

## **Draft Coastal and Marine Management Plan Response from Combined Environmental Working Group**

### **1. Lack of dust monitors along eastern section of mine.**

*Gulf as sensitive receptor:*

- “Flora and fauna contained within the marine environment are sensitive receptors which have the potential to be impacted by the Hillside Project” (MLP Section 8.3.9)
- DSD MLP Assessment Report (p. 363) – DSD “considers the sensitive receptors and associated environmental values for this environmental aspect to be:
  - marine ecosystems (health and diversity) and
  - marine fauna and flora (faunal and flora health and diversity”.

Given the Gulf’s status as a sensitive receptor, and given that dust deposition has been listed in the draft MP as one of the main risks to the marine environment (*Rex’s Air Quality Power Point Presentation; 2017*) the dearth of permanent dust monitors along the entire 6 km stretch of the Eastern WRD immediately adjacent to the Gulf is unacceptable. The MP indicates only one dust deposition gauge at the far northern point east of the Sandy Church Road.

Rex’s suggested options, given verbally during the 20<sup>th</sup> August 2017 Pine Point community meeting, are not adequate.

*Suggestion 1: That mobile dust monitors could be deployed along this section as needed. As noted in the Working Group’s response to the draft Air Quality Management Plan (see p 9),*

- These monitors lack the accuracy and precision of real time monitoring;
- The speed with which they can be relocated is unclear –may be too slow to respond to rapid changes in wind direction.
- The decision to deploy them rests entirely with the Company and therefore carries the risk that the frequency and speed of such deployment will not be subject to independent/community scrutiny; and
- There is no indication of how often the results of such intermittent monitoring will be reported to the community and with what level of detail.

*Suggestion 2: Additional dust deposition gauges could be placed along the eastern boundary of the WRD.*

- Such monitors, while useful, will only provide information on dust deposited on the landward side of the mine. Given their land-based location and in the absence of any TSP monitoring, they provide
  - no information on the amount of dust actually leaving the site or
  - the amount of dust deposited on the beach or on the intertidal habitats.

### **Requirements**

1. That one real-time BAM monitoring station be located on the eastern side of the mine site to measure dust emissions, esp. TSP.

This would

- a) Fill the information gap re dust emissions reaching the Gulf
- b) Ensure the Company is meeting Condition 1 and 5 (Schedule 2) which specifies emission limits for each 24 hour period. We assume these conditions require the Company to be

accountable for the level of emissions leaving the site on **all** sides, including the eastern boundary. With no monitoring on the eastern boundary, that will not be the case.

2. That an adequate number of dust deposition gauges be located as close to the coast as possible.

## 2. Groundwater monitoring

The draft Groundwater MP indicates two monitoring bores (for baseline aquifers) on the eastern side of the mine – one at the northern end and one mid-way. There are none at the southern coastal side of the eastern WRD. Why not?

## 3. Gaps in proposed Gulf monitoring program

The draft MP's description of the monitoring program is cursory and lacks sufficient information to explain clearly what will and **will not** be done.

It contains none of the detailed methodological descriptions outlined in the baseline studies and there is no clearly-stated commitment to implementing the full breadth of monitoring undertaken in those studies (excluding some components relevant only to the port location). In fact, several statements indicate otherwise.

- (p 9) that *"The coastal and marine ecological baseline surveys... **form a basis of the proposed monitoring program**".*
- (p 10) *The program will be conducted .....using the baseline sampling sites and **modified methodology...**"*

The Plan fails to specify which baseline methodologies **will not** be implemented, nor the reasons for omitting them.

A comparison between methodologies used in the 2011 baseline report and the draft MP suggest the following (see also Table 1):

### 1. Similarities

- Assessments of subtidal marine habitats, using towed video cameras – but no indication of how many transects will be done. In 2011 Baseline Study, 85 transects were done between Ardrossan and Pine Point and a rough count of figure 4-1 indicates approx. 40 of these were between James Well and Pine Point.
- Assessment of seagrass health

### 2. Differences

- No assessment of intertidal zone – ie no reference to line intercept transects from low to high tide zone. Yet baseline report states:
  - *Impact on intertidal zone needs to be taken into account by Rex, and*
  - *Information on the distribution and presence of the intertidal fauna will be important to detect potential impacts (p. 85).*
- No analysis of subtidal sediment characteristics. Yet, according to the baseline report, this is an important monitoring component that will *"help detect any changes in mine derived pollutants and provide measure of the success of control measures implemented"*. It is also a key method of identifying changes in concentration levels of heavy metals such as copper (see discussion point 3 below). According to the baseline report:

- *Marine sediments act as indicator of physical, chemical and biological processes. Organisms exposed to elevated concentrations of heavy metals, hydrocarbons and other pollutants may accumulate these compounds.*
- *Once pollutants are introduced into the marine ecosystem, they are very difficult and expensive to remove. Rex will be required to implement very stringent control measures to prevent the release of pollutants from mining activities. If these control measures fail the composition of marine sediment will alter to reflect an increase in pollutants from mining activities. **Monitoring marine sediment will provide measure of success of these control measures.***

**TABLE: Apparent Draft MP deviations from methodologies used in Marine Baseline Study, 2011**

Baseline study 2011	MP studies
<p><b>Coastal habitats and intertidal</b> <b><i>Line intercept transects from low to high tide zone and photo point monitoring.</i></b> Assessed</p> <ul style="list-style-type: none"> <li>• sediment grain size</li> <li>• invertebrate abundance and diversity of organisms and</li> <li>• beach width</li> <li>• flora survey from sand dunes and cliff habitats</li> </ul> <p>16 sites from Pine Point to just north of RP.</p> <p><b><i>Coastal bird survey</i></b> – walkover – birds observed from high water mark to 200 m off shore.</p>	<p><b>“Diversity of Marine Flora and Fauna” (p.12)</b> “Photo point and walkover survey of coastal foreshore ...between Pine Point and Rogues Point”.</p> <p><i>What will this involve?</i> <i>Does it include coastal bird survey?</i> <i>Will it include fauna surveys of coastal habitats?</i> <i>Will it include vegetation surveys to assess any dust impacts?</i> <i>Why only 6 permanent photo points to track the ongoing erosion of foreshore, cliffs and gullies compared with 16 in baseline study</i></p> <p><b>NO MENTION OF LINE INTERCEPT TRANSECTS FROM LOW TO HIGH TIDE ZONE</b></p>
<p><b>Subtidal sediment characteristics</b> <b><i>Aim: establish baseline of marine sediment component ( Physical and chemical features) that may be altered by pollutants from mining.</i></b></p> <p>13 locations between approx.. James Well and Pine Point at which sediment samples collected Samples analysed for particle size, inorganic elements (aluminium, iron, copper, lead, magnesium) organic carbons and hydro carbons etc.).</p>	<p><b>NOT REFERRED TO IN MP (see point 3 below)</b></p>

**Requirements:**

- *A far more detailed description of monitoring methodologies including the number of sites to be monitored and reasons for doing less than in the baseline survey.*  
The current description in this draft MP is vague and we believe lacks the level of detail that could be used for regulatory purposes and for community understanding of what is being proposed.
- *The inclusion (as per the baseline study) of on-going monitoring of:*

- *the intertidal zone and*
- *sub-tidal sediment characteristics (see further discussion below).*

#### **4. Assessment of soluble metals such as copper entering the marine environment**

The monitoring program outlined in the draft MP seems to focus primarily on identifying potential impacts from increased sedimentation. However, there are apparently no plans to monitor the chemical features or metal concentrations of any element in the marine environment.

The draft MP argues that the possibility of soluble metals such as copper entering the marine environment via surface or ground water flow is “low to negligible” (P. 8).

While this risk assessment may turn out to be correct, it is up to the Company to **PROVE** this by implementing a thorough, on-going monitoring program incorporating an assessment of the chemical composition of

- marine sediment;
- seagrasses; and
- biovalves (razor fish).

This three-pronged approach represents an amalgamation of methods used in the 2011 baseline study and the 2012 Ardrossan Region Baseline Study as described below.

##### **a) Baseline study Dec 2011**

- As noted earlier, this study monitored the chemical composition of marine sediment in the potential impact zone (ie offshore from the mine) and in transitional sites.

##### **b) Baseline Study ..from Ardrossan Region (Sept 2012)**

- According to this study (p 5): *“The presence of heavy metals and hydrocarbons potentially poses a hazardous impact on marine flora and fauna. Marine organisms can accumulate trace metals from the dissolved phase and from ingested food”.*
- It included the following methodologies:
  - A sediment analysis, including total and extractable metals
  - Seagrasses metal concentrations, including copper
  - Bio valves (razor fish) metal concentrations including copper. Razor fish were identified as important because they are potentially collected for food (p. 17).

While it is acknowledged that this second study was designed to provide baseline data for long-term monitoring of any impacts from the shipment of copper concentrate from the Port, these methodologies are also highly relevant to the mine site itself.

##### **Requirement**

The monitoring program for the marine environment impacted by the mine site should be expanded to include the following components of the baseline studies:

- An assessment of the chemical composition (metal concentrations) of
  - marine sediment
  - seagrasses and
  - bio valves.

This is necessary to allay community concerns about potential marine contamination from heavy metals.

## 5. No. of Monitoring Sites

- **Seagrass monitoring:**

Specific details on the number and location of monitoring sites are only provided for seagrass monitoring (see Figure 2, MP). Only five are specified: 3 in the impact zone and 2 transitional sites at Rogues Point and at approx. Parara.

Issues:

- Limited number of transition sites: **Question:** what is the justification of having only two? Why aren't more required?
- No control sites: Because both transitional sites could be affected by mine-generated contaminants carried northwards by the prevailing clockwise circulation pattern of the Gulf, they are not "control" sites.

**Requirement:** At least one (preferably more) control site(s) situated outside of any potential impact zone seems essential. This should be located to the south of Black Point, well away from possible impacts from dust carried by strong north-westerlies.

- **Photo point and walkover survey**

Six photo points (location not provided) are referred to. Why so few, given that the baseline study focused on 16 survey points between Pine Point to just north of Rogues Point.

## 5. Monitoring timing and frequency

- **Annual monitoring only:** The draft MP (p. 12) proposes annual monitoring at about the same time each year "*to minimise the effect of seasonal variation*" - presumably December to coincide with the timing of the baseline studies.

**Concern:** any changes from a once-per-year monitoring program may fail to detect any changes at an early stage in the process, thereby leading to delays in taking remedial action.

- **No monitoring of seasonal variations**

Draft MP states (p. 13) "*No significant change is expected from the baseline indicator values other than can be reasonably explained by seasonal variations ....*"

**Question:** how will differences due to seasonal variations be identified, given that baseline data for the mine site are only available for 5-8 December.

**Requirement:**

At least in the early stages of mine development and operation, at least six monthly monitoring is required to provide an understanding of seasonal variation and early detection of potential problems.

## 6. Continual review of monitoring techniques in response to changing technologies (p 13)

Given the rapid nature of technological change, continual research into and evaluation of new monitoring techniques is crucial both before and throughout the life of the mine. For example, we understand the use of satellite imagery to monitor changes in seagrass coverage are being used by marine biologists, while the rapid development of drone technology may represent another option.

**Requirement:**

An Advisory Panel, comprising community representatives and independent – preferably academic - experts/advisors responsible to the community be established to work collaboratively with Rex and its qualified marine biology on an on-going basis to:

- Participate in these “continual reviews of monitoring techniques” in collaboration with Rex’s qualified marine biologist
- Contribute to an ongoing assessment of/research into changing monitoring techniques
- Act as a community watch-dog re the monitoring program results etc

This Panel needs to be established before any mining operations commences.

**This document has been endorsed by the following WG members:**

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