

Karara Mining Limited

Environmental Plan - Flora and Vegetation Health Monitoring

CORP-EN-PLN-1012

14 October 2022

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1 PURPOSE AND SCOPE

The purpose of this plan is to assess the potential impacts upon the health of the Blue Hills (Mount Karara/Mungada Ridge/Blue Hills, banded ironstone formation) Priority Ecological Community (PEC) vegetation complexes, within the footprints of the Greater Karara Project caused by mining and mining related activities such as:

- dust;
- saline water application from dust control;
- fire; and
- feral species.

This plan has been developed to meet legislative requirements and has been written in accordance with the Office of the Environmental Protection Authority (OEPA) Environmental Assessment Guideline No. 17 – Preparation of management plans under *Part IV of the EP Act* (August 2015) and the Native Vegetation Condition Assessment and Monitoring Manual for Western Australia (Department of Environment and Conservation, 2009).

1.1 Objectives

The objectives of this plan are to detail:

- The process for selecting and establishing vegetation health monitoring and control sites;
- The timing, frequency and vegetation health parameters to be monitored;
- The criteria for assessing monitoring results to detect trigger and threshold criteria's prior to adverse changes in vegetation health; and
- The environmental response actions to prevent future vegetation health decline.

This plan supports the Environmental Management Plan CORP-EN-PLN-1020 (EMP). Compliance with this plan and the requirements of the EMP is mandatory.

2 DEFINITIONS

Table 1: Definitions

Abbreviation	Definition
BOM	Bureau of Meteorology
DBCA	Department of Biodiversity, Conservation and Attractions
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EC1:5 w/v method	This method uses one-part soil by weight to five parts distilled water by volume, producing a measurable solution to quantify soil salinity.
EMP	Environmental Management Plan
FCTs	Floristic Community Types
GIS	Geographic Information System
KML	Karara Mining Limited
m	Meter
MS805	Ministerial Statement 805
MS806	Ministerial Statement 806
NATA	National Association of Testing Authorities
OEPA	Office of Environmental Protection Authority
The PEC	Blue Hills (Mount Karara/Mungada Ridge/Blue Hills) vegetation complexes (banded ironstone formation) Priority Ecological Community

3 PLANNING

3.1 Legal and Other Requirement

KML assess and monitor vegetation health in accordance with the *Environmental Protection Act, 1986*. This plan has been developed to meet the requirements of condition 6.5 of Ministerial Statements 805 (MS805) and 806 (MS806) (Karara and Mungada Iron Ore Projects, respectively) by monitoring impacts from mining and mining related activities on the PEC due to:

1. Dust;
2. Saline water application for dust control;
3. Fire; and
4. Feral species.

Karara has obtained relevant approvals under the aforementioned acts, and the relevant conditions of approvals are incorporated into this procedure. A full summary of our obligations under relevant approvals can be found in KML's Obligations Register.

3.2 Roles And Responsibilities

Table 2 provides a summary of the roles and responsibilities to ensure compliance in the implementation of this plan. The main body of this plan should be referred to where clarification is required.

Table 2: Roles and Responsibilities

Relevant Role	Responsibility
External Consultant	<ul style="list-style-type: none"> • Undertake annual field monitoring using the Environmental Form – Rehabilitation and Vegetation Health Monitoring Form CORP-EN-FRM-1036.
KML GIS Coordinator	<ul style="list-style-type: none"> • Receive data for vegetation health monitoring locations and upload to the Geographic Information System (GIS) system.
KML Site Environmental Advisor	<ul style="list-style-type: none"> • Identify and establish suitable monitoring sites • Input vegetation health monitoring data into the vegetation health monitoring register (Worksite 7.2) • Report all trigger and threshold criteria exceedances internally. • Review vegetation health monitoring results for data integrity and quality.

Relevant Role	Responsibility
Advisor Environment	<ul style="list-style-type: none"> • Review vegetation health monitoring results and determine short- and long-term trends in the data. • Externally report threshold criteria exceedances to the OEPA. • Prepare and submit vegetation health monitoring data within annual reports.
Senior Advisor Environment	<ul style="list-style-type: none"> • Schedule and manage audits in accordance with the KML workload schedule. • In consultation with the OEPA develop and implement remediation plans upon exceedance of threshold criteria. • Implement trigger and threshold response actions.

3.3 Competence, Training And Awareness

Field monitoring and recording shall be completed by an external suitably qualified consultant. Data entry, assessment of results and reporting is the responsibility of the KML Environment Department. It is the responsibility of all KML employees and contractors to ensure they undertake the relevant training required to fulfil their role.

4 IMPLEMENTATION AND OPERATION

4.1 Site Selection And Establishment

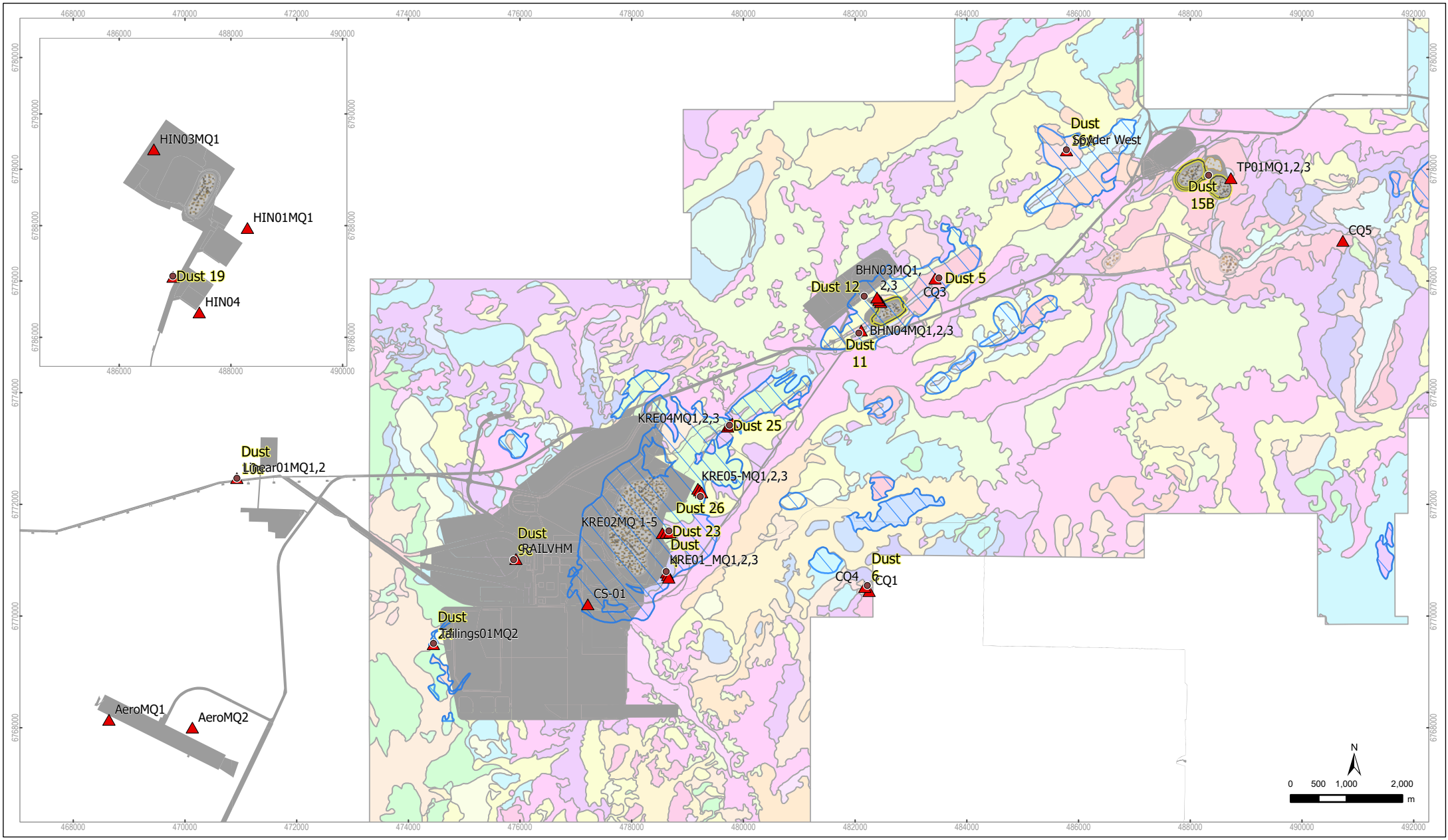
Monitoring transects are established near the clearing edge of mining operations and infrastructure. Monitoring transects have been established around the currently active mining areas (i.e. Karara mine site) and rehabilitated mine sites (i.e. Hinge, Blue Hills North and Terapod mine sites) (Figure 1, Table 3). Transects comprise of three 20m x 20m quadrats, which are orientated perpendicular and extend approximately 100m, 150m, and 200m from the approved disturbance footprint. A transect example is depicted in Figure 2. The monitoring transects and control quadrats are aligned as close as possible to dust deposition gauges (Figure 1, Table 3). In areas where crushing and screening activities have ceased or the targeted monitoring area is small, a single quadrat may be established (Figure 1, Table 3).

Control quadrats are established in areas where the vegetation assemblage is consistent with the PEC Floristic Community Types (FCTs) disturbed from operations. Control quadrats have been established to the south-east of Mount Karara, the north-east extension of Blue Hills, Mungada Ridge and Hinge. These control quadrats are located such that they will not be influenced by operations.

A review into the locations of monitoring transects was completed in 2019. Additional quadrats were installed within the Blue Hills PEC surrounding KIOP, which is currently in its operational phase, being KRE05MQ1, KRE05MQ2, and KRE05MQ3. Monitoring quadrats were removed from MIOP and HIOP, which have entered their closure phase. Additionally, control quadrat CQ5 was removed and replaced with control quadrat Spyder West. Details of current vegetation health monitoring quadrats are provided in Table 3 and Figure 1.

All quadrats are mapped using a handheld Global Positioning System and recorded on the KML Geographic Information System (GIS) database. Pegs are installed on all four corners of the quadrat with a 'Photo monitoring point' sign 3m within the northwest boundary (or other most appropriate) corner of the quadrat.

Figure 1: Vegetation Monitoring and Control Site Locations with Dust bottles



Karara Mine Iron Ore Project

Vegetation Health Monitoring and Control Sites



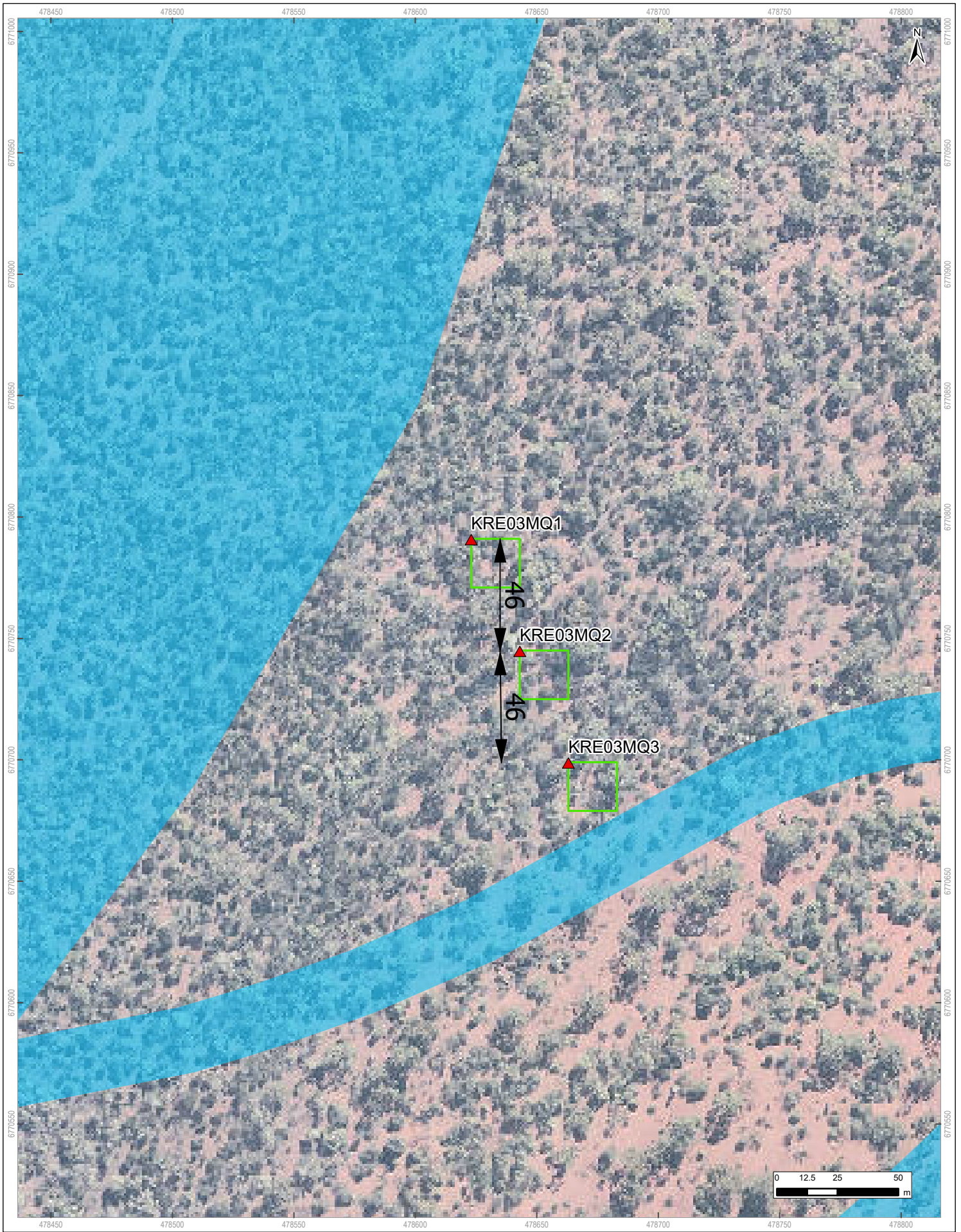
- Depositional Dust Gauge
- ▲ Vegetation Health Monitoring Site (Active)
- ▨ Blue Hills Priority Ecological Communities
- ▨ Open Pit
- Approved Mining Footprint

Floristic Communities	14	2	25	30	7
	15	20	26	31	8
	16	21	27	32	9
	17	22	28	4	CL
	18	23	29	5	Claypan
	19	24	3	6	R
	1	10	11	12	13



Ref: K0064 F1 Proj: GDA94 MGAZ50
 Version: B Scale: 1:90,000
 17 October 2022 Size: A4

Figure 2: Vegetation Health Monitoring Transect Design



25 June 2020
 Version: A
 Size: A4
 Ref: K0064 F2

Karara Mine Iron Ore Project - Figure 2

**Vegetation Health
 Monitoring Transect Design**

- ▲ Vegetation Health Monitoring Site
- Vegetation Health Monitoring Quadrats
- Approved Mining Footprint

GDA 1994 MGA Zone 50 SCALE: 1:2,000



Table 3: Vegetation Health Monitoring Locations

Quadrat Number	Area	Easting (mE)	Northing (mN)	No. Quadrats	PEC Area	FCT*	Significant Flora	Adjacent Dust Dep Gauge
Aerodrome 01MQ1	Aerodrome	468639	6768155	1	N	25	N	-
Aerodrome 01MQ2	Aerodrome	470132	6768015	1	N	26	N	-
BHN03	Blue Hills Pit	482390	6775716	3	Y	10	Y	12
BHN04MQ3	Blue Hills Pit	482109	6775125	1	Y	1/10	Y	11
HIN02MQ2	Hinge Pit/dump	486964	6787096	1	N	2	Y	19
HIN04 (Control site)	Hinge Workshop	487434	6786459	1	N	19a	N	-
KRE02	Karara Pit	478548	6771497	3	Y	1	Y	23
KRE03	Karara Pit	478623	6770791	3	Y	6	Y	4
KRE04	North of Karara Pit	479716	6773405	3	Y	6	N	25
KRE05	Karara Pit	479216	6772262	3	Y	6	N	26
Linear01MQ1	Mungada Road Security Gate	470929	6772483	1	N	26	Y	10a
Rail VHM	Rail Loop	475926	6771033	1	N	19a	N	9c

Quadrat Number	Area	Easting (mE)	Northing (mN)	No. Quadrats	PEC Area	FCT*	Significant Flora	Adjacent Dust Dep Gauge
Tailings01MQ2	Tails Storage Facility	474448	6769509	1	Y	12	N	24
TP01MQ1	Terapod Pit	488726	6777855	1	Y	10	Y	15B
CQ1 (Control Site)	Valley east of Karara Pit	482250	6770460	1	Y	6	Y	6
CQ3 (Control Site)	Area East of Blue Hills	483430	6776054	1	Y	10	Y	5
CQ4 (Control Site)	Valley east of Karara Pit	482173	6770533	1	Y	6	N	6
Spyder West	East of Terapod	485784	6778351	1	Y	10	N	16a

4.1.1 Timing and Frequency

Monitoring is conducted annually, during Spring (September). Monitoring shall occur for the duration of the entire life of the mine and for seven years post-mining.

4.2 Monitoring Parameters

Monitoring parameters have been established to compare and assess changes in vegetation condition and to identify if the change is as a result of mining or natural processes. KML have separated these monitoring parameters into two categories being:

- Threats and Impacts, and
- Vegetation Condition.

Threats and Impact parameters serve as leading indicators to assist in predicting adverse trends in vegetation health condition. For example, increased weed density can result in increased competition for native plants leading to a decline in overall health. Early detection of 'Threats and Impacts' allows for early implementation of response actions to prevent vegetation decline.

Vegetation Condition measures the change in vegetation health [comparatively to control sites] as a result of the Threats and Impacts. Vegetation Condition results shall be analysed concurrently with Threats and Impacts.

The below listed parameters are required to be monitored to ensure compliance with this Plan.

- **Threats and Impacts;**
 - Weeds;
 - Dust;
 - Saline water;
 - Feral grazing;
 - Erosion;
 - Drought stress, and
 - Fire.
- **Vegetation Condition** is assessed using an adapted Keighery Survey Condition Scale (Keighery 1994). This allows for the health of the monitoring quadrat to be compared to itself, control sites and other vegetation health monitoring sites. Any changes in vegetation health condition can be seasonally adjusted and intervention to improve condition can be undertaken if required. The adapted vegetation condition scale includes species diversity and plant density.

- **Species diversity** is calculated using population counts of all woody perennial plants within the quadrat to calculate the Shannon Weiner Diversity Index (H) as per the sum formula below.

$$H = - \sum_{i=1}^S \frac{n_i}{N} \times \ln \left(\frac{n_i}{N} \right)$$

- **Plant density** (stems/400m²) is calculated as the number of tree stems inside a standard quadrat area of 400m².

Field monitoring of these parameters is recorded using the Environmental Form – Rehabilitation and Vegetation Health Monitoring – CORP-EN-FRM-1036.

4.3 Assessment of Threats and Impacts to Vegetation

Table 4 provides the threat and impact scale rating, with a rating from 1 (Nil) to 5 (Extreme).

This section details the objectives and method for each threat and impact aspect.

4.3.1 Assessment of Impacts Related to Weeds

The objective of this parameter is to demonstrate that mining operations have not spread existing weed populations and/or increased weed density within the monitoring areas. Weeds, if they become established, become direct competition for native plants, smothering their growth or using scarce water and nutrient resources.

Weeds shall be visually assessed for the entire quadrat.

4.3.2 Assessment of Impacts Related to Dust

Long term deposition of dust on vegetation has the potential to cause a decline in vegetation health, either by physical action such as preventing photosynthesis and gas exchange by covering photosynthetic surfaces or blocking stomata; or by chemical reaction which may include changing soil chemistry or affecting leaf cellular chemistry.

The objective is to demonstrate that dust from mining operations is within KML's dust emission guideline limits outlined in KML's Environmental Procedure – Dust Monitoring CORP-EN-PRO-1005 and corresponds to no change to vegetation.

Dust shall be monitored through dust deposition and dust foliage cover. Dust deposition monitoring shall be undertaken monthly in accordance with the Environmental Procedure – Dust Monitoring CORP-EN-PRO-1005. Dust depositional bottles have been stationed near monitoring quadrats, as

shown in Figure 1. Percentage of dust foliage cover shall be visually assessed at each monitoring quadrat.

In order to reduce foot traffic and improve vegetation health at the Blue Hills vegetation complex Priority Ecological Community (PEC), KML has relocated dust monitoring bottle #12 two hundred meters to the West of its former position. This, and other management activities were incorporated to minimise impact and advance vegetation health in and surrounding the BHN03 monitoring point.

4.3.3 Assessment of Impacts Related to Dust Suppression Water Overspray

The objective of this monitoring is to ensure that water overspray, carried out as part of operations [particularly road haulage], is negligible and will not have an effect on the surrounding environment, including and not limited to vegetation health and vegetative communities associated with the PEC.

Dust suppression water is sourced from ground water bores and turkeys' nests in the vicinity of mining operations. Water quality is monitored in accordance with KMLs Environmental Procedure – Dust Monitoring CORP-EN-PRO-1005. As far as practicable, low salinity water (<15,000 Total Dissolved Solids) is used for general purpose dust suppression. The Dust Management Plan CORP-EN-PLN-1010 specifies where water usage is allowed for dust suppression based on salinity levels.

Overspray of water with high salinity has the potential to increase soil salinity and/or burn vegetation during periods of high temperatures resulting in vegetation health decline. To ensure dust suppression overspray is not impacting vegetation health, the following field monitoring shall be undertaken:

- Surface soil samples shall be collected from the north-west corner of each quadrat and analysed by a National Association of Testing Authorities (NATA) accredited laboratory for Electrical conductivity (EC). Alternatively, soil samples can be analysed in the field using a handheld Electrical Conductivity (EC) meter, as per the EC1:5w/v method (DAFWA 2006), refer to Appendix A.
- Observational assessment of soil surfaces for presence or absence of salt staining shall be undertaken.
- Observational assessment of foliage for presence or absence of saline residue shall be undertaken.

4.3.4 Assessment of Impacts Related to Feral Grazing

The objective of this monitoring is to determine if KMLs operations are resulting in an increase in feral animals and quantifying the impact of feral grazing on PEC vegetation health.

The most common feral animals recorded within the monitoring areas are the house mouse (*Mus musculus*), rabbit (*Oryctolagus cuniculus*), red fox (*Vulpes vulpes*), wild cat (*Felis catus*), wild dog (*Canis familiaris*, *Canis familiaris dingo* and hybrids) and goat (*Capra hircus*). The rabbit and goat are

well known for destruction of native vegetation and consequentially are reducing the quality and distribution of habitat and feed for native fauna species.

Grazing by feral animals will be visually assessed at each monitoring quadrat.

4.3.5 Assessment of Impacts Related to Erosion

The objective of this monitoring is to determine if KML's operations are resulting in land instability and sedimentation. The breakdown of soil structure and decline in available organic matter and nutrients can result in a reduction of soil fertility and soil moisture, ultimately restricting plant growth and vegetation health.

Erosion will be visually assessed at each monitoring quadrat.

4.3.6 Assessment of Impacts Related to Rainfall

The objective of this monitoring is to determine if rainfall patterns may account for changes in vegetation health. Monthly rainfall averages will be obtained annually from the Bureau of Meteorology (BOM) and an internally monitored rain gauge at Karara mine site and assessed against the scale outlined in Table 4.

4.3.7 Assessment of Impacts Related to Fire

A fire could result from natural causes (such as a lightning strike) or as a result of mining activities (through the introduction of ignition sources). General fire prevention and safety is outlined in Health and Safety Standard - Hot Work CORP-HS-STD-1030 and Health and Safety Plan - Emergency Management CORP-EN-PLN-1003.

Due to the fire prevention and mitigation measures implemented onsite, any fire caused from the KML operation would be an unplanned emergency event. Should any fire event occur onsite, an incident report shall be raised, and an investigation shall be carried out to determine the root cause. Following any investigation, corrective actions shall be implemented to ensure that controls are in place to prevent the likelihood of re-occurrence.

If a fire was to occur [caused by Karara operations], monitoring shall include the following components:

- Identify and photograph selected Priority and Threatened Flora for a species impacted by the fire.
- If any areas of the PEC are impacted by fire, annual monitoring shall be implemented at selected quadrats to examine regeneration of species specific to the PEC. The number of quadrats shall be determined by the area and number of PEC areas affected. Vascular plant

taxa within each quadrat shall be monitored for health, along with approximate percentage cover.

- Record the timing and quality of regeneration of the general vegetation through photographic monitoring points at selected quadrats.

Access to the fire areas shall be prohibited to minimise erosion. The exception is any work to monitor or rehabilitate flora.

For monitoring of post-fire PEC, vegetation population's foliage cover values and health rankings shall be compared against control values and immediate post fire records to observe natural rates of regeneration.

Table 4: Threats and Impact Rating Scale

1 Nil	2 Low	3 Moderate	4 High	5 Extreme
Weeds <1% of plants within the quadrat are weeds	Weeds 2-15% of plants within the quadrat are weeds.	Weeds 15-30% of plants within the quadrat are weeds.	Weeds 30-60% of plants within the quadrat are weeds.	Weeds 60-90% of plants within the quadrat are weeds.
Dust Dust deposition (g/m ² /month), is consistent with the background levels recorded at the control sites. No evidence of foliage dust cover.	Dust Dust deposition between 8 - 10 g/m ² /month for the monitoring month. 0-5% of plant foliage within the quadrat is covered in dust.	Dust Dust deposition exceeds 10 g/m ² /month for the monitoring month. 5-15% of plant foliage within the quadrat is covered in dust.	Dust Dust deposition exceeds 10 g/m ² /month for three consecutive months. 15-50% of plant foliage within the quadrat is covered in dust.	Dust Dust deposition exceeds 10 g/m ² /month for more than three months. >50% of plant foliage within the quadrat is covered in dust.
Salinity Non Saline soil - Soil salinity measurements using EC1:5 (w/v) recorded below 22ms/m, Salt staining absent on soil or foliage	Salinity Slightly saline soil - Soil salinity measurements using EC1:5 (w/v) recorded between 22-44ms/m Salt staining absent on soil or foliage	Salinity Moderately saline soil- Soil salinity measurements using EC1:5 (w/v) recorded between 44-89ms/m, Salt staining present on soil and or foliage	Salinity Very saline soil - Soil salinity measurements using EC1:5 (w/v) recorded between 89-178ms/m, Salt staining present on soil and or foliage	Salinity Extremely saline soil - Soil salinity measurements using EC1:5 (w/v) recorded above 178ms/m, Salt staining present on soil and or foliage
Feral Grazing No evidence of feral grazing to vegetation.	Feral Grazing Slight disturbance and damage to vegetation (0-5%).	Feral Grazing Low to moderate damage to vegetation (5 - 15%).	Feral Grazing Moderate disturbance and damage to vegetation (15-50%).	Feral Grazing Heavy disturbance and damage to vegetation (> 50%).
Erosion Low to None	Erosion Minor isolated, topsoil loss evident (0-5%)	Erosion Moderate scattered, moderate topsoil loss and/or some dissection by runoff channels or gullies (5 -15%)	Erosion Moderate to severe, severe topsoil loss and/or marked dissection by runoff channels or gullies (15-50%)	Erosion Severe extensive, complete truncation of soil profile and exposure of subsoil and/or deep intricate dissection by runoff channels or gullies (> 50%)
Rainfall Above average rainfall in highest 10% of historic data.	Rainfall Rainfall in highest 10-40% of historic data.	Rainfall Rainfall in middle 40% of historic data.	Rainfall Rainfall in lowest 10- 40% of historic data.	Rainfall Rainfall in lowest 10% of historic data (Drought conditions)
Fire: Record if fire occurred and consult with OEPA following a fire event.				

*Ratings based on the standards provided in the Native Vegetation Condition Assessment manual, DEC 2009 (Weeds pg121, Dust pg261, Erosion pg123, Feral grazing pg160), BOM (2015) about drought definitions (rainfall) and KML internal long-term baseline monitoring (Dust).

4.4 Assessment of Vegetation Condition

To determine the change in vegetation health as a result of threats and impacts, the following field data will be collected;

- All plant species present within the quadrat shall be identified and recorded;
- All seedlings, forbs, grasses and other annuals shall be recorded as present/absent, however woody perennial species shall be counted for calculation of plant density. Weeds and alien species will also be noted if present, but will not be included as part of plant diversity;
- Individual priority and threatened flora species as defined under the *Biodiversity Conservation Act 2016* shall be identified within the quadrat. Prior to undertaking monitoring a current list of priority and threatened flora species shall be obtained by the KML compliance department to identify any new species. Where identified, all individuals or clusters of these taxa will be counted, tagged, and numbered.
- Where a species cannot be identified, a sample of the plant or photograph shall be taken for later identification; and
- Point location images taken from each quadrat at the photo monitoring point.

The vegetation community shall be given a condition ranking, based on the Karara condition rating scale (adapted from the Keighery Condition Rating Scale) (refer to Table 5).

A review of the vegetation health condition results from 2011 to 2015 found that a pristine condition rating, as described by Keighery (1994) reflects that there is a complete absence of any measure of influence from post settlement. Based on these descriptions and the knowledge that Karara site was historically disturbed due to pastoral land use, and the close proximity to historical mining impacts, the site conditions have been revised to reflect this with previous ratings of pristine (1) by amended to excellent (2). For the purpose of this plan and with the knowledge of historical land use practices, KML have excluded the use of the pristine (1) rating only (Keighery 1994) and developed the Karara condition rating scale for use in all future vegetation health monitoring.

The Karara vegetation condition rating scale is based on a five-level quantitative rating system, with additional parameters such as species diversity and density to help minimise the subjectivity associated with the Keighery condition scale.

Table 5: Karara Vegetation Condition Rating Scale (Adapted from the Keighery Condition Rating Scale)

1 Pristine	2 Excellent	3 Very Good	4 Good	5 Degraded	6 Completely Degraded
Pristine or nearly so. No obvious signs of disturbance	Vegetation structure intact. Disturbance affecting individual species. Weeds are non-aggressive.	Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.	Vegetation structure significantly altered by obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.	Vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing	Vegetation Structure is no longer intact and the area is completely or almost completely without native species. These areas are often described as “parkland cleared” with the flora comprising weed or crop species with isolated native trees or shrubs.
	90-100% of Species diversity recorded in comparison 2015. 90-100% of species density recorded in comparison to 2015	75-90% of species diversity recorded in comparison to 2015. 75-90% of species density recorded in comparison to 2015.	50-75% of species diversity recorded in comparison to 2015. 50-75% of species density recorded in comparison to 2015.	30-50% of species diversity recorded in comparison to 2015. 30-50% of species density recorded in comparison to 2015.	<30% of species diversity recorded in comparison to 2015. <30% of species density recorded in comparison to 2015.

4.5 Trigger and Threshold Criteria's With Associated Response Actions

Based on the OEPA's environmental assessment guideline for the purposes of this plan, **Trigger criteria** is set at a level to forewarn adverse trends that may lead towards the threshold criteria.

Threshold criteria represent the limit of acceptable impact beyond which there is likely to be a significant effect on the environment.

Response actions are implemented when results of the monitoring parameters shows that either a trigger or threshold criteria has been exceeded.

4.5.1 Threats and Impacts

Trigger criteria:

Any **threat and impact** (excluding rainfall and fire) that is given a rating of good (3) **AND** no change detected at relevant control site.

Threshold criteria:

Any **threat and impact** (excluding rainfall and fire) that is given a rating of (4) **AND** no change detected at relevant control site.

Following exceedance of the trigger or threshold criteria the following response actions (refer to Table 6) will be implemented to minimise threats and impacts.

Table 6: Threats and Impacts Response Actions

Parameter	Trigger Response Actions	Threshold Response Actions
Weeds	Implement management actions in accordance with KML's Environmental Procedure – Flora, Weeds and Plant Pathogens CORP-EN-PRO-1009.	Investigate the primary cause of the exceedance. Externally report exceedance of threshold criteria to the OEPA.
Dust	Generate a hazard report for internal notification and investigation. Implement management actions in accordance with KML's Environmental Procedure - Dust Monitoring CORP-EN-PRO-1005 and Dust Management Plan CORP-EN-PLN-1010.	In consultation with the OEPA for development and implementation of remediation plan.
Salinity	Implement management actions in relation to	

Parameter	Trigger Response Actions	Threshold Response Actions
	water supply in accordance with KML's Environmental Procedure - Dust Management and Monitoring CORP-EN-PRO-1005 and Dust Management Plan CORP-EN-PLN-1010.	
Feral Grazing	Implement management actions in accordance with KML's Environmental Plan – Feral Animal Management – CORP-EN-PLN-1009.	
Erosion	Fill erosion channels with suitable material. Where practicable, establish physical barriers at the source of erosion.	
Rainfall	Consult with EPA upon event.	Consult with EPA upon event.
Fire	Consult with EPA upon event.	Consult with EPA upon event.

4.5.2 *Vegetation condition*

A review of the vegetation health condition monitoring results from 2011 to 2015 found that a condition rating of Excellent (2) was given to both control quadrats and majority of quadrats adjacent to operational areas for overall condition during the first year of monitoring. As a result, KML have deemed a condition rating of Excellent (2) as the baseline level for vegetation condition on all KML tenements.

Based on historical monitoring results to date and ensuring a conservative approach prior to compromising the health of vegetation to disturbance areas, the following trigger and threshold criteria have been adopted by KML vegetation condition.

Trigger criteria:

Condition rating of good (3) **AND** no change detected at relevant control site.

Threshold criteria:

Condition rating of degraded (4) **AND** no change in condition rating at relevant control site.

Following exceedance of the trigger or threshold criteria the following response actions (refer to Table 7) will be implemented to reduce the impact to vegetation health.

Table 7: Vegetation Condition Response Actions

Parameter	Trigger Response Actions	Threshold Response Actions
<p>Vegetation Condition</p>	<p>Investigate and identify threat and impact parameter that has been exceeded. If verified, implement the relevant actions of that exceeded parameter.</p>	<p>Investigate and identify threat and impact parameter that has been exceeded. If verified, implement the relevant actions of that exceeded parameter.</p> <p>Externally report exceedance of vegetation condition threshold criteria to the OEPA.</p> <p>Develop and implement remediation plan in consultation with OEPA.</p>

5 CHECKING

5.1 Incident Reporting

Any exceedance of the trigger and threshold criteria, as detailed in section 4.5, shall be reported as an internal incident. All incidents are documented and investigated in accordance with the KML Safety Procedure – Incident Management (CORP-HS-PRO-1046) and documented in INX for tracking and completion.

An exceedance of the threshold criteria shall be reported to the OEPA.

5.2 Control of Records

All information relating to vegetation health monitoring are maintained in the Vegetation Health Monitoring Register (worksite 7.2) folder and updated by the KML Environment Department.

All vegetation health monitoring quadrats are displayed spatially in the GIS system.

Monitoring results will be reported to the OEPA and the Department of Mines, Industry Regulation and Safety annually as part of the Annual Compliance Assessment Report and Annual Environmental Report, respectively.

5.3 Audits and Inspections

KML shall monitor compliance with this plan through annual Environmental Management System audits, as per the KML workload schedule. Actions arising from internal and external audits will be documented in INX.

6 DOCUMENT LIST

Document Title	KML Document Number
Environmental Form – Rehabilitation and Vegetation Health Monitoring	CORP-EN-FRM-1036
Environmental Plan – Environmental Management Plan	CORP-EN-PLN-1020
Environmental Procedure – Dust Monitoring	CORP-EN-PRO-1005
Environmental Plan – Dust Management Plan	CORP-EN-PLN-1010
Environmental Procedure - Flora Weeds and Plant Pathogens	CORP-EN-PRO-1009
Environmental Procedure – Feral Animal Management and Monitoring	CORP-EN-PRO-1050
Safety Plan – Emergency Management	CORP-EN-PLN-1003
Safety Procedure – Incident Management	CORP-HS-PRO-1046
Safety Standard – Hot Work	CORP-HS-STD-1030

7 DOCUMENT HISTORY

As a requirement of the ministerial statements Compliance Assessment Plans, all revisions of this document shall be submitted to the OEPA for approval prior to implementation.

Table 8: Document History

Version	Date submitted to OEPA	OEPA approval received
1	13/05/2013	18/11/2013
2	23/10/2014	
3	14/01/2016	18/01/2016
4	7/06/2017	15/10/2019
5	29/06/2020	
6	14/10/2022	

8 REFERENCES

BOM (2015) About Drought Definitions < <http://www.bom.gov.au/climate/drought/#tabs=About-drought>>

DAFWA (2006) *Salinity measures, units and classes*. Department of Agriculture and Food Western Australia. Viewed 9th May 2013 <http://www.agric.wa.gov.au/PC_92358.html?s=0>.

DEC (2009) Native Vegetation Condition Assessment and Monitoring Manual for Western Australia. Viewed 3rd November 2015 < http://www.dpaw.wa.gov.au/images/documents/plants-animals/monitoring/native_vegetation_condition_manual_full.pdf>.

EPA (2015) Environmental Assessment Guidelines for Preparation of Management Plans under Part IV of the *Environmental Protection Act 1986*. Viewed 3rd November 2015 < <http://edit.epa.wa.gov.au/EPADocLib/EAG%2017%20CEMPS%20August%202015.pdf>>.

Keighery, B (1994) *Bushland Plant Survey: A Guide for Community Surveys*. Wildflower Society of Western Australia, Perth WA.

APPENDIX A: SOIL SAMPLING METHODOLOGY

Where soil samples are collected and not sent to a NATA accredited laboratory for analysis, the 'EC1:5 w/v' method (DAFWA, 2006) will be used to measure EC. This method uses one-part soil by weight to five parts distilled water by volume, producing a measurable solution to quantify soil salinity.

Taking a sample

1. At a site as close as reasonably practicable to the NW corner within the quadrat; use a clean shovel to loosen soil to a depth of 100mm.
2. Ensure copious material is taken to obtain a 250g sample. Samples can be collected in calico lab sample bags or clean sample jars.
3. Label sample bag or jar with the sampled quadrat ID and date of collection.
4. Take samples back to the Site Environmental Laboratory (Dry-Lab).

Conducting sample analysis: EC1:5 W/V method

5. Using the Dry-Lab scales, separate a 100g laboratory sample from each field sample to create the solution. Put each 100g sample into a labelled solution bottle.
6. Measure out 500mL of de-ionised water before adding to each solution bottle.
7. Cap each bottle before shaking for 10 seconds.
8. Allow soil to settle for one minute or until the suspended solids have settled to the bottom.
9. Using a calibrated EC meter, measure and record each solution in mS/cm or $\mu\text{S}/\text{cm}$.

Assigning a salinity rating

10. Convert the EC recording to mS/m ($1000 \mu\text{S}/\text{cm} = 1 \text{ mS}/\text{cm} = 100 \text{ mS}/\text{m}$) and assign each sample a salinity rating from the scale provided in table 4.