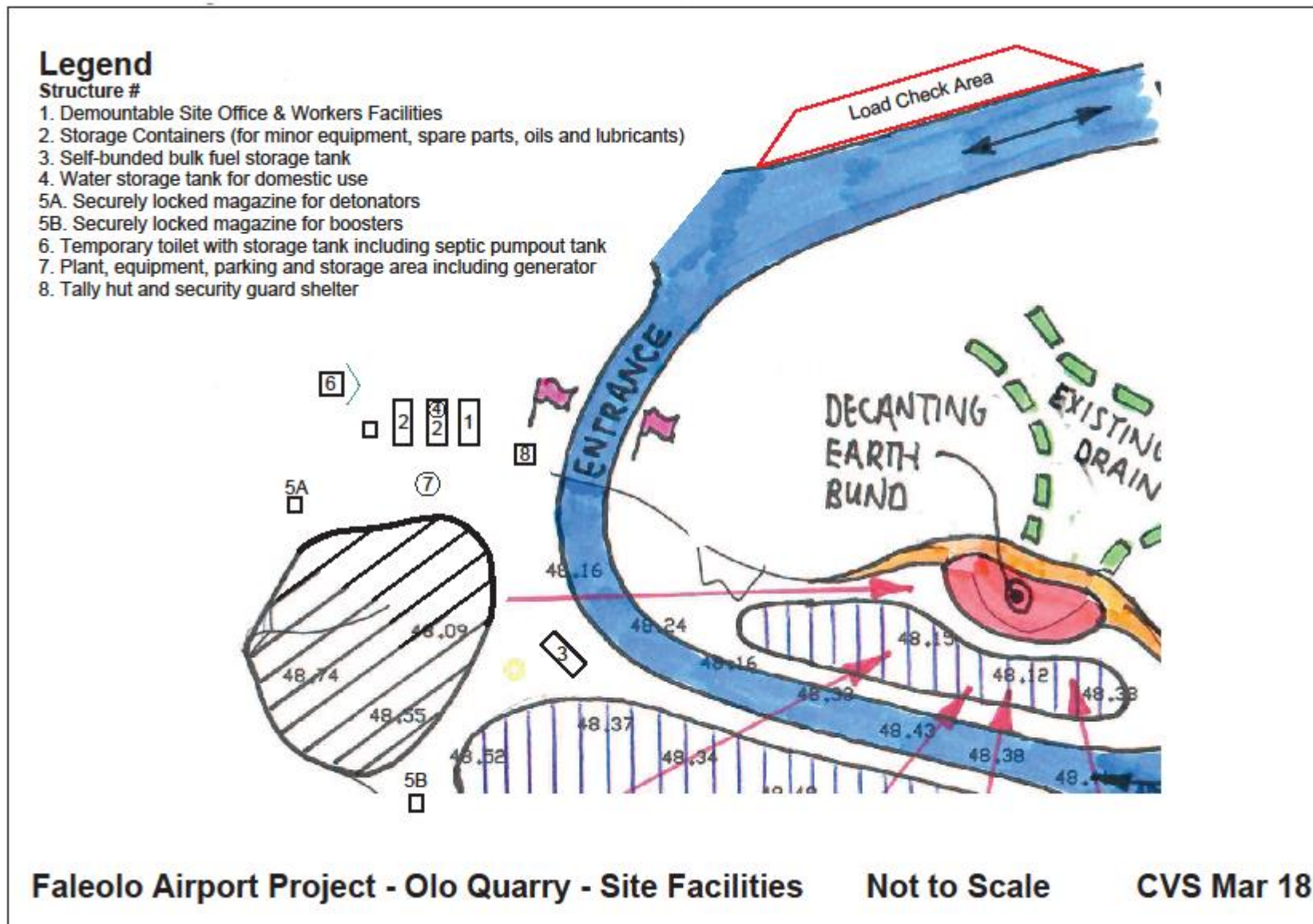
## Appendix C: Topographical Plan



## Appendix D: Layout Plan and Sediment &amp; Erosion Control Plan



## Appendix E: Site Facilities Plan




## Appendix F: Outline Consultation Programme

### Faleolo Airport: Outline Consultation Programme: Olo Quarry & Access Route Phase

Project Activity	Receptor/Target Group(s)	Key Messages	Contact Method	Time/Place
Quarry Specifically commencement of extraction work	Nearby Communities espec Mulifanua Residents in STEC houses	Blasting warning system Noise/dust mitigation Water bore protection Planned rehabilitation GRM	Meeting in community. Contact via Residents meeting at a convenient location along access route.	Mid March Parallel information provided to churches for noticeboard etc
Aggregate haulage Specifically commencement of access route upgrade works and commencement of aggregate haulage	Residents in STEC houses Nearby Communities espec Mulifanua Main Coast Road users	Route to be used. Upgrade, monitoring & maintenance TMP provisions Traffic speed, truck loading, noise, dust, GRM	Residents meeting at a convenient location along access route. Contact via STEC Meeting in community Contact via Info to LTA, media	In parallel with Quarry above, or standalone late March  Also provide info to churches Late April
Contractor's compound development & asphalt plant assembly	Airport personnel, SCG, Main Coast Road users	Location & purpose Worker safety & environmental protection	Airport noticeboards General media Community notices Info to LTA, media	Early April
Commence airside construction work/asphalt trials	Airport personnel, SCG	Programme & scope	Airport noticeboards & general media	Mid May

With further material to be added as project planning develops

## Appendix G: Quarry Daily Monitoring Record

 <b>Downer</b> <small>Relationships creating success</small>	<h1 style="margin: 0;">Daily Monitoring Record</h1> <h2 style="margin: 0;">Quarry Visual Inspection</h2>	<b>Form Q 10</b> Faleolo International Airport: Design & Construct: Pavements, Drainage & Service Infrastructure
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Site: Olo Quarry  
 Quarry Manager: \_\_\_\_\_

Week Beginning: \_\_\_\_\_  
 Signed: \_\_\_\_\_

Issue	Specific Requirements	Record Daily Findings							Comment/Results If Fail or ✖ Give Event Report or NCR Ref
		Pass/Fail or ✓/✖							
		M	T	W	T	F	S		
Standard PPE	All staff wearing (as appropriate); Hi-Vis Vests, steel toe capped boots, safety helmets, safety glasses, ear protection								
First Aid Site Management	First Aid box and stretcher provided								
	Vegetation & spoil in stable stockpiles								
	Dust levels monitored & controlled								
	Noise levels monitored & controlled								
Enhanced PPE (if site conditions require) Hazardous Substances	Access road traffic management adequate								
	Dust upgraded PPE used (masks/respirators)								
	Noise, upgraded PPE used (ear protection)								
	Diesel tank – bund functional, no spills								
Waste Management	Grease/oil/petrol appropriately stored								
	Waste bins used & regularly emptied								
Environment	Disposed of appropriately off site								
	Erosion & Sediment Control Plan installed								
	Cut off drains & bunds intact & functional								
	Silt fences intact & clear								
	Sediment/grit traps clear								
Of -site Emissions	Dust acceptable at boundary or controlled								
	Noise acceptable at boundary or controlled								
Plant	Fumes acceptable at boundary or controlled								
	Plant & equipment pre-start checks done								
	Trucks loaded correctly (no overload or spills)								
	Trucks using load check area at quarry gate								
Other (add further items as required)									

Document Distribution (Circle): Original/Copy - For: Base Office/Quarry File/Other

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**Appendix H: Significant Hazard Control Plans**

The following Significant Hazard Control Plans follow;

- Plant and Machinery
- Dust
- Noise
- Working in the Sun
- Hazardous Substances
- Electrical
- Quarry

If further Significant Hazards are identified then appropriate Significant Hazard Control Plans will be prepared.



## SIGNIFICANT HAZARD CONTROL PLAN

Department: PacificReview Date: 10/01/2018Register: SHCP# 002Item/Process/Area: WORKING WITH, AND AROUND, PLANT & MACHINERYRisk Rating :       HIGH       MSDS No:   N/A   WI or JSEA No:                     

Action (Yes or No)		1. Eliminate		2. Isolate	✓	3. Minimise
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### Hazard / Impact Controls:

CONTROL METHOD	ACTION REQUIRED	BY WHOM	BY DATE
1. Planned Operations	<p>All staff to participate in a toolbox meeting before beginning work. This meeting is to plan and discuss the job/Hazard ID review any change (Personnel, Plant, and Environment) during the day.</p> <p>Use the appropriate item of plant for the job, meeting all relevant legislative requirements.</p> <p>Modifications are only to be made by a competent person, and an engineer's certificate issued prior to use.</p>	Foreman/ Supervisor	
2. Competent Plant Operators	<p>Ensure operators are competent (trained and assessed) in operating the appropriate item of plant, or in the case of trainee operators they must be directly supervised by a competent operator.</p> <p>Operators must hold the appropriate license and endorsement for the plant they operate(W.T.R.F)</p> <p>Keep the implements as close to the ground as possible (about 300mm above ground) while in transit.</p> <p>Check that loose clothing is clear of machine levers before operating plant</p> <p>Operators to ensure that any attachments have been lowered to the ground before dismounting the machine and before leaving site.</p>	Foreman/ Supervisor	
3. Personal Protective Equipment (PPE)	At all times appropriate PPE must be worn by all staff ie. Hi-Visibility clothing Downer Long/Long Policy & steel capped safety boots. Hearing protection, safety glasses and hard hats where required.	All Staff	
4. ROPS/FOPS/ Guards/ Flashing Lights	<p>Ensure that ROPS/FOPS are fitted to plant when required by COP/Regulations and seatbelts are worn at all times when operating the plant.</p> <p>Suitable guards in place over all moving parts.</p> <p>All plant to be fitted with flashing lights and are to be used at all times.</p>	Foreman/ Supervisor	
5. Pre-Start Plant Inspections	<p>All operators to conduct and document a pre-start check of their machinery before undertaking work.</p> <p>Check and confirm that COF/WOF, Registration, RUC/ Time License are current before driving.</p> <p>If any faults are identified, report them immediately. If the faults cause a safety or compliance issue, tag the vehicle out and do not operate until the issue has been addressed.</p>	Operators	



## SIGNIFICANT HAZARD CONTROL PLAN

Department: PacificReview Date: 10/01/2018Register: SHCP# 003Item/Process/Area: DUST – NATURAL / LIME / CEMENT / CONCRETE / ASPHALTRisk Rating : HIGH MSDS No: N/A WI or JSEA No:           

Action (Yes or No)		1. Eliminate		2. Isolate	Yes	3. Minimise
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### **Hazard / Impact Controls:**

CONTROL METHOD	ACTION REQUIRED	BY WHOM	BY DATE
Planned Operations	All staff to participate in a toolbox meeting before beginning work. This meeting is to plan and discuss the job/Hazard ID for the day.  Plan operations to reduce time work area is left exposed, select methodologies that will reduce the amount of dust generated.  Work upwind of work area to minimize dust exposure.	Foreman/Supervisor & Contract Manager	
Planned Operations	Where possible dampen areas with water – use water cart when necessary	Foreman/Supervisor & Contract Manager	
Planned Operations	Ensure wet cutting methods are used for saws when cutting concrete or asphalt.	Foreman/Supervisor & Contract Manager	
Personal Protective Equipment (PPE)	At all times appropriate PPE must be worn by all staff eg. Safety goggles, overalls.  Where dust is present or while using a cutting saw, staff must wear P-2 Dust masks.	All Staff	

### **Additional Information:**

Medical Research Data : Various  
Technology Available : Not Applicable

### **Reason For Methods Used:**

Some dust is naturally occurring and cannot be avoided in many situations. Other dusts may contain hazardous particles such as silica and are potentially hazardous to health. Uncontrolled exposures to concrete, asphalt and rock cutting dust have been associated with all 3 types of Silicosis, therefore employees must be protected where possible and the hazard should be minimized.

- Code of Practice for the Management of Substances Hazardous to Health
- Workplace Exposure Standards

Health Monitoring Required	Yes		
Type of Monitoring	Lung Function		
Frequency	Annual		
Review Date	January 2019	By Whom:	Zero Harm



## SIGNIFICANT HAZARD CONTROL PLAN

Department: PacificReview Date: 10/01/2018Register: SHCP# 008Item/Process/Area: NOISERisk Rating:       HIGH       MSDS No:   N/A   WI or JSEA No:           

Action (Yes or No)		1. Eliminate	Yes	2. Isolate	Yes	3. Minimise
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### Hazard / Impact Controls:

CONTROL METHOD	ACTION REQUIRED	BY WHOM	BY DATE
1. Planned operations	Consider soundproofing requirements and/or noise levels in purchasing and design decisions for plant and machinery.  Plan your work. All staff to participate in Job START/ Hazard ID for the day	Managers / Supervisors  All	
2. Noise Reduction	Use barriers to isolate people from noise source where practicable.  Regularly service plant. Ensure exhaust mufflers etc. are in place and functioning correctly. Turn off plant / machinery when not required for use	Managers/ Supervisors  All	
3. PPE	Wear appropriate class of hearing protection - earmuffs / earplugs	All	
4. Health Check	Monitor effectiveness of ear protection through regular health checks	All	

### Additional Information:

Medical Research Data      Various  
Technology Available      Soundproof cabs, mufflers

### Reason For Methods Used:

#### **Approved Code of Practice for the Management of Noise in the Workplace**

Working with and around plant and machinery is something that we do everyday, it is not possible to eliminate this hazard and therefore we must find ways to minimize the risk for employees working alongside mechanical plant

Health Monitoring Required	Yes		
Type of Monitoring	Hearing Checks		
Frequency	Yearly		
Review Date	January 2019	By Whom:	Zero Harm



## SIGNIFICANT HAZARD CONTROL PLAN

Department: PacificReview Date: 10/01/2018Register: SHCP#020

Item/Process/Area: WORKING IN THE SUN – SUNBURN, HEAT EXHAUSTION, SUN STROKE, SKIN CANCER

Risk Rating : High

MSDS No: \_\_\_\_\_ WI or JSEA No: \_\_\_\_\_

Action (Yes or No)	1. Eliminate	Y	2. Isolate	Y	3. Minimise
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### Hazard / Impact Controls:

CONTROL METHOD	ACTION REQUIRED	BY WHOM	BY DATE
1. Personal Protective Clothing	<b>Sun burn and skin damage</b> Cover exposed skin with lightweight clothing. Long/Long Downer Policy Wear a hardhat with sun protection flap Cover any exposed skin with a high factor sun screen and reapply regularly especially when sweating. Wear UV Protection safety glasses. Examine skin regularly for any freckles or moles that change size, colour, surface characteristics, shape, or outline, and any bleeding or crusted sores that won't heal. If skin changes are found, have a doctor check and treat as early as possible.	All staff	
2. Personal Protective Clothing	<b>Sun stroke - heat exhaustion</b> When working in the sun, keep your fluid intake up by drinking 3 – 5 litres of water per day. Avoid caffeine fluids (tea, coffee, fizzy drinks) Wear a hardhat, and light weight long/long clothing that allows moisture to evaporate quickly. Do not work in the sun on an empty stomach. Where possible, programme work to avoid hard manual work during the hottest part of the day. Seek immediate medical attention for victims of Heat Exhaustion and Heat Stroke.	All staff	

### Reason For Methods Used:

Working in the sun cannot be avoided, effects can only be minimized.

Health Monitoring Required	Yes.
Type of Monitoring	Skin examination of moles freckles unusual growths
Frequency	Bi Annual
Review Date	April 2015
By Whom:	Zero Harm



## SIGNIFICANT HAZARD CONTROL PLAN

Department: PacificReview Date: 10/01/2018Register: SHCP# 026Item/Process/Area: HAZARDOUS SUBSTANCESRisk Rating: HIGHMSDS No: N/A

WI or JSEA No: \_\_\_\_\_

Action (Yes or No)	Yes	1. Eliminate	Yes	2. Isolate	Yes	3. Minimise
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### **Hazard / Impact Controls:**

CONTROL METHOD	ACTION REQUIRED	BY WHOM	BY DATE
1. Eliminate	Substitute a non hazardous substance wherever possible to eliminate exposure to hazardous substances.	Managers	Ongoing
2. Isolate	Use closed pipe work and computer controlled systems to transfer hazardous substances from tank/containers to processing vessels.	Managers	Ongoing
3. Storage	Storage areas must clearly show signage in accordance with HSNO Regulations. This includes Class Diamonds; HAZCHEM; no smoking and naked flame warning signs.  Ensure that all containers are correctly labelled, stored and segregated as required by HSNO Regulations.  Ensure that Location Test Certificates and Stationery Container Certificates are current for all hazardous substances stored on site.  Ensure storage racks are weight certified. Shrink wrap loose items together on pallets to prevent them falling from shelves. Ensure that safe stacking of containers is adhered to (IBC's 2 high, drums 2 pallets high if strapped). Ensure Cylinders are not left in vehicle access ways	Managers/ Operators	
4. Planned operations	Tank wagons must be clearly placarded in accordance with the RNZ 9904 Code of Practice. Dangerous Goods documentation and Emergency Procedure Guides must be carried with every load in a clearly labelled folder inside the driver's door. Drivers must have a "Dangerous Goods" endorsement on their driver's licence.  Ensure that Approved Handlers are certified for required substances and certification is current.  Ensure safety showers and eyewashes are located in close proximity to chemical handling areas.	Managers / Supervisors	
5. Training	Ensure that staff are trained to handle substances, wear specialised PPE and have access to current		



## SIGNIFICANT HAZARD CONTROL PLAN

Department: PacificReview Date: 10/01/2018Register: SHCP# 049Item/Process/Area: Electricity and Electrical AppliancesRisk Rating: HIGHSDS No: N/A WI or JSEA No:                     

Action (Yes or No)	1. Eliminate	Yes	2. Isolate	Yes	3. Minimise
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### Hazard Controls:

	Control Method	Action Required	By Whom	By Date
1.	JobSTART	Discuss in depth the electrical issues on site and an action plan as to who is going to do what in the work. Consider a rescue plan in the event of electrocution, and document what is to happen and who will be involved.		
	Prescribed Electrical Work	Only to be done by authorized and appropriately qualified people (registered electricians).	All Staff	
2.	Isolation/ Protection of power sources	Regularly inspect and maintain signs, fences, cages or cabinets which are in place to protect people from power sources (switchboards, transformers, etc).	All Staff	
3.	Use of Electrical appliances and tools	Ensure that all items are appropriately tested and tagged at appropriate intervals (as per AS/NZS 3012:2010 for Construction Sites or AS/NZS 3760:2010 for other sites including workshops). Inspect prior to use for any damage or exposed conductors.	All Staff	
4.	Working on electrical equipment	Do not work on any electrical equipment unless it has been shut-down and isolated and tagged out from all power-sources (see Lock Out – Tag Out procedure, HSM/26).	All Staff	
5.				

### Additional Information:

Medical Research Data:

Technology Available:

### Reason For Methods Used:

Electricity, and electrical appliances, are an integral part of the workplace, but there are strict controls on who can do certain work (Electricity Act 1992). There are also legal requirements for ensuring that electrical equipment and appliances are maintained in good, safe condition (AS/NZS 3012:2010 – Electrical Installations – Construction and Demolition Sites, and AS/NZS 3760:2010 – Safety and Inspection of Electrical Equipment)

See also SHCP#05 (Underground Services) and SHCP#10 (Working near Overhead Service Lines & Poles)

Health Monitoring Required	No		
Type of Monitoring	Not applicable		
Frequency	Not applicable		
Review Date	January 2019	By Whom:	Zero Harm Team



## SIGNIFICANT HAZARD CONTROL PLAN

Department: PacificReview Date: 10/01/2018Register: SHCP# 050Item/Process/Area: QUARRIES, GENERALRisk Rating: HIGHMSDS No: N/A

WI or JSEA No: \_\_\_\_\_

Action (Yes or No)	Yes	1. Eliminate	Yes	2. Isolate	Yes	3. Minimise
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### Hazard / Impact Controls:


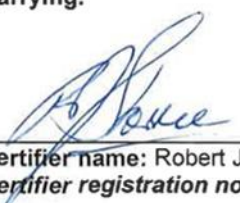

HAZARD	ACTION REQUIRED	BY WHOM	BY DATE
1. Visitors – un-inducted, supervised	Warning signage on quarry gates. All visitors to report to office, sign in and be escorted at all times by quarry staff.	Quarry Manager	
2. Plant Movement	Refer to Significant Hazard Control Plan No. 2	Quarry Manager	
3. Noise	Refer to Significant Hazard Control Plan No. 8	All staff	
4. Rooding within the quarry	<u>Haul Roads –</u> shall all have gradients less than 1 : 10 or have the Mines Inspectors dispensation to be steeper. Runaway lanes shall be provided where needed, with crash barriers along the sides of dangerous drop offs. <u>All Roads –</u> shall be regularly inspected by the Site Supervisor to ensure that they are maintained at a safe trafficable width for the type of vehicles using them, have well shaped running surfaces clear of spillage and watertables and side drains that are clear and free from scour.	Quarry Manager	
5. Nip-points/ moving parts	Guarding to be installed at all accessible nip-points and regularly checked. Only to be removed when plant is shut down and Locked-out. Guards must be bolted or fixed	Quarry Manager	
6. Building stockpiles	No loading out while stockpile building is in progress. Safety buffers shall be formed on the top of dump stockpiles and angles of repose shall be at 48°. Height of stockpiles to be limited to the maximum reach of the machine. Personnel to keep well away from stockpiles when dump trucks are stockpiling.	Quarry Manager	
7. Untidy walkways	All walkways to have floor planking, kickboards and rails in place. Maintain good housekeeping practices by ensuring that all walkways are clear and tidy. Monthly inspection schedule for housekeeping and condition	Quarry Manager	
8. Conveyors	Ensure that daily and weekly defect checks are completed.	Quarry Manager	

**Appendix I: Quarry Staff Qualifications**

Quarry Manager: Brett Swain



Shot Firer: Daniel Skilton

 INDEPENDENT CONSULTANCY SERVICES LTD	
<b>TEST CERTIFICATE</b>	
<b>Approved Handler</b>	
<b>Certificate Number: AH000012-2372</b>	
<b>Replaces certificate AH1572</b>	
Issued pursuant to Section 82 of the Hazardous Substances and New Organisms Act 1996	
Issue date: <b>18th February 2015</b>	Expiry date: <b>17th February 2020</b>
 <b>Name:</b> <i>Daniel Rex Skilton</i>  	
Date of Birth: <b>23/09/89</b>	
<b>Residential contact details:</b> 49B Caledonian Road Westport  Telephone: (021) 298 5374	<b>Work contact details:</b> Geotech Ltd PO Box 76 Charleston (03) 280 8603
<p>This certificate is issued in accordance with Regulation 5 of the Hazardous Substances and New Organisms (Personnel Qualifications) Regulations 2001. This certifies that the handler has met the relevant requirements for the substances and lifecycles specified below:</p>	
<b><u>Substances/Classes</u></b>	<b><u>Lifecycles</u></b>
<b>Explosives – Blasting</b> (Classes 1.1B, 1.1D & 1.4S)	<b>Use, Storage &amp; Transport</b>
<b>Conditions:</b>	
<ol style="list-style-type: none"><li>1) Unless surrendered or revoked beforehand, this certificate shall remain in force until the expiry date above and may be renewed thereafter by an authorised test certifier.</li><li>2) This certificate must be produced at the request of an enforcement officer appointed under the HSNO Act 1996.</li></ol>	
<b>Special conditions:</b>	
<ol style="list-style-type: none"><li>1) The certificate is limited to handlers in control of class 1 explosives in <b>Surface Mining &amp; Quarrying</b>.</li></ol>	
 <b>Test Certifier name:</b> Robert John Storrie <b>Test Certifier registration no:</b> TST00012	
<div style="border: 1px solid black; padding: 5px;"> INDEPENDENT CONSULTANCY SERVICES LTD PO Box 17-556 Sumner, Christchurch Phone: (03) 326 3101 Fax: (03) 326 3102 Mobile: 027 269 0601 E-mail: rob@ics.co.nz</div>	

## Appendix J: Recommended Responses to Potential Emergencies (inc Spill Response)

A copy of this information should be posted in a prominent location on site.

### FIRE/EXPLOSION

Action in the event of a fire should be, if possible, attempt to prevent small fires from developing into larger ones. As a rule paper/fabric/wood fires can be extinguished with water. **ALL ELECTRICAL FIRES MUST BE EXTINGUISHED WITH DRY POWDER or CO<sub>2</sub>**

If you are attempting to control a fire ensure some other staff member carries out the fire procedure as given below. They should:

- ◆ Raise the alarm immediately, warn any nearby personnel and (if functional) operate the nearest fire alarm.
- ◆ Ensure that the fire service (if available) is notified. Clearly state the location and nature of the emergency.
- ◆ Potentially dangerous machinery and fuel sources should be shut down if it is safe to do so. Leave lights on.
- ◆ Leave immediately by the nearest safe exit route. Move quickly but DO NOT RUN.
- ◆ Report to the designated **assembly point**.
- ◆ Stay at the assembly point until the “All Clear” is given by the Safety Officer.
- ◆ Only if it is safe to do so should any attempt to fight the fire be made.

**DO NOT ATTEMPT TO PUT OUT A FIRE IF IT INVOLVES PERSONAL RISK**

### CHEMICAL SPILL

**If large quantities of fuel, or a hazardous or unknown chemical is spilt:**

- ◆ Call the fire service and advise the nature of the spill and the quantity involved.
- ◆ If there is a possible risk to people, evacuate the area, ensuring that people remain upwind and the spill area is closed to public access by roping or taping off the area. Post warning signs.
- ◆ Remove all sources of ignition to prevent an explosion of flammable vapours.
- ◆ Only attempt to contain a spill if you have been trained in spill cleanup for the substance involved and have the proper equipment to do so. Otherwise, do not approach or come into contact with the substance.
- ◆ If safe to do so, reposition leaking containers to prevent further leakage.
- ◆ Refer to Emergency Spill Response Flowchart in Environmental Plan

### EARTHQUAKE/TSUNAMI

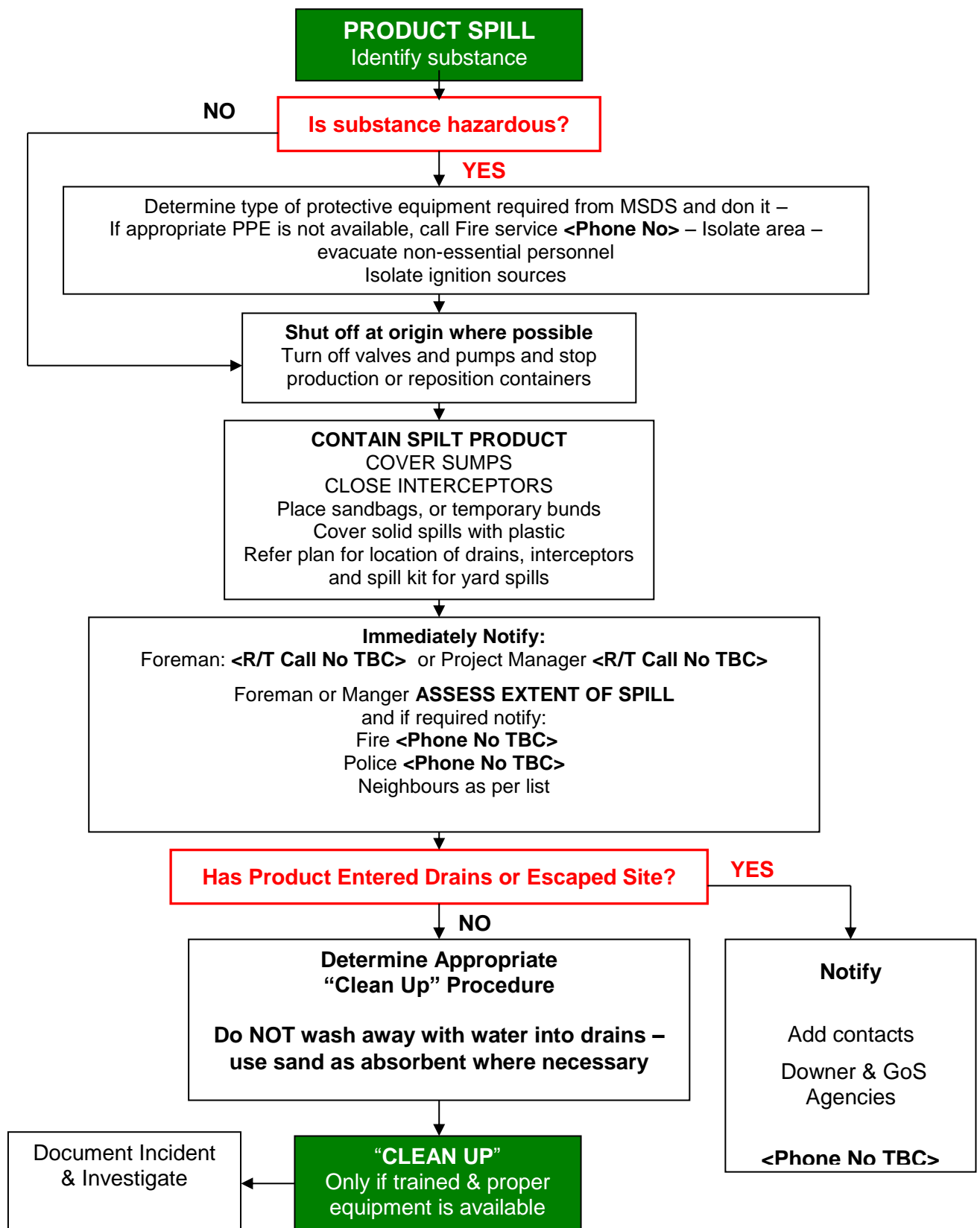
**At the first signs of an earthquake:**

- ◆ If outside, stay away from buildings and power lines. If indoors, stay indoors
- ◆ Take cover under any substantial item of furniture, such as a desk, counter work table, or in a doorway and hold on firmly.
- ◆ Stay away from glass doors and windows, tall shelves, light fixtures and objects that might fall.
- ◆ Turn off power, water and gas at the mains
- ◆ The GKD site is adjacent to the harbour and at risk from a tsunami. Follow PV escape routes.

### SEVERE WIND OR STORM

- ◆ Open a window on the side of the building AWAY from the wind – this will help relieve the pressure on the roof.
- ◆ Put tape across very large windows to stop them shattering.
- ◆ Don't go driving unless absolutely necessary.
- ◆ Listen to the nearest operating radio station for information.

## Emergency Spill & Runoff Procedure



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## **Appendix K: Consultation Record**