Appendix 6

Belmont Coal Project Emissions Inventory and Source Locations

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Scenario 1 Emissions Inventory

Equipment Position Number	*Proposed Belmont Coal Mine, Near Boggabri - Year 2*	TSP Emission Factor	PM_{10} Emission Factor	Emission Factor Units	Quantity (tonnes removed)	Number of Hectares	Average number of kilometres per return trip	Working days available	Working hours per day	TSP Emission Rate (mg/s)	PM_{10} Emission Rate (mg/s)	TSP Emission Flux ($mg/s/m^2$)	PM_{10} Emission Flux ($mg/s/m^2$)
1	Excavator (on Overburden)	0.0002	0.0001	kg/t	18480000	N/A	N/A	300	24	65	58	N/A	N/A
2	Excavator (on Coal)	0.033	0.016	kg/t	1400000	N/A	N/A	300	24	886	810	N/A	N/A
3	Trucks Dumping Overburden	0.0002	0.0001	kg/t	12936000	N/A	N/A	300	24	45	41	N/A	N/A
4	Trucks Dumping Coal	0.010	0.004	kg/t	1400000	N/A	N/A	300	24	270	227	N/A	N/A
5	Dozer on Overburden	0.419	0.054	kg/hr	N/A	N/A	N/A	300	24	58	14	N/A	N/A
6	Bulldozer on Overburden	0.419	0.054	kg/hr	N/A	N/A	N/A	300	24	58	14	N/A	N/A
7	Grader	0.190	0.085	kg/VKT	N/A	N/A	1	300	2	53	24	N/A	N/A
8	Scrapers	1.640	0.530	kg/VKT	N/A	N/A	20	300	3	759	245	N/A	N/A
9	Air - Track Drill	0.59	0.31	kg/hole	N/A	N/A	N/A	60	15	328	172	0.137	0.072
10	Crushing Plant	0.01	0.004	kg/t	1400000	N/A	N/A	300	24	540	216	N/A	N/A
11	Front End Loader (Processing Plant)	0.014	0.007	kg/t	1400000	N/A	N/A	300	24	773	372	N/A	N/A
12	Front End Loader (Auger Mining)	0.033	0.016	kg/t	600000	N/A	N/A	300	24	760	365	N/A	N/A
13	Blasting	86.412	44.93	kg/blast	N/A	N/A	N/A	50	1	4735	12482	0.658	1.734
14	Overburden Hauling Wheel Dust	1.358	0.322	kg/VKT	12936000	N/A	0.6	300	24	1355	321	N/A	N/A
15	Coal Hauling Wheel Dust	1.358	0.322	kg/VKT	1400000	N/A	2.8	300	24	147	35	N/A	N/A
16	Open Pit Wind Erosion	0.40	0.20	kg/ha/hr	N/A	11.3	N/A	N/A	N/A	N/A	N/A	0.006	0.005
17	Erosion	0.40	0.20	kg/ha/hr	N/A	0.8	N/A	N/A	N/A	N/A	N/A	0.006	0.003
18	Western Emplacement Wind Erosion	0.40	0.20	kg/ha/hr	N/A	11.3	N/A	N/A	N/A	N/A	N/A	0.011	0.006
19	Product Truck Loading	0.0006	0.0003	kg/t	1400000	N/A	N/A	300	24	423	200	N/A	N/A

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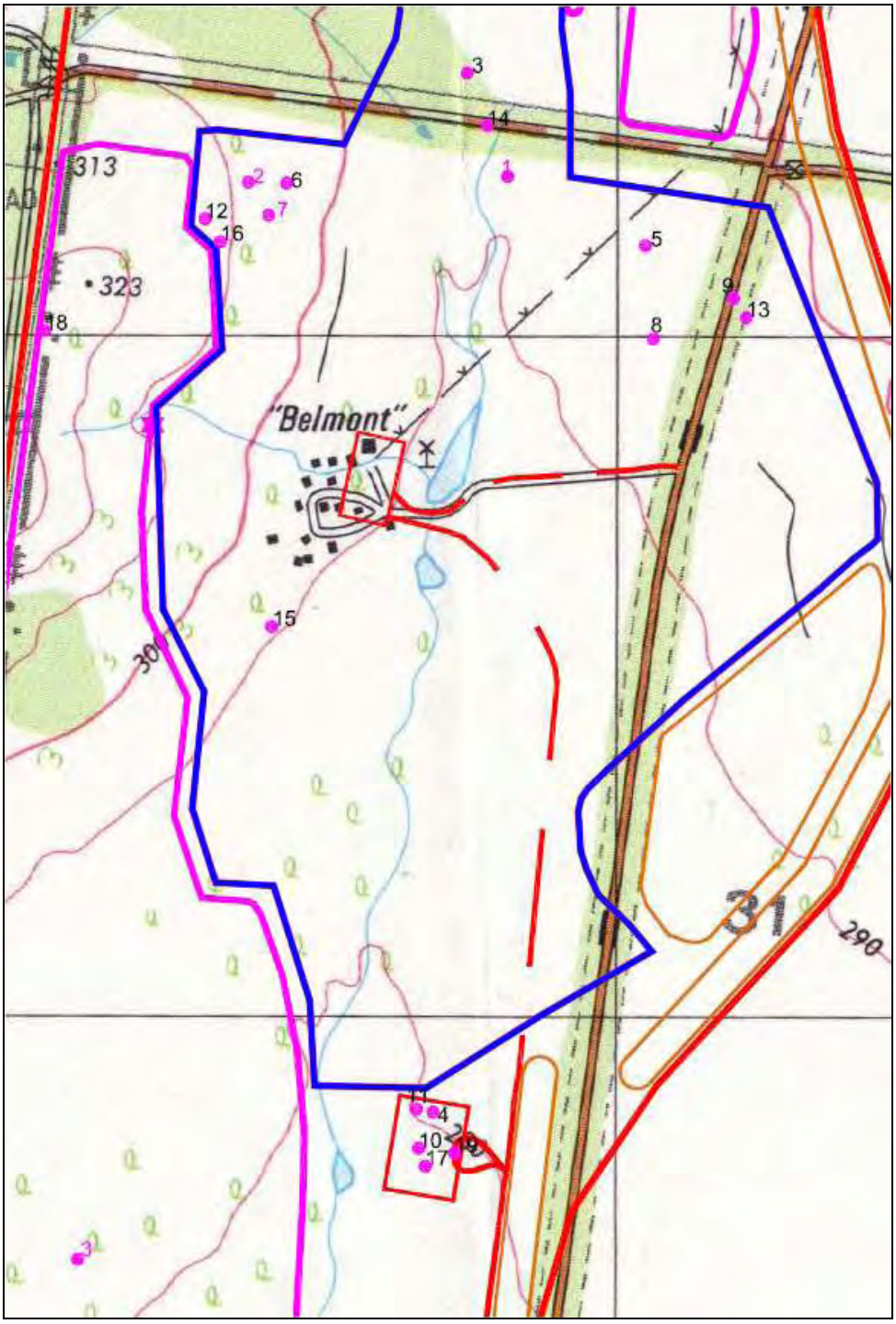
Scenario 2 Emissions Inventory

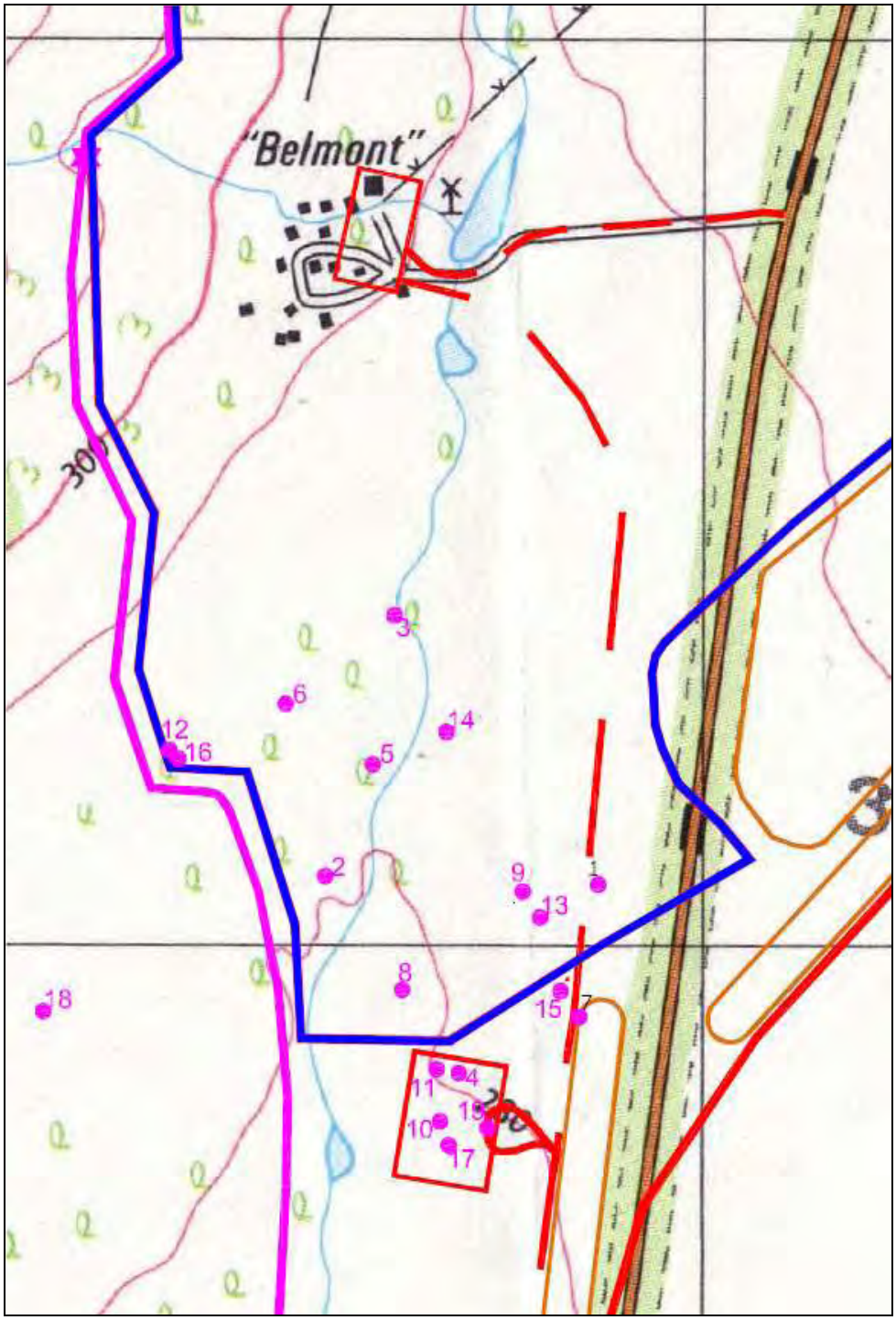
Equipment Position Number	***Proposed Belmont Coal Mine, Near Boggabri - Year 7***	**TSP Emission Factor**	**PM_{10} Emission Factor**	**Emission Factor Units**	**Quantity (tonnes removed)[1]**	**Number of Hectares**	**Average number of kilometres per return trip**	**Working days available [2]**	**Working hours per day [3]**	**TSP Emission Rate (mg/s) [4]**	**PM_{10} Emission Rate (mg/s) [3]**	**TSP Emission Flux ($mg/s/m^2$)**	**PM_{10} Emission Flux ($mg/s/m^2$)**
1	**Excavator (on Overburden)**	0.0002	0.0001	kg/t	18480000	N/A	N/A	300	24	65	58	N/A	N/A
2	**Excavator (on Coal)**	0.033	0.016	kg/t	1400000	N/A	N/A	300	24	886	810	N/A	N/A
3	**Trucks Dumping Overburden**	0.0002	0.0001	kg/t	12936000	N/A	N/A	300	24	45	41	N/A	N/A
4	**Trucks Dumping Coal**	0.010	0.004	kg/t	1400000	N/A	N/A	300	24	270	227	N/A	N/A
5	**Dozer on Overburden**	0.419	0.054	kg/hr	N/A	N/A	N/A	300	24	58	14	N/A	N/A
6	**Bulldozer on Overburden**	0.419	0.054	kg/hr	N/A	N/A	N/A	300	24	58	14	N/A	N/A
7	**Grader**	0.190	0.085	kg/VKT	N/A	N/A	1	300	2	53	24	N/A	N/A
8	**Scrapers**	1.640	0.530	kg/VKT	N/A	N/A	20	300	3	759	245	N/A	N/A
9	**Air - Track Drill**	0.59	0.31	kg/hole	N/A	N/A	N/A	60	15	328	172	0.137	0.072
10	**Crushing Plant**	0.01	0.004	kg/t	1400000	N/A	N/A	300	24	540	216	N/A	N/A
11	**Front End Loader (Processing Plant)**	0.014	0.007	kg/t	1400000	N/A	N/A	300	24	773	372	N/A	N/A
12	**Front End Loader (Auger Mining)**	0.033	0.016	kg/t	600000	N/A	N/A	300	24	760	365	N/A	N/A
13	**Blasting**	86.412	44.93	kg/blast	N/A	N/A	N/A	50	1	4735	12482	0.658	1.734
14	**Overburden Hauling Wheel Dust**	1.358	0.322	kg/VKT	12936000	N/A	0.6	300	24	1355	321	N/A	N/A
15	**Coal Hauling Wheel Dust**	1.358	0.322	kg/VKT	1400000	N/A	1.2	300	24	293	69	N/A	N/A
16	**Open Pit Wind Erosion**	0.40	0.20	kg/ha/hr	N/A	11.3	N/A	N/A	N/A	N/A	N/A	0.006	0.005
17	**Erosion**	0.40	0.20	kg/ha/hr	N/A	0.8	N/A	N/A	N/A	N/A	N/A	0.006	0.003
18	**Western Emplacement Wind Erosion**	0.40	0.20	kg/ha/hr	N/A	11.3	N/A	N/A	N/A	N/A	N/A	0.011	0.006
19	**Product Truck Loading**	0.0006	0.0003	kg/t	1400000	N/A	N/A	300	24	423	200	N/A	N/A

Scenario 1 Source Locations (see Emissions Inventory for Source ID)



Note: A colour version of this figure is available on the Project CD.

Scenario 2 Source Locations (see Emissions Inventory for Source ID)



Note: A colour version of this figure is available on the Project CD.

Appendix 7

Average Monthly Dust Deposition Isopleths

Appendix 7-1: Scenario 1
Appendix 7-2: Scenario 2

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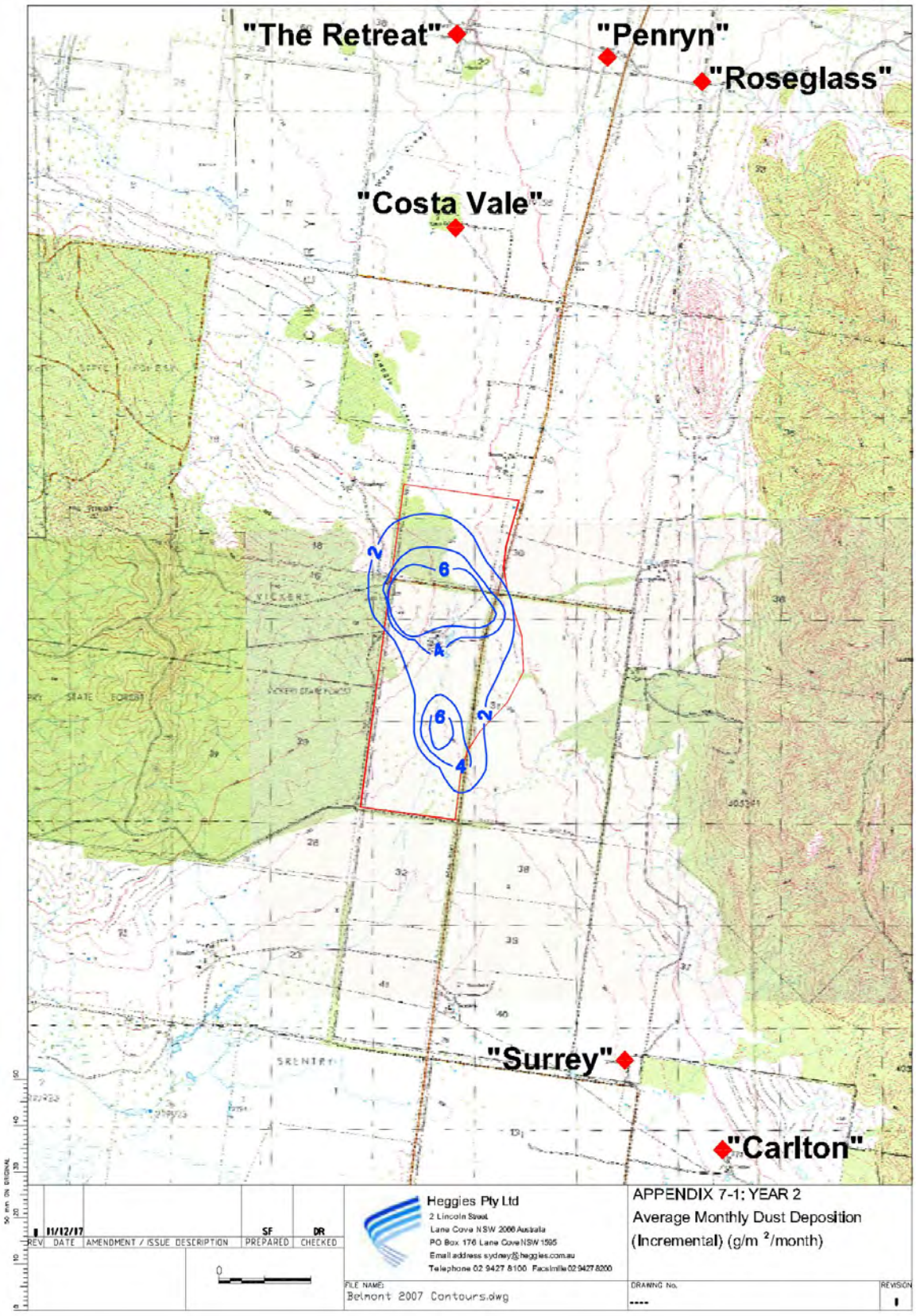

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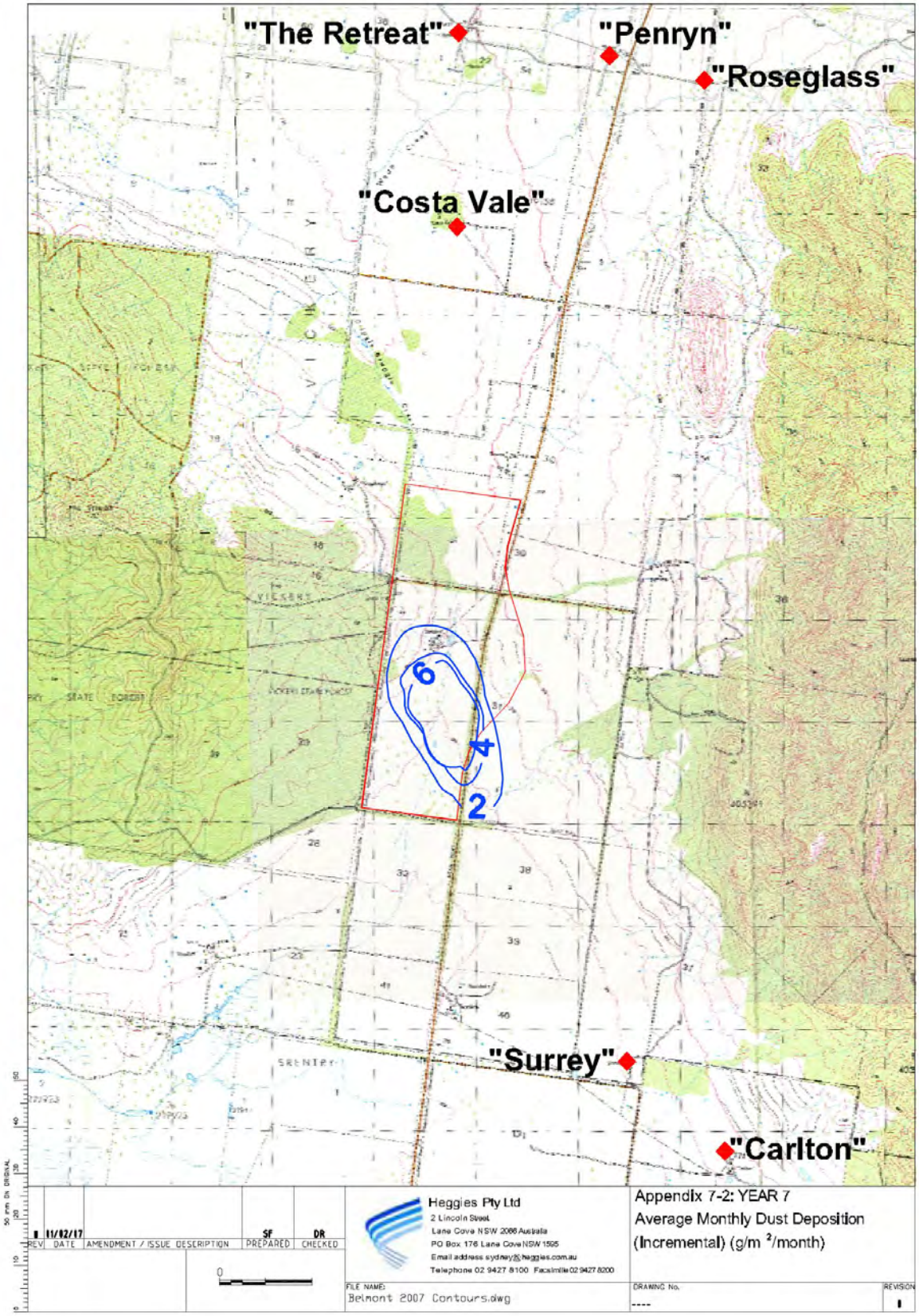

Note: A colour version of this figure is available on the Project CD.

Appendix 8

Predicted 3rd Highest Ground Level Concentrations of 24-hour Average PM_{10} Isopleths

Appendix 8-1: Scenario 1
Appendix 8-2: Scenario 2

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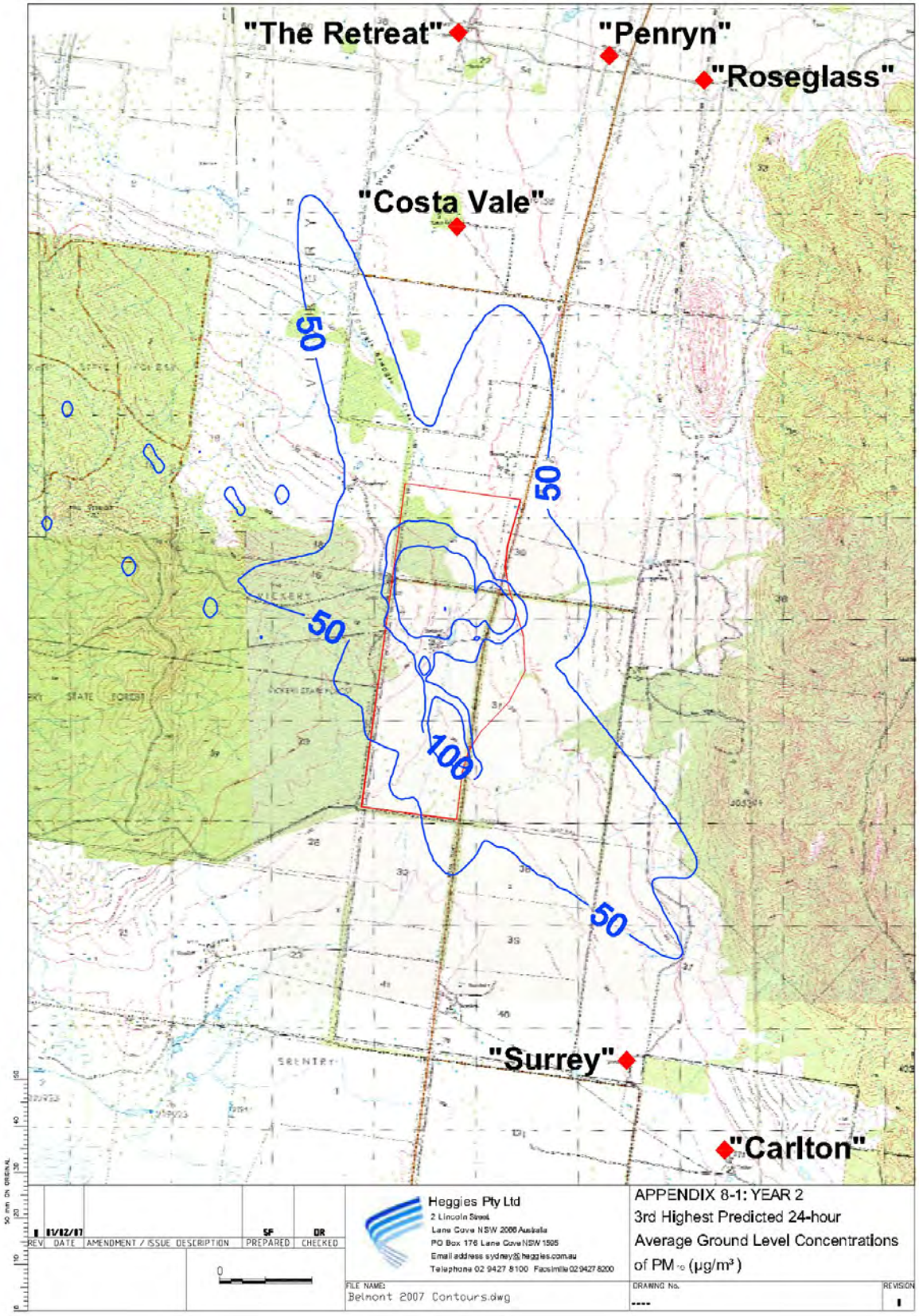

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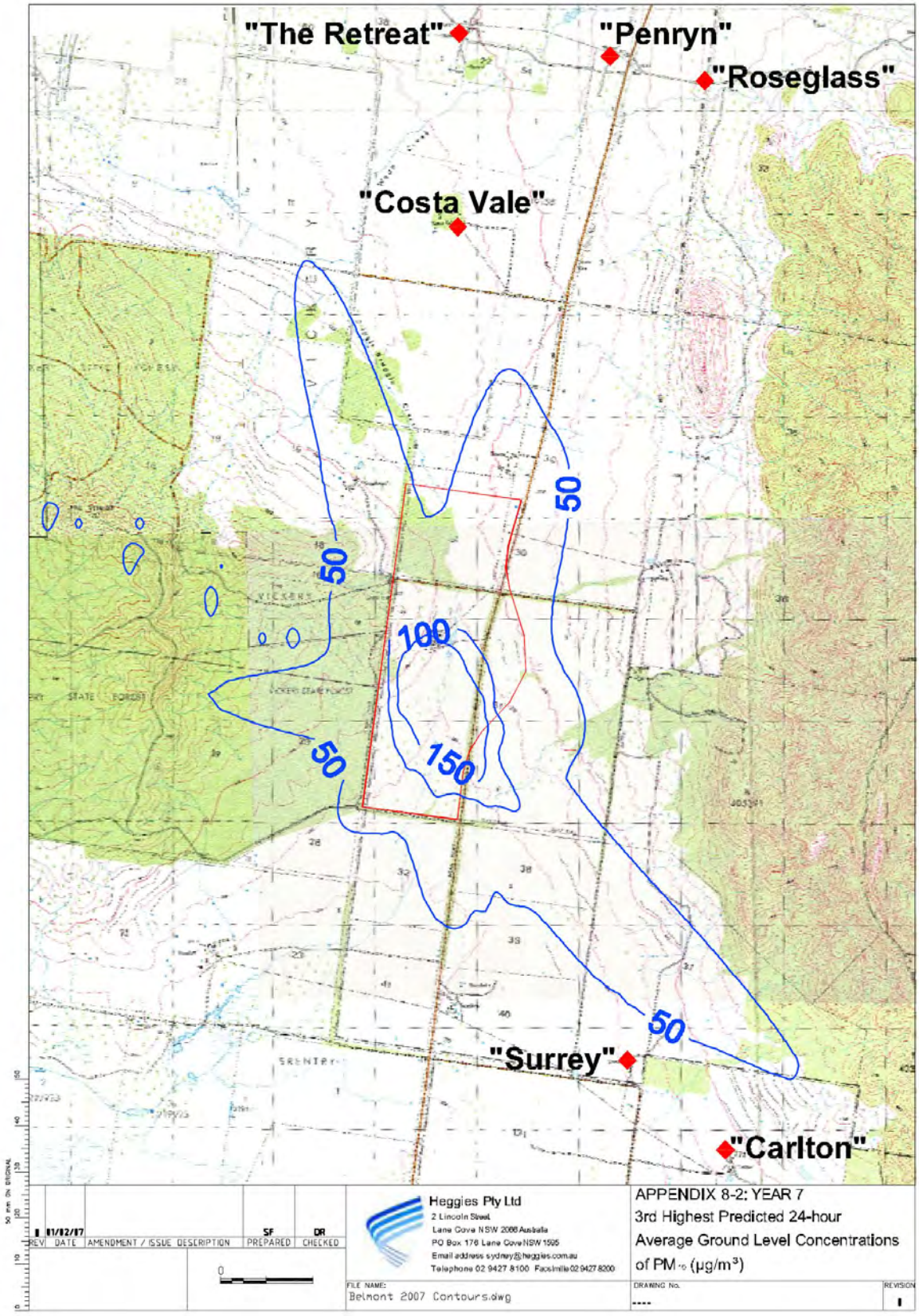

Note: A colour version of this figure is available on the Project CD.

Appendix 9

Predicted Maximum Ground Level Concentrations of Annual Average PM_{10} Isopleths

Appendix 9-1: Scenario 1
Appendix 9-2: Scenario 2

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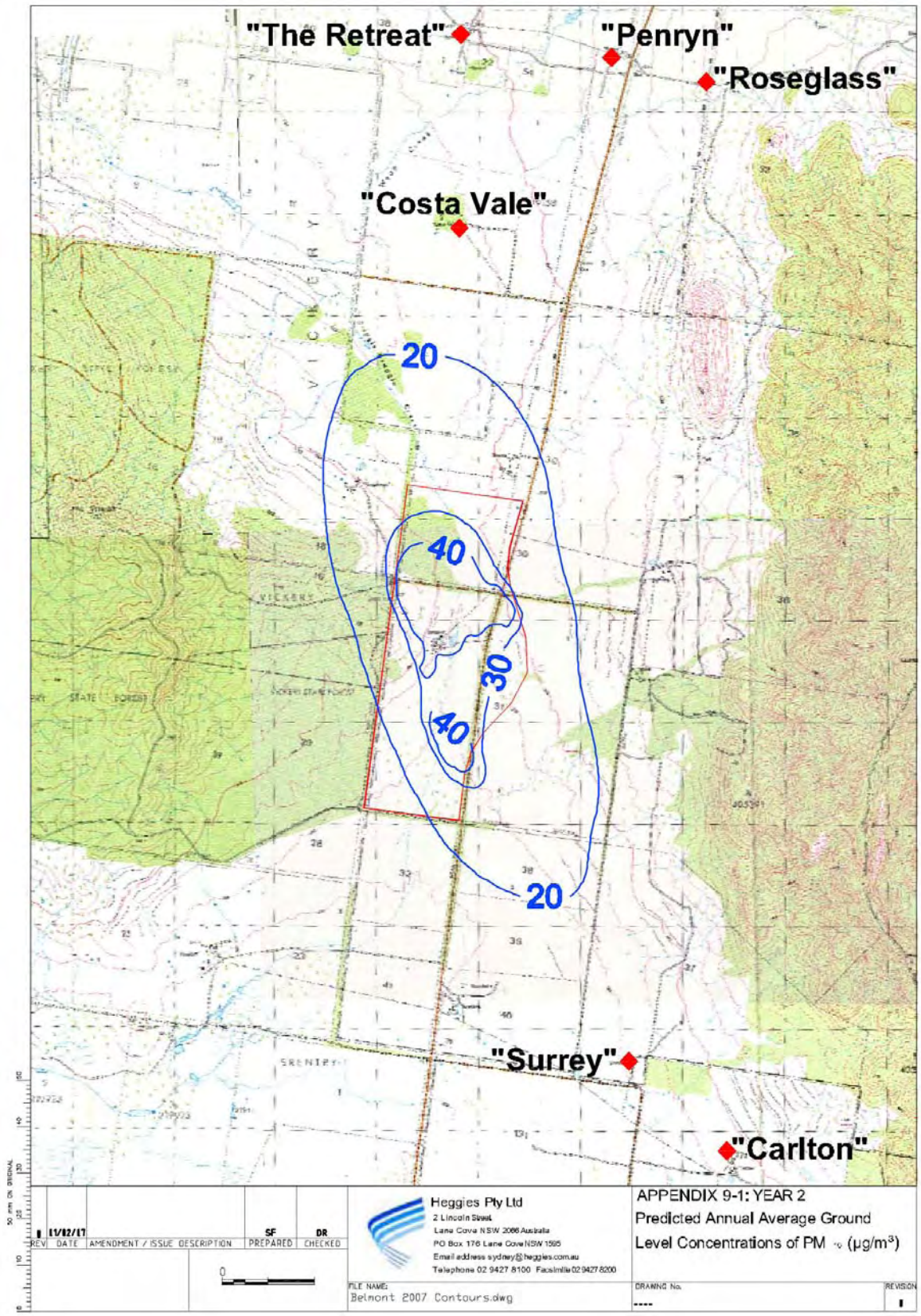

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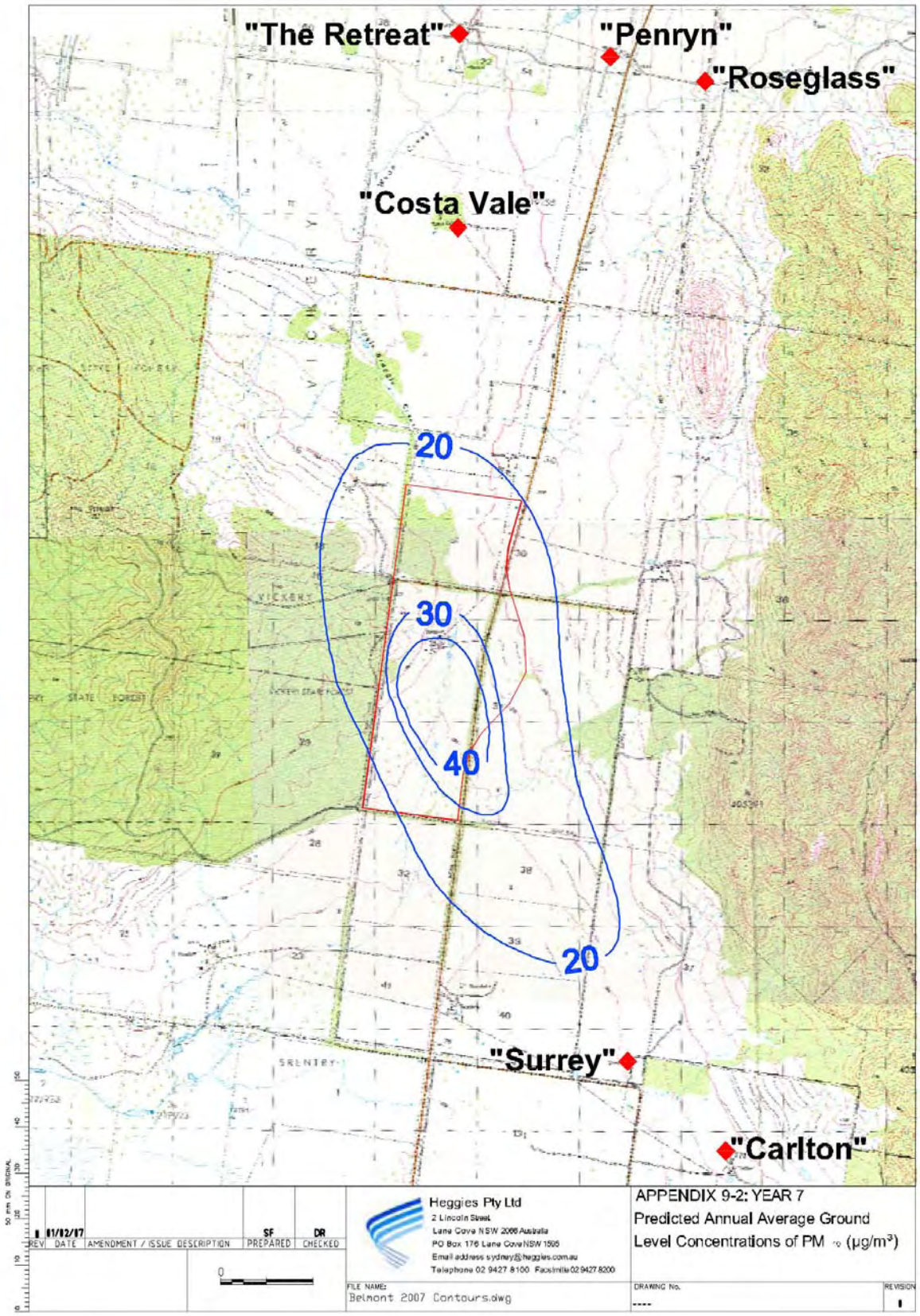

Note: A colour version of this figure is available on the Project CD.

Appendix 10

Greenhouse Gas Assessment - Belmont Coal Project

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1 The Greenhouse Gas Protocol Initiative

1.1 Introduction

The Greenhouse Gas Protocol Initiative (hereafter, "the GHG Protocol") is a multi-stakeholder partnership of businesses, non-governmental organizations (NGOs), governments, and others convened by the World Resources Institute (WRI), a U.S.-based environmental NGO, and the World Business Council for Sustainable Development (WBCSD), a Geneva-based coalition of 170 international companies. Launched in 1998, the Initiative's mission is to develop internationally accepted greenhouse gas (GHG) accounting and reporting standards for business and to promote their broad adoption. (WBCSD, 2005)

The GHG Protocol comprises two separate but linked standards:

- *GHG Protocol Corporate Accounting and Reporting Standard* (this document, which provides a step-by-step guide for companies to use in quantifying and reporting their greenhouse gas emissions).
- *GHG Protocol Project Quantification Standard* (forthcoming; a guide for quantifying reductions from greenhouse gas mitigation projects).

There are three scopes of emissions that are established for greenhouse gas accounting and reporting purposes, defined as follows.

1.2 Scope 1 Emissions – Direct GHG Emissions

The GHG Protocol defines Scope 1 emissions as those which result from activities under the company's control or from sources which they own. They are principally a result of the following activities.

- Generation of electricity, heat or steam. These emissions result from the combustion of fuels in stationary sources, e.g. boilers, furnaces or turbines.
- Physical or chemical processing. The majority of these emissions result from the manufacture or processing of chemicals and materials e.g. the manufacture of cement, aluminium, adipic acid and ammonia, or waste processing.
- Transportation of materials, products, waste, and employees. These emissions result from the combustion of fuels in company owned/controlled mobile combustion sources (e.g., trucks, trains, ships, airplanes, buses, and cars).
- Fugitive emissions. These emissions result from intentional or unintentional releases, e.g., equipment leaks from joints, seals, packing, and gaskets; carbon dioxide and methane emissions from coal mines and venting; hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport.

1.3 Scope 2 Emissions – Electricity indirect GHG Emissions

Scope 2 emissions are those which relate to the generation of purchased electricity consumed in its owned or controlled equipment or operations. For many companies, purchased electricity represents one of the largest sources of GHG emissions and the most significant opportunity to reduce these emissions.

1.4 Scope 3 Emissions – Other indirect GHG Emissions

The GHG protocol states that Scope 3 reporting is optional and covers all other indirect GHG emissions. Scope 3 emissions are defined as those which do not result from the activities of a company although arise from sources not owned or controlled by the company. Examples of Scope 3 emissions include the extraction and production of purchased materials, transportation of purchased fuels and the use of sold products and services.

In the case of the coal mining industry, Scope 3 emissions may include the transportation of sold coal and the use of this coal, either at home or overseas.

The GHG protocol flags the issue that the reporting of Scope 3 emissions may result in the double counting of emissions. A second problem is that as their reporting is optional, comparisons between countries and / or projects may become difficult. The GHG protocol also states that compliance regimes are more likely to focus on the “point of release” of emissions (direct emissions) and / or indirect emissions from the use of electricity. However, for GHG risk management and voluntary reporting, double counting is less important.

2 AGO Workbook

The Australian Greenhouse Office (AGO) Workbook, published by The Department of Environment and Heritage (DEH) in December 2005 provides a single source of current greenhouse gas emission factors for Australian organisations to estimate their emissions and abatement. It should be noted that the emission factors in the December 2005 AGO Workbook have been harmonised with the international reporting framework of the World Resources Institute / World Business Council for Sustainable Development (The GHG Protocol).

2.1 Direct Emissions

Direct emissions are defined in the AGO Workbook as those which are produced from sources within the boundary of an organisation and as a direct result of that organisation’s activities and arise from the following activities:

- Generation of energy, heat steam and electricity, including carbon dioxide (CO_2) and the products of incomplete combustion (methane (CH_4) and nitrous oxide (N_2O)).

- Manufacturing processes, which produce emissions (for example, cement, aluminium and ammonia production).
- Transportation of materials, products, waste and people; for example, use of vehicles owned and operated by the reporting organisation.
- Fugitive emissions – intentional or unintentional GHG releases (such as methane emissions from coal mines, natural gas leaks from joints and seals), and
- On-site waste management, such as emissions from company owned and operated landfill sites.

The AGO gives several examples of direct emissions; a company with a vehicle fleet would report the GHG emissions from the combustion of petrol or diesel in these vehicles as direct emissions. A mining company would report methane escaping from a coal seam during mining (fugitive emissions) as direct emissions and a cement manufacturer would report carbon dioxide released during cement production as direct emissions.

2.2 Indirect Emissions

The AGO Workbook defines indirect emissions as those which are generated in the wider economy as a consequence of an organisation's activities (particularly from its demand for goods and services), but which are physically produced by the activities of another organisation. The most important category of indirect emissions is from the consumption of electricity. Other examples of indirect emissions from an organisation's activities include upstream emissions generated in the extraction and production of fossil fuels, downstream emissions from transport of an organisation's product to customers, and emissions from contracted / outsourced activities. The appropriate emissions factor for these activities depends on the parts of the upstream production and downstream use considered in calculating emissions associated with the activity.

For purposes of harmonisation, the AGO emission factors for indirect emissions have been subdivided into Scope 2 and Scope 3 emissions (adopted by the GHG Protocol).

Broadly, the AGO Workbook defines Scope 3 emissions as including the following.

- Disposal of waste generated (e.g. if the waste is transported outside the organisation and disposed of).
- Use of products manufactured and sold.
- Disposal (end of life) of products sold.
- Employee business travel (in vehicles or aircraft not owned or operated by the reporting organisation).
- Employees commuting to and from work.
- Extraction, production and transport of purchased fuels consumed.
- Extraction, production and transport of other purchased good and materials.
- Purchase of electricity that is sold to an end user (reported by electricity retailer).

- Generation of electricity that is consumed in a transport and distribution system (reported by end user).
- Out-sourced activities.
- Transportation of products, materials and waste.

3 Draft Guidelines for Energy and Greenhouse in EIA

The Draft NSW EIA Guidelines were prepared in August 2002 by the NSW Sustainable Energy Development Authority (SEDA) and Planning NSW (now the Department of Planning (DOP)). The guidelines state that they are an advisory document and should principally be applied to projects which require an EIS under Part 4 and Part 5 of the Environmental Planning and Assessment Act 1979 (NSW) but can also be used for the assessment of other projects.

The Draft NSW EIA Guidelines define four scopes of emissions, the first three being adopted along the lines of the GHG Protocol with the fourth relating to emission abatement.

3.1 Scope 1: Direct Energy Use or GHG Emissions

Scope 1 considers energy use and GHG emissions that occur on site or are under a proponent's direct and immediate control. Scope 1 emissions broadly consist of the energy use and GHG emissions produced by the following activities.

- Production of electricity, heat or steam.
- Combustion of fossil fuels for any other purpose.
- Physical or chemical processing on site.
- Transportation of materials, products, waste and employees by proponent controlled vehicles.
- Fugitive emissions occurring on site.
- On site landfill wastes or wastewater treatment.
- Animal husbandry.
- On site vegetation or soil disturbance.

3.2 Scope 2: Indirect Energy Use or GHG Emissions from Import and Exports of Electricity, Heat or Steam

Scope 2 broadly focuses on the indirect emissions associated with the generation of purchased and imported electricity, heat or steam.

3.3 Scope 3: Other Indirect Energy Use or GHG Emissions

Scope 3 considers the indirect energy use or GHG emissions that are a consequence of the Project but do not occur on site or those emissions which are removed from the proponent's direct control. Examples of Scope 3 emissions as described in the Draft NSW EIA Guidelines include the following;

- Off site waste management (e.g. land filled waste or waste water treatment).
- Transportation of products, materials and waste by vehicles not controlled by the proponent.
- Employee related business or commuter travel.
- Outsourced activities.
- Production of imported materials, plant and equipment.
- Use of products or services produced by the Project (and end of life phases of products).

3.4 Scope 4: GHG Emission Abatement from Offset Opportunities

Scope 4 reporting under the Draft NSW EIA Guidelines allows the reporting of any carbon offsets which have occurred as a direct result of the Project. Proponents may report the following if applicable.

- Carbon sequestration performed by the proponents.
- Community based energy use or emissions reduction initiatives.
- The use of government endorsed Kyoto Protocol flexibility mechanisms such as Clean Development Mechanism (CDM) and Joint Implementation (JI) (refer **Section 3.4.1** below).

3.4.1 Kyoto Protocol Flexibility Mechanisms

Although Australia has not currently ratified the Kyoto Protocol (KP) and is therefore not bound by its commitments, the GHG offset mechanisms contained within the KP can be used as instruments for carbon reduction and can be reported in Scope 4 of the Draft NSW EIA Guidelines. The following mechanisms are relevant for reporting under Scope 4.

- Clean Development Mechanism (CDM) – Developed countries can invest in greenhouse gas emission reduction projects in developing countries.
- Joint Implementation (JI) – Developed countries can invest in greenhouse gas reduction projects in other developed countries.

4 Policy Instruments

4.1 The NSW Greenhouse Plan

Published in November 2005, the NSW Greenhouse Plan is a strategic document which sets out the NSW Government's aims and initiatives in terms of greenhouse gas emissions abatement over the next 20 to 45 years. The NSW Government state that it would like to meet the following criteria:

- A 60% reduction in greenhouse gas emissions by 2050, and
- Cutting greenhouse gas emissions to year 2000 levels by 2025.

The NSW Greenhouse Plan does not set out a methodology for reporting greenhouse gas emissions, rather seeks to:

- increase awareness among those expected to be most affected by the impacts of climate change,
- begin to develop adaptation strategies to those unavoidable climate change impacts, and
- put NSW on track to meeting the targets set out above.

5 GHG Reporting

Table 1 and **Table 2** shows the GHG emissions attributable to the Project under the Scope 1, 2 and 3 emissions categories as described in **Sections 1, 2** and **3**. For comparative purposes, non-CO_2 greenhouse gases are awarded a "CO_2-equivalence" based on their contribution to the enhancement of the greenhouse effect. The CO_2-equivalence of a gas is calculated using an index called the Global Warming Potential (GWP). The GWPs for a variety of non-CO_2 greenhouse gases are contained within the Intergovernmental Panel on Climate Change (IPCC) document *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*.

The GWPs of relevance to this assessment are:

- **Methane (CH_4)**: GWP of 21 (21 times more effective as a greenhouse gas than CO_2); and
- **Nitrous Oxide (N_2O)**: GWP of 310 (310 times more effective as a greenhouse gas than CO_2).

The short-lived gases such as CO, NO_2, and NMVOCs vary spatially and it is consequently difficult to quantify their global radiative forcing impacts. For this reason, GWP values are generally not attributed to these gases nor have they been considered further as part of this assessment.

The activities associated with the Project have been assessed for their GHG producing potential under the 3 Scope emission descriptions.

5.1 Scope 1: Direct Emissions

5.1.1 Fugitive emissions – Coal Bed Methane

The process of coal formation creates significant amounts of methane (CH_4). This CH_4 remains trapped in the coal until the pressure on the coal is reduced, which occurs during the coal mining process. The stored CH_4 is then released to the atmosphere.

The amount of CH_4 released during coal mining varies considerably as a function of factors such as the coal rank and depth, gas content, excavation methods and moisture levels (IPCC, 1996). As such, there are inherent uncertainties that must be considered when using estimates of CH_4 emission factors for coal excavation.

A proportion of the total CH_4 emitted from coal mining is generated by post-excavation activities such as coal processing and transportation. The processing of coal, including breaking, crushing and thermal drying, increases the surface area of the coal resulting in an increased rate of adsorption. CH_4 is desorbed during the transportation of coal as a result of direct exposure of the coal to air (IPCC, 1996).

The annual emissions of methane from this source have been estimated using Table 6 Section 4 of the AGO document *Factors and Methods Workbook, December 2005*.

5.1.2 Diesel Usage

Scope 1 GHG emissions attributable to diesel relate to the use of on site machinery (including on site transportation of coal product) and on site power generation.

The primary fuel source for the vehicles operating on site would be Automotive Diesel Oil (ADO). Data is available on the diesel consumption for all mobile and fixed equipment servicing the site, including onsite electricity generation, and is estimated as 5,225kL/year.

The annual emissions of CO_2 and other greenhouse gases from this source have been estimated using the Australian Greenhouse Office (AGO) document *AGO Factors and Methods Workbook, December 2005*. It has been assumed that the energy content of ADO is 38.6 MJ/L (ABARE, 2004).

5.1.3 Explosives

The use of explosives in mining leads to the release of greenhouse gases. The activity level is the mass of explosive used (in tonnes). Emissions factors are available for the three main types of explosives (Ammonium Nitrate with Fuel Oil (ANFO), Heavy ANFO and Emulsion).

An estimate of the CO_2 emissions resulting from blasting activities has been derived using information contained in Table 12 of the AGO document *Factors and Methods Workbook, December 2005*.

5.2 Scope 2: Electricity Indirect Emissions

5.2.1 Consumption of Purchased Electricity

The production of electricity by on-site power generating equipment is covered in Scope 1 GHG emissions. Scope 2 GHG emissions relate to the consumption of purchased electricity. Table 5 of the AGO document *Factors and Methods Workbook, December 2005* gives state emission factors for both Scope 2 and Scope 3 consumption of purchased electricity. State emission factors are used because electricity flows between states are significantly constrained by the capacity of the inter-state interconnectors and in some cases there are no interconnections.

The emission factor for Scope 2 covers emissions from fuel combustion at power stations associated with the consumption of purchased electricity. The Scope 3 emission factor covers both the emissions from the extraction, production and transport of fuels used in the production of the purchased electricity (i.e. fugitive emissions and stationary and mobile fuel combustion emissions) and also the emissions associated with the electricity lost in transmission and distribution on route to the customer. In this report, Scope 2 and 3 emissions for the consumption of purchased electricity have been reported separately so that the share of the transport and distribution loss can be correctly attributed under Scope 3 emissions – Generation of Electricity Consumed in a T & D System.

5.3 Scope 3: Other Indirect Emissions

5.3.1 Use of Products Manufactured and Sold

Indirect emissions of GHG from the combustion of product coal are expected “downstream” due to the extraction activities at the Belmont Coal Project. 1.4 Mt of coal annually are expected to be produced by this Project, with majority destined for International markets.

The GHG emissions from combustion of product coal have been based on a coal energy content of 29.75 GJ/t (7105 kcal/kg). Standard emission factors for coal combustion (Black coal – NSW Electricity Generation) have been taken from Table 1 of the AGO document *Factors and Methods Workbook, December 2005*.

The emission factors from Table 1 of the AGO document *Factors and Methods Workbook, December 2005* are generally used for Scope 1 emissions where fuel is being combusted on site, although in this context, the greenhouse gas emissions for the full life cycle of the coal are being assessed and are being reported as Scope 3 emissions as the coal is being combusted elsewhere. A full fuel life cycle for coal is possible with the addition of the Scope 3 emissions which relate to the extraction, production and transport of the fuel in question.

5.3.2 Employees Commuting to and from Work

Fuel usage and consequent GHG emissions attributable to company employees commuting to and from work can be reported under Scope 3 GHG emissions. Fuel consumption rates by vehicle type are given in Table 4 and fuel combustion emission factors are given in Table 3 of the AGO document *Factors and Methods Workbook, December 2005*. Assumptions regarding the fuel types and distances travelled by each employee are made where specific information is not available.

Employee vehicles are assumed to be in the category of Passenger Cars and use Automotive Diesel Oil (ADO). Distance travelled to and from work per employee is calculated based on the radius of the distance from the Project site to the closest habitation(s) of significance.

Information supplied by the proponent indicates that 48 light vehicle movements per day are to be completed by employees (1,200 per year based on a 300 day working year). The closest habitations of significance to the Belmont Coal Project are Gunnedah and Narrabri, 30km and 40km from Belmont by road respectively. Assuming a worst case scenario of diesel usage in all employee vehicles, an annual diesel consumption attributable to employee travel to work is 18 kL.

5.3.3 Extraction, Production and Transport of Purchased Fuels Consumed

See **Section 5.3.1.**

5.3.4 Extraction, Production and Transport of other Purchased Materials or Goods

GHG emissions relating to the extraction, production and transport of other purchased materials or goods such as raw materials in the production of concrete, for example should be reported here. In addition, if any other fuels are consumed on site, such as natural gas, the emissions should be reported both in Scope 1 emissions (direct emissions) and under this heading in Scope 3 relating to the extraction, production and transport of the fuel. In terms of the Belmont Coal Project, no significant items relate to this category.

5.3.5 Generation of Electricity Consumed in a T & D System

See **Section 5.2.1**.

5.3.6 Transportation of Products, Materials and Waste

Transportation of product coal from the site of extraction to the site of combustion will generally involve transport via road, rail and / or boat. Detailed calculations involving the number of kilometres travelled per tonne of coal produced are difficult if the product destination and method of transport is unknown. It is considered that Scope 3 emissions in the category "extraction, production and transport of purchased fuels consumed" will be sufficient to encompass the full life cycle of the product coal from extraction to ultimate combustion.

Table 1
Total Greenhouse Gas Emissions – Belmont Coal Project

ROM Production (tonnes)	Saleable Coal (tonnes)[1]	Emissions Source	Usage			Total Use	Units	Emission Factors			Emissions (t CO_2-e)			Total (t CO_2-e)[2]
			Scope 1	Scope 2	Scope 3			Scope 1	Scope 2	Scope 3	Scope 1	Scope 2	Scope 3	
1,500,000	1,125,000	Methane	4,240			4,240	tonnes	21			89,030			89,030
		Diesel	5,225		191	5,225	kL	2.7		0.3	14,108		5.4	14,113
		Explosives	2,849			2,849	tonnes	0.1673			477			477
		Electricity		0	0	0	kWh		0.835	0.15		0	0	0
		Coal			1,050,000	1,050,000	tonnes			97.7			5,449,828	3,051,904
TOTAL														**3,155,523**

Table 2
Total Greenhouse Gas Emissions – Belmont Coal Project (Potential Project Total – 7 Year Mine Life)

ROM Production (tonnes)	Saleable Coal (tonnes)[1]	Emissions Source	Usage			Total Use	Units	Emission Factors			Emissions (t CO_2-e)			Total (t CO_2-e)[2]
			Scope 1	Scope 2	Scope 3			Scope 1	Scope 2	Scope 3	Scope 1	Scope 2	Scope 3	
14,660,000	10,995,000	Methane	32,953			32,953	tonnes	21			692,018			692,018
		Diesel	36,575		126	36,701	kL	2.7		0.3	98,753		37.8	98,790
		Explosives	19,943			19,943	tonnes	0.1673			3,336			3,336
		Electricity		0	0	0	kWh		0.835	0.15		0	0	0
		Coal			10,995,000	10,995,000	tonnes			97.7			31,957,792	31,957,792
TOTAL														**32,751,937**
TOTAL Worst Case Year (Total/7 Years)														**4,678,848**

1) Based on 75% saleable coal 2) t CO2-e - tonnes of CO2 equivalent

NOTE: Table 2 is based on the maximum tonnage of coal available to be mined at the Project Site and represents a worst case scenario. It is not simply 7 times the annual coal tonnage mined

6 References

- ABARE (Australian Bureau of Agricultural and Resource Economics) (2004) *Energy Abbreviations and Definitions.*
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