



26 February 2016

John Burgess
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Rex Minerals

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Dear John

Re: Update of Rex Minerals Hillside Project Odour Impact Assessment

Rex Minerals has requested an update of the odour impact assessment based on the extended feasibility study (EFS) mine and tailings storage facility (TSF) design for resubmission of the mining lease application as requested by DMITRE.

The update of the odour impact assessment is summarised in this report letter. The modelling was based on the same methodology and emissions data as the original assessment¹ with updates of the meteorological data as for the EFS dust impact assessment update² and the smaller EFS TSF foot print.

Sincerely

Johan Meline
Manager SA

¹ Pacific Environment 2013, Hillside Project Dust and Odour Impact Assessment, 19 February 2013

² Pacific Environment 2015, Rex Minerals Hillside Project: Extended Feasibility Study Dust Impact Assessment, 3 September 2015

HILLSIDE PROJECT ODOUR IMPACT ASSESSMENT UPDATE

Introduction

The original Hillside air quality impact assessment (Pacific Environment, 2013) included assessment of potential odour impacts from residual flotation chemicals from the proposed Hillside TSF. The assessment concluded that there is a low risk of any odour impacts from any of the mining activities resulting in any nuisance odour impacts.

As part of the approvals assessment process for the Hillside Project EFS it has been requested that the odour impact assessment is updated to reflect the changes in the mine design for the EFS TSF smaller foot print.

The odour impact assessment update was completed based on the same modelling methodology as summarised in the original report (Pacific Environment, 2013). Updates included new meteorological data, as for the EFS dust impact assessment update (based on site observation data), and the new smaller TSF odour source foot print.

Emissions Estimation

The estimation of odour emissions for the updated TSF design with a smaller surface area was based on the same source emissions data as the original study (Pacific Environment, 2013). The updated TSF surface area details and odour emission rates are presented in Table 1. The updated total EFS TSF surface area and odour emissions are approximately 34% smaller/lower than what was assumed in the original 2013 study. The layout of the EFS TSF, and odour source, is presented in Figure 1.

Table 1: Updated TSF Odour Emission Rate

Source	Total odour emission rate (ou s ⁻¹)	Odour emission rate (ou m ⁻² s ⁻¹)	Surface Area (m ²)	Modelling source type
TSF	391,400	0.38	1,030,000	Area source

The TSF odour source was modelled for the Year 2 operations, which is the earliest it is expected that the TSF will reach the full TSF surface area of tailings and also before the TSF is built higher with the operations in later years³. This means that the Year 2 operations are representative of worst case operations considering the potential for maximum odour impacts from the mining operations.

³ The Year 2 TSF height above surrounding ground is approximately 45 m. This was assumed in the modelling.

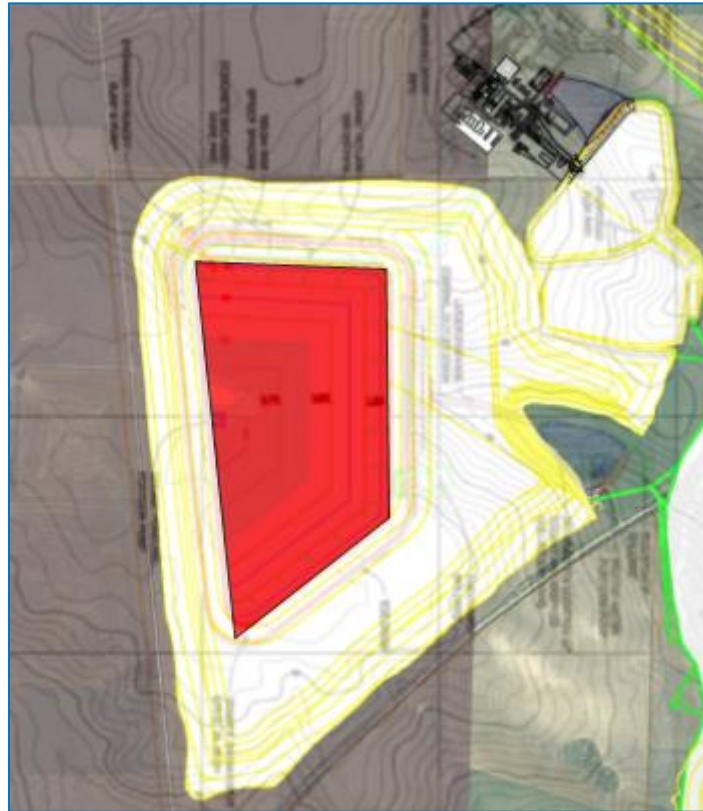


Figure 1: TSF Surface Area Applied as Odour Source (red polygon)

Results

The updated odour assessment results are presented as follows:

- The updated predicted odour results at the nearest sensitive receptors are presented in Table 2.
- The locations of the nearest sensitive receptors are presented in Figure 2.
- The contour plot for the predicted updated odour impacts is presented in Figure 3.

The results show that there is compliance with margin at all sensitive receptor locations.

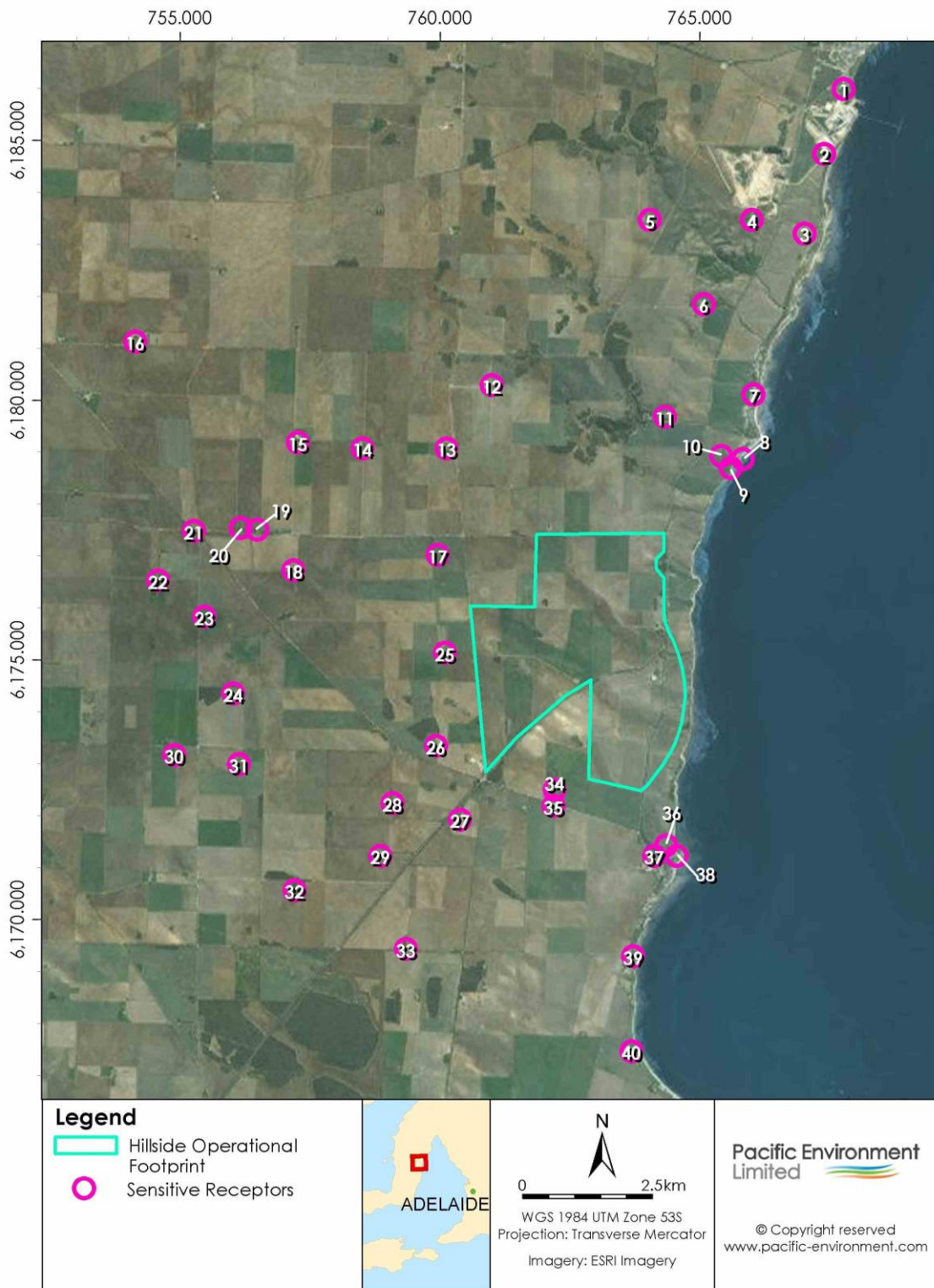


Figure 2: Sensitive Receptor Locations

Table 2: Predicted Odour Concentrations (99.9th percentile, 3 minute average)

Receptor Number	Odour Concentration (ou)	Assessment Criteria (ou)
1	0.4	4
2	0.4	4
3	0.5	10
4	0.9	10
5	1.3	10
6	1.1	10
7	0.5	10
8	0.6	6
9	0.6	6
10	0.6	6
11	0.9	10
12	3.5	10
13	3.8	10
14	3.1	10
15	2.1	10
16	1.3	10
17	2.9	10
18	1.8	10
19	1.8	10
20	2.2	10
21	2.3	10
22	2.1	10
23	1.9	10
24	1.4	10
25	1.9	10
26	1.8	10
27	2.0	10
28	1.7	10
29	1.6	10
30	2.2	10
31	1.2	10
32	1.1	10
33	1.6	10
34	1.8	10
35	1.8	10
36	0.6	6
37	0.6	6
38	0.6	6
39	0.6	10
40	0.6	10

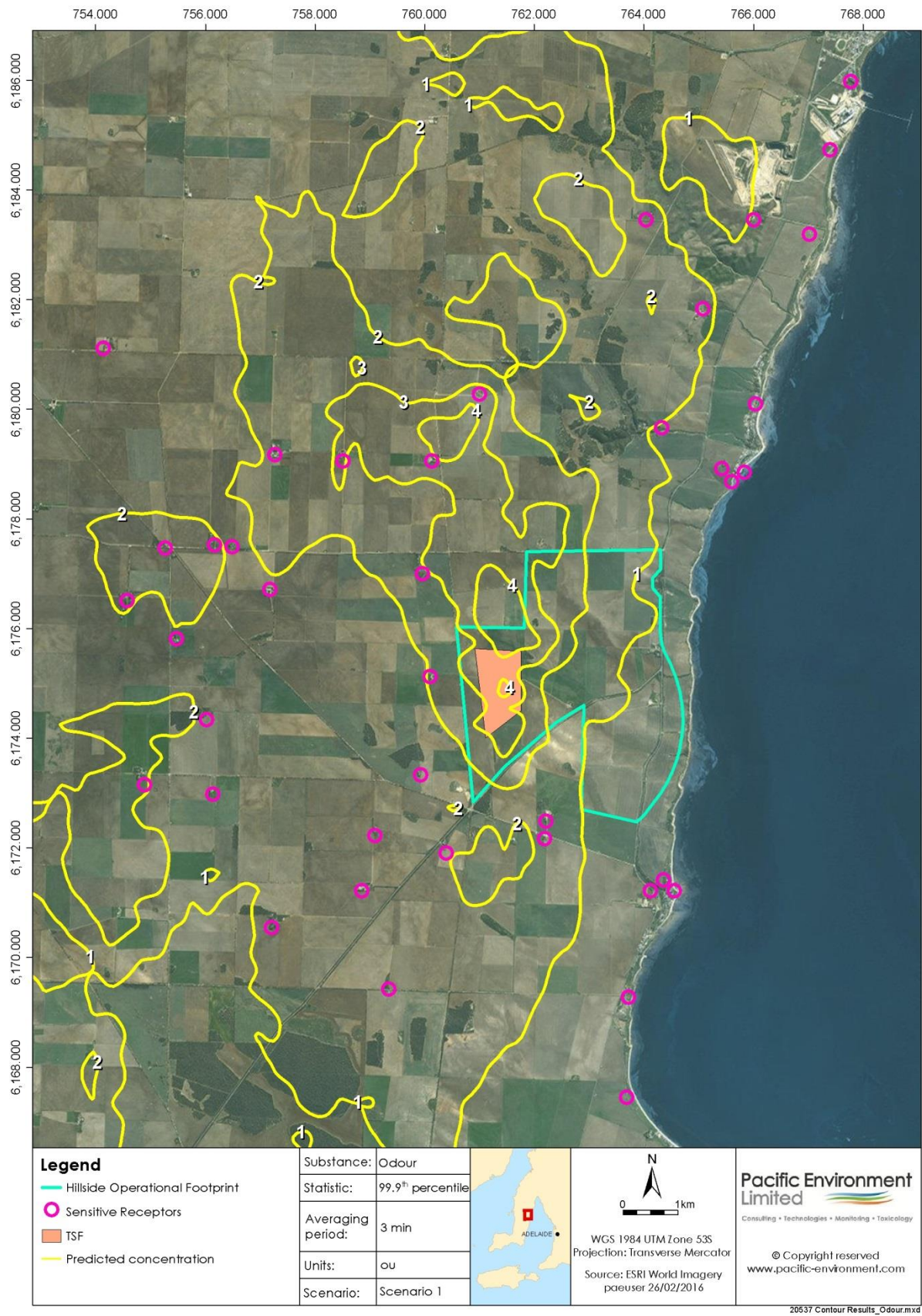


Figure 3: Contour Plot of the Predicted Updated Odour Concentrations

Conclusions

The results for the updated odour modelling, which includes a reduction in the TSF surface area due to the smaller EFS TSF foot print, show that there is compliance with margin to the odour assessment criteria at all sensitive receptors.

As discussed in the original assessment we note that it is our experience that odour emissions from mining activities are very limited. In most situations there is no detectable odour over TSFs or only the very lowest level of detectable odour present in the immediate vicinity of the TSF wet and dry beaches.