Surface Waters Investigation Report

Mareeba Landfill

Sample Events January - April 2017

Objectives	• To investigate the potential for environmental harm when a surface water test value has exceeded an environmental authority (licence) release limit or trigger value. • The investigation is conducted to meet the requirements of condition 3-W3 of Environmental Authority EPPR01792213. • The investigation is to be in accordance with the methodology outlined in the ANZECC Water Quality Guidelines 2000.
Methodology	1. Assess all test result values against the maximum limits. 2. Reference site trigger values must be determined by calculating the 80th percentile for NTU, Do and Electrical Conductivity and by calculating the 20th and 80th percentile for pH. A determination must be made of whether the calculated value is higher (or lower in the case of the minimum pH) than any default trigger value specified in Part 3 Table 2 Environmental Authority EPPR01792213. 3. The median of the results for the test site, determined based on a maximum of ten consecutive samples, must be compared to the adopted trigger values. 4. Check data for errors. 5. Plot values against 80th%ile background value BG and ANZECC 2000 corrected trigger value if applicable. 6. Compare with previous excursions. Eg trends. 7. For any test value that has exceeded the trigger value undertake a desk top assessment to recalculate trigger values based on analytic limits, chemical and water quality modifiers (eg. pH, hardness, alkalinity that reduce / increase bioavailability of toxicants), and account for any known mixture interactions. Managers may also opt to take management / remedial action instead. 8. If exceedance of the trigger value persists after modifiers have been considered, Managers must use the decision tree to determine whether further investigation is to be conducted or whether to proceed to management / remedial action. Further investigation involves performing direct toxicity assessment. This is a specialised science and Council may be better advised proceeding with remedial or management action.

Results	The following test values detected in the release waters exceeded the maximum release limit for Suspended Solids (50mg/L): 21/01/17: 165.6 18/01/17: 330 27/01/17: 50.4 02/02/17: 130.4 08/02/17: 1668 17/02/17: 695 24/02/17: 1040 24/03/17: 64 07/04/17: 1107 The following test values detected in the release waters exceeded the adopted trigger values for Electrical Conductivity (250uS/cm). Note there is no calculated trigger value as the sampling of the reference site under the Surface Waters Monitoring Program has only recently commenced. 21/01/17: 254 27/01/17: 256 08/02/17: 305 24/02/17: 362 24/03/17: 303 07/04/17: 273 The following test values detected in the release waters exceeded the adopted trigger values for NTU (6 NTU units). Note there is no calculated trigger value as the sampling of the reference site under the Surface Waters Monitoring Program has only recently commenced. 21/01/17: 226 18/01/17: 1100 27/01/17: 122 02/02/17: 204 08/02/17: 240 17/02/17: 972 24/02/17: 1100 24/03/17: 112 07/04/17: 1100 No corrections can be made for eco modifiers for SS, NTU or EC

Analysis and Potential for Harm	In the absence of site specific trigger values or an adequate data set, the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC 2000) default values were used to detect the need to investigate the potential for environmental harm. The release values since the start of 2017 have clearly exceeded the ANZECC default values. However, Golder Associates Pty Ltd notes that the site is located within a highly disturbed environment from agricultural activities and urban development. Consequently, the application of the ANZECC default values for the assessment of surface water is not considered appropriate (SWMP 2017). Under the SWMP, preliminary assessment of the surface water shall be performed by comparing the reference location to the release point and surface water monitoring locations. This shall be performed by tabulating the results and graphing the results in an X-Y plot over time. In the event that the concentrations of key leachate chemical parameters exceed the trigger levels the potential for landfill operations to be impacting on local surface water quality may require further investigation.
Recommendations and actions being taken.	*ANZECC Decision Tree* a) Take remedial / rehabilitative action. MSC has employed the option given by the decision tree rationale of ANZECC 2000 (fig 3.3.1, p 3.3-2) to take remedial / rehabilitative action for the Mareeba Landfill. A Surface Waters Management Plan is currently being prepared for the landfill to investigate the source and cause of elevated suspended solids and electrical conductivity with a view to preparing design and drawings for erosion and sediment controls under an approved TEP. Once finalised, the measures will be implemented with the objective to minimise the harm of surface waters releases from the site on receiving waters. b) MSC has finalised the Surface Waters Monitoring Program with Golder Associates to determine appropriate trigger limits for receiving waters. c) MSC has engaged NRA Environmental Consultants and Revegetation Contractors to assist MSC in the implementation of surface waters management obligations under the approved TEP. Should these courses of action change, MSC must move to direct toxicity assessment to determine impact on the environment.
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