Memorandum

To: Shaun Smith (RPS)

Cc: John Vyse (Bettergrow)

From: Darlene Heuff

Date: 10/11/2017

Subject: Greenspot Wetherill Park Dust Assessment – Additional Results

As requested, Advanced Environmental Dynamics Pty Ltd (AED) has prepared this memo that includes additional results from the dust assessment (AED Report # 959516.2) undertaken by AED in support of the Greenspot Wetherill Park (GWP) Environmental Impact Assessment (EIS).

In particular, the following are noted:

- The New South Wales (NSW) Department of Planning and Environment (DPE) have requested that Table 12 of AED Report # 959516.2 (*Greenspot Wetherill Park Dust Assessment*) is expanded to include background levels of dust as measured at the Environment and Heritage Protection's (EHP's) Prospect monitoring station (Figure 1).
- RPS has requested that result of the dispersion modelling include receptor locations as per the GWP Noise Assessment (Figure 2).

Figure 1: Location of EHP's Prospect Monitoring Station (Blue)

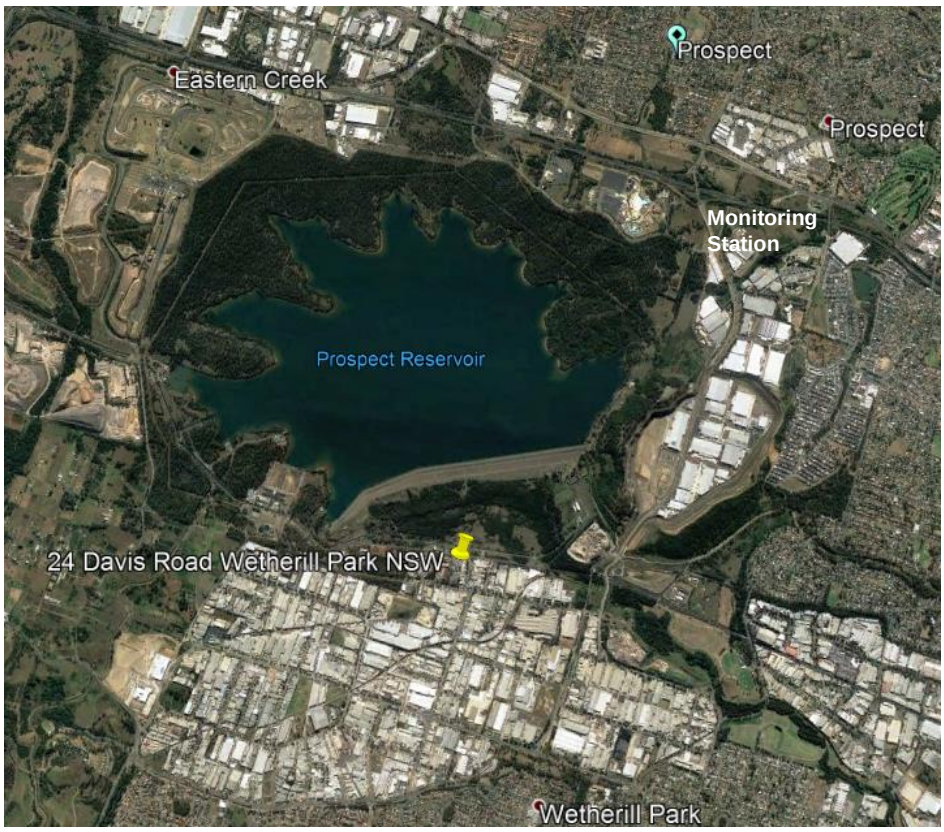
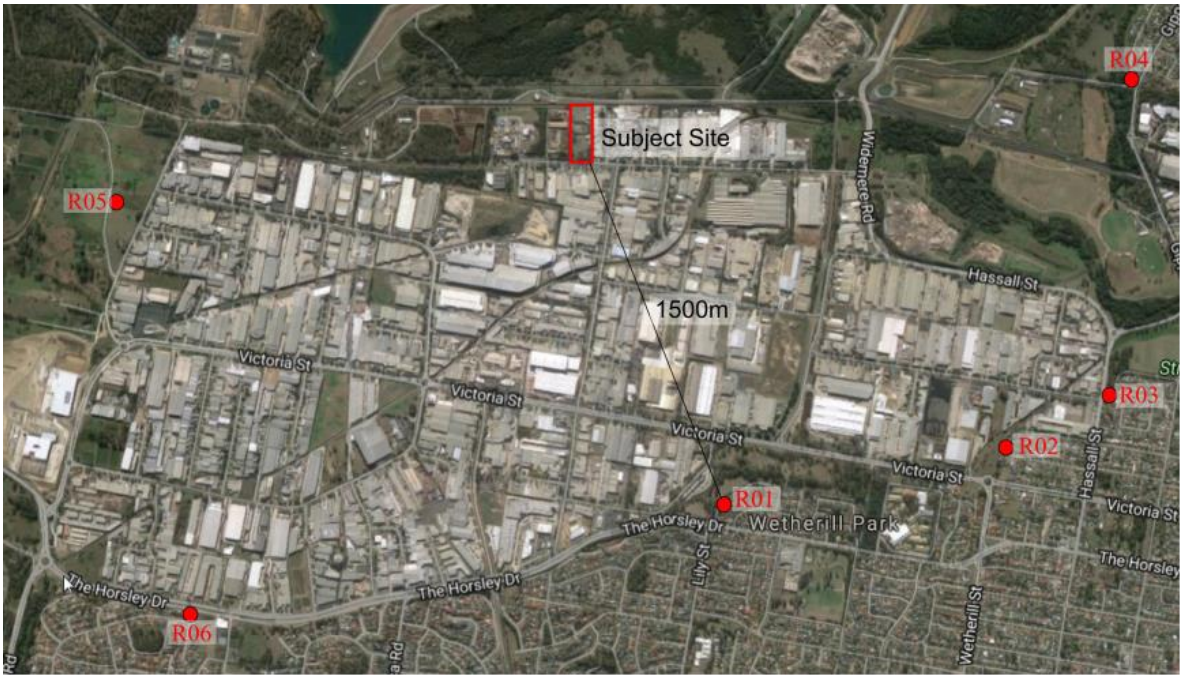


Figure 2: Receptor Locations (Source: GWP Noise Assessment)



In response, AED notes the following:

- The GWP EIS dust assessment was based on three years of hourly meteorology i.e. 2013, 2014 and 2015.
- As impacts of dust from GWP were anticipated to be minor, the domain of the dust model was limited to an approximately 1.5 km radius in order to maximise grid resolution in the vicinity of the boundaries of the Project site.
- Since the noise receptor locations are greater than 1.5 km from the Project site boundaries, the noted receptor locations are not within the domain of the dust model developed for GWP.
- Nonetheless, results of the modelling do suggest that impacts from the project at receptor locations will be:
  - less than 1 µg/m^3 for the 24 hour average concentration of PM_{10}
  - less than 0.5 µg/m^3 for the annual average concentration of PM_{10}
  - less than 1 µg/m^3 for the annual average concentration of TSP
- The project goals are summarised in Table 1.

Table 1: Project Goals (GWP EIS Dust Assessment)

Pollutant	Averaging Period	Project Goal	Source
TSP	Annual	90 µg/m^3	NHMRC (1996)
PM_{10}	24 hour	50 µg/m^3	NEPC (1998)
	Annual	30 µg/m^3	EPA (1998)
Dust deposition	Monthly(1)	2 mg/m^2/day	NERDDC (1988)
	Monthly(2)	4 mg/m^2/day	NERDDC (1988)

Note (1): Maximum increase in deposited dust levels
(2): Maximum total deposited dust level

- Results presented in this memo focus on those for TSP and PM_{10}. Background levels of dust deposition have not been estimated.
- AED has reviewed PM_{10} data from the Prospect monitoring station for 2013, 2014 and 2015. A summary of the data is provided in Table 2 through Table 4. Notably:
  - the maximum 24 hour average concentration of PM_{10} during 2013 and 2015 was greater than the project goal of 50 µg/m^3.

- In total, 4 exceedence days occurred during 2013 with only 1 exceedence day during 2015. Although AED has not investigated the nature of the exceedences during 2013 or 2015, likely causes may include bush fires, dust storms, localised sources, etc.
- There were no exceedences of the project goals for the annual average concentration of TSP and PM_{10} during these three years.

Table 2: Prospect Data: Percentiles of the 24 Hour Average Concentration of PM_{10}

Percentile	2013	2014	2015
100th	**81.8**	44.3	**68.7**
99th	49.9	35.0	37.0
95th	33.3	30.2	29.7
90th	29.9	25.6	26.1
80th	24.5	22.7	23.0
70th	21.9	20.2	20.0

Table 3: Prospect Data: 24 Hour Average Concentration of PM_{10}

Parameter	2013	2014	2015
Number of days of data	345	341	347
Number of Exceedences of the project objective of 50 µg/m^3	4	0	1

Table 4: Prospect Data: Annual Average Concentration of PM_{10}

2013	2014	2015
19.2	17.6	17.6

- The annual average concentration of TSP (Table 5) has been inferred from the Prospect monitoring station PM_{10} data assuming that the ratio of PM_{10} to TSP is approximately equal to ½ (based on NWS OEH concurrent TSP and PM10 monitoring data obtained during 2003 and 2004.)

Table 5: Annual Average Concentration of TSP (inferred from PM_{10} data)

2013	2014	2015
38.4	35.1	35.1

Results of the dust dispersion modelling at receptor locations are provided in Table 6 through Table 8. Note that a conservative approach has been adopted with project-only impacts at receptor locations less than what has been assumed here.

Table 6: Results for the 24 Hour Average Concentration of PM_{10} at Receptor Locations

	Maximum 24 hour average concentration of PM_{10}								
	Background Only			Project Only			Cumulative (Project + Background)		
	2013	2014	2015	2013	2014	2015	2013	2014	2015
Prospect	81.8	44.3	68.7	-	-	-	-	-	-
R01	-	-	-	<1	<1	<1	< 82.8	< 45.3	< 69.7
R02	-	-	-	<1	<1	<1	< 82.8	< 45.3	< 69.7
R03	-	-	-	<1	<1	<1	< 82.8	< 45.3	< 69.7
R04	-	-	-	<1	<1	<1	< 82.8	< 45.3	< 69.7
R05	-	-	-	<1	<1	<1	< 82.8	< 45.3	< 69.7
R06	-	-	-	<1	<1	<1	< 82.8	< 45.3	< 69.7

	Number of exceedences of Project Objective of 50 µg/m^3					
	Background Only			Cumulative (Background + Project = 1)		
	2013	2014	2015	2013	2014	2015
Prospect	4	0	1	-	-	-
R01	-	-	-	5	0	1
R02	-	-	-	5	0	1
R03	-	-	-	5	0	1
R04	-	-	-	5	0	1
R05	-	-	-	5	0	1
R06	-	-	-	5	0	1

Table 7: Results for the Annual Average Concentration of PM_{10} at Receptor Locations

	Annual Average Concentration of PM_{10}								
	Background Only			Project Only			Cumulative (Project + Background)		
	2013	2014	2015	2013	2014	2015	2013	2014	2015
Prospect	19.2	17.6	17.6	-	-	-	-	-	-
R01	-	-	-	<0.5	<0.5	<0.5	< 19.7	< 18.1	< 18.1
R02	-	-	-	<0.5	<0.5	<0.5	< 19.7	< 18.1	< 18.1
R03	-	-	-	<0.5	<0.5	<0.5	< 19.7	< 18.1	< 18.1
R04	-	-	-	<0.5	<0.5	<0.5	< 19.7	< 18.1	< 18.1
R05	-	-	-	<0.5	<0.5	<0.5	< 19.7	< 18.1	< 18.1
R06	-	-	-	<0.5	<0.5	<0.5	< 19.7	< 18.1	< 18.1

	Number of exceedences of Project Objective of 30 µg/m^3					
	Background Only			Cumulative (Background + Project = 0.5)		
	2013	2014	2015	2013	2014	2015
Prospect	0	0	0	-	-	-
R01	-	-	-	0	0	0
R02	-	-	-	0	0	0
R03	-	-	-	0	0	0
R04	-	-	-	0	0	0
R05	-	-	-	0	0	0
R06	-	-	-	0	0	0

Table 8: Results for the Annual Average Concentration of TSP at Receptor Locations

	Annual Average TSP								
	Background Only			Project Only			Cumulative (Project + Background)		
	2013	2014	2015	2013	2014	2015	2013	2014	2015
Prospect	38.4	35.1	35.1	-	-	-	-	-	-
R01	-	-	-	<1	<1	<1	< 39.4	< 36.1	< 36.1
R02	-	-	-	<1	<1	<1	< 39.4	< 36.1	< 36.1
R03	-	-	-	<1	<1	<1	< 39.4	< 36.1	< 36.1
R04	-	-	-	<1	<1	<1	< 39.4	< 36.1	< 36.1
R05	-	-	-	<1	<1	<1	< 39.4	< 36.1	< 36.1
R06	-	-	-	<1	<1	<1	< 39.4	< 36.1	< 36.1

	Number of exceedences of Project Objective of 90 µg/m^3					
	Background Only			Cumulative (Background + Project = 1)		
	2013	2014	2015	2013	2014	2015
Prospect	0	0	0	-	-	-
R01	-	-	-	0	0	0
R02	-	-	-	0	0	0
R03	-	-	-	0	0	0
R04	-	-	-	0	0	0
R05	-	-	-	0	0	0
R06	-	-	-	0	0	0

Summary of Results

In relation to potential cumulative impacts of dust from activities at GWP and background levels at the sensitive receptor locations noted in Figure 2, consideration of PM_{10} data from the Prospect monitoring station suggests that one additional exceedence of the project goal of 50 µg/m^3 for the 24 hour average concentration of PM_{10} may occur based on 2013 meteorology and background dust levels. It is noted however that GWP is estimated to contribute less than 1 µg/m^3 to dust levels at any of the receptor locations. No additional exceedences were predicted based on 2014 or 2015 meteorology and background levels.

No exceedences of the project goals for the annual average concentration of PM_{10} or TSP are predicted to occur as a result of cumulative impacts of dust from GWP combined with background levels of dust as measured at the Prospect monitoring station. It is further noted that GWP is estimated to contribute less than 0.5 µg/m^3 to the annual average concentration of PM_{10} and less than 0.5 µg/m^3 to the annual average concentration of TSP.

I trust you will not hesitate to contact me on 0400 661 182 if you have any questions and/or comments.

Sincerely,

Dr Darlene Heuff
Director and Principal Applied Scientist