MORGANITE ELECTRICAL CARBON
PPC PERMIT VP3339PD

ANNUAL GROUNDWATER REPORT

JULY 2010

Prepared for:

MORGANITE ELECTRICAL CARBON

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PROJECT: **Morganite Electrical Carbon** JOB NUMBER: **48-01-01**

TITLE: **ANNUAL GROUNDWATER REPORT – APRIL 2010**

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ORIGINAL	**Name** **T Roberts**	**Name** **M Jones**	**Name** **D Thomas**
DATE	**Signature** T. Roberts	**Signature** M Jones	**Signature**

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DATE	**Signature**	**Signature**	**Signature**

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DATE	**Signature**	**Signature**	**Signature**

MORGANITE ELECTRICAL CARBON

ANNUAL GROUNDWATER REPORTING

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1.0 INTRODUCTION

ExCAL Limited has been commissioned to undertake groundwater monitoring on behalf of Morganite Electrical Carbon in accordance with their Site Protection and Monitoring Program.

The groundwater monitoring commenced in October 2006 and this report provides the sampling methodology, record forms and results of monitoring to date. Sampling was undertaken in April 2010.

All laboratory analysis was undertaken by the UKAS accredited Chemtest Laboratories and Decus Research Laboratories.

2.0 GROUNDWATER MONITORING PROGRAMME

2.1 Introduction

This procedure provides guidance that is followed by all ExCAL staff when monitoring groundwater and taking samples.

2.2 Staff Responsibility

The project manager will ensure all personnel are proficient in groundwater sampling and are familiar with these procedures.

2.3 Site Equipment

The following site equipment is required to undertake groundwater monitoring: -

- Log Book
- Well Construction Details
- Site/monitoring well location Plan
- Dip Meter
- Bailers
- Decontamination Equipment
- Sampling Equipment (Bottles, Fixing Agents (if necessary) labels, chain of custody forms, icepacks).

2.4 Well Purging

Monitoring wells are always to be purged prior to sampling on each and every occasion. Purging involves the removal of 'stagnant' water that has been in contact with atmospheric gases and the well casing and screen materials. This contact can affect the water chemistry and oxygen can diffuse into the water and dissolved gases can volatilise or oxidise.

Organics may be adsorbed by the well casing and trace elements may also be leached from the well casing. Purging ensures a representative sample is obtained from the aquifer.

2.4.1 Purging Procedure

1. Dip water Level and Well Depth and Measure Internal Well Diameter;

2. Calculate Well Volume (50mm well: 0.5m = 1L and 35mm well: 1m = 1L);

3. Remove 3 x well volume using either dedicated bailer or submersible pump positioned at the TOP of the water column[*1];

([*1]If the water level is above the screened area and the pump intake is within the screened area, it is possible for a section of stagnant water to remain within the well. It is good practice, in such cases, to commence pumping at the top of the water table and slowly lower the pump during the purging process until the pump is within the screened section, when purging will be complete).

4. If the well purges dry, the water should be allowed to recover 90% of the pre-purge water level (or for two hours, which ever occurs first) prior to sampling;

5. In the case of sampling from domestic, industrial or public supply wells where a pump is permanently fixed within the well, the well should be pumped long enough to flush any pipework. If well construction details are available, the well should be purged of three well volumes. If this information is not available, the well should be pumped for approx. 15 minutes prior to sampling or until pH, temperature and specific conductivity stabilise. Care should be taken to adjust the pumping rate if necessary to avoid pumping the well dry[*2].

([*2]Pumping a well dry would lead to aeration of the well, resulting in volatile loss or change in the chemical characteristics of the aquifer nearest to the well. This will prevent a representative sample being collected).

2.5 Sample Collection

Groundwater samples should be collected immediately on completion of purging, unless significant drawdown has occurred in which case the well should be allowed to recover. Sampling must be undertaken within 24 hours of purging to ensure a representative sample is obtained.

All samples are collected using a dedicated bailer, which can be either Teflon or polyethylene (or stainless steel).

2.5.1 Sampling Procedure

The following procedure should be followed during sample collection (following purging): -

1. Lower bailer into well using nylon cord. Nylon cord should be knotted or marked in meter lengths and the bailer should be lowered to the mid point of the screened well section. Care should be taken to minimise agitation and exposure to the atmosphere;

2. Dispose of water from the first two bailers;

3. When sampling for volatiles take from the third bailer (ensure volatiles are placed in 60ml water vials with Teflon lid);

4. Sample for other determinants thereafter (ensure use of appropriate sample containers);

5. Record date and time of sample collection, the collection method, parameters to be analysed, the number and type of sample containers and any other information that may be relevant to interpretation;

6. Ensure all sample bottles are correctly labelled with the site reference number and borehole location;

7. All samples submitted to the laboratory must be accompanied by the laboratories chain of custody form.

3.0 RECORD FORMS

Sample Collection Form					Sheet …1… of ……1
Site Name Morriston	**EA Permit Number** VP3339PD				**Survey Reference** Groundwater Survey – April 2010
Site Operator Morganite Electrical Carbon	**Weather Conditions** Dry Fine				**Survey Personnel** Terence Roberts
	Monitoring Point or Sample Reference No.				
	BH5CH2M	BHD	BH6CH2M	BH7CH2M	

Strategy and Equipment Used						
Purge Strategy	(Use code)	MANUAL	MANUAL	MANUAL	MANUAL	MANUAL
Purge equipment	(State type)	BALER	BALER	BALER	BALER	BALER
Dedicated pump?	(Y/N)	N	N	N	N	N
Flow measurement	(Method)	VOLUME	VOLUME	VOLUME	VOLUME	VOLUME

Monitoring Point Measurements and Well Volume Estimate						
Date of measurement	dd/mm/yy	21/04/2010	21/04/2010	21/04/2010	21/04/2010	
Liner ID:	(mm)	50	50	50	50	
Datum point	-	GL	GL	GL	GL	
Depth of water:	(mbd)	3.80	2.90	4.60	2.5	
Depth to base:	(mbd)	4.90	4.90	6.20	4.5	
Depth to water:	(metres)	1.10	2.00	1.60	2.0	
Well volume	(litres)	8.9	7	10.5	5.8	
3 x well volume	(litres)	26.60	21.00	32.2	17.5	

Purging Record						
Start time of purging	hh:min	-	-	-	-	
End time of purging	(hh:min)	-	-	-	-	
Purge duration	(min)	-	-	-	-	
Purging rate	(l/min)	MANUAL	MANUAL	-	MANUAL	
Volume purged	Litres	27	21	33	18	
No of well volume	No.	3	3	3	3	
Depth to water after purge	(mbd)	-	-	-	-	
Pumped dry?	(Y/N)	N	N	N	N	

Water Quality Measurements (if applicable)						
Use flow through cell	(Y/N)					
Temp	(deg C)					
pH	-					
EC	(S/cm)					
DO	(mg/l or %)					
Eh	mV					

Quality Assurance				**Data Processing Trail**		
	Name	Date	Initials		Date	Initials
Survey:	T.Roberts	21/04/2010	TR	**Schedule Completed:**	25/04/2010	TR
QC Manager:	Mark Izzard	21/04/2010	MI	**Data Validated:**	25/04/2010	MI
Manager:	Dylan Thomas	21/04/2010	DT	**Computer Updated:**	25/04/2010	DT

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4.0 RESULTS OF LABORATORY ANALYSIS

Laboratory results for monitoring undertaken in April 2010 are presented in Appendix A.

Appendix A

Laboratory Reports

ExCAL Limited
1 St Mary's Street
Carmarthen,
Carmarthenshire,
SA31 1TN

Client ID : Morganite
Job Number: D-01-18-01-10

Certificate Number: 354

CERTIFICATE OF ANALYSIS

Samples Matrix: Water Samples

Sample Taken: 21/04/2010
Sample Received: 22/04/2010
Report Date: 11/05/2010

Sampled by: Tex.Roberts

Method code	DETERMINANDS	UNITS	*	SAMPLE INDENTIFICATION				
				BHD	BH5	BH6	BH7	
				240410001	240410002	240410003	240410004	
INORG 1	**pH**	**pH units**	A	7.03	6.99	7.16	7.80	
INORG 13	**Chloride**	**mg/L as CL**	A	29.73	10.40	11.84	13.53	
INORG 12	**Ammonia**	**mg/L as N**	A	0.41	0.62	0.42	2.2	
INORG 11	**Nitrate**	**mg/L as NO3**	A	3.02	1.61	2.27	1.74	
INORG 9	**Alkalinity**	**mg/L as CACO3**	A	120	255	350	260	
INORG 18	**TOC**	**mg/L**	A	29.0	17.0	22.9	9.9	

Samples filtered for Chloride, Ammonia and Alkalinity

* Accreditation Status

The sign < means 'less than'
The tests marked 'A' hold UKAS accreditation
The tests marked 'N' do not currently hold UKAS accreditation
The tests marked 'S' were subcontracted to an approved Laboratory
Any comments or interpretations are beyond the scope of the UKAS accreditation

Approved by: Michelle Jones

Signature: MJones

Title: Laboratory Manager

ExCAL UK Ltd
1 St Marys Street
Carmarthen
Carmarthenshire
SA31 1TN

FAO Michelle Jones

LABORATORY TEST REPORT

Results of analysis of 4 samples
received 23 April 2010

Morganite - EC1280

Chemtest
The right chemistry to deliver results

Report Date
17 May 2010

Login Batch No					111827			
Chemtest LIMS ID					AE89065	AE89066	AE89067	AE89068
Sample ID					BHD	BH5-CH2M	BH6-CH2M	BH7-CH2M
Sample No								
Sampling Date					21/04/2010	21/04/2010	21/04/2010	21/04/2010
Depth								
Matrix					*WATER*	*WATER*	*WATER*	*WATER*
SOP↓	Determinand↓	CAS No↓	Units↓	*				
1470	Iron (dissolved)	7439896	µg l-1	N	370	1500	160	680
1415	Calcium	7440702	mg l-1	U	47	140	120	55
	Potassium	7440097	mg l-1	U	12	12	13	9.2
	Magnesium	7439954	mg l-1	U	6.4	11	10	8.3
	Sodium	7440235	mg l-1	U	15	15	10	39
1670	TPH (Aqueous Phase)		µg l-1	U		<10	<10	<10
1700	Naphthalene	91203	µg l-1	N			<0.1	<0.1
	Acenaphthylene	208968	µg l-1	N			<0.1	<0.1
	Acenaphthene	83329	µg l-1	N			<0.1	<0.1
	Fluorene	86737	µg l-1	N			<0.1	<0.1
	Phenanthrene	85018	µg l-1	N			<0.1	<0.1
	Anthracene	120127	µg l-1	N			<0.1	<0.1
	Fluoranthene	206440	µg l-1	N			<0.1	<0.1
	Pyrene	129000	µg l-1	N			<0.1	<0.1
	Benzo[a]anthracene	56553	µg l-1	N			<0.1	<0.1
	Chrysene	218019	µg l-1	N			<0.1	<0.1
	Benzo[b]fluoranthene	205992	µg l-1	N			<0.1	<0.1
	Benzo[k]fluoranthene	207089	µg l-1	N			<0.1	<0.1
	Benzo[a]pyrene	50328	µg l-1	N			<0.1	<0.1
	Dibenzo[a,h]anthracene	53703	µg l-1	N			<0.1	<0.1
	Indeno[1,2,3-cd]pyrene	193395	µg l-1	N			<0.1	<0.1
	Benzo[g,h,i]perylene	191242	µg l-1	N			<0.1	<0.1
	Total (of 16) PAHs		µg l-1	N			<2	<2
1760	Dichlorodifluoromethane	75718	µg l-1	U		<1	<1	<1
	Chloromethane	74873	µg l-1	U		<1	<1	<1
	Vinyl chloride	75014	µg l-1	U		<1	<1	<1
	Bromomethane	74839	µg l-1	U		<20	<20	<20
	Chloroethane	75003	µg l-1	U		<2	<2	<2
	Trichlorofluoromethane	75694	µg l-1	U		<1	<1	<1
	1,1-Dichloroethene	75354	µg l-1	U		<1	<1	<1

All tests undertaken between 26-Apr-2010 and 4-May-2010

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

ExCAL UK Ltd
1 St Marys Street
Carmarthen
Carmarthenshire
SA31 1TN

FAO Michelle Jones

LABORATORY TEST REPORT

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Chemtest
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					111827			
					AE89065	AE89066	AE89067	AE89068
					BHD	BH5-CH2M	BH6-CH2M	BH7-CH2M
					21/04/2010	21/04/2010	21/04/2010	21/04/2010
					WATER	*WATER*	*WATER*	*WATER*
1760	Dichloromethane	75092	µg l-¹	U		ne	ne	ne
	trans-1,2-Dichloroethene	156605	µg l-¹	U		<1	<1	<1
	1,1-Dichloroethane	75343	µg l-¹	U		<1	<1	<1
	cis-1,2-Dichloroethene	156592	µg l-¹	U		<1	<1	<1
	Bromochloromethane	74975	µg l-¹	U		<1	<1	<1
	Trichloromethane	67663	µg l-¹	U		<1	<1	<1
	1,1,1-Trichloroethane	71556	µg l-¹	U		<1	<1	<1
	Tetrachloromethane	56235	µg l-¹	U		<1	<1	<1
	1,1-Dichloropropene	563586	µg l-¹	U		<1	<1	<1
	Benzene	71432	µg l-¹	U		<1	<1	<1
	1,2-Dichloroethane	107062	µg l-¹	U		<2	<2	<2
	Trichloroethene	79016	µg l-¹	U		<1	<1	<1
	1,2-Dichloropropane	78875	µg l-¹	U		<1	<1	<1
	Dibromomethane	74953	µg l-¹	U		<10	<10	<10
	Bromodichloromethane	75274	µg l-¹	U		<5	<5	<5
	cis-1,3-Dichloropropene	10061015	µg l-¹	U		<10	<10	<10
	Toluene	108883	µg l-¹	U		<1	<1	<1
	trans-1,3-Dichloropropene	10061026	µg l-¹	U		<10	<10	<10
	1,1,2-Trichloroethane	79005	µg l-¹	U		<10	<10	<10
	Tetrachloroethene	127184	µg l-¹	U		<1	<1	<1
	1,3-Dichloropropane	142289	µg l-¹	U		<2	<2	<2
	Dibromochloromethane	124481	µg l-¹	U		<10	<10	<10
	1,2-Dibromoethane	106934	µg l-¹	U		<5	<5	<5
	Chlorobenzene	108907	µg l-¹	U		<1	<1	<1
	1,1,1,2-Tetrachloroethane	630206	µg l-¹	U		<2	<2	<2
	Ethylbenzene	100414	µg l-¹	U		<1	<1	<1
	m- & p-Xylene	1330207	µg l-¹	U		<1	<1	<1
	o-Xylene	95476	µg l-¹	U		<1	<1	<1
	Styrene	100425	µg l-¹	U		<1	<1	<1
	Tribromomethane	75252	µg l-¹	U		<10	<10	<10

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					111827			
					AE89065	AE89066	AE89067	AE89068
					BHD	BH5-CH2M	BH6-CH2M	BH7-CH2M
					21/04/2010	21/04/2010	21/04/2010	21/04/2010
					WATER	*WATER*	*WATER*	*WATER*
1760	Isopropylbenzene	98828	µg l-¹	U		<1	<1	<1
	Bromobenzene	108861	µg l-¹	U		<1	<1	<1
	1,1,2,2-Tetrachloroethane	79345	µg l-¹	U		<10	<10	<10
	1,2,3-Trichloropropane	96184	µg l-¹	U		<50	<50	<50
	n-Propylbenzene	103651	µg l-¹	U		<1	<1	<1
	2-Chlorotoluene	95498	µg l-¹	U		<1	<1	<1
	1,3,5-Trimethylbenzene	108678	µg l-¹	U		<1	<1	<1
	4-Chlorotoluene	106434	µg l-¹	U		<1	<1	<1
	tert-Butylbenzene	98066	µg l-¹	U		<1	<1	<1
	1,2,4-Trimethylbenzene	95636	µg l-¹	U		<1	<1	<1
	sec-Butylbenzene	135988	µg l-¹	U		<1	<1	<1
	1,3-Dichlorobenzene	541731	µg l-¹	U		<1	<1	<1
	4-Isopropyltoluene	99876	µg l-¹	U		<1	<1	<1
	1,4-Dichlorobenzene	106467	µg l-¹	U		<1	<1	<1
	n-Butylbenzene	104518	µg l-¹	U		<1	<1	<1
	1,2-Dichlorobenzene	95501	µg l-¹	U		<1	<1	<1
	1,2-Dibromo-3-chloropropane	96128	µg l-¹	U		<50	<50	<50
	1,2,4-Trichlorobenzene	120821	µg l-¹	U		<1	<1	<1
	Hexachlorobutadiene	87683	µg l-¹	U		<1	<1	<1
	1,2,3-Trichlorobenzene	87616	µg l-¹	U		<2	<2	<2

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