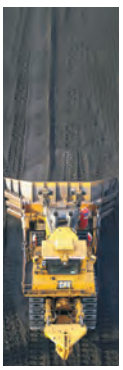
STRATFORDCOAL
Part of the Yancoal Australia Group

Stratford Mining Complex
Statement of Environmental Effects



APPENDIX B

AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

YANCOAL
兖煤澳大利亚有限公司

Pacific Environment Limited

Consulting • Technologies • Monitoring • Toxicology

15 June 2016

Mark Jacobs
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Yancoal Australia Ltd
Level 26, 363 George Street
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Sent via email: cberry@ResourceStrategies.com.au

Dear Mark

SUBJECT: Stratford Mining Complex Modification 1 – Air Quality and Greenhouse Gas Assessment

1 INTRODUCTION

In 2012 Pacific Environment (formerly PAEHolmes) completed an Air Quality and Greenhouse Gas Assessment (AQGHGA), *"Stratford Extension Project – Air Quality and Greenhouse Gas Assessment"* (**PAEHolmes, 2012**). Yancoal Australia Ltd (owners of Stratford Coal Pty Ltd [SCPL]) is now seeking an application to modify the Stratford Extension Project (Application Number SSD-4966) under Section 96(2) of the *Environmental Planning and Assessment Act, 1979* (the Modification) (see **Figure 1.1**).

The Modification relates to proposed interactions between the Stratford Mining Complex (SMC) and the Rocky Hill Coal Project (RHCP) (SSD-5156), a proposed open cut mining operation owned by Gloucester Resources Ltd (GRL), located approximately 5 kilometres (km) north of the SMC. The Environmental Impact Statement (EIS) and related documents for the RHCP were exhibited in August 2013, however the project was placed on hold by GRL in June 2015.

The proposed interactions relate to the transportation and processing of RHCP run-of-mine (ROM) coal using SCPL infrastructure. This integration would require the development of a dedicated private haul road between the SMC and the RHCP (**Figure 1.1**). The portion of the private haul road relevant to the SMC would be located within the north-eastern portion of Stratford's mining tenements, from which point haul trucks would use existing SMC haul roads to allow transport of coal to the ROM pad.

The main changes to the operations of the SMC associated with the Modification include:

- transport of sized ROM coal from the RHCP to the SMC during daytime hours only (7.00 am to 6.00 pm);
- extension of the SMC ROM pad to accommodate RHCP sized ROM coal;
- extension of SMC heavy vehicle parking areas;
- processing of RHCP coal at the SMC and transportation of the resulting product coal from the SMC to the Port of Newcastle;
- extension of on-site haul roads to accommodate RHCP haul trucks; and
- an at-grade level crossing (and associated controls) constructed at the intersection of Wenham Cox Road and the private haul road.

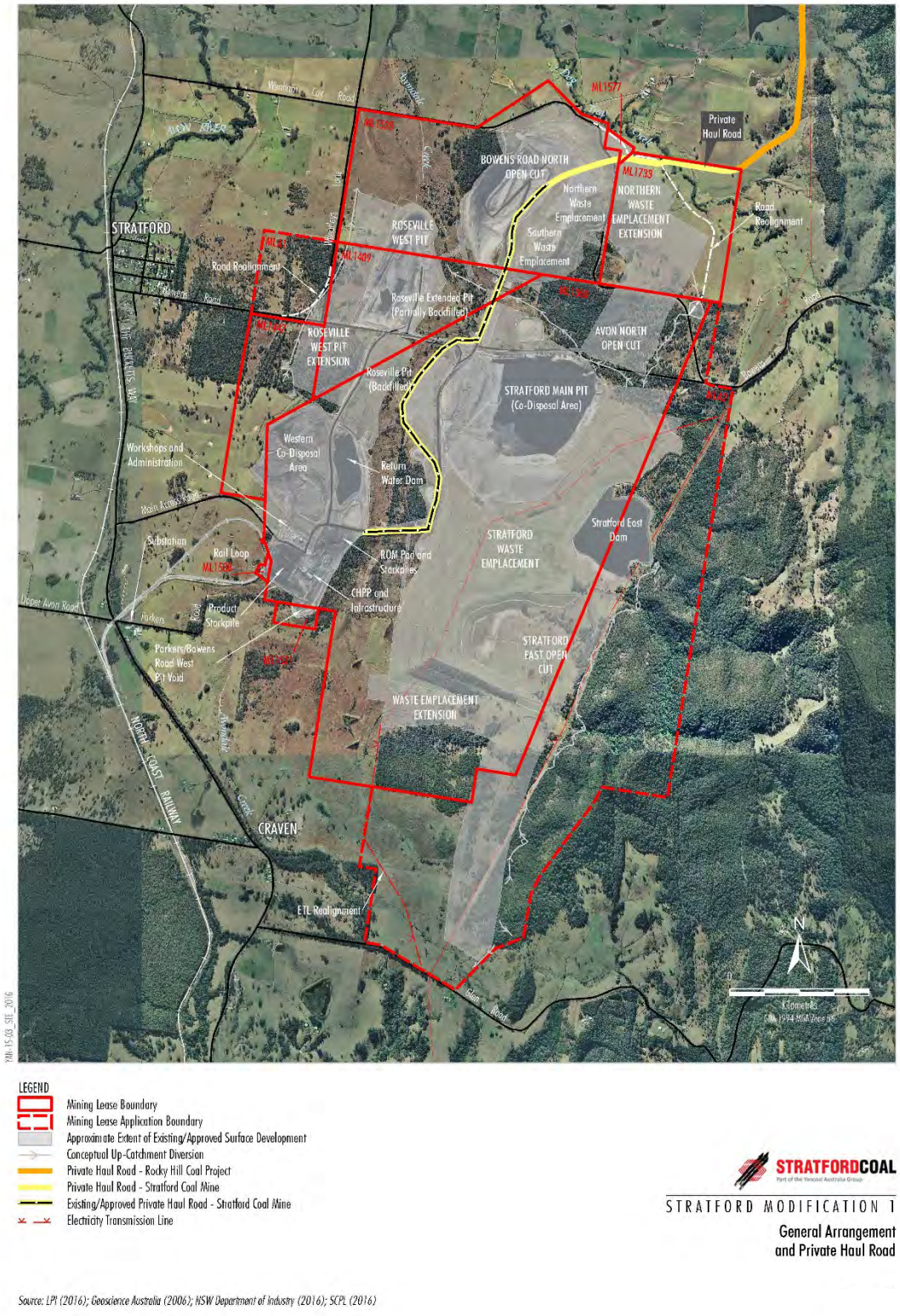

Figure 1.1: Stratford Mining Complex

2 ASSESSMENT CRITERIA

2.1 NSW EPA Impact Assessment Criteria/NEPM Reporting Goals

Table 2.1 summarises the air quality goals for concentrations of particulate matter that are relevant to this study.

Table 2.1: Air quality standards / goals for particulate matter concentrations

Pollutant	Averaging period	Standard / Goal	Agency
Total suspended particulate matter (TSP)	Annual mean	90 µg/m³	• National Health and Medical Research Council.
Particulate matter with an equivalent aerodynamic diameter less than 10 µm (PM_{10})	24-hour maximum	50 µg/m³	• NSW EPA impact assessment criteria. • NEPM reporting goal, no exceedances allowed but consideration of Exceptional Events (including dust and fires).
	Annual mean	30 µg/m³	• NSW EPA impact assessment criteria.
Particulate matter with an equivalent aerodynamic diameter less than 2.5 µm ($PM_{2.5}$)	24-hour maximum	25 µg/m³	• NEPM reporting goal, no exceedances allowed but consideration of Exceptional Events (including dust and fires).
	Annual mean	8 µg/m³	• NEPM reporting goal.

Notes: µg/m³ – micrograms per cubic metre, µm – micrometre.

Table 2.2 shows the maximum acceptable increase in dust deposition over the existing dust levels from an amenity perspective. These criteria for dust fallout levels are set to protect against nuisance impacts (**NSW DEC, 2005a**).

Table 2.2: EPA criteria for dust (insoluble solids) fallout

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m²/month	4 g/m²/month

Notes: g/m²/month – grams per square metre per month.

2.2 NSW Department of Planning and Environment Voluntary Land Acquisition and Mitigation Policy

On 15 December 2014, NSW Department of Planning and Environment (DP&E) released a policy relating to voluntary mitigation and land acquisition criteria for air quality and noise (**DP&E, 2014**).

The policy sets out voluntary mitigation and land acquisition rights where it is not possible to comply with the EPA impact assessment criteria even with the implementation of all reasonable and feasible avoidance and/or mitigation measures.

The voluntary mitigation and acquisition criteria are summarised in **Table 2.3** and **Table 2.4**, respectively.

Table 2.3: DP&E particulate matter mitigation criteria

Pollutant	Criterion	Averaging Period	Application
TSP	90 µg/m³	Annual mean	Total impact
PM_{10}	50 µg/m³	24-hour average	Incremental impact[(a)]
	30 µg/m³	Annual mean	Total impact
Deposited dust	2 g/m²/month	Annual mean	Incremental impact[(a)]
	4 g/m²/month	Annual mean	Total impact

[(a)] Zero allowable exceedances of the criterion over the life of the development.

Table 2.4: DP&E particulate matter acquisition criteria

Pollutant	Criterion	Averaging Period	Application[(a)]
TSP	90 µg/m³	Annual mean	Total impact
PM_{10}	50 µg/m³	24-hour average	Incremental impact[(b)]
	30 µg/m³	Annual mean	Total impact
Deposited dust	2 g/m²/month	Annual mean	Incremental impact[(b)]
	4 g/m²/month	Annual mean	Total impact

[(a)] Voluntary acquisition rights apply where the Project contributes to exceedances of the acquisition criteria at any residence or workplace on privately-owned land, or, on more than 25% of any privately-owned land, and a dwelling could be built on that land under exiting planning controls.
[(b)] Up to five allowable exceedances of the criterion over the life of the development.

Total impact includes the impact of the Project Modification and all other sources, whilst incremental impact refers to the impact of the Project Modification considered in isolation.

3 CURRENT AIR QUALITY

3.1 Introduction

Air quality standards and goals refer to pollutant levels that include the contribution from specific projects and existing sources. To fully assess impacts against all the relevant air quality standards and goals it is necessary to have information or estimates on existing dust concentration and deposition levels in the area in which the Modification is likely to contribute to these levels. It is important to note that the existing air quality conditions (that is, background conditions) will be influenced to some degree by the existing mining operations (albeit open cut mining was suspended in mid-2014). Therefore, these data provide an indication of the air quality performance of the SMC. Additional baseline data are presented in the original AQGHGA.

The SMC air quality monitoring network is shown in **Figure 3.1** and consists of:

- seven dust deposition gauges, measuring dust deposition rates over the period of one month;
- five high volume air samplers (HVASs), measuring PM_{10} concentrations for 24-hours periods on a one day in six run cycle;
- one Tapered Element Oscillating Microbalance (TEOM) measuring PM_{10} and $PM_{2.5}$ concentrations continuously; and
- a meteorological monitoring station.

Air quality sampling is undertaken in accordance with the provisions of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (**NSW DEC, 2005b**) (**Stratford Coal Pty Ltd, 2011**).

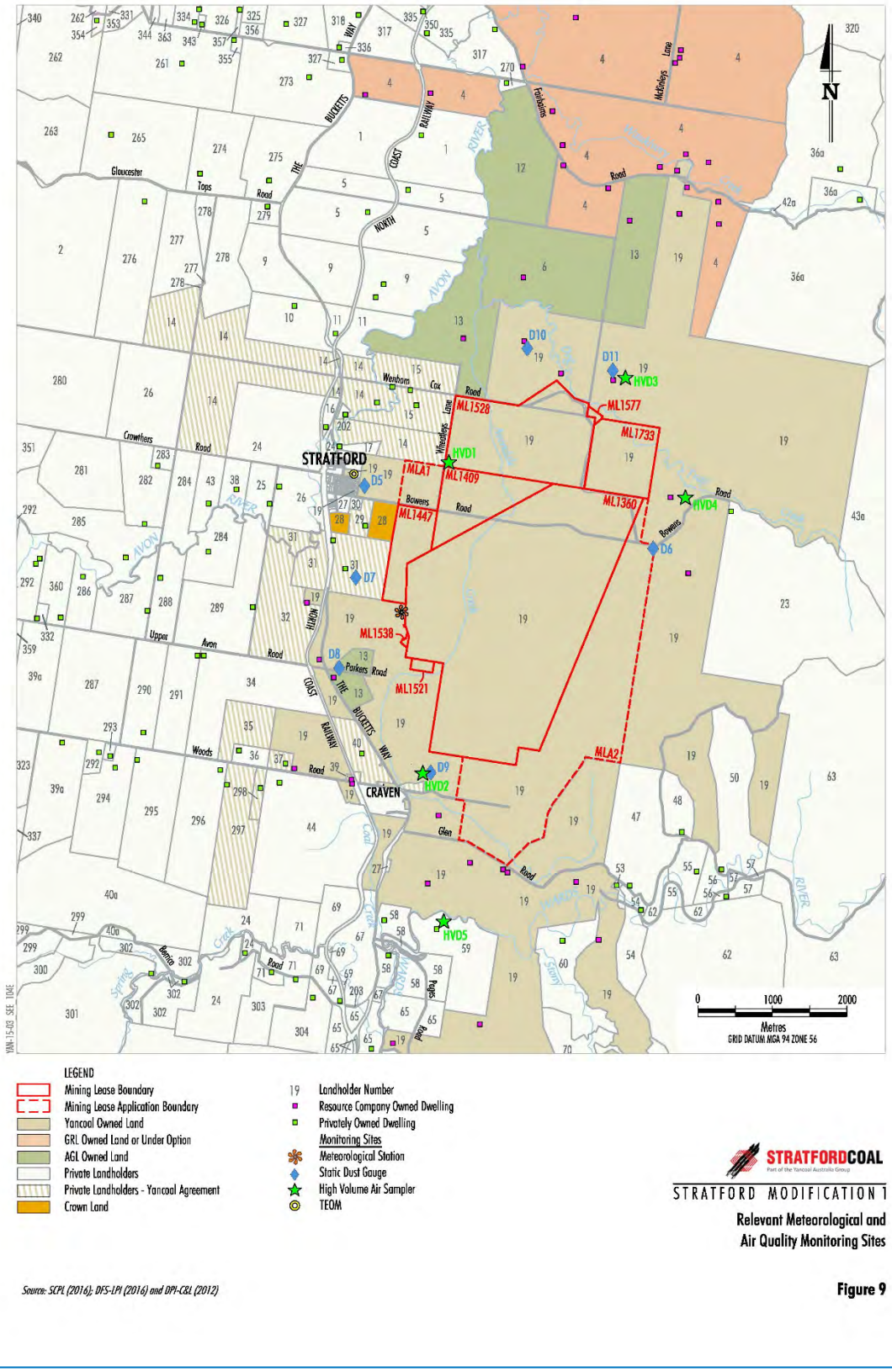

Figure 3.1: Environmental monitoring sites

3.2 Dust deposition

Table 3.1 provides a summary of the annual average dust deposition data collected at SMC since 2010. Data are presented as annual averages in accordance with annual environmental monitoring reporting requirements. Monitoring data show that dust deposition levels are below the NSW EPA impact assessment of 4 g/m²/month. The average across all sites for the last five years is 0.7 g/m²/month. It is noted that as the SMC is an existing mine, dust levels recorded at these monitors include any contribution from existing activities.

Table 3.1: Dust Deposition Annual Average (Insoluble Solids) – Stratford Coal Mine

Year	D5	D6	D7	D8	D9	D10	D11
2010	0.9	0.7	1.4	0.5	1.0	0.7	0.6
2011(a)	0.7	0.4	1.2	0.9	0.4	0.4	0.9
2012(a)	0.5	0.6	1.0	0.7	1.1	0.9	0.8
2013	0.6	0.9	0.5	0.8	0.4	0.6	1.1
2014	0.4	0.6	0.4	0.9	0.7	1.1	1.0
2015	0.6	0.6	0.5	0.7	0.3	0.5	0.7
Average	**0.6**	**0.6**	**0.8**	**0.7**	**0.6**	**0.7**	**0.9**
						Average across all sites	**0.7**
Notes: (a) Data unavailable between and including July 2011 and April 2012							

3.3 PM_{10}

3.3.1 HVASs

Table 3.2 provides a summary of the annual average PM_{10} concentration data collected to date from the HVASs. Monitoring results show that since monitoring began in 2001, there have been no exceedances of the NSW EPA annual average criterion of 30 µg/m³. The average across all sites for the monitoring period is 11 µg/m³.

Table 3.2: Annual Average PM_{10} Concentration – Stratford Coal Mine HVASs

Year	HVD1 (µg/m³)	HVD2 (µg/m³)	HVD3 (µg/m³)	HVD4 (µg/m³)	HVD5 (µg/m³)
2001	8	9	N/A	N/A	N/A
2002	13	15	N/A	N/A	N/A
2003	13	13	16	13	N/A
2004	12	11	13	10	N/A
2005	13	11	15	9	N/A
2006	8	8	12	6	N/A
2007	11	11	16	9	N/A
2008	11	10	12	8	19
2009	13	14	16	12	13
2010	10	10	11	9	9
2011	9	10	10	8	9
2012	10	10	9	8	9
2013	12	11	15	10	9
2014	10	11	15	9	9
2015(a)	8	6	10	7	6
Average	**11**	**11**	**13**	**9**	**10**
				Average across all sites	**11**
Note: N/A = Not Available; (a) 2015 data available up to 25 November					

3.3.2 TEOM

Table 3.3 provides a summary of the annual average PM_{10} and $PM_{2.5}$ concentration data collected since August 2012 at the TEOM. The data show that since monitoring began, there have been no exceedances of the NSW EPA annual average criterion for PM_{10} of 30 µg/m³. The average across all sites for the monitoring period is 13.4 µg/m³. The $PM_{2.5}$ data show one occasion (in 2013) where concentrations were above the NEPM reporting goal (0.2 µg/m³). In 2014 and 2015, the annual averages were below the NEPM Reporting Goal and the average of all data is 7.3 µg/m³.

Table 3.3: Annual Average PM_{10} Concentration – Stratford Coal Mine TEOM

Date	PM_{10}	$PM_{2.5}$
2013	14.6	8.2
2014	13.3	6.8
2015	12.2	6.9
Average	**13.4**	**7.3**

Figure 3.2 provides a plot of 24-hour average PM_{10} and $PM_{2.5}$ concentration data collected since August 2013 at the TEOM. Data are below the 24-hour average criteria for PM_{10} and $PM_{2.5}$ except for a period in October 2013, a period of widespread bushfire activity in eastern NSW and in November 2014. The November 2014 exceedance is addressed in the 2015 Annual Review (**SCPL, 2015**):

> *There was one high 24-hour average result (59.7 µg/m³) recorded during the reporting period. The high result occurred on the 1st of November 2014 with bushfires and heavy smoke noted in the valley at this time, which was likely the contributing factor in the 24-hour average exceedance of 50 µg/m³* ***(SCPL, 2015)****.*

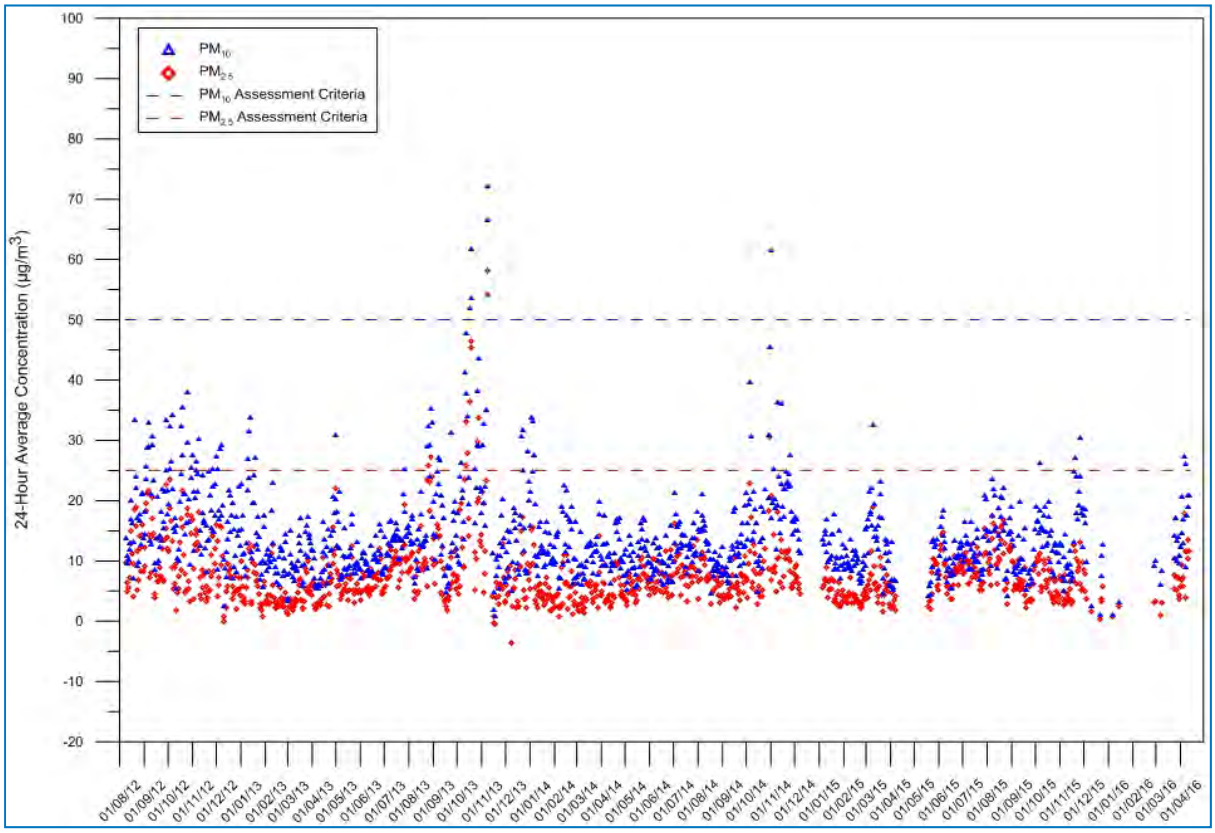

Figure 3.2 24 Hour PM_{10} and $PM_{2.5}$ concentrations Stratford village

4 ASSESSMENT METHODOLOGY

4.1 Meteorology

One of the most important factors in determining the transport of dust from emission sources at the SMC to the surrounding area is the frequency of different wind directions and wind speeds.

The SMC meteorological station has collected 15-minute averages of wind speed, wind direction, temperature, solar radiation, relative humidity, sigma-theta and rainfall since 2002. A period from November 2010 to October 2011 was chosen for the original AQGHGA (see **Figure 4.1**) (**PAEHolmes, 2012**).

Figure 4.2 presents windroses of more recent data for the SMC (2013 to 2015). Whilst there is a slight shift in the general wind patterns towards the northeast, the windroses do show a similar pattern to each other and to the model period used for the original AQGHGA (November 2010 to October 2011). On this basis, it is considered appropriate to assess the Modification using the same model period (i.e. November 2010 to October 2011).

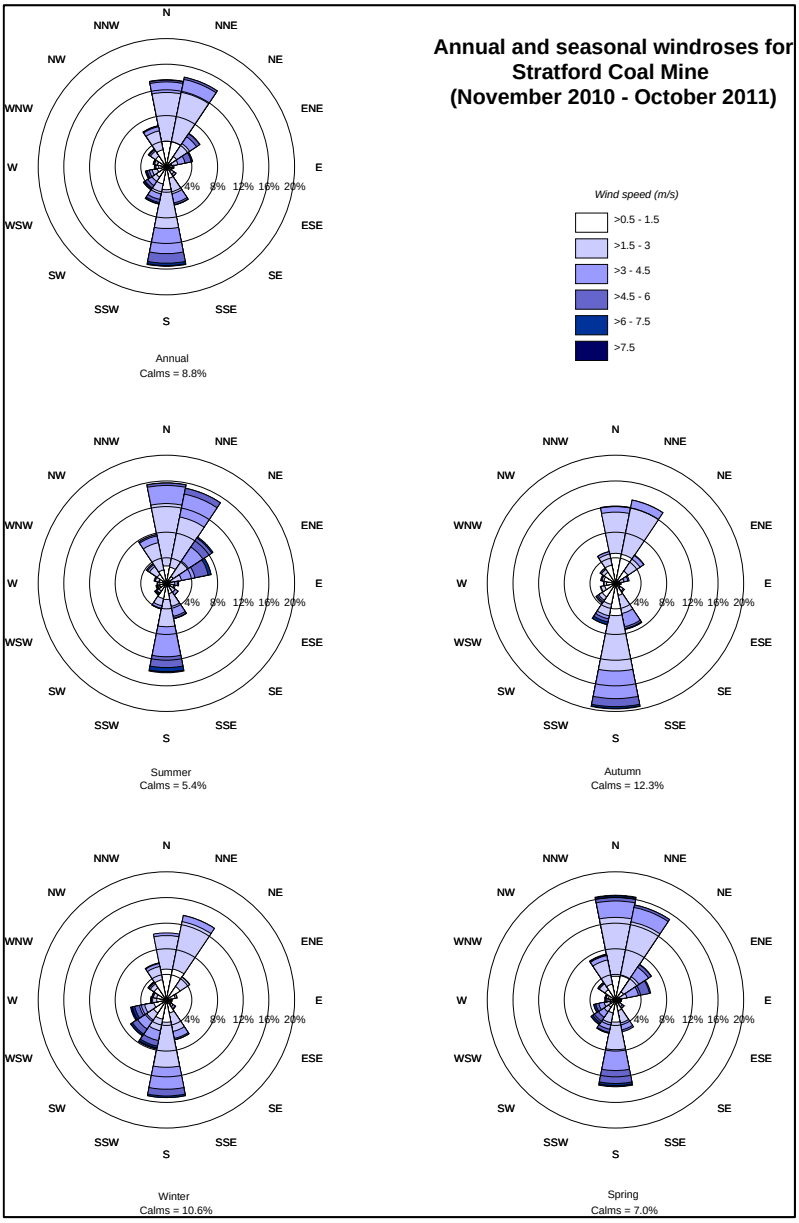

Figure 4.1: Annual and seasonal wind roses for the SMC – November 2010 to October 2011

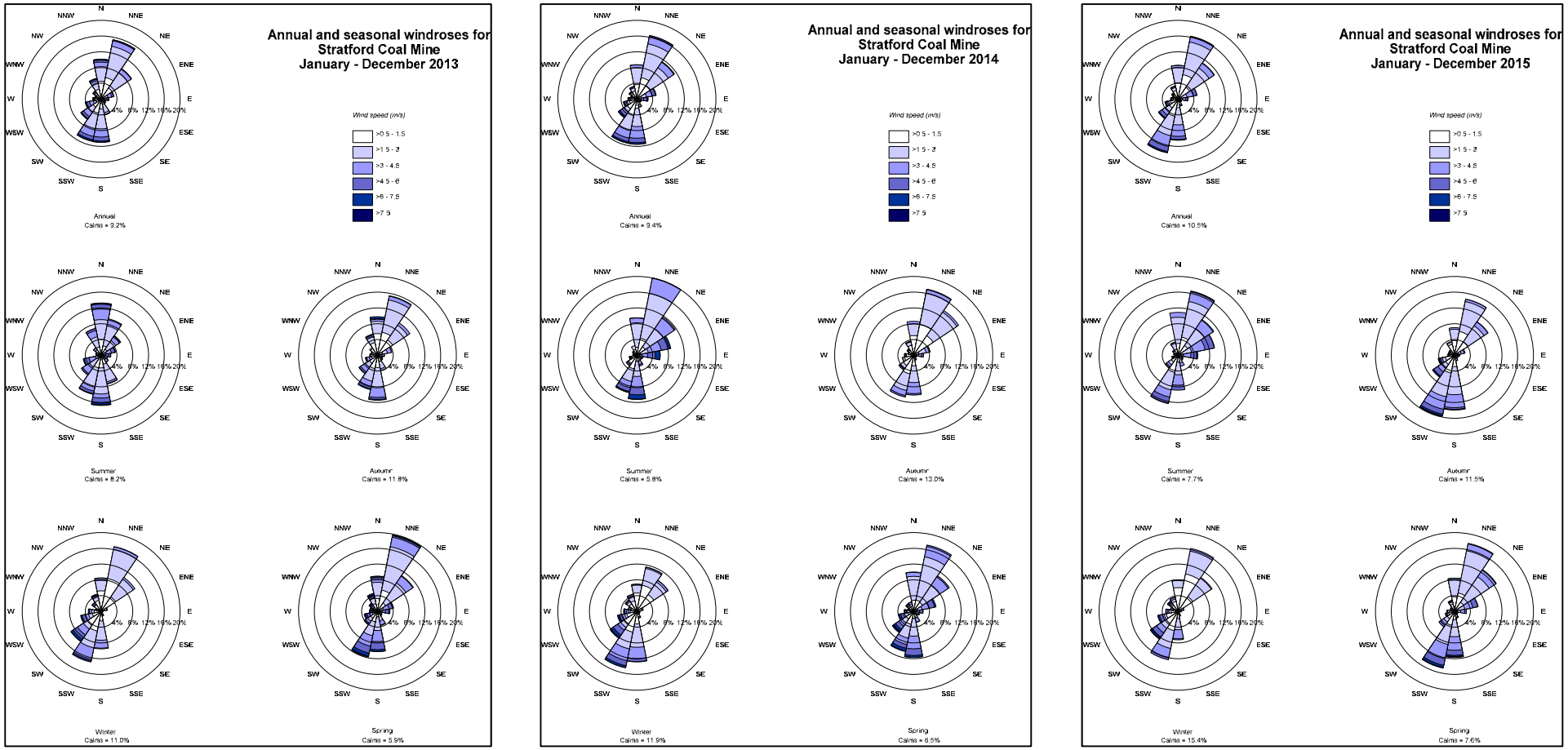

Figure 4.2: Annual and seasonal wind roses for SMC – 2013, 2014 and 2015

4.2 Estimated Emissions

Table 4.1 compares the total emissions estimated for Year 2, Year 6 and Year 10 (as modelled in the AQGHGA) with emissions calculated to account for the proposed Modification. The detailed inventories are presented in **Appendix A**.

There is a reduction in total TSP emissions in Year 2 (-4.7%) and Year 6 (-0.9%). This is because of changes to the SMC ROM coal processing schedule, which result in a reduction in the emissions associated with the processing of coal relative to those assessed in the previous AQGHGA. In Year 10, there is a small estimated increase in total TSP emissions of 4.1% as per the original AQGHGA, there is no Duralie coal processed in this year but there are now the additional emissions due to processing of the RHCP sized ROM coal. It is noted however that peak emissions occur in Year 6, therefore it follows that maximum predicted impacts would not change due to the Modification for most receivers. For those privately owned receivers where predicted impacts in Year 10 were greater that Year 6 in the original AQGHGA, the predicted increase in total emissions is considered unlikely to result in exceedances of the relevant criteria.

Table 4.1: Change in total TSP emissions resulting from the proposed Modification

Assessment Year	Original AQGHGA (kg)	Modification (kg)	% change
Year 2	1,476,612	1,406,672	-4.7
Year 6	1,585,557	1,571,610	-0.9
Year 10	1,444,662	1,503,511	4.1

Based upon previous air quality assessments completed by Pacific Environment, a total increase in TSP emissions of less than 10-20% will have a negligible impact on the ground level concentrations recorded at the assessed sensitive receptors.

Therefore, it is anticipated that the air quality impacts resulting from the Modification will be similar to those predicted in the original AQGHGA.

4.3 Cumulative Assessment

The original AQGHGA was undertaken prior to the RHCP EIS becoming available, therefore cumulative assessment was undertaken using a conservative assumption of 0.6 kilograms (kg) TSP/ tonne ROM applied to the then maximum ROM rate of 2.5 million tonnes per annum (Mtpa). Subsequent assessment of the RCHP found the actual ratios for Rocky Hill varied between 0.34 kg TSP/ tonne ROM to 0.59 kg TSP/ tonne ROM. Quantitative dispersion modelling of the RHCP was undertaken in the original AQGHGA to assess cumulative emissions.

Subsequent to lodgement of the EIS, the RHCP has been reconfigured and now has a peak ROM coal production rate of 1.6 Mtpa, which would further reduce predicted emissions. Consequently, given the SEP changes associated with the Modification are minor and do not affect peak TSP emissions (Section 4.2) the findings of the original AQGHGA would not change. The key findings were:

- *There are no privately owned receivers or vacant land that are predicted to experience annual average PM_{10} concentrations above the assessment criteria, due to emissions from the Project-only.*
- *There are no privately owned receivers or vacant land that are predicted to experience annual average TSP or dust deposition above the impact assessment criteria, either from the Project alone or cumulatively. There are no receivers or vacant land that are predicted to experience annual average $PM_{2.5}$ concentrations above the advisory reporting standard, either from the Project alone or cumulatively.*

The original AQGHGA included consideration of the Gloucester Gas Project. On 4 February 2016, the project's proponents, AGL Upstream Investments Pty Ltd (AGL) announced that it will not proceed with

the Gloucester Gas Project and that it will relinquish its Petroleum Exploration Licence for the Gloucester region (PEL 285) to the NSW Government. On the basis of this announcement, no further cumulative consideration of this project is considered warranted.

5 MANAGEMENT AND MITIGATION MEASURES

Air quality management at the SMC is currently undertaken in accordance with the Air Quality Management Plan (**Stratford Coal Pty Ltd, 2011**) for the Mine. It incorporates practical management measures to ensure dust emissions are minimised and that regulatory criteria are met at the sensitive receptors as outlined below. As evidenced by the monitoring data presented in **Section 3,** there have been no exceedances of any of the relevant air quality criteria. The Air Quality Management Plan would be revised prior to commencing mining operations at SMC.

6 GREENHOUSE GAS EMISSIONS

The estimated GHG emissions have been updated to account for the proposed changes. In order to provide a direct comparison, the same National Greenhouse Accounts (NGA) Factors (**DCCEE, 2011**) were used as per **PAEHolmes 2012**.

A summary of the emissions is presented in **Table 6.1**.

When compared with the total life of mine emissions estimated in the GHG assessment presented in **PAEHolmes 2012**, there is a 1.4% increase in Scope 1 emissions (associated with the additional years of diesel consumption on-site [e.g. for pumping of water]), an 18% increase in Scope 2 emissions (due to the additional electricity use associated with the additional years of processing of RHCP coal) and a 1.3% decrease in Scope 3 emissions. On an annual basis, emissions are similar to **PAEHolmes (2012)**. Scope 3 emissions associated with the RHCP are addressed in the RHCP EIS.

Ongoing monitoring and management of greenhouse gas emissions and energy consumption for the Modification (e.g. electricity usage) would occur through Yancoal's participation in the Commonwealth Government's National Greenhouse and Energy Report System (NGERS).

Under NGERS requirements, relevant sources of greenhouse gas emissions and energy consumption must be measured and reported on an annual basis, allowing major sources and trends in emissions/energy consumption to be identified.

Yancoal would assess energy usage from all aspects of its operations, including the SMC, and publicly report the results of energy efficiency assessments, and the opportunities that exist for energy.

Table 6.1: Summary of Estimated CO_2-e (tonnes) – All Scopes

Year	Scope 1 Emissions (t CO2-e)				Scope 2 Emissions (t CO2-e)	Scope 3 Emissions (t CO2-e)				
	Diesel	Fugitive Methane	Vegetation	*Total*	Electricity	Diesel	Electricity	Energy Production	Rail	*Total*
1	50,686	90,000	3,934	*144,620*	15,250	3,865	3,084	3,628,469	4,305	*3,639,724*
2	57,579	85,500	3,934	*147,013*	17,429	4,391	3,525	3,628,469	4,305	*3,640,690*
3	53,060	85,500	3,934	*142,494*	17,429	4,046	3,525	3,369,293	3,998	*3,380,861*
4	53,526	76,500	3,934	*133,960*	16,340	4,082	3,305	2,850,940	3,383	*2,861,709*
5	55,904	90,000	3,934	*149,838*	22,876	4,263	4,627	3,628,469	4,305	*3,641,664*
6	65,377	81,000	3,934	*150,311*	22,876	4,986	4,627	3,110,116	3,690	*3,123,418*
7	65,559	94,500	3,934	*163,992*	26,144	4,999	5,287	3,628,469	4,305	*3,643,061*
8	67,123	99,000	3,934	*170,057*	26,144	5,119	5,287	3,628,469	4,305	*3,643,180*
9	67,292	108,000	3,934	*179,225*	27,233	5,132	5,508	3,887,645	4,613	*3,902,897*
10	68,122	117,000	3,934	*189,055*	28,322	5,195	5,728	4,146,822	4,920	*4,162,665*
11	27,702	67,500	3,934	*99,136*	22,876	2,113	4,627	2,591,764	3,075	*2,601,578*
12	722	0	0	722	13,072	55	2,644	0	0	2,699
13	765	0	0	765	13,072	58	2,644	0	0	2,702
14	765	0	0	765	13,072	58	2,644	0	0	2,702
15	765	0	0	765	13,072	58	2,644	0	0	2,702
16	425	0	0	425	7,625	32	1,542	0	0	1,575
17	595	0	0	595	10,893	45	2,203	0	0	2,248
Total	635,967	994,500	43,270	1,673,737	313,724	48,498	63,450	38,098,925	45,203	38,256,075
Total PAEHolmes 2012	**643,244**	**963,405**	**43,270**	**1,649,919**	**265,794**	**49,053**	**53,756**	**38,627,124**	**45,818**	**38,775,751**
% change	**-1.1**	**3.2**	**0.0**	**1.4**	**18.0**	**-1.1**	**18.0**	**-1.4**	**-1.3**	**-1.3**

7 CONCLUSIONS

This letter report has investigated the likely effects on air quality and GHG emissions from the proposed Modification at the SMC. The proposed Modification is predicted to have minimal impact on particulate emission inventories for Year 2, Year 6 and Year 10 compared with the original AQGHGA (**PAEHolmes, 2012**).

Based on the original dispersion modelling completed for the AQGHGA and the negligible change in total TSP emissions, the assessment concluded that the proposed Modification is unlikely to result in exceedances of the NSW EPA's impact assessment criteria for annual average PM_{10}, TSP or dust deposition at any private properties in the vicinity of the site.

There is small increase in life of mine Scope 1 and a decrease in Scope 3 GHG emissions. There is a larger increase in life of mine Scope 2 emissions due to the potential additional electricity use associated with the processing of RHCP sized ROM coal. Annual GHG emissions are similar to the original AQGHGA.

Please do not hesitate to contact me should you require any further information.

Contact Details

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8 REFERENCES

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DP&E (2014). Voluntary Land Acquisition and Mitigation Policy for State Significant Mining, Petroleum and Extractive Industry Development. NSW Government 15 December 2014.

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PAEHolmes (2012). Stratford Extension Project – Air Quality and Greenhouse Gas Assessment, 22 October 2012.

Stratford Coal Pty Ltd (2011). "Stratford Mining Complex – Air Quality and Greenhouse Gas Management Plan".

Stratford Coal Pty Ltd (2015). "Annual Review 2015".

APPENDIX A: EMISSION INVENTORIES

Table A.1: TSP Emissions for Year 2 – Original AQA

ACTIVITY	TSP emission for Year 2 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
Topsoil Removal - Dozers/Excavators stripping topsoil (Avon North)	15,071	4,435	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Roseville West)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Stratford East)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil removal - Sh/Ex/FELs loading topsoil (Avon North)	7	15,875	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Roseville West)	6	15,107	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Stratford East)	18	42,324	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Hauling topsoil from Avon North to north soil stockpile	175	15,875	t/y	0.1101	kg/t	63.5	t/load	78	Vehicle gross mass (t)	4.1	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Roseville West to north soil stockpile	227	15,107	t/y	0.1504	kg/t	63.5	t/load	78	Vehicle gross mass (t)	5.6	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Stratford East to north soil stockpile	1,171	42,324	t/y	0.2767	kg/t	63.5	t/load	78	Vehicle gross mass (t)	10.3	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Emplacing topsoil from all pits at soil stockpile	13	30,983	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Drilling Roseville West Pit	788	4,452	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Avon North Pit	1,352	7,638	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Stratford East Pit	1,042	5,887	holes/y	0.59	kg/hole					70	% control						
OB - Blasting Roseville West Pit	1,388	43	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Avon North Pit	2,382	73	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Stratford East Pit	1,836	56	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Sh/Ex/FELs loading from Roseville West Pit OB to trucks	2,937	6,954,818	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Avon North Pit to trucks	5,039	11,932,305	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Stratford East Pit to trucks	3,884	9,197,322	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Hauling OB from Roseville West Pit to Stratford Waste Emplacement	112,105	6,954,818	t/y	0.1612	kg/t	63.5	t/load	78	Vehicle gross mass (t)	6	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Avon North Pit to Northern Waste Emplacement (daytime, not ev	32,096	5,468,973	t/y	0.0587	kg/t	136	t/load	181	Vehicle gross mass (t)	3.2	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Avon North Pit to Main Pit (evening/nighttime)	82,976	6,463,332	t/y	0.1284	kg/t	136	t/load	181	Vehicle gross mass (t)	7	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement	124,822	9,197,322	t/y	0.1357	kg/t	136	t/load	181	Vehicle gross mass (t)	7.4	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Emplacing OB from Roseville West Pit at Stratford Waste Emplacement	2,937	6,954,818	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Avon North Pit at Northern Waste Emplacement (daytime)	2,310	5,468,973	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Avon North Pit at Main Pit (evening/nighttime)	2,730	6,463,332	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit to Stratford Waste Emplacement	3,884	9,197,322	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Dozers on OB - Roseville West	55,259	16,261	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Northern Waste Emplacement (daytime, not evening)	11,052	3,252	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Main Pit (evening/nighttime)	13,061	3,843	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Stratford East (daytime only)	11,052	3,252	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
IB - Dozers ripping/pushing/clean-up (Avon North)	43,404	6,386	h/y	6.80	kg/h	10	silt content in %	4	moisture content of coal in %								
IB - Dozers ripping/pushing/clean-up (Stratford East)	43,404	6,386	h/y	6.80	kg/h	10	silt content in %	4	moisture content of coal in %								
IB - Dozers ripping/pushing/clean-up (Roseville West)	22,104	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Avon North)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Stratford East)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Roseville West)	13,373	361	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Loading ROM coal from Roseville West Pit to trucks	33,687	600,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Avon North Pit to trucks	50,530	900,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Stratford East Pit to trucks	11,229	200,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading coal for Co-Disposal area to trucks	5,614	100,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Hauling ROM coal from Roseville West Pit to ROM stkpile	10,961	600,000	t/y	0.183	kg/t	63.5	t/load	78	Vehicle gross mass (t)	6.8	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
CL - Hauling ROM coal from Avon North Pit to ROM stkpile	15,516	900,000	t/y	0.172	kg/t	136	t/load	181	Vehicle gross mass (t)	9.4	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
CL - Hauling ROM coal from Stratford East Pit to ROM stkpile	3,301	200,000	t/y	0.165	kg/t	136	t/load	181	Vehicle gross mass (t)	9.0	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
CL - Hauling coal from Co-Disposal area to ROM stockpile area	330	100,000	t/y	0.033	kg/t	136	t/load	181	Vehicle gross mass (t)	1.8	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
CL - Unloading ROM coal to ROM Stockpile	50,530	900,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Unloading ROM coal directly to hopper	25,265	900,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - Loading ROM coal (incl. DCM coal) from ROM stockpile to hopper	109,483	3,900,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - Unloading DCM coal to conveyor	289	3,000,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
CL - Unloading DCM coal to ROM stockpile	174	3,000,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %		% Control						
CL - ROM hopper unloading coal to conveyor	463	4,800,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
CL - Crushing	6,480	4,800,000	t/y	0.003	kg/t					50	% Control						
CL - Conveyer from hopper to CHPP	278	4,800,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	70	% Control						
CL - Conveyor unloading ROM coal to CHPP	463	4,800,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
CL - Dozer on product stockpiles	131,302	7,096	h/y	37.009	kg/h	10	silt content in %	7	moisture content of coal in %	50	% Control						
CL - Handling coal at CHPP	278	4,800,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %	70	% Control						
CL - Unloading coal to product stockpile	347	3,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %	50	% Control						
CL - Conveyor unloading to trains	347	3,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
WE - Stratford East Waste Emplacement	12,539	25.7	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Stratford East Pit	20,492	21	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f		% control				
WE - Stratford East Partial Rehabilitated Area	187	19.2	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	99	% control				
WE - Main Pit	12,198	25	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Roseville West Pit Waste Emplacement	29,958	61.4	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Roseville West Pit	35,617	36.5	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f		% control				
WE - Roseville West Partial rehabilitation	117	12	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	99	% control				
WE - Bowens Rd North exposed area down to pit water	13,954	14.3	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f		% control				
WE - Avon North Waste Rock Emplacement	32,739	67.1	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Avon North Pit	21,175	21.7	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f		% control				
WE - Avon North Partial rehabilitation	342	35	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	99	% control				
WE - Co-disposal Area	32,202	33	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f		% control				
WE - North Soil Stockpile	2,147	2	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f		% control				
WE - ROM Coal Stockpile	2,586	5.3	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Product Coal Stockpile	1,415	2.9	ha	976	kg/ha/y	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
Grading roads (Roseville West) (daytime)	43,671	70,956	km	0.6155	kg/km	8	speed of graders in km/h	8,870	grader hours								
Grading roads (Northern Waste Emplacement) (daytime)	21,835	35,478	km	0.6155	kg/km	8	speed of graders in km/h	4,435	grader hours								
Grading roads Main Pit (Nighttime)	13,101	21,287	km	0.6155	kg/km	8	speed of graders in km/h	2,661	grader hours								
Grading roads (Stratford East) (24 hours)	34,937	56,765	km	0.6155	kg/km	8	speed of graders in km/h	7,096	grader hours								

Total TSP emissions for Year 2 (kg/year)	1,476,612
TSP:ROM (includes Duralie)	0.31

Table A.2: TSP Emissions for Year 2 - Modification

ACTIVITY	TSP emission for Y2 (2019) (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
Topsoil Removal - Dozers/Excavators stripping topsoil (Avon North)	15,071	4,435	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Roseville West)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Stratford East)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil removal - Sh/Ex/FELs loading topsoil (Avon North)	7	15,875	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Roseville West)	6	15,107	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Stratford East)	18	42,324	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Hauling topsoil from Avon North to north soil stockpile	175	15,875	t/y	0.1101	kg/t	63.5	t/load	78	Vehicle gross mass (t)	4.1	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Roseville West to north soil stockpile	227	15,107	t/y	0.1504	kg/t	63.5	t/load	78	Vehicle gross mass (t)	5.6	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Stratford East to north soil stockpile	1,171	42,324	t/y	0.2767	kg/t	63.5	t/load	78	Vehicle gross mass (t)	10.3	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Emplacing topsoil from all pits at soil stockpile	13	30,983	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Drilling Roseville West Pit	788	4,452	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Avon North Pit	1,352	7,638	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Stratford East Pit	1,042	5,887	holes/y	0.59	kg/hole					70	% control						
OB - Blasting Roseville West Pit	1,388	43	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Avon North Pit	2,382	73	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Stratford East Pit	1,836	56	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Sh/Ex/FELs loading from Roseville West Pit OB to trucks	2,937	6,954,818	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Avon North Pit to trucks	5,039	11,932,305	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Stratford East Pit to trucks	3,884	9,197,322	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Hauling OB from Roseville West Pit to Stratford Waste Emplacement	112,105	6,954,818	t/y	0.1612	kg/t	63.5	t/load	78	Vehicle gross mass (t)	6	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Avon North Pit to Northern Waste Emplacement (daytime, not evening)	32,096	5,468,973	t/y	0.0587	kg/t	136	t/load	181	Vehicle gross mass (t)	3.2	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Avon North Pit to Main Pit (evening/nighttime)	82,976	6,463,332	t/y	0.1284	kg/t	136	t/load	181	Vehicle gross mass (t)	7	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement	124,822	9,197,322	t/y	0.1357	kg/t	136	t/load	181	Vehicle gross mass (t)	7.4	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Emplacing OB from Roseville West Pit at Stratford Waste Emplacement	2,937	6,954,818	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Avon North Pit at Northern Waste Emplacement (daytime)	2,310	5,468,973	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Avon North Pit at Main Pit (evening/nighttime)	2,730	6,463,332	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit to Stratford Waste Emplacement	3,884	9,197,322	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Dozers on OB - Roseville West	55,259	16,261	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Northern Waste Emplacement (daytime, not evening)	11,052	3,252	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Main Pit (evening/nighttime)	13,061	3,843	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Stratford East (daytime only)	11,052	3,252	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
IB - Dozers ripping/pushing/clean-up (Avon North)	43,404	6,386	h/y	6.80	kg/h	10	silt content in %	4	moisture content of coal in %								
IB - Dozers ripping/pushing/clean-up (Stratford East)	43,404	6,386	h/y	6.80	kg/h	10	silt content in %	4	moisture content of coal in %								
IB - Dozers ripping/pushing/clean-up (Roseville West)	22,104	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Avon North)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Stratford East)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Roseville West)	13,373	361	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Loading ROM coal from Roseville West Pit to trucks	33,687	600,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Avon North Pit to trucks	50,530	900,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Stratford East Pit to trucks	11,229	200,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading coal for Co-Disposal area to trucks	11,229	200,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Hauling ROM coal from Roseville West Pit to ROM stkpile	10,961	600,000	t/y	0.183	kg/t	64	t/load	78.02	Vehicle gross mass (t)	6.80	km/return trip	1.71	kg/VKT	2.00	% silt content	90.00	% control
CL - Hauling ROM coal from Avon North Pit to ROM stkpile	15,516	900,000	t/y	0.172	kg/t	136	t/load	181.48	Vehicle gross mass (t)	9.40	km/return trip	2.49	kg/VKT	2.00	% silt content	90.00	% control
CL - Hauling ROM coal from Stratford East Pit to ROM stkpile	3,301	200,000	t/y	0.165	kg/t	136	t/load	181.48	Vehicle gross mass (t)	9.00	km/return trip	2.49	kg/VKT	2.00	% silt content	90.00	% control
CL - Hauling coal from Co-Disposal area to ROM stockpile area	660	200,000	t/y	0.033	kg/t	136	t/load	181.48	Vehicle gross mass (t)	1.80	km/return trip	2.49	kg/VKT	2.00	% silt content	90.00	% control
CL - Unloading ROM coal to ROM Stockpile	53,338	950,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Unloading ROM coal directly to hopper	26,669	950,000	t/y	0.056	kg/t	7	moisture content in %					50.00	% control				
CL - Loading ROM coal from ROM stockpile to hopper	26,669	950,000	t/y	0.056	kg/t	7	moisture content in %					50.00	% control				
CL - Hauling sized coal from Rocky Hill sized coal bin to ROM stkpile (sealed road)	492	200,000	t/y	0.002	kg/t	60	t/load	55.00	Vehicle gross mass (t)	1.60	km/return trip	0.09	kg/VKT	0.40	g/m2 silt loading	-	% control
CL - Hauling sized ROM coal from Rocky Hill boundary to ROM stkpile (unsealed)	3,887	200,000	t/y	0.194	kg/t	60	t/load	55.00	Vehicle gross mass (t)	8.00	km/return trip	1.46	kg/VKT	2.00	% silt content	90.00	% control
CL - Unloading Rocky Hill coal to ROM stockpile	7	200,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3 in m/s	10.00	moisture content in %		% Control						
CL - Loading Rocky Hill ROM coal from ROM stockpile to hopper	3,660	200,000	t/y	0.037	kg/t	10	moisture content in %					50.00	% control				
CL - ROM hopper unloading coal to conveyor (inc Rocky Hill coal)	203	2,100,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
CL - Crushing	2,835	2,100,000	t/y	0.0027	kg/t					50	% Control						
CL - Conveyer from hopper to CHPP	122	2,100,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	70	% Control						
CL - Conveyor unloading ROM coal to CHPP	203	2,100,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
CL - Dozer on product stockpiles	131,302	7,096	h/y	37.0095	kg/h	10.00	silt content in %	7	moisture content of coal in	50	% Control						
CL - Handling coal at CHPP	122	2,100,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in	70	% Control						
CL - Unloading coal to product stockpile	154	1,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in	50	% Control						
CL - Conveyor unloading to trains	154	1,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
WE - Stratford East Waste Emplacement	12,539	25.7	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Stratford East Pit	20,492	21	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)		% control				
WE - Stratford East Partial Rehab Area	187	19.2	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	99	% control				
WE - Main Pit	12,198	25	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Roseville West Pit Waste Emplacement	29,958	61.4	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Roseville West Pit	35,617	36.5	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)		% control				
WE - Roseville West Partial Rehab	117	12	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	99	% control				
WE - Bowens Rd North exposed area down to pit water	13,954	14.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)		% control				
WE - Avon North Waste Rock Emplacement	32,739	67.1	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Avon North Pit	21,175	21.7	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)		% control				
WE - Avon North Partial Rehab	342	35	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	99	% control				
WE - Co-disposal Area	32,202	33	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)		% control				
WE - North Soil Stockpile	2,147	2	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)		% control				
WE - ROM Coal Stockpile	2,586	5.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Product Coal Stockpile	1,415	2.9	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
Grading roads (Roseville West) (daytime)	43,671	70,956	km	0.6155	kg/km	8	speed of graders in km/h	8,870	grader hours								
Grading roads (Northern Waste Emplacement) (daytime)	21,835	35,478	km	0.6155	kg/km	8	speed of graders in km/h	4,435	grader hours								
Grading roads Main Pit (Nighttime)	13,101	21,287	km	0.6155	kg/km	8	speed of graders in km/h	2,661	grader hours								
Grading roads (Stratford East) (24hs)	34,937	56,765	km	0.6155	kg/km	8	speed of graders in km/h	7,096	grader hours								

Table A.3: TSP Emissions for Year 6 – Original AQA

ACTIVITY	TSP emission for Year 6 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
Topsoil Removal - Dozers/Excavators stripping topsoil (Roseville West)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Stratford East)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil removal - Sh/Ex/FELs loading topsoil (Roseville West)	6	13,560	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Stratford East)	13	31,143	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
Topsoil removal - Hauling topsoil from Roseville West to south soil stockpile	186	13,560	t/y	0.1370	kg/t	63.5	t/load	78	Vehicle gross mass (t)	5.1	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Stratford East to south soil stockpile	1,196	31,143	t/y	0.3842	kg/t	63.5	t/load	78	Vehicle gross mass (t)	14.3	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Emplacing topsoil at south soil stockpile	6	13,560	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Drilling Roseville West Pit	1,045	5,902	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Stratford East Pit	3,041	17,183	holes/y	0.59	kg/hole					70	% control						
OB - Blasting Roseville West Pit	1,841	56	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Stratford East Pit	5,359	164	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Sh/Ex/FELs loading from Roseville West Pit OB to trucks	3,894	9,221,183	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Stratford East Pit to trucks	11,337	26,845,518	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Hauling OB from Roseville West Pit to Main Pit	81,750	4,610,592	t/y	0.1773	kg/t	64	t/load	78	Vehicle gross mass (t)	6.6	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
OB - Hauling OB (backfill) from Roseville West Pit to top of pit	59,455	4,610,592	t/y	0.1290	kg/t	64	t/load	78	Vehicle gross mass (t)	4.8	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement (daytime)	162,474	12,304,196	t/y	0.1320	kg/t	136	t/load	181	Vehicle gross mass (t)	7.2	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement (evening/night	165,346	14,541,322	t/y	0.1137	kg/t	136	t/load	181	Vehicle gross mass (t)	6.2	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Emplacing OB from Roseville West Pit at Main Pit	1,947	4,610,592	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB (backfill) from Roseville West Pit to top of pit	1,947	4,610,592	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit to Stratford Waste Emplacement (daytime)	5,196	12,304,196	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit to Stratford Waste Emplacement (night-time)	6,141	14,541,322	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	4	moisture content in %								
OB - Dozers on OB - Main Pit Waste Emplacement (waste from Roseville West) (daytime	22,104	6,504	h/y	6.8	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Roseville West (backfill) (daytime)	11,052	3,252	h/y	6.8	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Stratford Waste Emplacement (24 hours)	48,226	14,191	h/y	6.8	kg/h	10	% silt content	4	moisture content in %	50	% control						
IB - Dozers ripping/pushing/clean-up (Roseville West Open Pit)	59,680	8,781	h/y	6.8	kg/h	10	silt content in %	4	moisture content of coal in %								
IB - Dozers ripping/pushing/clean-up (Stratford East Open Pit) (24 hours)	43,404	6,386	h/y	6.8	kg/h	10	silt content in %	4	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Roseville West Open Pit) (daytime)	36,108	976	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Stratford East Open Pit) (24 hours)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Loading ROM coal from Roseville West Pit to trucks	42,109	750,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Stratford East Pit to trucks	58,952	1,050,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading coal for Co-Disposal area to trucks	11,229	200,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Hauling ROM coal from Roseville West Pit to ROM stockpile	9,671	750,000	t/y	0.129	kg/t	63.5	t/load	78	Vehicle gross mass (t)	4.8	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
CL - Hauling ROM coal from Stratford East Pit to ROM stockpile	19,257	1,050,000	t/y	0.183	kg/t	136	t/load	181	Vehicle gross mass (t)	10.0	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
CL - Hauling coal from Co-Disposal area to ROM stockpile area	660	200,000	t/y	0.033	kg/t	136	t/load	181	Vehicle gross mass (t)	1.8	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
CL - Unloading ROM coal to ROM Stockpile	56,145	1,000,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Unloading ROM coal directly to hopper	28,072	1,000,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - Loading ROM coal (incl. DCM coal) from ROM stockpile to hopper	70,181	2,500,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - Unloading DCM coal to conveyor	145	1,500,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %	50	% Control						
CL - Unloading DCM coal to ROM stockpile	87	1,500,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %		% Control						
CL - ROM hopper unloading coal to conveyor	338	3,500,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %	50	% Control						
CL - Crushing	4,725	3,500,000	t/y	0.003	kg/t					50	% Control						
CL - Conveyer from hopper to CHPP	203	3,500,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	70	% Control						
CL - Conveyor unloading ROM coal to CHPP	338	3,500,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %	50	% Control						
CL - Dozer on product stockpiles	131,302	7,096	h/y	37.009	kg/h	10	silt content in %	7	moisture content of coal in %	50	% Control						
CL - Handling coal at CHPP	203	3,500,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %	70	% Control						
CL - Unloading coal to product stockpile	280	2,900,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content of coal in %	50	% Control						
CL - Conveyor unloading to trains	280	2,900,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m/s	7	moisture content in %	50	% Control						
WE - Stratford East Pit	46,839	48.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Stratford East Waste Emplacement	38,252	78.4	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Stratford East Waste Emplacement (partial rehabilitation)	1,952	4.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Main Pit (waste emplacement)	23,029	23.6	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Roseville West Pit	58,842	60.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Roseville West Active Emplacement	42,448	43.5	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50					
WE - Roseville West Active Emplacement (partial rehabilitation)	55	5.6	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	99	% control				
WE - Roseville West Active Emplacement (backfill)	2,440	5.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Bowens Rd North exposed area down to pit water	10,734	11	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Avon North Pit	15,613	16.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Co-disposal Area	32,202	33	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - North Soil Stockpile	2,147	2.2	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - ROM Coal Stockpile	2,586	5.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Product Coal Stockpile	1,415	2.9	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
Grading roads (Roseville West) (daytime)	43,671	70,956	km	0.6155	kg/km	8	speed of graders in km/h	8,870	grader hours								
Grading roads Main Pit (Nighttime)	13,101	21,287	km	0.6155	kg/km	8	speed of graders in km/h	2,661	grader hours								
Grading roads (Stratford East) (24 hours)	34,937	56,765	km	0.6155	kg/km	8	speed of graders in km/h	7,096	grader hours								

Total TSP emissions for Year 6 (kg/yr)	**1,585,557**
TSP:ROM (includes Duralie)	**0.5**

Table A.4: TSP Emissions for Year 6 - Modification

ACTIVITY	TSP emission for Y6 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
Topsoil Removal - Dozers/Excavators stripping topsoil (Roseville West)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Stratford East)	11,052	3,252	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil removal - Sh/Ex/FELs loading topsoil (Roseville West)	6	13,560	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Stratford East)	13	31,143	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
Topsoil removal - Hauling topsoil from Roseville West to south soil stockpile	186	13,560	t/y	0.1370	kg/t	63.5	t/load	78	Vehicle gross mass (t)	5.1	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Stratford East to south soil stockpile	1,196	31,143	t/y	0.3842	kg/t	63.5	t/load	78	Vehicle gross mass (t)	14.3	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
Topsoil removal - Emplacing topsoil at south soil stockpile	6	13,560	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Drilling Roseville West Pit	1,045	5,902	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Stratford East Pit	3,041	17,183	holes/y	0.59	kg/hole					70	% control						
OB - Blasting Roseville West Pit	1,841	56	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Stratford East Pit	5,359	164	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Sh/Ex/FELs loading from Roseville West Pit OB to trucks	3,894	9,221,183	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Stratford East Pit to trucks	11,337	26,845,518	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Hauling OB from Roseville West Pit to Main Pit	81,750	4,610,592	t/y	0.1773	kg/t	64	t/load	78	Vehicle gross mass (t)	6.6	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
OB - Hauling OB (backfill) from Roseville West Pit to top of pit	59,455	4,610,592	t/y	0.1290	kg/t	64	t/load	78	Vehicle gross mass (t)	4.8	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement (daytime)	162,474	12,304,196	t/y	0.1320	kg/t	136	t/load	181	Vehicle gross mass (t)	7.2	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement (evening/nightti	165,346	14,541,322	t/y	0.1137	kg/t	136	t/load	181	Vehicle gross mass (t)	6.2	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Emplacing OB from Roseville West Pit at Main Pit	1,947	4,610,592	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Emplacing OB (backfill) from Roseville West Pit to top of pit	1,947	4,610,592	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit to Stratford Waste Emplacement (daytime)	5,196	12,304,196	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit to Stratford Waste Emplacement (nighttime)	6,141	14,541,322	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Dozers on OB - Main Pit Waste Emplacement (waste from Roseville West) (daytime)	22,104	6,504	h/y	6.8	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Roseville West (backfill) (daytime)	11,052	3,252	h/y	6.8	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Stratford Waste Emplacement (24hrs)	48,226	14,191	h/y	6.8	kg/h	10	% silt content	4	moisture content in %	50	% control						
IB - Dozers ripping/pushing/clean-up (Roseville West Open Pit)	59,680	8,781	h/y	6.8	kg/h	10	silt content in %	4	moisture content of coal in %								
IB - Dozers ripping/pushing/clean-up (Stratford East Open Pit) (24hrs)	43,404	6,386	h/y	6.8	kg/h	10	silt content in %	4	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Roseville West Open Pit) (daytime)	36,108	976	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Stratford East Open Pit) (24hrs)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Loading ROM coal from Roseville West Pit to trucks	42,109	750,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Stratford East Pit to trucks	58,952	1,050,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading coal for Co-Disposal area to trucks	-	-	t/y	0.056	kg/t	7	moisture content in %										
CL - Hauling ROM coal from Roseville West Pit to ROM stockpile	9,671	750,000	t/y	0.129	kg/t	64	t/load	78.02	Vehicle gross mass (t)	4.80	km/return trip	1.71	kg/VKT	2.00	% silt	90.00	% control
CL - Hauling ROM coal from Stratford East Pit to ROM stockpile	19,257	1,050,000	t/y	0.183	kg/t	136	t/load	181.48	Vehicle gross mass (t)	10.00	km/return trip	2.49	kg/VKT	2.00	% silt	90.00	% control
CL - Hauling coal from Co-Disposal area to ROM stockpile area	-	-	t/y	0.033	kg/t	136	t/load	181.48	Vehicle gross mass (t)	1.80	km/return trip	2.49	kg/VKT	2.00	% silt	90.00	% control
CL - Unloading ROM coal to ROM Stockpile	50,530	900,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Unloading ROM coal directly to hopper	25,265	900,000	t/y	0.056	kg/t	7	moisture content in %					50.00	% control				
CL - Loading ROM coal from ROM stockpile to hopper	25,265	900,000	t/y	0.056	kg/t	7	moisture content in %					50.00	% control				
CL - Hauling sized coal from Rocky Hill sized coal bin to ROM stkpile (sealed road)	3,201	1,300,000	t/y	0.002	kg/t	60	t/load	55.00	Vehicle gross mass (t)	1.60	km/return trip	0.09	kg/VKT	0.40	g/m2 silt	-	% control
CL - Hauling sized ROM coal from Rocky Hill boundary to ROM stkpile (unsealed)	25,265	1,300,000	t/y	0.194	kg/t	60	t/load	55.00	Vehicle gross mass (t)	8.00	km/return trip	1.46	kg/VKT	2.00	% silt	90.00	% control
CL - Unloading Rocky Hill coal to ROM stockpile	76	1,300,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	10.00	moisture content in %		% Control						
CL - Loading Rocky Hill ROM coal from ROM stockpile to hopper	23,787	1,300,000	t/y	0.037	kg/t	10	moisture content in %					50.00	% control				
CL - ROM hopper unloading coal to conveyor (inc Rocky Hill Coal)	299	3,100,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content of coal in	50.00	% Control						
CL - Crushing	4,185	3,100,000	t/y	0.003	kg/t		average of (wind speed/2.2)^1.3			50.00	% Control						
CL - Conveyer from hopper to CHPP	179	3,100,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content in %	70.00	% Control						
CL - Conveyor unloading ROM coal to CHPP	299	3,100,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content of coal in	50.00	% Control						
CL - Dozer on product stockpiles	131,302	7,096	h/y	37.009	kg/h	10	silt content in %	7.00	moisture content of coal in	50.00	% Control						
CL - Handling coal at CHPP	179	3,100,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content of coal in	70.00	% Control						
CL - Unloading coal to product stockpile	203	2,100,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content of coal in	50.00	% Control						
CL - Conveyor unloading to trains	203	2,100,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content in %	50.00	% Control						
WE - Stratford East Pit	46,839	48.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Stratford East Waste Emplacement	38,252	78.4	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Stratford East Waste Emplacement (partial rehab)	1,952	4.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Main Pit (waste emplacement)	23,029	23.6	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Roseville West Pit	58,842	60.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Roseville West Active Emplacement	42,448	43.5	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50					
WE - Roseville West Active Emplacement (partial rehab)	55	5.6	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	99	% control				
WE - Roseville West Active Emplacement (backfill)	2,440	5.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Bowens Rd North exposed area down to pit water	10,734	11	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Avon North Pit	15,613	16.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Co-disposal Area	32,202	33	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - North Soil Stockpile	2,147	2.2	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - ROM Coal Stockpile	2,586	5.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Product Coal Stockpile	1,415	2.9	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
Grading roads (Roseville West) (daytime)	43,671	70,956	km	0.6155	kg/km	8	speed of graders in km/h	8,870	grader hours								
Grading roads Main Pit (Nighttime)	13,101	21,287	km	0.6155	kg/km	8	speed of graders in km/h	2,661	grader hours								
Grading roads (Stratford East) (24hrs)	34,937	56,765	km	0.6155	kg/km	8	speed of graders in km/h	7,096	grader hours								

Table A.5: TSP Emissions for Year 10 – Original AQA

ACTIVITY	TSP emission for Year 10	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
Topsoil Removal - Dozers/Excavators stripping topsoil (Roseville West)	15,071	4,435	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Stratford East)	15,071	4,435	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil removal - Sh/Ex/FELs loading topsoil (Roseville West)	2	4,991	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Stratford East)	2	5,817	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
Topsoil removal - Hauling topsoil from Roseville West to north soil stockpile	114	4,991	t/y	0.2278	kg/t	63.5	t/load	181	Vehicle gross mass (t)	5.8	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Stratford East to north soil stockpile	356	5,817	t/y	0.6128	kg/t	63.5	t/load	181	Vehicle gross mass (t)	15.6	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
Topsoil removal - Emplacing topsoil from Roseville West at North soil stockpile	2	4,991	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
Topsoil removal - Emplacing topsoil from Stratford East at North soil stockpile	2	5,817	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
OB - Drilling Roseville West Pit	1,030	5,821	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Stratford East Pit	3,184	17,989	holes/y	0.59	kg/hole					70	% control						
OB - Blasting Roseville West Pit	1,815	56	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Stratford East Pit	5,611	172	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Sh/Ex/FELs loading from Roseville West Pit to trucks	3,840	9,093,691	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Stratford East Pit to trucks	11,869	28,104,655	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
OB - Hauling OB from Roseville West Pit to Roseville West Emplacement	127,037	9,093,691	t/y	0.1397	kg/t	64	t/load	78	Vehicle gross mass (t)	5.2	km/return trip	1.7	kg/VKT	2	% silt	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement	268,028	28,104,655	t/y	0.0954	kg/t	136	t/load	181	Vehicle gross mass (t)	5.2	km/return trip	2.5	kg/VKT	2	% silt	90	% control
OB - Emplacing OB from Roseville West Pit at Roseville West waste emplaceme	3,840	9,093,691	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit at Stratford Waste Emplacement	11,869	28,104,655	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	4	moisture content in %								
OB - Dozers on OB - Roseville West (daytime)	22,104	6,504	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Stratford East (24 hours)	48,226	14,191	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
IB - Dozers ripping/pushing/clean-up (Roseville West Pit) (daytime)	79,573	11,708	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %								
IB - Dozers ripping/pushing/clean-up (Stratford East Pit) (24 hours)	43,404	6,386	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Roseville West Pit) (daytime)	48,144	1,301	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Stratford East Pit) (24 hours)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Loading ROM coal from Roseville West Pit to trucks	42,109	750,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Stratford East Pit to trucks	103,868	1,850,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Hauling ROM coal from Roseville West Pit to ROM stockpile	9,671	750,000	t/y	0.129	kg/t	64	t/load	78	Vehicle gross mass (t)	4.8	km/return trip	1.7	kg/VKT	2	% silt	90	% control
CL - Hauling ROM coal from Stratford East Pit to ROM stockpile	36,983	1,850,000	t/y	0.200	kg/t	136	t/load	181	Vehicle gross mass (t)	10.9	km/return trip	2.5	kg/VKT	2	% silt	90	% control
CL - Unloading ROM coal to ROM Stockpile	72,988	1,300,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Unloading ROM coal directly to hopper	36,494	1,300,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - Loading ROM coal from ROM stockpile to hopper	36,494	1,300,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - ROM hopper unloading coal to conveyor	251	2,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	7	moisture content of coal in %	50	% Control						
CL - Crushing	3,510	2,600,000	t/y	0.003	kg/t					50	% Control						
CL - Conveyer from hopper to CHPP	150	2,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	7	moisture content in %	70	% Control						
CL - Conveyor unloading ROM coal to CHPP	150	2,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	7	moisture content in %	70	% Control						
CL - Dozer on product stockpiles	131,302	7,096	h/y	37.009	kg/h	10	silt content in %	7	moisture content of coal in %	50	% Control						
CL - Handling coal at CHPP	150	2,600,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	7	moisture content of coal in %	70	% Control						
CL - Unloading coal to product stockpile	138	1,426,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	7	moisture content in %	50	% Control						
CL - Conveyor unloading to trains	138	1,426,000	t/y	0.0002	kg/t	0.94	average of (wind speed/2.2)^1.3 in m	7	moisture content in %	50	% control						
WE - Stratford East Pit	55,426	56.8	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Straford East Waste Emplacement (partial rehabilitation)	98	10.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	99	% control				
WE - Straford East Waste Emplacement (active)	10,246	21.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Roseville West Pit	57,085	58.5	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Roseville West Active Emplacement (backfill)	7,514	15.4	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Roseville West Waste Emplacement (partial rehabilitation)	65	6.7	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	99	% control				
WE - Avon North (partial rehabilitation)	208	21.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	99	% control				
WE - Co-disposal Area	32,202	33.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - ROM Coal Stockpile	2,586	5.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
WE - Product Coal Stockpile	1,415	2.9	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f	50	% control				
Grading roads (Roseville West) (daytime)	32,025	52,034	km	0.6155	kg/km	8	speed of graders in km/h	6,504	grader hours								
Grading roads (Stratford East) (24 hours)	34,937	56,765	km	0.6155	kg/km	8	speed of graders in km/h	7,096	grader hours								

Total TSP emissions for Year 10 (kg/year)	1,444,662
TSP:ROM	0.6

Table A.6: TSP Emissions for Year 10 - Modification

ACTIVITY	TSP emission for Y10 (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
Topsoil Removal - Dozers/Excavators stripping topsoil (Roseville West)	15,071	4,435	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil Removal - Dozers/Excavators stripping topsoil (Stratford East)	15,071	4,435	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %	50	% control						
Topsoil removal - Sh/Ex/FELs loading topsoil (Roseville West)	2	4,991	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
Topsoil removal - Sh/Ex/FELs loading topsoil (Stratford East)	2	5,817	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
Topsoil removal - Hauling topsoil from Roseville West to north soil stockpile	114	4,991	t/y	0.2278	kg/t	63.5	t/load	181	Vehicle gross mass (t)	5.8	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
Topsoil removal - Hauling topsoil from Stratford East to north soil stockpile	356	5,817	t/y	0.6128	kg/t	63.5	t/load	181	Vehicle gross mass (t)	15.6	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
Topsoil removal - Emplacing topsoil from Roseville West at N soil stockpile	2	4,991	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
Topsoil removal - Emplacing topsoil from Stratford East at N soil stockpile	2	5,817	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 in	4	moisture content in %								
OB - Drilling Roseville West Pit	1,030	5,821	holes/y	0.59	kg/hole					70	% control						
OB - Drilling Stratford East Pit	3,184	17,989	holes/y	0.59	kg/hole					70	% control						
OB - Blasting Roseville West Pit	1,815	56	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Blasting Stratford East Pit	5,611	172	blasts/y	33	kg/blast	2,800	Area of blast in square metres	105	holes/blast								
OB - Sh/Ex/FELs loading from Roseville West Pit to trucks	3,840	9,093,691	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 i	4	moisture content in %								
OB - Sh/Ex/FELs loading OB from Stratford East Pit to trucks	11,869	28,104,655	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 i	4	moisture content in %								
OB - Hauling OB from Roseville West Pit to Roseville West Emplacement	127,037	9,093,691	t/y	0.1397	kg/t	64	t/load	78	Vehicle gross mass (t)	5.2	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
OB - Hauling OB from Stratford East Pit to Stratford Waste Emplacement	268,028	28,104,655	t/y	0.0954	kg/t	136	t/load	181	Vehicle gross mass (t)	5.2	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
OB - Emplacing OB from Roseville West Pit at Roseville West waste emplace	3,840	9,093,691	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 i	4	moisture content in %								
OB - Emplacing OB from Stratford East Pit at Stratford Waste Emplacement	11,869	28,104,655	t/y	0.0004	kg/t	0.94	average of (wind speed/2.2)^1.3 i	4	moisture content in %								
OB - Dozers on OB - Roseville West (daytime)	22,104	6,504	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
OB - Dozers on OB - Stratford East (24hrs)	48,226	14,191	h/y	6.80	kg/h	10	% silt content	4	moisture content in %	50	% control						
IB - Dozers ripping/pushing/clean-up (Roseville West Pit) (daytime)	79,573	11,708	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %								
IB - Dozers ripping/pushing/clean-up (Stratford East Pit) (24hrs)	43,404	6,386	h/y	6.80	kg/h	10	silt content in %	4	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Roseville West Pit) (daytime)	48,144	1,301	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Dozers ripping/pushing/clean-up (Stratford East Pit) (24hrs)	26,260	710	h/y	37.01	kg/h	10	silt content in %	7	moisture content of coal in %								
CL - Loading ROM coal from Roseville West Pit to trucks	42,109	750,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Loading ROM coal from Stratford East Pit to trucks	103,868	1,850,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Hauling ROM coal from Roseville West Pit to ROM stockpile	9,671	750,000	t/y	0.129	kg/t	64	t/load	78	Vehicle gross mass (t)	4.8	km/return trip	1.7	kg/VKT	2	% silt content	90	% control
CL - Hauling ROM coal from Stratford East Pit to ROM stockpile	36,983	1,850,000	t/y	0.200	kg/t	136	t/load	181	Vehicle gross mass (t)	10.9	km/return trip	2.5	kg/VKT	2	% silt content	90	% control
CL - Unloading ROM coal to ROM Stockpile	72,988	1,300,000	t/y	0.056	kg/t	7	moisture content in %										
CL - Unloading ROM coal directly to hopper	36,494	1,300,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - Loading ROM coal from ROM stockpile to hopper	36,494	1,300,000	t/y	0.056	kg/t	7	moisture content in %					50	% control				
CL - Hauling sized coal from Rocky Hill sized coal bin to ROM stkpile (sealed	3,447	1,400,000	t/y	0.002	kg/t	60	t/load	55.00	Vehicle gross mass (t)	1.60	km/return trip	0	kg/VKT	0.40	g/m2 silt	-	% control
CL - Hauling sized ROM coal from Rocky Hill boundary to ROM stkpile (unsea	27,208	1,400,000	t/y	0.194	kg/t	60	t/load	55.00	Vehicle gross mass (t)	8.00	km/return trip	1	kg/VKT	2.00	% silt	90.00	% control
CL - Unloading Rocky Hill coal to ROM stockpile	82	1,400,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	10.00	moisture content in %								
CL - Loading Rocky Hill ROM coal from ROM stockpile to hopper	25,617	1,400,000	t/y	0.037	kg/t	10	moisture content in %					50	% control				
CL - ROM hopper unloading coal to conveyor (inc Rocky Hill)	386	4,000,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content of coal in	50.00	% Control						
CL - Crushing	5,400	4,000,000	t/y	0.003	kg/t		average of (wind speed/2.2)^1.3			50.00	% Control						
CL - Conveyer from hopper to CHPP	232	4,000,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content in %	70.00	% Control						
CL - Conveyor unloading ROM coal to CHPP	232	4,000,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content in %	70.00	% Control						
CL - Dozer on product stockpiles	131,302	7,096	h/y	37.009	kg/h	10	silt content in %	7.00	moisture content of coal in	50.00	% Control						
CL - Handling coal at CHPP	232	4,000,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content of coal in	70.00	% Control						
CL - Unloading coal to product stockpile	251	2,600,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content in %	50.00	% Control						
CL - Conveyor unloading to trains	251	2,600,000	t/y	0.000	kg/t	1	average of (wind speed/2.2)^1.3	7.00	moisture content in %	50.00	% control						
WE - Stratford East Pit	55,426	56.8	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Straford East Waste Emplacement (partial rehab)	98	10.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	99	% control				
WE - Straford East Waste Emplacement (active)	10,246	21.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Roseville West Pit	57,085	58.5	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - Roseville West Active Emplacement (backfill)	7,514	15.4	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Roseville West Waste Emplacement (partial rehab)	65	6.7	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	99	% control				
WE - Avon North (partial rehab)	208	21.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	99	% control				
WE - Co-disposal Area	32,202	33.0	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)						
WE - ROM Coal Stockpile	2,586	5.3	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
WE - Product Coal Stockpile	1,415	2.9	ha	976	kg/ha/year	10	silt content in %	117	days >0.25mm rainfall (p)	3	% time ws>5.4 m/s (f)	50	% control				
Grading roads (Roseville West) (daytime)	32,025	52,034	km	0.6155	kg/km	8	speed of graders in km/h	6,504	grader hours								
Grading roads (Stratford East) (24hrs)	34,937	56,765	km	0.6155	kg/km	8	speed of graders in km/h	7,096	grader hours								