

APPENDIX N - Visual Photographs of Quarry from Neighbouring Sites



PHOTO 1 – View of Quarry from Elizabeth Drive Entrance



PHOTO 2 – View from Elizabeth Drive. Dust/Noise Monitoring Point 1



PHOTO 3 – View from Hubertus Country Club Carpark



PHOTO 4 – View from Residence on Commonwealth Leased Land



PHOTO 5 – View from Adjoining Northern Neighbouring Property



PHOTO 6 – View from Commonwealth Leased Land Elizabeth Drive

APPENDIX O - Dust Monitoring Results
Water Monitoring Results

STATIC DUST REPORTING PERIOD

GPS D1 0289133 6249958 D2 0288713 6249427 D3 0288685 6248867 D4 0289381 6249156 D5 0289782 6249330

Location ID D1 Elizabeth Drive: D2 Hurbertus Club: D3 Jackson Road: D4 South Paddock: D5 East House

	Insoluble Solids (g/m ² /Month)					Combustible Matter (g/m ² /month)					Ash (g/m ² /month)					Collected and analysed	NOTES:
	D1	D2	D3	D4	D5	D1	D2	D3	D4	D5	D1	D2	D3	D4	D5		
Mar-09	1.7	0.7	1.6	6.4	1.2	0.7	0.3	0.5	3.8	0.5	1.1	0.5	1.1	2.6	0.7	Golders Associates	
Apr-09	1.1	0.4	1.3	0.7	0.8	0.3	0.2	0.2	0.2	0.3	0.8	0.2	1.1	0.5	0.5	Golders Associates	
May-09	0.6	0.4	2.1	1.3	0.7	0.3	0.1	0.3	0.4	0.3	0.4	0.2	1.8	0.9	0.4	Golders Associates	
Jun-09	0.1	0.2	0.1	0.4	1.2	0.1	0.1	0	0.2	0.2	0	0.1	0.1	0.2	1	Golders Associates	
Jul-09	0.8	0.8	1.7	0.5	0.4	0.2	0.3	0.4	2.1	0.2	0.6	0.6	1.3	0.4	0.3	Golders Associates	
Nov-09	0.9	0.8	1.7	0.8	0.8	0.2	0.1	0.3	0.3	0.1	0.7	0.7	1.4	0.5	0.7	VG	
Dec-09	3.6	5.1	4	2.4	8.6	1.1	2.4	1.1	0.6	6.4	2.5	2.7	2.9	1.8	2.2	VG	
Jan-10	1	0.9	2.1	3.6	2.4	0.8	0.8	1.8	2.3	1.5	0.2	0.1	0.3	1.3	0.9	VG	
Feb-10	3.3	0.8	1.4	2.7	1.4	1.8	0.2	0.3	1.6	0.6	1.5	0.6	1.1	1.1	0.8	VG	
Mar-10	0.8	1.2	2.9	0.8	1.4	0.6	1	1.3	0.6	0.5	0.2	0.2	1.6	0.3	0.8	VG	
Apr-10	0.5	0.4	1.4	0.6	1.2	0.2	0.2	0.4	0.3	0.4	0.3	0.2	1	0.4	0.8	VG	
May-10	2.6	0.3	2.7	0.6	4.6	1.4	0.1	0.6	0.1	1.3	1.2	0.2	2.1	0.5	3.4	VG D5 Insects	
Jun-10	0.5	0.1	0.5	1.1	0.6	0.2	0	0.1	0.7	0.2	0.4	0.1	0.4	0.4	0.4	VG All gauges full of rain water	
Jul-10	0.7	0.3	0.9	3.8	0.7	0.5	0.2	0.3	2.3	0.2	0.2	0.1	0.7	1.6	0.5	VG D4 Insects	
Aug-10	0.7	0.5	0.8	0.9	0.6	0.5	0.3	0.4	0.5	0.3	0.3	0.2	0.4	0.3	0.3	VG	
Sep-10	0.2	0.1	0.4	0.2	1.5	0	0	0	0	0.7	0.2	0.1	0.4	0.1	0.9	VG D3 Gauge tampered with	
Oct-10	4.3	0.4	1.1	0.3	0.8	0.6	0.2	0.3	0.1	0.2	3.6	0.2	0.8	0.2	0.6	VG D1 Insects, D4 Broken Funnel,	
Nov-10	0.8	0.4	1.2	1.2	0.5	0.5	0.2	0.3	0.6	0.1	0.4	0.2	0.9	0.7	0.6	VG All gauges full of rain water	
Dec-10	0.5	2.8	0.9	2.7	0.1	0.9	1.7	0.3	2.3	0.2	0.3	1.1	0.6	0.4	0.5	VG D4 Bird droppings, D2 Insects	
Jan-11	0.2	0.8	1	1.9	0.2	0	0.1	0.6	1.1	0	0.2	0.8	0.4	0.8	0.2	VG Weed Spraying and slashing occurring	
Feb-11	1.9	0.6	2.2	1.8	0.6	1.1	0.3	0.5	1	0.2	0.9	0.4	1.7	0.8	0.5	VG D2 gauge was damaged. Repaired	
Mar-11	0.6	1	1.7	0	0.7	0.1	0.5	0.4	0	0.2	0.5	0.5	1.4	0	0.4	VG D4 gauge damaged.	
Apr-11	3	1.4	0.4	1.8	1.5	2.2	1.6	0.1	0.1	0.7	0.8	1.9	0.3	1.7	0.8	VG D3 gauge funnel broken damaged	
May-11	0.4	0.4	0.9	9	0.4	0.2	0.2	0.3	0.7	0.2	0.1	0.2	0.6	8.4	0.1	VG D4 Sample contained visible dirt	
Jun-11	0.1	0.3	1	9	0.1	0	0	0.4	0	0	0	0	0.6	0	0.1	VG D1,D2,D4 Samples damaged during testing	
Jul-11	1.5	0.3	0.9	3	0.4	0.8	0.1	0.2	0.3	0.1	0.8	0.2	0.7	2.7	0.4	VG D4 contained dirt in jar	
Aug-11	0.2	0.3	0.8	1.3	0.5	0.1	0	0.1	0.2	0.2	0.1	0.3	0.7	1.1	0.3	VG	
Sep-11	0.1	0.3	1.2	0.7	1.4	0.1	0.1	0.3	0.2	0.4	0.3	0.3	1.2	0.7	1.4	VG	
Oct-11	0.6	0.3	1.2	1.1	0.6	0.4	0	0.2	0.4	0.2	0.2	0.3	1	0.7	0.4	VG D3 Gauge tampered with	
Nov-11	1	3.4	2.8	5.2	0.6	0.5	1.8	0.8	1.2	0.2	0.5	1.6	2	3.9	0.4	VG D1,D2,D3,D4 Insects and droppings	
Dec-11	3.2	0.9	1	2.1	0.1	2.3	0.2	0.4	1.3	0	0.9	0.7	0.6	0.7	0.1	VG D1,D2,D3,D4,D5 Gauge full & bird droppings	
Jan-12	1.3	0.9	2.8	1.9	0.4	0.6	0.4	1.2	0.7	0.2	0.7	0.5	1.6	1.2	0.2	VG	
Feb-12	1.3	0.6	1.2	2	0.2	1	0.4	0.6	0.7	0.1	0.3	0.2	0.6	1.3	0.2	VG All gauges full of rain water	
Mar-12	0.4	0.3	4.6	2.4	3.2	0.2	0.1	1.4	0.8	1	0.2	0.2	3.2	1.6	2.2	VG All gauges full of rain water, D3 gauge bird droppings	
Apr-12	1.8	0.6	2.7	1.4	0.7	1.1	0.3	0.5	0.6	0.2	0.7	0.3	2.2	0.8	0.5	VG All gauges full of rain water	
May-12	0.3	0.3	0.6	0.7	0.7	0.2	0.2	0.2	0.3	0.4	0.1	0.1	0.4	0.4	0.3	VG	
Jun-12	0.4	0.3	1.6	4.5	0.7	0.2	0.2	0.5	0.7	0.3	0.2	0.1	1.1	3.8	0.4	VG South Paddock D4 Seed, Algae & dust	
Jul-12	0.4	0.2	0.7	0.2	0.7	0.1	0.1	0.1	0.1	0.1	0.4	0.1	0.6	0.2	0.8	VG D1 Paddock ploughed and seeded	
Aug-12	0.2	0.3	0.7	2	0.2	0.1	0.1	0.3	0.4	0.1	0.2	0.2	0.4	2	0.2	VG D3 Bird Droppings	
Sep-12	0.6	0.5	1.4	5.6	0.4	0.2	0.2	0.5	1.4	0.1	0.4	0.3	0.9	4.2	0.3	VG	
Oct-12	0.8	0.8	1.1	1.8	4	0.5	0.5	0.6	0.2	1.7	0.3	0.3	0.5	1.6	2.3	VG D5 Bird Droppings & D4 Motobike adjacent on track	
Nov-12	2.6	0.8	1.7	3.6	1.5	1.3	0.4	0.6	1.1	0.7	1.3	0.4	1.1	2.5	0.8	VG D5 Insects in jar. High winds and heavy rains during period	
Dec-12	3.6	0.5	5.2	1.1	4.4	1.9	0.1	2.6	0.3	2.1	1.7	0.4	2.6	0.8	2.3	VG D1-D3,D4 all had bird droppings and beetles.	
Jan-13	3.5	1.4	4.2	1.1	2.8	1.8	0.5	1.5	0.1	0.9	2.1	0.9	2.7	1	1.9	VG D1,D3,D4 had Beetles & algae.	
Feb-13	0.6	0.3	1.1	0.2	1.1	0.1	0.1	0.3	0.1	0.3	0.5	0.2	0.8	0.2	0.8	VG All gauges full of rain water	
Mar-13	0.8	0.2	0.7	0.7	0.5	0.4	0.1	0.2	0.2	0.1	0.4	0.2	0.5	0.4	0.4	VG Rain water in all gauges	
Apr-13	1.1	1	9.5	2	2.1	0.5	0.5	0.7	1	0.4	0.6	0.5	4.8	1	3.7	VG D4 Paddock Recently Slashed, D3 Yard Mowed and loose dirt in Horse Paddocks	
May-13	1.9	0.5	1.1	0.3	2	1.1	0.3	0.4	0.1	0.1	0.8	0.2	0.7	0.3	2	VG D1 Bird Droppings, D4 Recent Earthworks	
Jun-13	1	0.6	0.6	4.3	0.1	0.5	0.5	0.4	0.5	0.1	0.5	0.1	0.2	3.8	0.1	VG All Gauge full of water, D1 Bird Droppings, D4 Bird Droppings & Dust	
Jul-13	1.3	0.6	0.9	1.6	0.6	0.6	0.2	0.2	0.1	0.1	0.7	0.4	0.7	1.6	0.5	VG D1 Bird Droppings, D3 Horses on training track, D4 Some visible dust	
Aug-13																	
Sep-13																	
Oct-13																	
Nov-13																	
Dec-13																	
Jan-14																	
Total Monitoring Period																	
Average	1.2	0.8	1.6	2.1	1.3	0.6	0.4	0.5	0.7	0.5	0.6	0.4	1.1	1.3	0.8		
Min	0.1	0.1	0	0.1	0	0	0	0	0	0	0	0	0.1	0	0.1		
Max	4.3	5.1	5.5	9	8.6	2.3	2.4	2.6	3.8	6.4	3.6	2.7	4.8	8.4	3.4		
Pre Extraction Period (March 2009 to December 2010)																	
Average	1.3	0.9	1.5	1.6	1.6	0.5	0.4	0.5	0.9	0.7	0.8	0.4	1.1	0.7	0.9		
Min	0.1	0.1	0.1	0.2	0.4	0	0	0	0	0.1	0	0	0.1	0.1	0.3		
Max	4.3	5.1	4	6.4	8.6	1.8	2.4	1.8	3.8	6.4	3.6	2.7	2.9	2.6	3.4		
During Extraction Period (January 2011 to August 2011)																	
Average	1.0	0.7	1.1	3.5	0.6	0.6	0.4	0.3	0.4	0.2	0.4	0.5	0.8	1.9	0.4		
Min	0.1	0.3	0.4	0	0.1	0	0	0.1	0	0	0	0	0.3	0	0.1		
Max	3	1.8	2.2	9	1.5	2.2	1.6	0.6	1.1	0.7	0.9	1.9	1.7	8.4	0.8		
Post Extraction Period (September 2011 to Current)																	
Average	1.2	1.0	2.1	2.2	0.9	0.7	0.4	0.7	0.8	0.3	0.4	0.5	1.5	1.4	0.7		
Min	0.3	0.3	1	0.7	0.1	0.1	0	0.2	0.2	0	0.2	0.2	0.6	0.7	0.1		
Max	3.2	3.4	4.6	5.2	3.2	2.3	1.8	1.4	1.3	1	0.9	1.6	3.2	3.9	2.2		
Summary of Monitoring Periods																	
	D1	D2	D3	D4	D5												
Total Monitoring Period	1.2	0.8	1.6	2.1	1.3												
Pre-Extraction Period (March 2009 to December 2010)	1.3	0.9	1.5	1.6	1.6												
During Extraction Period (January 2011 to August 2011)	1.0	0.7	1.1	3.5	0.6												
Post-Extraction Period (September 2011 to Current)	1.2	1.0	2.1	2.2	0.9												

SURFACE WATER SAMPLING REPORTING

REPORTING PERIOD FROM 5 June 2012 - 4 June 2013

EPA Licence Ref **M6**
 Site Ref **WS1**
 Location: **Oaky Creek Crossing Elizabeth Drive (Down Stream)**

EPA Licence Ref **M7**
 Site Ref **WS2**
 Location: **Upstream in Oaky Creek.**

EPA Licence Ref
 Site Ref
 Location: **Sed Holding Pond or Pit Floor Sump**

Date of Sample	Boiochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	pH	Oil & Grease (mg/L)	Comments	Tested By:
Concentration Limits	150	50	5.5-8.5	30		
Limit of Reading 21/11/2012	2	1	0.1	5		
18/02/2013	0	14	6.6	0	Shallow	VGT
19/06/2013						

Date of Sample	Boiochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	pH	Oil & Grease (mg/L)	Comments	Tested By:
Concentration Limits	150	50	5.5-8.5	30		
Limit of Reading 21/11/2012	2	1	0.1	5		
18/02/2013	0	46	6.5	0	Dark, Odour, Shallow	VGT

Date of Sample	Boiochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	pH	Oil & Grease (mg/L)	Comments	Tested By:
Concentration Limits	150	50	5.5-8.5	30		
Limit of Reading 21/11/2012	2	1	0.1	5		
18/02/2013	0	9	8.4	0	Sed Holding Pond 2	VGT
	0	11	9.2	0	Sed Pond 1	VGT
	0	12	8.6	0	Sed Pond 2	VGT
	0	58	7.5	0	Bridge Dam Turbid	VGT
		6	8.6	0	Pit Sump	VGT

Average	0.0	14.0	6.6	0.0		
Min	0	14	6.6	0		
Max	0	14	6.6	0		

Average	0.0	46.0	6.5	0.0		
Min	0	46	6.5	0		
Max	0	46	6.5	0		

Average	0.0	19.2	8.5	0.0		
Min	0	6	7.5	0		
Max	0	58	9.2	0		

SURFACE WATER SAMPLING REPORTING

REPORTING PERIOD FROM 18 JANUARY 2011 - CURRENT

EPA Licence Ref **M6**
 Site Ref **WS1**
 Location: **Oaky Creek Crossing Elizabeth Drive (Down Stream)**

EPA Licence Ref **M7**
 Site Ref **WS2**
 Location: **Upstream in Oaky Creek. Entrance to Quarry**

EPA Licence Ref
 Site Ref
 Location: **Sed Holding Pond or Pit Floor Sump**

Date of Sample	Biochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	pH	Oil & Grease (mg/L)	Comments	Tested By:	Date of Sample	Biochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	pH	Oil & Grease (mg/L)	Comments	Tested By:	Date of Sample	Biochemical Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	pH	Oil & Grease (mg/L)	Comments	Tested By:						
Concentration Limits	150	50	5.5-8.5	30				150	50	5.5-8.5	30				150	50	5.5-8.5	30								
Limit of Reading	2	1	0.1	5				2	1	0.1	5				2	1	0.1	5								
18/02/2010					No Flow														5	8	Pit Floor	VGT				
18/02/2010					No Flow														27	7.8	Sed Holding Pond 1	VGT				
21/07/2010					No Flow										4	33	7.2 Less than 5						VGT			
19/08/2010		28	6.9		No Flow	VGT		13	7.3										13	7.6			VGT			
20/09/2010	12	68	6.6 Less Than 5		No Flow, Floating Veg	VGT		17	143	7.1 Less Than 5					8	15	8.6 Less Than 5						VGT			
21/10/2010	6	14	6.8 Less Than 5		No Flow, Floating Veg	VGT		14	31	7.2 Less Than 5					5	1	8.9 Less Than 5						VGT			
22/11/2010	7	6	6.9 Less Than 5		No Flow	VGT		13	30	6.5	22	Dump car in creek	VGT		8	76	7.1 Less than 5						VGT			
20/01/2011	31	69	7.2 Less Than 5		No Flow, Floating Veg	VGT		7	9	7.1 Less Than 5					19	68	8.1 Less than 5						VGT			
22/03/2011	12	9	7.3 Less Than 5		No Flow, Floating Veg	VGT		86	280	6.6 Less Than 5					27	63	8.1 Less than 5						VGT			
20/06/2011								1	165	6.7 Less Than 5					4	10	9.1 Less than 5						VGT			
20/06/2011															4	9	8.4 Less than 5						VGT			
21/07/2011	2	4	6.8 Less Than 5		No Flow	VGT		4	280	6.6 Less Than 5														VGT		
23/08/2011	3	31	6.6 Less Than 5		No Flow	VGT		4	329	6.9 Less Than 5														VGT		
20/12/2011	2	34	7.1 Less Than 5		Flowing	VGT		5	55	7.1 Less Than 5														VGT		
19/01/2012	2	6	6.9 Less Than 5		No Flow	VGT		3	104	7.2 Less Than 5														VGT		
20/02/2012	4	57	6.9 Less Than 5		Strong Flow	VGT		5	39	6.9 Less Than 5					6	173	7.6				12	Sed Holding Pond 1	VGT			
21/03/2012	7	14	7.3 Less Than 5		No Flow	VGT		8	12	7.3 Less Than 5														VGT		
19/04/2012	9	64	7 Less Than 5		Fast Flowing. Rains	VGT		8	29	7 Less Than 5														VGT		
19/04/2012	9	64	7 Less Than 5		Fast Flowing. Rains	VGT		8	29	7 Less Than 5														VGT		
21/11/2012																9	8.4								Sed Holding Pond 2	VGT
18/02/2013	0	14	6.6	0	Shallow	VGT		0	46	6.5	0	Dark, Odour, Shallow	VGT		0	11	9.2							VGT		
															0	12	8.6							VGT		
															0	58	7.5							VGT		
19/06/2013																6	8.6							VGT		
23/07/2013															2	25	8.6							VGT		
															2	4	8.3							VGT		

Average	7.4	33.3	7.0	0.0	
Min	0	4	6.6	0	
Max	31	69	7.3	0	

11.6	114.8	6.9	0.0	
0	9	6.5	0	
86	329	7.3	0	

6.4	37.3	8.4	3.1	
0	4	7.5	0	
27	173	9.2	12	

**APPENDIX P – Western Stockpiles Visual Analysis Illustration
Eastern Stockpiles Visual Analysis Illustration**

KEY

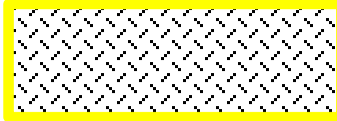





-  existing stockpile zone
-  Photo - photo position and direction
-  no view of clay extraction stockpiles due to natural topography
-  no vision of clay extraction stockpiles due to earth berm
-  filtered vision of clay extraction stockpiles
-  Recommended indigenous tree planting in clumps



Photo 3- View from Elizabeth Drive at the entrance looking south- stockpiles not visible



Photo 4- View from Elizabeth Drive showing distant stockpiles



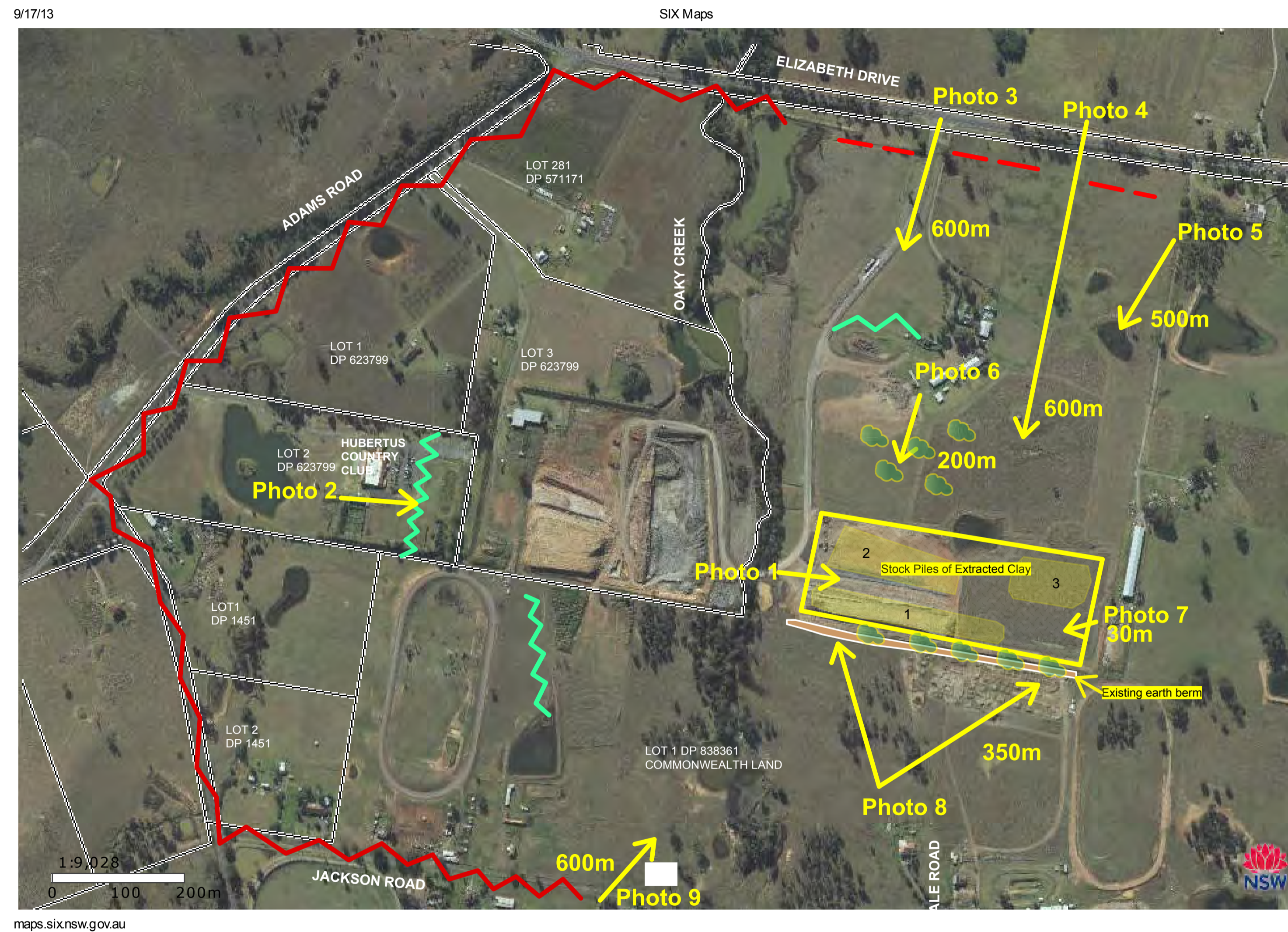
Photo 5- View from Driveway on Elizabeth Drive showing distant stockpiles



Photo 2- Earth berm obscures view from Hubertus Country Club



Photo 1- View from the base of stockpile 1 looking east



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1/1



Photo 6- Internal view from Commonwealth leased residence



Photo 7- Internal view looking west from the highest point on the site

VISUAL ANALYSIS

Context

The stockpile of extracted clay and shale sits on Commonwealth Land Lot 1- DP 838361, Badgerys Creek. The Commonwealth land extends for approximately 1km to the east and greater than 1km to the south; it is dissected to the north by Elizabeth Drive. Within the Commonwealth land are several leased residential properties. To the west are several private lots as shown on the aerial map. Epic Mines is carrying out extractive industry processes in the property immediately to the west of the stockpile area.

Description

The stockpile is located 600m south of Elizabeth Drive at number 2420. The area comprises three piles of clay-shale running east-west totalling approximately 2.74 ha. Stockpile 3 to the east has its highest point at an RL 74.5m, 0.5m above the natural ground level of the highest surveyed point of the site. The view from the base of stockpile 1 represents the most extreme view point of the pile; the pile is 7m high from its base at the western end and 4m high from its base at the eastern end. The view in Photo 1 shows the pile from its western end. Stockpile 2 rises to a maximum of 4m above the immediate surrounding ground levels.

Methodology

The stockpile has been visually assessed on the 01/10/2013 from key points including public roads, private properties and internal views from Commonwealth leased residences. A scale of impact has been done by percentage visibility and categorised as None = no visibility, Very Low = 10% visibility, Low = 25% visibility, Moderate = 50% visibility, High = 75% visibility and Extreme = 100% visibility. The analysis has been divided into external views from outside Commonwealth land or roads bisecting Commonwealth land and internal views from leased residences in Commonwealth land. Recommendations to mitigate adverse view impacts are proposed. Photo 1 provides the baseline Extreme view used as an analytical standard.

External Views

Interrupted distant views of the stockpile are available from Elizabeth Drive, as shown in Photos 3, 4 & 5. The impact visibility is Low. All other external views are obscured by the natural topography &/or constructed earth berms as shown on the plan and in Photo 2. The impact is None.

Internal Views

The immediate view from the base of the stockpiles is shown in Photo 1. This represents the Extreme visual of the stockpile. This view is only available from Oaky Creek directly beneath the stockpiles, otherwise this view is blocked by the riparian vegetation and topography to the west. Stockpile 1 is visible from the leased residences at the end of Ferndale Street (Photo 8) and Jackson Road (Photo 9). Existing vegetation makes the impact from Jackson Road Low and from Ferndale St Moderate.

Photo 6 is taken from the leased residences north of the stockpile looking towards the south and shows a High visual impact. Photo 7 is taken immediately to the east of the stockpile. There is no residence located for over 600m or road for 1000m further east. The impact from the east of the site looking west is Very Low to None. All internal views from the west looking east are none.

Recommendations

The visual external impact is Low to None so no mitigation measures are necessary with regard to them. The visual impact from leased residences on Commonwealth land is Low to Moderate south of the stockpile and High directly north of the piles. To reduce the internal visual impact it is recommended that clump plantings of 3 to 5 indigenous trees along the existing berm to the south and scattered clump plantings to the north be undertaken to mitigate these visual impacts. The feasibility of implementing this recommendation is dependent on the acceptability of these plantings under any future plans for the Commonwealth site.



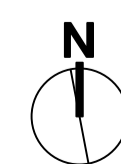
Photo 9- View from corner post of Jackson Road, Commonwealth leased residence.



Photo 8- View from back paddock of Ferndale Street, Commonwealth leased residence.



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Epic Mines
2420 Elizabeth Drive
Badgerys Creek

PROJECT

Stockpile
Clay-Shale Extraction
Epic Mines
Lot 1-DP 838 361
Commonwealth Land

DRAWN
WW

SCALE
1:NTS

DATE
26/11/13

DWG NO

EM VA01

REV

TITLE
VISUAL ANALYSIS



Photo 1 – North of the western stockpile area (300 m)



Photo 2 – North East of the western stockpile area (240 m)



Photo 3 – South of the stockpile area 325 m)



Photo 4 – North West of the stockpile area (285 m)



Photo 5 – North West of the stockpile area (615 m)



Legend	
Photo direction	0000
Site Boundary	000
Stockpile area	000
View obscured due to site topography	000
View filtered due to trees/bushes/shrubs	0000
Area visible	000
Recommended mitigation measures	00



Photo 6 – North of the stockpile area (255 m)



Photo 7 – Site address at main entry (535 m)



Photo 8 – Corner Adams Road & Elizabeth Drive (680 m)



Photo 9 – Corner Elizabeth drive and main site entry point (810 m)



Photo 10 – North East of the stockpile area (590 m)

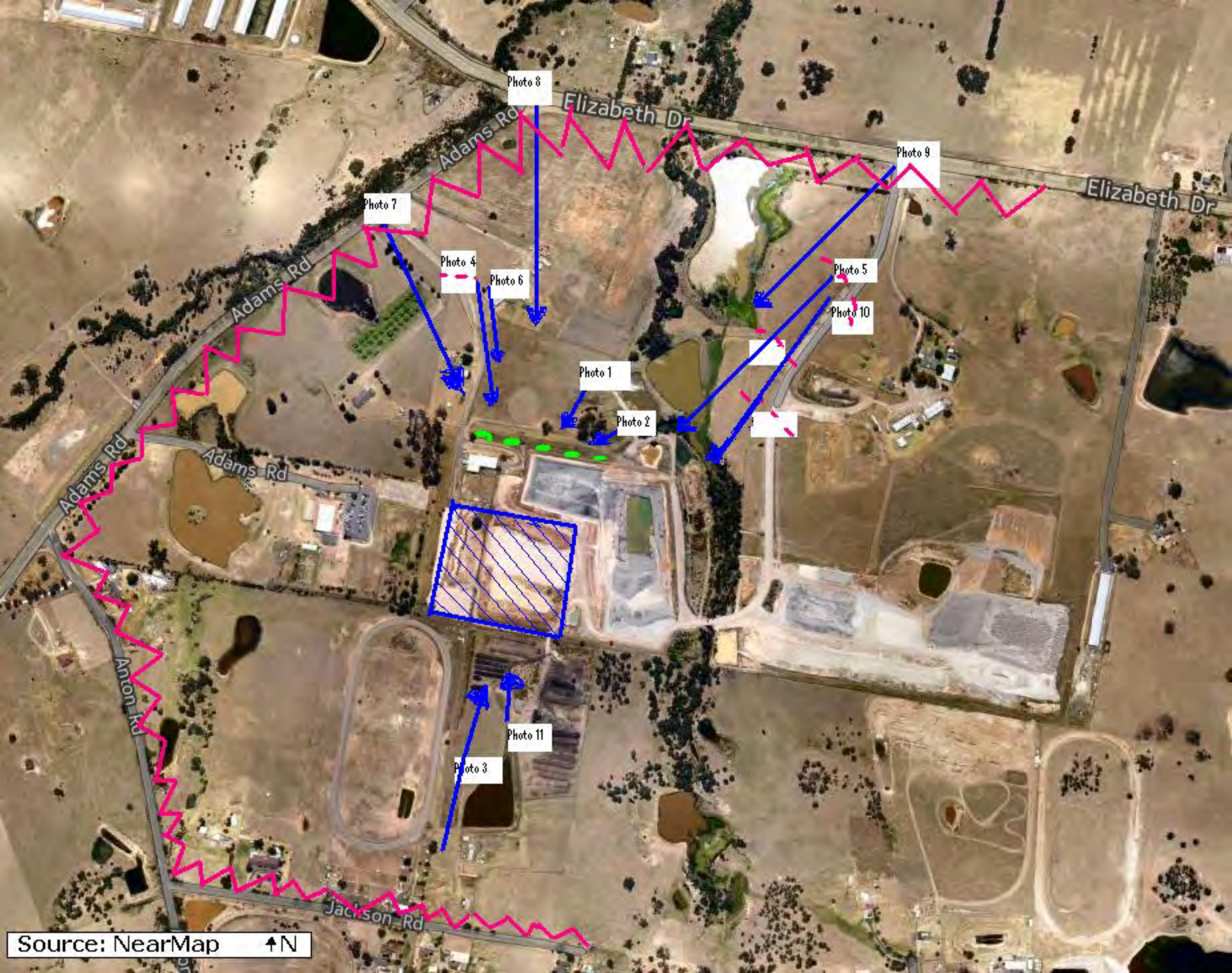


Photo 8

Elizabeth Dr

Photo 9

Elizabeth Dr

Photo 7

Photo 4

Photo 6

Photo 5

Photo 10

Adams Rd

Photo 1

Photo 2

Adams Rd

Adams Rd



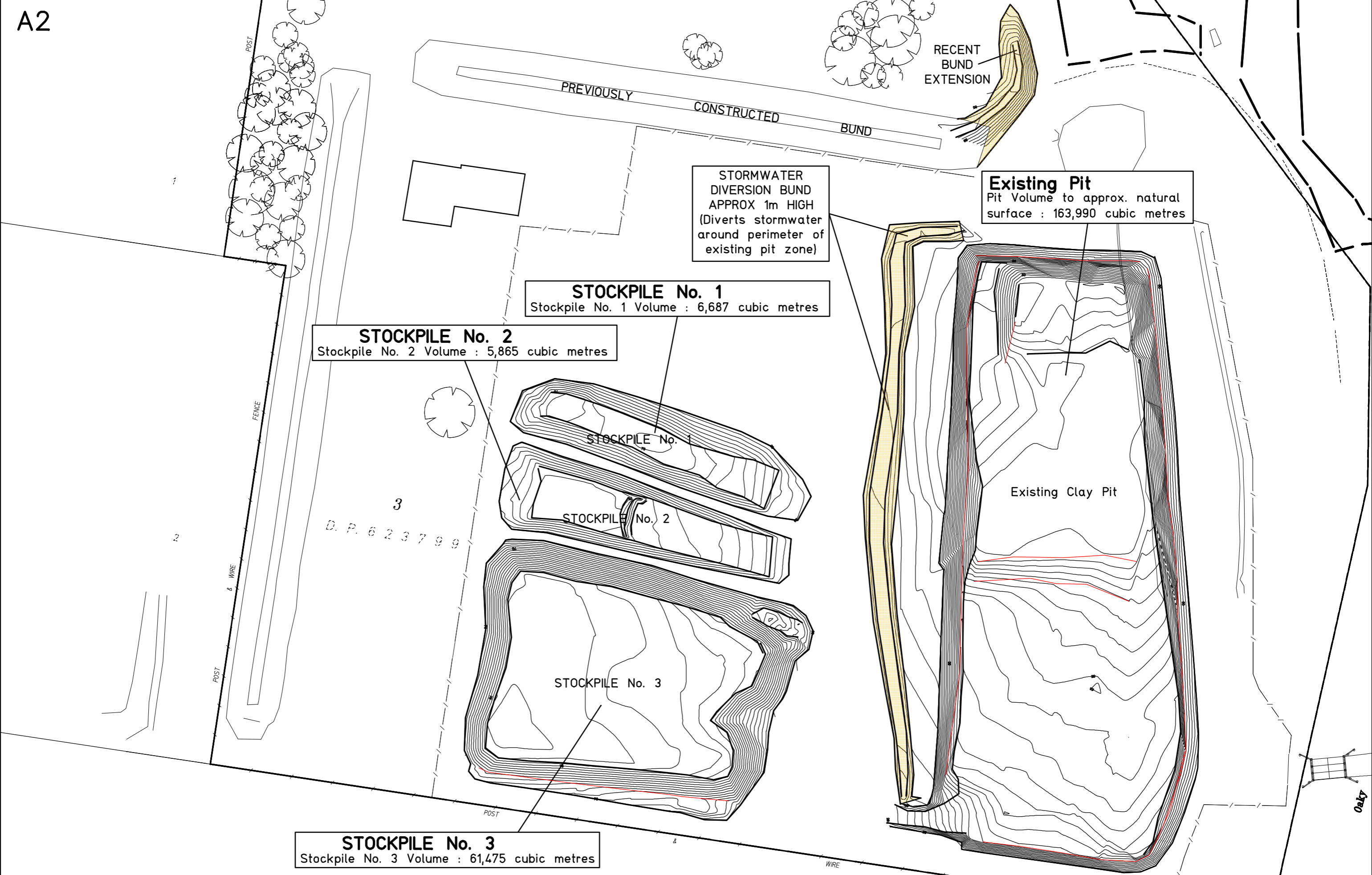
Photo 11

Photo 3

Jackson Rd

Source: NearMap ↑N

**APPENDIX Q – Western Stockpiles Surface Water Management Illustration
Eastern Stockpiles Surface Water Management Illustration**



MONAGHAN SURVEYORS PTY LTD
Consultants in Land & Engineering Surveying

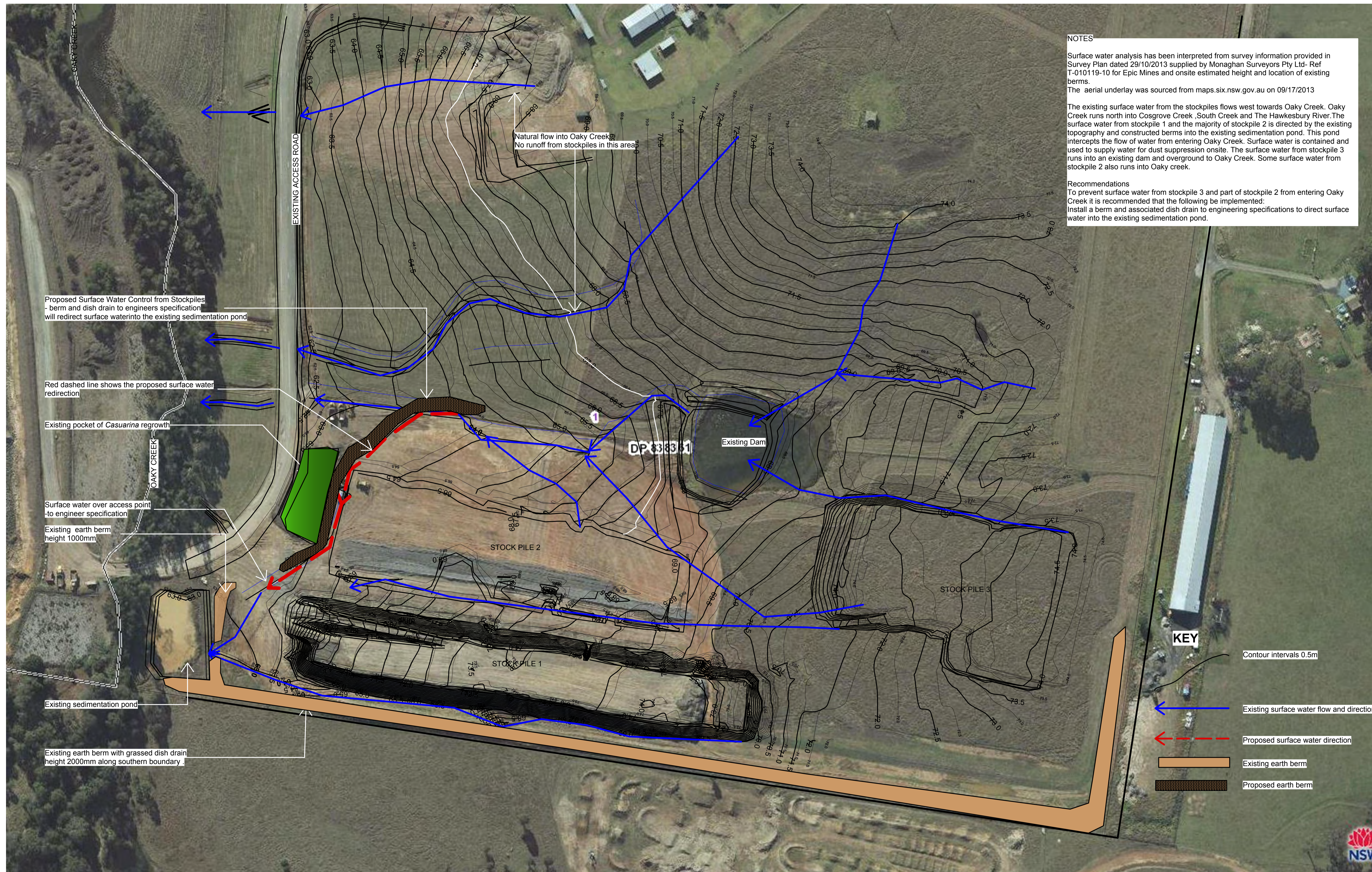
1 Dight Street, WINDSOR N.S.W. 2756
Ph. (02)4577-0106 Fax (02)4577-5321
email: mailbox@monaghansurveyors.com.au

0	10	20	30	40	50	Table of mm					100	110	120	130	140	150
Reduction Ratios																
Plan : 1:1500																
Horiz. : - Vert. : -																
Contour Interval : 0.5 metre																
Datum : AHD																
Origin : PM43336 (RL61.255 AHD)																
Prepared by : G. Monaghan																
Plan Date : 21-05-2012																
Checked : -																
Surveyed by : GM & WS																
Survey Date : 04-05-2012																
Signed :																

LOCALITY : Luddenham
PARISH : Bringelly
COUNTY : Cumberland
Council : Liverpool
Council Ref : -
Approval Date : -

Client : Epic Mining
Project : Plan of Compiled Detail Site Information of Lot 3 in D.P.623799 & Adjoining Lot 281 in D.P.571171 No. 275 Adams Road LUDDENHAM

Approved : SHEET No. 1 OF 2 SHEETS
Computer Ref : 01019-V2
Proj. Name : Epic Mining
REF : **01019-V1**



NOTES

Surface water analysis has been interpreted from survey information provided in Survey Plan dated 29/10/2013 supplied by Monaghan Surveyors Pty Ltd- Ref T-010119-10 for Epic Mines and onsite estimated height and location of existing berms.

The aerial underlay was sourced from maps.six.nsw.gov.au on 09/17/2013

The existing surface water from the stockpiles flows west towards Oaky Creek. Oaky Creek runs north into Cosgrove Creek, South Creek and The Hawkesbury River. The surface water from stockpile 1 and the majority of stockpile 2 is directed by the existing topography and constructed berms into the existing sedimentation pond. This pond intercepts the flow of water from entering Oaky Creek. Surface water is contained and used to supply water for dust suppression onsite. The surface water from stockpile 3 runs into an existing dam and overground to Oaky Creek. Some surface water from stockpile 2 also runs into Oaky creek.

Recommendations
To prevent surface water from stockpile 3 and part of stockpile 2 from entering Oaky Creek it is recommended that the following be implemented:
Install a berm and associated dish drain to engineering specifications to direct surface water into the existing sedimentation pond.

Proposed Surface Water Control from Stockpiles - berm and dish drain to engineers specification will redirect surface water into the existing sedimentation pond

Red dashed line shows the proposed surface water redirection

Existing pocket of *Casuarina* regrowth

Surface water over access point - to engineer specification

Existing earth berm height 1000mm

Existing sedimentation pond

Existing earth berm with grassed dish drain height 2000mm along southern boundary

Natural flow into Oaky Creek
No runoff from stockpiles in this area

DP 838 361

Existing Dam

STOCK PILE 2

STOCK PILE 1

STOCK PILE 3

KEY

Contour intervals 0.5m

← Existing surface water flow and direction

← Proposed surface water direction

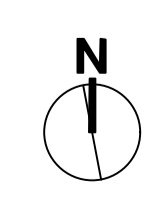
Existing earth berm

Proposed earth berm

0 50 100 METRES



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Epic Mining PTY Limited
ABN 86144713931
2420 Elizabeth Drive
Badgerys Creek

PROJECT
Stockpile
Clay- Shale Extraction
Epic Mines
Lot 1 - DP 838 361
Commonwealth Land

DRAWN
WW

SCALE
1:1000 @ A1

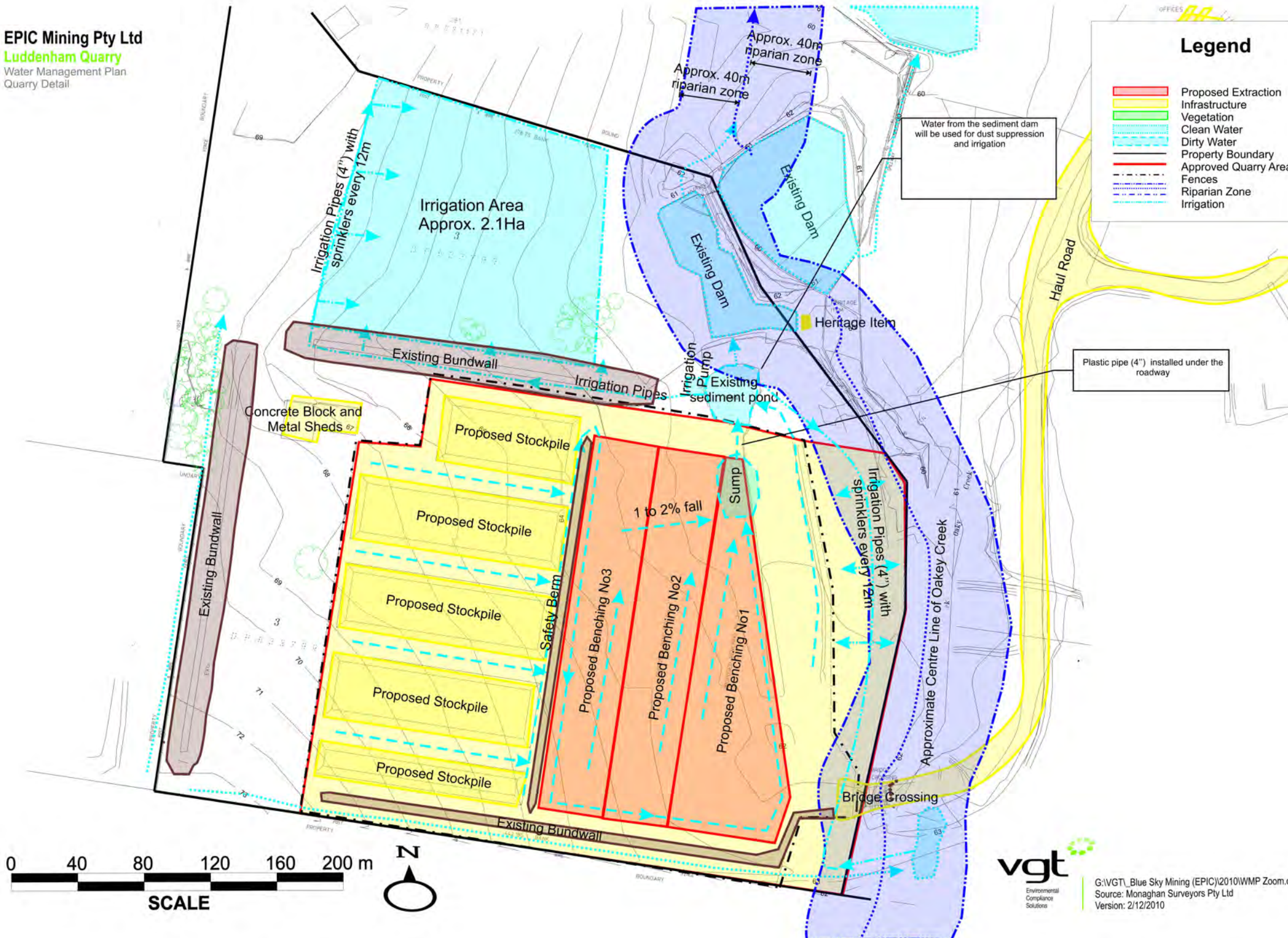
DATE
25/11/13

DWG NO
SW EM01

REV
Rev 1 -12/12/2013

TITLE
Surface Water Plan



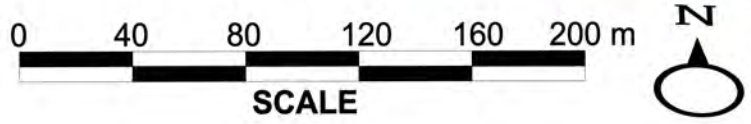


Legend

- Proposed Extraction
- Infrastructure
- Vegetation
- Clean Water
- Dirty Water
- Property Boundary
- Approved Quarry Area
- Fences
- Riparian Zone
- Irrigation

Water from the sediment dam will be used for dust suppression and irrigation

Plastic pipe (4") installed under the roadway



APPENDIX R – Proposed Locations of Environmental Discharge & Monitoring Points

POINT ID	EASTING	NORTHING
D1	288909	6249690
D2	289843	6249430
D3	288675	6248860
D4	289502	6249145
N1	288909	6249690
N2	289843	6249430
N3	288950	6248930
N4	289547	6248773
WS1	289160	6249975
WS2	289200	6249110
WMS1	289410	6249615
BMS1	288990	6249230
BMS2	289197	6249323
BMS3	289193	6249376



EPIC MINING PTY LTD – 275 ADAMS ROAD, LUDDENHAM	PROPOSED ENVIRONMENTAL MONITORING POINTS	Ref: NICS142001_FIG002	Nicolas Israel – September 2014
Dust Monitoring Points - ■	Noise Monitoring Points - ★	Water Sampling Points - +	Weather Monitoring Station - ▲
			Groundwater Monitoring Bore - ●

APPENDIX S – Copy of Independent Environmental Auditor’s Report

AUSTRALIAN WORKPLACE MANAGEMENT PTY LTD

INDEPENDENT ENVIRONMENTAL AUDIT

For Epic Mining

17/10/2013

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AUDIT REPORT

An Environmental Management Audit of Epic Mining's operations and administration systems was undertaken on 17.10.2013, to satisfy the ongoing audit requirements of the NSW Government Department of Infrastructure, Planning and Natural Resources. This audit is based on the requirements listed in the Development Application and in conjunction with the standards for Environmental Auditing and Environmental Management Systems.

Based upon the evidence reviewed and the responses to questions raised during the audit, enquiries specific to external consultant reports and to system effectiveness, including the systems witnessed and from sampling records and documentation specific to the audit requirement of the D.A., plus the Environment Protection Licence conditions and the requirements of the requisite standards; it is my opinion that Epic Mining Pty Ltd's operations and environmental administration systems comply with the conditions and requirements stated within the above mentioned criteria.

During the audit it was noted that Epic Mining may wish to consider the following observations as possible opportunities for continual improvement of its Environmental Management System:

- Develop an Environmental Management Policy stating Epic Mining's commitment to environmental management as a base document supporting overall actions and activities for stakeholders including workers, contractors, the community and other interested parties.
- Establish a specific Environmental Accident/Incident reporting, investigation and corrective action plan for effective management of matters that may need appropriate action and follow through for operational and/or system improvement.



Neil Laidler MBA, BBus
Principal Consultant
Australian Workplace Management Pty Ltd
Lead Auditor Quality, Safety and Environmental Management Systems
Registered JAS-ANZ Auditor

AUDIT REQUIREMENT

The NSW Government Department of Infrastructure, Planning and Natural Resources have requested an audit of Epic Mining's Environmental Performance. Amongst other things the request for an Independent Environmental audit includes, as per Schedule 6 of the DA, the following relevant items:

- c) Assess the environmental performance of the development, and its effects on the surrounding environment;
- d) Assess whether the development is complying with the relevant standards, performance measures, and statutory requirements;
- e) Review the adequacy of the Applicant's Environmental Management Strategy and Environmental Monitoring Program; and, if necessary,
- f) Recommend measures or actions to improve the environmental performance of the development, and/or the environmental management and monitoring systems.

An audit was undertaken at the Epic Mining site and office at 275 Adams Road, Luddenham NSW 2525 on 17th October 2013.

The audit was conducted with reference to the ISO 19011:2003 and in accordance with the requirements of ISO 14001:2004. Australia has adopted these international standards for auditing Environmental Management Systems.

THE AUDIT PLAN AND AREAS COVERED

- Opening meeting;
- Scope and plan of audit;
- Discussion of DIPNR requirements;
- Viewing procedures processes, plans, reports, correspondences, legislative and regulatory requirements;
- Site tour, taking notes and photographs of operational activities including:
 - o Extraction
 - Extraction of clay and shale;
 - Loading of clay and shale;
 - Storage of clay and shale;
 - Bunding;
 - Dam rehabilitation;
 - Drainage works (stormwater run-off control);
 - Dust suppression;
 - Bio-diesel fuel storage;
 - Monitoring stations;
 - o Rehabilitation
 - Non-commercial composting of green waste;
 - Regeneration of riparian zone;
 - Irrigation of grassed area; and
 - Re-vegetation of areas previously disturbed.
 - o Administration, Workshop and Laboratory Activities
 - Storage of documentation;
 - Contractor management, induction package and awareness program; and
 - Equipment storage and servicing.

- Assess the environmental performance of the development, and its effects on the surrounding environment;
- Assess whether the development is complying with the relevant standards, performance measures, and statutory requirements;
- Review the adequacy of the Applicant's Environmental Management Strategy and Environmental Monitoring Program; and, if necessary,
- Recommend measures or actions to improve the environmental performance of the development, and/or the environmental management and monitoring systems.

The audit report has been arranged sequentially as per the table below listing the order within the standard of mandatory elements that must be observed within Environmental Management Systems, and covers the NSW Government Department of Infrastructure, Planning and Natural Resources requirements and the Environment Protection Licence for Epic Mining No. 12863 and the ISO 14001:2004.

Environmental Management Systems as relevant to the operations of the company.

Standard Reference	Requirements
4.3.1	Environmental Aspects
4.3.2	Legal and Other Requirements
4.3.3 4.4.7 4.5.1	Objectives, Targets and Programs Monitoring and Measurement Evaluation of Compliance
4.4.1	Resources, Roles and Responsibilities
4.4.2	Competence, Training and Awareness
4.4.3	Communication
4.4.4 4.5.4	Documentation and Records
4.4.6	Operational Control
4.5.2	Evaluation of Compliance
4.5.3	Corrective and Preventative Action Audit and System Review

AUDIT FINDINGS

4.3.1 ENVIRONMENTAL ASPECTS

Air:	Dust
Water & Land:	Discharge to waters and ground water
Noise:	Operations
Community:	Operations
Flora and Fauna:	Loss of Habitat

Positive impacts:

- Removal of rubbish and replanting indigenous species in riparian zone;
- Trial plot of casuarina self-germinated trees;
- Removal of dead trees and replacement with similar species from tube stock;
- Bunding: control run-off and erosion;
- Compost: green waste composted, mixed with clay and used as top dress for re-vegetation/rehabilitation;
- Re-vegetation of areas with grass;
- Noise attenuation walls at boundaries;
- Reuse of silt from dams, blended with saleable products; and
- Use of council green waste, composted on site, blended with unsaleable clay and used for re-vegetation projects;
- Grass in adjacent paddocks kept short to reduce the potential for pests, vermin and wildfires;
- All fuel used onsite is biodiesel – operation is carbon neutral.

The flora and fauna assessment notes:

“All the vegetation remnants that will be cleared have highly altered and disturbed structures. None of the plant or animal species recorded on the subject site were identified as rare or threatened”. (Section 5.2, second paragraph Flora and fauna assessment, prepared by Ambrose Ecological Services Pty Ltd).

No koala roost or food trees were found on the site.

Mine site- former cleared land, used for dairying, late horse grazing paddocks. Only “natural” vegetation was a section of creek, part of which had been dammed and site of rubbish tipped. Creek has been cleared of rubbish and dead trees, and planted with tube stock. Weed suppression remains a problem.

A trial plot exists of self-seeded casuarinas trees near the creek.

4.3.2 LEGAL AND OTHER REQUIREMENTS

Epic Mining operates within the requirements of:

- Protection of the Environment Operations Act NSW(1997);
- Work Health and Safety Act 2011;
- Environment Protection Licence No: 12863;
- Development Consent;
- Pollution Incident Response Management Plan;
- Emergency Response Plan;
- Vegetation Management Plan;
- Noise Management Plan; and
- Bushland Management Plan.

4.3.3, 4.4.7 & 4.5.1 OBJECTIVES, TARGETS AND PROGRAMS, MONITORING AND MEASUREMENT & EVALUATION OF COMPLIANCE

Objectives and targets appear within various management plans and as stipulated within the Environment Protection Licence.

A monitoring and reporting program has been prepared and implemented on site to obtain data for analysis and record results for comparative purposes against specified criteria expressed within the Environment Protection Licence requirements.

Mandatory monitoring is performed by specialized consultancies.

Sighted reports for specialised providers (see below).

All environmental monitoring requirements are performed as per the schedule within the Environment Protection Licence by third party consultants. Sighted records for the following:

Air and Water Monitoring

VGT Environmental Compliance Solutions.

NATA Accredited Laboratory – 15230.

Engaged to collect samples of dust from 5 static monitoring stations on a monthly basis, and PM10 monthly at positions 2 and 4 setup for a 24 hour basis. (Refer to site plan).

On some occasions the results appear to be marginally outside of the target range for dust, however the reports qualify these results as influenced by random events of contamination (e.g. bird droppings, feathers, and insects).

Also engaged to collect water samples (grab samples) from up-stream and downstream the creek that runs through the property. (Licence requirement). The site operators also voluntarily obtain further water sampling from all the dams onsite at the same frequency.

Noise Monitoring

Global Acoustics Pty Limited.

Environmental Noise Modelling and Impact Assessment providers.

Engaged to collect samples of noise across 5 static monitoring stations on a quarterly basis.

Records examined show that sample results are mainly within the specified criteria.

Reports are analysed upon receipt for areas requiring attention. Variances are reported to the NSW Environment Protection Authority in Parramatta, when the analysis results become available.

4.4.1 RESOURCES, ROLES AND RESPONSIBILITIES

Epic Mining have a flat but effective management structure. The Quarry is driven by the pro-active on-site presence of the Operations Manager who is responsible for the day-to-day activities of the operations and administrative functions.

The organization is well resourced, as evidenced by current IT technologies, modern communications, including two-way radios onsite, offices, amenities, repair and maintenance facilities.

4.4.2 COMPETENCE TRAINING AND AWARENESS

The Operations Manager has a Bachelor of Applied Science, and has extensive relevant industry experience. He has been previously employed in the following roles:

- Concrete and soil tester 1997-1998;
- Raw materials and quarry supervisor 1998-2000;
- Raw materials manager 2000-2006;
- Operations Manager for Lion Quarries 2006-2009;
- Safety Advisor and Consultant for the development of safety systems and protocols; and
- Operations Manager of Epic Mining.

His qualifications, academic and professional experience, and demeanor show that he is qualified and competent in his role as Operations Manager.

4.4.3 COMMUNICATION

Epic Mining adequately demonstrated various communication methods, contract and information dissemination via tool box meetings, inductions, agreements, reports, minutes of management meetings, diary notes, contents of registers, reports from consultants and Epic Mining reports to authorities.

Community meetings between the Manager, neighbours and other interested parties were discontinued after poor attendance. The Operations Manager now visits the five neighbouring property owners/residents on a regular basis, to listen to any of their concerns.

Regular communication and consultation with the NSW Environment Protection Authority who is the Appropriate Regulatory Authority, under the Protection of the Environment Operations Act 1997, for the activities conducted on site.

The NSW Police have expressed an interest in using the mine site for training purposes, including search and rescue exercises.

The Rural Fire Service has been in touch about using the water in the dams for aerial fire-fighting.

4.4.4 & 4.5.4 DOCUMENTATION AND RECORDS

The organization maintains files and registers containing recorded evidence of its responsibilities and obligations. Sighted within the Administration Office were consultants' reports, correspondence, test and monitoring results, etc. Files are securely maintained within the administration office which is locked when the Operations Manager is not in attendance. The building is secured with barred numerals and other security systems.

4.4.6 OPERATIONAL CONTROL

The organization has identified activities that are associated with specific environmental aspects and impacts. Accordingly, specific procedures have been established, implemented and maintained to reduce the likelihood and to effectively control situations that could lead to unintended consequences.

4.5.2 EVALUATION OF COMPLIANCE

The organization undertakes reviews regularly to monitor environmental performance data. External consultants monitor licence requirements and regularly report results. These results are collated by Epic Mining to check that performance is within the necessary tolerances and ranges. Variations are explained. The results are collated and sent to the NSW EPA as part of the reporting requirements included in the EPL 12863.

4.5.3 CORRECTIVE AND PREVENTATIVE ACTION & AUDIT AND SYSTEM REVIEW

It was evident that system elements are reviewed and re-evaluated, e.g. Road Transport Protocol', (November 2010), and the contractor management systems.

Additionally regular audits are undertaken by other interested parties ensuring compliance with a wider range of obligations, eg. Department of Primary Industries, NSW EPA, and inspection by the Federal Government over the stockpile lot, as Managing Agent, via the Department of Infrastructure and Transport.

RECORDS AND REPORTS REFERENCED

1. Environment Protection Licence
Number 12863
Anniversary date 05 - June
Licence Version Date 28 – November - 2011
2. Dust Monitoring Reports
Prepared by: VGT Environmental Compliance Solution
PO Box 2335
Greenhills NSW 2323
3. Water Testing Results
Prepared by: VGT Environmental Compliance Solution
PO Box 2335
Greenhills NSW 2323
4. Noise Report
Prepared by: 'Global Environmental Solutions'
SLR Consulting Australia P/L
Prepared By: Global Acoustics Pty Ltd
5. Vegetation Management Plan for a Shale Quarry.
Adams Road, Luddenham
Prepared by: UBM Ecological Consultants
Building P5, Yarramundi Road

University of Western Sydney (Hawkesbury)
PO Box 652
Richmond NSW 2753
6. Community meeting notes –up to late 2010, when the manager began regular visits to the occupants of the 5 neighbouring properties.
7. Flora and Fauna Assessment
Prepared by: Ambrose Ecological Service Pty Ltd
8. Road Transport Protocol, November 2010
Prepared by: Samuel Tarabori
Approved by: Dennis Pethybridge
9. Noise Management Plan
Prepared by: Golder Associate
December 2009
10. Site Rehabilitation Plan
Prepared by: Conacher Environmental Group
April 2009
11. Bushland Management Plan
Prepared by: Ambrose Ecological Service Pty Ltd
October 2001

12. Acoustic Assessment
Prepared by: Douglas Nicolaisen and Associates
December 2002

13. Contractor Management Part 1 & Part 2
Induction Package
Mine Safety Management Plan
Prepared by: Samuel Tarabori
March 2010

14. Emergency Response Plan
Prepared by: Samuel Tarabori
May 2012

15. Pollution Incident Response Management Plan
Prepared by: Samuel Tarabori
May 2012

16. Mines Operations Plan
Prepared by: Samuel Tarabori
November 2010