



APPENDIX 9

Greenhouse Gas and Energy
Calculation Spreadsheet

APPENDIX 9

GHG Calculations – 2012 Operations (192,127 tonnes)

Stationary Diesel Use

Activity Data	Energy Use		Emission Factors		
			CO ₂	CH ₄	N ₂ O
kL	GJ/kL	GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
240.348	38.6	9,277.43	69.2	0.1	0.2
			t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)			642	0.93	1.86
Total GHG emissions (t CO₂-e)			644.79		

Electricity Use

Activity Data	Energy Use		Emission Factors		
			CO ₂	CH ₄	N ₂ O
GJ	GJ		kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
1,709.68	1,709.68		245	N/A	N/A
			t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)			418.87	N/A	N/A
Total GHG emissions (t CO₂-e)			418.87		

Extraction, Production and Distribution of Energy Purchased

Activity Data		Emission Factors		
		CO ₂	CH ₄	N ₂ O
Purchased energy	GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
Stationary Diesel	9,277.43	5.3	N/A	N/A
Transport Diesel	18,874.04	5.3	N/A	N/A
Electricity	1,709.68	49.0	N/A	N/A
		t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)		232.97	N/A	N/A
Total GHG emissions (t CO₂-e)				232.97

Product Transport

Activity Data						Emission Factors		
						CO ₂	CH ₄	N ₂ O
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
Oberon	29,917	8	7,252.50	0.546	152.85	69.2	0.2	0.5
Bathurst	56,791	100	172,092.85	0.546	3,626.96	69.2	0.2	0.5
Blue Mountains	12,901	180	70,370.78	0.546	1,483.11	69.2	0.2	0.5
Western Sydney	57,917	270	473,869.31	0.546	9,987.08	69.2	0.2	0.5
Other	34,601	164	171,954.60	0.546	3,624.05	69.2	0.2	0.5
Total	192,127		895,540.04		18,874.05	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)						1,306.08	3.77	9.44
Total GHG emissions (t CO₂-e)								1,319.29

Transport of Materials (Diesel)

Activity Data						Emission Factors		
						Scope 1	Scope 3	Full Life Cycle
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
Oakville - Oberon	729.31	300	6,630	0.546	139.73	69.9	5.3	75.2
						t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)						N/A	N/A	10.51
Total GHG emissions (t CO₂-e)								10.51

GHG Calculations – Operations at 400,000 tpa

Stationary Diesel Use

Activity Data	Energy Use		Emission Factors		
			CO ₂	CH ₄	N ₂ O
kL	GJ/kL	GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
400	38.6	15,440	69.2	0.1	0.2
			t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)			1,068.45	1.54	3.01
Total GHG emissions (t CO₂-e)			1,073		

Electricity Use

Activity Data	Energy Use		Emission Factors		
			CO ₂	CH ₄	N ₂ O
GJ	GJ		kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
2,847.58	2,847.58		241	N/A	N/A
			t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)			686.26	N/A	N/A
Total GHG emissions (t CO₂-e)			686.26		

Extraction, Production and Distribution of Energy Purchased

Activity Data		Emission Factors		
		CO ₂	CH ₄	N ₂ O
Purchased energy	GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
Stationary Diesel	15,440	5.3	N/A	N/A
Transport Diesel	39,295	5.3	N/A	N/A
Electricity	2,847.58	52.0	N/A	N/A
		t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)		438.17	N/A	N/A
Total GHG emissions (t CO₂-e)		438.17		

Product Transport

Activity Data						Emission Factors		
						CO ₂	CH ₄	N ₂ O
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
Oberon	62,286	8	15,099.64	0.546	318.23	69.2	0.2	0.5
Bathurst	118,236	100	358,290.91	0.546	7,551.20	69.2	0.2	0.5
Blue Mountains	26,859	180	146,503.64	0.546	3,087.65	69.2	0.2	0.5
Western Sydney	120,581	270	986,571.82	0.546	20,792.59	69.2	0.2	0.5
Other	72,038	164	358,007.03	0.546	7,545.21	69.2	0.2	0.5
Total	400,000		1,864,476.03		39,294.89	t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)						2,719.21	7.85	19.64
Total GHG emissions (t CO₂-e)								2746.71

Transport of Materials (Diesel)

Activity Data						Emission Factors		
						Scope 1	Scope 3	Full Life Cycle
Destination	Product (t)	Return Distance (km)	Distance Travelled (km)	Diesel Use (l/Km)	Diesel Use (GJ)	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ	kg CO ₂ -e/GJ
Oakville – Oberon	1,804	300	16,400	0.546	345.64	69.9	5.3	75.2
						t CO ₂ -e	t CO ₂ -e	t CO ₂ -e
Breakdown of individual GHG emissions (t CO ₂ -e)						N/A	N/A	25.99
Total GHG emissions (t CO₂-e)								25.99



Newcastle

75 York Street
Teralba NSW 2284

Ph. 02 4950 5322

www.umwelt.com.au