



Interim Annual Review

2015




STRATFORD MINING COMPLEX

ANNUAL REVIEW

Reporting Period: 1st July 2015 to 31st December 2015

Table 1 – Annual Review Title Block

Name of operation	<i>Stratford Extension Project</i>
Name of operator	<i>Yancoal Australia Ltd</i>
Development consent/ project approval #	<i>DA No. SSD-4966</i>
Name of holder of Development consent/ project approval #	<i>Stratford Coal Pty Limited</i>
Mining lease #	<i>ML1360, ML1409, ML1447, ML1521, ML1528, ML1538, ML1577</i>
Name of holding of mining lease	<i>Gloucester Coal Ltd/CIM Stratford Pty Ltd/Stratford Coal Pty Ltd/CIM Resources Ltd/EXCEL Mining Pty Ltd/ICA Coal Pty Ltd</i>
Water licence #	<i>20BL169101, 20BL169102, 20BL169103, 20BL169104, 20BL169400</i>
Name of holder of water licence	<i>Gloucester Coal Ltd/CIM Stratford Pty Ltd/Stratford Coal Pty Ltd</i>
MOP/ RMP start date	<i>1st July 2015</i>
MOP/ RMP end date	<i>30th November 2016</i>
Annual Review start date	<i>1st July 2015</i>
Annual Review end date	<i>31st December 2015</i>
<p>I, (Insert Authorised Reporting Officer Name), certify this audit report is true and accurate record of the compliance status of Stratford Mining Complex for the period of 1st July 2015 to 31st December 2015 and that I am authorised to make this statement on behalf of Yancoal.</p> <p>Note.</p> <p>a) The Annual Review is an 'environmental audit' for the purpose of section 122B(2) of the Environmental Planning and Assessment Act 1979. Section 122E provides that a person must not include false or misleading information (or provide information for inclusion in) an audit report produced to the Minister in connection with an environmental audit if the person knows that the information is false or misleading in a material respect. The maximum penalty is, in the case of the corporation, \$1 million and for an individual \$250,000.</p> <p>b) The Crimes Act 1900 contains other offences relating to false and misleading information: section 192G (Intention to defraud by false or misleading statement – maximum penalty 5 years imprisonment); sections 307A, 307B and 307C (False or misleading applications/information/documents-maximum penalty 2 years imprisonment or \$22, 000, or both).</p>	
Name of authorised reporting officer	<i>Mr John Cullen</i>
Title of authorised reporting officer	<i>Operations Manager</i>
Signature of authorised reporting officer	
Date	<i>6 / 5 / 2016</i>

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1. STATEMENT OF COMPLIANCE

Table 2- Statement of Compliance

Were all conditions of the relevant approval(s) complied with?	
Development Consent DA No. SSD-4966	NO
ML1360, ML1409, ML1447, ML1521, ML1528, ML1538, ML1577	YES

Table 3 – Non-compliances

Relevant Approval	Condition #	Condition Description (summary)	Compliance status	Comment	Section addressed
DA No. SSD-4966	Condition 6 Schedule 3	Prepare a Noise Management Plan and submit to the Secretary for approval prior to 31 December 2015.	Administrative Non-compliance	Refer text below.	Section 1
DA No. SSD-4966	Condition 23 Schedule 3	Prepare an Air Quality Management Plan and submit to the Secretary for approval prior to 31 December 2015.	Administrative Non-compliance	Refer text below.	Section 1
DA No. SSD-4966	Condition 32 Schedule 3	Prepare a Water Management Plan and submit to the Secretary for approval prior to 31 December 2015.	Administrative Non-compliance	Refer text below.	Section 1
DA No. SSD-4966	Condition 39 Schedule 3	Prepare a Biodiversity Management Plan and submit to the Secretary for approval prior to 31 December 2015.	Administrative Non-compliance	Refer text below.	Section 1
DA No. SSD-4966	Condition 43 Schedule 3	Prepare a Heritage Management Plan and submit to the Secretary for approval prior to 31 December 2015.	Administrative Non-compliance	Refer text below.	Section 1
DA No. SSD-4966	Condition 45 Schedule 3	Undertake intersection upgrades prior to 31 December 21015.	Administrative Non-compliance	Refer text below.	Section 1
DA No. SSD-4966	Condition 49 Schedule 3	Prepare a Transport Monitoring Program and submit to the Secretary for approval prior to 31 December 2015.	Administrative Non-compliance	Refer text below.	Section 1
DA No. SSD-4966	Condition 4 Schedule 5	Annual Review submitted to the Secretary by the end of March each year.	Administrative Non-compliance	An Annual Review for the 2014/15 financial year was submitted in October 2015. This Annual Review details activities to the end of 2015.	Whole document
DA No. SSD-4966	Condition 9 Schedule 5	Independent Environmental Audit undertaken prior to 31 December 2015.	Administrative Non-compliance	Refer text below.	Section 10

Development Consent for the Stratford Extension Project (SEP) was granted by the NSW Planning Assessment Commission on 29 May 2015. Stratford Coal Pty Ltd (SCPL) have proposed to delay commencing the development in the near term. SSD-4966 contains several conditions which have specific timeframes for meeting the terms of the consent or as otherwise agreed by the Secretary. SCPL have requested approval of the Secretary for DP&E, to meet the specified requirements at least 3 months prior to the commencement of operations in the new mining areas. The requested extension as submitted to the Department on 16 October 2015, included conditions regarding environmental management plans, environmental auditing, and road and intersection upgrades. A second request was submitted to the Department on 22 December 2015, regarding an extension for the biodiversity offset security and conservation bonds to 12 months after the approval of the Biodiversity Management Plan. At the time of submission, SCPL are currently awaiting a response from DP&E.

2. INTRODUCTION

This Annual Review (AR) has been compiled in accordance with Condition 4 Schedule 5 of Development Consent DA No. SSD-4966. The AR describes the environmental protection, pollution control and rehabilitation activities at the Stratford Mining Complex (SMC) since the last report dated June 2015. As required by Condition 4, comparisons of environmental monitoring results have been made against relevant statutory requirements, monitoring results of previous years and relevant predictions of Environmental Assessments. Environmental activities planned for the next 12 months are also discussed.

The SMC is located approximately 100km north of Newcastle in New South Wales. Refer **Figure 1 (Appendix 1)**.

Stratford Coal Pty Ltd (SCPL) is the owner and operator of the Stratford Mining Complex. SCPL is a wholly owned subsidiary of Yancoal Australia Limited (Yancoal).

The Stratford Mining Complex is located in an area of 1,500ha of cleared former grazing land owned by SCPL to the east of The Bucketts Way, between the villages of Stratford and Craven. Refer **Figure 1 (Appendix 1)**. Development Consent was approved by the NSW Minister for Planning on 19 December 1994 and Mining Lease Number 1360 was granted by the NSW Minister for Mineral Resources on 21 December 1994 with production commencing in June 1995.

Stratford Mining Complex consists of the open-cut Bowens Road North and Roseville West mining pits with a coal handling and processing plant (CHPP) and associated raw and product coal handling and rail loading and unloading facilities. Both pits have been placed into care and maintenance with only minor mining of previously processed ROM coal from the codisposal reclaim area during the reporting period.

Development Consent for the Stratford Extension Project (SEP) was approved by the NSW Planning Assessment Commission as delegate for the Minister for Planning on 29 May 2015. The SEP provides for the continuation and extension of operations at the SMC including the mining of three new open cut areas. At the time of this report no operations have commenced under the SEP.

2.1 MINE CONTACTS

The SMC is an owner operated mine site by SCPL. Site personnel responsible for mining, CHPP, rehabilitation and environmental issues at the end of the reporting period were:

Operations Manager, Stratford & Duralie Operations	Mr John Cullen
CHPP Manager	Mr Paul Davis
Environment & Community Coordinator	Mr Michael Plain

Note that all personnel listed above are employees of SCPL.

3. APPROVALS

3.1.1 Status of Leases, Licences and Approvals

The Stratford Mining Complex has the following approvals:

- Development Consent issued by the Minister for Planning dated 19 December 1994 and various modifications/amendments (refer previous AR reports)
- Mining Lease (ML) 1360 dated 21 December 1994 issued by the Minister for Minerals and Energy to CIM Resources Ltd, Excel Mining Pty Ltd and ICA Coal Pty Ltd. The lease was issued for a period of 21 years.
- Environment Protection Licence (EPL) 5161 in July 2000 issued under the *Protection of the Environment Operations Act 1997* as modified by subsequent variations (refer to EPA website).
- ML 1409 covering the balance of the Roseville Pit was granted for a 21 year period from 7 January 1997.
- Approval of SCM's Mining Operations Plan (MOP), including updates and amendments.
- ML1447 issued on 1 April, 1999. .
- Issuing of Development Consent on 25 July 2001 for the proposed Bowens Road North Open Cut Coal Mine. Mining commenced in the Bowens Road North Mine in February 2003.
- Mining Lease 1528 dated 31st January 2003 issued by the Minister for Minerals and Energy to Gloucester Coal Ltd and CIM Stratford Pty Ltd. The lease was issued for a period of 21 years.
- Approval of Gloucester Coal's BRN MOP, covering life of mine activities, on the 4th February 2003.
- EPL 11745 issued by the Environment Protection Authority in accordance with Section 55, *Protection of the Environment Operations Act 1997* as modified by subsequent variations (refer to EPA website).
- Surrender of the 1994 Stratford Development Consent and replacement with the 1999 Stratford Development Consent when processing Duralie Coal Mine's coal at Stratford commenced. This surrender occurred in July 2003.
- Section 126 *Coal Mines Regulations Act (1982)* approval for the deposition of Duralie and Duralie blend rejects into both the Bowens Road West North and Stratford Main pits was granted during 2003.
- Section 127 *Coal Mines Regulations Act (1982)* approval for the Discontinuance of Roseville and Bowens Road West Pits as Reject Emplacement Areas was issued in November 2003.
- Groundwater licence approval for the BRN, SCM, Bowens Road West and Roseville pits was granted by DIPNR on the 1st September 2004.
- Approval of a Review of Environmental Factors for exploration drilling within the south Stratford area was approved by the DPI in July 2005
- ML 1577 was granted on the 1st March 2006 allowing mining activities within Ellis' Corner.
- Exploration Lease 6904 was granted on the 9th October 2007.
- Modification to Development Consent on 26 November 2010 to approve the deepening of the Roseville West pit, rail loop augmentation, provision for additional rejects and waste rock to be emplaced in the Main Pit void and approved an irrigation area.

- Modification to the Development Consent on 26 November 2010 to approve the westward pushback of the BRN pit highwall and increased permitted rate of coal mining from 0.9 million tonnes per annum (Mta) to 1.0 Mta.
- Approval of Development Consent (SSD-4966) for the Stratford Extension Project was granted by the Planning Assessment Commission as delegate of the Minister for Planning on 29 May 2015. The expiry of this licence is 31 December 2025.
- Stratford Mining Complex Mining Operations Plan was update and approved by the Director General for DRE on 23 June 2015 following approval of the Stratford Extension Project. The term of acceptance for the MOP is 1 July 2015 to 30 November 2016.

3.1.2 Amendments to Approvals/Licences over the Reporting Period

The following approvals and amendments were granted during the reporting period;

- Commonwealth approval for the Stratford Extension Project (EPBC 2011/6176) was granted by the Department of the Environment on 29 January 2016.
- Mining Lease 1733 for the Avon North Open Cut was granted by the Minister for the Resources & Energy on 8 April 2016.

4. OPERATIONS SUMMARY

Table 4 - Production Summary

Material	Approved limit (specify source)	Previous reporting period (tonnes)	This reporting period (tonnes)	Next reporting period (tonnes)
Waste Rock/ Overburden	N/A	0	0	0
ROM Coal (SMC Only)	2.6 million tonnes per annum	143,996	79,050	1,655,000
Codisposal Reject	Approx. 12.3 million tonnes over life of project.	523,295	257,573	499,000
Saleable product	N/A (Process limit of 5.6 million tonnes per annum)	1,638,164	715,100	1,156,000

Total saleable product for the 6 month reporting period was 715,100 tonnes.

Forecast production from the Co-Disposal reclaim for the next reporting period is 108,000 tonnes inclusive. Production will continue from Co-Disposal reclaim at approximately 9,000t/month.

Total waste mined (BRN/Roseville/Codisposal) during the reporting period was 0 bcm.

Actual coal production to date by month for the full reporting period is shown in **Table 5**.

Table 5: Product Coal Produced by Month

MONTH	Coking Coal	Thermal Coal	Total Product Coal
July 2015	66,303	79,290	145594
August 2015	52,427	47,892	100318
September 2015	49,589	64,543	114132
October 2015	83,787	76,703	160490
November 2015	66,273	57430	123703
December 2015	37,048	33816	70863
Total Annual	355,427	359,674	715,100

4.1 EXPLORATION

No exploration was carried out within Authorisation 315 during the reporting period. A program to plug and rehabilitate approximately 20 historic boreholes was completed during the reporting period.

At the time of publication, no exploration activities are planned for Authorisation 315 during the 2016 reporting period.

4.1.1 Estimated Mine Life

Mining of the Bowens Road North pit ceased in September 2014. Mining in the Roseville West pit had ceased in December 2013.

Processing of coal from both the Co-disposal area (refer 4.2 below) and receiving coal from Duralie Coal Mine for coal processing, handling and railing continued during the reporting period.

No activities have commenced under the Stratford Extension Project at the time of submission of this Annual Review.

Proven and probable reserves for the Stratford Mine as of 31st December 2015 was 38.8 million tonnes, based on depletions from the June 2014 JORC statements. Further detail is provided in the JORC Guidelines.

4.2 OPEN CUT MINING

Mining in BRN and Roseville West pits has now ceased for the interim.

Reprocessing of previously emplaced CHPP reject material (Cell 3 and Cell 2) to produce a low grade thermal coal product continued during the reporting period and will continue during the 2016 operational term.

No mining is scheduled to occur within the coming year under the existing project with the exception of reprocessing of emplaced CHPP reject material.

4.2.1 Mining Equipment and Method

The mining equipment currently in use at SMC is listed in **Table 6** provided below.

Table 6: Current Mining Equipment

Item	Description	Number
Excavator	Komatsu 20T	1
Rigid Dump Truck	Caterpillar 775F	2
Articulated Dump Truck	Volvo A40	2
Track Dozer	Caterpillar D10T	1
Track Dozer	Caterpillar D10R	1
Water Cart	Caterpillar 775E	1
Front End Loader	Caterpillar 988H	1
Front End Loader	Caterpillar 992k	1

The mining sequence in the SMC open cuts is summarised below:

- Tree clearing is limited to the minimum required for ongoing operations and undertaken ahead of the advancing face or dump. The distance is limited to 100m where possible.
- Topsoil is removed to a nominal depth of 100mm. Topsoil is generally stripped down to the underlying clay layer or bleached B horizon, depending on soil type.

- Overburden removal is undertaken by hydraulic excavator in backhoe configuration. Generally, the first 10m of clay overburden is free-dug or ripped. All other overburden needs either blasting or ripping prior to excavation.
- Significant coal partings are removed using a small hydraulic excavator in backhoe configuration.

The majority of overburden waste excavated is re-deposited in previous mined open cut pits. Codisposal waste continues to be placed as reject material within the Stratford Main Pit.

4.3 COAL HANDLING AND BENEFICIATION

4.3.1 Washery Throughput

Coal is processed in a 600 tonnes per hour (tph) coal handling and processing plant (CHPP) with coarse coal (i.e. 50mm down to 1mm) treated using dense medium cyclones (50mm to 1.5mm), “teeter bed” separator/spirals (1.5mm to 0.4mm) and floatation (0.4mm to <0.1mm). The CHPP operates on a two shift, 7 days per week basis. Feed to the CHPP is by front end loader based on blending of coal plies from the ROM stockpile. The essential elements of the CHPP and their design capacities are as follows:

ROM coal production	5.6 Mtpa
CHPP feed rate	600 tph
Product coal	3.3 Mtpa
Train load out rate	3,000 tph

Reclaimed previously emplaced CHPP reject material was also used as feed for the CHPP, as an addition to Duralie ROM coal during the reporting period.

4.3.2 Coal Stockpile Capacity (ROM & Product)

ROM coal stockpile capacity	150,000 t
Product coal stockpile capacity	400,000 t

4.3.3 Product Transport

There were no changes to the mode of product transport during the reporting period. All saleable coal is transported from site by rail. A total 205 trains were loaded at SMC during the reporting period.

4.4 WASTE MANAGEMENT AND RECYCLING

4.4.1 Chemical Characterisation of Residues

During the reporting period the CHPP received coals from the Stratford Co-disposal reclaim area, and the Duralie Coal Mine.

CHPP waste material generated from the Stratford and Bowens Road North mines has been previously analysed. Geochemical testing has indicated that:

- Mudstone, sandstone and clay spoil materials are classified as non-acid forming;
- Carbonaceous spoil materials are classified as potentially acid forming with a low capacity to generate acid;

- Dense Media Bath reject materials are classified as non-acid forming; and
- Co-disposed slimes are likely to be non-acid forming whilst co-disposed beach deposit materials are potentially acid forming with a low capacity to generate acid.

Reference should be made to the *Stratford Coal Mine, Life of Mine Reject Disposal Plan, Version 5* (approved 2010) (Gilbert & Associates 2009) for a detailed description of reject management at the Stratford Coal Mine. In general the rejects, both coarse and fine fractions, are pumped via pipeline from the CHPP to the Stratford Main pit where they are deposited below final void ground water levels.

4.4.2 Sewerage Treatment and Disposal

Sewerage treatment at the mine site consists of:

- A “Bio-Treat” tank system located at the main site office. The system works on the combined principles of primary settlement and aerobic treatment. Treated effluent is then discharged via a spray system into a grassed area near the office. An additional line of irrigation was installed within the existing effluent disposal area during the previous reporting period;
- A similar primary treatment and aeration system located at the CHPP. Treated effluent is pumped onto a vegetated area south of the CHPP incorporating the CHPP noise bund;
- A septic tank system for treatment of sewage from the Training Building. “Grey water” is discharged via a spray system into a grassed area near the main site office.
- An active aeration system for treatment of sewage from the bath-house complex. Secondary stage treated effluent is discharged via the spray irrigation system servicing the main office building;
- A one (1) man septic tank system and transpiration trench located at the Rail Load-out Bin; and

These sewerage treatment facilities are registered with Gloucester Shire Council.

4.4.3 Fuel Containment

Fuel (diesel) at the mine site is stored within a fuel farm facility (adjacent to the Workshop). A Dangerous Goods Notification was held for this facility during the reporting period. No incidents or reportable spills related to this facility occurred during the reporting period.

The fuel farm contains one (1) 110,000 litre above ground diesel tank. A concrete bund surrounds the tank. Rainfall and any spilt fuel within the bunded area is directed to a collection sump from where it is pumped to a reclaimer system located in the lube bay and passed through an oil water separator.

The CHPP area has two above ground tanks containing chemical reagents, a 10,000 litre tank contains diesel and a 20,000 litre tank contains a frother, “Metfroth”.

4.4.4 Oil and Grease Containment and Disposal

Bulk oil is stored within a bunded area.

Used engine oils (lubricating oils) and hydraulic oils are recovered during plant and vehicle servicing in the workshop and in the field.

Within the workshop area, a separate bunded area holds an 18,000 litre waste oil tank and oil/grease drums. The lube bay is fitted with a silt trap and oil separator. A wash pad facility also contains a silt trap. Waste oil is removed from site by a commercial contractor for subsequent recycling off-site on a

regular basis.

Oil for gearboxes and lubrication at the CHPP is stored in drums in a concrete bunded area.

All contractors are required to manage and remove from site all waste oil generated during their operations.

Used oil filters are stored within wheelie bins and removed from site by a suitably licensed contractor.

4.4.5 Used Tyres

Used tyres generated on-site are disposed of by burial at the mine site within backfilled sections of the Open pits. Consultation has previously occurred with the EPA.

- Tyres are placed in discrete lots and buried with a minimum cover of 5 metres;
- Disposal sites are adequately recorded for future reference. The depth of disposal is also recorded;
- Tyres stockpiled for disposal are adequately protected from fires; and
- Tyres disposed of are not placed with any other combustible material.

4.4.6 Rubbish Disposal

All domestic rubbish (e.g. food scraps, paper etc.) is deposited in industrial rubbish bins that are periodically emptied by a registered waste contractor and tracked in accordance with legislative requirements.

Scrap metal at the CHPP and Workshop is collected and placed in bins that have been provided by a scrap metal merchant. The merchant collects the scrap metal whenever the bins become full.

Used 205L drums are periodically collected by a licensed contractor. Paper and cardboard is collected for recycling from the Workshop, CHPP and Main Office building. Mixed recycling bins are located at the main office. All contractors are responsible for the collection and removal of their own rubbish.

4.5 HAZARDOUS AND EXPLOSIVE MATERIALS MANAGEMENT

Hazardous materials are stored and used in accordance with relevant safety data sheets (SDS).

Bulk explosive are approved for storage within an explosive compound at site. No blasting activities are currently being undertaken at the SCM and there are currently no explosives stored on site.

4.5.1 Status of Licences

Workcover NSW Dangerous Goods Notification 35/030521 applies to the Stratford Coal Mine.

5. ACTIONS REQUIRED FROM PREVIOUS ANNUAL REVIEW

The Department of Planning & Environment provided notification on 11 November 2015 that the SMC Annual Review 2015 was generally in accordance with the project approval requirements and no amendments were required.

The Division of Resources & Energy have provided notification of a proposed site inspection to be undertaken in May 2016 and no other actions have been received regarding the 2015 report.

Table 7: Actions from the previous Annual Review

Action required from previous Annual Review	Requested by	Action taken by the operator	Where discussed in Annual Review
Follow IMP Guideline for 2016 AR	DP&E	Guideline followed	Throughout Review

6. ENVIRONMENTAL PERFORMANCE

6.1 REVIEW OF PERFORMANCE

A review of environmental performance in relation to EPA EPL's and Development Consent Conditions is summarised below. This performance is further discussed in the sections on environmental management activities and environmental monitoring.

6.1.1 Environment Protection Licences 5161 and 11745

- All monitoring has generally been carried out in accordance with licence conditions,
- Monitoring of dust, water quality, noise and blasting have been carried out in accordance with a schedule agreed to by EPA.
- Records of environmental monitoring activities have been kept.
- A record of alleged pollution complaints has been maintained.
- A copy of this Annual Review has been forwarded to the EPA as well as other agencies as listed in the Development Consent. These agencies are the Division of Resources & Energy (DRE), Gloucester Shire Council (GSC), SMC Community Consultative Committee, Department of Planning & Environment (DP&E) and National Parks & Wildlife Service (NPWS).
- Dust suppression measures are in place. Dust monitoring to date (dust deposition gauges and high volume (PM10) air samplers) shows that current dust suppression systems are effective and dust levels are generally below the conditions of consent limits. Monitoring results during the reporting period have demonstrated compliance of the SMC with the air quality management criteria.
- Quarterly noise compliance monitoring was carried out during September 2015 and December 2015. On the basis of calculated noise measurements, daytime, evening and night time noise compliance was achieved for all noise surveys. Accordingly, the noise monitoring results during the reporting period, do not constitute a breach of the noise criteria provided in the EPL's.

6.1.2 Development Consent or Approval Conditions

Development Consent for the Stratford Extension Project (SEP) was granted by the NSW Planning Assessment Commission on 29 May 2015. Stratford Coal Pty Ltd (SCPL) have proposed to delay

commencing the development in the near term. SSD-4966 contains several conditions which have specific timeframes for meeting the terms of the consent or as otherwise agreed by the Secretary. SCPL have requested approval of the Secretary for DP&E, to meet the specified requirements at least 3 months prior to the commencement of operations in the new mining areas. The requested extension as submitted to the Department on 16 October 2015, included conditions regarding environmental management plans, environmental auditing, and road and intersection upgrades. A second request was submitted to the Department on 22 December 2015, regarding an extension for the biodiversity offset security and conservation bonds to 12 months after the approval of the Biodiversity Management Plan. At the time of submission, SCPL are currently awaiting a response from DP&E.

Project Approval conditions which were met during this reporting period include those related to administrative and reporting conditions, operation of a meteorological station and inversion towers, operation of dust monitoring equipment including real-time dust, operation of a real-time noise unit, operation of a community hotline, operation of a community consultative committee, surface and ground water monitoring including biological monitoring, blast monitoring including a blast hotline, and rehabilitation monitoring. Environmental monitoring data was regularly reported as required by the project approval and associated environmental management plans.

No Independent Environmental Audit of the Stratford Mining Complex were scheduled during the reporting period.

An Independent Environmental Audit of the Stratford Mining Complex was conducted by Trevor Brown and Associates during November 2014. The audit conclusions indicated a generally high standard of compliance of the Stratford Coal Mine Project activities with the relevant conditions of approval granted to the project under the Development Consent, Environmental Protection Licences and Mining Leases. The audit report and SCM's response to the recommendations were provided to DP&E in February 2015. Following further correspondence with DP&E the audit report was revised and resubmitted to DP&E on 16 July 2015. Following acceptance by DP&E the full audit report and responses to the recommendations will be made available on the Stratford Coal website at <http://www.stratfordcoal.com.au/environment/environmental-audit.php>

6.2 METEOROLOGICAL MONITORING

A meteorological station (i.e. weather station) is operated at the mine site as required by the Development Consent. The location of the station is shown on **Figure 2 (Appendix 1)**.

6.2.1 Rainfall

Table 8 below summarises the rainfall record obtained from the site Weather Station (tipping bucket) rain gauge during the reporting period. The graphical representation of monthly recorded rainfall during the reporting period is provided in **Appendix 2**.

Table 8: Stratford Mine - Monthly Rainfall Records

MONTH	YEAR				Stroud District Average ³ 1889-2010
	2015		2014		
	Monthly Total (mm)	No. of Rain Days/Month ²	Monthly Total (mm)	No. of Rain Days/Month ²	
January	105.2	10	23.0	5	115.3
February	59.0	12	61.2	8	125.0
March	101.2	9	126.0	13	147.3
April	106.6	11	45.0	14	100.9
May	137.2	15	11.8	7	91.5
June	21.8	11	26.8	12	101.1
July	12.6	8	15.2	5	75.1
August	40.0	2	113.8	15	65.3
September	58.8	13	47.6	11	63.1
October	38.0	9	17.2	5	78.3
November	154.0	14	40.6	8	83.3
December	105.8	11	188.0	19	100.8
Total	940.2	125	716.2	122	1147.0

- Notes:
1. No. of Rain Days/Month - the number of days in the month on which rain fell.
 2. When tipping bucket rain gauge data used, a "rain day" by definition requires a minimum recording of >0.20mm comprising dew, heavy fog or light rain (or a combination thereof).
 3. Average based on Stroud Post Office records

The 2015 calendar year rainfall total was lower than the long-term district average. Four of the twelve months in this period exceeded their respective long term average.

The three wettest months for the AR reporting period (July 2015 to December 2015) were (in order, wettest first): November 2015, December 2015 and September 2015. Reciprocally, the three driest monthly periods were (in order of increasing rainfall): July 2015, October 2015 and August 2015.

6.2.2 Wind Speed and Direction

Table 9 below indicates the monthly minimum, average and maximum wind speeds and the dominant wind directions by month for the period July 2015 to December 2015, inclusive. The graphical representations of the monthly minimum, average and maximum wind speeds recorded for each month during this period are provided in **Appendix 2**.

Table 9: Monthly Average and Maximum Wind Speeds and Dominant Wind Directions by Month

MONTH	MINIMUM WIND SPEED RECORDED (m/s)	AVERAGE WIND SPEED (m/s)	MAXIMUM WIND SPEED RECORDED (m/s)	DOMINANT WIND DIRECTIONS
July 2015	0	1.8	20.3	NNE, SSW
August 2015	0	1.8	15.1	NE
September 2015	0	2.2	18.4	SSW
October 2015	0	2.3	14.9	NNE
November 2015	0	2.3	16.7	NNE, SSW
December 2015	0	2.5	18.1	NNE

6.2.3 Temperature

Table 10 summarises monthly air temperatures for the reporting period.

Table 10: Monthly Minimum, Average and Maximum Air Temperatures

MONTH	MINIMUM AIR TEMP RECORDED (degC)	AVERAGE AIR TEMP (degC)	MAXIMUM AIR TEMP RECORDED (degC)
July 2015	-2.6	9.9	21.4
August 2015	-2.7	12.0	28.1
September 2015	0.7	14.0	29.9
October 2015	7.9	19.5	37.4
November 2015	10.1	20.9	39.0
December 2015	9.9	21.5	37.6

The graphical representation of the daily minimum, average and maximum atmospheric temperatures recorded for each month during this period is provided in **Appendix 2**.

6.3 AIR QUALITY

6.3.1 Dust Control Procedures

At the CHPP, potential dust emission sources are controlled by water sprays at a number of locations:

- Run of Mine (ROM) Coal Bin
- Crusher Station
- Stamler Feeder/Breaker
- Product Coal Stockpile (overhead sprays on the conveyor)

Sprays are automated in most instances by a solenoid connected to the weight of material on the conveyor belt. Sprays at the ROM Bin, Crusher Station and Stamler operate when 50t/hr of material is on the belts.

The product coal stockpile sprays are located on the overhead conveyor system. A wind speed/direction device provides information to a computer located in the coal preparation plant control room that can electrically activate solenoids valves. The valves open and close in a programmed cycle that alternatively activates sprinkler heads above the stockpile. The dust suppression system operates when the wind speed exceeds 5m/s for >30 seconds.

The following dust control procedures are used during mining operations:

- Minimising topsoil stripping operations ahead of the pre-strip to minimise the area of exposed ground;
- Restricting the extent of area exposed to dust generation;
- Minimising truck overloading and spillage onto haul roads;
- Fitting drills with dust suppression equipment;
- Regular maintenance of haul roads;
- Prompt rehabilitation of disturbed ground;
- Watering of haul roads; and
- Watering of disturbed areas at the end of shift on Saturdays to help mitigate any potential dust generation on Sundays and on public holidays when the mine is not operating (as necessary).

6.3.2 Dust Monitoring and Criteria

Stratford Coal Pty Ltd monitors air quality (dust) surrounding the mine site by means of a network of seven (7) static dust fallout gauges, five (5) high volume PM₁₀ air samplers and a meteorological monitoring station (i.e. weather station). The locations of these monitoring sites are shown on **Figure 2 (Appendix 1)**.

Monthly dust fallout levels are measured so that dust deposition rates in g/m²/month can be determined at or near seven (7) residences that surround the mine site. The annual average condition of consent limit for dust deposition is 4.0g/m²/month. Petrographic (evaluation for the presence of coal) analysis is undertaken on dust collected from sampling locations D5 and D6.

The high volume air samplers (HVAS) (PM₁₀), also used for total suspended particulate (TSP) estimation, are located near Stratford Village, Craven Village, Clarke residence, ex-Ellis residence and Cassar residence. The Cassar HVAS was installed in 2008 to provide background data and is not currently a licensed location. Sampling is undertaken over a 24 hour 6 day week cycle in accordance with AS 2724.3. The EPA goal for PM₁₀ air quality is an annual average limit of 30ug/m³/day and a National Environmental Protection Measure (NEPM) 24-hour average limit of 50ug/m³/day. The National Health and Medical Research Council (NHMRC) goal for TSP air quality is an annual average of 90 ug/m³.

6.3.3 Review of Dust Monitoring Results

6.3.3.1 Dust Deposition Gauges

Dust levels recorded were all less than 4.0g/m²/month with the exception of one high result in December 2015 at gauge D6. This result was found to be affected with insects, vegetation and other contaminants. The annual average dust levels did not exceed the conditions of consent annual

average limit of 4g/m²/month for any deposition gauge. Graphical representation of the dust deposition results and annual averages for the seven (7) dust deposition gauges (D5-D11) are provided within **Appendix 3**.

The percentage of coal recorded within insoluble matter from location D5 and D6 was 10% or less on all sampling months.

The dust deposition monitoring results are similar to results presented in previous reports and align with predictions made in the Stratford Extension Project EIS (2012) that dust deposition levels would not exceed relevant air quality criteria at any residence.

6.3.3.2 High Volume (PM₁₀) Dust Samplers

Figure 4-3 (Appendix 3) shows the HVAS monitoring results in µg/m³/day (24 hours) for the monitoring sites at Stratford, Craven, Clarke, Ellis and Cassar for the reporting period. All monitoring results were less than the EPA limit of 50µg/m³/day.

Figure 4-4 (Appendix 3) shows the running/cumulative average for the five HVAS during the reporting period. Annual averages for all sampling locations were below the 30 µg/m³/day EPA limit.

6.3.3.3 High Volume (TSP) Dust Calculation

Figure 4-5 (Appendix 3) shows the Total Suspended Particulate estimates across the five HVAS during the reporting period. A local PM₁₀-TSP relationship was previously established (refer previous ARs) to support derivation of TSP results from actual reporting period PM₁₀ measurements. The EPA Impact Assessment Criterion of 90 ug/m³ was not exceeded during the reporting period.

The HVAS monitoring results are generally similar to those reported in previous ARs and align with predictions made in the Stratford Extension Project EIS (2012) that particulate levels (PM₁₀ and TSP) would not exceed relevant air quality criteria at any residence.

6.3.3.4 TEOM (PM₁₀)

A Tapered Element Oscillating Microbalance analyser (TEOM) which measures PM₁₀ on a real-time continuous basis began operation in June 2013. The annual average from 1 July 2015 to 31 December 2015 is 11.3ug/m³ for PM₁₀. There were nil results exceeding the 24 hour average PM₁₀ criteria of 50ug/m³ recorded during the reporting period. 24 hour average results for the reporting period and graphical representation of the running/cumulative average of PM₁₀ results are provided in **Appendix 3**. The TEOM results are generally consistent with those measured by the HVAS units. The TEOM results continue to be utilised as a management tool for operations to determine proactive and reactive dust controls.

6.4 SEDIMENT AND EROSION CONTROL

Sediment generation and erosion is primarily controlled by:

- Timely progressive rehabilitation and vegetation establishment on disturbed areas (e.g. completed sections of the overburden dump) to minimise the area exposed to erosion;
- The direction of runoff from disturbed areas into sediment dams for settlement of suspended solids; and
- The placement of silt fences down slope of other disturbed areas (e.g. down slope of topsoil stockpiles before a grass cover has been established).

All sediment dams are monitored on a minimum quarterly basis or following receipt of sufficient rain whereby such dams have the potential to spill. Maintenance activities are undertaken on sediment

dams as required. Sediment dams are cleaned out when the storage volume is reduced by sediment deposition (i.e. when 30% of storage volume is lost to sediment build up) and inspected after major rainfall events. Silt fences are cleaned out and/or repaired to maintain their effectiveness.

During the reporting period no spills occurred from any of sediment dams. It should be noted that at all times pumping (where possible) of sediment dams in order to prevent or limit the amount of spilling water was undertaken. Prioritisation of pumping operations takes into account the likely quality of spilling water when a dam was considered vulnerable to spilling.

Areas under rehabilitation are stabilised by structural controls such as bench drains and contour banks (if required) to break up effective slope length exposed to erosion. Final slopes will generally not exceed 14 degrees in order to limit the potential for erosion and sediment generation. For any final slope exceeding 14 degrees, DRE approval is obtained.

6.5 BIOREMEDIATION

Operations at the SCM are conducted with the aim of minimising the potential for land contamination. A bioremediation area, was established at the end of February 2014. A logbook is kept which covers deposition, maintenance and disposal of materials from the bioremediation area.

No upgrade of the bioremediation facility was undertaken during the reporting period as operations have been in care and maintenance and only minor volumes of contaminated material have been deposited at the current facility.

6.6 FLORA AND FAUNA MANAGEMENT

No vegetation clearance activities were undertaken during the reporting period and no activities are planned for the next reporting period. As such minimal management of flora and fauna has been required with the exception of weed and feral pest management.

6.6.1 Biodiversity Offsets

An Offset Strategy has been implemented at the SMC as a requirement under the BRN Development Consent Modification (2010). The BRN Offset area is adjacent to the Duralie Offset and is managed under the approved Duralie Coal Biodiversity Management Plan. The Duralie Coal Mine Annual Biodiversity Report contains a review of SCM environmental performance and progress against the requirements of the Biodiversity Management Plan covering the biodiversity offset area. A summary of the report is provided in Section 3.9 of the Duralie Coal Mine Annual Review.

A Biodiversity Offset Strategy is also required under the SEP Development Consent (2015). A Biodiversity Management Plan will be developed prior to operations commencing which will describe the management measures to be undertaken in the Biodiversity Offset Area, the Biodiversity Enhancement Area and the Rehabilitation Areas.

6.7 WEED CONTROL

An independent contractor is engaged to provide weed spraying services on all mining leases and company owned residential properties. Weed control activities were undertaken during the reporting period for the various target species including Giant Parramatta Grass, Lantana, Blackberry and Tussock grass.

6.8 BLASTING

6.8.1 Blast Criteria and Control Procedures

No blasting activities were undertaken at the Stratford Mining Complex during the reporting period. However, should any blasting resume then SCPL will reinstate the approved Blast Management Plan and monitoring requirements under relevant Development Approvals and EPL licenses.

6.8.2 Review of Blast Monitoring Results

There was no blasting during the reporting period.

6.8.3 Dilapidation Reports

No dilapidation inspections were undertaken during the reporting period.

6.8.4 Complaints

No blast related complaints were received during the reporting period.

6.9 NOISE

6.9.1 Noise Criteria and Control Procedures

SCPL undertakes quarterly attended noise monitoring surveys in order to determine status of compliance with noise limits provided in the Development Consent and Environmental Protection Licences (EPLs). Quarterly monitoring was conducted at the Atkins, Clarke Gates, Ellis, Hall, Lowry, Pryce Jones and Van der Drift for the September 2015 and December 2015 surveys.

During quarterly noise surveys LA_{eq} (15 minute) noise levels are measured and recorded then compared to the permitted day, evening and night noise limits. Monitoring results and reports are available on the Stratford Coal Mine website.

6.9.2 Review of Noise Monitoring Results

Noise monitoring during the reporting period was undertaken in September 2015 and December 2015. A summary of Noise Survey results are provided in **Tables 11 and 12**. Full quarterly noise reports can be accessed on the Stratford Coal website (www.stratfordcoal.com.au).

Table 11: Stratford Mine Noise Contribution – September 2015 Survey

Monitoring	Sound Pressure Level	Sound Pressure Level	Sound Pressure Level	Noise Criteria (day/evening/night)	Excursion dB(A)
Location	LA _{eq} (15 minute) for Day 14/09/15	LA _{eq} (15 minute) for Evening 14/09/15	LA _{eq} (15 minute) for Night 14&15/09/15	LA _{eq} (15 minute)	LA _{eq} (15 minute)
Atkins	Nil	27	Nil, Nil	35	0/0/0,0
Clarke Gates ³	Nil	Nil	--		0/0/0,0
Ellis ¹	Nil	Nil	--		0/0
Hall	Nil	32	25,22		0/0/0,0
Lowry ¹	Nil	32	29, 27		0/0
Pryce Jones	Nil	35	35, 32		0/0/0,0
Van der Drift ¹	29	30	29, 24		0/0/0,0

¹ Owned by Stratford Coal Pty Ltd (SCM)

² Land subject to acquisition upon request

³ A private agreement exists between the SPCL and this residence

The Stratford Mine noise emissions were found to be compliant with the day, evening and night-time noise criterion at all residences on privately owned land for the September 2015 noise monitoring survey. Monitoring results and reports are available on the Stratford Coal Mine website.

Table 12: Stratford Mine Noise Contribution - December 2015 Survey

Monitoring	Sound Pressure Level	Sound Pressure Level	Sound Pressure Level	Noise Criteria (day/evening/night)	Excursion dB(A)
Location	L _{Aeq} (15 minute) for Day 14/12/15	L _{Aeq} (15 minute) for Evening 14/12/15	L _{Aeq} (15 minute) for Night 14/12/15	L _{Aeq} (15 minute)	L _{Aeq} (15 minute)
Atkins	Nil	Nil	20	35	0/0/0,0
Clarke Gates ³	Nil	Nil	--		0/0/0,0
Ellis ¹	Nil	Nil	--		0/0
Hall	Nil	Nil	27		0/0/0,0
Lowry ¹	Nil	30	26		0/0
Pryce Jones	Nil	27	32		0/0/0,0
Van der Drift ¹	Nil	29	Nil		0/0/0,0

¹ Owned by Stratford Coal Pty Ltd (SCM)

² Land subject to acquisition upon request

³ A private agreement exists between the SPCL and this residence

The Stratford Mine noise emissions were found to be compliant with the day, evening and night-time noise criterion at all residences on privately owned land for the December 2015 noise monitoring survey. Monitoring results and reports are available on the Stratford Coal Mine website.

A review of 2015 quarterly noise survey results in light of the SEP Development Consent indicates that survey results were consistent with EIS predictions and compliant with the Development Consent noise criteria. Accordingly, and in compliance with the approved Stratford Noise Management Plan (Vipac 2006) and the INP, noise monitoring results are in compliance with noise criteria provided in the applicable planning approvals.

6.9.3 Mobile Plant Noise Assessments

The SMC fleet of mobile plant including haul trucks, excavators, dozers, loaders and other items are annually assessed for sound power levels (SWL).

Availability of mobile plant for noise testing is subject to production requirements and servicing/maintenance/breakdowns.

Noise assessments of mobile plant are scheduled to be undertaken again during the 2016 reporting period.

6.9.4 Noise Control Measures

The following operational measures have been undertaken (both prior to, and during, this Annual Review period) in an effort to reduce/control noise emissions. Operations in the BRN and Roseville pits have currently ceased.

- BRN mining fleet of 789 Cat trucks and 994 Liebherr excavators replaced with smaller (and relatively quieter) Cat 775E and Cat 30T trucks and small excavators; operations have now ceased;
- Roseville mine fleet Cat 30T trucks and small excavators; operations have now ceased;
- Roseville pit haul road surface designed below natural surface to reduce noise emissions;
- Establishment of noise bunds on the western side of Roseville Extension Pit;
- Reversing sirens on mobile plant replaced with broad band "duck quacks";

- Start up alarms on CHPP conveyors have been turned down to minimum levels still consistent with coal mine safety regulations;
- Installation of exhaust mufflers on product stockpile dozer;
- Installation of noise cladding on secondary crushing circuit;
- Installation of noise attenuation boarding adjacent to ROM hopper;
- Maintenance of acoustic barriers (e.g. noise bunds) along the northern side of the main haul road, the western site of the western haul road and the western side of the Roseville haul road to control noise emissions from mobile plant. Noise bunds are also maintained on the western side of the BRN haul road and northern perimeter of the BRN box cut;
- Export train scheduling is under the control of Pacific National, the rail transport contractor, in conjunction with the Rail Infrastructure Corporation, rail ownership and management. Pacific National was approached by SCPL with a view to scheduling trains on day and afternoon shifts as much as possible to avoid/minimise train loading on night shift. However, Pacific National reiterated its previous position of being constrained by other non-coal users of the Northern Rail Line as well as demands at the Newcastle coal loading facility, and hence is not able to avoid night time train loading;
- Use of a D10T XQ dozer for use on the product stockpile, a machine that is quieter relative to earlier equivalent plant;
- Noise cladding (Hushclad) of the CHPP southern wall completed during 2012;
- Enclosure of train loader completed February 2014: and
- Commissioning and ongoing use of a continuous noise monitoring unit (“real time noise monitoring”).

Further control measures would be implemented prior operations commencing in accordance with the SEP Development Consent and EIS.

6.9.5 Noise Management Plan

A Draft Noise Management Plan for the Stratford Mining Complex was submitted to the Department of Planning & Infrastructure during the 2011/12 reporting period. This Plan was required under the 2010 Development Consent Modification. The Noise Management Plan would be revised and submitted to DP&E for approval prior to operations commencing for the SEP.

6.9.6 Complaints

Two (2) noise related complaints were received during the reporting period (complaints include general mine noise, stockpile dozer noise and general train noise). A full detailed complaints list is provided in **Appendix 5**.

6.10 LANDSCAPING AND VISUAL SCREENING

No additional visual screening works were undertaken during the reporting period. For a list of previous landscaping and visual screening works completed in previous years please refer to the previous Annual Review reports available on the Stratford Coal Mine website. Maintenance of tree plantings including slashing of grass and weed spraying continues to be undertaken as required.

6.11 LIGHTING EMISSIONS

No complaints regarding lighting emissions were received during the reporting period.

6.12 CULTURAL AND NATURAL HERITAGE CONSERVATION

No additional items of Aboriginal heritage were discovered and no topsoil stripping activities were undertaken during the reporting period.

6.13 SPONTANEOUS COMBUSTION

There were no incidences of spontaneous combustion during the reporting period.

6.14 BUSH FIRE MANAGEMENT

Development Consent SSD 4966 Schedule 3 Condition 51 requires SMC to be suitably equipped to respond to any fires on site and to assist the Rural Fire Service and emergency services as much as possible if there is a fire in the surrounding area.

The following bushfire management related activities/works are undertaken:

- Members of the Gloucester Bush Fire Management Committee and relevant Government Agencies have inspected the mine site on a number of occasions;
- Access arrangements onto and through the mine site for local Bushfire Brigade officers to fight bushfires have been made;
- A number of old fire trails up onto the ridge on the eastern side of the mine site have been cleared and re-opened;
- SCPL have given an undertaking to GBFMC members that the water cart(s) will be made available for bushfire fighting purposes where suitable access for this machinery is available;
- SCM periodically (as required) undertakes hazard reduction burns, in consultation with the local Bushfire Brigade.
- Fuel loads on cleared pastures area on the mine site that are removed from mining operations are reduced by cattle agistment and/or periodic slashing (subject to erosion and faunal, especially wildlife corridor, considerations).

No hazard reduction burning was undertaken during the reporting period.

6.15 FERAL ANIMAL CONTROL

During the previous reporting period a wild dog trapping program was undertaken in the area surrounding the Stratford Mine Site and broader region. No other feral animal control activities were undertaken. A subsequent survey will be undertaken in 2016 to determine requirements for ongoing control measures.

6.16 COAL WASHERY REJECTS / REJECT MANAGEMENT

6.16.1 Handling and Disposal Procedures

The Stratford Mine utilises a co-disposal method that combines the coarse rejects with the intermediate sized materials and tailings.

The control of acid generation in deposited reject, this is managed by incorporating limestone into the reject stream, establishing reject beaches 2-3 m above water level such that they are significantly inundated with rising pit waters within 6-12 months, dosing the reject beach surface with lime at appropriate rates, and alternating the discharge point so that deposited reject beaches are essentially not exposed for more than 1 year.

Acid generation on the exposed reject beach is managed by application of <4mm size limestone at a rate of 80t CaCO₃/hectare incorporated into the top 300-500mm of exposed surface. Limestone is incorporated into the top surface of the surface reject via surface broadcasting/spreading and ripping with appropriate equipment. In addition limestone <4mm is introduced to the CHPP reject stream at a rate of approximately 5 kg/t (based on a neutralising value of >90%) when Duralie coal is being processed. Limestone analysis is conducted on a regular basis to test sizing and neutralising value.

Sections of the containment areas, other than the SMC Main Pit, once filled and sufficiently drained are firm enough for rehabilitation (i.e. covered with a capping layer (as required), topsoiled and revegetated) to be progressively undertaken concurrent with disposal operations elsewhere within the containment area (past experience).

Reject material has been discharged into the Stratford Main Pit since May 2003. Liming of the exposed reject beach was undertaken during the reporting period at the rates described above and records are maintained at the SMC.

7. WATER MANAGEMENT

The main principles of the water management system on-site are:

- Diversion of clean water around disturbed areas;
- The capture and storage of any water falling on disturbed areas in a dirty water storage system;
- Water usage on-site designed to use dirty water first;
- No sediment laden water having a high suspended solids concentration being discharged off site. However, this on occasions is not possible due to the inability to retain sediment water on site for sufficient time to allow sufficient settlement of fine suspended solids (typically clay particles). It should also be noted that the dispersible nature of exposed clays on site hinders settlement. Any discharge of sediment laden water from site is conducted in such a manner as to mitigate the likelihood of suspended solids reaching offsite streams and routine sampling/analysis is undertaken;
- Since the cessation of mining within the Stratford Main Pit in May 2003 the void has become available for the storage of excess mine waters. The availability of the Main Pit for water storage effectively addressed the short term water balance issues faced by the operation over previous years; and
- Due to an annual excess of water, SCPL investigated the establishment of irrigation upon selected areas of the SMC waste emplacement area. Following this investigation, and regulatory approval, a centre pivot irrigator was installed to irrigate an area of rehabilitated waste emplacement.

The principle uses for water at the SMC are:

- CHPP process water;
- dust suppression including water of haul roads and active mining areas, watering of product coal stockpiles and ROM coal; and
- Irrigation of rehabilitated pastures.

SCPL has investigated options for the beneficial reuse of mine water however continue to maintain zero discharge of mine water from site. The mine water balance at SMC is managed predominantly through the irrigation of excess water on rehabilitated pasture and storage within on site containment facilities. Where possible all clean water is diverted offsite.

7.1.1 Water Supply and Demand

The main water supply storage on-site for the CHPP is the Return Water Dam (RWD), located to the north of the Industrial Area. The RWD is one of three permanent mine water storages on-site. Water used by the CHPP is drawn from the RWD and comprises water pumped from the Co-Disposal facility, pit produced water, water from specific sediment dams and surface water runoff from the Co-Disposal area.

The principal water losses in the CHPP water circuit are:

- Loss of water to co-disposal material (water locked up in rejects, lost as seepage or evaporation).
- Evaporation from water bodies.
- Water retained in product coal and railed off site.

Estimates of water losses from the CHPP circuit are in the order of 5 ML per week with plant throughput in the order of 200L/s.

The RWD storage capacity is nominally 500 ML.

The Stratford East Dam (SED) is another permanent mine water storage facility on site. The SED spillway is currently at RL 164.5m with a water holding capacity of 2,850 ML.

The third permanent water storage body is the Stratford Main Pit. The Main Pit has a holding capacity of 37,000 ML to RL 115. Stratford Main Pit is used for both water and codisposal reject storage.

At the commencement of the reporting period the SED, RWD and Main Pit contained 1,578 ML, 335 ML and 10,491 ML (stored water and submerged reject material less reject volume), respectively.

At the completion of the reporting period the Stratford East Dam, Return Water Dam and Main Pit contained 1,670 ML, 335 ML and 10,865 ML (stored water only) respectively.

No mine water was disposed of to watercourses during the reporting period under EPA approval.

In December 2009, Gilbert & Associates assisted SCPL in preparation of a Life of Mine Reject Disposal Plan for the Stratford Mine. As part of preparation of this Plan, the site water balance was modelled. Following initial modelling, SCPL devised the following modifications to the future site water management strategy:

1. Upon conclusion of mining operations in the Bowens Road North open cut (approximately at the end of 2013), water would be pumped from the Main pit to Bowens Road North. The aim of this would not only be to reduce the volume of water held in the Main pit, but to rapidly inundate Bowens Road North as a means of mitigating the potential for generation of poor quality water in this open cut. At present, it is estimated that more than 8,500 ML of storage volume would be available in Bowens Road North up to RL 112. Pumped transfer would be managed to maintain freeboard in Bowens Road North to limit the risk of spill due to high rainfall.
2. At the same time as commencing water transfer to Bowens Road North open cut, water would be pumped from the Main pit to the Stratford East Dam, making use of this dam's available storage capacity. Pumped transfer would be managed so as to maintain adequate freeboard in the Stratford East Dam against high rainfall. No pumping to the Stratford East Dam has commenced.
3. Irrigation of water from the Stratford East Dam over waste emplacement areas commenced in the second half of 2011. Irrigation will occur on an area of rehabilitated waste emplacement adjacent to the Stratford East Dam. Irrigation will be governed by soil moisture, with irrigation suspended during wet weather or in periods following rain until soil moisture levels fell to levels low enough such that irrigation would not lead to direct runoff. Runoff from irrigation areas will be directed to the Stratford East Dam. Reducing the volume of water held in the Stratford East Dam by irrigation would increase its capacity for storage of water transferred from the Main pit.

Site water balance modelling has concluded that water storage capacity on site, under assumptions including the strategy outlined above, would be sufficient to accommodate disposal of washery reject material within the Main pit until at least 2020.

7.1.2 Water Balance Review

An independent Annual Water Balance Review (Hydro Engineering & Consulting, 2015) for the Stratford Mine was conducted for the 2015 calendar year and a summary is provided below.

Quantitative water balance

The water management system at the Stratford mine has operated under a surplus water balance, which means that over time there has been a trend for more water to report to site storages from the mine workings and associated project site catchments than is required to support processing and mining activities.

Bowens Road North Open Cut

A mine pit water balance analysis was undertaken for the BRNOC using data recorded during 2015 to assess the relative contributions of surface water and groundwater sources to mine inflows (i.e. the relative contribution of rainfall runoff versus groundwater seepage into the pit). Active mining of the BRNOC ceased in 2014 and the dewatering pump was removed.

As at 21/03/2016, surveyed water level indicates a stored water volume of 464 ML. The volume of groundwater calculated reporting to the pit sump in 2015 was 112 ML. This compares to the Stratford Extension Project EIS prediction of 150 ML. The groundwater inflow rate predicted from water balance analysis has been below Bowens Road North Project EIS (2001) predictions since 2005 and the estimated rate at the end of 2015 remains below the Stratford Extension Project EIS (2012) prediction.

Roseville West Open Cut

A mine pit water balance analysis was undertaken for the RWOC using data recorded during 2015 to assess the relative contributions of surface water and groundwater sources to mine inflows (i.e. the relative contribution of rainfall runoff versus groundwater seepage into the pit). Active mining of the RWOC ceased in 2013 and the dewatering pump was removed.

As at 21/03/2016, surveyed water level indicates a stored water volume of 327 ML. The volume of groundwater calculated reporting to the pit sump in 2015 was 83 ML. This compares to the Stratford Extension Project EIS prediction of 226 ML. The groundwater inflow rate predicted from water balance analysis is below the value predicted for the Stratford Extension Project EIS (2012).

SCPL holds existing groundwater licences for dewatering issued by the NSW Department of Primary Industries that allow for the annual volumetric limits. Note that estimated groundwater inflow to BRNOC and RWOC over 2015 (refer to full report (HEC, 2015)) are below the annual volumetric limit.

Contained Water Storages

A water balance analysis was undertaken for the Stratford Main Pit, Stratford East Dam and RWD using data recorded during 2015 to assess the relative contributions of the various sources to storage inflows (i.e. the relative contribution of rainfall runoff versus pumped inflow).

The table below provides a summary of water stored at the beginning and end of 2015, as well as inflows to and outflows from the three monitored contained water storages as a whole (Stratford Main Pit, Stratford East Dam and Return Water Dam).

Component	ML
Start* of Year Total Storage Volume	12,072
End** of Year Total Storage Volume	12,024
Change in Total Storage Volume	-48
<i>Inflows</i>	
Rainfall Runoff	960
Pumped from Open Cut Pits	0
Pumped from Other Storages	203
Groundwater	7
Rejects Water	1,250
Seepage†	<1
TOTAL	2,421
<i>Outflows</i>	
Evaporation	738
CHPP Supply	1,279
Haul Road Dust Suppression	33
Irrigation	164
Entrained in Rejects	182
Seepage†	73
TOTAL	2,469
Inflow minus Outflows	-48

Even though water stored in the Stratford Main Pit, Stratford East Dam and RWD decreased (-48 ML) over 2015, water was allowed to accumulate in BRNOC and RWOC resulting in an overall increase in stored water on site.

Table 13 – Water Take

Water Licence #	Water sharing plan, source and management zone (as applicable)	Entitlement*	Passive take / inflows	Active pumping	Total
20BL169101	Stratford (Roseville) Pit	20ML extraction. Renewed 28/09/2014.	0	0	
20BL169102	Roseville Extended and West Pit	315ML extraction. Renewed 28/09/2014.	83ML	0	83ML
20BL169103	Bowens Road North Pit	410ML extraction. Renewed 14/06/2015.	112ML	0	112ML
20BL169104	Bowens Rd West (Parkers) Pit	186ML extraction. Renewed 28/09/2014.	0	0	
20BL169400	Stratford Main Pit	500ML extraction. Renewed 31/07/2012.	7ML	0	7ML

7.2 WATER MONITORING RESULTS

7.2.1 Surface Water Management

Surface water management is divided into the management of clean and dirty water as outlined below. Dirty water comprises both mine water and sediment laden/turbid water. Section 7.2.1.3 covers management of runoff from the overburden dump and sediment and erosion control.

7.2.1.1 Clean Water Management

The key principle of clean water management is the segregation of clean water from dirty water by the construction of diversion drains around disturbed areas, thereby minimising the quantity of dirty water generated.

Surface water controls aim to prevent clean runoff water from entering the open cut mining, overburden/interburden dumping areas and rejects disposal areas, at various stages during mine life. The main structures are:

- Diversion drains/bunds on the eastern and western side of Stratford site, designed to divert clean water runoff around disturbed areas.
- Flood control embankments north of the Main Pit and east of the backfilled Roseville Pit which are/were designed to reduce the likelihood of floodwaters within Avondale Creek entering either pit;
- A 1:100yr ARI flood control bund around the northern end of the former Roseville Pit extension;
- A 1:100yr ARI flood control bund around the northern end of the Roseville West Pit;
- A 1:100yr ARI flood control bund around the southern end of the Bowens Road North Pit;
- A culvert under the BRN haul road to allow for clean water runoff into Avondale Creek;
- Culverts under the Main Coal Haul Road and Roseville Pit Haul Road which allows Avondale Creek to flow through the site;
- A clean water interception dam located east of the BRN waste dump to prevent waters ponding against the dump;
- Various runoff control drains/bunds about disturbed areas and overburden dumps designed to divert clean water runoff around active mine areas; and

7.2.1.2 Mine Related Water Management

Mine related water management refers to the control, collection and re-use of water which may have become contaminated by mining operations and associated activities or which by its nature is considered to be undesirable for release to the environment. Mine related water comprises mine water and sediment laden/turbid water. Mine water is water that has come into contact with mining activities. Sediment laden/turbid water has come into contact with disturbed areas but predominantly not core mining areas.

Mine related waters are characterised by higher salinity, lower pH, elevated suspended solids and/or higher turbidity than clean water runoff.

The main objectives of the mine related water control facilities are:

- Segregation of clean water from mine related water, to minimise the quantities of mine related water to be managed;

- Reuse of mine related water (washing coal); and
- Preventing the release of mine water from site.

The principal sources of mine related water are:

- Rainfall runoff in mining pits mixing with particulate matter and with relatively saline groundwater;
- Groundwater flowing into mining pits;
- Rainfall runoff from active sections of the overburden dump;
- Rainfall runoff from the Industrial Area;
- Rainfall runoff from haul roads;
- Runoff and seepage from co-disposal areas; and
- Direct rainfall falling on dirty water storages.

Mine related water uses and losses are:

- Co-disposal material (water locked up in rejects, lost as seepage or evaporation);
- Evaporation and seepage losses from water storages;
- Haul road dust suppression; and
- Water retained in product coal and railed off site.

The main permanent mine related water storages on site are the RWD, SED, Bowens Road West Pit (Parkers Pit) and the Stratford Main Pit. Mine water is also stored in the BRN and Roseville West pits whilst no operations are occurring.

The Stratford Main Pit holds mine related water due to the active co-disposal process.

Due to water being excess to need, management in past years has focused on maximising water use/loss. The future need to discharge waters from the Stratford site is expected to be limited due to the availability of the Stratford Main Pit for water storage and the installation of irrigation upon approved areas of the SCM waste emplacement.

7.2.1.3 Overburden Dump Water Runoff Management

Active dump runoff management involves directing runoff from active dump areas to dedicated waste dump runoff sediment dams. The main sediment dams for the BRN waste dump are Sediment Dam 4 (SD4) and BRN Pit itself since it accepts runoff from the adjacent out of pit dump. A small volume of water also collects on the eastern side of this dump. This water is discharged to land, if required, given acceptable water quality or alternately pumped into the catchment of SD4.

Sediment dam sizing is based on:

- Sufficient capacity to hold runoff from a 1 in 20 year, 1 hour duration rainfall event (54.88mm equivalent) falling over the full active dump area; and
- Sufficient area to provide for settling/sedimentation of any particles coarser than fine silt size in a 1 in 20 year, 1 hour duration rainfall event.

7.2.1.4 Haul Road Runoff Management

Haul road runoff is generally separated from overburden dump runoff as haul road runoff tends to be more saline than dump runoff. This is likely to be due to accumulation of salts from ongoing water spraying for dust suppression and coal spillage on the haul roads.

All runoff from the Main Coal Haul Road together with the southern end of the Roseville Haul Road is directed to the Haul Road Sediment Dam (SD14). Runoff from the Western Haul Road flows to the Western Sediment Dam (SD13) and Stratford Main Pit. Runoff from the northern end of Roseville Haul Road reports to the Roseville West pit area. Runoff from the southern end of the haul road reports to the Roseville South Sediment Dam (SD12). Runoff from the BRN Haul Road reports to sediment dams SD1-SD4.

Whilst the operations are currently in care and maintenance and the majority of haul roads aren't in use all haul road sediment dams have been bypassed to direct runoff directly to the Stratford Main Pit or Roseville West Pit with the exception of SD14.

Sediment dam sizing is based on providing sufficient capacity to hold runoff from a 1 in 20 year, 1 hour duration rainfall event (for a given catchment). Runoff in excess of such an event will result in a dam spilling in accordance with the design criteria. It should be noted that at all times pumping (where possible) of sediment dams in order to prevent or limit the amount of spilling water was undertaken. Prioritisation of pumping operations takes into account the likely quality of spilling water when a dam was considered vulnerable to spilling.

De-silting of haul road dams is undertaken when significant siltation has occurred (nominally 30% silt by volume or obstruction of outlet structure). The suspended sediment load in runoff water entering these dams can be high due to the mudstone used to construct and sheet the haul roads and the action of the haul trucks on the mudstone during wet weather.

7.2.2 Surface Water Monitoring

Stratford Coal Pty Ltd has a network of ten (10) main routine monitoring sites as shown **Figure 2 (Appendix 1)**. These sites are the same as those used during the baseline EIS studies for the Stratford and BRN Environmental Impact Studies and is consistent with the SEP EIS. The sites and their locations are shown in **Table 14**.

Table 14 - Routine Monthly Surface Water Monitoring Sites

SITE	AREA	PROPERTY	HYDROLOGICAL LOCATION
W1	Wenham Cox Road	GLENAVON	Avon River upstream of the mine (i.e. upstream of junction with Dog Trap Creek)
W2	Marengo	BIGNALL	Avon River downstream of the mine (i.e. downstream of junction with Dog Trap Creek)
W3	Dog Trap Creek	Ex-ELLIS/SCM	Upstream Dog Trap Creek (above junction with Avondale Creek)
W3A	Dog Trap Creek	Ex-ELLIS/SCM	Upstream Dog Trap Creek (above junction with Avondale Creek) and Upstream of BRN Operations.
W4	Avondale Swamp	Ex-ATKINS/AGL	Dog Trap Creek downstream of junction with Avondale Creek
W5 SWQ2	Wenham Cox Road	SCM	Avondale Swamp (Creek) downstream of mine and upstream of junction with Dog Trap Creek
W6	Parkers Road	SCM	Upstream of Mine on Avondale Creek
W8	Bowens Road	SCM	Avondale Creek in the centre of operations
W9	The Glenn Road	SCM	Upper Avondale
W10	Bowens Road	SCM	"Lemon Tree" Creek upstream of Avondale Creeks junction.

A variation to EPL 5161 in 2003 modified the Stratford water sampling regime to align with the program approved for the BRN project i.e. water sampling at the listed sampling locations after a

rainfall event of greater than 25mm in any 24hr period, with sampling not to be repeated within 21 days after the sample date. Monthly sampling is undertaken should a "no greater than 25mm in 24hr rainfall" event occur. Water sampling is not undertaken in no flow conditions.

7.2.2.1 Review of Water Monitoring Results

Surface water monitoring charts and comprehensive surface water data tables are provided within **Appendix 4**.

No flows were observed on the following occasions at surface water monitoring sites:

Site W1:	October 2015
Site W2:	October 2015
Site W4:	October 2015
Site W5:	October 2015
Site W6:	July 2015, October 2015
Site W8:	October 2015
Site W9:	July 2015, October 2015
Site W10:	July 2015, October 2015

pH

Figure 5-1 (Appendix 4) shows the pH results for each sampling month in the reporting period. pH ranges by sampling site (with average values bracketed) were:

Site	pH Range	pH Average
Site W1:	7.0 to 8.1	(7.5)
Site W2:	7.3 to 7.8	(7.6)
Site W3:	6.7 to 7.6	(7.3)
Site W3A:	5.9 to 7.1	(6.8)
Site W4:	7.1 to 7.6	(7.4)
Site W5:	6.8 to 7.5	(7.1)
Site W6:	6.6 to 7.3	(6.8)
Site W8:	6.8 to 8.1	(7.5)
Site W9:	6.0 to 6.2	(6.1)
Site W10:	6.8 to 7.2	(7.0)

Across all sites the pH ranged from 5.9 to 8.1 with specific location averages essentially neutral. pH results were consistent with previous year's results however results showed more variation than previous years where no flow conditions prevailed.

The Surface Water Assessment (Gilbert & Associates, 2012) for the Stratford Extension Project EIS 2012 presents data from the Stratford Coal Surface Water Quality Monitoring Program, 1994 to 2011. Results for the reporting period are similar to pH results from the 1994 to 2011 monitoring period.

Electrical Conductivity (EC)

Figure 5-2 (Appendix 4) shows the electrical conductivity results for each sampling month in the reporting period. EC ranges by sampling site (with average values bracketed) were:

Site	EC Range	EC Average
Site W1:	165 to 440 uS/cm	(327 uS/cm)
Site W2:	306 to 1020 uS/cm	(507 uS/cm)
Site W3:	376 to 740 uS/cm	(561 uS/cm)
Site W3A:	398 to 560 uS/cm	(461 uS/cm)
Site W4:	459 to 1170 uS/cm	(711 uS/cm)
Site W5:	299 to 1160 uS/cm	(710 uS/cm)
Site W6:	285 to 570 uS/cm	(452 uS/cm)
Site W8:	430 to 1107 uS/cm	(842 uS/cm)
Site W9:	72 to 164 uS/cm	(118 uS/cm)
Site W10:	500 to 1006 uS/cm	(763 uS/cm)

All sites had generally similar average EC values compared to previous reporting periods. Results showed more variation than previous years where no flow conditions prevailed.

Results for the reporting period are similar to EC results from the 1994 to 2011 monitoring period as presented in the Surface Water Assessment (Gilbert & Associates, 2012).

Total Suspended Solids (T.S.S.)

Figure 5-3 (Appendix 4) shows the total suspended solids results for each sampling month in the reporting period. T.S.S. ranges by sampling site (with average values bracketed) were:

Site	TSS Range	TSS Average
Site W1:	9 to 96 mg/l	(43 mg/l)
Site W2:	10 to 14 mg/l	(12 mg/l)
Site W3:	26 to 108 mg/l	(51 mg/l)
Site W3A:	12 to 30 mg/l	(18 mg/l)
Site W4:	6 to 52 mg/l	(24 mg/l)
Site W5:	13 to 40 mg/l	(24 mg/l)
Site W6:	14 to 22 mg/l	(18 mg/l)
Site W8:	6 to 83 mg/l	(38 mg/l)
Site W9:	9 to 16 mg/l	(13 mg/l)
Site W10:	14 to 34 mg/l	(23 mg/l)

TSS average concentrations were lower when compared with the previous reporting period. Results showed more variation than previous years where no flow conditions prevailed. During the reporting period there were four slightly elevated TSS results recorded (W1; November 2015, W3; August & December 2015, W8; July 2015). The elevated results are likely due to no/low flow conditions in the months prior to the sampling events followed by high rainfall events at the time of sampling and occurred both upstream and downstream of operations.

Results for the reporting period are similar to historical TSS results from the 1994 to 2011 monitoring period as presented in the Surface Water Assessment (Gilbert & Associates, 2012).

Turbidity

Figure 5-4 (Appendix 4) shows the turbidity results for each sampling month in the reporting period. Turbidity readings by sampling site (with average values bracketed) were:

Site	Range	Average
Site W1:	7.9 to 145.0 NTU	(41.6 NTU)
Site W2:	3.0 to 27.9 NTU	(11.1 NTU)
Site W3:	16.0 to 147.0 NTU	(59.0 NTU)
Site W3A:	10.0 to 40.0 NTU	(27.0 NTU)
Site W4:	2.9 to 19.3 NTU	(8.7 NTU)
Site W5:	7.3 to 93.0 NTU	(35.2 NTU)
Site W6:	4.7 to 174.0 NTU	(92.9 NTU)
Site W8:	2.9 to 75.4 NTU	(32.1 NTU)
Site W9:	80.0 to 85.7 NTU	(82.9 NTU)
Site W10:	37.0 to 140.0 NTU	(75.2 NTU)

Average turbidity concentrations were similar when compared with the previous reporting period with less variation than previous periods that had prevalent no flow conditions.

Results for the reporting period are similar to historical turbidity results from the 1994 to 2011 monitoring period as presented in the Surface Water Assessment (Gilbert & Associates, 2012).

Iron [Fe]

Figure 5-5 (Appendix 4) shows the iron results for each sampling month in the reporting period. Iron concentration ranges by sampling site were (average values bracketed):

Site	Range	Average
Site W1:	1.88 to 2.60 mg/l	(2.25 mg/l)
Site W2:	0.80 to 2.40mg/l	(1.43 mg/l)
Site W3:	1.88 to 4.51 mg/l	(3.16 mg/l)
Site W3A:	2.87 to 5.02 mg/l	(3.94 mg/l)
Site W4:	0.65 to 2.92 mg/l	(1.47 mg/l)
Site W5:	0.51 to 2.88 mg/l	(2.06 mg/l)
Site W6:	3.41 to 6.92 mg/l	(5.36 mg/l)
Site W8:	0.35 to 4.69mg/l	(2.19 mg/l)
Site W9:	2.68 to 5.54 mg/l	(4.11 mg/l)
Site W10:	1.64 to 3.14 mg/l	(2.17 mg/l)

Iron concentration ranges were similar to those for the previous reporting period and higher than previous years which had prevalent no flow conditions. No elevated iron results were recorded during the reporting period.

Results of surface water monitoring during the reporting period are in concurrence with the Environmental Assessments that concluded "mining operations at the Stratford Mining Complex would not jeopardise local or regional water quality". In addition, an environmental audit undertaken during the previous reporting period found that the water quality monitoring at the Stratford Mining Complex indicates that there has been no significant or measurable change to the water quality attributable to mining (Trevor Brown & Associates, 2015)

7.2.2.2 Dam Overflows/Discharges

No overflows or discharges occurred during the 2015 interim reporting period. Overflows and controlled discharges from sediment dams are sampled and analysed in accordance with the Water Management Plan.

7.2.2.3 Biological Monitoring of Avondale Creek Catchment

One macro-invertebrate survey was undertaken during the reporting period. The survey occurred in September 2015 (Invertebrate Identification Australasia 2015). The results and conclusions of the survey are summarised below.

Six sites were sampled on the 11th of September 2015 for aquatic macro-invertebrates and water quality using rapid assessment techniques. All sites during this survey contained sufficient water to sample although all were low and only the river sites were flowing. The sites surveyed includes two sites located on the Avon River, one above (Site W1) and one below (Site W2) the confluence of the Avon River and Avondale Creek. Two sites are on Avondale Creek, Site W8 is at Bowens Road downstream of the Stratford Coal Handling and Preparation Plant and Site W5 is immediately upstream of where the Avondale Creek crosses Wenham Cox Road. One site (Site S3) is monitored for background data and is located along an unnamed creek which receives water from the clean water diversions and runoff from the rehabilitated waste dump and then feeds into Avondale Creek. Site W3 is located on Dog Trap Creek and is the control site.

During the September 2015 survey a total of 56 genera representing 40 families were recorded. Six biological indices are used to determine the condition of the streams in and adjacent to the project area.

The results of the September 2015 survey indicate that the overall aquatic biodiversity across the river sites (Sites W1 and W2) showed a decreasing trend in all taxa based indices and mixed trends within the ratio indices compared with the previous survey. Although there is a general decrease in river condition compared with the previous survey, the biodiversity and condition indices are still equivalent or comparable to those of the 2014 survey. These current changes over the last twelve months in ecosystem condition/health appear to be the direct result of decreases in rainfall, particularly during the mid to late winter season. This timely rainfall has sustained the necessary habitats to persist and the development of the associated aquatic fauna. The very recent recharge of the river systems has had a significant impact on the aquatic fauna community and therefore the results will reflect the persistent flow conditions.

These results indicate that there have been no significant changes or differences between Sites W1 and W2 either in the physiochemical or biological parameters tested. Therefore the data indicates there is no evidence of an adverse effect from the mining operations on the ecology of the Avon River or the upper Avondale Creek sites.

Collectively, all biological monitoring reports to date have not indicated any significant adverse impact from either the general operations of the mine or the historical controlled release of mine water into the Avondale Creek and Avon River systems as per predictions made in environmental assessments that "mining operations at the Stratford Mining Complex would not jeopardise local or regional water quality".

The September 2015 Macro-invertebrate Survey report can be made available on request from the Environmental Department.

7.2.3 Mine Water Offsite Discharge

No mine water was disposed of to watercourses during the reporting period.

7.3 GROUNDWATER

7.3.1 Groundwater Management

Groundwater characteristics of the mine site were studied by Golder Associates in 1981-82. These studies indicated that the coal seams represented the main aquifer systems in the region. Groundwater is also found in the overlying colluvium and fractured sections of overburden.

Available data indicates a sub-regional groundwater flow from southwest to northwest. The water table approaches ground surface in the swampy northwest corner of the basin. The colluvium functions as the principal recharge to the basin. Groundwater is generally saline, highly mineralised water with slight to high acidic pH and is generally unsuitable for domestic consumption or irrigation.

Groundwater resources within the project area were utilised in the early stages of the Stratford Project, as required, to provide make-up water for the CHPP. Since the mine start-up period, water has not been in deficit and no groundwater harvesting has occurred.

Water from the Bowens Road West (Parkers) Pit comprising seepage and rainfall/runoff is pumped directly to the CHPP or alternately the RWD. The Stratford Main Pit is currently used for reject deposition and has a return water line reporting to the RWD. Groundwater gained in the BRN and Roseville West pits is pumped directly to the RWD or the Stratford Main Pit.

The groundwater monitoring network described below will be augmented with additional monitoring sites as mining progresses in accordance with the Stratford Extension Project (2012).

Stratford Village Bores

As part of its Development Consent Conditions, SCM is required to monitor existing groundwater bores in Stratford village rated by Council and other bores licensed by the NSW Office of Water in the vicinity of the mine. The purpose of this monitoring is to determine whether the mine site is having any effect on the bores in Stratford village. A 1994 hydro-geological study indicated that the mine should not impact any rated bores in Stratford village.

There are no rated bores in the Stratford village. However, Stratford Coal Pty Ltd measures standing water levels in existing (non-rated) bores within the Stratford village at six (6) monthly intervals. These bores are also field analysed for pH and electrical conductivity. A disused SCM bore to the east of Stratford on the northern side of Bowens Road and bores on the former Griffin and former Bramley properties are also included in the bore monitoring program.

Roseville Pit Bores (RB Series)

An amendment to SCM's Development Consent Conditions issued by the Department of Urban Affairs and Planning (DUAP) in 1996 following application by SCM to develop the Roseville Pit included the need for groundwater monitoring in accordance with DLWC requirements. The intention of this monitoring was to determine whether operation of Roseville Pit was adversely impacting the quality or quantity of the local groundwater resource. Four (4) bores (RB1-RB4) were monitored on a quarterly basis for water quality and depth to water. One of these 4 bores (RB4) was destroyed by mining within the Roseville West pit in 2009. The general location of these bores is shown on **Figure 2 (Appendix 1)**.

Stratford Project Bores (GW Series)

In January 1999 the DMR approved SCM's Life of Mine MOP. Within this MOP there was provision for supplementary groundwater monitoring. Installation of seven (7) additional groundwater monitoring wells were advocated within the MOP of which six (6) were installed (coded GW1-GW5 and GW7). The seventh well could not be installed due to rock refusal within the designated monitoring location. Gauging of depth to water within these wells commenced at the time of installation whilst the first round of sampling for analysis was undertaken in June 1999. Monitoring during this reporting period was conducted during August 2015 and November 2015. The general location of these bores is shown on **Figure 2 (Appendix 1)**.

Associated with approval of the Roseville void for storage of washery reject material, an additional groundwater monitoring well was required by the DMR in consultation with the DLWC. This well (coded as GW8) was installed during the 2000/1 reporting period.

BRN Pit Bores (MW Series)

Nine (9) groundwater monitoring bores, MW1-9, were installed around the perimeter of the BRN open cut in 2002 to determine any effect the operations may have on groundwater levels and/or quality. An additional bore (coded MW10) was established on the northern limit of the Ellis Corner pit expansion during the 2005/6 reporting period. A further two additional bores (coded MW11 and MW12) were established on the northern limit of the Ellis Corner pit expansion. Four (4) groundwater monitoring bores (MW1, MW2, MW5 and MW9) were destroyed, due to mining activities, during the 2012-2013 reporting period. The locations of the monitoring bores are shown on **Figure 2 (Appendix 1)**.

Parkers Pit Bore

Approval for placement of reject within the Parkers Pit (Bowens Road West Pit) was granted during the 2003/4 reporting period with an additional bore BRWN1 being established to determine any potential impacts to groundwaters.

7.3.2 Groundwater Monitoring

Stratford Village Bores

Monitoring of bores at Stratford Village is required by SCPL's Development Consent to determine whether any impact is occurring from mining activities on groundwater quality and water levels within the Village. Studies in the Stratford Coal EIS concluded that groundwater at Stratford village was highly unlikely to be linked to groundwater in the Main Deposit.

The bores are typically monitored in March and October each year. Monitoring during the reporting period was undertaken in October 2015. Results and a bore location plan can be found in Appendices 4 and 1 respectively.

Sampling to date shows that most of the groundwater bores monitored are similar in quality to the bores monitored on the mine site. Other bores, such as Smith, are of much better quality. It is understood that these bores are relatively shallow, and given the lower elevations of the sites are tapping into the shallower alluvial aquifers, as opposed to the deeper groundwater aquifers tapped by the majority of bores.

Results show that there has been no significant difference in depth to standing water level for the bores gauged to date. The next routine monitoring of these bores is scheduled for March 2016.

Roseville Pit Bores (RB Series)

Compliance with a condition attached to the Amended Development Consent for Roseville Pit required the monitoring of four (4) bores adjacent to Roseville Pit (RB1 – RB4) and will continue under the SEP Development Consent. Monitoring is programmed on a quarterly basis for depth to groundwater and samples collected and analysed for electrical conductivity (EC), pH, sodium, chloride and sulphate. Monitoring bore RB4 was destroyed by mining within the Roseville West pit during an earlier reporting period. The locations of these bores are shown on **Figure 2 (Appendix 1)**.

Monitoring results for the Roseville groundwater bores are provided in **Table 15** below with full analytical results within **Appendix 4**.

Table 15: Bores Monitored in Relation to Roseville Pit

Bore	Average DTW	Average pH	Average EC	Average SO4	Average Na	Average Cl
Units	metres		uS/cm	mg/l	mg/l	mg/l
RB1	4.58	6.9	10,550	39	1,615	3,305
RB2	3.45	6.6	9,585	127	1,690	3,180
RB3	**	**	**	**	**	**

Notes ** Unable to retrieve sample due to dry bore

Monitoring data recorded during the reporting period indicated:

- prevailing high water table – particularly for RB1 & 2;
- neutral pH; this is consistent with historic monitoring results;
- electrical conductivity was substantially elevated when compared with local surface water flows, as is consistently seen. Average electrical conductivity readings for RB1 and RB2 bores were similar to those of the previous period;
- RB1 and RB2 had similar average sulphate concentration to the previous period results;
- average sodium concentrations for the reporting period were comparable to those for the previous reporting period; and
- average chloride concentrations for the reporting period were comparable to those for the previous reporting period at RB1 and RB2.

Groundwater monitoring data from the Roseville Pit Bores during the reporting period does not demonstrate a significant or measurable change in water table level or groundwater quality that could be attributed to the mining activities across the Stratford Mining Complex area. These results concur with predictions made in the EIS2012 and the Groundwater Assessment 2012 that negligible impact on groundwater levels or quality, from mining in the short term is likely.

Stratford Project Bores (GW Series)

Six (6) groundwater monitoring wells (designated GW1 – GW5, GW7) are gauged, sampled and tested in accordance with the 1999 Development Consent and will continue under the SEP Development Consent. Note that one (1) additional monitoring well – GW8 - was installed following use of the Roseville Pit void as an emplacement area. Monitoring is done on a quarterly basis. Samples collected are analysed for electrical conductivity, pH, sodium, chloride, filtered iron and sulphate. The locations of these bores are shown on **Figure 2 (Appendix 1)**. Full analytical results are also shown in **Appendix 4**.

A summary of monitoring results for the Stratford Project bores is provided in **Table 16**.

Table 16: Bores Monitored in Relation to the Stratford Project

Site	Average Depth to Water (m)	Average pH	Average EC (uS/cm)	Average Sodium Concentration (mg/l)	Average Chloride Conc. (mg/l)	Average Iron (filtered) Conc. (mg/l)	Average Sulphate Conc. (mg/l)
GW1	16.07	**	**	**	**	**	**
GW2	9.94	6.4	4930	735	1230	31.6	30
GW3	3.20	3.9	4095	714	1120	34.5	78
GW4	0.80	6.4	15395	15130	4760	3.1	119
GW5	4.07	6.6	7555	1010	1630	24.0	110
GW7	2.86	6.1	2480	333	660	9.1	99
GW8	12.80	**	**	**	**	**	**

Notes: ** Unable to retrieve sample due to dry bore

Monitoring for the GW series bores to date has indicated (when compared to the previous reporting period):

- water table levels across the majority of wells were comparable to the previous reporting period;
- average pH units recorded were similar to previous year's results across the data set;
- Electrical conductivities were generally higher than the previous reporting period results;
- Sodium and chloride concentrations were generally comparable with the previous period with the exception of an elevated sodium result at GW4 during August 2015; and
- Filtered iron concentrations were generally similar as were sulphate concentrations.

Groundwater monitoring data from the Stratford Project Bores during the reporting period does not demonstrate a significant or measurable change in water table level or groundwater quality that could be attributed to the mining activities across the Stratford Mining Complex area. These results concur with predictions made in the EIS 2012 and the Groundwater Assessment 2012 that negligible impact on groundwater levels or quality, from mining in the short term is likely.

Bowens Road North Pit Bores (MW Series)

Monitoring results for the BRN groundwater bores are provided in **Table 17** below with full analytical results within **Appendix 4**.

Table 17: Bores Monitored in Relation to Bowens Road North Pit

Bore ID	Average Depth to Water (metres)	Average pH	Average Electrical Conductivity (uS/cm)	Average Sulphate (mg/l)
MW3	5.31	**	**	**
MW4	15.23	6.0*	5700*	74*
MW6	9.03	6.4	368	24
MW7	10.35	6.0*	4400*	418*
MW8	7.22	6.2*	1706*	***
MW10	****	****	****	****
MW11	10.08	7.0	1113	22
MW12	3.36	6.6	1213	21
Griffin	3.20	6.6	1213	21

Notes: *One sample only in average calculation
 ** Unable to retrieve sample due to dry bore
 *** Not enough water for lab sample
 **** Bore blocked

Monitoring data recorded during the reporting period indicated:

- depth to water measurement generally indicated a similar water table relative to results from the previous reporting period;
- pH results were largely neutral. Results were consistent with last reporting period;
- electrical conductivity was substantially elevated when compared with local surface water flows and comparable with those in the previous reporting period, and
- sulphate concentrations were generally consistent with the previous reporting period.

Overall, BRN groundwater monitoring generally showed a similar profile to previous years monitoring results.

Groundwater monitoring data from the Bowens Road North Pit Bores during the reporting period does not demonstrate a significant or measurable change in water table level or groundwater quality that could be attributed to the mining activities across the Stratford Mining Complex area. These results concur with predictions made in the EIS 2012 and the Groundwater Assessment 2012 that negligible impact on groundwater levels or quality, from mining in the short term is likely.

Parkers Pit Bore (BRWN1)

Approval granted for the deposition of rejects within the Bowens Road West North pit in May 2003 required the installation and monitoring of bore BRWN1 and monitoring of existing bores GW2 and GW4 on a monthly basis. Backfilling of the pit was completed in January 2004. Since December 2004 ground water monitoring has been undertaken on a six-monthly basis for depth to groundwater and samples collected and analysed for electrical conductivity (EC), pH, ORP and sulphate. The locations of these bores are shown on **Figure 2 (Appendix 1)**.

Monitoring results during this reporting period for the BRWN1 bore are provided in **Table 18** below with full analytical results within **Appendix 4**. Monitoring results for GW2 and GW4 are presented in **Table 16**.

Table 18: BRWN1 Monitored in Relation to Bowens Road West North (Parkers Road) Pit

Site	Average depth to water (m)	Average pH	Average EC US/cm	Average Sulphate Concentration (mg/l)
BRWN1	0.56	6.0	6385	489

Monitoring data recorded during the reporting period indicated:

- a prevailing consistently high water table,
- pH was slightly acidic,
- electrical conductivity levels were comparable to Stratford Mine area bores,
- sulphate concentrations were similar to those reported for the previous reporting period

Groundwater monitoring data from the Parkers Pit Bore during the reporting period does not demonstrate a significant or measurable change in water table level or groundwater quality that could be attributed to the mining activities across the Stratford Mining Complex area. These results concur with predictions made in the EIS 2012 and the Groundwater Assessment 2012 that negligible impact on groundwater levels or quality, from mining in the short term is likely.

8. REHABILITATION

The primary objectives of the rehabilitation program are provided in **Table 19** below.

Table 19: Rehabilitation Objectives

Feature	Objective
Mine site (as a whole)	<p>Safe, stable and non-polluting</p> <p>Constructed landforms drain to the natural environment</p> <p>Minimise visual impact of final landforms as far as is reasonable and feasible and be sympathetic to the original Gloucester valley landform</p>
Final voids	<p>Minimise the size and depth of final voids so far as is reasonable and feasible</p> <p>Minimise the drainage catchment of final voids so far as is reasonable and feasible</p> <p>Minimise high wall instability risk so far as is reasonable and feasible</p> <p>The size and depth of final voids must be designed having regard to their function as long-term groundwater sinks, to maximise groundwater flows across back-filled pits to the void and to not be a source of saline groundwater for aquifers and streams</p> <p>Designed and constructed to ensure adequate freeboard to ensure no spillage under any foreseeable conditions</p> <p>Minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood</p>
Surface infrastructure	To be decommissioned and removed, unless the Deputy Secretary, Resources and Energy agrees otherwise
Agricultural land	Establish a minimum of 300 hectares of land with Class 4 agricultural suitability
Other land	<p>Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprising:</p> <ul style="list-style-type: none"> • a wildlife corridor (shown as Biodiversity Enhancement Area in the figure in Appendix 8); • local native plant species; and • a landform consistent with the surrounding environment
Stratford and Glen heritage railway corridors	<p>Road and transmission alignments to avoid heritage railway corridors</p> <p>Rehabilitation activities to avoid or minimise impacts</p>
Community	<p>Ensure public safety, with an emphasis on final voids</p> <p>Minimise the adverse socio-economic effects associated with mine closure</p>

8.1 BUILDINGS

No buildings were constructed, demolished or renovated during the reporting period.

8.2 REHABILITATION OF DISTURBED LAND

Rehabilitation of land is undertaken in accordance with the approved Rehabilitation Management Plan (RMP).

During the reporting period no new areas of rehabilitation have been completed following completion of the BRN and Roseville waste emplacement in the previous reporting period.

Table 20 presents a summary of the rehabilitation undertaken at the Stratford mine site during the reporting period. BRN, Roseville and the Stratford Main pits are all shown as active areas despite no operations occurring at the current time.

Table 20 – Rehabilitation status

Mine area type	Previous RP (actual)	This RP (actual)	Next RP (forecast)
Total mine footprint	1107		
Total active disturbance	211	211	206
Land being prepared for rehab	5	5	0
Land under active rehabilitation	0	0	0
Completed rehabilitation	251	251	256

Maintenance activities on rehabilitated land have been undertaken. During the reporting period approximately 30 hectares on the established BRN and Roseville rehabilitation was supplemented with the planting of 1160 tube stock of canopy species. Additionally, two areas identified with rill erosion on BRN rehabilitation have been repaired and two sections of slumping drains on the BRN rehabilitation have been repaired,

8.3 OTHER INFRASTRUCTURE

No other infrastructure rehabilitation was conducted during the reporting period.

8.4 REHABILITATION TRIALS AND RESEARCH

Rehabilitation trials have been undertaken in the Duralie Coal Mine Biodiversity Offset Areas. The program has trialled several methods for ground preparation, seeding and planting to determine the most suitable and cost effective methods for completing the remaining offset revegetation and mine site rehabilitation. The techniques include both direct seeding and tube stock with inoculated and inoculated seed. Full detail on the results of the rehabilitation trials will be included in the Duralie Coal Mine Annual Review 2016.

8.5 FURTHER DEVELOPMENT OF THE FINAL REHABILITATION PLAN

8.5.1 Land use Objective/Current Use

Prior to mining, the project area was used for cattle grazing and dairying. One of the major objectives of the rehabilitation programme is the re-instatement of Land Capabilities IV, V and VI on areas disturbed and rehabilitated during the course of mining operations.

To date, most of the topsoil recovered from areas impacted by mining activities has largely consisted of soil captured from Class IV areas with the remainder being from Class V land. Areas that have been fully rehabilitated predominantly involve completed sections of out of pit waste landforms. Rehabilitation has been conducted in accordance with guidelines stated within *Rehabilitation Principles (Section 4.1)*. On the basis of comment passed by officers of the former DLWC and DMR during past annual rehabilitation site inspections, successful re-instatement of pre-mining land capabilities is being achieved.

Cleared areas not required for mining in the short term are used for cattle agistment. Remnant vegetation and areas of natural regeneration, outside of areas to be affected by mining and associated

activities are not disturbed. Fencing is erected (where possible) to protect areas of natural regeneration from cattle grazing pressure or erosion.

No changes to agricultural land suitability of areas adjacent to mine operations have occurred during the reporting period.

Under the Bowen Road North Development Consent Modification dated November 2010 there is a requirement to implement an offset strategy (as described within Section 3.1 of the environmental assessment *Bowens Road North Open Cut June 2010 Modification*). This offset strategy is described within a Duralie Coal Biodiversity Management Plan which was submitted to the Secretary of the Department of Planning and Environment and approved in March 2012.

The SEP Development Consent (SSD-4966) requires the implementation of the biodiversity offset strategy and the rehabilitation strategy as described in the EIS 2012. Prior to mining commencing under the extension project SCPL will update the Biodiversity Management Plan and the Rehabilitation Management to the satisfaction of the DP&E Secretary and the DRE Secretary respectively.

8.5.2 Final Void Treatment

The final Stratford void comprises the area in the vicinity of where the last coal was mined. This area is adjacent to the now closed section of Bowens Road and is the northern extent of the Main Deposit.

A detailed plan addressing decommissioning of the final void was approved by the DMR/DLWC in 1999. This plan proposed rapid filling of the void by introducing available surface water flows into the void at the end of mine life (a process estimated to take of the order of twenty (20) years - subject to prevailing rainfall). On completion of filling it was predicted that the void will periodically spill into Avondale Creek.

Given expected continuation of mining operations until at least 2020 it is now envisaged that the Main Deposit final void will effectively be filled with waste material. A revised plan addressing the proposed filling of the void with CHPP reject material to below pre mine groundwater levels followed by inert waste capping was approved by the DII – Minerals and Energy Division on 9th February 2010.

The final BRN void will be located to the north-north-west of the Stratford Main Deposit void. This void will be considerably smaller (i.e. approximately one seventh the size) than the Stratford void. This void will be rehabilitated in accordance with the BRN Landscape and Revegetation Management Plan and Water Management Plan.

The Roseville Extension void will be fully backfilled with waste from the Roseville West Pit. The final Roseville West void will be backfilled in accordance with requirements of DII and GSC which are yet to be formalised.

The management of the BRN and Roseville West final voids is likely to change under the Stratford Extension Project. If the operations in accordance with Stratford Extension Project proceed the BRN and Roseville West voids would be backfilled. At the cessation of mining operations voids would remain in the Roseville West Extension, Avon North and Stratford East Pits. The management of these final voids is described in the rehabilitation strategy and would be included in the Rehabilitation Management Plan

8.6 REHABILITATION MONITORING

Monitoring of the Stratford Mining Complex rehabilitation areas is described in Section 10 of the Stratford Mining Complex Rehabilitation Management Plan and aims to monitor the progress towards meeting the rehabilitation completion criteria.

Rehabilitation is monitored visually on a regular basis to ensure vegetation is establishing and to determine the need for any maintenance and/or contingency measures (e.g. supplementary plantings,

weed or erosion control). The visual monitoring includes:

- monitoring of soil erosion status and the effectiveness of erosion control methods;
- the presence of weeds or feral animals;
- mine landform runoff water quality; and
- early identification of areas requiring remedial planting or other maintenance works to maintain rehabilitation progress.

It is expected that these programmes would be further developed at a time closer to the final stages of rehabilitation and mining operations and would be included in future revisions of the RMP.

The assessment of rehabilitation quality and ecosystem value is conducted via the use Ecosystem Function analysis (EFA). It is expected this programme would be further developed during the life of mine as rehabilitation works are completed.

In December 2013 a fixed transect-based Landscape Function Analysis (LFA) and Vegetation Structure monitoring program was established across the Stratford Coal Mine Rehabilitation areas. These 30 transects were assessed again in February 2015 as part of a second round of monitoring in accordance with Section 10 of the Stratford Coal Mine Rehabilitation Management Plan A copy of the full report is available from the Stratford Coal Environmental Department.

Results of the 2015 Survey indicate indices of landscape functionality remain generally high across the three Mounds, particularly soil surface stability (indicating little risk of erosion). The exception is the 2006-08 revegetation on the Bowen Mound where there has been a significant decline in soil surface stability to a relatively low value. The indices for water infiltration and nutrient cycling have also significantly declined on this portion of the Mound. There has also been a significant decline in soil surface stability across the grazed pasture established in 1996/97 on the Stratford mine.

Average decline in functionality is likely due to the generally poor surface condition across parts of the Mound including the substantial gully and sheet erosion that has become quite pronounced in places. Attention to stabilise active erosion points will be required to redress this.

The analysis of these results provides the basis for the following recommendations: (Greening Australia, 2015);

1. Continue monitoring of mine rehabilitation using the highly informative *Landscape Function Analysis* methodology. The existing number of transects has now demonstrated the capacity to detect statistically significant changes.
2. Photo-monitoring is a useful complementary method for rapidly assessing and communication changes in vegetation structure and soil surface cover.
3. The Bowen and Roseville Mounds exhibit a significant lack of long-lived Eucalypts. Enhancement (in-fill) plantings of Eucalypts are required. Future revegetation should consider the installation of Eucalypt seedlings (as tube stock) integrated with direct seeding, if reliable establishment of Eucalypts cannot be achieved through direct seeding alone.
4. The single patch of Eucalypt forest re-established on the Stratford Mound (Transects 16 & 17) provides a high quality reference site for successful rehabilitation.
5. Research trials are suggested in respect to the use of native grasses (e.g. *Themeda australis*) as a long-term ground cover. The continued use of kikuyu should be avoided due to its smothering nature in un-grazed woody rehabilitation (i.e. Roseville and much of the Bowen Mound).
6. By chance, small patches of significant gully, rill and sheet erosion have been encountered near some transects on the Bowen and Roseville Mounds. A focused survey to rapidly assess the extent of gully erosion on these two Mounds should be conducted and remedial action taken.

During the reporting period the recommendations above have been addressed. Infill plantings of tube stock have been undertaken on the BRN and Roseville rehabilitation. The areas identified with erosion have been repaired. Research trials at the Duralie Mine Site have been conducted with the use of native grass ground covers in addition to the shrub and canopy species. The success of the rehabilitation trials will be monitored over the next reporting period. The rehabilitation monitoring program will be undertaken again during the next reporting period.

8.7 REHABILITATION TARGETS

The following rehabilitation targets are set for the next 12 months:

- A total of 5 Ha of rehabilitation is currently planned for the next reporting period within the codisposal reclaim area. Please refer to **Figure 3**.

9. COMMUNITY RELATIONS

9.1 COMMUNITY CONSULTATIVE COMMITTEE

The Community Consultative Committee (CCC) for the Stratford Coal Mine is currently comprised of:

- An independent Chairperson;
- Five (5) local community representatives;
- One (1) local government representatives (Gloucester Shire Council); and
- Two (2) DCPL representatives.

One CCC meetings was held during the reporting period in November 2015. Copies of CCC minutes are available on the Stratford Coal website [www.stratfordcoal.com.au/].

No site inspections were conducted following CCC meetings during the 2015 reporting period.

9.2 ENVIRONMENTAL COMPLAINTS

Complaints (by category) received by Stratford Coal Mine over the last 3 reporting years are as follows:

YEAR	12/13	13/14	14/15	2015 interim (July – December 2015)
Noise	37	11	11	2
Train	0	0	0	0
Blasting	13	2	0	0
Air Quality	6	0	0	0
Water	1	0	0	0
Lighting	1	1	0	0
Traffic Safety	0	0	0	0
Traffic Movement	0	0	0	0
Ground Surface Damage	0	0	0	0
Visual	0	0	0	0
Other	0	0	1	0
Total	56	14	12	2

A total of 2 complaints were received during the reporting period (July 2015 to December 2015). Both complaints were related to noise.

A complaints listing is provided in **Appendix 5**. A summary of complaints by category is provided in the relevant sections of the report.

9.3 LIAISON AND COMPLAINT RESOLUTION

In accordance with the Development Consent Conditions, SCPL was required to establish and maintain a complaints handling and response procedure. SCPL operates a system to receive, handle, respond to and record complaints relating to operation of the SMC.

A dedicated complaints telephone number is in place 24 hours per day. This number is 1300 658 239. The number is advertised within the *Sensis White Pages Directory (Newcastle)*, a local telephone directory (*Pink Pages*) and in the local newspapers (*Gloucester Advocate and Dungog Chronicle*) on a six monthly basis.

Stratford staff, when notified of a complaint, determine an appropriate response on the basis of the nature of the complaint. This may involve a site visit/inspection, liaison with personnel on site by telephone or other appropriate action. All complaints are responded to as soon as practicable. All complaints received and responses taken in relation to each complaint are recorded in a Complaints Register. The Complaints Register is tabled at each Community Consultative Committee meeting for the period covered since the last Committee meeting and is included in **Appendix 5**.

9.4 EMPLOYMENT STATUS AND DEMOGRAPHY

In December 2015, the total number of staff and FTE's employed at the Stratford Mining Complex was 24.5, including 1 environmental representative and shared services with the nearby Duralie Coal mine.

9.5 EMPLOYEE ENVIRONMENTAL AWARENESS TRAINING

Contractors and new employees working at site are provided with information on environmental issues as part of Yancoal induction training which is required to be update on a periodic basis. This includes elements such as the reporting obligations of personnel and the management of environmental incidents.

During the reporting period staff and operators at the Stratford CHPP were trained in the SMC Pollution Incident Response Management Plan. Additionally, a toolbox talk was presented to all operators on general environmental awareness.

10. INDEPENDENT AUDIT

An Independent Environmental Audit of the Stratford Mining Complex was conducted by Trevor Brown and Associates during November 2014.

The audit conclusions indicated a generally high standard of compliance of the Stratford Mining Complex Project activities with the conditions of approval granted to the project under the Project Approval, Environmental Protection Licence and Mining Leases.

The audit report and SMC response to the recommendations were provided to DP&E in February 2015. Following further correspondence with DP&E the audit report was resubmitted to DP&E on 16 July 2015 by the independent auditor and following acceptance by DP&E the full audit report and responses to the recommendations will be made available on the Stratford Coal website at <http://www.stratfordcoal.com.au/environment/environmental-audit.php>

Development Consent (SSD-4966) Condition 9 Schedule 5 required an Independent Environmental Audit to be commissioned prior to 31 December 2015. In light of the audit being undertaken in November 2014 and limited activities currently being undertaken, SCPL requested rescheduling the audit until December 2017 and are currently awaiting a response from DP&E.

11. INCIDENTS AND NON-COMPLIANCE DURING THE REPORTING PERIOD

Development Consent for the Stratford Extension Project (SEP) has been granted by the NSW Planning Assessment Commission however Stratford Coal Pty Ltd (SCPL) have proposed to delay commencing the development in the near term. Development Consent SSD-4966 contains several conditions which have specific timeframes for meeting the terms of the consent or as otherwise agreed by the Secretary. As such, SCPL have requested approval of the Secretary for DP&E to meet the specified requirements *at least 3 months prior to the commencement of operations in the new mining areas*. The requested extensions include conditions regarding environmental management plans, environmental auditing, road and intersection upgrades, biodiversity offset security and conservation bonds. SCPL are currently awaiting response from DP&E.

During the reporting period there have been no other incidents or non-compliances at the SMC.

12. ACTIVITIES TO BE COMPLETED IN THE NEXT REPORTING PERIOD

12.1 ENVIRONMENTAL MANAGEMENT

The following environmental targets have been set for the next 12 months:

- Continue to mitigate contributed mine noise emissions where possible, with particular focus on the product stockpile dozer;
- Progress rehabilitation works to satisfy MOP nominated targets; and
- Ensure compliance with SEP Development Consent (SSD-4966) prior to the commencement of operations.

13. REFERENCES

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Appendix 1:

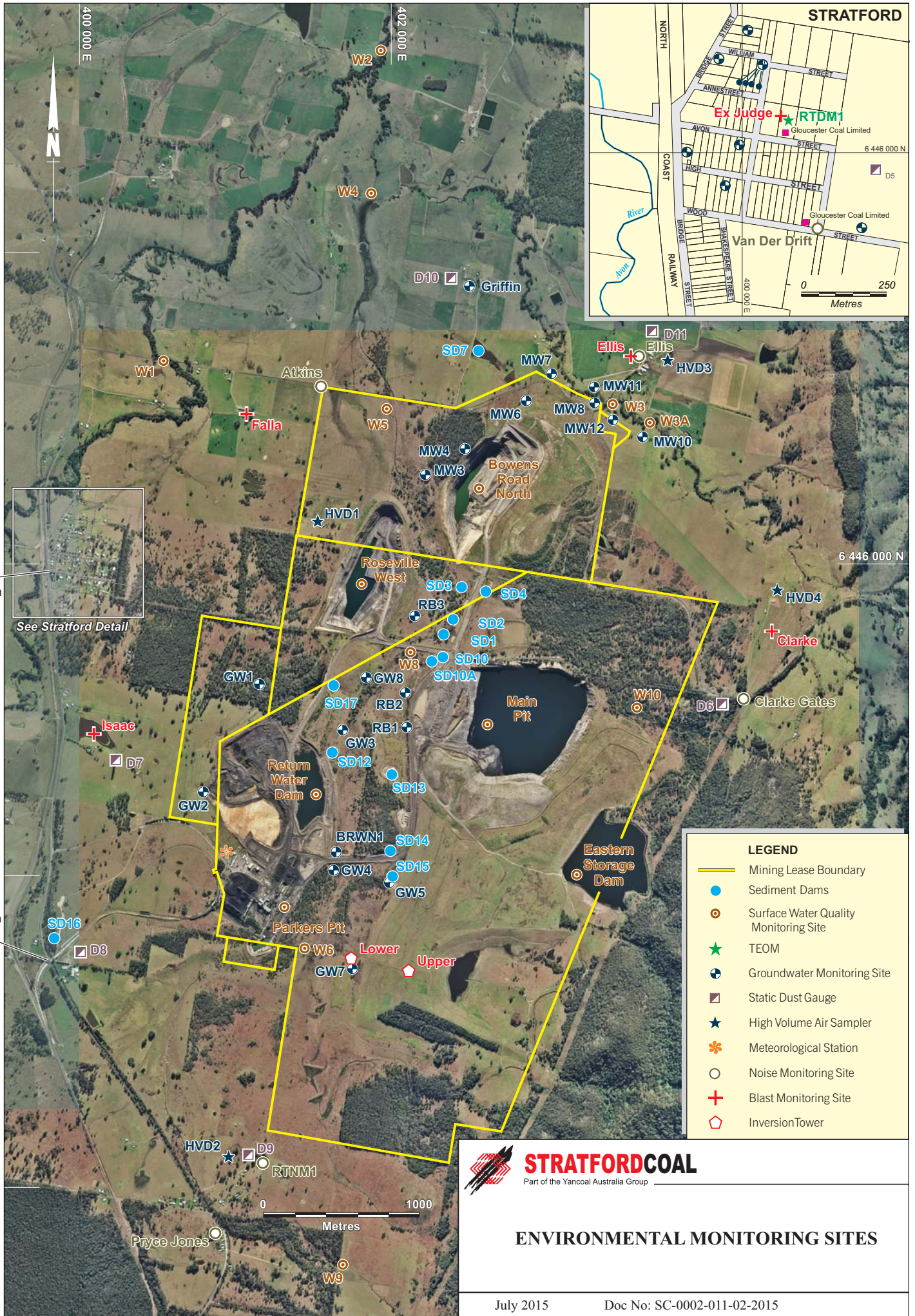
- **Site Locality Plan**
- **Monitoring Locations**
- **Disturbed and Rehabilitated Land Plan.**



STRATFORDCOAL STRATFORD OPERATIONS
Part of the Yancoal Australia Group

ANNUAL REVIEW

SITE LOCATION PLAN



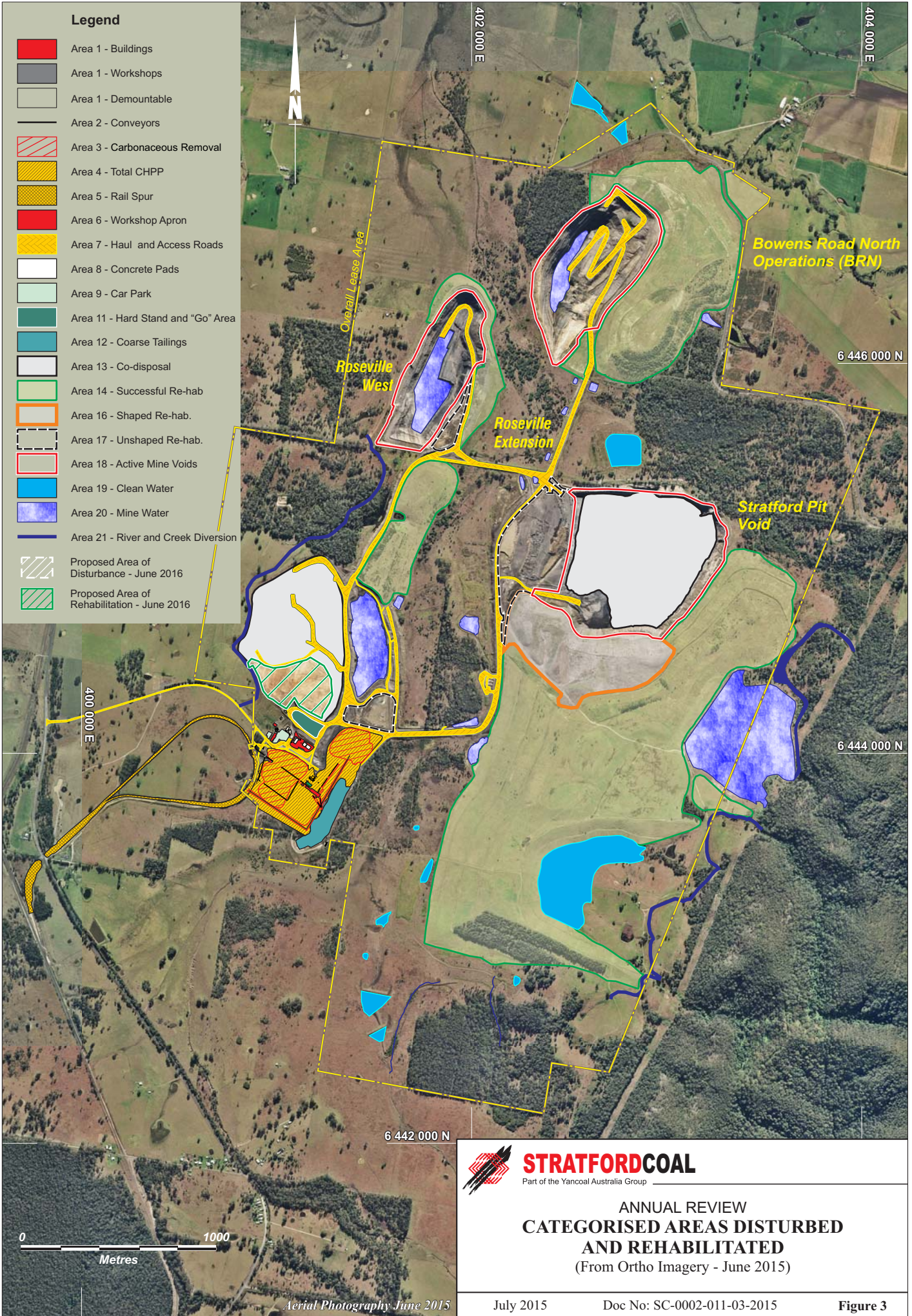
LEGEND

- Mining Lease Boundary
- Sediment Dams
- Surface Water Quality Monitoring Site
- ★ TEOM
- ⊕ Groundwater Monitoring Site
- ▣ Static Dust Gauge
- ★ High Volume Air Sampler
- ✱ Meteorological Station
- Noise Monitoring Site
- + Blast Monitoring Site
- ⬠ Inversion Tower



ENVIRONMENTAL MONITORING SITES

1165m
★ HVD5



Legend

- Area 1 - Buildings
- Area 1 - Workshops
- Area 1 - Demountable
- Area 2 - Conveyors
- Area 3 - Carbonaceous Removal
- Area 4 - Total CHPP
- Area 5 - Rail Spur
- Area 6 - Workshop Apron
- Area 7 - Haul and Access Roads
- Area 8 - Concrete Pads
- Area 9 - Car Park
- Area 11 - Hard Stand and "Go" Area
- Area 12 - Coarse Tailings
- Area 13 - Co-disposal
- Area 14 - Successful Re-hab.
- Area 16 - Shaped Re-hab.
- Area 17 - Unshaped Re-hab.
- Area 18 - Active Mine Voids
- Area 19 - Clean Water
- Area 20 - Mine Water
- Area 21 - River and Creek Diversion
- Proposed Area of Disturbance - June 2016
- Proposed Area of Rehabilitation - June 2016

Overall Lease Area

Roseville West

Roseville Extension

Bowens Road North Operations (BRN)

Stratford Pit Void

402 000 E

404 000 E

6 446 000 N

400 000 E

6 444 000 N

6 442 000 N



Aerial Photography June 2015



**ANNUAL REVIEW
CATEGORISED AREAS DISTURBED
AND REHABILITATED**
(From Ortho Imagery - June 2015)

Appendix 2:

Meteorological Monitoring

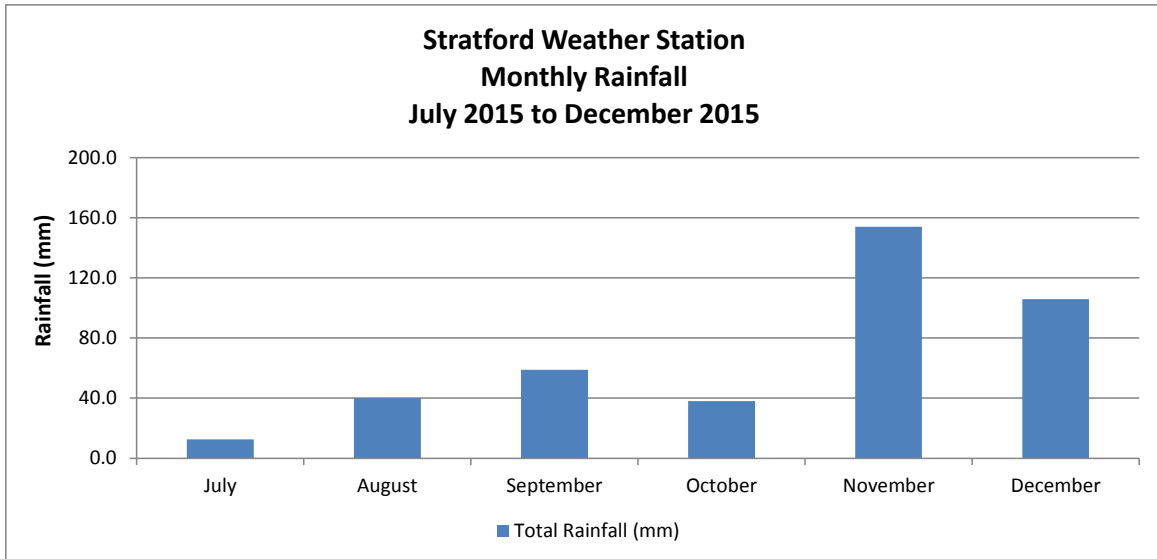


Figure 3-1: Monthly Recorded Rainfall during the Reporting Period

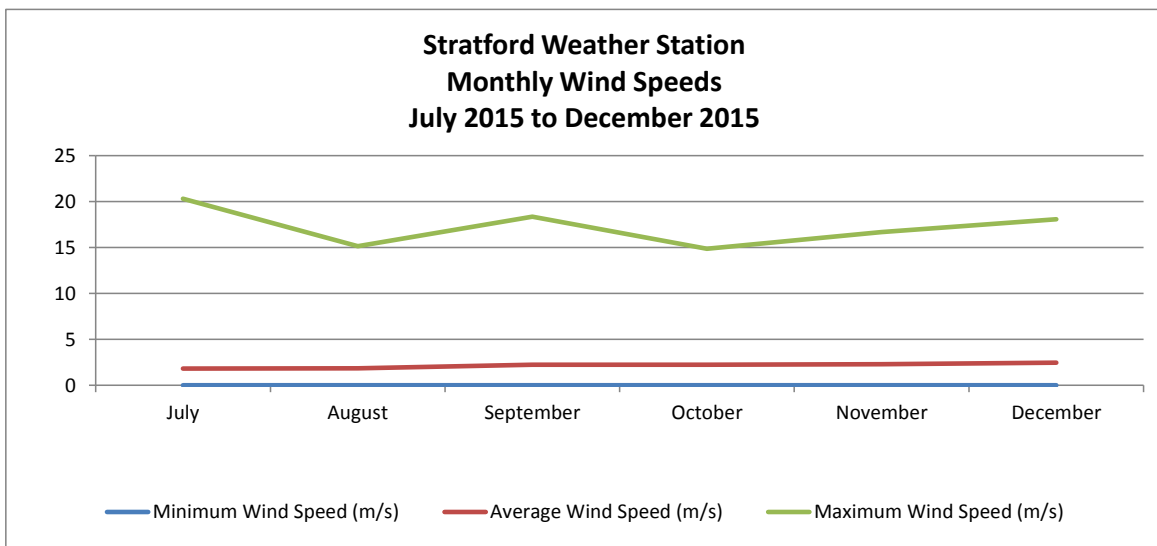


Figure 3-2: Minimum, Maximum and Average Wind Speeds during the Reporting Period

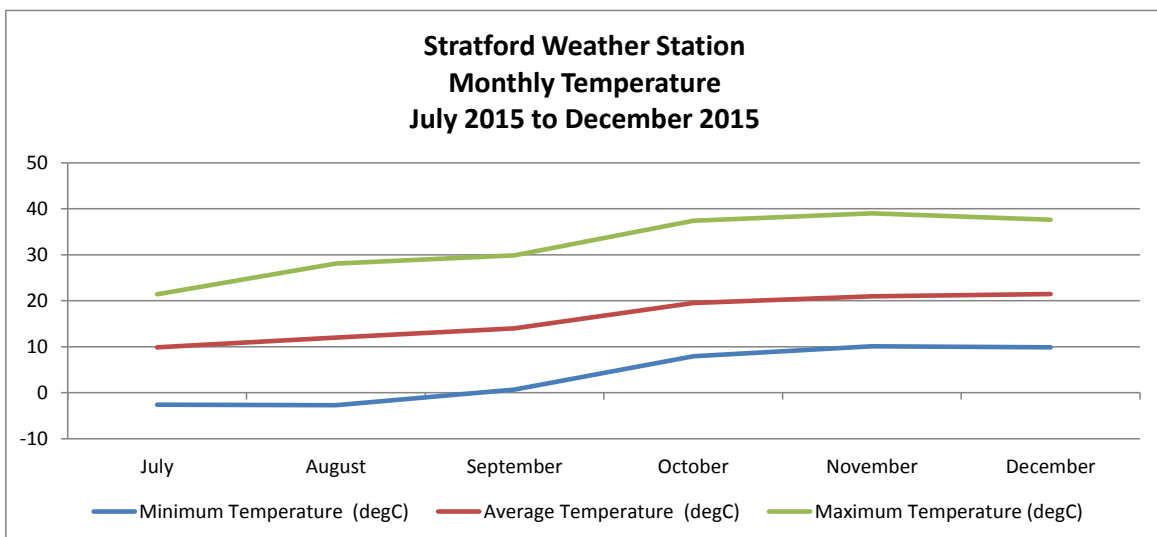
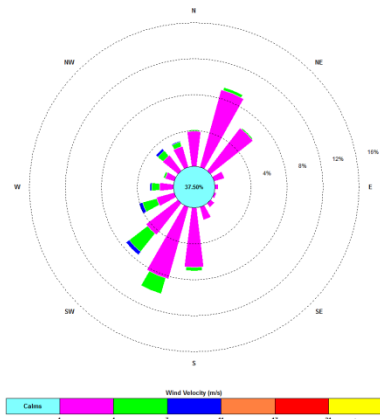
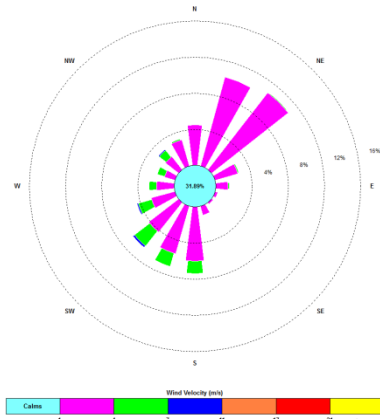


Figure 3-3: Minimum, Maximum and Average Temperatures during the Reporting Period

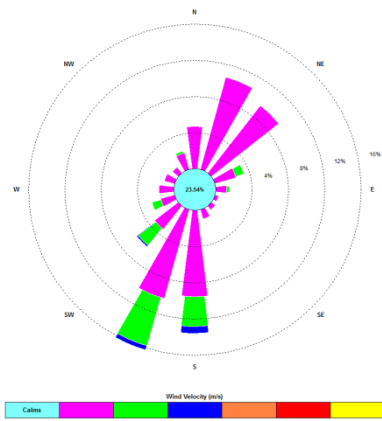
July 2015



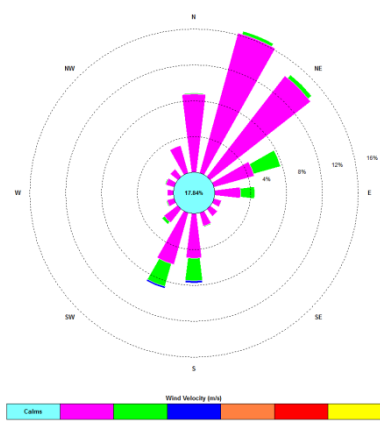
August 2015



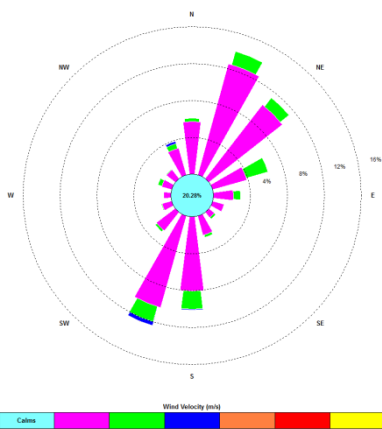
September 2015



October 2015



November 2015



December 2015

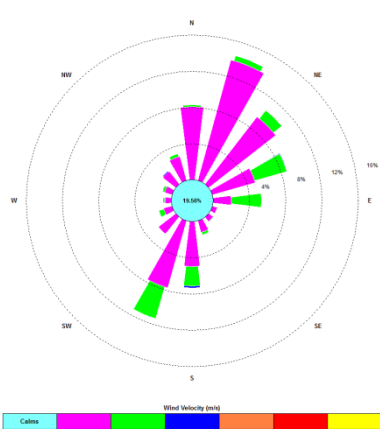


Figure 3-4: Monthly Windroses Displaying Wind Direction and Speed Frequencies during the Reporting Period

Appendix 3:

Air Quality Monitoring

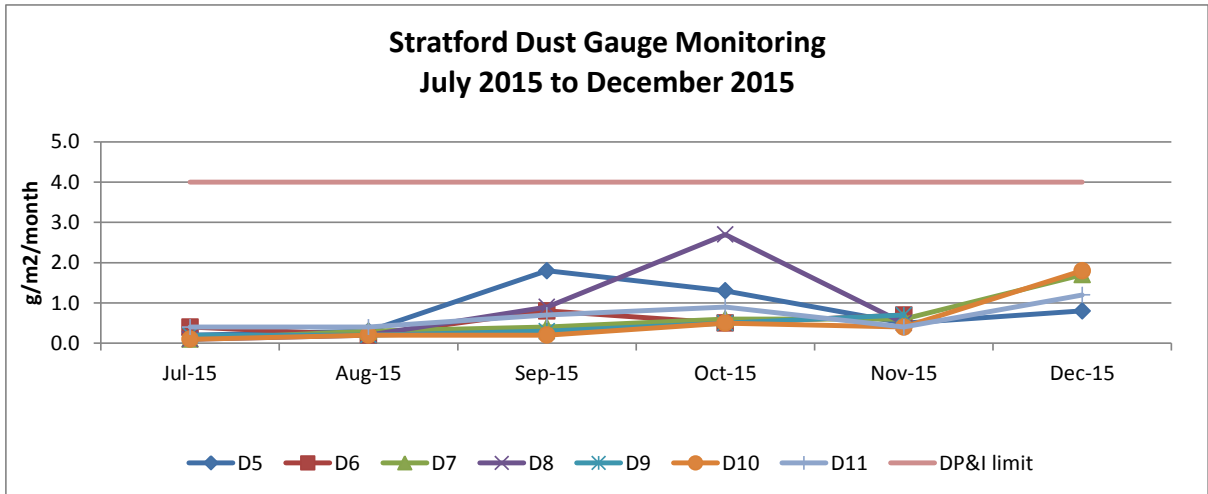


Figure 3-1: Depositional Dust Monitoring Results from July 2015 to December 2015

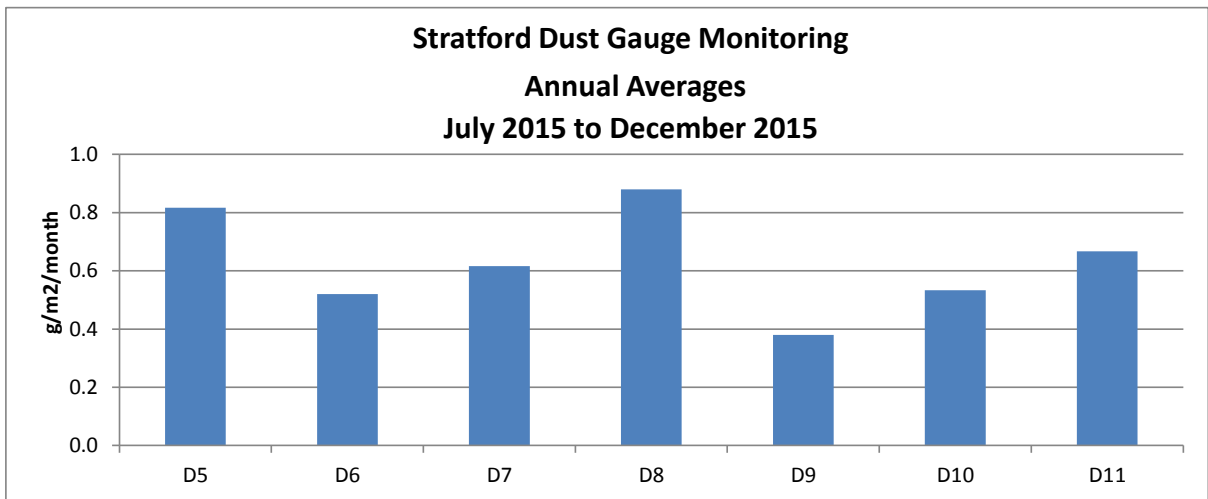


Figure 3-2: Depositional Dust Annual Averages from July 2015 to December 2015

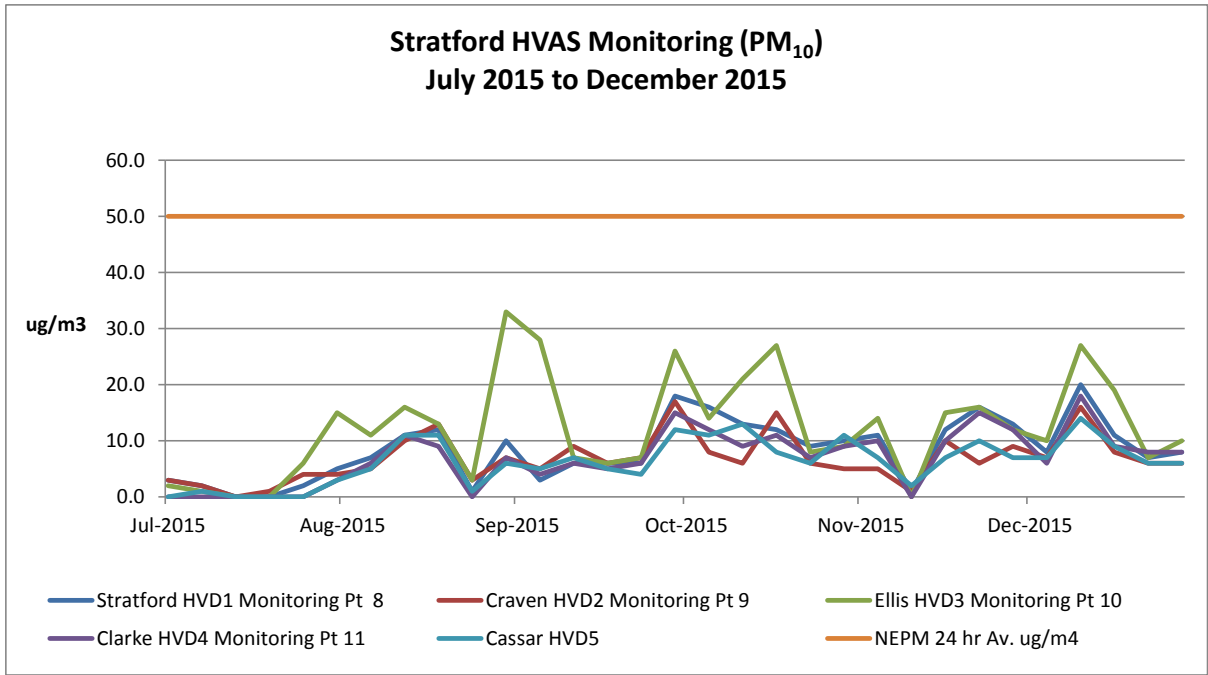


Figure 3-3: High Volume Air Sampler (HVAS) PM₁₀ Results

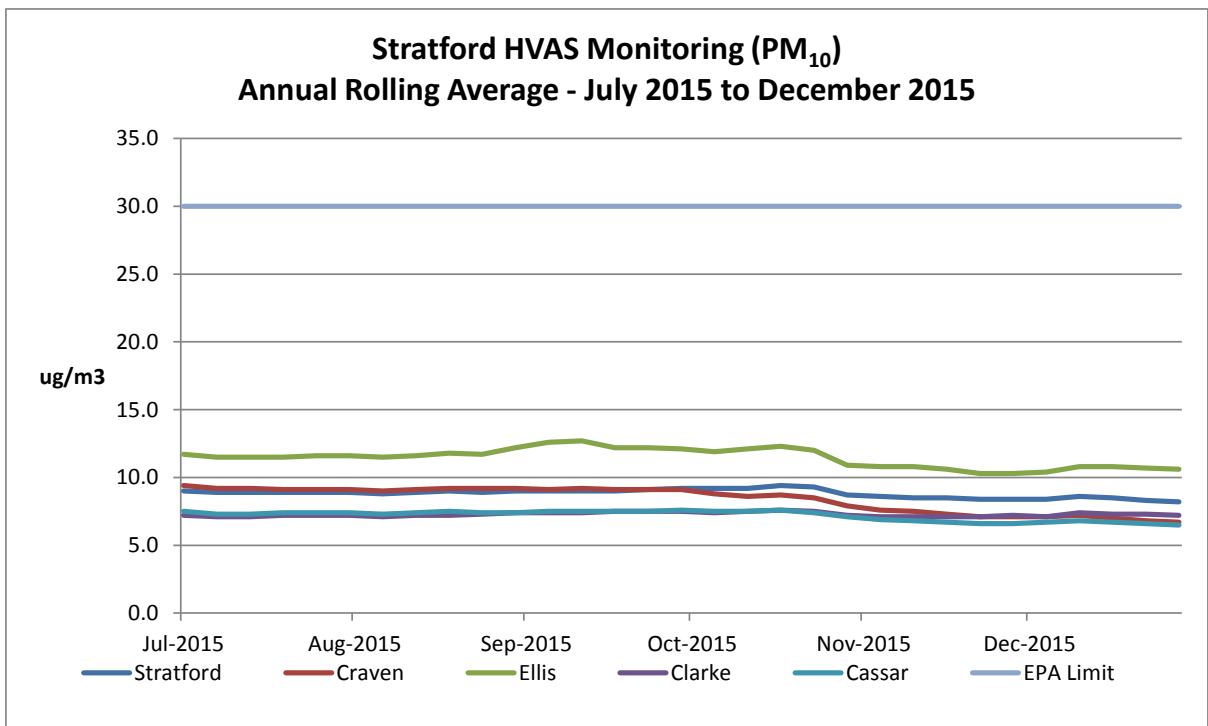


Figure 3-4: HVAS PM₁₀ Rolling Annual Average Results

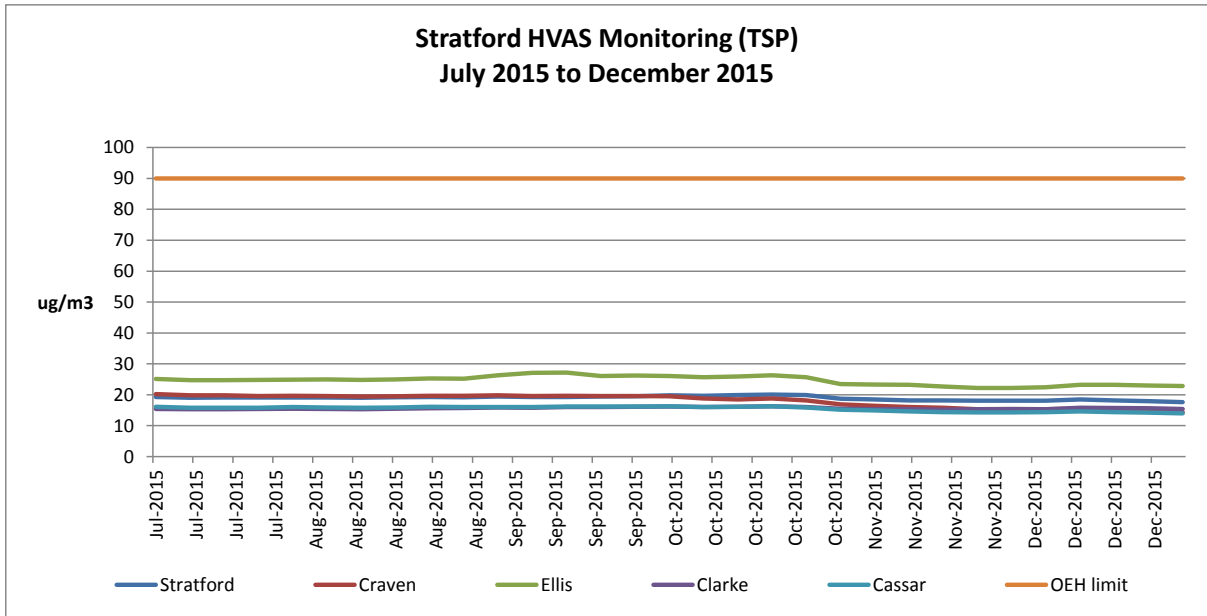


Figure 3-4: HVAS Total Suspended Particulates (TSP) Results

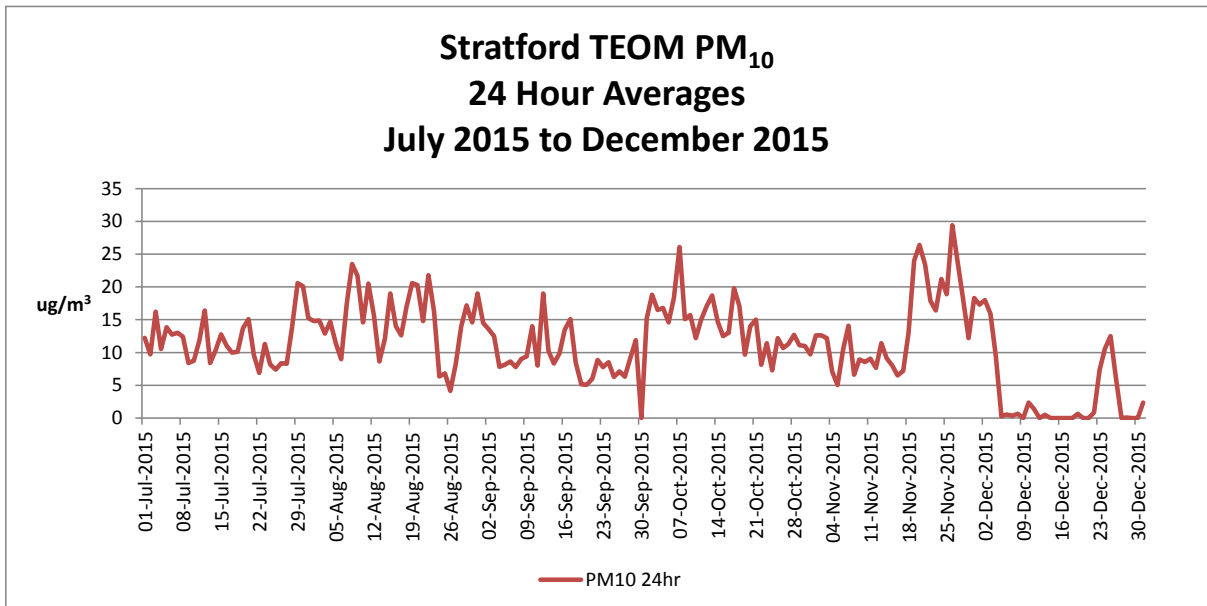


Figure 3-5: Real Time Dust Monitoring (PM₁₀) Results during the Reporting Period

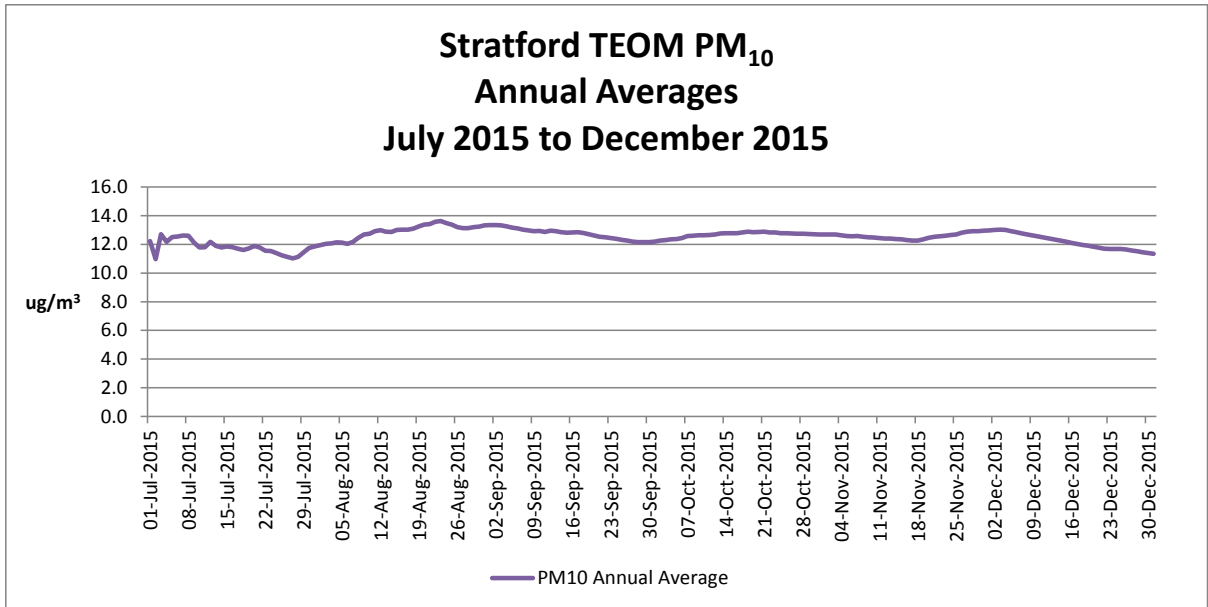


Figure 3-6: Rolling Annual Average TEOM (PM₁₀) Results during the Reporting Period

Appendix 4:

Surface Water and Groundwater Monitoring

Surface waters

W1

DATE	EVENT	Flow	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)
31-Jul-15	Routine	Low flow	8.06	330	9.9	9.3	194	<5	63	8	41	12	8	<0.001	0.134	1.98	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.3	0.02
24-Aug-15	Event	High flow	7.76	406	16.1	7.9	232	9	70	7	48	19	12	<0.001	0.432	2.52	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.5	0.03
29-Sep-15	Routine	Mod flow	6.97	440	20.4	8.7	228	<5	71	6	74	18	11	<0.001	0.091	2.60	0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.3	0.04
28-Oct-15	Routine	Nil flow																						
8-Nov-15	Event	High flow	7.70	165		145	186	96	37	<1	29	8	5	<0.001	0.091	<0.05	<0.001	<0.0001	<0.001	<0.05	<0.0001	0.004	1.1	0.1
23-Dec-15	Event	High flow	7.13	292	21.7	37	239	24	52	4	51	13	7	0.001	0.067	1.88	0.002	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.2	0.09

W2

DATE	Event	Flow	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)
31-Jul-15	Routine	Low flow	7.77	390	10.3	6.4	282	<5	62	18	49	13	9	<0.001	0.114	1.16	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.3	0.02
24-Aug-15	Event	Low flow	7.68	403	17.3	3.0	239	<5	65	10	49	18	11	<0.001	0.104	0.8	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.4	0.02
29-Sep-15	Routine	Lowflow	7.82	1020	24.7	9.1	268	<5	41	72	215	22	28	<0.001	0.130	0.8	<0.001	<0.0001	<0.001	<0.05	0.0001	<0.001	0.6	0.02
28-Oct-15	Routine	Nil flow																						
8-Nov-15	Event	Slow flow	7.28	415	21.2	27.9	234	14	52	8	63	12	10	<0.001	0.290	2.4	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.1	0.11
23-Dec-15	Event	Steady flow	7.37	306	21.9	9.2	215	10	64	2	49	16	9	<0.001	0.279	2.0	0.002	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.8	0.11

W3

DATE	EVENT	Flow	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Lead (mg/L)	Boron (mg/L)	Mercury (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)
31-Jul-15	Routine	Low flow	7.34	512	11.1	16	296	28	90	14	60	15	12	<0.001	1.2	1.88	0.003	<0.0001	<0.001	<0.001	<0.05	<0.0001	3.2	0.36
24-Aug-15	Event	Low flow	7.27	580	17.6	17	314	108	78	18	64	20	16	0.002	1.21	2.44	0.002	<0.0001	<0.001	<0.001	<0.05	<0.0001	3.3	0.52
29-Sep-15	Routine	Low flow	7.59	740	27.4	16	362	28	137	6	109	19	17	0.001	1.21	2.04	0.003	<0.0001	<0.001	<0.001	<0.05	<0.0001	6	0.45
28-Oct-15	Routine	Low flow	7.54	555	17.2	75	394	32	112	13	77	15	13	0.003	0.894	4.51	0.008	<0.0001	<0.001	0.002	<0.05	<0.0001	6.3	1.87
8-Nov-15	Event	Low flow	6.70	376		83	282	26	73	14	56	15	11	<0.001	0.82	3.99	0.006	<0.0001	<0.001	0.002	<0.05	<0.0001	2.9	0.37
23-Dec-15	Event	Mod flow	7.21	601	21.5	147	502	81	116	28	75	20	15	0.007	0.965	4.09	0.006	<0.0001	0.002	0.002	<0.05	<0.0001	12.1	3.24

W3A

DATE	EVENT	Flow	pH	Cond. (uS/cm)	Temperature (°C)	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)
31-Jul-15	Routine	Low flow	6.98	399	11.9	36	257	12	54	20	53	14	10	<0.001	2.42	5.02	0.004	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.2	0.04
24-Aug-15	Event	Low flow	7.09	460	17.2	10	282	12	49	19	55	19	13	<0.001	1.57	4.13	0.003	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.6	0.04
29-Sep-15	Routine	Low flow	7.07	560	24.9	31	298	22	74	11	97	21	14	<0.001	1.21	3.45	0.002	<0.0001	<0.001	<0.05	0.0003	<0.001	2.1	0.16
28-Oct-15	Routine	low flow	5.90	508	16.4	31	312	14	76	6	102	20	13	<0.001	3.15	3.74	0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.4	0.05
8-Nov-15	Event	Low flow	7.00	440	NR	40	264	15	72	5	101	23	15	<0.001	1.6	2.87	0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	7.2	0.21
23-Dec-15	Event	Low flow	6.48	398	20.8	14	288	30	47	11	75	16	10	<0.001	1.59	4.4	0.003	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.4	0.19

W4

DATE	Event	FLOW	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)
31-Jul-15	Routine	Low flow	7.43	459	10.1	7	282.0	<5	56	31	60	13	12	<0.001	0.105	1.17	0.00	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.4	0.03
24-Aug-15	Event	Low flow	7.6	623	16.1	2.9	348.0	30	46	45	135	18	20	<0.001	0.643	0.88	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	21.6	0.13
29-Sep-15	Routine	Low Flow	7.1	1170	22.1	8.1	624.0	6	27	103	260	23	33	<0.001	0.125	0.65	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.6	0.03
28-Oct-15	Routine	Nil flow																						
8-Nov-15	Event	Mod Flow	7.2	844	20.5	6.2	412.0	8	105	6	171	22	20	<0.001	0.469	1.72	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	1	0.13
23-Dec-15	Event	Low flow	7.5	460	21.7	19.3	301.0	52	74	5	78	17	13	<0.001	0.526	2.92	0.00	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.3	0.3

W5

DATE	Event	Flow	pH	Cond. (uS/cm)	Temp °C	TDS (mg/L)	TSS (mg/L)	Turbidity (NTU)	Chloride (mg/L)	Sulphate (mg/L)	Iron (filt.) (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Mn (mg/L)	Lead (mg/L)	Alkalinity (mg/L)
31-Jul-15	Routine	Low flow	7.43	459	10.1	7	282	<5	56	31	60.00	13	12	<0.001	0.105	1.17	0.002	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.4	0.03
24-Aug-15	Event	Low flow	7.60	623	16.1	2.9	348	30	46	45	135.00	18	20	<0.001	0.643	0.88	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	21.6	0.13
29-Sep-15	Routine	Low Flow	7.10	1170	22.1	8.1	624	6	27	103	260.00	23	33	<0.001	0.125	0.65	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.6	0.03
28-Oct-15	Routine	Nil flow																						
8-Nov-15	Event	Mod Flow	7.20	844	20.5	6.2	412	8	105	6	171.00	22	20	<0.001	0.469	1.72	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	1	0.13
23-Dec-15	Event	Low flow	7.50	460	21.7	19.3	301	52	74	5	78.00	17	13	<0.001	0.526	2.92	0.004	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.3	0.3

W6

DATE	Event	Flow	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)	
31-Jul-15	Routine	Dry																							
24-Aug-15	Event	No flow																							
29-Sep-15	Routine	Low flow	7.27	570	26.2	4.7	461	14	9	10	140	8	12	0.002	0.043	5.76	<0.001	<0.0001	0.006	<0.05	<0.0001	0.002	1.4	0.16	
28-Oct-15	Routine	Nil Flow																							
8-Nov-15	Event	Mod flow	6.60	285	NR	100.0	282	17	9	<1	65	5	7	0.01	0.06	3.41	<0.001	0.0004	0.002	<0.05	<0.0001	0.002	1.4	0.14	
23-Dec-15	Event	Low flow	6.62	500	22	174.0	362	22	4	16	146	8	13	0.003	0.186	6.92	0.001	<0.0001	0.006	<0.05	<0.0001	0.003	1.1	0.18	

W8

DATE	Event	Flow	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)	
31-Jul-15	Routine	Low flow	7.8	874	13.2	75.4	508	83	26	116	154	18	25	<0.001	0.089	0.8	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.6	0.07	
24-Aug-15	Event	Low flow	7.46	969	17.4	2.9	464	6	27	1222	157	22	31	<0.001	0.319	0.81	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.7	0.08	
29-Sep-15	Routine	Low Flow	8.1	1107	23.2	3.1	614	<5	33	111	235	21	32	<0.001	0.026	0.35	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	0.4	<0.01	
28-Oct-15	Routine	Nil flow																							
8-Nov-15	Event	Low flow	6.8	830		50	510	16	87	53	190	21	26	<0.001	1.17	4.3	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.3	0.1	
23-Dec-15	Event	Low Flow	7.1	430	22.5	29.3	331	46	92	20	58	12	14	<0.001	0.531	4.69	0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.4	0.16	

W9

DATE	Event	Flow	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)	
31-Jul-15	Routine	Dry																							
24-Aug-15	Event	No Flow																							
29-Sep-15	Routine	Low Flow	6.0	164	22	85.7	275	9	13	3	32	4	4	0.074	0.004	5.54	0.001	<0.0001	0.007	<0.05	<0.0001	0.002	1.5	0.12	
28-Oct-15	Routine	Dry																							
08-Nov-15	Event	Mod flow	6.2	72	NR	80	162	16	10	<1	16	2	2	0.03	<0.001	2.68	<0.001	0.0002	0.002	<0.05	<0.0001	<0.001	1.6	0.1	
23-Dec-15	Event	No Flow																							

W10

DATE	Event	Flow	pH	Cond. (uS/cm)	Temp °C	Turbidity (NTU)	TDS (mg/L)	TSS (mg/L)	Alkalinity (mg/L)	Sulphate (mg/L)	Chloride (mg/L)	Calcium (mg/L)	Mg (mg/L)	Copper (mg/L)	Mn (mg/L)	Iron (filt.) (mg/L)	Arsenic (mg/L)	Cd (mg/L)	Cr (mg/L)	Boron (mg/L)	Mercury (mg/L)	Lead (mg/L)	Tot. N (mg/L)	Tot. P (mg/L)	
31-Jul-15	Routine	No flow																							
24-Aug-15	Event	Mod flow	7.21	1006	16.4	37	541	22	25	93	176	43	27	<0.001	0.064	1.64	<0.001	<0.0001	<0.001	<0.05	<0.0001	<0.001	1.3	0.04	
29-Sep-15	Routine	No Flow																							
28-Oct-15	Routine	Dry																							
8-Nov-15	Event	Low flow	7.1	500		140	464	14	20	57	115	19	11	<0.001	0.06	3.14	<0.001	<0.0001	0.001	<0.05	<0.0001	0.002	1.6	0.09	
23-Dec-15	Event	mod flow	6.81	783	20.4	48.5	546	34	42	76	170	26	15	<0.001	0.059	1.72	<0.001	<0.0001	<0.001	<0.05	<0.0001	0.001	1	0.05	

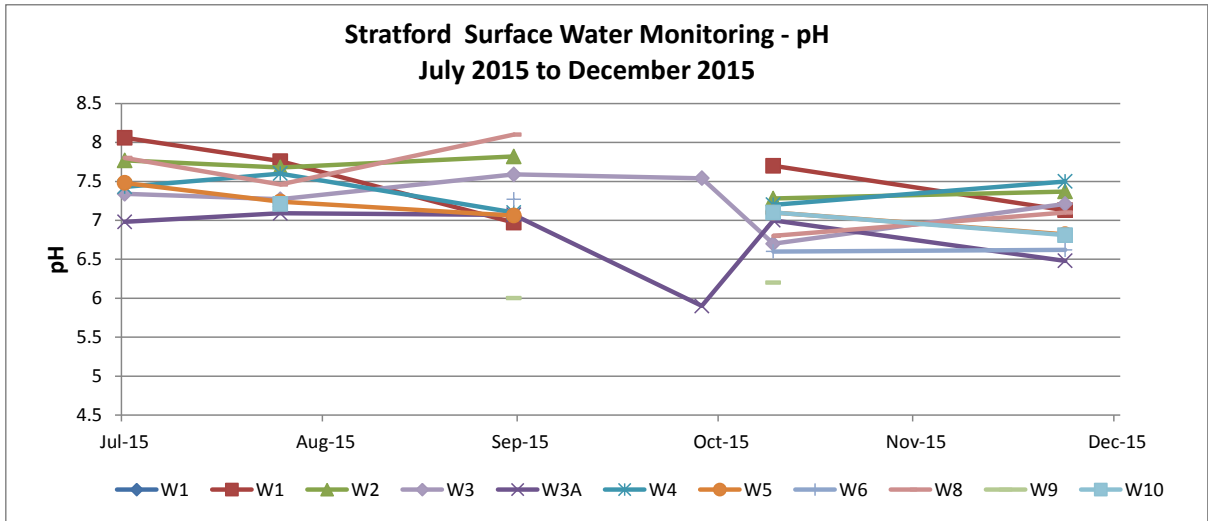


Figure 5-1: Surface Water Monitoring Results - pH

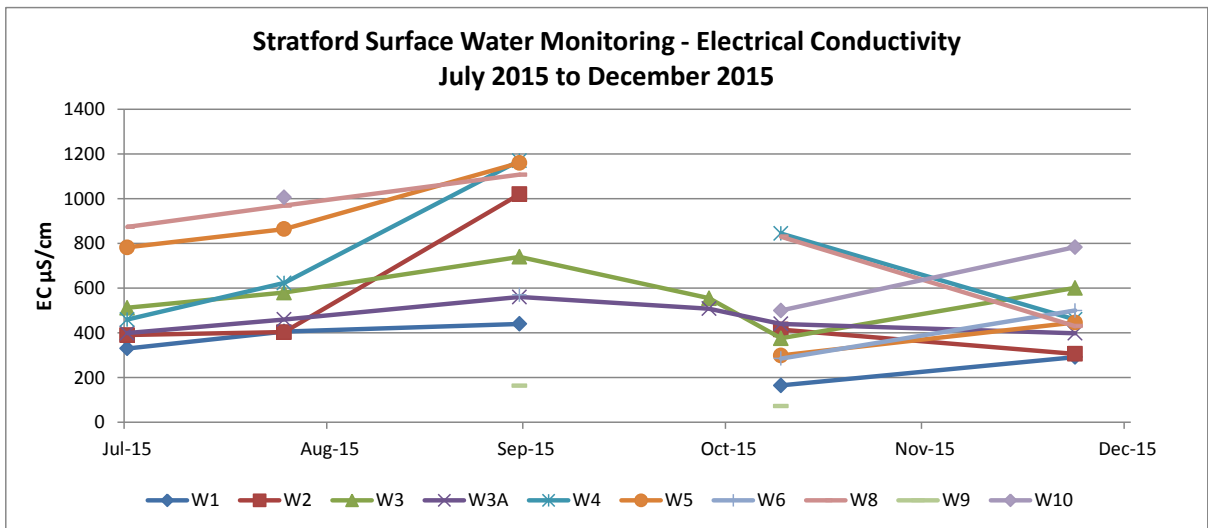


Figure 5-2: Surface Water Monitoring Results - Electrical Conductivity

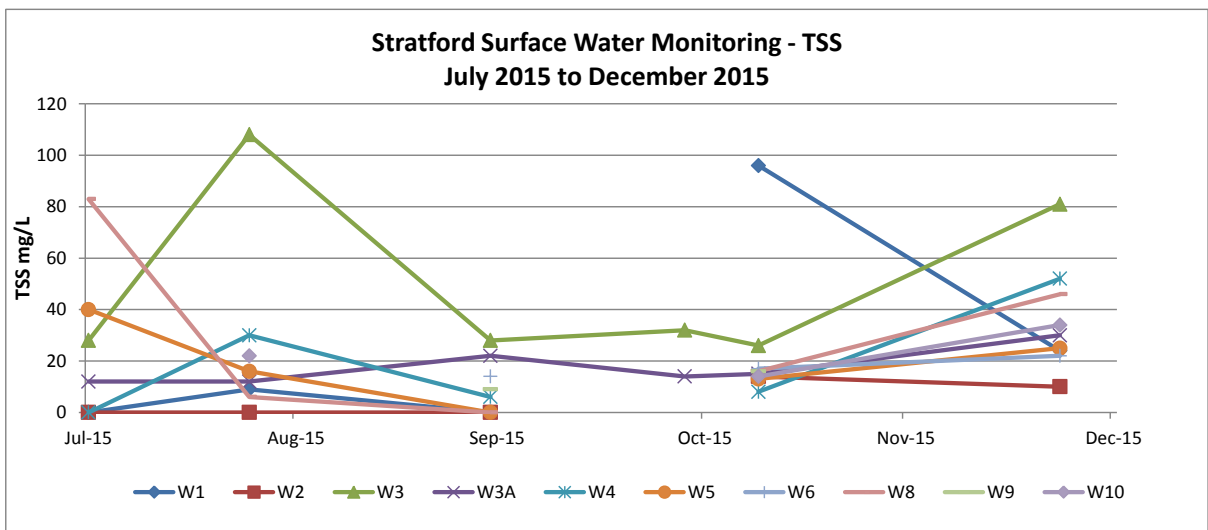


Figure 5-3: Surface Water Monitoring Results - Total Suspended Solids

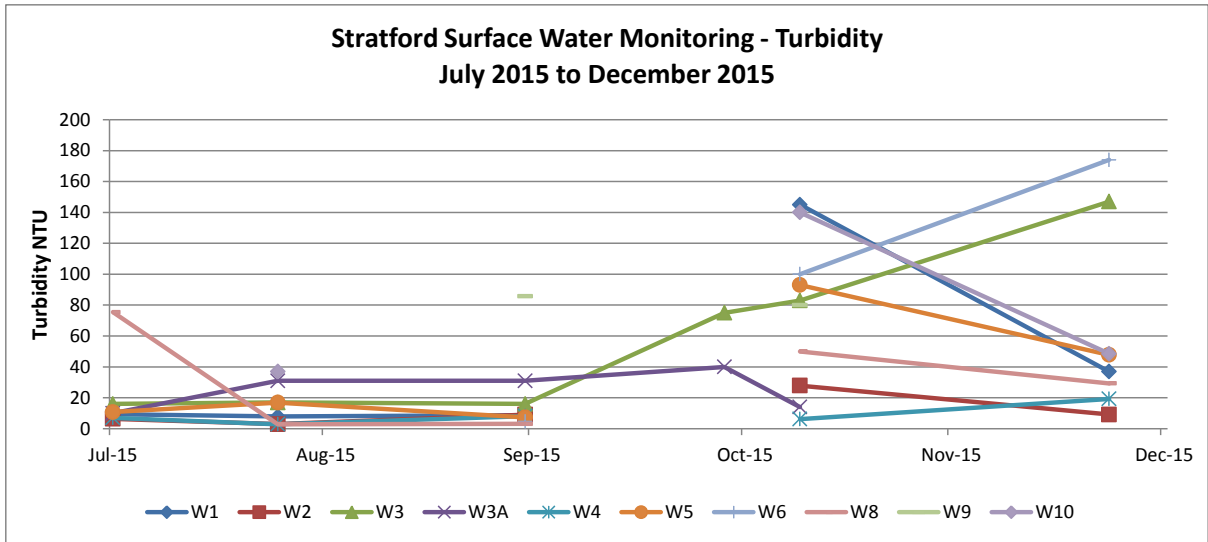


Figure 5-4: Surface Water Monitoring Results - Turbidity

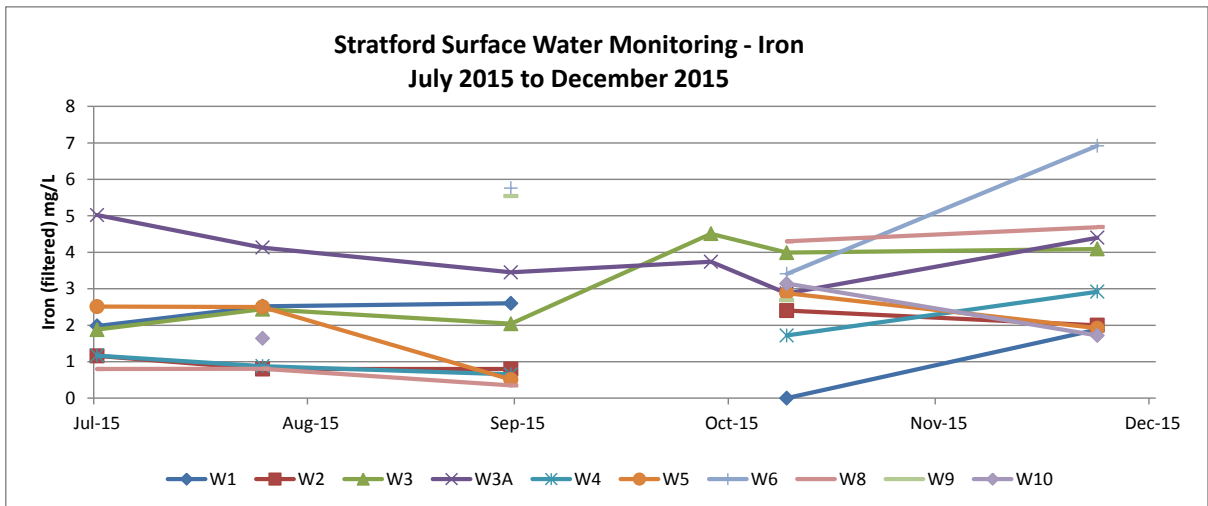


Figure 5-5: Surface Water Monitoring Results - Iron

Groundwaters

Bore ID	Date	Depth to Water	Well Depth	DtoW	pH	EC	Na	Cl	Fe(filt)	SO4	TSS	ORP	Temp
		from top of collar		below ground		uS/cm	mg/l	mg/l	mg/l	mg/l	mg/l		
		(m)	(m)										
GW1	13-Aug-15	16.04	16.42	15.14									
	24-Nov-15	16.10	16.42	15.20									
GW2	13-Aug-15	9.90	17.03	8.70	6.45	4800	690	1140	35.1	28	252	58	19.0
	24-Nov-15	9.98	17.03	8.78	6.38	5060	779	1320	28.0	31	793	-62	24.0
GW3	13-Aug-15	3.67	6.38	2.77	3.70	4190	693	1040	39.4	75	317	417	20.0
	24-Nov-15	2.72	6.38	1.82	4.20	4000	735	1200	29.6	80	458	197	23.0
GW4	13-Aug-15	0.88	5.97	0.18	6.40	14990	27740	4430	2.3	103	41	124	18.0
	24-Nov-15	0.72	5.97	0.02	6.40	15800	2520	5090	3.9	134	49	54	20.0
GW5	13-Aug-15	4.12	8.55	3.12	6.80	6590	1000	1570	29.7	114	451	117	19.4
	24-Nov-15	4.02	8.55	3.02	6.41	8520	1020	1690	18.2	106	142	-70	21.4
GW7	13-Aug-15	2.92	8.28	2.17	6.02	3250	427	779	9.31	95	58	100	19.0
	24-Nov-15	2.80	8.28	2.05	6.20	1710	239	540	8.87	102	41	-51	23.1
GW8	13-Aug-15	12.79	11.75	11.89									
	24-Nov-15	12.80	11.75	11.90									

Bore Id	DATE	Depth	Bore	Volume	pH	Cond.	ORP	Sulfate	Sodium	Chloride	Iron	TSS	Temp
		(m)	Volume	Purged		(uS/cm)	(mV)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	mg/L	°C
BRWN1	13-Aug-15	0.55	6.7	11.0 (dry)	5.9	6270	185	502	1020	1390	4.48	172	19.1
	24-Nov-15	0.56	6.7	11.0 (dry)	6.1	6500	47	476	1160	1560	3.28	206	21.1

Bore Id	DATE	Depth to Water Level (m)	Corrected DTWL (m)	Bore Vol. (L)	Purged Vol. (L)	pH	Cond. (uS/cm)	ORP (mv)	Temp °C	Calcium (mg/L)	Iron (mg/L)	Lead (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Sodium (mg/L)	bonate (as Ca (mg/L)	Chloride (mg/L)	Sulphate (mg/L)
MW11	24-Jul-15	9.78	9.28																	
	31-Aug-15	9.76	9.26	32.0	96.0	6.99	1091	7		65	0.50	<0.001	10	0.031	0.05	2	173	318	122	22
	22-Sep-15	9.72	9.22																	
	13-Oct-15	9.77	9.27																	
	13-Nov-15	11.73	11.23	83.9	86.0	7.04	1134	-89		55	0.55	0.001	10	0.042	0.09	3	166	317	152	22
	16-Dec-15	9.70	9.20																	
MW12	24-Jul-15	3.32	2.82																	
	31-Aug-15	3.30	2.80	11.2	33.0	6.50	570	97		16	6.35	0.008	12	1.66	0.05	2	60	63	74	15
	22-Sep-15	3.33	2.83																	
	13-Oct-15	3.42	2.92																	
	13-Nov-15	3.36	2.86	11.1	33.0	6.53	574	-75		20	1.26	<0.001	15	1.97	0.04	3	69	72	126	9
	16-Dec-15	3.41	2.91																	
Griffin	24-Jul-15	2.72	2.32																	
	31-Aug-15	2.76	2.36			7.02	1152	190		49	0.32	<0.001	26	0.108	0.04	2	201	186	253	26.00
	22-Sep-15	2.75	2.35																	
	13-Oct-15	3.39	2.99																	
	13-Nov-15	3.91	3.51			6.21	1274	-314		49	0.56	0.004	30	0.139	0.10	2	161	150	291	15.00
	16-Dec-15	3.68	3.28																	

Bore Id	DATE	Depth to Water Level (m)	pH	Cond. (uS/cm)	ORP	Temp	Calcium (mg/L)	Iron (mg/L)	Magnesium (mg/L)	Manganese (mg/L)	Lead (µg/L)	Phosphorus (mg/L)	Potassium (mg/L)	Sodium (mg/L)	Chloride (mg/L)	Sulphate (mg/L)	Bicarbonate as CaCO3 (mg/L)
Bagnell	8-Oct-15	7.39	8.0	1970	314	22.4	36	0.23	10	0.084	0.002	0.07	3	451	413	3	540
Ex-Bramley	8-Oct-15	6.27	7.70	510	320	21	57	0.25	4	0.106	0.005	0.26	2	38	74	3	143
Ex-Butler/McDonald	8-Oct-15	Not home															
Fardell (ex Horner)	8-Oct-15	Not Home															
Forbes	8-Oct-15	Not home															
Germon	8-Oct-15	10.00	7.50	3010	209.0	22.0	65	6	48	0.376	0.007	0.02	5	721	782	82	666
Ex-Griffin	8-Oct-15	3.28	6.9	1090	59	20	46	0.66	23	0.134	<0.001	0.12	2	164	272	6	154
Hooker	8-Oct-15	4.50	7.7	270	148	21.2	36	0.58	4	0.006	0.002	0.24	8	10	15	14	112
Mitchell	8-Oct-15	Not Home															
Glew	8-Oct-15	Not home															
Smith	8-Oct-15	Not home															
SCPL Bore, Wood St	8-Oct-15	10.45	6.90	3700	60	20.5	209	2.81	146	0.466	0.022	0.12	8	946	1540	115	514

Appendix 5:

Complaints

Stratford Complaint Summary

Period: 12 Months to March 2016

Total No. of Complaints: 6 (6 noise, 0 other)

Total No. of Complainants: 4

Date/Time of Complaint	Complainant Location	Method of Complaint	Nature of Complaint	Investigation/Outcome
21:29hrs 8/03/15	Upper Avon Rd, Stratford	Community hotline	Noise	Complaint received regarding 'noise from mine. DCPL contacted complainant to discuss noise concerns. Confirmed there was an export train being loaded between 1909 to 2249 and 1 dozer was on the southern stockpile to tidy up for a little while after the train finished. Advised that the plant was not running during the night.
00:27hrs 4/05/15	Stratford (Approx. 4.2km NNW of CHPP)	Community hotline	Noise	1) Complainant Stated: 'Humming noise'. 2) CHPP running from 11:30 to approx. 5:00am, dozer was operating on stockpile. Overcast and light southerly wind most of the night. Weak inversion present. 3) Review of audio files confirmed background humming noise from the CHPP however below real-time noise alarm levels.
13:00hrs 29/05/2015	Stratford Approx 2.5km west of source	Direct to phone	Noise	Phone call received notifying of a 'banging' sound that was different to usual. Environmental representatives attended residence at approximately 1:30pm to determine if could identify the potential noise and source. Contacted CHPP to understand activities. CHPP operating, dozer on stockpile, train unloading on loop prior to phone call from resident. Further investigation and review believes it could be attributed to dozer operator dropping blade on ground to remove/clean build up. Advised CHPP to communicate this noise source audible off site & adjust operating protocol.
07:41hrs 3/06/2015	Stratford village	Community Hotline	Noise	Noise complaint received, however no other details left and no call back requested. 2) CHPP supervisor investigated operations, the stockpile dozer was pushing off V4. Supervisor listened to real-time noise audio file and commented there seems to be no dominant mine noise. No call back requested. No further change to current controls for operations.
15/10/2015 22:04hrs	Approx. 3km W of CHPP	Community Hotline	Noise	Noise complaint received at 10:04pm. DCPL returned call to complainant on 16/10. The complainant advised the noise from the CHPP had been loader than usual. DCPL advised the export train was loading from 9:00pm to 11:07pm and the stockpile dozer was operating from 7pm to 11:15pm. The stockpile dozer was reduced to first gear after 10pm. The real-time noise measurements were below alarm levels, however the presence of an inversion may have contributed to the audibility. The complainant advise the noise improved after the complaint was lodged, this corresponds to limiting dozer push and train loading finishing.
3/12/2015 22:04hrs	Approx. 3km W of CHPP	Community Hotline	Noise	Noise complaint received at 10:48pm. DCPL returned call to complainant on 11am 4th December. Left a message on complainant's phone advising of train loading from 9:46pm to 11:47pm with the stockpile dozer also in operation. The real-time noise measurements were below alarm levels, however the presence of an inversion may have contributed to the audibility. Provided a direct contact number to return call if resident required further detail.