HOLMES AIR SCIENCES

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Dear Ben,

Additional air dispersion modelling for proposed Visy Stage 2 operations

1. INTRODUCTION AND BACKGROUND

Following our recent email communications we have carried out additional air dispersion modelling for the proposed Visy Stage 2 operations at Tumut.

The main changes from the operations as presented in the Environmental Assessment (EA) are as follows:

1. Lime Kiln (LK2) will be ducted into existing Stack 1;
2. Phase 1a scenario will have only the new Recovery Boiler (RB2) ducted to Stack 2;
3. Phase 1b scenario will have only RB2 and the Gas Fired Boiler ducted to Stack 2; and
4. Phase 2 scenario will have only RB2 and the Multi-Fuel Boiler (MFB) ducted to Stack 2.

You provided us with new emissions data for Phase 1a, Phase 1b and Phase 2 on 22 May 2007 and these data are summarised in **Section 2**. Changes to the emissions data have occurred following more recent information on emission levels from suppliers.

It is understood that there could be two different flow rates to match the different firing rates in RB2. The RB2 will typically be operated at the lower rate (750 tds/day) to keep in balance with the rest of the mill. Whenever the existing recovery boiler is operated at a lower firing rate, the firing rate on RB2 may increase (to a maximum of 900 tds/day).

For our air dispersion modelling, there are six scenarios as follows:

1. "Phase 1a 750": Includes Stack 1 (LK2) and Stack 2 (750 tds/day);
2. "Phase 1a 900": Includes Stack 1 (LK2) and Stack 2 (900 tds/day);
3. "Phase 1b 750": Includes Stack 1 (LK2) and Stack 2 (750 tds/day);
4. "Phase 1b 900": Includes Stack 1 (LK2) and Stack 2 (900 tds/day);

5. “Phase 2 750”: Includes Stack 1 (LK2), Stack 2 (750 tds/day) and Stack 3 (turbine); and

6. “Phase 2 900”: Includes Stack 1 (LK2), Stack 2 (900 tds/day) and Stack 3 (turbine)

Details of the emissions data and model results are provided in the sections below. The approach to the modelling is identical to that described in our air quality impact assessment report (**Holmes Air Sciences, 2007**).

2. STACK AND EMISSIONS DATA

The physical characteristics of the modelled emission sources are shown in **Table 1**.

Table 1 : Physical characteristics of modelled sources

Physical characteristics	Stack 1 (existing)	Stack 2 (proposed)	Stack 3 (proposed)
Location (AMG coordinates, m)	603282, 6093442	603225, 6093405	603231, 6093398
Stack base elevation (m)	359	356	356
Stack height (m)	85	85	25
Internal stack tip diameter (m)	2.66	2.25 (2.66 in EA)	3.25
Cross-sectional area (m^2)	5.56	3.98	8.30

Table 2 summarises the stack concentrations and mass emission rates from each source. These data have been used for the current air dispersion modelling.

Table 2 : Emission characteristics of modelled sources

Case	**EA emissions**						**Post EA emissions**							
Source ID	Stack 1	Stack 1	Stack 2	Stack 1	Stack 2	Stack 3	Stack 1	Stack 2						Stack 3
Emission scenario	Existing	Phase 1		Phase 2			Phase 1a, 1b, 2	Phase 1a 750	Phase 1a 900	Phase 1b 750	Phase 1b 900	Phase 2 750	Phase 2 900	Phase 2
Flow rate (Nm^3/s)	8.56E+01	8.56E+01	8.56E+01	8.56E+01	8.56E+01	1.10E+02	9.45E+01	4.41E+01	5.29E+01	8.08E+01	8.96E+01	8.08E+01	8.96E+01	1.10E+02
Exit velocity (m/s)	2.56E+01	2.56E+01	2.56E+01	2.56E+01	2.56E+01	2.10E+01	2.84E+01	1.84E+01	2.21E+01	3.37E+01	3.74E+01	3.37E+01	3.74E+01	2.10E+01
Temperature (K)	4.53E+02	4.53E+02	4.53E+02	4.53E+02	4.53E+02	4.33E+02	4.53E+02	4.53E+02	4.53E+02	4.53E+02	4.53E+02	4.53E+02	4.53E+02	4.33E+02
Concentrations (mg/Nm^3)														
Cadmium	3.20E-03	3.20E-03	3.49E-03	3.20E-03	1.14E-02	0.00E+00	3.40E-03	5.30E-03	5.30E-03	3.20E-03	3.40E-03	1.20E-02	1.13E-02	0.00E+00
Chlorine	2.20E+00	2.20E+00	2.20E+00	2.20E+00	5.93E+01	0.00E+00	2.33E+00	3.70E+00	3.70E+00	2.00E+00	2.17E+00	6.56E+01	5.95E+01	0.00E+00
Mercury	4.20E-03	4.20E-03	4.27E-03	4.20E-03	2.87E-02	0.00E+00	4.50E-03	7.00E-03	7.00E-03	3.90E-03	4.20E-03	3.11E-02	2.87E-02	0.00E+00
NO_x	1.43E+02	1.43E+02	1.45E+02	1.43E+02	2.27E+02	5.95E+01	1.96E+02	2.05E+02	2.05E+02	1.50E+02	1.56E+02	2.35E+02	2.40E+02	5.95E+01
TSP	3.60E+01	3.60E+01	1.70E+01	3.60E+01	2.56E+01	2.97E+00	1.99E+01	5.00E+01	5.00E+01	2.94E+01	3.14E+01	3.91E+01	4.02E+01	2.97E+00
TCDD (equivalent)	2.60E-08	2.60E-08	2.60E-08	2.60E-08	6.68E-08	0.00E+00	2.80E-08	4.33E-08	4.33E-08	2.00E-08	3.00E-08	6.91E-08	7.00E-08	0.00E+00
Total Heavy Metals	2.97E-01	2.97E-01	2.98E-01	2.97E-01	5.58E-01	0.00E+00	3.10E-01	4.95E-01	4.95E-01	2.72E-01	2.94E-01	5.61E-01	5.50E-01	0.00E+00
HF	2.60E-01	2.60E-01	2.60E-01	2.60E-01	1.32E+00	0.00E+00	2.80E-01	4.33E-01	4.33E-01	2.40E-01	2.60E-01	1.42E+00	1.32E+00	0.00E+00
TRS as H_2S	1.59E+00	1.59E+00	1.59E+00	1.59E+00	1.59E+00	0.00E+00	2.66E+00	3.00E+00	3.00E+00	1.64E+00	1.77E+00	1.64E+00	1.77E+00	0.00E+00
SO_2	2.43E+02	2.43E+02	2.43E+02	2.43E+02	3.03E+02	2.66E-01	2.14E+02	8.80E+01	8.80E+01	4.82E+01	5.21E+01	1.15E+02	1.13E+02	2.66E-01
HCl	4.99E+01	4.99E+01	4.99E+01	4.99E+01	8.66E+01	0.00E+00	4.81E+01	4.81E+01	4.81E+01	2.63E+01	2.84E+01	6.71E+01	6.52E+01	0.00E+00
H2SO4 as SO_3	9.20E+00	9.20E+00	9.20E+00	9.20E+00	1.74E+01	0.00E+00	9.76E+00	1.53E+01	1.53E+01	8.38E+00	9.06E+00	1.75E+01	1.73E+01	0.00E+00
CO	2.94E+02	2.94E+02	1.96E+02	2.94E+02	2.21E+02	1.38E+01	2.89E+02	1.25E+02	1.25E+02	9.12E+01	9.45E+01	1.20E+02	1.21E+02	1.38E+01
VOC (as n-propane)	2.10E+01	2.10E+01	2.24E+01	2.10E+01	2.10E+01	9.67E-01	2.12E+01	3.71E+01	3.71E+01	2.18E+01	2.33E+01	2.03E+01	2.19E+01	9.67E-01
Methanol	1.22E+00	1.22E+00	1.22E+00	1.22E+00	1.22E+00	0.00E+00	1.10E+00	2.60E+00	2.60E+00	1.40E+00	1.51E+00	1.40E+00	1.51E+00	0.00E+00
Antimony	2.04E-03	2.04E-03	2.04E-03	2.04E-03	6.49E-03	0.00E+00	2.17E-03	3.41E-03	3.41E-03	1.86E-03	2.01E-03	6.82E-03	6.48E-03	0.00E+00
Arsenic	2.00E-02	2.00E-02	2.00E-02	2.00E-02	4.12E-02	0.00E+00	2.12E-02	3.33E-02	3.33E-02	1.82E-02	1.97E-02	4.18E-02	4.09E-02	0.00E+00
Beryllium	1.90E-05	1.90E-05	2.21E-05	1.90E-05	8.85E-04	0.00E+00	2.02E-05	3.17E-05	3.17E-05	2.05E-05	2.16E-05	9.81E-04	8.88E-04	0.00E+00
Chromium	1.66E-02	1.66E-02	1.70E-02	1.66E-02	4.95E-02	0.00E+00	1.76E-02	2.77E-02	2.77E-02	1.55E-02	1.67E-02	5.17E-02	4.93E-02	0.00E+00
Cobalt	2.71E-03	2.71E-03	2.73E-03	2.71E-03	4.79E-03	0.00E+00	2.87E-03	4.51E-03	4.51E-03	2.49E-03	2.69E-03	4.78E-03	4.76E-03	0.00E+00
Copper	1.90E-01	1.90E-01	1.90E-01	1.90E-01	2.48E-01	0.00E+00	2.02E-01	3.17E-01	3.17E-01	1.73E-01	1.87E-01	2.37E-01	2.45E-01	0.00E+00
Lead	5.23E-02	5.23E-02	5.24E-02	5.23E-02	1.19E-01	0.00E+00	5.54E-02	8.71E-02	8.71E-02	4.77E-02	5.16E-02	1.22E-01	1.19E-01	0.00E+00

Case	**EA emissions**						**Post EA emissions**							
Source ID	Stack 1	Stack 1	Stack 2	Stack 1	Stack 2	Stack 3	Stack 1	Stack 2						Stack 3
Emission scenario	Existing	Phase 1		Phase 2			Phase 1a, 1b, 2	Phase 1a 750	Phase 1a 900	Phase 1b 750	Phase 1b 900	Phase 2 750	Phase 2 900	Phase 2
Manganese	1.33E-01	1.33E-01	1.33E-01	1.33E-01	1.97E-01	0.00E+00	1.41E-01	2.22E-01	2.22E-01	1.21E-01	1.31E-01	1.92E-01	1.95E-01	0.00E+00
Nickel	1.71E-02	1.71E-02	1.77E-02	1.71E-02	2.46E-02	0.00E+00	1.81E-02	2.85E-02	2.85E-02	1.62E-02	1.74E-02	2.39E-02	2.43E-02	0.00E+00
Selenium	6.65E-03	6.65E-03	6.66E-03	6.65E-03	7.57E-03	0.00E+00	7.06E-03	1.11E-02	1.11E-02	6.06E-03	6.56E-03	7.08E-03	7.48E-03	0.00E+00
Tin	3.47E-02	3.47E-02	3.47E-02	3.47E-02	5.71E-02	0.00E+00	3.68E-02	5.78E-02	5.78E-02	3.16E-02	3.42E-02	5.65E-02	5.67E-02	0.00E+00
Vanadium	4.13E-03	4.13E-03	4.13E-03	4.13E-03	9.01E-03	0.00E+00	4.38E-03	6.89E-03	6.89E-03	3.76E-03	4.07E-03	9.19E-03	8.96E-03	0.00E+00
Mass emission rates (g/s)														
Cadmium	2.74E-04	2.74E-04	2.99E-04	2.74E-04	9.72E-04	0.00E+00	3.21E-04	2.34E-04	2.80E-04	2.58E-04	3.05E-04	9.69E-04	1.01E-03	0.00E+00
Chlorine	1.88E-01	1.88E-01	1.88E-01	1.88E-01	5.07E+00	0.00E+00	2.20E-01	1.63E-01	1.96E-01	1.62E-01	1.94E-01	5.29E+00	5.33E+00	0.00E+00
Mercury	3.60E-04	3.60E-04	3.65E-04	3.60E-04	2.45E-03	0.00E+00	4.25E-04	3.09E-04	3.70E-04	3.15E-04	3.76E-04	2.51E-03	2.57E-03	0.00E+00
NO_x	1.22E+01	1.22E+01	1.24E+01	1.22E+01	1.94E+01	6.54E+00	1.86E+01	9.04E+00	1.08E+01	1.21E+01	1.39E+01	1.89E+01	2.15E+01	6.54E+00
TSP	3.08E+00	3.08E+00	1.45E+00	3.08E+00	2.19E+00	3.27E-01	1.88E+00	2.21E+00	2.65E+00	2.37E+00	2.81E+00	3.16E+00	3.60E+00	3.27E-01
TCDD (equivalent)	2.23E-09	2.23E-09	2.23E-09	2.23E-09	5.72E-09	0.00E+00	2.65E-09	1.91E-09	2.29E-09	1.62E-09	2.69E-09	5.58E-09	6.27E-09	0.00E+00
Total Heavy Metals	2.54E-02	2.54E-02	2.55E-02	2.54E-02	4.78E-02	0.00E+00	2.93E-02	2.18E-02	2.62E-02	2.20E-02	2.63E-02	4.53E-02	4.93E-02	0.00E+00
HF	2.23E-02	2.23E-02	2.23E-02	2.23E-02	1.13E-01	0.00E+00	2.65E-02	1.91E-02	2.29E-02	1.94E-02	2.33E-02	1.14E-01	1.18E-01	0.00E+00
TRS as H_2S	1.36E-01	1.36E-01	1.36E-01	1.36E-01	1.36E-01	0.00E+00	2.51E-01	1.32E-01	1.59E-01	1.32E-01	1.59E-01	1.32E-01	1.59E-01	0.00E+00
SO_2	2.08E+01	2.08E+01	2.08E+01	2.08E+01	2.60E+01	2.92E-02	2.03E+01	3.88E+00	4.66E+00	3.89E+00	4.67E+00	9.33E+00	1.01E+01	2.92E-02
HCl	4.27E+00	4.27E+00	4.27E+00	4.27E+00	7.42E+00	0.00E+00	4.54E+00	2.12E+00	2.54E+00	2.12E+00	2.54E+00	5.42E+00	5.84E+00	0.00E+00
$H2SO_4$ as SO_3	7.88E-01	7.88E-01	7.88E-01	7.88E-01	1.49E+00	0.00E+00	9.23E-01	6.75E-01	8.09E-01	6.77E-01	8.11E-01	1.41E+00	1.54E+00	0.00E+00
CO	2.51E+01	2.51E+01	1.67E+01	2.51E+01	1.89E+01	1.52E+00	2.74E+01	5.51E+00	6.61E+00	7.36E+00	8.46E+00	9.73E+00	1.08E+01	1.52E+00
VOC (as n-propane)	1.80E+00	1.80E+00	1.92E+00	1.80E+00	1.80E+00	1.06E-01	2.01E+00	1.64E+00	1.96E+00	1.76E+00	2.09E+00	1.64E+00	1.96E+00	1.06E-01
Methanol	1.04E-01	1.04E-01	1.04E-01	1.04E-01	1.04E-01	0.00E+00	1.04E-01	1.15E-01	1.38E-01	1.13E-01	1.35E-01	1.13E-01	1.35E-01	0.00E+00
Antimony	1.75E-04	1.75E-04	1.75E-04	1.75E-04	5.56E-04	0.00E+00	2.05E-04	1.50E-04	1.80E-04	1.50E-04	1.80E-04	5.51E-04	5.80E-04	0.00E+00
Arsenic	1.71E-03	1.71E-03	1.71E-03	1.71E-03	3.52E-03	0.00E+00	2.00E-03	1.47E-03	1.76E-03	1.47E-03	1.76E-03	3.37E-03	3.67E-03	0.00E+00
Beryllium	1.63E-06	1.63E-06	1.89E-06	1.63E-06	7.57E-05	0.00E+00	1.91E-06	1.40E-06	1.68E-06	1.66E-06	1.94E-06	7.92E-05	7.95E-05	0.00E+00
Chromium	1.42E-03	1.42E-03	1.45E-03	1.42E-03	4.23E-03	0.00E+00	1.67E-03	1.22E-03	1.47E-03	1.25E-03	1.50E-03	4.18E-03	4.42E-03	0.00E+00
Cobalt	2.32E-04	2.32E-04	2.34E-04	2.32E-04	4.10E-04	0.00E+00	2.72E-04	1.99E-04	2.39E-04	2.01E-04	2.41E-04	3.86E-04	4.26E-04	0.00E+00
Copper	1.63E-02	1.63E-02	1.63E-02	1.63E-02	2.12E-02	0.00E+00	1.91E-02	1.40E-02	1.68E-02	1.40E-02	1.68E-02	1.91E-02	2.19E-02	0.00E+00
Lead	4.47E-03	4.47E-03	4.48E-03	4.47E-03	1.02E-02	0.00E+00	5.24E-03	3.84E-03	4.61E-03	3.85E-03	4.62E-03	9.88E-03	1.06E-02	0.00E+00
Manganese	1.14E-02	1.14E-02	1.14E-02	1.14E-02	1.69E-02	0.00E+00	1.33E-02	9.78E-03	1.17E-02	9.79E-03	1.17E-02	1.55E-02	1.75E-02	0.00E+00
Nickel	1.46E-03	1.46E-03	1.51E-03	1.46E-03	2.10E-03	0.00E+00	1.72E-03	1.26E-03	1.51E-03	1.30E-03	1.56E-03	1.93E-03	2.18E-03	0.00E+00
Selenium	5.69E-04	5.69E-04	5.70E-04	5.69E-04	6.48E-04	0.00E+00	6.67E-04	4.89E-04	5.87E-04	4.90E-04	5.87E-04	5.72E-04	6.70E-04	0.00E+00

Case	EA emissions						Post EA emissions							
Source ID	Stack 1	Stack 1	Stack 2	Stack 1	Stack 2	Stack 3	Stack 1	Stack 2						Stack 3
Emission scenario	Existing	Phase 1		Phase 2			Phase 1a, 1b, 2	Phase 1a 750	Phase 1a 900	Phase 1b 750	Phase 1b 900	Phase 2 750	Phase 2 900	Phase 2
Tin	2.97E-03	2.97E-03	2.97E-03	2.97E-03	4.89E-03	0.00E+00	3.48E-03	2.55E-03	3.06E-03	2.55E-03	3.06E-03	4.57E-03	5.07E-03	0.00E+00
Vanadium	3.54E-04	3.54E-04	3.54E-04	3.54E-04	7.71E-04	0.00E+00	4.14E-04	3.04E-04	3.65E-04	3.04E-04	3.65E-04	7.42E-04	8.03E-04	0.00E+00

5. AIR DISPERSION MODEL RESULTS

Model results are summarised in **Table 3**. These show the highest predicted ground-level concentrations for any location in the modelling domain (which covers an area of 20 km by 20 km around the mill). Pollutants that have an ambient air quality criteria noted by the DECC are shown.

The complete records of model results for each receptor, pollutant, averaging time and scenario are provided in electronic spreadsheets that will accompany this letter.

Table 3 : Highest predicted ground-level concentrations

Pollutant	Averaging time	Percentile	EA model results (µg/m³)			Post EA model results (µg/m³)						Ambient air quality criteria
			Existing	Phase 1	Phase 2	Phase 1a_750	Phase 1a_900	Phase 1b_750	Phase 1b_900	Phase 2_750	Phase 2_900	
CO	1-h maximum	100	2.29E+02	3.85E+02	4.28E+02	1.84E+02	1.93E+02	2.02E+02	1.95E+02	2.11E+02	2.02E+02	30000
NO_X	1-h maximum	100	1.11E+02	2.27E+02	3.88E+02	1.97E+02	1.93E+02	1.64E+02	1.66E+02	2.21E+02	2.33E+02	-
NO_2	1-h maximum	100	2.23E+01	4.54E+01	7.76E+01	3.93E+01	3.85E+01	3.28E+01	3.33E+01	4.43E+01	4.65E+01	246
NO_X	Annual	100	9.50E-01	1.87E+00	3.23E+00	2.45E+00	2.48E+00	2.15E+00	2.19E+00	3.48E+00	3.52E+00	62
TSP	24-h maximum	100	2.59E+00	3.87E+00	4.98E+00	4.35E+00	4.56E+00	3.61E+00	3.84E+00	4.79E+00	4.97E+00	50
TSP	Annual	100	2.40E-01	3.47E-01	4.45E-01	4.14E-01	4.23E-01	2.99E-01	3.11E-01	3.98E-01	4.04E-01	30
SO_2	1-h maximum	100	1.90E+02	3.84E+02	4.33E+02	1.36E+02	1.42E+02	1.44E+02	1.40E+02	1.64E+02	1.56E+02	570
SO_2	24-h maximum	100	1.75E+01	3.59E+01	4.05E+01	2.05E+01	2.10E+01	1.91E+01	1.96E+01	2.42E+01	2.42E+01	228
SO_2	Annual	100	1.62E+00	3.16E+00	3.55E+00	1.91E+00	1.92E+00	1.69E+00	1.71E+00	2.08E+00	2.06E+00	60
HF	24-h maximum	100	1.87E-02	3.85E-02	1.19E-01	4.46E-02	4.72E-02	3.81E-02	4.02E-02	1.25E-01	1.21E-01	1.5
CD	1-h maximum	99.9	8.74E-04	1.78E-03	3.92E-03	1.97E-03	2.14E-03	1.67E-03	1.75E-03	3.87E-03	3.69E-03	0.018
HG	1-h maximum	99.9	1.15E-03	2.27E-03	8.86E-03	2.60E-03	2.83E-03	2.13E-03	2.24E-03	9.03E-03	8.32E-03	0.18
TCDD	1-h maximum	99.9	7.11E-09	1.39E-08	2.50E-08	1.62E-08	1.76E-08	1.22E-08	1.49E-08	2.45E-08	2.46E-08	0.000002
CL	1-h maximum	99.9	6.00E-01	1.18E+00	1.66E+01	1.36E+00	1.48E+00	1.10E+00	1.16E+00	1.71E+01	1.56E+01	50
H_2SO_4	1-h maximum	99.9	2.51E+00	4.93E+00	7.15E+00	5.67E+00	6.16E+00	4.60E+00	4.85E+00	6.87E+00	6.75E+00	18
HCL	1-h maximum	99.9	1.36E+01	2.67E+01	3.67E+01	2.17E+01	2.43E+01	1.89E+01	1.98E+01	2.91E+01	2.91E+01	140
TRS as H_2S	1-h maximum	99	1.94E-01	3.84E-01	3.84E-01	6.19E-01	6.36E-01	5.11E-01	5.32E-01	5.11E-01	5.32E-01	0.23
Pb	Annual	100	3.48E-04	6.80E-04	1.10E-03	8.56E-04	8.73E-04	6.38E-04	6.61E-04	1.07E-03	1.05E-03	0.5
Sb	1-h maximum	99.9	5.58E-04	1.09E-03	2.30E-03	1.26E-03	1.37E-03	1.02E-03	1.08E-03	2.26E-03	2.17E-03	9
As	1-h maximum	99.9	5.46E-03	1.07E-02	1.64E-02	1.23E-02	1.34E-02	9.98E-03	1.05E-02	1.59E-02	1.56E-02	0.09
Be	1-h maximum	99.9	5.20E-06	1.09E-05	2.44E-04	1.17E-05	1.28E-05	1.03E-05	1.08E-05	2.54E-04	2.30E-04	0.004
Cr	1-h maximum	99.9	4.53E-03	8.98E-03	1.78E-02	1.03E-02	1.12E-02	8.40E-03	8.86E-03	1.75E-02	1.68E-02	0.09
Cu	1-h maximum	99.9	5.20E-02	1.02E-01	1.17E-01	1.17E-01	1.28E-01	9.52E-02	1.00E-01	1.11E-01	1.15E-01	18

Mn	1-h maximum	99.9	3.64E-02	7.13E-02	8.87E-02	8.19E-02	8.90E-02	6.64E-02	6.99E-02	8.41E-02	8.54E-02	18
Ni	1-h maximum	99.9	4.66E-03	9.29E-03	1.11E-02	1.06E-02	1.15E-02	8.70E-03	9.17E-03	1.06E-02	1.09E-02	0.18
Methanol	1-h maximum	99.9	3.33E-01	6.53E-01	6.53E-01	8.79E-01	9.10E-01	6.32E-01	6.68E-01	6.32E-01	6.68E-01	3000

Notes: Red font represent model results which are high than predicted in the EA. NO_2 predictions assume that 20% of the NO_x is NO_2 at the point of maximum ground-level concentration. The most stringent H_2S criterion of 1.38 $\mu g/m^3$ was divided by a peak-to-mean factor of 6 to compare with concentrations at nose-response averaging time.

The model results from **Table 3** show that maximum ground-level concentrations are below air quality criteria for each modelled pollutant and for each modelled scenario, with the exception of TRS (as H_2S). Consideration of existing background levels needs to be given to CO, NO_2, TSP (as PM_{10}), SO_2 and HF while all other pollutants are assessed by comparing the incremental prediction against the criteria (**DEC, 2005**).

Differences between EA and post EA model predictions of CO, NO_2, TSP, SO_2 and HF are considered to be small. It follows from the air quality impact assessment (**Holmes Air Sciences, 2007**) that inclusion of background levels to the model results in **Table 3** will still demonstrate compliance with the ambient air quality criteria for these pollutants.

From **Table 3** it is only TRS (as H_2S) where the highest ground-level concentrations are predicted to be above the criterion. The highest ground-level concentrations were predicted on the high ground to the north-east of the site, within Visy's boundary. To investigate this further, the model prediction at the most affected residence for each scenario have also been examined. Results are shown in **Table 4**.

Table 4 : Predicted concentrations of TRS (as H_2S)

	Nose-response TRS (as H_2S)* concentration at the 99th percentile (µg/m³)						
EA results	**Existing**	**Phase 1**				**Phase 2**	
At most affected ground-level location	1.16	2.30				2.30	
At most affected ground-level residence	0.24	0.48				0.48	
Post EA results	**Existing**	**Phase 1a 750**	**Phase 1a 900**	**Phase 1b 750**	**Phase 1b 900**	**Phase 2 750**	**Phase 2 900**
At most affected ground-level location	1.16	3.71	3.81	3.07	3.19	3.07	3.19
At most affected ground-level residence	0.24	0.76	0.80	0.64	0.67	0.64	0.67

** Model results were multiplied by a peak-to-mean factor of 6 to estimate concentrations at nose-response averaging time.*

DECC air quality criteria for H_2S:
- *1.38 µg/m³ for urban population (~2000 people or more)*
- *4.83 µg/m³ for single residence (~2 people or less)*

It can be seen from **Table 4** that the model results show compliance with the most stringent goal (1.38 µg/m³) at every residential location for each modelled scenario. Compliance with the 4.83 µg/m³ criterion is predicted for every ground-level location in the model domain.

5. CONCLUDING REMARKS

The CALPUFF air dispersion model was re-run for the proposed Visy Stage 2 operations, following amendments to model scenarios and emissions data. Six additional model scenarios were run.

The model results suggested that air quality impacts would be similar to those presented in the EA, with the exception of H_2S, where some more significant increases over EA results were predicted. Results for all scenarios have been shown to comply with the DECC's ambient air quality criteria at all residences for all pollutants modelled.

Electronic spreadsheets containing all the dispersion model results for each scenario, residential receptor, pollutant and averaging time will accompany this letter.

I trust this information is of some assistance. Please contact me if you have any questions regarding the air dispersion modelling.

Yours faithfully,

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REFERENCE

DEC (2005)
"Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW", August 2005.

Holmes Air Sciences (2007)
"Air quality impact assessment: Expansion of Visy Pulp and Paper Mill, Tumut, NSW". Report dated 24 January 2007.