

PACIFIC

Passive seismic techniques for environmentally friendly and cost efficient mineral exploration

D5.1– Environmental, Health, Safety and Risk Management Committee Charter

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Duration	36 months	Lead Beneficiary	BEOW

Description

An ultimate Charter governing the roles, responsibilities, composition and membership of the Committee will be outlined and implemented prior to the activation of PACIFIC programs.

Dissemination Level

PU	Public	x
PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

History

Author	Date	Reason for change	Release
Nick Arndt	26/07/2018	First draft	V0
Sara Skogsater	27/07/2018	Changes in the text	V1
Kurt Budge	27/07/2018	Changes in the text	V2
Sara Vinklatova	20/08/2018	Updates following remarks of the independent expert	V3

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1 Charter of the Environmental and Safety Risk Management Committee of the PACIFIC Project

1.1 Purpose

The PACIFIC project aims to develop a new, low-cost and environmentally friendly tool for exploring for buried mineral deposits.

The PACIFIC approach will build on the "traditional" passive seismic method, which is capable of providing useful broad-brush background information about the geological and structural setting of mineralised regions, but lacks the resolution needed for reliable identification of ore bodies. Two radically new developments are planned; reflection passive seismics, which is appropriate for greenfield exploration, and the multi-array method, which will typically be deployed during drilling or in brownfield exploration.

The environmental impact of both methods is less than alternative geophysical methods, particularly active seismic surveys, but like any field operation, environmental and safety risks remain and need to be effectively managed.

This document describes the principles that will govern the operation of the Environmental and Safety Risk Management Committee (hereafter "the Committee"), the membership of the Committee, and its operational procedures. This Committee and the tasks involved are described in the PACIFIC Grant Agreement Annex 1 (Description of Action) in work package 5 (WP5).

1.2 Goals of the Committee

The overall goal of the Committee is to oversee, monitor and assure compliance with the guidelines relating to environmental and safety risks associated with operations conducted in the framework of the PACIFIC project. A detailed account of the objectives and tasks is given in the Grant Agreement Annex 1 description of WP5 - Environmental and safety risk assessment.

The main objectives of WP5 and of the Committee are to:

- Ensure PACIFIC does no harm.
- Ensure legal and regulatory compliance of the partners.
- Ensure that partners have adequately assessed environmental, health and safety risks and are effectively managing them, through the development of a Risk Register and Management System, including reporting procedures with respect to auditing, non-compliance, accidents/incidents and near-misses, and continuous improvement.

1.3 Members of the Committee

The Committee will be composed of representatives of partners BEOW, UGA, SISP, SIBSTIL and DIAS as well as external advisors, referred to as "Members" in the following. The Members are chosen for their knowledge in the field.

The initial composition of the Committee is shown in Annex 1 for information. If required and if there is a consensus among the Committee and PACIFIC partners, the composition of the Committee can be changed during the project.

1.4 Roles and responsibilities

The key tasks of the Committee include:

- Establishing a Risk Register and Management System for the PACIFIC consortium;

- Assessing where PACIFIC may be exposed to risk and compliance issues, including non-compliance with laws, regulations, standards, understanding that corporate partners undertaking tasks have the ultimate responsibility for ensuring the health and safety of individuals and environmental performance;
- Receiving, reviewing and commenting on reports concerning non-compliance, accidents and near-misses within the relevant risk areas, and ensuring that such reports are sent to relevant stakeholders (if required);
- Monitoring and reviewing the adequacy and effectiveness of the Risk Register and Management System;
- Auditing the Management System (as required);
- Making recommendations to PACIFIC in relation to issues concerning environmental, health and safety risk management;
- Constantly reviewing and emerging new risks

1.5 Financial provisions

All expenses related to the members' participation in the Committee will be covered by the involved partners' budget for WP5 of the PACIFIC project.

1.6 Confidentiality

The operation of the Committee is not subject to confidentiality issues.

1.7 Duration and termination

This agreement shall come into force as of the date of its approval by the Committee members and last until the termination of the PACIFIC project. A member shall be entitled to withdraw from the Committee upon prior notification to the PACIFIC Coordinator. However, the member undertakes not to opt out in abusive manner or at undue time.

2 Concrete actions of the committee

The Committee draw up the Environmental and Safety Risk charter in M2/Marathon TeleGA meeting in 2018. The work continued in M5/Marathon, when the first report on Environmental and Safety was completed.

The Committee communicated before each survey to evaluate and anticipate the risks and their conclusions were transmitted to the field crews via the person in charge of each operation (John McBride at Marathon and Gerrit Olivier at Kallak).

The Risk assessment together with the deployment inspection form filled by John McBride before and during the Marathon experiment can be found in Annexes 2 and 3.

After the Marathon experiment, John McBride reported that there were no significant environmental or safety issues in a presentation to the Committee during the Marathon workshop in June 2019.


Likewise Gerrit Olivier reported no important environmental or safety issues in September 2019 after a field experiment at Kallak.

The Committee will communicate during a virtual meeting in the month before the major operations at Kallak in the summer of 2021 and will meet again following the survey.

Annex 1 - Composition of the Committee

Organisation	Competence	Representative
BEOW	Geophysicists in charge of the Kallak project, WP4	Rasmus Blomqvist, Kurt Budge and Bill Craggs
UGA	Health and safety office of ISTerre	Mikael Langlais (to be confirmed)
SISP	Geologist and president of SISP	Nicholas Arndt
SIBSTIL	Geologist in charge of the Marathon project, WP3	John McBride
DIAS	Research assistant officer	Huda Mohamed
G. CHUNNETT CONSULTING	External expert with wide experience in mineral exploration	Gordon Chunnnett

Annex 2- Risk Assessment at the Marathon deposit

	Approved by:
	Prepared by: John McBride
	Prepared September 11, 2018 Latest Revision:
<p>Risk Assessment – PACIFIC Passive Seismic WP3 “pilot test of the passive reflection seismic technique at the SIBSTIL Marathon deposit”</p>	

Purpose:

An appropriate risk assessment evaluation must be performed whenever a safety concern is identified through analysis of safety data or other means, or a project or new/revised policy, procedure or work practice is being considered that could potentially affect the safety of our employees, our operation, the public, or the environment. The risk assessment evaluation must be performed as soon as practicable after identification of the safety concern and prior to initiation of the project and implementation of the change.

Background:

In total 1025 nodes will be deployed, 425 as array (for 3D reflection imaging) and 600 as a profile (for 2D reflective imaging). The 2D array will have a spacing of 150m and cover an area from the Pic river in the east, to the powerline in the north, to Hare Lake in the west and to the Airport in the south, see figure 1. While the 2D profile line will have a spacing of 50m and overlay the 2D array. The line will have a length of 6000m and extend from the Pic River to Hare Lake. Access to the work site is varied and will include truck, ATV and helicopter. The project is part of a research partnership with the PACIFIC group.

Work Program:

Activities:

The work plan for the passive seismic project can be divided into four parts. Activity for each part are listed in table 1 with corresponding pre existing policies and procedures. All identified planned activities have an existing policy or procedure, therefore no procedures need to be modified or changed. Conducting the field work under the existing policies and procedures should adequately reduce and manage risk.

1. Pre inspection and site preparation
2. Sensor Deployment
3. Data acquisition
4. Sensor Retrieval

Work Plan	Timing	Contractors	Supervisors	Activity	Procedure	New Procdures Required
Pre Inspection and Site Preparation	September 12 th to 13 th	Haveman Brothers - 2 people	John McBride SCI			
Sensor Deployment	September 17 th to 21 st	Haveman Brothers - 10 people, Sisprobe - 2 people	John McBride SCI			
Data Acquisition	September 21 st to October 21 st	SAExploration equipment, no personnel on site	John McBride SCI			
Sensor Retrieval	October 22 nd to 26 th	Haveman Brothers - 10 people, PACIFIC members - unknown	John McBride SCI			

Timing:

Part 1: Pre inspection and site preparation will occur from September 12th to 13th, 2018

Part 2

Crew:

The inspection and deployment will be conducted by a crew from Haveman Brothers, equipment will be rented from SAExploration and transportation by air will be operated by Wilderness Helicopters.

Site Management will be under the supervision of John McBride, a Stillwater Canada Inc. representative.


All actions planned for the work program have been previously identified for risks and a policy or preceded is in place. Those existing policies and procedures are sufficient to properly mitigate risk. All contractors, visitors and employees will review all policies and relavant procedures prior to commencing work activities.

Actions planned:

	Actions Planned	Policy or Procedure
1	Passenger Vehicle Travel	1.6.004 Passenger Vehicle Procedure
2	All-Terrain Vehicle Travel	1.6.002 All-Terrain Vehicle Operation Procedure
3	Helicopter Travel	Helicopter Safety Procedure

4	Traversing	1.1.003 General Work Practices Procedure, 1.6.021 Working in Remote Area Procedure
5	Use of Hand Tools	1.6.018 Hand Tool Safety Procedure
6	Working In Remote Locations	1.6.021 Working in Remote Areas Procedure
7	Weather	1.6.011 Working in Extreme Hot or Cold Weather Conditions Procedure
8	Wildlife	1.6.022 Bear Safety Procedure, 10.1.004 Migratory Bird Procedure
9	Personal Protective Equipment	1.6.009 Personal Protective Equipment (PPE) Procedure
10	Chain Saw Operations	1.6.003 Chain Saw Procedure
11	Cutting of Pads and Laydown Areas	1.6.001 Line, Trail , Pad Cutting Procedure
12	General Safety	1.1.003 General Work Practices Procedure
13	Fueling and equipment storage	1.2.002 Environmental Procedure for Contractors, 1.6.004 Passenger Vehicle Procedure

Annex 3 – Workplace Inspection Form

	<h3>Workplace Inspection Form</h3>
<p>Work Plan #</p>	<p>PACIFIC Passive Seismic techniques for environmentally friendly and cost efficient mineral exploration</p>

Inspector: (Print Name)

1.
John McBride

Signature:

1. 

2.

2.

3.

3.

Date: September 20, 2018 at 13:22

Location(s):

Marathon, Ontario – Marathon PGM-Cu project, work location was in the field at UTM 5505081N, 5405116E

Activities:

Deployment phase of the PACIFIC seismic program, travel to and from site by trucks, ATV and by foot. Working alone in the field deploying ZLand C1 sensors.

Contractor:

Inspected Haveman Brothers, other contractors on site include Wilderness Helicopters, Clark Exploration and Sisprobe

Supervisor:

Mike Haveman

Signature:

Comments:

The inspection was intended to observe all practices involved in the deployment phase and specifically observe at least one contractor deploy a sensor. Traverses were designed so that workers were close in proximity to one and other during the field work. Risk assessment of the activity was completed prior to the commencement of the work and is utilized in this inspection.

Minimal environmental impact occurred as existing laydown areas were utilized and traversing had minimal impact on the local flora. No animal encounters occurred. No remediation is required for this activity.

Checklist:

Training and Procedures:	Observations & Recommendations:
<ul style="list-style-type: none"> ✓ WHMIS training valid ✓ Health and Safety rep present if 5 or more workers regularly work at site ✓ Appropriate workers have first-aid training ✓ Training for all required tasks with valid certificates/licenses (ex. Operating chainsaws, ATV's, driver's license, etc..) ✓ Completed SCI site orientation. ✓ Field crew familiar with communication procedures ✓ Participated in daily safety meeting ✓ Emergency contact numbers and equipment readily available (ex. First aid kit) ✓ Process for reporting critical injuries and unusual occurrences is in place. ✓ Familiar the operation of the ZLand C1 node ✓ Supervisors are on site an aware of their workers locations ✓ Pre site inspection completed prior to commencement of work ✓ Workers traveling by helicopter are aware of loading and unloading procedure ✓ Helicopter pilot has confirmed safe flying conditions for the day 	<p>All crew members had valid first aid and certificates were provided prior to the commencement of work</p> <p>All workers who operated trucks or all-terrain vehicles had proper certification and provided it prior to the commencement of work</p> <p>Site orientation was completed by all contractors</p> <p>SCI radios were provided to each field person and the communication plan was reviewed, communication throughout the project went well.</p> <p>Safety meeting was performed in the morning and the daily activity plan was reviewed</p> <p>Review and field practice was completed as orientation prior to beginning deployment. Travers were organized, mapped and discussed prior to the work day.</p> <p>Helicopter pilot disconnected each load prior to handling and the ground crew reconnected for lift, this reduced the risk during slinging</p>

	No flying was required on this day but there was a delay on day 3 due to low cloud cover
Equipment:	Observations & Recommendations:
<ul style="list-style-type: none"> ✓ Pre-shift equipment and vehicle check list are completed ✓ Hand held tools are in good condition ✓ PPE worn appropriate for task and in good condition ✓ Appropriate field equipment for the season ✓ Hand held radios and spot locators on hand and functional ✓ Fire extinguisher on hand and in good condition ✓ Plan of travel in place ✓ Communication plan for high traffic areas to reduce collisions ✓ Loads to be transported are securely loaded and checked ✓ Only designated operators are using chainsaws 	<p>A flat tire occurred – the issue was communicated early in the day by the radio contact and a pump was brought in to correct the issues, no further action was necessary.</p> <p>All contractors wore high visibility clothing and weather appropriate</p> <p>One radio was lost during a travers but a spare radio was supplied so there was minimal lapse in communication</p> <p>Supervisor selected travers for crew based on their level of experience and abilities</p> <p>Access trail is gate to limit public travel</p> <p>No further chain sawing was required all site prep work was completed prior to the deployment phase</p>
<p>Season Equipment:</p> <p><u>Fall</u></p> <ul style="list-style-type: none"> ✓ “No Hunting” Signs posted during hunting season ✓ Bear control program in place, bear spray and reporting system for bear sightings ✓ Extreme weather condition prevention measures and awareness in place ✓ Gated access is locked and signed 	<p>Multiple No hunting signs posted</p> <p>No reported bear or wildlife sightings</p> <p>Phil Dales was supplied with bear spray</p> <p>Heavy rains expected for day 5 and work plan was modified to reduce risk of weather hazards</p> <p>Yes</p>
Hazardous and Non-Hazardous Materials Checklist	Observations & Recommendations:
<p>Identification:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Containers labelled to meet legal requirements <input type="checkbox"/> Label easy to read ✓ Material Safety Data Sheet available, current and complete 	<p>N/A</p> <p>ZLand C1 and all other SDS supplied to contractors</p>

<p>Preventative Measures:</p> <ul style="list-style-type: none"> ✓ Ventilation adequate ✓ Products or materials stored in accordance to the MSDS, legislations or procedures ✓ Are incompatible products been stored together 	<p>Yes</p> <p>No</p>
<p>Handling Procedure:</p> <ul style="list-style-type: none"> ✓ Is the handling procedure adequate and followed ✓ Smoking around flammable/combustible materials ✓ Smoking on the work site 	<p>Smoking was not observed on the work site</p>
<p>Leaks and Spills:</p> <ul style="list-style-type: none"> ✓ Evidence of leaks or spills ✓ Spill kits on site and available ✓ All spills must be reported ✓ Fueling in designated areas 	<p>Fueling of equipment was done in town at a designated fueling station</p>
<p>Waste Disposal:</p> <ul style="list-style-type: none"> ✓ Is there garbage on site ✓ Proper garbage disposal 	<p>All sites visited were free of debris</p>
<p>PPE Specific to Hazardous:</p> <ul style="list-style-type: none"> ✓ PPE adequate and in use (ex. Gloves, eye protections, reflective clothing (hunters orange), footwear, etc...) 	<p>Proper foot wear, high visibility clothing, weather appropriate clothing, safety glasses and gloves were being worn</p>
<p><i>Additional Hazards or Risks not identified in the initial risk assessment:</i></p> <p>Incoming weather will have high rains which will increase the risk of slips, trips and falls because of slippery conditions and softer ground. More remote and difficult station locations will be completed today and lower risk sites will be completed during wet conditions.</p> <p>Hunters were observed approaching the gate and traveling the access trail</p> <p><i>Adverse Effect/Possible Injury:</i></p> <p>Increase in slips, trips and falls which could cause minor to moderate bodily harm.</p> <p>Accidently discharge of a firearm can be deadly</p> <p><i>Risk Rating:</i></p> <p>Low for high rain fall</p>	

Low for hunters

Persons Exposed:

Field crews including Haveman Brothers, Sisprobe, Clark Exploration and SCI

Existing Control:

Working pairs, proper footwear, communication plans, planned travers,

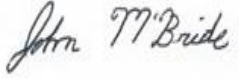
Locked gate and no hunting signs

Additional Control:

Changed work plan to reduce high risk areas during high rain conditions

Additional no hunting signs and communication with hunters to inform them of the restricted area

Follow-Up Action Items

Action Item	Responsible Person	Action Taken	Date Completed	Authorized Signature
Flat Tire on ATV	Ted Gilverson (operator) and John McBride (supervisor)	John McBride Traveled to site with a pump and repaired tire, no further action was required	September 20, 2018	
Post additional no hunting signs along main access trail	John McBride	Posted 3 no hunting signs along trail	September 21, 2018	