NEWCASTLE COAL INFRASTRUCTURE GROUP
COAL EXPORT TERMINAL

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT 2011

November 2011

Revision 1

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LIST OF ATTACHMENTS

1 INTRODUCTION

This Annual Environmental Management Report (AEMR) has been prepared for the Newcastle Coal Infrastructure Group (NCIG) Coal Export Terminal project (the Project) in accordance with the conditions of the approved Construction Environmental Management Plan (CEMP) and Operation Environmental Management Plan (OEMP) (Sections 5.2 and 7.2 respectively). The CEMP was prepared in accordance with Condition 7.2 and the OEMP was prepared in accordance with Condition 7.5, both within Schedule 2 of the Project Approval (06_0009) which was granted on 13 April 2007.

This is the third AEMR prepared for the NCIG Project and it covers the period April 2010 to March 2011 (i.e. a 12 month period), which includes the commencement of terminal operation and Stage 2AA construction of the Project.

The AEMR reviews the performance of the Project against the requirements of the Project Approval and provides an overview of environmental management actions and summarises monitoring results over the 12 month reporting period. The AEMR will be distributed to relevant government agencies and stakeholders, and copies provided to other interested parties, if requested.

During the AEMR reporting period, minor dredging operations by NCIG continued until September 2010 and involved in-river dredging with no land based reclamation. These activities and related environmental management are not the subject of this AEMR. Only the environmental management requirements of both the CEMP and the OEMP, which are associated with the terrestrially based coal export terminal construction activities, are detailed by this AEMR. Details of the compliance of dredging activities are outlined in separate reports.

1.1 APPROVALS, LEASES, LICENCES AND PERMITS

The Project is being undertaken under the approvals, leases, licences and permits presented in Table 1.

Table 1: Project Approval, Leases, Licences and Permits

Instrument	Relevant Authority	Date Granted	Duration of Approval
Project Approval (06_0009)	Department of Planning	13 April 2007	5 years unless substantially commenced
Project Lease	State Property Authority	22 January 2008	35 years
Environmental Protection Licence (EPL) (No. 12693)	Department of Environment and Climate Change	26 October 2007	Until the licence is surrendered or revoked. The licence is subject to review every 5 years.
Environment Protection and Biodiversity Conservation Act 1999	Department of the Environment and Heritage	11 October 2007	Perpetuity
Maritime Services Act 1935 s13JE	NSW Maritime	02 October 2007	Perpetuity
Environmental Representative	Department of Planning	03 October 2007	Perpetuity
Project Ecologist	Department of Planning	02 May 2007 & 25 October 2007	Perpetuity

1.2 MANAGEMENT PLANS AND MONITORING PROGRAMMES

In accordance with the Project Approval, the Project is currently being undertaken under a number of environmental management plans and monitoring programmes, including:

- Construction Environmental Management Plan
- Construction Noise Management Plan
- Construction Surface Water Management Plan
- Construction Traffic Management Protocol
- Acid Sulfate Soil Management Plan
- Environmental Monitoring Programme
- Erosion and Sediment Control Plan
- Surface Water Monitoring Programme
- Vehicle Traffic Management Plan
- Site Water Management Plan
- Green and Golden Bell Frog Management Plan
- Compensatory Habitat and Ecological Monitoring Program
- Vegetation Clearance Protocol
- Coordinated Works Programme
- Compliance Tracking Programme
- Green and Golden Bell Frog Monitoring Programme
- Avifauna Monitoring Programme
- Operation Environmental Management Plan
- Operation Dust Management Plan
- Operation Noise Management Plan
- Operation Spontaneous Combustion Management Plan
- Operation Water Management Plan

1.3 PROJECT CONTACTS

Contact Details for the Project are provided below:

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1.4 PROJECT BACKGROUND

The Newcastle Coal Infrastructure Group (NCIG) Coal Export Terminal (CET) (the Project) is located on Kooragang Island in Newcastle, New South Wales (NSW) (Figure 1.1). The Project includes the construction and operation of a CET up to 66 million tonnes per annum (Mtpa), including associated rail and coal handling infrastructure and wharf/shiploading facilities on the south arm of the Hunter River.

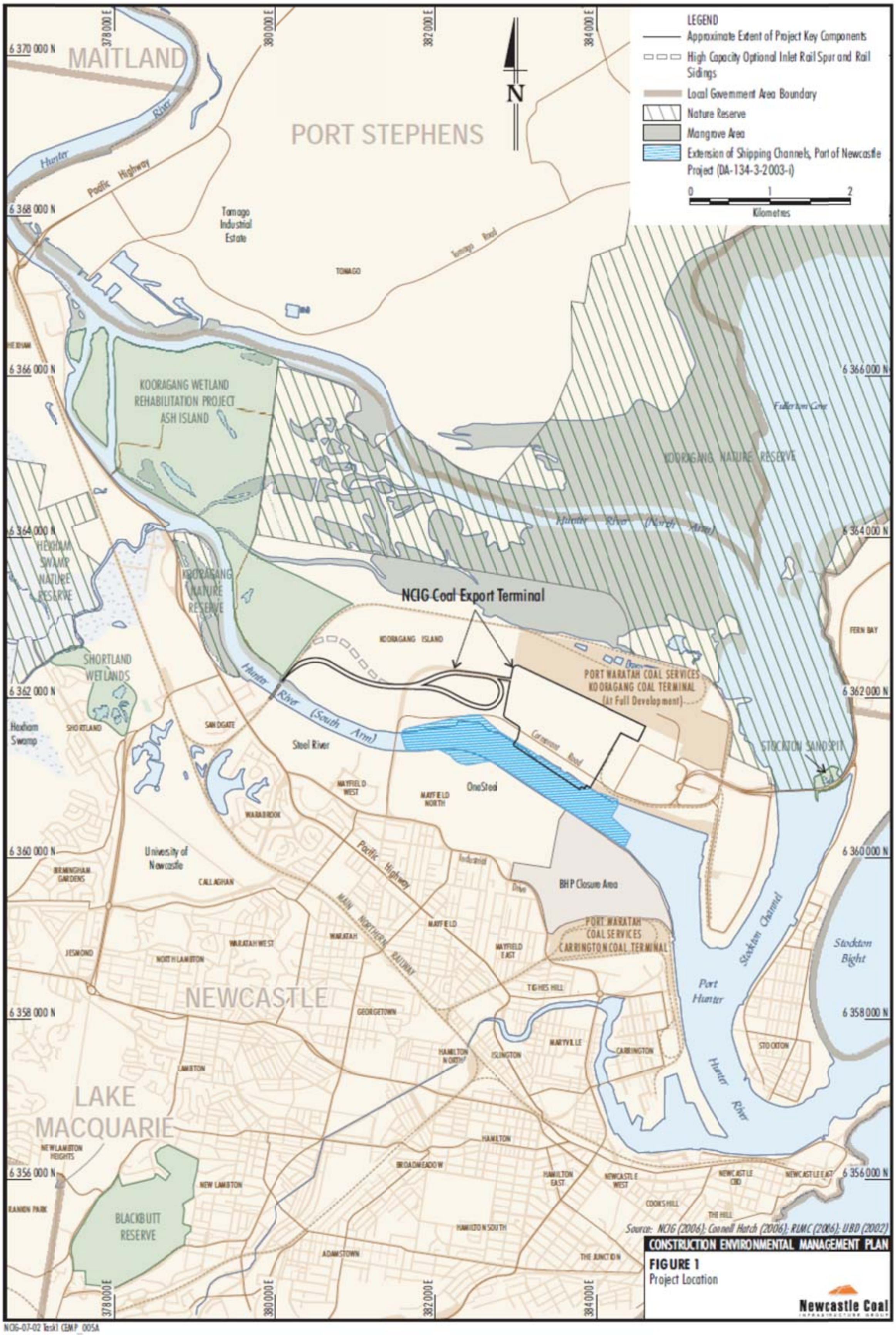


Figure 1.1: Project Location

NCIG is the proponent of the Project and is a consortium of the following six companies:

- Hunter Valley Energy Coal Limited;
- Centennial Coal Company Limited;
- Donaldson Coal Pty Limited;
- Peabody Energy Australia Coal Pty Limited;
- Yancoal Australia Limited; and
- Whitehaven Coal Mining Pty Ltd.

NCIG was formed in response to a call for Expressions of Interest for the development of land on Kooragang Island by the NSW State Government in 2004. The outcome of this process was that in 2006 NCIG was awarded the right to develop the parcel of land that is now the Project site. Project Approval (06_0009) was granted in April 2007 and construction of Stage 1 of the coal export terminal (30 Mtpa) commenced in April 2008. Stage 1 of construction has been practically completed with operations commenced during the reporting period. Some minor works related to Stage 1 continued, while Stage 2AA has commenced.

The general arrangement of the CET is shown on Figure 1.2. The general arrangement is based on the planned maximum coal throughput of 66 Mtpa. The main activities associated with the Project during the reporting period include:

- Receival of trains on the NCIG rail sidings;
- Unloading of coal at the train unloading station;
- Coal stacking and reclaiming activities in the stockyard;
- Loading ships at berths K8 and K9;
- Construction of Stage 2AA involving:
    - a coal storage area including coal stockpiles, conveyors, transfer points and combined stacker/reclaimer;
    - conveyors and buffer bin;
    - rail spur, rail siding and rail loop, train unloading station and connecting conveyors;
    - electricity reticulation and control systems.

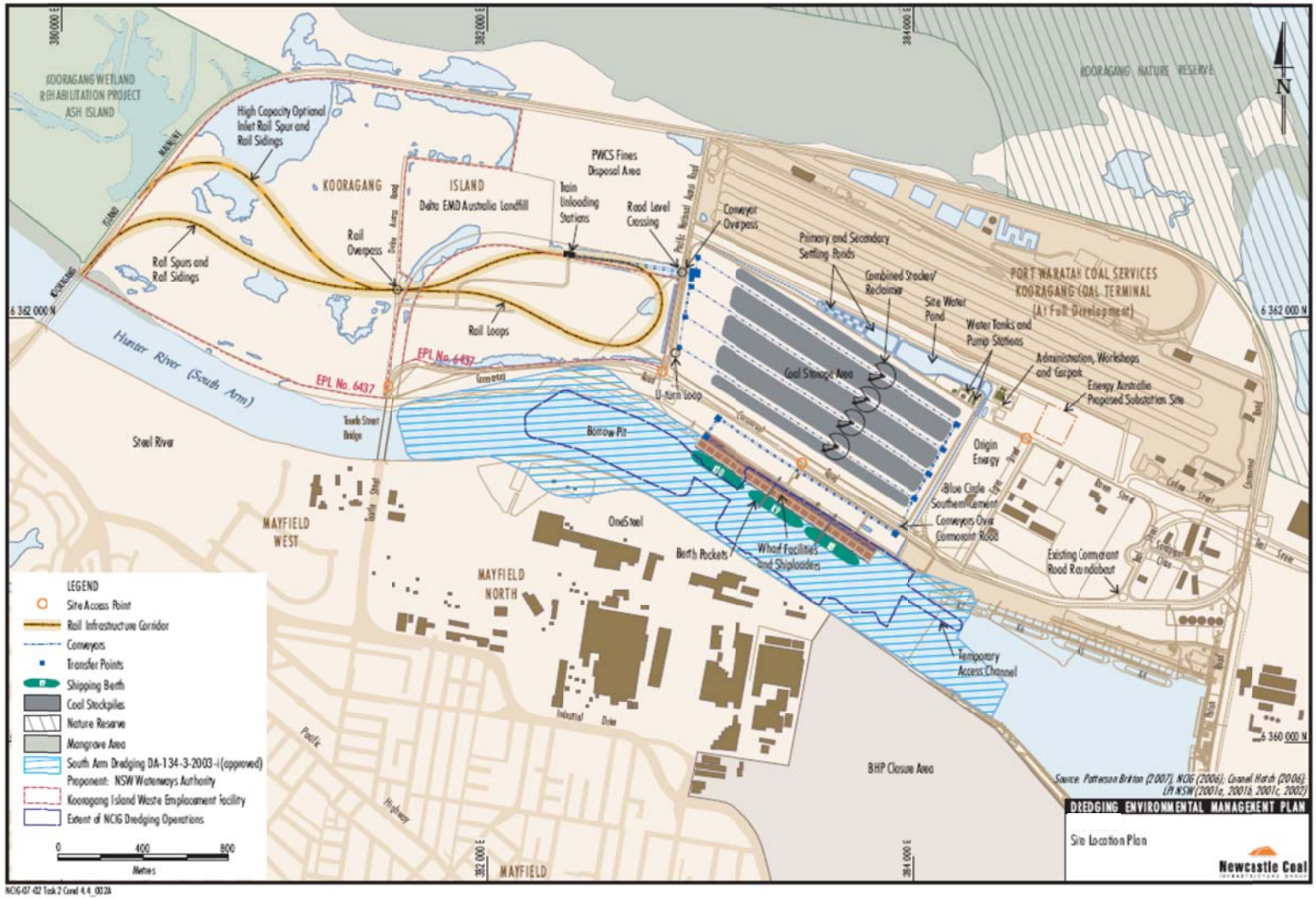


Figure 1.2: Project Layout

2 OVERVIEW OF ACTIVITIES

2.1 OPERATION

The April 2010 – March 2011 reporting period saw the initial handover of the Stage 1 plant to the operations team. The official NCIG Opening Ceremony took place on 3 May. Other significant milestones achieved by the operations team included:

- First Panamax Vessel loaded – May 2010.
- Official Handover to Operations team – 19 June 2010.
- 10 Million tonnes throughput – February 2011.

Figure 2.1: NCIG Opening Ceremony

Figure 2.2: NCIG Opening Ceremony

Figure 2.3: Ship at K9 Berth

The rail unloading facility (Figures 2.5 and 2.9), stockyard (Figures 2.8 and 2.11) and wharf (Figures 2.7 and 2.10) facilities were fully operation during the period. A number of NCIG environmental management systems were also in operation during the period. These include the NCIG real-time dust monitoring network (Figure 2.4), consisting of four Environmental Beta Attenuation Monitors (EBAMs) located at the boundaries of the stockyard, and the stockyard dust suppression system (Figure 2.6).

Figure 2.4: EBAM Dust Monitor installation

Figure 2.5: Train at Dump Station 1

Figure 2.6: Coal Stockyard Dust Suppression Sprays

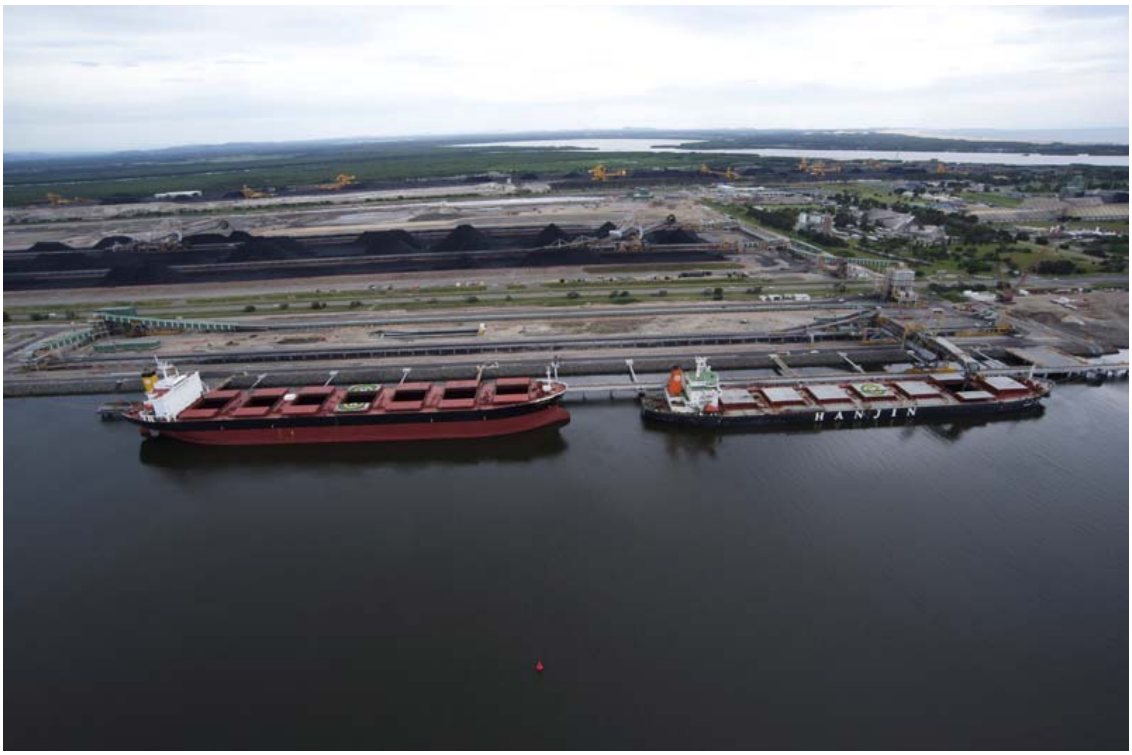


Figure 2.7: Shiploading (K8) and Ship at Berth (K9)

Figure 2.8: Stacking Operations over SR02

Figure 2.9: Train unloading at Dump Station 1 and Train parked adjacent (left)

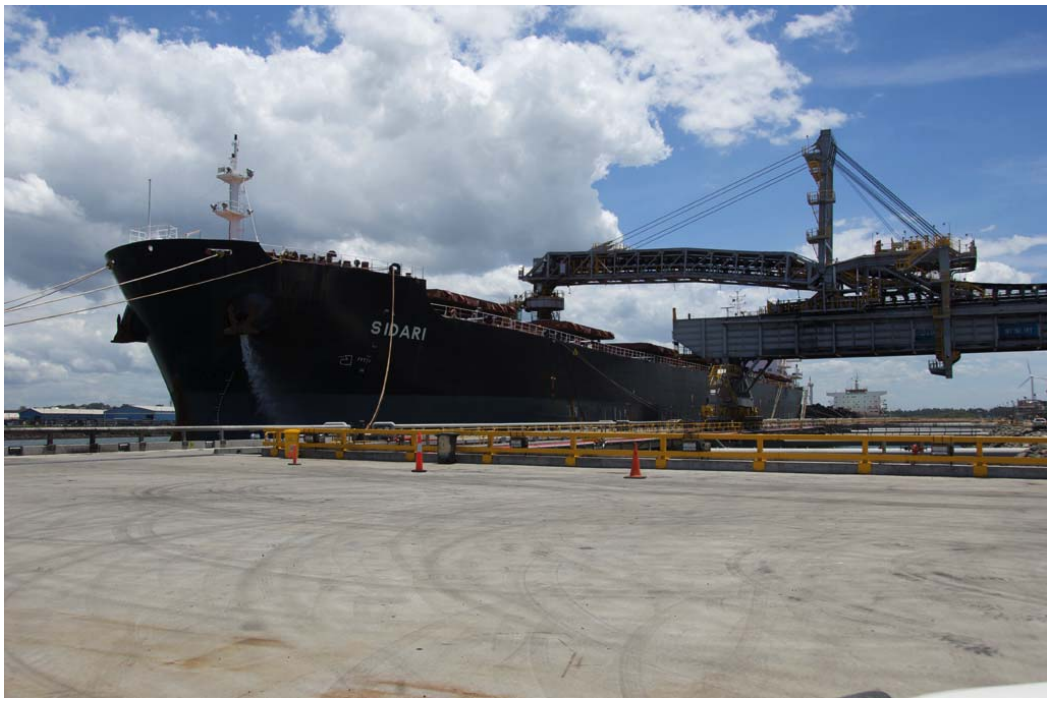


Figure 2.10: Shiploading at K8 Berth

Figure 2.11: Reclaiming Operations over SR01

Figure 2.12: NCIG Wharf and Stockyard

2.2 CONSTRUCTION

Stage 1 of the Project reached practical completion during the previous reporting period, with the Project 97.9% complete. Construction activities during this reporting period were predominantly associated with commissioning activities of Stage 1 machinery and plant and the initial phases of construction of Stage 2AA. Milestones and specific activities associated with construction included:

- Commencement of Stage 2AA construction – November 2010.
- Commissioning of the Shiploader, Stacker/Reclaimers, and inbound and outbound conveyor systems.
- Construction of the Clearwater Pond (Figure 2.15).
- Completion of Stage 1 wharf marine piling (Figure 2.19)
- Mechanical completion of Stage 1 – June 2010.
- SR3 Berm construction (Figure 2.14)
- Stage 2AA ground improvement works (dynamic replacement and soil mixing) (Figures 2.16 and 2.18).
- Supply of material for dynamic replacement (Figure 2.23)
- Erection of navigation aids 5 and 6 (Figure 2.21)
- Construction of inbound concrete structures.
- Construction of Dump Station 2 (Figures 2.17 and 2.20).
- Delivery of viaduct panels and planks.
- Piling for conveyors 6, 7, 13, 22 and Buffer Bin 2 (Figure 2.22).
- Inbound and outbound structural and mechanical installations.
- Installation of SR3 rail track.
- Construction of SR3 berm pavement.
- Extension of Transfer House 6.

Figure 2.13: NCIG Stockyard, showing operational stockyard and Stage 2AA construction

Figure 2.14: Construction of SR03 Berm

Figure 2.15: Clearwater Pond construction

Figure 2.16: Dynamic Replacement

Figure 2.17: Development of Diaphragm Wall for Dump Station 2

Figure 2.18: Soil Mixing activities

Figure 2.19: Completion of Stage 1 Wharf Structure

Figure 2.20: Excavation for Diaphragm Wall

Figure 2.21: Navigation Aids

Figure 2.22: Piling for Buffer Bin 2

Figure 2.23: Delivery of materials for Dynamic Replacement

Figure 2.24: Dust Suppression on SR03 Berm

Figure 2.25: Foundations for Conveyor 22

Figure 2.26: March 2010 Aerial Photograph of Project

Figure 2.27: March 2011 Aerial Photograph of Project

3 ENVIRONMENTAL MANAGEMENT AND PERFORMANCE

3.1 METEOROLOGY

3.1.1 Environmental Management

In accordance with Condition 2.8, Schedule 2 of the Project Approval (06_0009), an on-site meteorological monitoring station was operated during the reporting period to monitor weather conditions representative of the site. This station was installed on the NCIG site (see Figure 3.1.1) in accordance with the requirements of the CEMP.

3.1.2 Environmental Performance

Table 3.1.1 outlines the monitoring locations, meteorological parameters recorded and frequency of monitoring for the Project in accordance with the CEMP.

Table 3.1.1: Summary of the Meteorological Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
• Temperature • Relative humidity • Net solar radiation • Rainfall • Wind speed and direction • Sigma theta (rate of change of wind direction).	Project automated meteorological station[1].	Continuously monitored and the data averaged over 15 minute periods.	N/A.

[1] The location of monitoring sites is shown on Figure 3.1.1.

The meteorological monitoring results for the reporting period are summarised below.

The monthly statistical information for each of the meteorological monitoring parameters is detailed in Table 3.1.2. From this information Figure 3.1.2 illustrates the variation in average temperature during the reporting period. These variations from the winter to summer seasons are the expected seasonal norms.

Figure 3.1.1: Environmental Monitoring Sites

Table 3.1.2: Meteorological Monitoring Information

	Rainfall					Wind Speed					Sigma Theta			
	Mean	SD	Max	Min		Mean	SD	Max	Min		Mean	SD	Max	Min
Apr-10	0.01	0.12	4.2	0	Apr-10	2.51	1.63	11.9	0	Apr-10	9.04	8.87	93.0	0
May-10	0.04	0.30	7.2	0	May-10	2.71	1.77	11.9	0	May-10	9.16	9.23	92.0	0
Jun-10	0.03	0.27	4.8	0	Jun-10	3.05	1.88	12.9	0	Jun-10	8.09	7.52	93.0	0
Jul-10	0.03	0.18	4.6	0	Jul-10	2.57	1.72	11.7	0	Jul-10	8.65	8.25	92.0	0
Aug-10	0.01	0.13	6.2	0	Aug-10	4.41	2.98	14.4	0	Aug-10	7.95	7.55	93.0	0
Sep-10	0.00	0.04	1.2	0	Sep-10	3.39	2.31	14.9	0	Sep-10	10.26	8.92	100.0	0
Oct-10	0.04	0.38	10.6	0	Oct-10	2.84	5.24	51.8	0	Oct-10	10.92	8.56	81.0	0
Nov-10	ND	ND	ND	ND	Nov-10	2.10	1.40	7.5	0	Nov-10	45.38	32.59	102.6	7.8
Dec-10	0.45	1.81	9.4	0	Dec-10	2.02	1.46	7.8	0	Dec-10	22.30	19.26	101.0	5.0
Jan-11	0.41	0.76	8.0	0	Jan-11	0.05	0.08	2.6	0	Jan-11	23.89	21.92	102.9	2.7
Feb-11	0.10	0.30	11.6	0	Feb-11	2.01	1.42	10.9	0	Feb-11	27.63	20.53	98.5	1.3
Mar-11	0.01	0.30	12.8	0	Mar-11	2.85	2.02	14.1	0	Mar-11	21.70	16.29	98.7	0.9

	Temperature @ 2m					Temperature @ 10m					Solar Radiation			
	Mean	SD	Max	Min		Mean	SD	Max	Min		Mean	SD	Max	Min
Apr-10	19.74	3.49	30.4	10.9	Apr-10	19.14	3.31	29.2	10.3	Apr-10	146.01	210.63	818	0
May-10	15.85	3.54	26.4	7.8	May-10	15.3	3.47	25.8	6.9	May-10	101.90	158.38	629	0
Jun-10	13.40	3.44	20.3	4.5	Jun-10	12.87	3.36	19.4	4.2	Jun-10	93.67	145.27	541	0
Jul-10	13.11	2.99	21.9	5.4	Jul-10	12.59	2.93	21.3	4.8	Jul-10	77.70	127.35	606	6
Aug-10	13.24	3.48	23.4	5.1	Aug-10	12.67	3.33	22.5	4.2	Aug-10	143.06	204.54	765	6
Sep-10	16.48	3.75	28.6	7.8	Sep-10	15.84	3.60	27.7	7.2	Sep-10	167.54	240.16	882	0
Oct-10	18.98	3.09	29.2	2.8	Oct-10	18.55	2.93	28.2	3.3	Oct-10	156.14	231.67	1132	1
Nov-10	21.21	3.45	30.9	13.0	Nov-10	20.62	3.23	29.9	12.6	Nov-10	201.54	286.37	1209	0
Dec-10	23.49	2.86	32.6	14.4	Dec-10	22.79	2.78	32.2	13.6	Dec-10	222.08	301.96	1225	1
Jan-11	25.15	3.01	38.1	18.5	Jan-11	24.32	2.84	36.8	19.1	Jan-11	247.36	318.99	1220	0
Feb-11	25.06	4.11	40.5	15.8	Feb-11	24.35	4.06	39.8	15.0	Feb-11	166.14	256.37	1117	0
Mar-11	23.18	3.01	38.1	17.2	Mar-11	22.39	2.76	37.2	16.5	Mar-11	151.75	238.15	1126	1

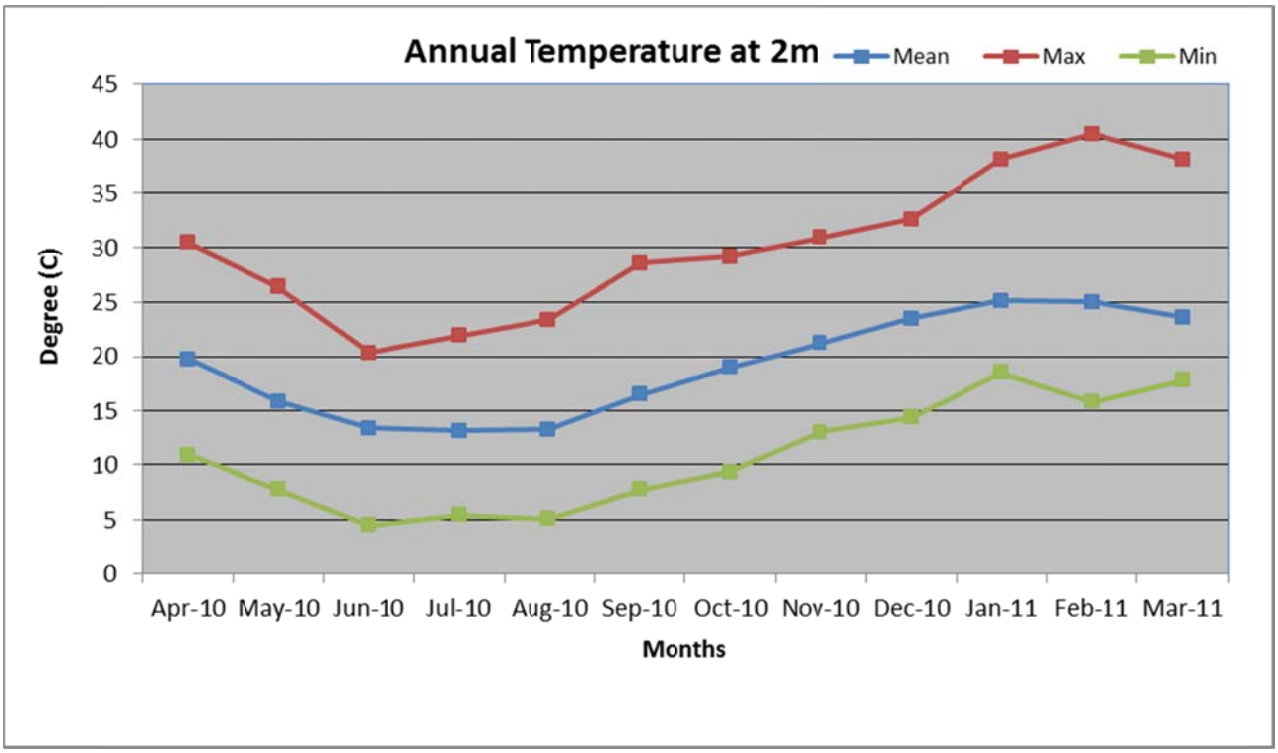


Figure 3.1.2: Average Temperature

The daily rainfall recorded at the project site is illustrated by Figure 3.1.3. A total of 874mm of rain was received on the site during the reporting period with the highest rainfall events recorded in the May 2010 to July 2010 period. Relatively low rainfall was also received during the August 2010 to January 2011 period

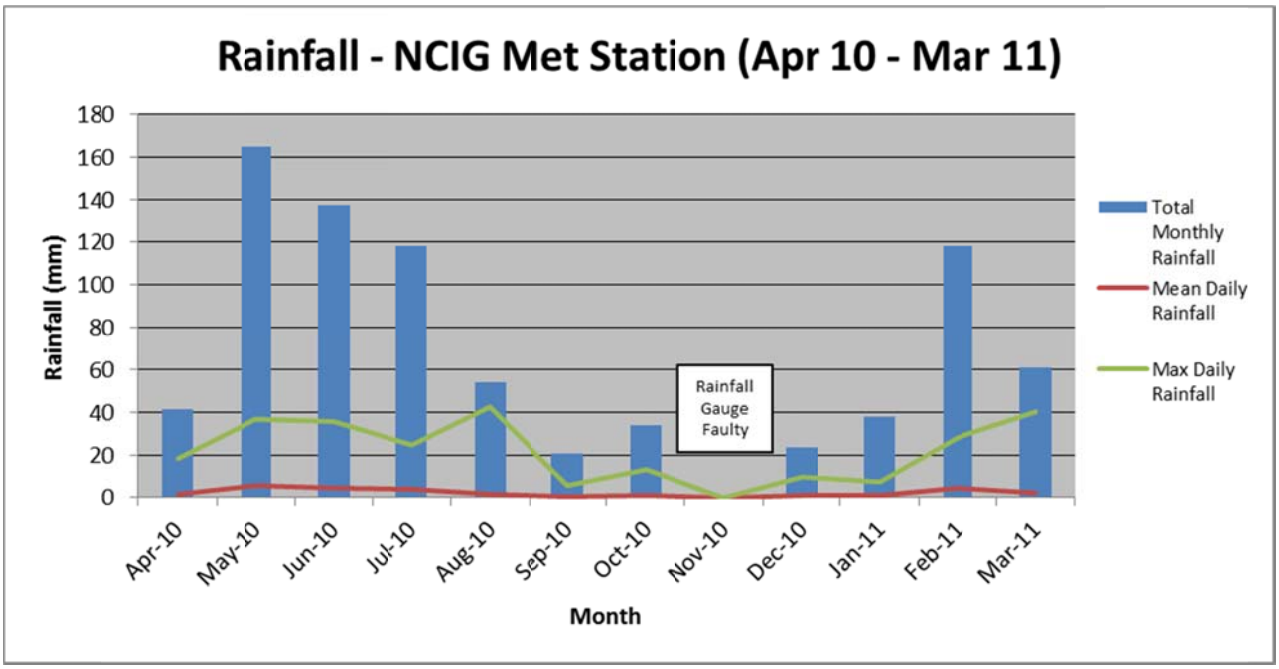
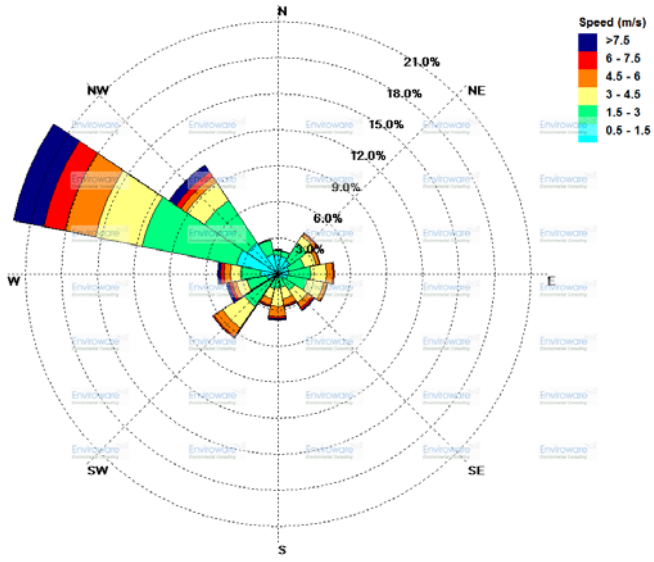
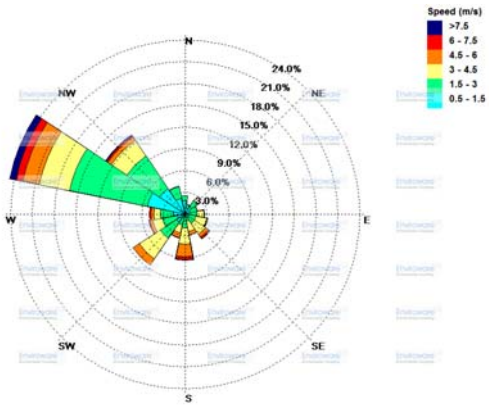


Figure 3.1.3: Daily and Average Rainfall

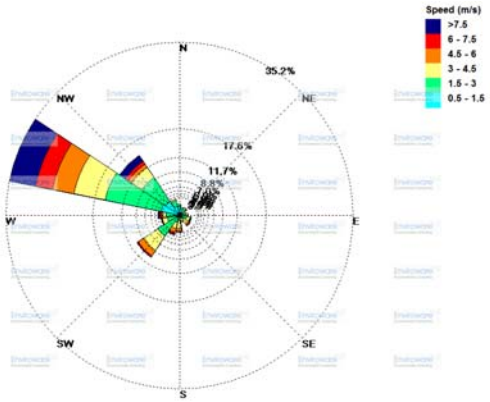
Figure 3.1.4 also illustrates the seasonal variation in wind speed and direction at the site which highlights that the dominant conditions in relation to wind has a westerly aspect during the autumn, winter and spring periods and has a predominately easterly aspect with some westerlies during the summer period.



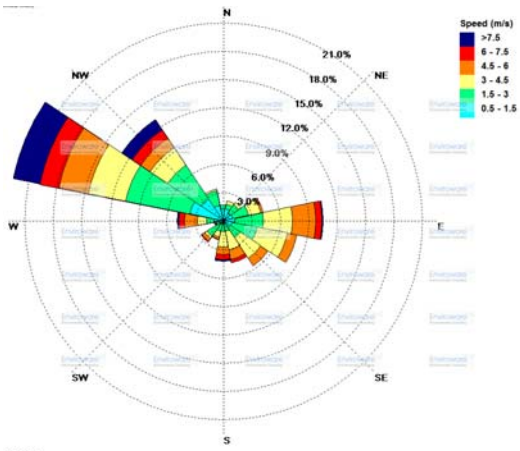
Annual



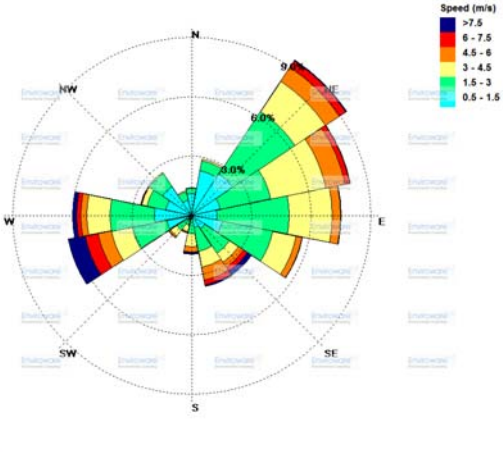
Autumn



Winter



Spring



Summer

Figure 3.1.4: Seasonal Wind Conditions

3.1.3 Reportable Incidents

The meteorological station was relocated in October 2010 from adjacent the construction car park to adjacent the Clearwater Pond onsite. This was to locate the station to a more secure location on the site and where it could be connected to the operations communications system and existing mains power. A period of rainfall data was lost (approximately 1 month) during the month of November due to an issue with communications connections from the sensor to the remote system.

3.1.4 Further Improvements

Due to the relocation of the weather station, the positioning and alignment of the unit and individual sensors were reviewed in accordance with relevant conditions and Australian Standards. A meteorological consultant was engaged to check compliance of the station with these conditions. Minor adjustments were made during this process to ensure compliance. Monitoring of compliance with the relevant conditions and standards will be ongoing.

3.2 AIR QUALITY

3.2.1 Environmental Management

In accordance with Conditions 2.2 and 2.4, Schedule 2 of the Project Approval (06_0009) NCIG designed and constructed the Project in a manner that minimises or prevents the emission of visible dust beyond the boundary of the site (including windblown and traffic generated dust).

In accordance with Condition 2.5, Schedule 2 of the Project Approval (06_0009) dust emissions are being controlled on all internal roads, trafficable areas and manoeuvring areas by sealing, or otherwise treating surfaces to minimise the potential for dust generation.

In accordance with Condition 2.1, Schedule 2 of the Project Approval (06_0009) NCIG did not permit any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act, 1997*, to be emitted beyond the boundary of the Project site.

In accordance with Condition 2.6, Schedule 2 of the Project Approval (06_0009) NCIG has designed, constructed, operated and maintained the project in a manner that minimises the potential generation of fugitive dust emissions from plant and equipment. This has been through minimisation of coal transfer points, enclosure of conveyors, installation of belt cleaning systems and installation of dust suppression sprays both on the conveyor system and in the stockyard.

3.2.2 Environmental Performance

Table 3.2.1 outlines the monitoring locations, air quality parameters recorded, frequency of monitoring and air quality criteria for the Project in accordance with the CEMP and OEMP.

Table 3.2.1: Summary of the Meteorological Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Dust deposition[2].	DG1, DG2, DG3, DG4, DG5 and DG6[1].	Monthly during the first three months of construction, then quarterly.	4 g/m^2/month.
Total Suspended Particulates (TSP).	HVAS1, HVAS2, HVAS3, HVAS4.	6-daily.	90µg/m^3 (NHMRC annual average)

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Particulate Matter <10 microns (PM_{10}).	HVAS1, HVAS2, HVAS3, HVAS4.	6-daily.	50µg/m^3 (OEH 24hr daily limit, NEPM 24hr daily limit – allows for 5 exceedences in a year)

[1] The location of monitoring sites is shown on Figure 3.1.1.

[2] Dust deposition was analysed in accordance with AS/NZS 3580.10.1-2003 *Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.*

[3] TSP was analysed in accordance with AS/NZS 3580.9.3-2003 *Methods for Sampling and Analysis of Ambient Air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) – high volume sampler gravimetric method.*

[4] PM10 was analysed in accordance with AS/NZS 3580.9.6-2003 *Methods for Sampling and Analysis of Ambient Air – Determination of suspended particulate matter – PM10 high volume sampler with size selective inlet – Gravimetric method.*

The depositional dust monitoring results for the reporting period are displayed in Figures 3.2.1 and 3.2.2 below.

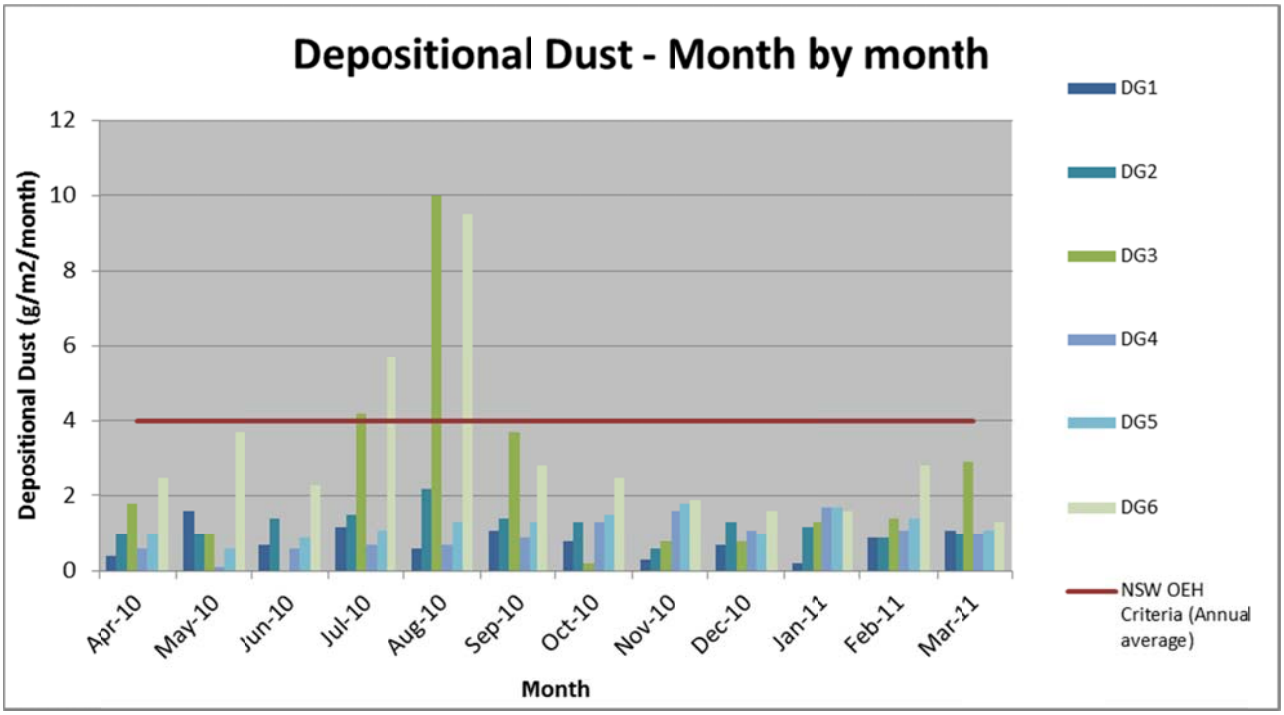


Figure 3.2.1: Month by Month Depositional Dust

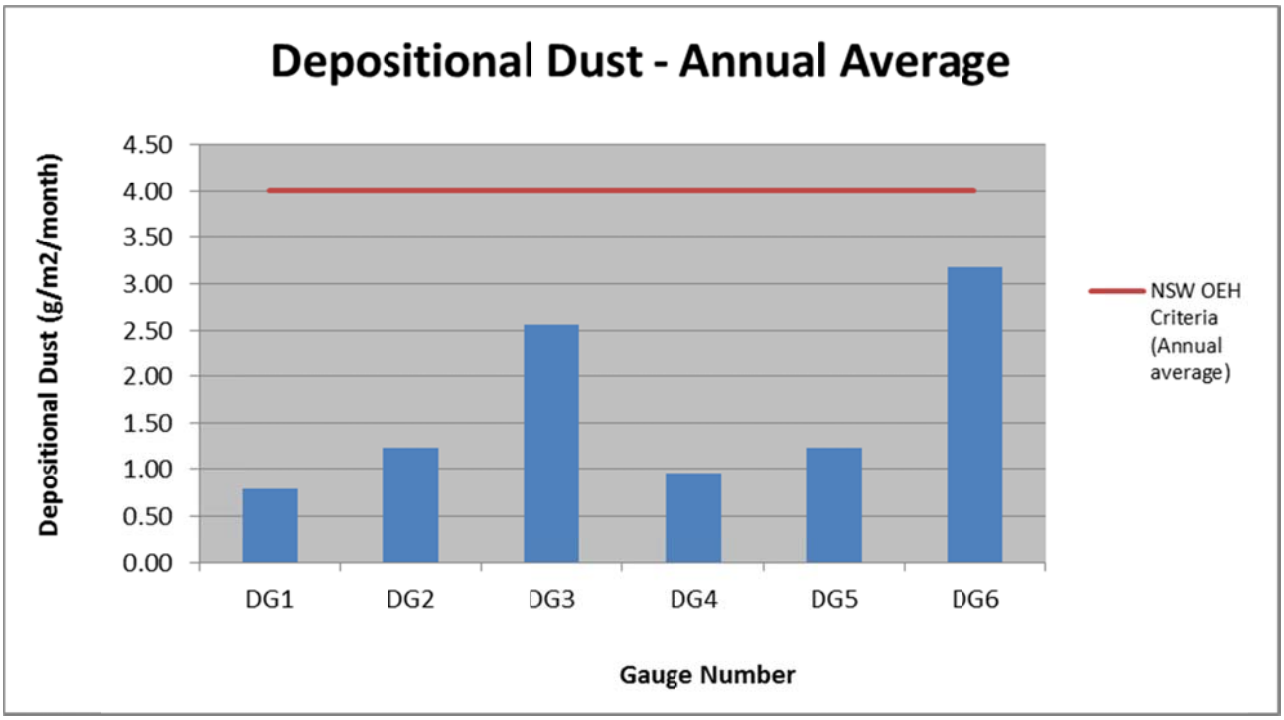


Figure 3.2.2: Annual Average Depositional Dust

Average depositional dust results were below the monthly criteria of 4 grams per square metre per month at all depositional dust gauge locations (Figure 3.2.2). Figure 3.2.1 shows that DG3 exceeded the 4g/m^2/month criteria in July (4.2) and August (10.0) 2010, however this was caused by contaminated samples. DG6 also exceeded the criteria in July (5.7) and August (9.5) 2010, which was caused by contamination. All other dust gauges were consistently below the criteria. It should be noted that the criteria is specific only to an annual average for each location. Figure 3.2.2 illustrates that the annual average at each location was below 4g/m^2/month during the reporting period. Full dust deposition data for the reporting period is provided in Attachment A.

Air quality monitoring results from High Volume Air Sampling (HVAS), as they relate to both Total Suspended Particulate (TSP) and Particulate Matter less than 10 Microns (PM_{10}), are displayed in Figures 3.2.3 and 3.2.4.

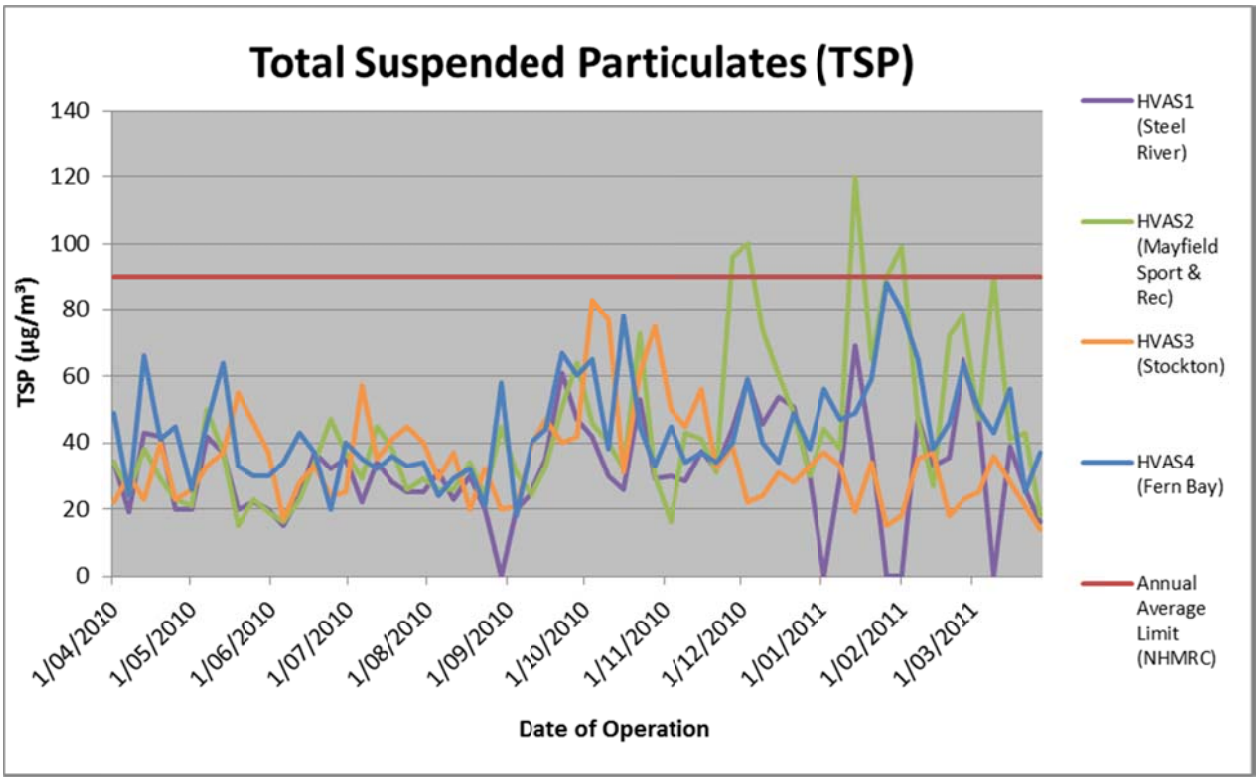


Figure 3.2.3: Total Suspended Particulates (TSP)

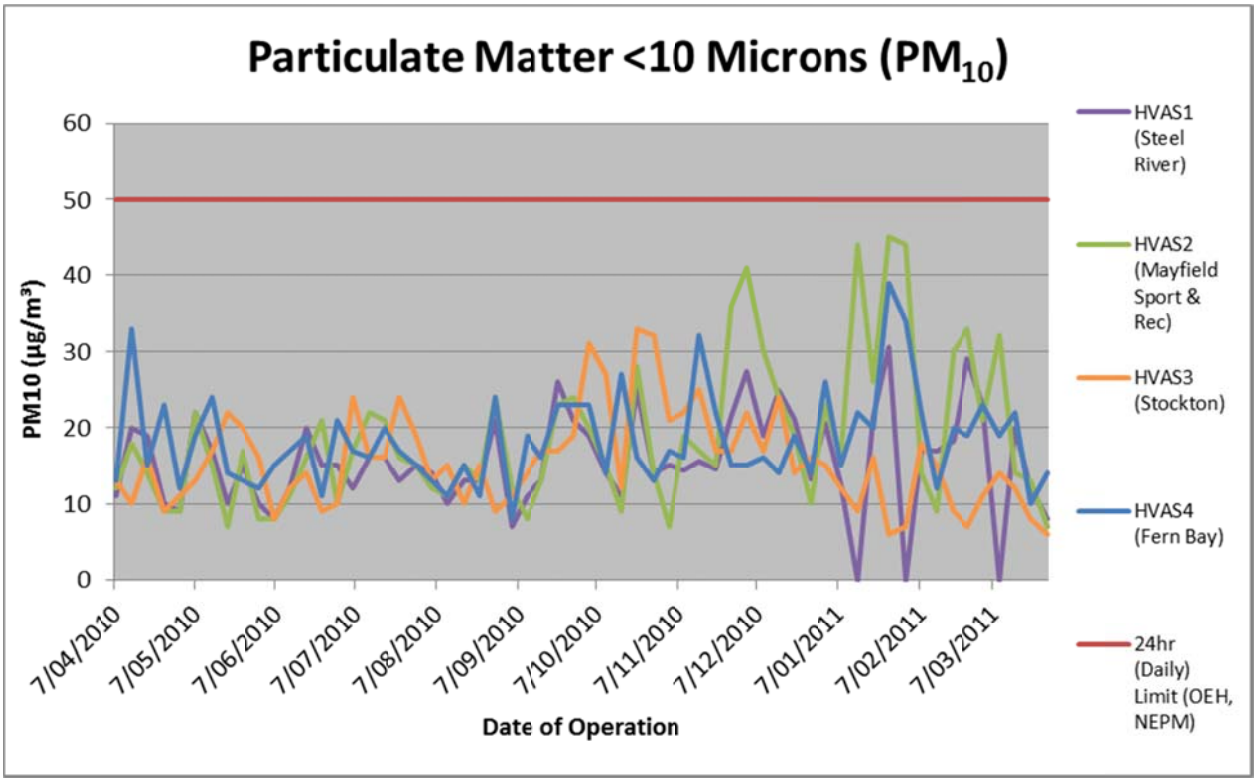


Figure 3.2.4: Total Suspended Particulates (TSP)

The annual average TSP concentrations for all four monitoring locations were below the NHMRC Annual Average Limit of 90µg/m^3. Daily concentrations of PM10 were also below their respective guideline of 50µg/m^3 (OEH and NEPM). The OEH Annual Average Goal of 30µg/m^3 was also not exceeded, as shown in Table 3.2.2 below.

Table 3.2.2: Annual Average PM10 Concentrations

	HVAS1	HVAS2	HVAS3	HVAS4
Annual Average Concentration (Apr 10 – Mar 11)	16.37	18.63	15.57	18.32

Dust from coal handling operations was managed primarily through suitable design of plant and machinery, including enclosures and housed areas at the dump station, conveyors, transfer houses, the buffer bin and feeders throughout the site. Additional measures include operation of dust suppression and moisture addition sprays at transfer points positioned both in transfer houses and on the machines (i.e. Stacker/Reclaimers and the Shiploader). Dust suppression spray guns have also been positioned along the berms directly adjacent the coal stockpiles. These operate on an automatic sequence, which takes into account varying weather conditions and evaporation rates of water from stockpiles. The onsite weather station is also connected to the system. This system is managed in accordance with the Operations Dust Management Plan (ODMP).

In accordance with Condition 3.2 e) of Project Approval (06_0009), NCIG utilises real-time monitoring data to inform environmental management decisions associated with the project. This is done through interaction with real-time Environmental Beta Attenuation Monitors (EBAMs), which measure PM_{10}. These are located at the boundaries of the stockyard and are used to assist the management of operation to ensure compliance with project obligations.

The dust control measures implemented during construction of the Project include the following:

- demarcation and minimisation of ground disturbance areas;
- paving of appropriate internal roads;
- watering of exposed ground disturbance areas and high traffic areas using water trucks to minimise the generation of dust;
- establishment of grass pasture on disturbed areas as soon as possible;
- confining vehicle movements to designated access routes;
- limiting the speed of vehicles on unpaved roads; and
- limiting ground disturbance activities during identified windy conditions.

All stockpiled construction materials were also managed to minimise wind-blown dispersal of the materials in accordance with Condition 2.45 of Project Approval (06_0009) by limiting the height of the stockpiles and watering of the stockpiles during windy conditions.

3.2.3 Reportable Incidents

No environmental incidents were reported during the reporting period relating to air quality conditions. Complaints regarding air quality received during the reporting period (see Section 3.13) were responded to in accordance with the Complaints Response Procedure.

3.2.4 Further Improvements

Further enhancement of NCIG's Dust Management System will be made in the following reporting period. This will include improved utilization of existing dust controls and further development of pro-active and reactive management responses.

3.3 WATER QUALITY

3.3.1 Environmental Management

In accordance with Condition 7.6 c), Schedule 2 of the Project Approval (06_0009), an Operations Water Management Plan (OWMP) was developed which defines the surface water, stormwater and groundwater controls on the NCIG Project site during operation. The Plan includes specific measures designed to avoid sediment-laden, coal-laden or hydrocarbon-impacted surface water from entering Deep Pond, wetland areas or the Hunter River. The Plan also includes a monitoring programme of surface water utilised on and around the Site. The plan identifies water management infrastructure and water requirements for activities such as dust suppression and plant washdown. A site water balance is included, which accounts for water captured on site through rainfall and volumes of water that may be required from the local potable water system.

In accordance with Condition 7.3b), Schedule 2 of Project Approval (06_0009), a Construction Surface Water Management Plan (CSWMP) was developed which defines how surface water and stormwater is managed on the NCIG CET site during construction. The Plan includes the definition of appropriately-sized stormwater controls, in accordance with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). The Plan also includes specific measures designed to avoid sediment-laden stormwater from entering Deep Pond, wetland areas or the Hunter River, and a monitoring programme for stormwater leaving the Site.

The CSWMP and OWMP identify that surface water runoff from disturbance areas during construction and operation of the Project could potentially contain sediments, soluble salts, fuels, oils, grease and other contaminants, in particular coal residue. The potential surface water quality impacts that relate to these contaminants from each area of the Project site are summarised in Table 3.3.1.

Table 3.3.1: Potential Surface Water Quality Impacts

Project Site	Potential Impact Scenario	Potential Contaminant
Rail Infrastructure Corridor	Uncontrolled drainage of sediment laden runoff to downstream waterbodies within the Kooragang Island Waste Emplacement Facility (KIWEF) during construction of rail embankments.	Sediments, soluble salts, heavy metals, organic contaminants, fuels, oils and grease.
	Uncontrolled drainage of runoff from access roads and construction areas to downstream waterbodies within the KIWEF.	
	Uncontrolled drainage of runoff from exposed soils within the existing KIWEF to downstream waterbodies.	
	Potential erosion and sedimentation resulting from runoff from the rail corridor and associated drainage system.	
	Release/spill into downstream waterbodies.	Coal, diesel, lubricants and hydrocarbons.
Coal Storage Area	Uncontrolled drainage to downstream waterbodies during construction of the coal storage area.	Sediments, soluble salts, heavy metals, organic contaminants, fuels, oils, lubricants and low pH water.
	Uncontrolled drainage of runoff from access roads and construction areas to downstream waterbodies.	
	Spillage/overflow of site water to downstream waterbodies.	
	Release/spill into downstream waterbodies due to rupture of fuel tank (diesel/petrol).	Sediments, coal, diesel, lubricants and hydrocarbons.
Wharf Facilities and Shiploader Area	Uncontrolled drainage of sediment laden runoff to the south arm of the Hunter River during construction of the berths and wharf structure, excavation on or near the banks of the South Arm of the Hunter River and during piling operations.	Sediments, soluble salts, fuels, oils and grease.
	Uncontrolled drainage of runoff to the south arm of the Hunter River from access roads and wharf construction areas including excavation on or near the banks of the South Arm of the of the Hunter River.	
	Release/spill into South Arm of the Hunter River.	Sediments, coal, diesel, lubricants, hydrocarbons.

This identification of surface water flows was utilised to develop the monitoring programme defined in both the CSWMP and the OWMP which aim to ensure adjacent waterbodies are not impacted by NCIG construction activities. The CSWMP and OWMP were approved by the Department of Planning (now NSW Planning and Infrastructure) as part of the Construction Environmental Management Plan (CEMP) and Operations Environmental Management Plan (OEMP) respectively.

The surface water management strategies, as they are consistent in both the CSWMP and OEMP, are:

- the separation of surface water runoff generated from within the active CET and Project construction areas from that generated from surrounding areas;
- containment and reuse of water onsite;
- the implementation of adequate water management controls to minimise the potential for impacts to off-site water resources such as adjacent wetland areas, Deep Pond and the Hunter River (Figure 3).

A separate Soil and Water Management Plan was developed for dredging activities in accordance with Condition B4.5(b), Sub-Schedule B, Schedule 2, of the Port Consent. The Soil and Water

Management Plan outlines the measures employed to manage surface water and to minimise soil erosion and the discharge of sediments and other pollutants to lands and/or waters for the duration of dredging and excavation works conducted as part of the extension of shipping channels in the Port of Newcastle. While the results for monitoring requirements under the Soil and Water Management Plan are not included in this report, the general aim of protecting water quality in the south arm of the Hunter River was maintained.

The management of erosion and sedimentation is outlined is Section 3.4

3.3.2 Environmental Performance

Table 3.3.2 outlines the monitoring locations, frequency of monitoring and monitoring parameters for the Project in accordance with the CEMP and OEMP. These monitoring elements form the Surface Water Monitoring Programme for the Project. It should be noted that NCIG ceased to discharge water from settling ponds to the Hunter River prior to the commencement of this reporting period. As such, there was no requirement to monitor discharge points in accordance with EPL 12693.

Table 3.3.2: Surface Water Monitoring Program

Monitoring Locations	Frequency	Parameters
Primary and secondary settling ponds, overflow pond.	Monthly.	• pH; • Electrical conductivity (EC); • Turbidity; • Temperature.
	During period of heavy rainfall (i.e. more than 20 mm of rainfall in a 24 hour period).	• Water level.
Surface water monitoring sites.[1]	Monthly.	• pH; • EC; • Turbidity; • Temperature.
Drainage, erosion and sediment control infrastructure.	Monthly.	• Structural stability and effectiveness in controlling sediment migration.
Collection sumps	Weekly	• Level of collected sediment.

[1] Monitoring locations are shown on Figure 3.1.1 and 3.3.2.

A site drainage network was established to capture site runoff. The topography grades to the north and west of the Project site and the existing flow path for surface runoff was incorporated into the completed site surface profile.

The drainage network that was established for dredging activities was incorporated into the design of the permanent water management infrastructure on the site. This design involves stormwater draining from east to west in the coal stockpile area at which point it collects in an open drain and is directed to the north-west of the site (see Figure 3.3.1). Surface water captured in the construction area of the stockyard is redirected both to the east and west. Both operations and construction surface water is then captured in primary settling ponds across the north of the site where fines are allowed to settle. This water cascades from the primary ponds into a secondary settlement pond prior to collection in the clearwater pond where it is then pumped to water storage tanks and is then available for reuse on the site. This water resource is to be utilised primarily for dust suppression purposes across the site, but also washdown and belt cleaning activities.

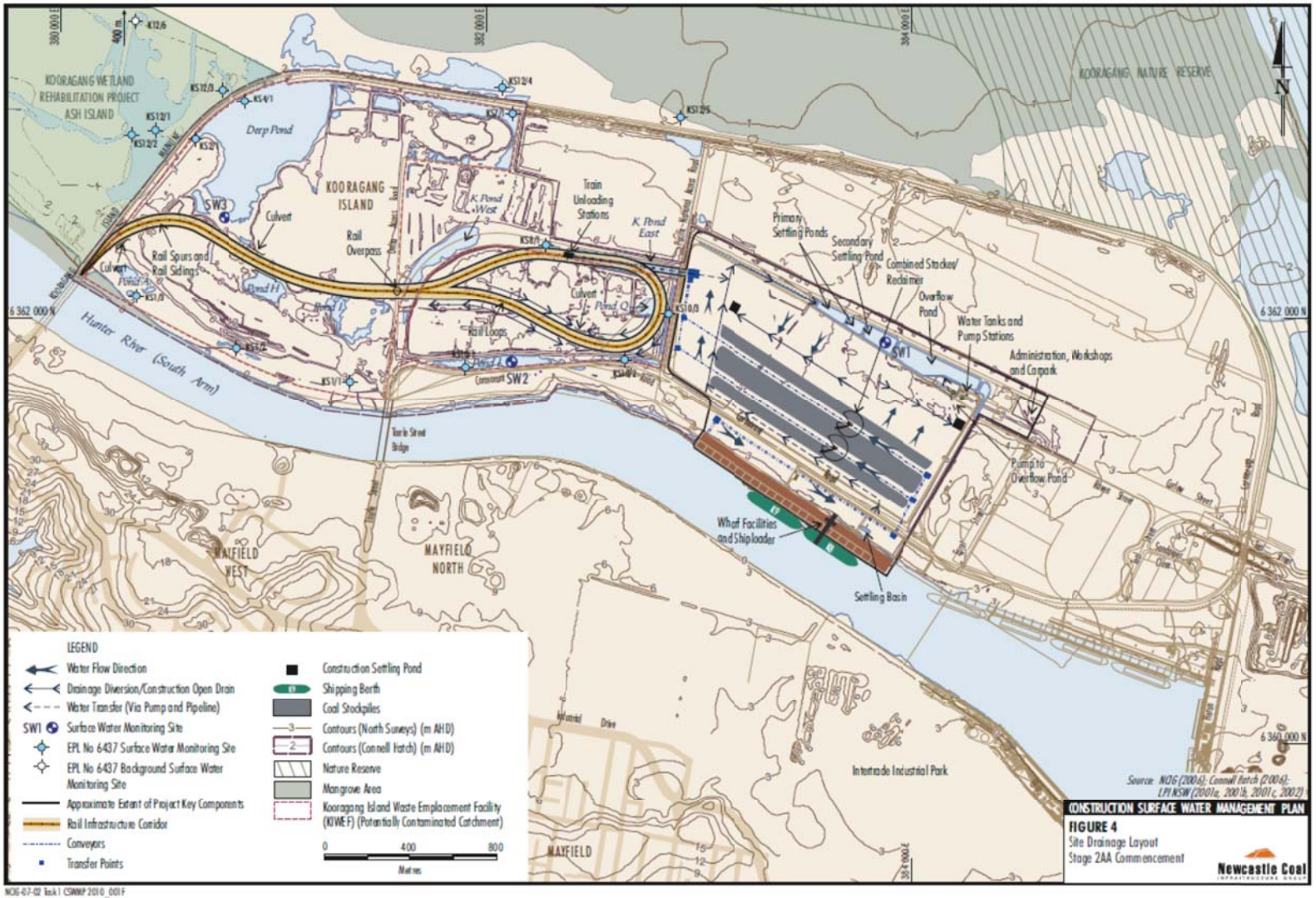


Figure 3.3.1: Permanent Site Drainage Layout

Within the design of the drainage network, stormwater from the wharf and rail areas of the site are also directed into the stockyard water management system. Stormwater collected on the wharf is accumulated in an on-site pond and then pumped across Cormorant Road. Stormwater captured in the vicinity of the train unloading station is also pumped to the stockyard, with both sources eventually made available for reuse after treatment in the northern settlement ponds.

Sampling of surface water ponds was also undertaken during the reporting period in accordance with the CSWMP and OWMP. The location of the sampling undertaken is illustrated in Figure 3.3.1 with the water quality results recorded detailed in Attachment B. These results show that some water quality parameters on site (Pond 2) were comparable with offsite water resources while others were variable. Values for pH on site were within a healthy range throughout the year (6.5-8.5), while offsite resources were slightly alkaline. Electrical conductivity and Dissolved Oxygen (DO), while being seasonally variable, were comparable between sites. Turbidity values were generally less on site in comparison to offsite, which is likely due to sediment and erosion controls and settling processes further upstream within the settling pond system.

3.3.3 Reportable Incidents

No environmental incidents or complaints were reported relating to water quality management were made during the reporting period.

3.3.4 Further Improvements

Further additions to the surface water management system will be made through Stage 2AA construction. This will include subsurface drainage from beneath Coal Stockpile Pads 3and 4 and associated collection sumps. Surface water drainage controls will also be constructed at the rail facility with the development of Dump Station 2.

3.4 EROSION AND SEDIMENT CONTROL

3.4.1 Environmental Management

In accordance with Condition 2.43, Schedule 2 of the Project Approval (06_0009) NCIG took all reasonable measures to prevent soil erosion and the discharge of sediments and pollutants from the site during construction activities.

In accordance with Condition 2.42, Schedule 2 of the Project Approval (06_0009) NCIG has designed and constructed surface water and stormwater management infrastructure on the site to accommodate a 1 in 100 annual recurrence interval (ARI) rainfall event.

All erosion, sediment and pollution control infrastructure is being maintained on the Project site at or above design capacity during construction of the Project and will continue to be until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment, in accordance with Condition 2.44, Schedule 2 of Project Approval (06_0009).

All stockpiled construction materials have been managed to minimise erosion or dispersal of the materials in accordance with Condition 2.45 of Project Approval (06_0009). All fill/preload material brought to the Project site is managed in a manner that minimises erosion and dispersal of those materials to the downstream waters (e.g. south arm of the Hunter River).

In accordance with Condition 2.49, Schedule 2 of the Project Approval (06_0009), all stormwater and surface water management infrastructure associated with the operation of the Project is lined with a low-permeability material to minimise potential leakage. Stormwater is reused onsite to for beneficial purposes such as the wetting of coal to reduce dust emissions from the Site.

All grey wastewaters from the site are directed to sewer in accordance with a Trade Waste Licence, approved through Hunter Water Corporation, in accordance with Condition 2.51, Schedule 2 of Project Approval (06_0009).

Erosion and sediment control measures and general surface water management measures for the Project are documented in the approved Construction Surface Water Management Plan (CSWMP) and the Operations Water Management Plan (OWMP).

3.4.2 Environmental Performance

Table 3.4.1 outlines the monitoring locations, erosion and sediment control parameters recorded, frequency of monitoring and air quality criteria for the Project in accordance with the CEMP.

Table 3.4.1: Summary of the Erosion and Sediment Control Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Structural stability and effectiveness in controlling sediment migration.	Drainage, erosion and sediment control infrastructure.	Monthly and following significant rainfall events (i.e. greater than 20 mm in 24 hours).	N/A.

The management of erosion and sedimentation for the NCIG Project is detailed by the Erosion and Sediment Control Plan (ESCP). The ESCP is a document that is continually modified to account for project areas and activities of identified risk of erosion and sedimentation. Activities that have the potential to cause or increase soil erosion at the Project have been identified and are primarily due to exposure of soils during construction activities.

The general erosion and sediment control principles adopted take into account the general recommendations for site drainage works presented in *Managing Urban Stormwater: Soils and Construction – Volume 1* (Landcom, 2004) which underpin the goal of protecting adjacent wetland areas, Deep Pond and the Hunter River. These principles involve:

- Minimising surface disturbance and restricting access to undisturbed areas.
- Separation of runoff from disturbed and undisturbed areas where practicable.
- construction of surface drains to facilitate the efficient transport of surface runoff or utilisation of existing stormwater systems.
- Construction of the site drainage network including perimeter bunds, internal bunds, primary settling ponds and hydraulically controlled discharge structures.
- Construction of primary and secondary settling ponds, site water pond and sediment dams to contain runoff up to specified design criterion.
- Installation of a silt curtain in the south arm of the Hunter River local to the disturbance area during construction of the shipping berth batters, wharf structure and during piling operations (in the River) that may create excessive material disturbance.

In ensuring the erosion and sediment control principles are adhered to, development activities on the Project have been typically undertaken in the following order:

1. Construction of sediment fences (down slope of disturbance areas) where required.
2. Installation of silt curtains in identified water bodies, including the Hunter River, where required.

3. General construction works are only commenced once erosion and sediment control measures are in place.
4. Construction of drainage diversions (typically upslope of disturbance areas) – these were only constructed where they significantly reduced the runoff catchment of disturbance areas and connected to the site drainage network where practicable.
5. Construction of the primary and secondary settling ponds and a clearwater pond.
6. Construction of collection drains (down slope of disturbance areas) where required to convey runoff to the site drainage network (including primary and secondary settling ponds and a site water pond).

Erosion and Sediment Control Plans (ESCP), detailing specific erosion and sediment control measures, are developed in a progressive manner prior to the development of each Project component requiring land disturbance. This is undertaken through a risk assessment process associated with the individual task proposed and are modified as required to ensure that the goal of protecting water bodies from erosion and sedimentation is achieved.

Temporary erosion and sediment controls (e.g. silt fences and sediment control structures) are installed prior to the commencement of construction activities on the Project site. Routine (i.e. monthly) inspections of sediment control structures, as well as inspections following significant rainfall events (e.g. 20 millimetres (mm) or more in a 24 hour period), are conducted by NCIG personnel. During these inspections, sediment control structures were inspected for capacity, structural integrity and effectiveness. Any deficiencies identified by these inspections are assessed, prioritised and rectified in the appropriate timeframe.

A network of permanent stormwater structures has been constructed to manage runoff around the site. All long-term site water management structures are lined with low permeability materials (e.g. compacted clay) to minimise the potential for leakage. Water management structures are designed with sufficient capacity for a 1 in 100 year average recurrence interval (ARI) rainfall event. The majority of these structures, particularly the settling pond system, were completed during this reporting period as illustrated by Figures 3.4.1. Figure 3.4.2 illustrates completion of permanent structures, in this case an open V-drain along the Southern Haulage Rd.

Figure 3.4.1: Settling Pond Infrastructure

Figure 3.4.2: Construction of Stormwater Infrastructure

3.4.3 Reportable Incidents

No environmental incidents or complaints relating to erosion or sediment control were made during the reporting period.

3.4.4 Further Improvements

No scheduled improvement to erosion and sediment control is required for the next period as the construction of the permanent surface water management infrastructure was completed during this reporting period. Ongoing amendments to construction erosion and sediment control will be made as necessary to accommodate the change in work areas.

3.5 GROUNDWATER

3.5.1 Environmental Management

In accordance with the requirements of the Construction Environmental Management Plan (CEMP) and the Operations Water Management Plan (OWMP) groundwater quality monitoring was undertaken on a monthly basis. Requirements for groundwater monitoring are also stipulated in Environmental Protection Licence 12693.

3.5.2 Environmental Performance

Table 3.5.1 outlines the monitoring locations, groundwater monitoring parameters recorded, frequency of monitoring and groundwater criteria for the Project in accordance with the CEMP.

Table 3.5.1: Summary of the Groundwater Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
pH, EC, TDS, TSS, sulfate, polycyclic aromatic hydrocarbons (PAH), Al, As III, Cd, Co, Cu, Fe, K, Na, Pb, Hg, Zn, Cr total, Cr VI, Mg, Mn, Mo, Ni, Zn, Cyanide, Ammonia, Phenol	GW1[1].	6-monthly.	Refer CEMP and OWMP.
Groundwater level.		6-monthly	N/A.

[1] The location of monitoring sites is shown on Figure 3.1.1.

The Project site includes a relatively shallow groundwater table in areas of fill from previous landuse activities. Consequently, any interception of the groundwater table during Project construction activities or effect on the groundwater system as a result of Project operations is being managed. NCIG has incorporated into the design of the Project a comprehensive suite of construction methods and design systems. In response to groundwater conditions encountered on the project site the following groundwater management contingency measures were adopted for specific Project elements:

- piled foundations together with diaphragm sub-surface perimeter walls and jet-grouted base for construction of the train unloading stations base and adjacent conveyors were constructed to minimise groundwater inflow or connection (this was completed for Stage 1 in the previous reporting period);
- a low permeability capping layer was incorporated into the rail embankment formation to minimise infiltration; and

- groundwater bores were established to monitor groundwater levels, and water quality around the perimeter of the coal storage area and along the rail infrastructure corridor.

A summary of the groundwater monitoring results recorded during the reporting period is illustrated in Table 3.5.2. As can be seen, frequency of monitoring was in excess of that which was stipulated in the CEMP and OWMP.

An assessment of the monitoring records found that the variability and magnitude of the groundwater quality results was relatively consistent with the baseline water quality which was defined prior to commencement of project activities and results from the previous reporting period. Depth to groundwater was mildly variable in this period, although this largely appeared to reflect general periods of little or, conversely, significant rainfall. It is also noted that there were no concentrations of PAH or Hexavalent Chromium reported above the limit of detection in this reporting period. These results generally indicate that NCIG activities, such as diaphragm wall development and construction of Dump Station 2 did not impact on local groundwater.

Table 3.5.2: Summary of the Groundwater Monitoring

	GW1	GW1	GW1	GW1	GW1	GW1	GW1	GW1	GW1	GW1	GW1
Date	16/04/2010	17/05/2010	15/06/2010	5/08/2010	13/09/2010	11/10/2010	9/11/2010	9/12/2010	10/01/2011	8/02/2011	10/03/2011
Water Level (m)	1.39	1.5	1.9	1.3	1.29	1.42	-	1.29	1.40	1.54	1.7
pH	7.57	7.82	7.71	7.51	7.48	7.68	7.62	7.53	7.57	7.46	7.7
Elec Cond µS/cm	9370	9150	8050	9360	12500	9920	10100	10400	9290	10200	9500
TDS (mg/L)	6050	5320	5610	5860	5250	6290	5370	5690	6330	5800	5350
Suspended Solids (mg/L)	27	14	26	18	20	42	36	10	24	43	59
Sulfate (mg/L)	509	656	546	544	564	561	586	535	574	501	453
Magnesium (mg/L)	88	78	105	94	93	95	93	100	93	100	100
Sodium (mg/L)	1730	1680	1890	1880	1780	1910	1760	1900	1790	1820	1930
Potassium (mg/L)	118	108	123	117	110	116	108	119	115	113	123
Aluminium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	0.010	0.010	<0.01	<0.01	<0.01	<0.01
Arsenic (mg/L)	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Cadmium (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0025	0.0002	0.0003	<0.0001
Cobalt (mg/L)	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Copper (mg/L)	0.010	0.010	0.008	0.004	0.005	0.005	0.004	0.004	0.005	0.002	0.003
Lead (mg/L)	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.002	<0.001	<0.001
Manganese (mg/L)	0.046	0.010	0.011	0.016	0.013	0.096	0.134	0.194	0.332	0.142	0.23
Nickel (mg/L)	0.003	0.003	0.002	0.010	<0.001	0.004	0.001	0.002	0.006	0.002	0.006
Zinc (mg/L)	0.061	0.065	0.070	0.021	0.041	0.061	0.031	0.02	0.05	0.007	0.026
Iron (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.23	<0.05	<0.05	0.1
Mercury (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Hexavalent Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene (µg/L)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1.2.3.cd)pyrene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene (µg/L)	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

3.5.3 Reportable Incidents

No environmental incidents or complaints relating to groundwater quality conditions were made during the reporting period.

3.5.4 Further Improvements

No improvement to groundwater quality monitoring is required for the next period. The current groundwater quality monitoring network will be incorporated into an extended monitoring system prior to the commencement of NCIG operational activities.

3.6 LAND CONTAMINATION

3.6.1 Environmental Management

In accordance with Condition 2.53, Schedule 2 of the Project Approval (06_0009) NCIG engaged an appropriately qualified person to audit construction of the rail infrastructure over land used as part of the Kooragang Island Waste Emplacement Facility (KIWEF) against the commitments contained in the NCIG Project Environmental Assessment and supporting documents.

Prior to any excavation on the Project, a comprehensive surface and sub-surface soil sampling and analysis programme was undertaken in order to characterise the material to be excavated. The sampling programme was undertaken in accordance with the NSW Environment Protection Authority (EPA) (2004b) *Guidelines for the Assessment, Classification and Management of Liquid and Non-Liquid Waste*. The aim of the programme was to identify the risk associated with contamination across the stockyard and rail areas and to determine the suitability of the site for the development of the NCIG project. The findings of this process were that there existed a manageable risk associated with contamination and that the site was suitable for the proposed development.

In accordance with Condition 2.54, Schedule 2 of the Project Approval (06_0009) NCIG did not direct any contaminated materials removed from the site to a waste management facility that was not lawfully permitted to accept the materials.

3.6.2 Environmental Performance

There were minimal excavations into the existing ground surface during the construction of the stockyard areas. The construction activities in this area primarily focussed on filling to raise the level of the existing ground therefore there was little disturbance with potentially contaminated soils.

The construction of the train unloading station – Dump Station 2 was commenced in this reporting period. This work required excavation into existing ground for the preparation of foundations. Ongoing observations and testing of dewatering water indicated no contamination above relevant site criteria. This was in alignment with previous experience during construction of Dump Station 1.

In accordance with the NCIG Environmental Assessment, capping of the rail infrastructure area with a low permeability material took place in the previous reporting period. This capping activity was undertaken to ensure that the entire footprint of the NCIG rail infrastructure in the KIWEF area is capped with low permeability material in accordance with the commitments made in the NCIG Environmental Assessment and to DECC (now OEH). Audit reports were produced by an independent auditor and provided to Department of Planning (DoP) and Department of Environment, Climate Change Water (DECCW), verifying that capping was in accordance with the Project Approval and the Environmental Assessment. There were no major excavations into the constructed capping during this monitoring period.

3.6.3 Reportable Incidents

No environmental incidents or complaints were reported relating to land contamination were made during the reporting period.

3.6.4 Further Improvements

No improvement to land contamination management is required for the next period.

3.7 ACID SULFATE SOILS

3.7.1 Environmental Management

In accordance with Condition 7.3(a), Schedule 2 of Project Approval (06_0009), an Acid Sulfate Soil Management Plan (ASSMP) was developed in accordance with the guidance provided in the *Acid Sulfate Soil Manual* (ASSMAC, 1998). This addresses the management of Acid Sulfate Soils (ASS) identified during excavations on the Project site. The ASSMP was approved by the Department of Planning.

3.7.2 Environmental Performance

Table 3.7.1 outlines the monitoring locations, ASS monitoring parameters recorded, frequency of monitoring and ASS criteria for the Project in accordance with the ASSMP.

Table 3.7.1: Summary of the ASS Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Presence of acid sulfate soils or potential acid sulfate soils.	Excavation sites.	Prior to any excavation.	See ASSMP.
	ASS treatment area.	After treatment.	

Soil testing and assessments of the ASS risk was undertaken during excavations and major earthworks in the previous reporting period and it was determined the potential and actual ASS risk associated with these activities was limited. The ASSMP was however prepared to provide sampling, validation and management measures if ASS is encountered during further construction of the Project.

The NSW Acid Sulfate Soil Management Advisory Committee (ASSMAC), *Acid Sulfate Soil Manual* (1998), presents guidelines for the sampling, determination and management of ASS materials dependent on the quantity of material to be disturbed and the type of disturbance (linear, bulk). The guidelines provided in the *Acid Sulfate Soil Manual* (ASSMAC, 1998) are considered appropriate for use at the Project site.

The *Acid Sulfate Soil Manual* (ASSMAC, 1998) outlines 'Action Criteria' based on laboratory analysis of ASS characteristics. These Action Criteria are based on the soil texture together with the volume of material which is to be disturbed to determine if the material is to be managed as an ASS. The Action Criteria was used to assess 'neutralisation' of lime treated soils.

During the reporting period there were no excavations undertaken that required initiation of the representative surface and sub-surface soil sampling and analysis programme. Excavations conducted on site were predominantly in fill imported onto site or material reclaimed from the Hunter River. The ASS risk associated with these sources of material was known to be low. Excavations were also conducted into areas of non-imported fill, specifically at Dump Station 2. However, based on experience from construction for Dump Station 1 and previous sampling, the risk of ASS in this area was low. No ASS was excavated or handled during this reporting period.

3.7.3 Reportable Incidents

No incidents or complaints were reported relating to acid sulphate soils management during the reporting period.

3.7.4 Further Improvements

No improvement to acid sulphate soils management is required for the next period.

3.8 NOISE AND VIBRATION

3.8.1 Environmental Management

In accordance with Condition 2.9, Schedule 2 of the Project Approval (06_0009) NCIG and its contractors minimised noise emissions from plant and equipment operated on the Project site as outlined in the *NSW Industrial Noise Policy* (EPA, 2000).

In accordance with Condition 2.10, Schedule 2 of the Project Approval (06_0009), general site preparation, filling/preloading and construction works that may generate an audible noise at any residential receptor was only undertaken between 7.00 am and 6.00 pm.

In accordance with Condition 2.11, Schedule 2 of the Project Approval (06_0009) piling works was not to be conducted on Sundays or public holidays.

Construction noise management measures are further detailed in the Construction Noise Management Plan (CNMP).

In accordance with Condition 2.13, Schedule 2 of the Project Approval (06_0009), Stage 1 of the NCIG Terminal has been designed, constructed, operated and maintained to ensure that the noise contributions from the plant do not exceed the maximum allowable noise contributions specified in Table 3.8.2 below, at the locations and the time periods indicated.

In accordance with Condition 2.14, Schedule 2 of the Project Approval (06_0009), the assessment of noise contributions was:

- Measured at the most affected point on or within the Site boundary at the most sensitive receiver to determine compliance with $L_{Aeq(15\ minute)}$ night noise limits.
- Measured at one metre from the dwelling façade to determine compliance with $L_{A1(1\ minute)}$ noise limits.
- Subject to the modification factors provided in Section 4 of the New South Wales Industrial Noise Policy (EPA, 2000), where applicable.

In accordance with Condition 2.15, Schedule 2 of the Project Approval (06_0009), NCIG has taken steps to ensure that trains operated on the Site meet noise performance criteria established. This includes construction of dedicated noise abatement berms directly adjacent the NCIG rail line and design and construction of the rail alignment to reduce noise from locomotive and wagon wheels.

Operations noise management measures are further detailed in the Operations Noise Management Plan (ONMP).

3.8.2 Environmental Performance

Table 3.8.1 outlines the monitoring locations, noise and vibration monitoring parameters recorded, frequency of monitoring and noise and vibration criteria for the Project in accordance with the CEMP and ONMP.

Table 3.8.1: Summary of the Meteorological Monitoring Programme

Monitoring Parameter	Monitoring Sites	Frequency	Criteria
Attended and unattended noise monitoring.	N1, N3, N5, N9, N13 and N14[1].	Monthly for first 3 months then quarterly.	See below.
Unattended continuous noise monitoring.	Selected locations.	Minimum period of one week per quarter.	See below.
Ground vibration.	Adjacent industrial receivers within 180 m of piling activities.	Weekly when piling within 180m of industrial receiver.	See CNMP.
Attended noise monitoring	All static and mobile elements of terminal operations.	Quarterly	See ONMP.

[1] The location of monitoring sites is shown on Figure 3.1.1.

The noise impact assessment criteria as defined by the Project approval and the Environmental Protection Licence (EPL12693) are provided in Tables 3.8.2 and 3.8.3.

Table 3.8.2: Residential Noise Impact Assessment Criteria

Location	Day, Evening, Night At all times	Night 10:00pm to 7:00am Monday to Saturday 10.00pm to 8.00am on Sundays and Public Holidays	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(night)}$	$L_{A1(1\ minute)}$
Fern Bay West	41	37	57
Fern Bay East	39	36	55
Stockton West	41	37	57
Stockton East	38	35	56
Mayfield West	45	40	55
Mayfield	44	39	62
Carrington	36	33	52

Where: a) wind speeds up to 3 ms^{-1} (measured at 10 m above ground level).
b) temperature inversion conditions up to 3°C per 100 m and wind speeds up to 2 ms^{-1} (measured at 10 m above ground level).

Table 3.8.3: Industrial Noise Impact Assessment Criteria

Non-residential Location	Land Use	Intrusive $L_{Aeq(15minute)}$			Acceptable Amenity $L_{Aeq(period)}$[1]			Maximum Amenity $L_{Aeq(9hour)}$
		Day	Evening	Night	Day	Evening	Night	Night
Mayfield West	Commercial Steel River	Intrusive noise not applicable			65	65	65	70
Kooragang Island	Industrial	Intrusive noise not applicable			70	70	70	75
Mayfield North		Intrusive noise not applicable			70	70	70	75
Any	School	Intrusive noise not applicable			External 45 when in use			50
Any	Hospital	Intrusive noise not applicable			External 50 when in use			55

Note 1: Daytime 0700 hours to 1800 hours, Evening 1800 hours to 2200 hours, Night-time 2200 hours to 0700 hours.

Noise monitoring was undertaken by specialists acoustic consultants during the reporting period. This monitoring was conducted on a quarterly basis to coincide with both construction works on the project and commencement of operations throughout the reporting period. No piling activities were undertaken within 180m of an industrial receiver and, as such, no vibration monitoring was conducted during the period.

The monitoring undertaken principally consisted of:

- Unattended noise monitoring – two (2) Type EL316 environmental noise loggers were deployed at the nearest potentially affected receptors for a period of one week. The noise loggers were programmed to record statistical noise level indices continuously in 15 minute intervals, including LAmax, LA1, LA50, LA90, LA99, LAmin and LAeq.
- Attended noise monitoring - operator attended noise survey was conducted at each noise logger location to assist in defining noise sources and the character of noise in the area and therefore to qualify unattended noise logging results. These measurements were conducted over 15 minute periods using a Bruel & Kjaer Type 2250 sound level meter.
- Vibration monitoring - In accordance with the CNMP, vibration monitoring was conducted during construction piling activities within 180m of adjacent industrial receivers (i.e. Blue Circle Southern) on a weekly basis. Vibration surveys were conducted weekly for a significant amount of the monitoring period whilst piling activities were conducted on the northern bank of the Hunter River (South Arm) and the eastern section of the stockyard area to determine vibration levels at the nearest industrial receiver (Blue Circle Southern).

The conclusion of the specialised acoustic consultants was that throughout the reporting period noise surveys identified that current construction, as well as operation of the NCIG Terminal was conducted below the relevant noise criteria.

In accordance with Condition 3.6, Schedule 2 of the Project Approval (06_0009), NCIG undertook a program to confirm the noise performance of Stage 1 of the project, during a period in which plant operated under normal operating conditions. The report stated that the off-site environmental noise emissions from NCET Stage 1 comply with the Project Approval environmental noise limits in accordance with Schedule 2, Noise Impacts, Operation Noise, Conditions 2.13, 2.14 and 2.15.

3.8.3 Reportable Incidents

No environmental incidents were reported relating to noise or vibration during the reporting period. Complaints regarding noise received during the reporting period (see Section 3.13) were responded to in accordance with the Complaint Response Procedure.

3.8.4 Further Improvements

No improvement to noise monitoring is required for the next period. Notwithstanding, NCIG implements a Continuous Noise Improvement Program. The program will continue to be implemented as part of ongoing NCIG operations.

3.9 HERITAGE

3.9.1 Environmental Management

The DECCW advised that as the Project construction site has been the subject of extensive disturbance over a period of more than 50 years, it considers that no Aboriginal heritage objects of significance will be present (DEC, pers. comm. 15 February 2007).

Notwithstanding, the management of items of Aboriginal cultural heritage significance during construction of the Project incorporated the following elements:

- During induction training, NCIG personnel were advised of their responsibility to advise management if they uncover any item that could be of Aboriginal heritage significance.
- If potential archaeological material is identified, construction activities proximal to the potential archaeological material will cease and OEH's North East Branch - Environment Protection and Regulation Division, Regional Archaeologist will be contacted to determine appropriate management requirements.
- If items of Aboriginal cultural heritage significance are salvaged on-site, they will be stored in a keeping place on-site for the duration of the Project.
- At the cessation of the Project, if any salvaged Aboriginal objects are stored on-site their ongoing management will be determined in consultation with the Aboriginal community and the OEH.

3.9.2 Environmental Performance

During the reporting period induction training was attended by all NCIG personnel. This training included information relating to aboriginal heritage and the potential identification of items of archaeological significance.

During the reporting period there were no items of potential Aboriginal cultural heritage significance identified.

3.9.3 Reportable Incidents

No incidents or complaints were reported relating to heritage during the reporting period.

3.9.4 Further Improvements

No improvement to heritage is required for the next period.

3.10 FLORA AND FAUNA

3.10.1 Environmental Management

In accordance with Conditions 2.16 and 2.19, Schedule 2 of the Project Approval (06_0009) NCIG employed two qualified ecologists (Dr David Goldney and Dr Arthur White), approved by the Director-General, to undertake a pre-construction survey of areas affected by construction works for the presence of *Litoria aurea* (the Green and Golden Bell Frog) (see Figure 3.10.1). These ecologists also provided advice on the mitigation and management of impacts to listed threatened species that may be affected by the NCIG Project works.

While Green and Golden Bell Frog individuals were not identified during the pre-construction survey, previous surveys have identified the presence of the species on the Project site. Therefore a management plan for the relocation of Green and Golden Bell Frog individuals was prepared in accordance with Condition 2.16, Schedule 2 of the Project Approval (06_0009). The Green and Golden Bell Frog Management Plan (GGBFMP) was developed in consultation with DECC (now Office of Environment and Heritage) and the Regional Land Management Corporation (now Hunter Development Corporation).

In accordance with Condition 2.17, Schedule 2 of the Project Approval (06_0009) NCIG has designed and constructed relevant rail infrastructure associated with the Project to include culverts, underpasses or other similar measures to permit the movement of *Litoria aurea* and other amphibian

species under the NCIG rail infrastructure (see Figure 3.10.2). The culverts and underpasses were installed to include suitable habitat for the Green and Golden Bell Frogs and to provide protection from predators in accordance with guidance provided by Dr Arthur White.

Figure 3.10.1: The Green and Golden Bell Frog (*Litoria aurea)*

Figure 3.10.2: Installed Rail Culverts for Green and Golden Bell Frog Movement

In accordance with Condition 2.18, Schedule 2 of the Project Approval (06_0009) all employees and contractors involved in construction of the Project are trained in site hygiene management in

accordance with *Hygiene Protocol for the Control of Disease in Frogs* (NPWS, 2001) prior to the commencement of work. In addition, all operations employees and contractors are inducted into site Green and Golden Bell Frog Management and the importance of hygiene management.

A Compensatory Habitat and Ecological Monitoring Program (CHEMP) has also been prepared to guide the construction of Green and Golden Bell Frog habitat which suitably replaces habitat damaged or destroyed by construction works. This plan was initially submitted to DECCW and DoP in 2008. Through discussions and agreed amendments, the CHEMP was approved by DoP on 16 November 2010. Details of compensatory habitat work completed in the period are given in Section 3.10.3.

A Vegetation Clearance Protocol (VCP) was also prepared to satisfy those commitments of the Project Environmental Assessment (EA) that relate to vegetation clearance during construction of the Project.

3.10.2 Environmental Performance

The Green and Golden Bell Frog *Litoria aurea* is listed as Endangered under the *Threatened Species Conservation Act, 1995* (TSC Act) and Vulnerable under the EPBC Act. The Green and Golden Bell Frog is estimated to have disappeared from 90% of its former range within NSW.

Known and potential Green and Golden Bell Frog habitat is located across the Project site and surrounds. Disturbance to Green and Golden Bell Frog habitat occurred as a result of construction activities which primarily involved completely infilling Big Pond and partial disturbance of Ponds H, K and Q (see Figure 3.10.3). Most of the known and potential Green and Golden Bell Frog habitat recorded across the Project site and surrounds (i.e. Ponds A, B, C, D, E, F, G, I, J, L, O, T, U, V, AA, AC, AD) has not however been directly disturbed by Project activities.

Figure 3.10.3: Green and Golden Bell Frog Habitat Areas.

In order to minimise Project-related impacts on the Green and Golden Bell Frog the following management procedures were implemented in accordance with the GGBFMP:

- environmental induction training;
- site hygiene management;
- delineation of disturbance areas;
- pre-clearance surveys;
- Green and Golden Bell Frog relocation procedures; and
- construction works procedures.

All employees and contractors involved in the construction of the Project were informed about the presence and importance of the Green and Golden Bell Frog as a part of the site induction process. Similarly, operations employees and contractors are informed about the presence of the Green and Golden Bell Frog in areas adjacent to the Stage 1 operations site, in particular the NCIG rail facility. Training was also provided on appropriate site hygiene practices in accordance with *Hygiene Protocol for the Control of Disease in Frogs* (NPWS, 2001) prior to the commencement of work.

All ground disturbance activities were completed previously on the site, therefore there were no pre-clearance surveys undertaken during the reporting period. Areas of active earthworks continued to be delineated by fencing, however, in order to prevent the movement of amphibian species back into a construction area that had been previously cleared, these fencelines were regularly monitored for the presence of the Green and Golden Bell Frog to confirm that there were no individuals in the vicinity that may be at risk.

If individual frogs were identified adjacent to the constructed delineation fencelines or elsewhere on the site, and thought to be at potential risk of harm, they were captured and translocated in accordance with the Green and Golden Bell Frog Management Plan. Details of the individual Green and Golden Bell Frogs managed in accordance to this process are outlined in Table 3.10.1.

Table 3.10.1: Translocated Green and Golden Bell Frogs

Date	Health	Size (cm)	Location Identified	Location Translocated
18/8/10	Good	6cm	Inside Pumphouse	Delta Ponds
9/10/10	Good	7cm	Dump Station cable pit	Delta Ponds
4/3/11	Good	3cm	TH03 sump	Area I
4/3/11	Good	3cm	TH03 sump	Area I
4/3/11	Good	3cm	TH03 sump	Area I
4/3/11	Good	3cm	TH03 sump	Area G
4/3/11	Good	3cm	TH03 sump	Area G
4/3/11	Good	4cm	TH03 sump	Area G

During the reporting period a total of 8 Green and Golden Bell Frogs were sighted on site and assessed as being at risk and subsequently translocated in accordance with the Green and Golden Bell Frog Management Plan. All specimens were alive and in good condition, ranging from 3–7cm in length. Individuals relocated in August and October 2010 were considered to be adults, based on size. Six juveniles were found in an operations sump in March 2011 and relocated accordingly.

In accordance with the Project requirements under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) approval, NCIG undertook Green and Golden Bell Frog monitoring during the reporting period. The overall objective of this Green and Golden Bell Frog monitoring programme is to monitor the dynamics of the Green and Golden Bell Frog within habitat areas adjacent to the Project site (within the Kooragang Island Waste Emplacement Facility), and any other locations where captured frogs have been relocated. Table 3.10.2 details the monitoring programme components.

Table 3.10.2: Green and Golden Bell Frog Monitoring Programme

Monitoring Component	Details
Timing	Surveys will be conducted during favourable seasonal and climatic conditions (e.g. between September and February, after heavy rain). Where logistically practicable, diurnal and nocturnal monitoring surveys will be conducted for a period of approximately two to four days and generally covering the locations identified in Figure 2, and will include locations where captured frogs have been released. A minimum of two surveys will be conducted each year during favourable seasonal and climatic conditions. Surveys will be separated by at least 2 weeks. Monitoring will be conducted annually until 2020. Thereafter, monitoring will be undertaken on a three-yearly basis until 2030. The requirement to monitor beyond 2030 will be determined at that time in consultation with the DEWR.
Locations	Monitoring locations will include Green and Golden Bell Frog habitat within the Kooragang Island Waste Emplacement Facility (Figure 2) and any other locations where captured frogs have been relocated (Section 3.2)
Methodology	Monitoring methodology may include, however not necessarily be limited to, frog call recording, active searches, spotlighting and call playback. The monitoring programme will be conducted in accordance with *Threatened Species Survey and Assessment: Guidelines for Developments and Activities (Working Draft)* (DEC, 2004). In addition, the monitoring surveys will be conducted in accordance with relevant DECC permits.
Parameters	Monitoring parameters will include, but not necessarily be limited to: • Green and Golden Bell Frog presence/absence, distribution, habitat utilisation, behaviour and abnormalities. • Observations of other frog species distribution, relative abundance and abnormalities. • Observations of other threatened frog species (listed under the TSC Act and/or the EPBC Act). • Water quality (i.e. salinity and pH) and habitat condition. Additional general information recorded during monitoring surveys may include: • date; • time of day; • rainfall (mm); • site location (GPS co-ordinates and map location); • survey methodology utilised; • sampling effort; • habitats surveyed; • weather conditions (including temperature); • number of observers; • photographs taken; and • any other relevant information.

The results of the monitoring programme conducted by Dr Arthur White during favourable seasonal and climatic conditions between September 2010 and April 2011 are illustrated in Table 3.10.3.

Table 3.10.3: Green and Golden Bell Frog Monitoring Results

	Sept 2010	Oct 2010	Nov 2010	Dec 2010	Jan 2011	Feb 2011	March 2011	April 2011
A	-	-	-	-	-	-	-	-
Deep Pond SW	-	-	-	-	-	-	-	-
H	-	-	-	-	-	-	-	-
I	-	-	-	-	-	-	-	-
J	-	-	-	-	-	-	-	-
K	-	-	-	-	-	-	-	-
B	-	√	-	Dry	-	Dry	-	Dry
C	-	√	√	√	√	-	√	-
D	-	-	Dry	Dry	-	Dry	-	Dry
DPE 1	-	-	-	-	-	-	-	-
Deep Pond North	√	√	√	-	√	-	-	-
Deep Pond East	NS	NS	-	√	NS	NS	NS	NS
F	-	-	-	-	-	-	-	-
G	-	-	-	-	-	-	-	-
P	-	-	-	√	Dry	Dry	-	-
Q	-	-	-	√	-	-	-	-
Dead Tree Lagoon*	NS	-	-	NS	NS	NS	-	NS
Ash 1*	NS	-	-	NS	NS	NS	-	NS
Ash 2*	NS	√	-	NS	NS	NS	-	NS
Ash 3*	NS	√	√	NS	NS	NS	-	NS
Ash 4*	NS	√	-	NS	NS	NS	-	NS

* – ponds along Bell Frog track, Ash Island
√ – calling
Dry – survey location dry at the time of survey
NS – not surveyed

A monitoring programme was also conducted during the reporting period to survey the utilisation of Deep Pond, adjacent to the NCIG rail infrastructure area, by bird species with the primary focus on Australasian Bittern and shorebirds. This Avifauna Monitoring Programme was undertaken by the Hunter Bird Observers Club and the resulting information was provided to NCIG by way of agreement. The results of the monthly surveys conducted during the 2010 calendar year are illustrated by Table 3.10.4. The aim of the monitoring programme is to identify the pattern of usage of Deep Pond by all birds over the annual cycle and determined the extent of any potential impact by the NCIG activities on this usage.

In comparison to the 2009 results, there has been a decrease in the total number of birds using the pond from 8364 to 7115 in 2010. This is due mainly to a decrease in overall pond usage over the winter and spring period. This is explained for two reasons:

Table 3.10.4: Avifauna Monitoring Results

Deep Pond Totals 2010													
	16/01/2010	13/02/2010	13/03/2010	17/04/2010	15/05/2010	26/06/2010	24/07/2010	28/08/2010	25/09/2010	22/10/2010	20/11/2010	16/12/2010	Total 2010
Musk Duck	1												1
Black Swan	22	9	63	2	4	10	33	41	23	13	9	77	306
Pacific Black Duck	83	95	24	5		10			2			17	236
Australasian Shoveler	12	26	25	7	12	8							90
Grey Teal	166	46	5	8	2	4							231
Chestnut Teal	912	848	542	1384	423				3	2	1	148	4263
Hardhead	8		1				4						13
Australasian Grebe			1										1
Hoary-headed Grebe	3												3
Darter	1												1
Little Pied Cormorant		4								1			5
Little Black Cormorant	4	5	13									2	24
Great Cormorant	1	3				2					2	2	10
Australian Pelican	4	16	2	16	19			3	2			1	63
White-faced Heron				11	1					1			13
Little Egret		1											1
Great Egret	5	35			1			1		1			43
Intermediate Egret		2											2
Cattle Egret	1	1										2	4
Australian White Ibis	4	16	4	2	5							1	32
Royal Spoonbill	5	27	2	7	1								42
Black-shouldered Kite		1		1				1					3
Whistling Kite	1	2		1							1		5
White-bellied Sea-Eagle		1		2	2	2			1				8
Swamp Harrier	1	2			1	2		2			1	1	10
Brown Goshawk								1					1
Collared Sparrowhawk					1	1							2
Australian Hobby		1											1
Buff-banded Rail			1										1
Lewin's Rail											1		1
Purple Swamphen	16	16	5	1	2	2	2						44
Dusky Moorhen									1				1
Black-tailed Godwit		10	12	44									66
Bar-tailed Godwit					2								2
Marsh Sandpiper	11	14	29	9	1								64
Common Greenshank	4	1	3	3	1								12
Red-necked Stint					4								4
Sharp-tailed Sandpiper	1	2											3
Black-winged Stilt	286	319		265	279								1149
Red-necked Avocet	5	3											8
Red-capped Plover					35								35
Double-banded Plover					5								5
Black-fronted Dotterel	2		1		14	2	2		1			2	24
Masked Lapwing	7	7	43	6	18	6				1	2	3	93
Silver Gull	2	23	13	16									54
Gull-billed Tern			29		14								43
Caspian Tern		1											1
White-fronted Chat					9	4		1				1	15
Chestnut-breasted Mannikin					6								6
Clamorous Reed-Warbler	20												20
Tawny Grassbird	5												5
Little Grassbird	5												5
Golden-headed Cisticola	20				20								40
	1618	1537	818	1790	882	53	41	50	33	19	17	257	7115

Source: Hunter Bird Observers Club

- Conditions of other local wetlands and waterbodies were more suitable over this period due to climatic conditions, which encouraged local populations such as waterfowl to temporarily relocate.
- Shorebirds, including Migratory Shorebirds, were found in large numbers in Deep Pond early in the year, after which a migratory event occurred. This occurred due to significant rain events in in-land Australia, where in-land wetlands attract large populations of shorebirds from areas including the Hunter Estuary.

The relatively small reduction in bird usage of Deep Pond is not considered to be significant, and in fact the end of the 2010 monitoring period saw the return of a number of species.

The Vegetation Clearance Protocol (VCP) was implemented to minimise impacts on threatened flora and fauna species within the Project area. The key components of the VCP are outlined below and include:

- delineation of areas to be cleared of existing vegetation;
- pre-clearance surveys;
- managing impacts on fauna; and
- vegetation clearance procedures.

The delineation of areas that were identified to be cleared of existing vegetation was undertaken to prevent any accidental damage to vegetation not targeted for removal. Pre-clearance surveys involved habitat assessments to identify potential habitat features located within areas requiring vegetation clearance for construction of the Project.

Features with the potential to provide roosting and/or nesting resources for birds and/or arboreal mammals (e.g. grass tussocks and hollow openings, cracks, loose bark of trees) or shelter and/or breeding resources for frogs and/or reptiles (e.g. grass swales, grass tussocks and rock crevices) were identified during the habitat assessment.

Following the preliminary habitat assessment, a secondary habitat assessment was conducted to assess the usage of habitat features by fauna. The secondary habitat assessment may include:

- active searches and/or spotlighting for arboreal mammals, frogs and or reptiles; and/or
- observation of hollows and nests/roosts for usage by bird species.

The vast majority of vegetation clearance occurred during the 2008-2009 reporting period. Some isolated areas of vegetation were cleared during this period. For these areas the vegetation clearance procedure was undertaken either by the approved ecologist (Dr Arthur White) or by an appropriate NCIG environmental representative. Each of the assessments undertaken determined that there was no habitat or fauna species of significance within the delineated areas of vegetation. Areas of vegetation were felled/cleared as soon as practicable following the completion of the pre-clearance surveys habitat assessments to ensure that the occupation status of the cleared area did not change in the intervening time period.

3.10.3 Compensatory Habitat and Ecological Monitoring Program

A number of works have been undertaken in relation to the CHEMP prior to and since approval of the program by DoP (now NSW Planning and Infrastructure). The following points highlight the major works undertaken and milestones achieved during this reporting period.

9/11/10 - Consultation with Dr Arthur White (Approved Project Ecologist) regarding preferred locations for compensatory habitat on Ash Island. Preferred locations were based on Dr White's understanding

of the area, including recent monitoring results and locations neighbouring recent prevalence of GGBF.

15/11/10 – Commissioning of work to complete a constraints map for Ash Island, including areas of interest for proposed compensatory habitat.

1/12/10 – Consultation meeting with Department of Environment, Climate Change and Water (now NSW Office of Environment and Heritage) – National Parks and Wildlife Service Division to discuss preferred locations for compensatory habitat. Key items discussed include land use constraints, areas already reserved for BHP Billiton Compensatory Habitat Program and current understanding of the GGBF population on Kooragang and Ash Islands. Major outcome of meeting was a list of four potential CH sites, which satisfied OEH – NPW's management objectives for Ash Island. A meeting was scheduled with NPWS at Ash Island to inspect and ground-truth areas discussed.

14/1/11 – Meeting with NPWS on Ash Island. Observations were recorded on vegetation and habitat present, and hence suitability for CH construction. Of the four locations, two areas were agreed upon as being a preferred location for CH (including the original CHEMP Stage 3 area), with the other two having potential land use and vegetation constraints (i.e. saltmarsh). All areas were intended to be investigated in more detail.

7/2/11 – Commissioning of Preliminary Assessment of Monitoring Approach and Population Modelling Capability.

8/2/11 – Response received from OEH – NPWS regarding path forward for assessment of proposed compensatory habitat areas on Ash Island. The letter provided approval in principle for NCIG to commence investigations in the areas visited to determine suitability for CH. At completion of these investigations, NCIG are to communicate the outcomes with OEH – NPWS to then proceed with the Reference of Environmental Factors (REF) process.

28/2/11 – flyover conducted of Ash Island to provide georectified aerial photograph of potential CH areas for flora and fauna mapping purposes. This was provided to relevant flora and fauna consultants for site survey purposes.

9/2/11 – Tour of Shortland Constructed GGBF Habitat w/ University of Newcastle – Amphibian Research Unit. The visit was also used to look at the successes and shortcomings of the constructed habitat projects and profile potential research projects with Newcastle Uni.

9/2/11 – Provision of scopes for investigation of compensatory habitat areas to relevant flora and fauna sub-consultants.

17/2/11 – Meeting with Dr Jose Rodriguez, Newcastle Uni Professor in Environmental Engineering. This was relating to candidature on the Consultative Board and to present the approved CHEMP. Dr Rodriguez has since indicated his willingness to be involved on the CB.

As identified in the CHEMP, an Annual Works Program is to be provided for compensatory habitat works to be completed during the next reporting period. Table 3.10.5 provides a list of key works, milestones and projects to be completed between April 2011 and March 2012.

Table 3.10.5: CHEMP Annual Works Program – April 2010 - March 2011

Works/Milestone/Stage	Intended Completion Date
Completion of Flora and Fauna Assessments – Proposed Compensatory Habitat Areas, Ash Island	July 2011
Inaugural Consultative Board Meeting	July 2011
Decision on Population Modelling approach and area to be compensated, to be agreed on by the Consultative Board	August 2011

Works/Milestone/Stage	Intended Completion Date
Provision of Review of Environmental Factors (REF) to OEH, for intrusive investigative works program (soil and groundwater sampling) to be undertaken on Ash Island, and associated impacts.	September 2011
Commencement of first Green and Golden Bell Frog research project	November 2011
Second Consultative Board Meeting	November 2011
Provision of Review of Environmental Factors (REF) to OEH, for proposed Compensatory Habitat Trial Ponds on Ash Island	January 2012
Approval for Compensatory Habitat Trial Pond development provided by OEH	March 2012

3.10.4 Reportable Incidents

No incidents or complaints were reported relating to flora and fauna management during the reporting period.

3.10.5 Further Improvements

Aside from ongoing implementation of the Compensatory Habitat and Ecological Monitoring Program, no improvement to flora and fauna management is required for the next period.

3.11 TRAFFIC MANAGEMENT

3.11.1 Environmental Management

The Project Approval (06_0009) contains a range of requirements that pertain to road transport (Conditions 2.21 to 2.37, Schedule 2). These requirements are addressed where relevant in the Construction Traffic Management Protocol.

3.11.2 Environmental Performance

The road improvements proposed to conform to the Conditions of the Project Approval for the construction phase of the CET are generally those permanent works that would be required during the future operation of the proposed coal loader. In accordance with Condition 2.37, Schedule 2 of the Project Approval (06_0009), NCIG has designed, constructed and maintained all permanent internal road works for Stage 1 of the project to comply with the provisions of relevant Australian Standards, RTA standards and guidelines and Council codes.

Traffic management during the construction phase focussed on the immediate imposition of movement restrictions at key intersections to limit the potential for delays to traffic flows on Cormorant Road.

NCIG has developed a Vehicle Traffic Management Plan (VTMP) in accordance with the Construction Traffic Management Protocol. This plan provides the approved traffic routes for NCIG construction traffic across the site. This plan also dictates the approved traffic routes for construction traffic on adjacent public roads, including the prevention of right-hand turns onto Cormorant Road from Egret Street, Pacific National Road and the NCIG Wharf Access Road intersection, in order to minimise any disruption to through traffic on this road. Each contractor on the NCIG project site also developed VTMPs to ensure that construction traffic is adequately managed on internal and external roads.

During the reporting period, NCIG gained approval from the NSW Roads and Traffic Authority (RTA) to undertake works on three intersections on Cormorant Road, namely the Egret Street, Pacific National Road and the NCIG Wharf Access Road intersections onto Cormorant Road. Work was completed for

the Egret Street intersection and works have started for the two intersections at Pacific National Road and the NCIG Wharf Access Road.

In addition to the above, a Vehicle Traffic Management Plan has been developed for operational vehicles which came into effect at the commencement of NCIG operational activities.

3.11.3 Reportable Incidents

No incidents or complaints were reported relating to traffic management during the reporting period.

3.11.4 Further Improvements

No improvement to traffic management is required for the next period.

3.12 WASTE MANAGEMENT

3.12.1 Environmental Management

Measures to avoid and minimise the generation of wastes and promote waste re-use and recycling have been adopted during construction of the Project and include:

- waste avoidance – practices were developed that reduce the amount of waste on-site, via selective purchasing procedures and the use of bulk purchasing, where practicable;
- material reuse – reuse of recyclable or reusable materials where practicable; and
- recycling – materials such as metals, oil, timber, plastics, glass and paper were recycled where practicable.

In accordance with Conditions 2.54 and 2.56, Schedule 2 of the Project Approval (06_0009), all waste materials removed from the site was directed to a waste management facility lawfully permitted to accept the materials.

In accordance with Condition 2.57, Schedule 2 of the Project Approval (06_0009), waste was not received at the site during the reporting period. In addition, NCIG complied with the requirements of EPL No. 6437 as it relates to the on-going management of the Kooragang Island Waste Emplacement Facility.

3.12.2 Environmental Performance

The principles of waste management, being waste avoidance, material reuse and recycling have been adopted by NCIG and all construction contractors on the site during the reporting period. The focus of this process has been the avoidance of waste, however the recycling of waste products was also actively pursued with paper, aluminium, steel, plastics, timber and glass being the primary materials collected. Recycled concrete was also been incorporated into the pavement design for the rail and stockyard areas as a means of improving reuse of waste materials.

A 12,000 litre (L) waste oil tank was installed prior to operations to enable the collection and storage of waste hydrocarbons during NCIG operational activities, before being removed by licensed waste transporters on a periodic basis. A purpose built oil/water separator system has also been installed at the workshop and truck washdown areas, which will be inspected and maintained on a regular basis during operations.

A Waste Management Plan has been developed and incorporated into the environmental management system for the operations of the NCIG Terminal.

During the reporting period there was no waste material stored, treated, processed or reprocessed or disposed of on the Kooragang Island Waste Emplacement Facility that would constitute a breach of the conditions of EPL No. 6437.

3.12.3 Reportable Incidents

No incidents or complaints were reported relating to waste management during the reporting period.

3.12.4 Further Improvements

No improvement to waste management is required for the next period.

3.13 COMMUNITY RELATIONS

3.13.1 Environmental Management

During Project construction the following complaints handling system was implemented:

- In accordance with Conditions 6.2, Schedule 2 of the Project Approval (06_0009), NCIG established a telephone number, postal address and email address prior to the commencement of construction for community complaints and enquiries. Current details are provided below:
  - 24-hour complaints telephone hotline: 1800 016 304
  - Postal address for written complaints: PO Box 644
Newcastle NSW 2300
  - Email address for electronic complaints: enquiries@ncig.com.au
- In accordance with Condition 6.2, Schedule 2 of the Project Approval (06_0009), the community were informed of the phone, email and postal addresses via the NCIG website (www.ncig.com.au), notices in local newspapers and signage adjacent to the Project.
- In accordance with Conditions 6.3, Schedule 2 of the Project Approval (06_0009), NCIG recorded all complaints received in a Complaints Register.
- In accordance with Condition 6.4 of the Project Approval (06_0009), NCIG established and maintained a website for the provision of electronic information associated with the Project including all relevant Management Plans.

3.13.2 Environmental Performance

The general structure of Complaint Response Procedure is shown on Figure 3.13.1. Upon receiving a complaint all details relating to the issue of concern were recorded in the Complaints Register including:

- the date and time, where relevant, of the complaint;
- the means by which the complaint was made (telephone, mail or email);
- any personal details of the complainant that were provided, or if no details were provided, a note to that effect;
- the nature of the complaint; and
- a record of any operational or meteorological conditions that may have potentially contributed to the complaint.

Within 2 working days of a complaint being registered, an initial response was provided to the complainant and a preliminary assessment commenced to determine likely causes of the complaint

using relevant available information (i.e. climatic conditions, environmental monitoring results and current construction activities). Table 3.13.1 provides a summary of the complaints received during the reporting period. In every case the investigation of the complaint determined that the issue of concern was not as a result of an exceedence of relevant Project Approval or EPL criteria.

The outcome of the complaints handling process was recorded in the Complaints Register, including:

- action taken by NCIG in relation to the complaint, including all follow-up contact with the complainant; and
- details of the finding of the investigation and the reason(s) why no action was taken.

Every effort was made to ensure that the concerns of the complainant were addressed in a manner that resulted in a mutually acceptable outcome.

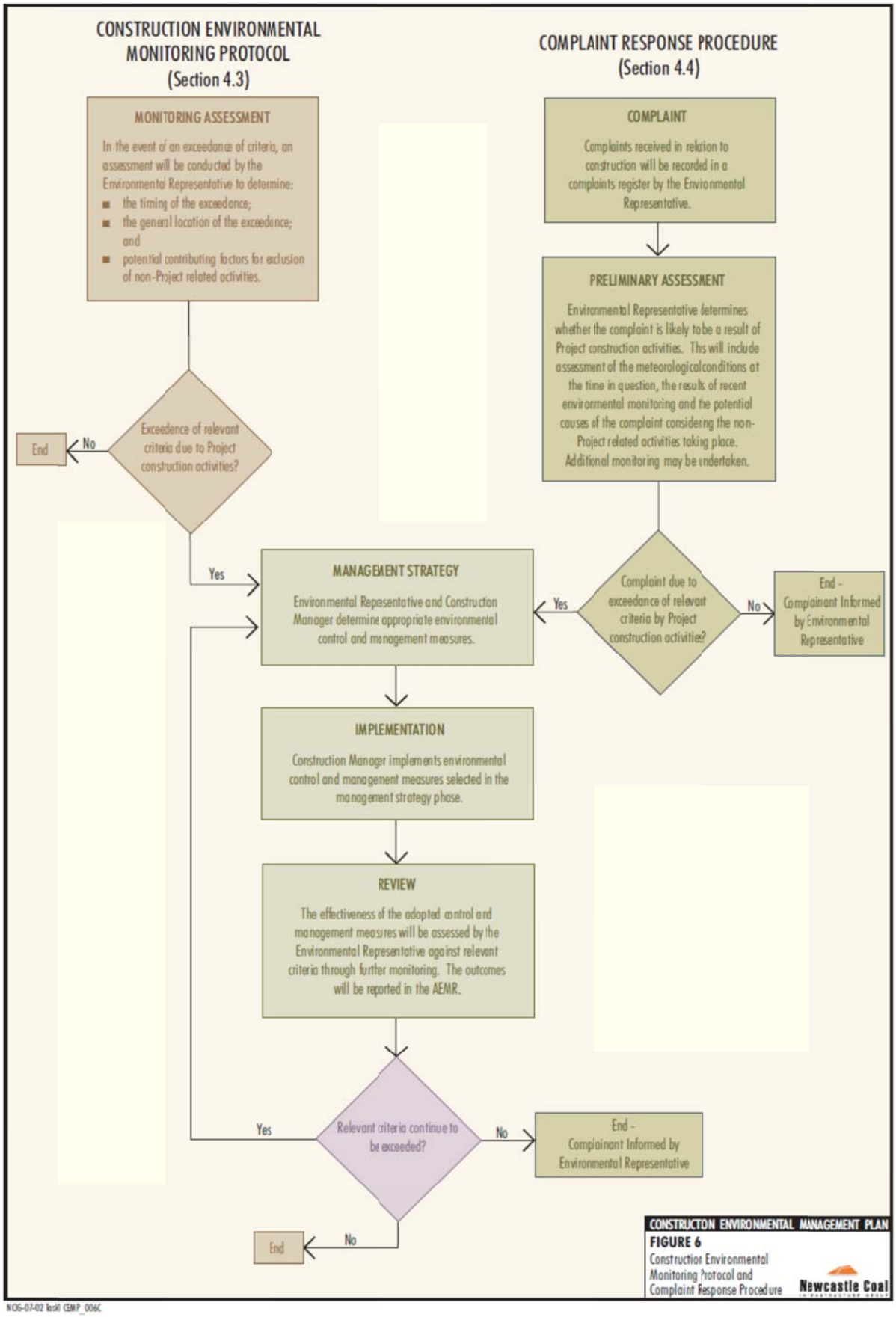


Figure 3.13.1: Complaint Response Procedure

Table 3.13.1: Community Complaints Register Summary

Date of Complaint	Environmental Concern Raised	Issue	Action Taken
8/2/2010	Dust	Drove past the site and could not see stockpile sprays operating and also has dust on her outdoors area.	Visited residence with PWCS to discuss concerns. Spoke at length about dust control measures at both PWCS and NCIG. Took a dust sample from outdoors area for further analysis. Met with residence and provided copy of report illustrating low coal percentage in dust sample. Also provided information from PWCS monitoring data. Resident satisfied that no further action would be taken by PWCS or NCIG.
9/3/2010	Dust	Concern that coal dust is contaminating their drinking water.	Spoke to resident about issue of concern and arranged to visit residence to discuss further. Met with resident at Fullerton Cove residence and discussed concern that coal dust may be contaminating rainwater tank and their drinking water. No coal dust evident due to recent rain. Explained NCIG dust controls. New water filter recently installed at residence. Resident satisfied with NCIG response and will call again if issue arises again.
10/8/2010	Other	Road user was driving past NCIG site on Cormorant Rd and a rock struck windscreen of car. Windscreen was smashed and driver believed rock had come from the NCIG overhead gantry.	Spoke to driver and details of incident discussed. The vehicle driver was driving east along Cormorant Road when a rock struck the windscreen when she was approximately in line with overhead gantry. Driver thought they saw something fall. NCIG reported back that the gantry over the road is full enclosed. There was no coal being moved by conveyor across the road at the time of the incident and there were no other activities being undertaken in the area at the time. It was also reported that NCIG only handle coal and not rocks as reported. Further investigation was undertaken by complainant and determined that the incident was likely caused by a rock (they found the likely rock) that fell off a passing truck.
18/11/2010	Dust	Coal dust noticed on outdoor furniture. Dust noticed during winter months but a problem now as cleaned area to be used. Area didn't get any coal dust prior to NCIG terminal becoming operations.	DECCW will pass on NCIG details to allow resident to contact NCIG if want further action. No contact made with NCIG.
13/1/2011	Dust	A dust complaint was received from a Mayfield resident stating that dust from NCIG has been impacting residence since April 2010.	Left message with complainant to give NCIG a call to discuss issue of concern and organise a meeting to inspect dust. Undertook inspection of residence and discussed dust concerns. Sample of dust taken from rear of property where dust observed to be worst. Dust analysis report provided to resident that detailed that coal component was 4.4%. This is a low reading and resident agreed that no further action required by NCIG.

Date of Complaint	Environmental Concern Raised	Issue	Action Taken
17/1/2011	Dust	Complaint from Mayfield resident stating that dust was an issue in house when north-east and east wind are blowing. Resident believes dust is originating from NCIG coal stockpiles.	Called resident and offered to meet with them at their home to discuss issue of concern and investigate further. NCIG and PWCS met with residents and discussed dust issue of concern. Dust sample was taken from residence and sent for analysis. Analysis of dust sample determined that coal component was 6.6%. On basis of low coal reading it was agreed with residents that no further action required by NCIG or PWCS.
18/1/2011	Dust	Stockton resident rang to complain about dust in house and community. She reported that it is a chronic problem that has been occurring for some months and believes the dust is coming from NCIG coal stockpiles.	Discussed with complainant their concerns about dust in the community. Outlined NCIG dust management system and offered to visit residence to inspect problem. Resident declined offer of visit. Resident will contact NCIG if dust issue becomes further problem and want action from NCIG.
19/1/2011	Dust	Resident from Warabrook registered a complaint in relation to dust fallout. Stated it has been an issue for the last 12 months.	Called complainant and discussed problem which relates to blackening of footpath and other surfaces by coal dust. Offered to come to site for inspection and further discussion of dust concerns. Meeting held with residents and discussed issues of concern. Blackened footpath found to be caused by fungal growth and not due to dust fallout as reported. Resident should contact NCC to discuss cleaning of footpath. NCIG not required to take further action.
19/1/2011	Dust	Stockton resident complaint in relation to dust. Stated that dust very noticeable in the last 6 months mainly when there are westerly winds. Noticeable on window sills and inside house.	Spoke to complainant about dust issue and offered to visit their residence to investigate further. Complainant stated that it is not too bad at the moment. Conditions worst when westerly winds blowing. Left an NCIG contact number and they would call back if it gets bad again and needs investigation.
22/1/2011	Dust	Complaint from Mayfield resident in relation to dust.	Called resident and made arrangement to meet at residence to view dust problem and potentially take sample. Visited residence and discussed dust issue and collected a dust sample from dirty surfaces. Provided dust analysis report to resident which found that the coal component of dust was 3.1%. Low coal component revealed that dust problem not due to NCIG activities. Resident will call back if dust issue gets worse.
25/1/2011	Dust	Dust complaint received from Newcastle resident stating that there is coal dust on his property every day.	Messages left on resident's phone providing contact details and opportunity to call back if they want NCIG to follow up further. Resident to call back if they want further action by NCIG. No contact made with NCIG.

Date of Complaint	Environmental Concern Raised	Issue	Action Taken
27/1/2011	Dust	Complaint received that rocks on road are resulting in vehicle damage along Cormorant Road. This specifically relates to windscreen damage.	Contacted caller and discussed issue. 3 windscreens broken in 12 months on Cormorant Road thought to be caused by NCIG activities. Stated RTA responsibility to maintain road but NCIG currently doing work which should improve conditions.
27/1/2011	Dust	Mayfield resident made complaint about dust on house and driveway.	Spoke to complainant and discussed their dust issue. Problem related to accumulation of dust on recently painted house. Offered to visit house and inspect issue and potentially take sample for analysis. Sample of dust taken from front and back of house and sent for analysis. Analysis of dust samples determined that coal component was 10.2% and 12% for rear and front samples respectively. Discussed with resident that due to house aspect (rear to NCIG) that low coal % unlikely to be due to NCIG activities.
10/2/2011	Dust	Dust complaint received from Warabrook relating to dust in swimming pool at residence over long time period. Not relating to event on day of complaint.	Spoke to complainant in relation to dust issue and offered to visit site to inspect and possibly take sample. Inspection of pool and surrounding area found that there was no evident dust problem. The issue in the pool is related to excessive algae growth. Resident to contact pool maintenance specialist
18/2/2011	Dust	Stockton resident called and enquired about NCIG dust management system. Resident stated that coal dust is an issue in Stockton. Also stated that many residents in the suburb are concerned about dust and the potential impacts on health.	Spoke to resident and provided information about the NCIG dust management system and how it operates. Offered to visit residence and take a dust sample and also to speak to complainant and any other resident that may have concerns about NCIG operation. Resident declined offer of visit. Resident will contact NCIG if dust issue becomes further problem and want action from NCIG.
18/2/2011	Dust	Resident of Stockton made a complaint in relation to what they suspected to be coal dust being deposited on washing on the 17th February. They initially spoke to PWCS about this matter and PWCS have undertaken an initial investigation. Resident also stated that they have noticed increased dust over the last 12 months that they believe to be associated with NCIG coal stockpiles.	Called resident and talked through concerns. They believe dust on washing originated from NCIG stockpiles. Discussed with resident that weather data reveals that for the 17th wind direction was from E and NE before turning south in the afternoon. Based on this and the particle size on washing very unlikely to be from NCIG. They stated that PWCS have visited site and taken a sample of dust for analysis. Resident said they would call back if dust accumulation becomes noticeable again. PWCS analysis of sample collected at the residence found that coal component was 0.8%. Resident provided with copy of analysis report

Date of Complaint	Environmental Concern Raised	Issue	Action Taken
13/3/2011	Dust	Community member driving along Cormorant Road observed excessive dust being produced by reclaiming activities. Their initial concern was that there was a problem with SR01 but then they realised it was dust. A phone message was left with NCIG HSEC Manager and photos were provided.	Spoke to complainant and they provided further detail on what was observed from Cormorant Road. After investigation, provided information to complainant in relation to issue observed. Dust generation from reclaiming activities as a result of pocket of dusty coal in stockpile. Dust evident for approximately 15 minutes. NCIG will investigate further measures to limit risk of dust during future reclamation activities.

In addition to the management of community complaint NCIG also liaised with local community groups in the form of a Community Reference Group (CRG) meeting, held in April 2010. This liaison was typically undertaken on request and was designed to provide information about the progress of the project to interested parties.

NCIG has also developed an initiative titled the Community Support Program. This process involves engagement with local community groups and providing support to community based events and projects. The Program seeks applications on a six monthly basis from community groups that are seeking support for their endeavours. NCIG would undertake an assessment process and provide primarily financial support to these community events and projects. NCIG participated with the community groups in these project and events wherever possible. Through this process groups within the Fern Bay, Stockton, Mayfield and greater Newcastle area were assisted by NCIG.

A Project newsletter was also prepared by NCIG and distributed in January 2011 to surrounding residents of the suburbs of Fern Bay, Stockton, Mayfield West, Mayfield East, Mayfield North, Warrabrook, Tighes Hill, Sandgate and Shortland. The newsletter provided residents with general information relating to the Coal Export Terminal. Specifically information was provided on the progress of operational activities and to notify residents of the commencement of Stage 2AA of Project construction activities and outline noise and vibration generating construction activities to be undertaken that may affect their noise and vibration amenity. The newsletter included details for registering community complaints and enquiries (i.e. telephone number, postal address and email address).

The chronology of community liaison held during the reporting period is outlined in Table 3.13.2.

Table 3.13.2: Community Liaison Summary

Date	Type
April 2010	Community Reference Group Meeting
April 2010	Community Support Program
October 2010	Community Support Program
January 2011	Community Newsletter

3.13.3 Reportable Incidents

No incidents were reported relating to community relations during the reporting period. Complaints received during the period are detailed in the section above.

3.13.4 Further Improvements

No improvement to community relations is required for the next period.

3.14 ENVIRONMENTAL MONITORING PROGRAM

An Environmental Monitoring Programme was implemented to monitor the environmental performance of the Project during construction and the commencement of operations in accordance with the Project Approval (06_0009), environmental licences and other statutory conditions. The programme was established and implemented at the commencement of construction works.

The Environmental Representative was responsible for the implementation of the construction environmental monitoring programme and is responsible for ensuring that adequate environmental monitoring is maintained throughout the Project construction.

The details of the monitoring undertaken are provided in the previous sections, however, an overview of the construction Environmental Monitoring Programme, as they are in both the Construction Environmental Management Plan (CEMP) and Operations Environmental Management Plan (OEMP), is provided in Tables 3.14.1 and 3.14.2.

Table 3.14.1: Construction Environmental Monitoring Program

Monitoring Focus	Monitoring Sites	Frequency	Criteria
Meteorology			
Temperature, relative humidity, net solar radiation rainfall, wind speed and direction and sigma theta (rate of change of wind direction).	Project meteorological station[1].	Continuously monitored and the data averaged over 15 minute periods.	N/A.
Erosion and Sediment Control			
Structural stability and effectiveness in controlling sediment migration.	Drainage, erosion and sediment control infrastructure.	Monthly.	See Appendix C.
Noise			
Attended and unattended noise monitoring.	N1, N3, N5, N9, N13, N14, N15, N16 and N17[1].	Quarterly.	See Appendix A.
Unattended continuous noise monitoring.	Selected locations.	Minimum period of one week per quarter.	See Appendix A.
Air Quality			
Dust deposition[2].	DG1, DG2, DG3, DG4, DG5, DG6 HVAS1, HVAS2, HVAS3, HVAS4, EBAM1, EBAM2, EBAM3 and EBAM4[1].	Quarterly.	Maximum increase of 2 g/m^2/month, up to a total of 4 g/m^2/month.
Vibration			
Ground vibration.	Adjacent industrial receivers within 180 m of piling activities.	Weekly.	See Appendix A.
Surface Water			
pH, electrical conductivity (EC), turbidity, temperature.	Primary and secondary settling ponds, overflow pond.	Monthly.	See Appendix C.
	Surface water monitoring sites[1].	Monthly.	See Appendix C.
Water level.	Primary and secondary settling ponds, overflow pond.	Following heavy rainfall (i.e. more than 20 mm of rainfall in a 24 hour period).	See Appendix C.
Level of collected sediment.	Collection sumps.	Weekly.	See Appendix C.
Groundwater			
pH, EC, TDS, TSS, Al, Co, Cu, Fe, Mg, Mn, Ni, K, Na, total PAHs Zn (refer Table 5).	GW1[1].	Six monthly.	Refer Section 4.3.1.
Acid Sulfate Soils			
Presence of acid sulfate soils or potential acid sulfate soils.	Excavation sites.	Prior to any excavation.	See Appendix B.
	Acid sulfate soil treatment area.	After treatment.	

1 Monitoring sites are shown on Figure 5.

2 Dust deposition will be analysed in accordance with AS/NZS 3580.10.1-2003 *Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.*

Table 3.14.2: Operations Environmental Monitoring Program

MONITORING FOCUS	MONITORING SITES	FREQUENCY	CRITERIA
Meteorology			
Temperature, relative humidity, net solar radiation rainfall, wind speed and direction and sigma theta (rate of change of wind direction).	Project automated meteorological station[1].	Continuously monitored and the data averaged over 15 minute periods.	N/A.
Erosion and Sediment Control			
Structural stability and effectiveness in controlling sediment migration.	Drainage, erosion and sediment control infrastructure.	Monthly and following significant rainfall events (i.e. greater than 20 mm in 24 hours).	See Appendix C.
Noise			
Attended and unattended noise monitoring.	Fern Bay, Stockton, Mayfield, Carrington per Section 4.2 ONMP.	Quarterly.	See Appendix B.
Attended noise monitoring in case of complaint.	Reference locations proximal to the Project[1].	At the commencement of operation.	
Air Quality			
Dust monitoring.	DG1, DG2, DG3, DG4, DG5, and DG6[1].	Monthly	See Appendix A.
	HVAS1, HVAS2, HVAS3 and HVAS4	Every 6 days	
	EBAM1, EBAM2, EBAM3 and EBAM4	Continuous	
	PWCS	Through regular consultation	
Surface Water			
pH, electrical conductivity (EC), total dissolved solids (TDS) and total suspended solids (TSS).	Secondary settling ponds[4].	Monthly.	See Appendix C.
	Surface water monitoring sites[4].	Monthly.	
Water level.	Primary and secondary settling ponds[4].	Following heavy rainfall (i.e. more than 20 mm of rainfall in a 24 hour period).	
Drainage, erosion and sediment control	All areas of NCIG	Monthly.	
Groundwater			
pH, EC, TDS, TSS, sulfate, polycyclic aromatic hydrocarbons (PAH), As III, Cd, Cu, Pb, Hg, Zn, Cr VI, Mn and Ni (refer Table 5).	GW1[1].	6 Monthly.	See Appendix C.
Groundwater level.		6 Monthly.	

1 The location of monitoring sites is shown on Figure 4.
2 Dust deposition will be analysed in accordance with AS/NZS 3580.10.1-2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter– Gravimetric Method.
3 PM_{10} will be monitored in accordance with the Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales (EPA, 2001).
4 The location of monitoring sites in detailed in the OWMF (Appendix C) and Figure 4.

4 COMPLIANCE AUDITS

Audits were undertaken in relation to NCIG Construction activities which considered the compliance status of the Project for the reporting period. These reviews were conducted to meet the requirements of Condition 5.1 of development Approval 06-009 a) as outlined below:

5.1 The Proponent shall develop and implement a **Compliance Tracking Program** to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to:

a) provisions for periodic review of the compliance status of the project against the requirements of this approval;

The details and outcomes of the audits conducted are illustrated below:

4.1 JULY 2010

A review of the compliance status of the NCIG Coal Export Terminal Construction activities was undertaken by the legal firm McCullough Robertson (MR) prior to the commencement of operations of the NCIG Stage 1 Coal Export Terminal in July 2010. This review specifically focussed on the compliance of the Stage 1 NCIG Coal Export Terminal construction works against the Development Consent (06_0009) and meets the requirements of Condition 5.1a).

The outcome of the MR assessment of the NCIG compliance status is as follows:

> *We consider that as at the date of commencement of operations NCIG was in compliance with the relevant conditions of Project Approval 06-009 which were required to be completed prior to the commencement of operations.*

On this basis NCIG commenced operation of the Stage 1 NCIG Coal Export Terminal in accordance with the approved management plans, licences and permits.

4.2 OCTOBER 2010

A review of the compliance status of the NCIG Coal Export Terminal operational activities was initiated by the legal firm McCullough Robertson (MR) in October 2010. This review specifically focussed on the compliance of the Stage 1 NCIG Coal Export Terminal construction works prior to the commencement of Stage 2AA works against the Development Consent (06_0009) and meets the requirements of Condition 5.1a).

The outcome of the MR assessment of the NCIG compliance status is as follows:

> *we consider that NCIG was, as at October 2010, operating in compliance with the relevant conditions of Project Approval 06-009.*

On this basis NCIG continued operations of the Stage 1 NCIG Coal Export Terminal in accordance with the approved management plans, licences and permits and commenced the Stage 2AA construction activities.

4.3 OCTOBER 2010 – COMPLIANCE TRACKING

A review of the Compliance Tracking Program document was undertaken in October 2010 to confirm the ongoing compliance of the NCIG project against the requirements of the development consent (06_0009). This review determined that NCIG met the requirements for all aspects of the consent that were relevant to the stage of the project development as at October 2010 (i.e. elements of the consent relating to operational activities had not been achieved as operations were not yet initiated). With completion of the review, the Compliance Tracking Program document was revised and submitted to the Department of Planning.

5 ACTIVITIES PROPOSED IN NEXT AEMR PERIOD

The commencement of Stage 1 operations and Stage 2AA construction occurred during the reporting period. Significant activity is proposed to be undertaken in the next AEMR period in accordance with the Project Approval and environmental management and monitoring programmes. The principle elements are:

- Continuation of Stage 2AA construction.
- Continual increase in throughput of NCIG Terminal operations.

ATTACHMENT A

DUST DEPOSITION MONITORING RESULTS

	DG1				DG2				DG3				Comments
	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	
Apr-10	0.4	3.2	0.2	0.2	1.0	3.2	0.4	0.6	1.8	3.8	0.9	0.9	
May-10	1.6	2.4	0.8	0.8	1.0	3.0	0.3	0.7	1.0	3.8	0.3	0.7	
Jun-10	0.7	3.6	0.5	0.2	1.4	3.0	0.5	0.9	-	3.0	-	-	
Jul-10	1.2	2.7	0.7	0.5	1.5	3.4	0.6	0.9	4.2	4.0	2.2	2.0	Insects and Bird Droppings found in DG3 and DG6
Aug-10	0.6	3.2	0.4	0.2	2.2	3.5	1.0	1.2	10.0	4.0	4.5	5.7	Bird droppings at DG3
Sep-10	1.1	2.6	0.8	0.3	1.4	4.0	0.5	0.9	3.7	4.0	1.4	2.3	
Oct-10	0.8	3.1	0.1	0.7	1.3	3.4	0.6	0.7	0.2	4.0	0.6	0.6	
Nov-10	0.3	2.8	0.2	0.1	0.6	3.3	0.1	0.5	0.8	2.2	0.4	0.4	
Dec-10	0.7	2.3	0.2	0.5	1.3	2.6	0.4	0.9	0.8	2.8	0.4	0.4	Insects found in all samples
Jan-11	0.2	2.7	0.1	0.1	1.2	3.3	0.7	0.5	1.3	2.8	0.7	0.6	Insects found in all samples, bird droppings in DG06
Feb-11	0.9	2.2	0.5	0.4	0.9	3.2	0.3	0.6	1.4	3.3	0.7	0.7	
Mar-11	1.1	2.9	0.5	0.6	1.0	2.9	0.3	0.7	2.9	3.4	1.6	1.3	

	DG4				DG5				DG6				Comments
	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	IS	Limit	Ash	Com.	
Apr-10	0.6	2.6	0.3	0.3	1.0	3.0	0.6	0.4	2.5	4.0	1.9	0.6	
May-10	0.1	2.6	0.0	0.1	0.6	3.0	0.2	0.4	3.7	4.0	3.0	0.7	
Jun-10	0.6	2.1	0.3	0.3	0.9	2.6	0.5	0.4	2.3	4.0	1.8	0.5	
Jul-10	0.7	2.6	0.3	0.4	1.1	2.9	0.6	0.5	5.7	4.0	4.8	0.9	Insects and Bird Droppings found in DG3 and DG6
Aug-10	0.7	2.7	0.4	0.3	1.3	3.1	0.8	0.5	9.5	4.0	8.2	1.3	Bird droppings at DG3
Sep-10	0.9	2.7	0.3	0.6	1.3	3.3	0.4	0.9	2.8	4.0	2.0	0.8	
Oct-10	1.3	2.9	0.6	0.7	1.5	3.3	0.8	0.7	2.5	4.0	1.1	1.4	
Nov-10	1.6	3.3	0.6	1.0	1.8	3.5	1.0	0.8	1.9	4.0	0.9	1.0	
Dec-10	1.1	3.6	0.4	0.7	1.0	3.8	0.5	0.5	1.6	3.9	0.3	1.3	Insects found in all samples
Jan-11	1.7	3.1	1.0	0.7	1.7	3.0	1.0	0.7	1.6	3.6	0.6	1.0	Insects found in all samples, bird droppings in DG06
Feb-11	1.1	3.7	0.5	0.6	1.4	3.7	0.6	0.8	2.8	3.6	0.9	1.9	
Mar-11	1.0	3.1	0.4	0.6	1.1	3.4	0.5	0.6	1.3	4.0	0.5	0.8	

ATTACHMENT B

SURFACE WATER MONITORING RESULTS

Temperature (°C)

	Rail Loop	Former Big Pond	Delta Pond	Pond F	Deep Pond
23-Apr		*All Ponds are dry*			
28-May	19	19.5	20.2	19.7	-
29-Jun	15	15.5	14.2	14.3	-
27-Jul	16	16.2	15.6	15.5	15.8
24-Aug	19	18.2	17.5	17.7	-
28-Sep	25.7	24.9	25.7	26.7	-

pH

	Rail Loop	Former Big Pond	Delta Pond	Pond F	Deep Pond
23-Apr		*All Ponds are dry*			
28-May	6.9	6.8	6.5	6.07	-
29-Jun	8.5	8.45	8.33	8.65	-
27-Jul	8.31	9.08	8.64	8.24	8.36
24-Aug	7.93	9.02	9.05	8.9	-
28-Sep	7.99	9.1	8.8	9.56	-

Electrical Conductivity (µS)

	Rail Loop	Former Big Pond	Delta Pond	Pond F	Deep Pond
23-Apr		*All Ponds are dry*			
28-May	17000	19500	2930	4490	-
29-Jun	2300	2400	2440	3500	-
27-Jul	2470	6990	2290	3190	2259
24-Aug	2500	2990	5450	2430	-
28-Sep	3800	4850	2630	3770	-

Turbidity (NTU)

	Rail Loop	Former Big Pond	Delta Pond	Pond F	Deep Pond
23-Apr		*All Ponds are dry*			
28-May	15.4	17.3	26.4	393	-
29-Jun	77	65	4	25	-
27-Jul	10.5	15.8	5.8	13.6	140.5
24-Aug	5.6	2.4	17	4.8	-
28-Sep	7.5	18	11.8	8.4	-

Total Dissolved Soilds (PPM)

	Rail Loop	Former Big Pond	Delta Pond	Pond F	Deep Pond
23-Apr		*All Ponds are dry*			
28-May	6000	1250	1750	2720	-
29-Jun	1170	1350	1260	1830	-
27-Jul	1280	3780	1180	1660	1168
24-Aug	1330	1560	3560	1250	-
28-Sep	2000	3670	1350	1930	-

Temperature (°C)

	Pond 2	Deep Pond	Black Swan Pond
Jul-10	16.2	17.7	18.1
Aug-10	18	22	20.4
Sep-10	23.9	20	20
Oct-10	22.5	25.6	28.4
Nov-10	29.2	25.5	21.2
Dec-10	20.2	26	28
Jan-11	31.4	35.8	35.5
Feb-11	24.4	30.3	32.7
Mar-11	21.3	26.9	25.4

pH

	Pond 2	Deep Pond	Black Swan Pond
Jul-10	6.85	7	8
Aug-10	7.58	8.24	10.26
Sep-10	8.25	8.4	10.8
Oct-10	8.8	8.65	10.8
Nov-10	8.65	8.41	9.44
Dec-10	8.32	8.62	9.44
Jan-11	8.63	8.91	8.6
Feb-11	8.67	9.93	9.26
Mar-11	8.04	8.81	9.12

Electrical Conductivity (µS)

	Pond 2	Deep Pond	Black Swan Pond
Jul-10	7.24	3.43	7.9
Aug-10	4.36	2.68	5.34
Sep-10	5.2	4.84	10.8
Oct-10	3.95	5.12	6.12
Nov-10	7.15	2.78	3.11
Dec-10	3.86	3.05	5.62
Jan-11	5.01	5.17	7.49
Feb-11	3.91	5.34	4.18
Mar-11	3.97	5.61	3.55

Turbidity (NTU)

	Pond 2	Deep Pond	Black Swan Pond
Jul-10	13.1	5.4	2.8
Aug-10	18.1	22.3	2.8
Sep-10	34.7	35.5	6.7
Oct-10	12	73	5
Nov-10	8.2	36.8	31.1
Dec-10	10.8	162.9	10.4
Jan-11	35.9	22.3	75.7
Feb-11	11.3	96.2	136.2
Mar-11	12	128.8	27.3

Dissolved Oxygen (mg/L)

	Pond 2	Deep Pond	Black Swan Pond
Jul-10	10.2	9.33	8.6
Aug-10	6.2	5.56	8.6
Sep-10	4.5	2.57	2.09
Oct-10	6	7.04	13.7
Nov-10	6.5	4.13	-
Dec-10	1.28	2.59	2.53
Jan-11	1.98	2.12	3.98
Feb-11	2.7	1.17	2.07
Mar-11	2.61	3.71	4.3

Redox (mV)

	Pond 2	Deep Pond	Black Swan Pond
Jul-10	-	-	-
Aug-10	44	56	21
Sep-10	120	60	42
Oct-10	92	105	12
Nov-10	6	32	-196
Dec-10	66	67	37
Jan-11	18	57	52
Feb-11	48	-14	38
Mar-11	81	22	25