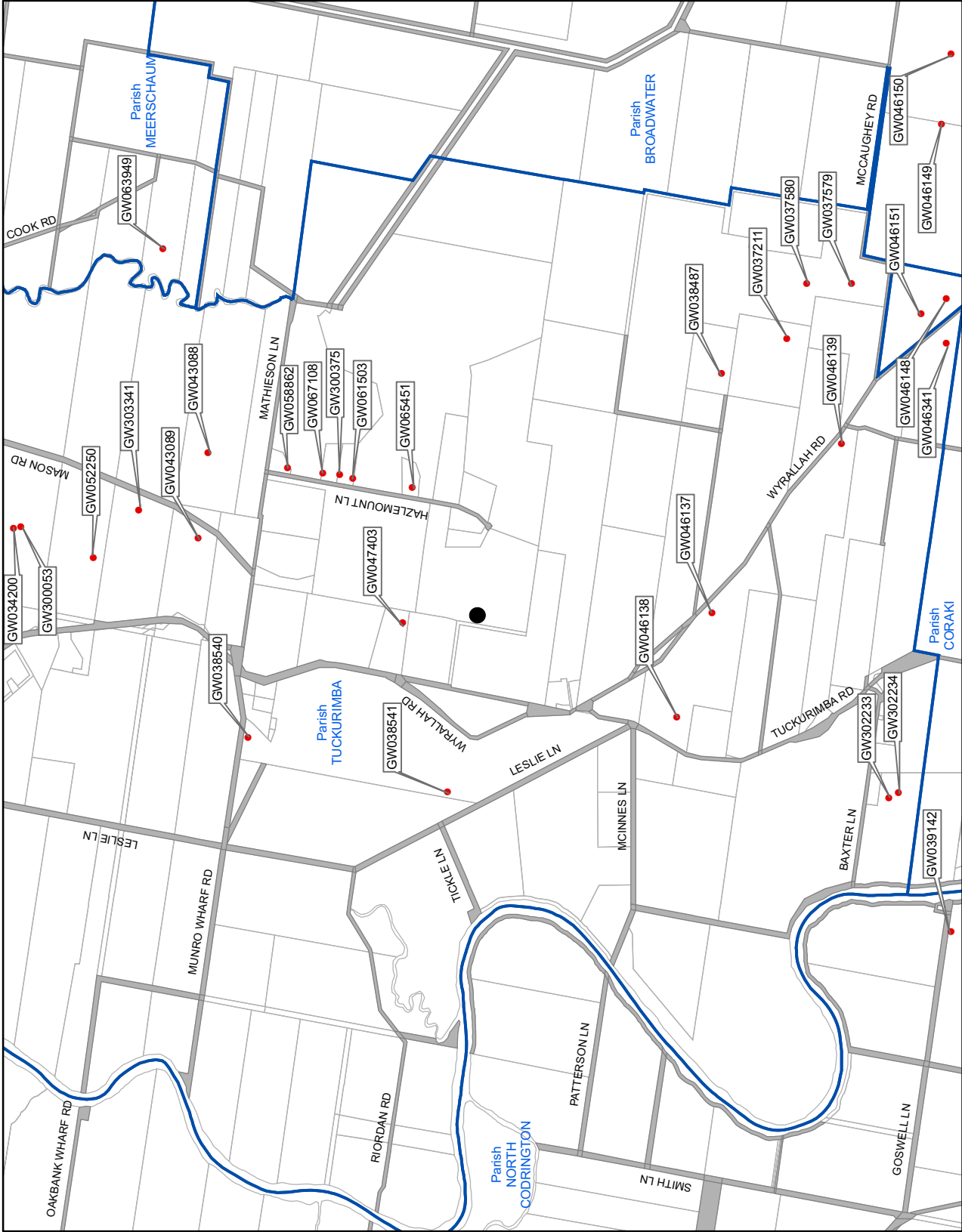


Annex B

DWE Groundwater Bore Search Data

Groundwater Bores in the Area



Legend



Parish



Groundwater Bores



Road Parcels



Cadastre Parcels



NSW Government
Department of Water & Energy

Produced by the Department of Water and Energy
Science and Information Branch, Orange
Date: January 2008 Project Number: PN00799 WR2008-013
Projection: [Geographic] Datum: [GDA94]
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Department of Water and Energy
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ORANGE NSW 2800

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Date/Time :25-Jan-2008 12:32 PM
 User :VMARTIN
 Report :RMGW001D.QRP
 Executable :S:\G5\PROD32\Ground.exe
 Exe Date :13-Sep-2007
 System :Groundwater
 Database :Edbp



DEPARTMENT OF WATER AND ENERGY

Work Summary

GW034200

Converted From HYDSYS

Licence : 30BL025899		Licence Status : Active	Intended Purpose(s)
Work Type : Bore		Authorised Purpose(s)	STOCK
Work Status : (Unknown)			
Construct. Method : (Unknown)			
Owner Type : Private			
Commenced Date :	Final Depth :	11.00 m	
Completion Date :	Drilled Depth :	0.00	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : 602 - CLARENCE MORETON BASIN		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A : ROUS	TUCKURIMBA	38
	Licensed : ROUS	TUCKURIMBA	PT 38
Region : 30 - NORTH COAST		CMA Map : 9540-2S	WARDELL
River Basin : 203 - RICHMOND RIVER		Grid Zone : 56/2	Scale : 1:25,000
Area / District :			
Elevation :		Northing : 6801348	Latitude (S) : 28° 54' 55"
Elevation Source : (Unknown)		Easting : 531839	Longitude (E) : 153° 19' 36"
GS Map : 0005B4	MGA Zone : 56	Coordinate Source : GD.,ACC.MAP	

Construction Negative depths indicate Above Ground Level;

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	(Unknown)	0.00	11.00	127			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
----------	--------	---------------	----------	------------	------------	-------------	----------------	---------------	-----------------

(No Water Bearing Zone Details Found)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
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Remarks

*** End of GW034200 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW037211

Converted From HYDSYS

Licence :30BL101029		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	STOCK
Work Status :(Unknown)			
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	3.60 m	
Completion Date :	Drilled Depth :	3.70 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Good
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	55
	Licensed :ROUS	TUCKURIMBA	55
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6796575	Latitude (S) :28° 57' 30"
Elevation Source :(Unknown)		Easting :532855	Longitude (E) :153° 20' 14"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	2438			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	3.60	0.60	Unconsolidated	0.60		0.25			Good

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	3.04	3.04	Peat	Peat	
3.04	3.65	0.61	Sand Water Supply	Sand	

Remarks

*** End of GW037211 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW037579

Converted From HYDSYS

Licence :30BL101059		Licence Status Active	
Work Type :Excavation		Authorised Purpose(s)	Intended Purpose(s)
Work Status :Supply Obtained		STOCK	STOCK
Construct. Method :> 100 sq.m.			
Owner Type :Private			
Commenced Date :	Final Depth :	3.60 m	
Completion Date :	Drilled Depth :	3.70 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	TUCKURIMBA	80
		Licensed :ROUS	TUCKURIMBA	80
Region :30 - NORTH COAST			CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER			Grid Zone :56/2	Scale :1:25,000
Area / District :				
Elevation :			Northing :6796174	Latitude (S) :28° 57' 43"
Elevation Source :(Unknown)			Easting :533151	Longitude (E) :153° 20' 25"
GS Map :0005B4		MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H P Component Type From (m) To (m) OD (mm) ID (mm) Interval Details

(No Construction Details Found)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.70	3.60	0.90	Unconsolidated	1.50					(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	2.74	2.74	Soil Peaty	Soil	
2.74	3.65	0.91	Sand Water Supply	Sand	

Remarks

*** End of GW037579 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW037580

Converted From HYDSYS

Licence :30BL101060		Licence Status :Active	Intended Purpose(s)
Work Type :Excavation		Authorised Purpose(s)	STOCK
Work Status :Supply Obtained			
Construct. Method :> 100 sq.m.			
Owner Type :Private			
Commenced Date :	Final Depth :	3.60 m	
Completion Date :	Drilled Depth :	3.70 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	99
	Licensed :ROUS	TUCKURIMBA	99
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6796451	Latitude (S) :28° 57' 34"
Elevation Source :(Unknown)		Easting :533152	Longitude (E) :153° 20' 25"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H P Component Type From (m) To (m) OD (mm) ID (mm) Interval Details

(No Construction Details Found)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.70	3.60	0.90	Unconsolidated	1.50					(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	2.74	2.74	Soil Peaty	Soil	
2.74	3.65	0.91	Sand Water Supply	Sand	

Remarks

*** End of GW037580 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW038487

Converted From HYDSYS

Licence :30BL101058		Licence Status :Active	Intended Purpose(s)
Work Type :Excavation		Authorised Purpose(s)	STOCK
Work Status :(Unknown)			
Construct. Method :> 100 sq.m.			
Owner Type :Private			
Commenced Date :	Final Depth :	3.60 m	
Completion Date :	Drilled Depth :	3.70 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	123
	Licensed :ROUS	TUCKURIMBA	123
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6796976	Latitude (S) :28° 57' 17"
Elevation Source :(Unknown)		Easting :532666	Longitude (E) :153° 20' 7"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H P Component Type From (m) To (m) OD (mm) ID (mm) Interval Details

(No Construction Details Found)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	3.60	0.60	Unconsolidated	0.70					(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	3.04	3.04	Soil Peaty	Soil	
3.04	3.65	0.61	Sand Water Supply	Sand	

Remarks

*** End of GW038487 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW038540

Converted From HYDSYS

Licence :30BL101463		Licence Status Active	
Work Type :Well		Authorised Purpose(s)	Intended Purpose(s)
Work Status :(Unknown)		STOCK	STOCK
Construct. Method :Hand Dug			
Owner Type :Private			
Commenced Date :	Final Depth :	1.50 m	
Completion Date :01-Jan-1930	Drilled Depth :	1.50 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - LARRESCY		Standing Water Level :	
GWMA :804 - ALSTONVILLE BASALT		Salinity :	Good Stock
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	20
	Licensed :ROUS	TUCKURIMBA	20 755746
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6799905	Latitude (S) :28° 55' 42"
Elevation Source :(Unknown)		Easting :530698	Longitude (E) :153° 18' 54"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1219			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.90	1.50	0.60	Fractured	0.30		0.25			Good Stock

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	1.52	1.52	Basalt Water Supply	Basalt	

Remarks

*** End of GW038540 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW038541

Converted From HYDSYS

Licence :30BL101464		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	STOCK
Work Status :(Unknown)			
Construct. Method :Hand Dug			
Owner Type :Private			
Commenced Date :	Final Depth :	1.80 m	
Completion Date :01-Jan-1940	Drilled Depth :	1.80 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Good Stock
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	20
	Licensed :ROUS	TUCKURIMBA	20
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6798675	Latitude (S) :28° 56' 22"
Elevation Source :(Unknown)		Easting :530397	Longitude (E) :153° 18' 43"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1219			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
1.20	1.80	0.60	Fractured	0.60		0.19			Good Stock

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Topsoil	Topsoil	
0.30	1.82	1.52	Basalt Water Supply	Basalt	

Remarks

*** End of GW038541 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW039142

Converted From HYDSYS

Licence :	Licence Status : Active	Intended Purpose(s)
Work Type : Bore	Authorised Purpose(s)	G/WATER XPLORE
Work Status : Test Hole		
Construct. Method : Cable Tool		
Owner Type : D.W.R. (NSW Dept Infrastructure, Planning & Nat Re		
Commenced Date :	Final Depth : 15.00 m	
Completion Date : 01-Sep-1975	Drilled Depth : 22.00 m	
Contractor Name :		
Driller :		
Assistant Driller's Name :		
Property :	Standing Water Level :	
GWMA :	Salinity : 501-1000 ppm	
GW Zone :	Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A : ROUS	NORTH CODRINGTON	51
	Licensed :		
Region : 30 - NORTH COAST	CMA Map : 9540-2S	WARDELL	
River Basin : 203 - RICHMOND RIVER	Grid Zone : 56/2	Scale : 1:25,000	
Area / District :			
Elevation :	Northing : 6795568	Latitude (S) : 28° 58' 3"	
Elevation Source : (Unknown)	Easting : 529631	Longitude (E) : 153° 18' 15"	
GS Map : 0005B4	MGA Zone : 56	Coordinate Source : GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Backfill	Backfill	15.00	22.00	203			
1	1	Casing	P.V.C.	-0.60	15.00	102			(Unknown)
1		Casing	Casing Protector	0.00	0.00	152			(Unknown)
1	1	Opening	Slots	6.00	9.00	102		1	Slotted On Site; SL: 0mm; A: 0mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	9.00	3.00	Unconsolidated	5.00		0.06			501-1000 ppm

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	Clay Dark Grey	Clay	
1.00	4.00	3.00	Clay Grey	Clay	
4.00	6.00	2.00	Clay Grey Sandy Water Supply	Clay	
6.00	9.00	3.00	Clay Grey Sandy	Clay	
9.00	10.00	1.00	Clay Grey	Clay	
10.00	13.00	3.00	Sandstone Pink White Sandy Claybound	Sandstone	
13.00	14.00	1.00	Clay Yellow	Clay	
14.00	16.00	2.00	Clay Yellow White Sandy	Clay	
16.00	17.00	1.00	Clay White Yellow Pink Sandy	Clay	
17.00	19.00	2.00	Clay Orange Yellow Sandy	Clay	
19.00	21.00	2.00	Clay White Grey Sandy	Clay	
21.00	21.50	0.50	Clay Yellow Sandy	Clay	
21.50	22.00	0.50	Sandstone	Sandstone	

Remarks

CORAKI

*** End of GW039142 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW043088

Converted From HYDSYS

Licence :30BL102046		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	NOT KNOWN
Work Status :(Unknown)			
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	3.00 m	
Completion Date :	Drilled Depth :	3.00 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Hard
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	34
	Licensed :ROUS	TUCKURIMBA	34
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6800147	Latitude (S) :28° 55' 34"
Elevation Source :(Unknown)		Easting :532242	Longitude (E) :153° 19' 51"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1828			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.40	3.00	0.60	Unconsolidated	1.20		0.25			Hard

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	3.04	3.04	Sand Clayey Water Supply	Sand	

Remarks

LICENSEE STATES WATER CORROSIVE

*** End of GW043088 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW043089

Converted From HYDSYS

Licence :30BL102047			Licence Status :Active		Intended Purpose(s) DOMESTIC FARMING STOCK
Work Type :Well			Authorised Purpose(s)		
Work Status :(Unknown)			DOMESTIC		
Construct. Method :(Unknown)			FARMING		
Owner Type :Private			STOCK		
Commenced Date :			Final Depth :	1.20 m	
Completion Date :			Drilled Depth :	1.20 m	
Contractor Name :					
Driller :					
Assistant Driller's Name :					
Property : - N/A			Standing Water Level :		Domestic
GWMA : -			Salinity :		
GW Zone : -			Yield :		

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	TUCKURIMBA	41
		Licensed :ROUS	TUCKURIMBA	41
Region :30 - NORTH COAST			CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER			Grid Zone :56/2	Scale :1:25,000
Area / District :				
Elevation :			Northing :6800210	Latitude (S) :28° 55' 32"
Elevation Source :(Unknown)			Easting :531782	Longitude (E) :153° 19' 34"
GS Map :0005B4	MGA Zone :56		Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Concrete Cylinder	0.00	0.00	1219			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.90	1.20	0.30	Consolidated	1.50		0.38			Domestic

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	1.21	1.21	Sandstone Water Supply	Sandstone	

Remarks

*** End of GW043089 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046137

Converted From HYDSYS

Licence :30BL103624		Licence Status Active	
Work Type :Well		Authorised Purpose(s)	Intended Purpose(s)
Work Status :(Unknown)		STOCK	STOCK
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	2.40 m	
Completion Date :01-Jan-1920	Drilled Depth :	2.40 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Stock
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	59
	Licensed :ROUS	TUCKURIMBA	59
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6797041	Latitude (S) :28° 57' 15"
Elevation Source :(Unknown)		Easting :531367	Longitude (E) :153° 19' 19"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1524			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.10	2.10	0.00	Unconsolidated	1.80		0.06			Stock

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	2.44	2.44	Soil Black Water Supply	Soil	

Remarks

*** End of GW046137 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046138

Converted From HYDSYS

Licence :30BL103625		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	STOCK
Work Status :Supply Obtained			
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	2.40 m	
Completion Date :01-Jan-1920	Drilled Depth :	2.50 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Stock
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	54
	Licensed :ROUS	TUCKURIMBA	54
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6797258	Latitude (S) :28° 57' 8"
Elevation Source :(Unknown)		Easting :530799	Longitude (E) :153° 18' 58"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1524			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.40	2.40	0.00	(Unknown)	2.10					Stock

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	2.44	2.44	Driller	(Unknown)	
2.44	2.45	0.01	Basalt Water Supply	Basalt	

Remarks

*** End of GW046138 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046139

Converted From HYDSYS

Licence :30BL103626		Licence Status :Active	Intended Purpose(s)
Work Type :Spear		Authorised Purpose(s)	STOCK
Work Status :(Unknown)			
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	5.50 m	
Completion Date :01-Jan-1930	Drilled Depth :	5.50 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Stock
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	91
	Licensed :ROUS	TUCKURIMBA	91
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6796238	Latitude (S) :28° 57' 41"
Elevation Source :(Unknown)		Easting :532285	Longitude (E) :153° 19' 53"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Corrugated Galvanised Iron	-0.80	-0.80	32			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
4.90	5.50	0.60	Unconsolidated			0.05			Stock

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	4.88	4.88	Driller	(Unknown)	
4.88	5.49	0.61	Sand Water Supply	Sand	

Remarks

*** End of GW046139 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046148

Converted From HYDSYS

Licence :30BL103608		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	STOCK
Work Status :Supply Obtained			
Construct. Method :Hand Dug			
Owner Type :Private			
Commenced Date :	Final Depth :	3.70 m	
Completion Date :01-Jan-1933	Drilled Depth :	3.70 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Fair
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	CORAKI	150
	Licensed :ROUS	CORAKI	150
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6795590	Latitude (S) :28° 58' 2"
Elevation Source :(Unknown)		Easting :533068	Longitude (E) :153° 20' 22"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1829			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.40	3.70	0.30	Unconsolidated	0.00		0.38			Fair

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.61	0.61	Pug	Pug	
0.61	3.35	2.74	Clay	Clay	
3.35	3.66	0.31	Sand Water Supply	Sand	

Remarks

*** End of GW046148 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046149

Converted From HYDSYS

Licence :30BL103609		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	STOCK
Work Status :Supply Obtained			
Construct. Method :Hand Dug			
Owner Type :Private			
Commenced Date :	Final Depth :	4.00 m	
Completion Date :01-Jan-1940	Drilled Depth :	4.00 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Good
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	BROADWATER	110
	Licensed :ROUS	BROADWATER	110
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6795618	Latitude (S) :28° 58' 1"
Elevation Source :(Unknown)		Easting :534016	Longitude (E) :153° 20' 57"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1829			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.70	4.00	0.30	Unconsolidated	0.60					Good

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.91	0.91	Loam Sandy	Loam	
0.91	3.66	2.75	Clay	Clay	
3.66	3.96	0.30	Sand Water Supply	Sand	

Remarks

*** End of GW046149 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046150

Converted From HYDSYS

Licence :30BL103610		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	STOCK
Work Status :Supply Obtained			
Construct. Method :Hand Dug			
Owner Type :Private			
Commenced Date :	Final Depth :	3.40 m	
Completion Date :	Drilled Depth :	3.40 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Good
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	BROADWATER	110
	Licensed :ROUS	BROADWATER	110
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6795555	Latitude (S) :28° 58' 3"
Elevation Source :(Unknown)		Easting :534394	Longitude (E) :153° 21' 11"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Timber	0.00	0.00	1524			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.00	3.30	0.30	Unconsolidated	0.00					Good

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.91	0.91	Loam Sandy	Loam	
0.91	3.05	2.14	Clay	Clay	
3.05	3.35	0.30	Sand Water Supply	Sand	

Remarks

*** End of GW046150 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046151

Converted From HYDSYS

Licence :30BL103611		Licence Status Active	Intended Purpose(s) DOMESTIC STOCK
Work Type :Spear		Authorised Purpose(s)	
Work Status :(Unknown)		STOCK	
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	4.00 m	
Completion Date :01-Jan-1950	Drilled Depth :	4.00 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Good
GW Zone : -		Yield :	

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	CORAKI	150
		Licensed :ROUS	CORAKI	150
Region :30 - NORTH COAST			CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER			Grid Zone :56/2	Scale :1:25,000
Area / District :				
Elevation :			Northing :6795744	Latitude (S) :28° 57' 57"
Elevation Source :(Unknown)			Easting :532988	Longitude (E) :153° 20' 19"
GS Map :0005B4		MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing (Unknown)	0.00	4.00	0			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
3.70	4.00	0.30	Unconsolidated			0.38			Good

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.61	0.61	Pug	Pug	
0.61	3.66	3.05	Clay	Clay	
3.66	3.96	0.30	Sand Water Supply	Sand	

Remarks

*** End of GW046151 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW046341

Converted From HYDSYS

Licence :30BL103964		Licence Status Active	
Work Type :Spear		Authorised Purpose(s)	Intended Purpose(s)
Work Status :(Unknown)		STOCK	STOCK
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	4.30 m	
Completion Date :01-Jan-1965	Drilled Depth :	4.30 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Stock
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	65
	Licensed :ROUS	TUCKURIMBA	65
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6795591	Latitude (S) :28° 58' 2"
Elevation Source :(Unknown)		Easting :532825	Longitude (E) :153° 20' 13"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	(Unknown)	0.00	0.00	32			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
4.30	4.30	0.00	(Unknown)						Stock

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.30	0.30	Soil Black	Soil	
0.30	2.74	2.44	Clay	Clay	
2.74	4.27	1.53	Sandy	(Unknown)	

Remarks

*** End of GW046341 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW047403

Converted From HYDSYS

Licence :30BL128972		Licence Status :Active	Intended Purpose(s)
Work Type :Well		Authorised Purpose(s)	IRRIGATION
Work Status :(Unknown)			
Construct. Method :(Unknown)			
Owner Type :Private			
Commenced Date :	Final Depth :	7.50 m	
Completion Date :01-Sep-1979	Drilled Depth :	7.50 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA :804 - ALSTONVILLE BASALT		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	L3 (69)
	Licensed :ROUS	TUCKURIMBA	L3 (P+ Port 69)
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6798949	Latitude (S) :28° 56' 13"
Elevation Source :(Unknown)		Easting :531318	Longitude (E) :153° 19' 17"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Concrete Cylinder	-0.30	3.90	1350			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
(No Water Bearing Zone Details Found)									

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	4.00	4.00	Soil Sandy Alluvial	Soil	
4.00	7.50	3.50	Clay	Clay	

Remarks

*** End of GW047403 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW052250

Converted From HYDSYS

Licence :30BL117727		Licence Status :Active	Intended Purpose(s)
Work Type :Excavation		Authorised Purpose(s)	NOT KNOWN
Work Status :Reconditioned Bore			
Construct. Method :< 100 sq.m.			
Owner Type :Private			
Commenced Date :	Final Depth :	3.00 m	
Completion Date :	Drilled Depth :	3.00 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	33
	Licensed :ROUS	TUCKURIMBA	P+ Port 33
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6800856	Latitude (S) :28° 55' 11"
Elevation Source :(Unknown)		Easting :531675	Longitude (E) :153° 19' 30"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	Nil	0.00	0.00	0			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
2.10	2.30	0.20	(Unknown)	2.50					(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	0.50	0.50	Loam Reddish	Loam	
0.50	2.00	1.50	Shale Reddish Gravel	Shale	
2.00	3.00	1.00	Clay Rocky	Clay	

Remarks

Changed from 2m to 3m on 08/12/80 R/C-WELL CHANGED TO TURKEY NEST

*** End of GW052250 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW058862

Converted From HYDSYS

Licence :30BL130144		Licence Status Active	
Work Type :Bore open thru rock		Authorised Purpose(s)	Intended Purpose(s)
Work Status :(Unknown)		STOCK	STOCK
Construct. Method :Rotary Air			
Owner Type :Private			
Commenced Date :	Final Depth :	30.00 m	
Completion Date :01-Mar-1984	Drilled Depth :	30.00 m	
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	Good
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	L1 DP621364 (75)
	Licensed :ROUS	TUCKURIMBA	LT1 DP621364 PT75
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000
Area / District :			
Elevation :		Northing :6799655	Latitude (S) :28° 55' 50"
Elevation Source :(Unknown)		Easting :532159	Longitude (E) :153° 19' 48"
GS Map :0005B4	MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	0.00	165			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
10.00	10.00	0.00	Consolidated			0.25			(Unknown)
20.00	20.00	0.00	Consolidated			0.38			(Unknown)
28.00	28.00	0.00	Consolidated			1.89			(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	28.00	28.00	Sandstone Nominal Water Supply	Sandstone	
0.00	28.00	28.00	Rock Nominal	Rock	
28.00	30.00	2.00	Driller	(Unknown)	

Remarks

*** End of GW058862 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW061503

Converted From HYDSYS

Licence :30BL133998		Licence Status Active	
Work Type :Bore		Authorised Purpose(s)	Intended Purpose(s)
Work Status :(Unknown)		DOMESTIC	DOMESTIC
Construct. Method :Rotary Air		STOCK	STOCK
Owner Type :Private			
Commenced Date :	Final Depth :	50.00 m	
Completion Date :01-Aug-1985	Drilled Depth :	50.00 m	
Contractor Name :			
Driller :1504	JACKWITZ, William Douglas		
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	TUCKURIMBA	L2 DP621364 (75)
		Licensed :ROUS	TUCKURIMBA	LT2 DP621364
Region :30 - NORTH COAST			CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER			Grid Zone :56/2	Scale :1:25,000
Area / District :				
Elevation :			Northing :6799255	Latitude (S) :28° 56' 3"
Elevation Source :(Unknown)			Easting :532104	Longitude (E) :153° 19' 46"
GS Map :0005B4		MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	50.00	125			Seated on Bottom
1	1	Opening	Slots - Vertical	38.00	50.00	125		1	SL: 0mm; A: 3mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
25.00	27.00	2.00	Fractured			0.13			(Unknown)
40.00	48.00	8.00	Fractured			0.78			(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	Loam Sandy	Loam	
3.00	25.00	22.00	Sandstone	Sandstone	
25.00	27.00	2.00	Shale Soft Water Supply	Shale	
27.00	33.00	6.00	Sandstone	Sandstone	
33.00	40.00	7.00	Clay	Clay	
40.00	48.00	8.00	Shale Water Supply	Shale	
48.00	50.00	2.00	Sandstone	Sandstone	

Remarks

*** End of GW061503 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW063949

Converted From HYDSYS

Licence :30BL135791		Licence Status :Active	
Work Type :Bore		Authorised Purpose(s)	Intended Purpose(s)
Work Status :(Unknown)		DOMESTIC	DOMESTIC
Construct. Method :Rotary		STOCK	STOCK
Owner Type :Private			
Commenced Date :	Final Depth :	25.00 m	
Completion Date :01-Jan-1987	Drilled Depth :	25.00 m	
Contractor Name :			
Driller :1504	JACKWITZ, William Douglas		
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	(Unknown)
GW Zone : -		Yield :	

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	MEERSCHAUM	3
		Licensed :ROUS	MEERSCHAUM	3
Region :30 - NORTH COAST		CMA Map :9540-2S	WARDELL	
River Basin :203 - RICHMOND RIVER		Grid Zone :56/2	Scale :1:25,000	
Area / District :				
Elevation :		Northing :6800421	Latitude (S) :28° 55' 25"	
Elevation Source :(Unknown)		Easting :533353	Longitude (E) :153° 20' 32"	
GS Map :0005B4		MGA Zone :56	Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	25.00	125			Seated on Bottom
1	1	Opening	Slots - Vertical	19.00	25.00	125		1	Slotted In Hole; SL: 0mm; A: 0mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
20.00	21.00	1.00	(Unknown) (natural flow)			0.60			(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	8.00	8.00	Sandstone Soft	Sandstone	
8.00	25.00	17.00	Multicoloured Water Supply	(Unknown)	

Remarks

*** End of GW063949 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW065451

Converted From HYDSYS

Licence :30BL138403		Licence Status Active	
Work Type :Bore		Authorised Purpose(s)	Intended Purpose(s)
Work Status :(Unknown)		DOMESTIC	DOMESTIC
Construct. Method :Rotary Air			
Owner Type :Private			
Commenced Date :		Final Depth :	41.00 m
Completion Date :20-Oct-1988		Drilled Depth :	41.00 m
Contractor Name :D C JACKWITZ			
Driller :1326		JACKWITZ, Wiliam D.	
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	
GW Zone : -		Yield : 0.30 L/s	

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	TUCKURIMBA	LOT 14 DP746186
		Licensed :ROUS	TUCKURIMBA	14 746186
Region :30 - NORTH COAST			CMA Map :9540-2S	WARDELL
River Basin :203 - RICHMOND RIVER			Grid Zone :56/2	Scale :1:25,000
Area / District :				
Elevation :	0.00		Northing :6798886	Latitude (S) :28° 56' 15"
Elevation Source :			Easting :532049	Longitude (E) :153° 19' 44"
GS Map :0005B4	MGA Zone :56		Coordinate Source :	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	41.00	168			Rotary Air
1	1	Casing	P.V.C.	0.00	41.00	140			Seated on Bottom
1	1	Opening	Slots - Vertical	6.00	41.00	140		1	Sawn; SL: 150mm; A: 3mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.00	8.00	1.00	Consolidated			0.10			
27.00	28.00	1.00	Consolidated			0.10			
37.00	38.00	1.00	Consolidated			0.10			

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	4.00	4.00	TOPSOIL		
4.00	14.00	10.00	ORANGE SANDSTONE		
14.00	30.00	16.00	SANDSTONE		
30.00	35.00	5.00	BLACK SHALE		
35.00	41.00	6.00	SANDSTONE		

Remarks

*** End of GW065451 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW067108

Converted From HYDSYS

Licence :30BL140746		Licence Status :Active	Intended Purpose(s)
Work Type :		Authorised Purpose(s)	
Work Status :(Unknown)		DOMESTIC	
Construct. Method :		STOCK	
Owner Type :			
Commenced Date :	Final Depth :		
Completion Date :	Drilled Depth :		
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :	
GWMA : -		Salinity :	
GW Zone : -		Yield :	

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	TUCKURIMBA	LOT 2 DP736216
		Licensed :ROUS	TUCKURIMBA	2 736216
Region :30 - NORTH COAST			CMA Map :	
River Basin :203 - RICHMOND RIVER			Grid Zone :	Scale :
Area / District :				
Elevation :	26.50 m (A.H.D.)		Northing :6799439	Latitude (S) :28° 55' 57"
Elevation Source :Est. Contour 8-15M.			Easting :532132	Longitude (E) :153° 19' 47"
GS Map :0005B4	MGA Zone :56		Coordinate Source :GD.,ACC.MAP	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1	1	Casing	P.V.C.	0.00	30.00	137			Seated on Bottom
1	1	Opening	Slots	21.00	30.00	137	1		SL: 0mm; A: 3mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
22.00	30.00	8.00	Consolidated	18.50		0.90			

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
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Remarks

*** End of GW067108 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW300053

Licence :30BL177154		Licence Status Cancelled	
Work Type :Bore		Authorised Purpose(s)	
Work Status :(Unknown)		STOCK	
Intended Purpose(s)			
IRRIGATION			
Construct. Method :Rotary			
Owner Type :			
Commenced Date :		Final Depth :	
36.00 m			
Completion Date :02-Jan-1995		Drilled Depth :	
36.00 m			
Contractor Name :P.H. SLADE			
Driller :1456		SLADE, Phillip Henry	
Assistant Driller's Name :			
Property : - ALLEN'S		Standing Water Level :	
9.00 m			
GWMA : -		Salinity :	
Brackish			
GW Zone : -		Yield :	
6.60 L/s			

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	TUCKURIMBA	LOT 1 DP184763
		Licensed :ROUS	TUCKURIMBA	1 184763
Region :30 - NORTH COAST		CMA Map :		
River Basin :		Grid Zone :		Scale :
Area / District :				
Elevation :		Northing :6801301		Latitude (S) :28° 54' 57"
Elevation Source :		Easting :531847		Longitude (E) :153° 19' 36"
GS Map :		MGA Zone :56		Coordinate Source :

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	30.00	200			Percussion
1		Hole	Hole	30.00	36.00	168			Percussion
1	1	Casing	PVC Class 6	0.00	30.00	160			Driven into Hole
1	1	Opening	Slots - Diagonal	23.00	30.00	160		1	PVC; Sawn; A: 4mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
23.00	30.00	7.00		9.00		6.60	30.00		Brackish

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	Clay	Clay	
1.00	6.50	5.50	Weathered sandstone	Sandstone	
6.50	23.00	16.50	Sandstone (Grey)	Sandstone	
23.00	30.00	7.00	Fractured sandstone	Sandstone	
30.00	36.00	6.00	Sandstone (Grey)	Sandstone	

Remarks

Form A Remarks:

FORM A PHOTOCOPY DID NOT HAVE SECOND HALF OF PAGE CONTAINING DRILLERS LOG AND SITE PLAN DETAILS.

*** End of GW300053 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW300375

Licence :30BL138758		Licence Status :Active	
Work Type :Bore		Authorised Purpose(s)	
Work Status :(Unknown)		DOMESTIC	
Construct. Method :(Unknown)		STOCK	
Owner Type :			
Commenced Date :		Final Depth :40.00 m	
Completion Date :31-Oct-1989		Drilled Depth :	
Contractor Name :Robert Leslie TANNER			
Driller :1412		TANNER, Robert Leslie	
Assistant Driller's Name :			
Property : - N/A		Standing Water Level :25.00 m	
GWMA : -		Salinity : (Unknown)	
GW Zone : -		Yield :1.50 L/s	

Site Details

Site Chosen By		County	Parish	Portion/Lot DP
		Form A :ROUS	TUCKURIMBA	LOT 3 DP736216
		Licensed :ROUS	TUCKURIMBA	3 736216
Region :30 - NORTH COAST		CMA Map :		
River Basin :		Grid Zone :		Scale :
Area / District :				
Elevation :		Northing :6799334		Latitude (S) :28° 56' 1"
Elevation Source :		Easting :532124		Longitude (E) :153° 19' 47"
GS Map :		MGA Zone :56		Coordinate Source :Map Interpretation

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	40.00				(Unknown)
1	1	Casing	P.V.C.	0.00	40.00	140			(Unknown)

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
0.00	40.00	40.00		25.00	35.00	1.50			(Unknown)

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
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Remarks

Form A Remarks:

Flow has varied greatly since 1989 - being nearly dry for 3 years. Some improvement has occurred so for this Spring.

This information was provided on the Form "AG".

*** End of GW300375 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW302233

Licence :30BL178626		Licence Status :Active	Intended Purpose(s)
Work Type :Bore		Authorised Purpose(s)	STOCK
Work Status :(Unknown)			
Construct. Method :			
Owner Type :			
Commenced Date :	Final Depth :		
Completion Date :	Drilled Depth :		
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - HUNT'S		Standing Water Level :	
GWMA : -		Salinity :	
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	LOT 12 DP 773824
	Licensed :ROUS	TUCKURIMBA	12 773824
Region :30 - NORTH COAST		CMA Map :	
River Basin :		Grid Zone :	Scale :
Area / District :			
Elevation :		Northing :6795953	Latitude (S) :28° 57' 51"
Elevation Source :		Easting :530360	Longitude (E) :153° 18' 42"
GS Map :	MGA Zone :56	Coordinate Source :	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	3000			(Unknown)
1	1	Casing	Lining	0.00	6.00				

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
(No Water Bearing Zone Details Found)									

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
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Remarks

*** End of GW302233 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW302234

Licence :30BL178627		Licence Status :Active	Intended Purpose(s)
Work Type :Bore		Authorised Purpose(s)	STOCK
Work Status :(Unknown)			
Construct. Method :			
Owner Type :			
Commenced Date :	Final Depth :		
Completion Date :	Drilled Depth :		
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - HUNT'S		Standing Water Level :	
GWMA : -		Salinity :	
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	LOT 12 DP773824
	Licensed :ROUS	TUCKURIMBA	12 773824
Region :30 - NORTH COAST		CMA Map :	
River Basin :		Grid Zone :	Scale :
Area / District :			
Elevation :		Northing :6795891	Latitude (S) :28° 57' 53"
Elevation Source :		Easting :530389	Longitude (E) :153° 18' 43"
GS Map :	MGA Zone :56	Coordinate Source :	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H	P	Component	Type	From (m)	To (m)	OD (mm)	ID (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	3000			(Unknown)
1	1	Casing	Lining	0.00	6.00				

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
(No Water Bearing Zone Details Found)									

Drillers Log

From (m)	To (m)	Thickness(m)	Drillers Description	Geological Material	Comments
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Remarks

*** End of GW302234 ***

DEPARTMENT OF WATER AND ENERGY

Work Summary

GW303341

Licence :30BL178521		Licence Status :Active	
Work Type :Bore		Authorised Purpose(s)	Intended Purpose(s)
Work Status :		FARMING	FARMING
Construct. Method :		STOCK	STOCK
Owner Type :			
Commenced Date :	Final Depth :		
Completion Date :	Drilled Depth :		
Contractor Name :			
Driller :			
Assistant Driller's Name :			
Property : - IRVIN'S		Standing Water Level :	
GWMA : -		Salinity :	
GW Zone : -		Yield :	

Site Details

Site Chosen By	County	Parish	Portion/Lot DP
	Form A :ROUS	TUCKURIMBA	LT 1 DP 727910
	Licensed :ROUS	TUCKURIMBA	1 727910
Region :30 - NORTH COAST		CMA Map :	
River Basin :		Grid Zone :	Scale :
Area / District :			
Elevation :		Northing :6800574	Latitude (S) :28° 55' 20"
Elevation Source :		Easting :531935	Longitude (E) :153° 19' 39"
GS Map :	MGA Zone :56	Coordinate Source :Map Interpretation	

Construction

Negative depths indicate Above Ground Level;

H-Hole;P-Pipe;OD-Outside Diameter;ID-Inside Diameter;C-Cemented;SL-Slot Length;A-Aperture;GS-Grain Size;Q-Quantity;PL-Placement of Gravel Pack;PC-Pressure Cemented;S-Sump;CE-Centralisers

H P Component Type From (m) To (m) OD (mm) ID (mm) Interval Details

(No Construction Details Found)

Water Bearing Zones

From (m) To (m) Thickness (m) WBZ Type S.W.L. (m) D.D.L. (m) Yield (L/s) Hole Depth (m) Duration (hr) Salinity (mg/L)

(No Water Bearing Zone Details Found)

Drillers Log

From (m) To (m) Thickness(m) Drillers Description Geological Material Comments

Remarks

Form A Remarks:

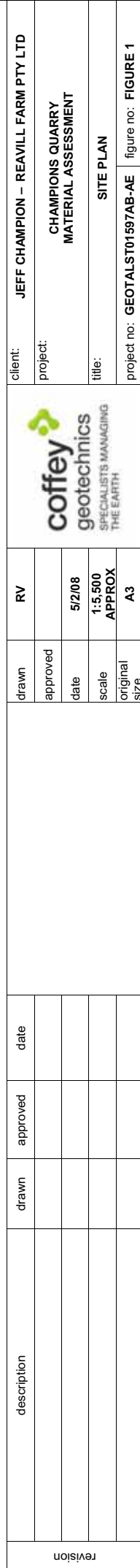
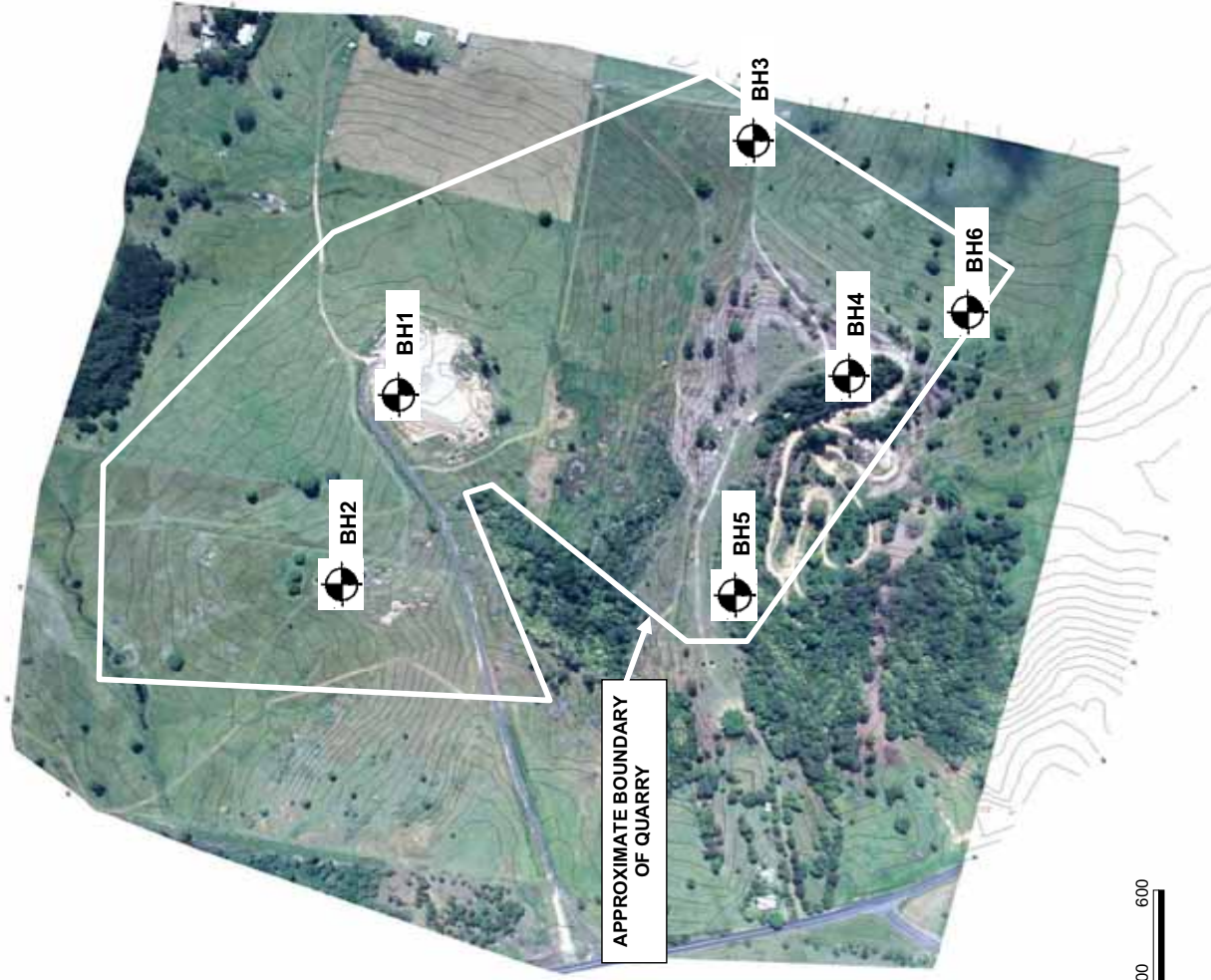
Current owner has only recently bought property and does not know any of the Bore specifications

*** End of GW303341 ***

*** End of Report ***

Annex C

Coffey Geotechnics Site Investigation Plan and Borelogs



Borehole No. **BH2**

Sheet 1 of 4

Project No. **GEOTALST01597AB**

Engineering Log - Borehole

Client: **CHAMPIONS QUARRY**

Date started: **15.10.2007**

Principal:

Date completed: **15.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **NORTH OF EXISTING QUARRY**

Checked by:

drill model and mounting: PIONEER 160 4wd ISUZU Easting: 531199 slope: -90° R.L. Surface: 28.7
hole diameter: 100 mm Northing 6798403 bearing: datum: AHD

drilling information				material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
1	2	3							soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
TCAD		C			28	1		SW	TOPSOIL: Sand, medium grained, orange/brown, with traces of CH clay and organics	M	L		TOPSOIL/COLLUVIUM
								SP	SAND: fine to medium grained, pale orange/brown, cobbles at 0.6 m with traces of medium plasticity clay		MD		RESIDUAL SOIL
Borehole BH2 continued as cored hole													
					27	2							
					26	3							
					25	4							
					24	5							
					23	6							
					22	7							
					21	8							

method AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	support M mud N nil C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	notes, samples, tests U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	classification symbols and soil description based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	consistency/density index VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense
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Borehole No. **BH2**

Engineering Log - Cored Borehole

Sheet 2 of 4

Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **15.10.2007**

Principal:

Date completed: **15.10.2007**Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: ***NORTH OF EXISTING QUARRY***

Checked by:

drill model & mounting: PIONEER 160 4wd ISUZU

Easting: 531199

slope: -90°

R.L. Surface: 28.7

hole diameter: 100 mm

Drilling fluid:

Northing: 6798403

bearing:

datum: AHD

drilling information					material substance					rock mass defects						
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength					Is ₍₅₀₎ MPa D- diam-etral A- axial	defect spacing mm		defect description type, inclination, planarity, roughness, coating, thickness
								VL	L	M	H	VH		EH	RQD %	
			-28	1		Continued from non-cored borehole										
NMLC			-27	2		SAND: fine to coarse grained, brown/orange SANDSTONE: fine grained, orange and pale grey, distinctly bedded, remoulds to SP-fine grained sand, with some medium plasticity clay pp=240kPa	RS XW						<<			SM, 20°, PL, SO, Clay, 80 mm
			-26	3									<<			
		▼ 8.50 AM 16/10/07	-25	4		pp=160kPa SILTSTONE: white, indistinctly laminated, remoulds to a low plasticity clayey silt, very stiff							10			PT, 7°, PL, SO, CN
			-24	5		SANDSTONE: fine to coarse grained, pale grey, remoulds to SW, sandstone										
			-24	5		SILTSTONE: pale grey, laminated pp=250kPa SANDSTONE: fine to coarse grained, pale orange, distinctly bedded, fining upwards	HW									PT, 3°, PL, SO, CN
			-23	6		NO CORE=0.10 m SANDSTONE: fine to coarse grained, orange to pale grey, distinctly bedded	HW									SM, 6°, L, SO, Clay, 80 mm SM, 4°, PL, SO, Clay, 20 mm SM, 5°, PL, SO, Clay, 80 mm
			-23	6		pp=100kPa Colour change to pale grey at 6.1 m.	MW					D 0.79 A 1.9	62			PT, 5°, PL, RO, CN
			-22	7												
		-21	8									D 0.18 A 0.17	95			

method

DT diatube

AS auger screwing

AD auger drilling

RR roller/tricone

CB claw or blade bit

NMLC NMLC core

NQ, HQ, PQ wireline core

core-lift

casing used

barrel withdrawn

graphic log/core recovery

core recovered

- graphic symbols

indicate material

no core recovered

water

10/1/98 water level on date shown

water inflow

partial drill fluid loss

complete drill fluid loss

water pressure test result (lugeons) for depth interval shown

weathering

FR fresh

SW slightly weathered

MW moderately weathered

HW highly weathered

XW extremely weathered

DW distinctly weathered (covers MW and HW)

strength

VL very low

L low

M medium

H high

VH very high

EH extremely high

defect type

JT joint

PT parting

SM seam

SZ sheared zone

SS sheared surface

CS crushed seam

planarity

PL planar

CU curved

UN undulating

ST stepped

IR irregular

roughness

VR very rough

RO rough

SO smooth

SL slickensided

coating

CN clean

SN stained

VN veneer

CO coating

Borehole No. **BH2**

Engineering Log - Cored Borehole

Sheet 3 of 4

Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **15.10.2007**

Principal:

Date completed: **15.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **NORTH OF EXISTING QUARRY**

Checked by:

drill model & mounting: PIONEER 160 4wd ISUZU		Easting: 531199		slope: -90°		R.L. Surface: 28.7							
hole diameter: 100 mm		Drilling fluid:		Northing: 6798403		bearing: datum: AHD							
drilling information			material substance			rock mass defects							
method	core-lift	water	RL	depth metres	graphic log core recovery	material	weathering alteration	estimated strength	IS ₍₅₀₎ MPa	D- diam- etral A- axial	defect spacing mm	defect description	
						rock type; grain characteristics, colour, structure, minor components		VL L M H VH EH			30 100 300 1000 3000	type, inclination, planarity, roughness, coating, thickness	
												particular general	
NMLC			20	9		SANDSTONE: fine to coarse grained, orange to pale grey, distinctly bedded (continued)	SW						
			19	10		Sandstone is medium to coarse grained from 10-12.25 m, fining upwards.							
			18	11			MW						
			17	12									
			16	13			SW						
			15	14									
			14	15									
			13	16		Colour change to orange from 15.6 to 16.05 m.	MW						
method			core-lift			water			weathering			defect type	
DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core			casing used barrel withdrawn graphic log/core recovery core recovered - graphic symbols indicate material no core recovered			10/1/98 water level on date shown water inflow partial drill fluid loss complete drill fluid loss water pressure test result (lugeons) for depth interval shown			FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high			joint parting seam sheared zone sheared surface crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular	
												roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating	

Borehole No. **BH2**

Sheet 4 of 4

Project No: **GEOTALST01597AB**

Engineering Log - Cored Borehole

Client: **CHAMPIONS QUARRY**

Date started: **15.10.2007**

Principal:

Date completed: **15.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **NORTH OF EXISTING QUARRY**

Checked by:

drill model & mounting: PIONEER 160 4wd ISUZU		Easting: 531199		slope: -90°		R.L. Surface: 28.7											
hole diameter: 100 mm		Drilling fluid:		Northing: 6798403		bearing: datum: AHD											
drilling information			material substance			rock mass defects											
method	core-lift	water	RL	depth metres	graphic log core recovery	material	weathering alteration	estimated strength	IS ₅₀ MPa	D- diam- etral	A- axial	RQD %	defect spacing mm	defect description			
						rock type; grain characteristics, colour, structure, minor components								type, inclination, planarity, roughness, coating, thickness			
NMLC				12		SANDSTONE: fine to coarse grained, orange to pale grey, distinctly bedded (continued)	HW							SM, 4°, PL, SO, Clay, 40 mm			
				17		Colour change to pale grey at 16.05 m.	SW							CS, 5°, PL, RO, CN			
				18													
				19													
				20		SILTSTONE: dark grey, laminated coaliferous											
						SANDSTONE: fine to medium grained, grey											
						SILTSTONE: dark grey, laminated											
				21		BH2 terminated due to limit of required investigation.											
						BH2 terminated at 20.3m											
				22													
				23													
				24													
method			core-lift			water			weathering			defect type			roughness		
DT diatube			casing used			10/1/98 water level on date shown			FR fresh			JT joint			VR very rough		
AS auger screwing			barrel withdrawn			water inflow			SW slightly weathered			PT parting			RO rough		
AD auger drilling						partial drill fluid loss			MW moderately weathered			SM seam			SO smooth		
RR roller/tricone						complete drill fluid loss			HW highly weathered			SZ sheared zone			SL slickensided		
CB claw or blade bit									XW extremely weathered			SS sheared surface					
NMLC NMLC core									DW distinctly weathered (covers MW and HW)			CS crushed seam					
NQ, HQ, PQ wireline core																	
			graphic log/core recovery						strength			planarity			coating		
			core recovered						VL very low			PL planar			CN clean		
			- graphic symbols						L low			CU curved			SN stained		
			indicate material						M medium			UN undulating			VN veneer		
			no core recovered						H high			ST stepped			CO coating		
									VH very high			IR irregular					
									EH extremely high								

Borehole No. **BH3**

Engineering Log - Borehole

Client: **CHAMPIONS QUARRY**

Principal:

Project: **RESOURCE ESTIMATE**

Borehole Location: ***EASTERN EXTENT OF PROPOSED QUARRY***

Sheet 1 of 4

Project No: **GEOTALST01597AB**Date started: **16.10.2007**Date completed: **16.10.2007**

Logged by: **ALB**

Checked by:

drill model and mounting:		PIONEER 160 4wd ISUZU		Easting: 531657		slope: -90°		R.L. Surface: 36.2					
hole diameter:		100 mm		Northing 6797945		bearing:		datum: AHD					
drilling information				material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations
	1 2 3								soil type: plasticity or particle characteristics, colour, secondary and minor components.			100 200 300 400	
TCAD		CM			36			SC	TOPSOIL: Clayey Sand, fine to coarse grained, dark brown, clay is medium plasticity, traces of rootlets and organics	M	L		RESIDUAL TOPSOIL
						1		SP	SAND: fine to medium grained, orange/brown, traces of very low strength sandstone		D		EXTREMELY WEATHERED ROCK
					35			SP	SAND: fine to medium grained, pale orange/brown, with trace of medium plasticity clay		VD		
									Borehole BH3 continued as cored hole				
						2							
						3							
						4							
						5							
						6							
						7							
						8							
method				support		notes, samples, tests		classification symbols and soil description		consistency/density index			
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT				M mud C casing penetration 1 2 3 4 water water inflow water outflow		U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal		based on unified classification system moisture D dry M moist W wet Wp plastic limit W _L liquid limit		VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense			

Engineering Log - Cored Borehole

Client: **CHAMPIONS QUARRY**

Principal:

Project: **RESOURCE ESTIMATE**

Borehole Location: **EASTERN EXTENT OF PROPOSED QUARRY**

Borehole No. **BH3**

Sheet 2 of 4

Project No: **GEOTALST01597AB**

Date started: **16.10.2007**

Date completed: **16.10.2007**

Logged by: **ALB**

Checked by:

drill model & mounting: PIONEER 160 4wd ISUZU Easting: 531657 slope: -90° R.L. Surface: 36.2
hole diameter: 100 mm Drilling fluid: Northing: 6797945 bearing: datum: AHD

drilling information					material substance					rock mass defects				
method	core-lift	water	RL	depth metres	graphic log core recovery	material	weathering alteration	estimated strength	IS ₍₅₀₎ MPa	D- diam- etral A- axial	RQD %	defect spacing mm	defect description	
						rock type; grain characteristics, colour, structure, minor components		VL L M H VH EH				30 100 300 1000 3000	particular	general
			36											
			35	1		Continued from non-cored borehole								
NMLC			34	2		SANDSTONE: fine to medium grained, pale orange to pale grey and red, indistinctly bedded	HW				97		PT, 14°, PL, RO CO, Fe	
			33	3									PT, 16°, PL, RO, CN	
			32	4		SILTSTONE: pale grey, interbedded with 100 mm width sandstone interbedded, fine grained								
			31	5		SANDSTONE: fine to medium grained, white and pink to pale grey, distinctly bedded	MW						PT, 3°, PL, RO, CN	
			30	6		Colour change to pale grey from 5.0m	SW						PT	
			29	7									JT, 39°, CU., RO, CO, Fe	
				8									JT, 2°, PL, RO, CO, Fe	

method	core-lift	water	weathering	defect type	roughness
DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core	casing used barrel withdrawn graphic log/core recovery core recovered - graphic symbols indicate material no core recovered	10/1/98 water level on date shown water inflow partial drill fluid loss complete drill fluid loss water pressure test result (lugeons) for depth interval shown	FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high	JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular	VR very rough RO rough SO smooth SL slickensided CN clean SN stained VN veneer CO coating

Borehole No. **BH3**

Engineering Log - Cored Borehole

Sheet 3 of 4

Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **16.10.2007**

Principal:

Date completed: **16.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **EASTERN EXTENT OF PROPOSED QUARRY**

Checked by:

drill model & mounting: PIONEER 160 4wd ISUZU		Easting: 531657		slope: -90°		R.L. Surface: 36.2								
hole diameter: 100 mm		Drilling fluid:		Northing: 6797945		bearing: datum: AHD								
drilling information			material substance				rock mass defects							
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH	IS ₍₅₀₎ MPa D- diam- A- axial	RQD % 30 100 300 1000 3000	defect spacing mm	defect description type, inclination, planarity, roughness, coating, thickness		
NMLC			28	9		SANDSTONE: fine to medium grained, white and pink to pale grey, distinctly bedded (continued)	SW		D 4.25 A 5	100				
			27	10		SANDSTONE: fine to medium grained, banded orange-brown and red-brown	HW		D 2.23 A 2.15					
			26	11					D 2.23 A 3.13	94				
			25	12		Fine to coarse grained from 11.5 m.			D 0.87 A 1.06					
			24	13					D 0.54 A 0.56	0				
			23	14										
			22	15										
			21	16										
method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core			core-lift  casing used  barrel withdrawn graphic log/core recovery  core recovered - graphic symbols indicate material  no core recovered			water  10/1/98 water level on date shown  water inflow  partial drill fluid loss  complete drill fluid loss  water pressure test result (lugeons) for depth interval shown			weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high			defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating		

General: PT, 10-15°, PL, RO, CN

SM, 10°, PL, SO, Clay, 250 mm

Engineering Log - Cored Borehole

Client: **CHAMPIONS QUARRY**

Principal:

Project: **RESOURCE ESTIMATE**

Borehole Location: **EASTERN EXTENT OF PROPOSED QUARRY**

Borehole No. **BH3**

Sheet 4 of 4

Project No: **GEOTALST01597AB**

Date started: **16.10.2007**

Date completed: **16.10.2007**

Logged by: **ALB**

Checked by:

drill model & mounting: PIONEER 160 4wd ISUZU		Easting: 531657		slope: -90°		R.L. Surface: 36.2								
hole diameter: 100 mm		Drilling fluid:		Northing: 6797945		bearing: datum: AHD								
drilling information			material substance			rock mass defects								
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH IS ₍₅₀₎ MPa D- diam- etral A- axial	RQD % 30 100 300 1000 3000	defect spacing mm	defect description type, inclination, planarity, roughness, coating, thickness			
NMLC			20			SANDSTONE: fine to medium grained, banded orange-brown and red-brown (continued)	HW	D 0.74 A 0.75	80		SM, 10°, PL, SO, Clay, 25 mm			
			19								JT, 65°, UN, SO, CO, Clay			
			18			Colour change to banded white and orange at 18.2 m.		D 0.15 A 0.84			JT, 62°, UN, SO, CO, Clay			
			18								JT, 60°, UN, RO, CO, Fe			
			19					D 3.41 A 2.27						
			20											
			21					D 4.59 A 4.86	77		JT, 72°, UN, RO, CO, Fe			
			21					D 1.89 A 1.97			JT, 20°, IR, RO, CO, Fe			
			22			BH3 terminated at 21.65 due to direction of client. BH3 terminated at 21.65m								
			23											
			24											
method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core			core-lift  casing used  barrel withdrawn graphic log/core recovery  core recovered  - graphic symbols indicate material  no core recovered			water  10/1/98 water level on date shown  water inflow  partial drill fluid loss  complete drill fluid loss  water pressure test result (lugeons) for depth interval shown			weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high			defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating		

Borehole No. **BH5**

Engineering Log - Borehole

Sheet 1 of 7
Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **22.10.2007**

Principal:

Date completed: **22.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **WESTERN EXTENT OF PROPOSED QUARRY**

Checked by:

drill model and mounting: P120 CANTER 4wd Easting: 531105 slope: -90° R.L. Surface: 47.2
hole diameter: 100 mm Northing 6797994 bearing: datum: AHD

drilling information							material substance												
method	penetration			support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material soil type: plasticity or particle characteristics, colour, secondary and minor components.	moisture condition	consistency/ density index	pocket penetro- kPa	structure and additional observations				
TCAD	1	2	3				47			SP	SAND: fine to medium grained, red/brown to orange/brown, traces of fine to coarse grained gravel and medium plasticity clay Trace of rootlets to 0.9 m.	M	L	100	200	300	400	RESIDUAL SOIL	
					C	SPT 10,25 N*=R	46	1		SC	Clayey SAND: fine to medium grained, orange/brown, clay is medium plasticity Borehole BH5 continued as cored hole		D					EXTREMELY WEATHERED SANDSTONE	
								2											
							45												
								3											
							44												
								4											
							43												
								5											
							42												
								6											
							41												
								7											
							40												
								8											

method	support	notes, samples, tests	classification symbols and soil description based on unified classification system	consistency/density index
AS auger screwing* AD auger drilling* RR roller/tricone W washbore CT cable tool HA hand auger DT diatube B blank bit V V bit T TC bit *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4  no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Engineering Log - Cored Borehole

Client: **CHAMPIONS QUARRY**

Principal:

Project: **RESOURCE ESTIMATE**

Borehole Location: **WESTERN EXTENT OF PROPOSED QUARRY**

Borehole No. **BH5**

Sheet 2 of 7

Project No: **GEOTALST01597AB**

Date started: **22.10.2007**

Date completed: **22.10.2007**

Logged by: **ALB**

Checked by:

drill model & mounting: P120 CANTER 4wd Easting: 531105 slope: -90° R.L. Surface: 47.2
hole diameter: 100 mm Drilling fluid: Northing: 6797994 bearing: datum: AHD

drilling information					material substance				rock mass defects				
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength	IS ₍₅₀₎ MPa D- diam- etral A- axial	RQD %	defect spacing mm	defect description type, inclination, planarity, roughness, coating, thickness	
								VL L M H VH EH			30 100 300 1000 3000	particular	general
			47										
			46	1		Continued from non-cored borehole							
NMLC			45	2		SANDSTONE: fine to medium grained, orange/brown, remoulds to medium plasticity clayey sand, indistinctly bedded	XW		D A 0.02 0.02	0			
			44	3		SANDSTONE: fine to medium grained, orange and pale grey, distinctly bedded	HW		D A 0.09 0.07	60			
			43	4					D A 0.01 0.01	45		JT, 39°, IR, RO, CO, Clay	
			42	5					D A 0.09 0.15	84		SM, 61°, PL, SO, Clay, 10 mm	
			41	6					D A 0.14 0.13	100		SM, 10°, PL, SO, Clay, 50 mm	
			40	7									
				8									

method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core	core-lift  casing used  barrel withdrawn graphic log/core recovery  core recovered - graphic symbols indicate material  no core recovered	water  10/1/98 water level on date shown  water inflow  partial drill fluid loss  complete drill fluid loss  water pressure test result (lugeons) for depth interval shown	weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high	defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating
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Engineering Log - Cored Borehole

Client: **CHAMPIONS QUARRY**

Principal:

Project: **RESOURCE ESTIMATE**

Borehole Location: **WESTERN EXTENT OF PROPOSED QUARRY**

Borehole No. **BH5**

Sheet 3 of 7

Project No: **GEOTALST01597AB**

Date started: **22.10.2007**

Date completed: **22.10.2007**

Logged by: **ALB**

Checked by:

drill model & mounting: P120 CANTER 4wd		Easting: 531105		slope: -90°		R.L. Surface: 47.2								
hole diameter: 100 mm		Drilling fluid:		Northing: 6797994		bearing: datum: AHD								
drilling information			material substance			rock mass defects								
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength VL L M H VH EH IS ₅₀ MPa D- diam- A- axial	RQD % 30 100 300 1000 3000	defect spacing mm	defect description type, inclination, planarity, roughness, coating, thickness			
NMLC			39			SANDSTONE: fine to medium grained, orange and pale grey, distinctly bedded (continued)	HW		100		SM, 14°, PL, SO, Clay, 10 mm			
			38	9				D 0.02 A 0.03			SM, 10°, PL, RO, Coal, 3 mm			
			37	10					96		SM, 5°, PL, SO, Clay, 5 mm			
			36	11		SANDSTONE: fine to coarse grained, orange/brown to pale grey, distinctly bedded, traces of coal and conglomerate interbeds to 12.9 m	MW	D 0.34 A 0.29			SM, 8°, UN, SO, Coal, 4 mm			
			35	12		50 mm pyrite vein at 12.15 m.	SW	D 3.91 A 3.06			SM, 5°, UN, SO, Coal, 4 mm			
			34	13		150 mm wide siltstone bed at 12.7 m.		D 2.9 A 2.91	98		SM, 10°, PL, SO, Clay, 80 mm			
			33	14		SANDSTONE: fine to medium grained, pale grey, distinctly bedded								
			32	15				D 2.56 A 3.02	97					
			16											
method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core			core-lift  casing used  barrel withdrawn graphic log/core recovery  core recovered  - graphic symbols indicate material  no core recovered			water  10/1/98 water level on date shown  water inflow  partial drill fluid loss  complete drill fluid loss  water pressure test result (lugeons) for depth interval shown			weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high			defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating		

General: PT, 5-13°, PL, RO, CN

Borehole No. **BH5**

Engineering Log - Cored Borehole

Sheet 4 of 7

Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **22.10.2007**

Principal:

Date completed: **22.10.2007**Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **WESTERN EXTENT OF PROPOSED QUARRY**

Checked by:

drill model & mounting:P120 CANTER 4wd						Easting: 531105		slope: -90°		R.L. Surface: 47.2										
hole diameter: 100 mm Drilling fluid:						Northing: 6797994		bearing:		datum: AHD										
drilling information						material substance				rock mass defects										
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength					Is ₍₅₀₎ MPa D- diam- etral A- axial	defect spacing mm	defect description					
								VL	L	M	H	VH			EH	RQD %	30	100	300	1000
NMLC			31			SANDSTONE: fine to medium grained, pale grey, distinctly bedded (continued)	SW													
			17			Fine to medium grained from 16.9 m.														
			30				FR													
			18																	
			29																	
			19																	
			28																	
			20																	
			27																	
			21																	
			26																	
			22																	
			25																	
			23																	
			24																	
			24																	
method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core						core-lift casing used barrel withdrawn graphic log/core recovery core recovered - graphic symbols indicate material no core recovered		water 10/1/98 water level on date shown water inflow partial drill fluid loss complete drill fluid loss water pressure test result (lugeons) for depth interval shown		weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high		defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating								

Borehole No. **BH5**

Engineering Log - Cored Borehole

Sheet 5 of 7
Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **22.10.2007**

Principal:

Date completed: **22.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **WESTERN EXTENT OF PROPOSED QUARRY**

Checked by:

drill model & mounting: P120 CANTER 4wd		Easting: 531105		slope: -90°		R.L. Surface: 47.2											
hole diameter: 100 mm		Drilling fluid:		Northing: 6797994		bearing: datum: AHD											
drilling information			material substance				rock mass defects										
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength				IS ₅₀ MPa D- diam- etral A- axial	RQD %	defect spacing mm	defect description type, inclination, planarity, roughness, coating, thickness		
								VL	L	M	H					VH	EH
NMLC			23			SANDSTONE: fine to medium grained, pale grey, distinctly bedded (<i>continued</i>)	FR										
			25														
			22														
			26														
			21														
			27														
			20														
			28			20 mm wide pyrite vein at 27.5 m.											
			19			SILTSTONE: dark grey to grey, laminated with some 20 mm to 100 mm wide fine grained sandstone interbeds, Anisotropic strength: VH strength perpendicular to bedding, L parallel to bedding	SW										
			28														
			29														
			30														
		17															
		31															
		16				SANDSTONE: fine to medium grained, grey to pale grey, distinctly bedded, with 20-100 mm wide siltstone interbeds											
		32															

method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core	core-lift  casing used  barrel withdrawn graphic log/core recovery  core recovered  - graphic symbols indicate material  no core recovered	water  10/1/98 water level on date shown  water inflow  partial drill fluid loss  complete drill fluid loss  water pressure test result (lugeons) for depth interval shown	weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high	defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular	roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating
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Engineering Log - Cored Borehole

Client: **CHAMPIONS QUARRY**

Principal:

Project: **RESOURCE ESTIMATE**

Borehole Location: **WESTERN EXTENT OF PROPOSED QUARRY**

Borehole No. **BH5**

Sheet 6 of 7

Project No: **GEOTALST01597AB**

Date started: **22.10.2007**

Date completed: **22.10.2007**

Logged by: **ALB**

Checked by:

drill model & mounting: P120 CANTER 4wd Easting: 531105 slope: -90° R.L. Surface: 47.2
hole diameter: 100 mm Drilling fluid: Northing: 6797994 bearing: datum: AHD

drilling information					material substance					rock mass defects							
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength					Is ₍₅₀₎ MPa D- diam- etral A- axial	RQD %	defect spacing mm	defect description	
								VL	L	M	H	VH				EH	particular
NMLC			15			SANDSTONE: fine to medium grained, grey to pale grey, distinctly bedded, with 20-100 mm wide siltstone interbeds <i>(continued)</i>								100			
				33		SANDSTONE: fine to coarse grained, pale grey, distinctly bedded						D A 2.56 4.48					
			14														
				34										100			
			13			Colour change to pale orange and pale grey at 34.5-35.4 m.	MW					D A 3.58 3.65					
			12			Colour change to pale grey at 35.4 m.	SW										
				36								D A 2.9 2.97				JT, 65°, PL, RO, SN, Fe	
			11														
				37									D A 4.25 3.52	100			
			10														
			38														
		9															
			39									D A 1.33 2.63	99			JT, 17°, IR, RO, SN, Fe	
		8															
			40														

General: PT, 5-13°, PL, RO, CN

method	core-lift	water	weathering	defect type	roughness
DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core	casing used barrel withdrawn graphic log/core recovery core recovered - graphic symbols indicate material no core recovered	10/1/98 water level on date shown water inflow partial drill fluid loss complete drill fluid loss water pressure test result (lugeons) for depth interval shown	FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high	JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular	VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating

Borehole No. **BH5**

Engineering Log - Cored Borehole

Sheet 7 of 7

Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **22.10.2007**

Principal:

Date completed: **22.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **WESTERN EXTENT OF PROPOSED QUARRY**

Checked by:

drill model & mounting: P120 CANTER 4wd				Easting: 531105		slope: -90°		R.L. Surface: 47.2			
hole diameter: 100 mm Drilling fluid:				Northing: 6797994		bearing:		datum: AHD			
drilling information				material substance				rock mass defects			
method	core-lift	water	RL	depth metres	graphic log core recovery	material rock type; grain characteristics, colour, structure, minor components	weathering alteration	estimated strength	IS ₍₅₀₎ MPa D- diam- etral A- axial	defect spacing mm	defect description type, inclination, planarity, roughness, coating, thickness
NMLC			7	41		SANDSTONE: fine to coarse grained, pale grey, distinctly bedded (<i>continued</i>)	SW	VL L M H VH EH	D A 4.59 3.85	99	
			6						D A 3.91 4.82		
				42		BH5 terminated at 41.6 due to limit of required investigation. BH5 terminated at 41.6m					
				43							
				44							
				45							
				46							
				47							
				48							

method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core	core-lift  casing used  barrel withdrawn graphic log/core recovery  core recovered - graphic symbols indicate material  no core recovered	water  10/1/98 water level on date shown  water inflow  partial drill fluid loss  complete drill fluid loss  water pressure test result (lugeons) for depth interval shown	weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high	defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular	roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating
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Borehole No. **BH6**

Engineering Log - Borehole

Sheet 1 of 4

Project No: **GEOTALST01597AB**

Client: **CHAMPIONS QUARRY**

Date started: **22.10.2007**

Principal:

Date completed: **22.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **SOUTHERN EXTENT OF PROPOSED QUARRY**

Checked by:

drill model and mounting: JACRO 6WD Easting: 531450 slope: -90° R.L. Surface: 29.2
hole diameter: 100 mm Northing 6797729 bearing: datum: AHD

drilling information					material substance									
method	penetration	support	water	notes samples, tests, etc	RL	depth metres	graphic log	classification symbol	material	moisture condition	consistency/ density index	pocket penetro- meter kPa	structure and additional observations	
TCAD	1 2 3	CM			29	1		SP	TOPSOIL: Sand, fine to medium grained. grey to dark grey, with trace of organics and rootlets	M	L		TOPSOIL, COLLUVIAL	
					28	2			Traces of clay from 0.8 m.					
					27	3			Borehole BH6 continued as cored hole					
					26	4								
					25	5								
					24	6								
					23	7								
					22	8								

method	support	notes, samples, tests	classification symbols and soil description	consistency/density index
AS AD RR W CT HA DT B V T *bit shown by suffix e.g. ADT	M mud C casing penetration 1 2 3 4 no resistance ranging to refusal water 10/1/98 water level on date shown water inflow water outflow	U ₅₀ undisturbed sample 50mm diameter U ₆₃ undisturbed sample 63mm diameter D disturbed sample N standard penetration test (SPT) N* SPT - sample recovered Nc SPT with solid cone V vane shear (kPa) P pressuremeter Bs bulk sample E environmental sample R refusal	based on unified classification system moisture D dry M moist W wet Wp plastic limit WL liquid limit	VS very soft S soft F firm St stiff VSt very stiff H hard Fb friable VL very loose L loose MD medium dense D dense VD very dense

Borehole No. **BH6**

Sheet 4 of 4

Project No: **GEOTALST01597AB**

Engineering Log - Cored Borehole

Client: **CHAMPIONS QUARRY**

Date started: **22.10.2007**

Principal:

Date completed: **22.10.2007**

Project: **RESOURCE ESTIMATE**

Logged by: **ALB**

Borehole Location: **SOUTHERN EXTENT OF PROPOSED QUARRY**

Checked by:

drill model & mounting: JACRO 6WD		Easting: 531450		slope: -90°		R.L. Surface: 29.2	
hole diameter: 100 mm		Drilling fluid:		Northing: 6797729		bearing: datum: AHD	
drilling information				material substance		rock mass defects	
method	core-lift	water	RL	depth metres	material	weathering alteration	defect description
					rock type; grain characteristics, colour, structure, minor components		type, inclination, planarity, roughness, coating, thickness
						estimated strength	
						IS ₍₅₀₎ MPa	
						D- diam- A- axial	
						RQD %	
						defect spacing mm	
							particular
							general
NMLC			13		SANDSTONE: fine to coarse grained, pale brown and orange to grey, distinctly bedded (<i>continued</i>)	SW	
			17				
			12		Colour change to orange at 17.2-17.9 m.		
			18			FR	
			11				
			19				
			10		2 x 60 mm width siltstone beds at 19.5 m and 19.8 m.		
			20				
			9				
			21				
			8				
			22		BH6 terminated at 21.95 m due to limit of required investigation. BH6 terminated at 21.95m		
			7				
			23				
			6				
			24				

method DT diatube AS auger screwing AD auger drilling RR roller/tricone CB claw or blade bit NMLC NMLC core NQ, HQ, PQ wireline core	core-lift  casing used  barrel withdrawn graphic log/core recovery  core recovered - graphic symbols indicate material  no core recovered	water  10/1/98 water level on date shown  water inflow  partial drill fluid loss  complete drill fluid loss  water pressure test result (lugeons) for depth interval shown	weathering FR fresh SW slightly weathered MW moderately weathered HW highly weathered XW extremely weathered DW distinctly weathered (covers MW and HW) strength VL very low L low M medium H high VH very high EH extremely high	defect type JT joint PT parting SM seam SZ sheared zone SS sheared surface CS crushed seam planarity PL planar CU curved UN undulating ST stepped IR irregular	roughness VR very rough RO rough SO smooth SL slickensided coating CN clean SN stained VN veneer CO coating
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Annex D

Summary Groundwater Level Gauging Data

GEOTALST01597AB**Champion's Quarry***Borehole Completion Details*

Borehole	GPS to WGS1984 UTM 56J		Date Commenced	Date completed	Surface Level (AHD)	Rotary Drilling Depth		Rock Coring Depth		Standing Water Level Depth (m)	Measurement Date	Notes	Piezometer Installed?
	m E	m N				Start (m)	End (m)	Start (m)	End (m)				
BH1	531336	6798300	12/10/2007	12/10/2007	29.3	0.0	1.0	1.0	20.3	10.8 10.45	15/10/2007 8:30 23/10/2007	level during drilling level at completion of drilling program	No
BH2	531199	6798403	15/10/2007	15/10/2007	28.7	0.0	1.0	1.0	20.3	3.2 3.3 1.2	16/10/2007 8:30 23/10/2007 18/01/2008	level during drilling level at completion of drilling program level following significant January rainfalls	Piezo to 20m, Slotted and Filtersock 14m-20m, Sand backfilled, Bentonite Plug from 0m - 0.5m
BH3	531657	6797945	16/10/2007	16/10/2007	36.2	0.0	1.2	1.2	21.7	4.8 10.33 7.3	17/10/2007 23/10/2007 18/01/2008	level during drilling level at completion of drilling program level following significant January rainfalls	Piezo to 21.5m, Slotted and Filtersock 15.5m-21.5m, Sand backfilled, Bentonite Plug from 0m - 0.5m
BH4	531440	6797931	17/10/2007	19/10/2007	50.2	0.0	1.0	1.0	42.3	3.8 9.55 9.41 9.52 2.7	18/10/2007 8:30 19/10/2007 8:30 22/10/2007 10:00 23/10/2007 18/01/2008	level during drilling level during drilling level 3 days after drilling hole finished level at completion of drilling program level following significant January rainfalls	No
BH5	531105	6797994	22/10/2007	23/10/2007	49.2	0.0	1.3	1.3	41.6	4.8 5.8 6.4	23/10/2007 15:30 23/10/2007 8:00 18/01/2008	level at completion of drilling program, note level rising during day so levels thought to be unreliable. level following significant January rainfalls	Piezo to 41.6m, Slotted and Filtersock 35.6m-41.6m, Sand backfilled, Bentonite Plug from 0m - 0.5m
BH6	531450	6797729	22/10/2007	22/10/2007	29.2	0.0	1.0	1.0	22.0	17.8 1.1	23/10/2007 10:30 18/01/2008	level at completion of drilling, but likely affected by drill water level following significant January rainfalls	Piezo to 22.0m, Slotted and Filtersock 16m-22m, Sand backfilled, Bentonite Plug from 0m - 0.5m

Annex E

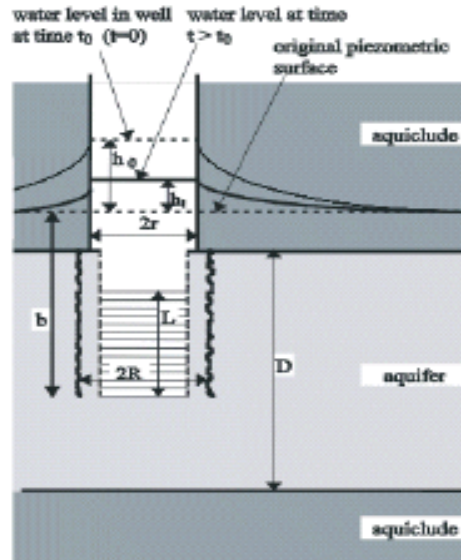
Rising Head Test Data

Bouwer-Rice Slug Test (unconfined or leaky confined, full or partially penetrating well)

The Bouwer-Rice (1976) slug test is designed to estimate the hydraulic conductivity of an aquifer. With the slug test, the portion of the aquifer “tested” for hydraulic conductivity is small compared to a pumping test, and is limited to a cylindrical area of small radius (r) immediately around the well screen.

In a slug test, a solid “slug” is lowered into the piezometer, instantaneously raising the water level in the piezometer. The test can also be conducted in the opposite manner by instantaneously removing a “slug” or volume of water (bail test).

The solution is appropriate for the conditions shown in the figure below.



Bouwer-Rice (1976) developed an equation for hydraulic conductivity as follows:

$$K = \frac{r^2 \ln\left(\frac{R_{corr}}{R}\right)}{2L} \cdot \frac{1}{t} \cdot \ln\left(\frac{h_e}{h_r}\right)$$

where:

r = piezometer radius (or r_{eff} if water level change is within the screened interval)

R = radius measured from centre of well to undisturbed aquifer material

R_{cont} = contributing radial distance over which the difference in head, h_0 , is dissipated in the aquifer

L = the length of the screen

h_t = displacement as a function of time (h_t/h_0 must always be less than zero, i.e. water level must always approach the static water level as time increases)

h_0 = initial displacement

Since the contributing radius (R_{cont}) of the aquifer is seldom known, Bouwer-Rice developed empirical curves to account for this radius by three coefficients (A, B, C) which are all functions of the ratio of L/R . Coefficients A and B are used for partially penetrating wells, and coefficient C is used only for fully penetrating wells.

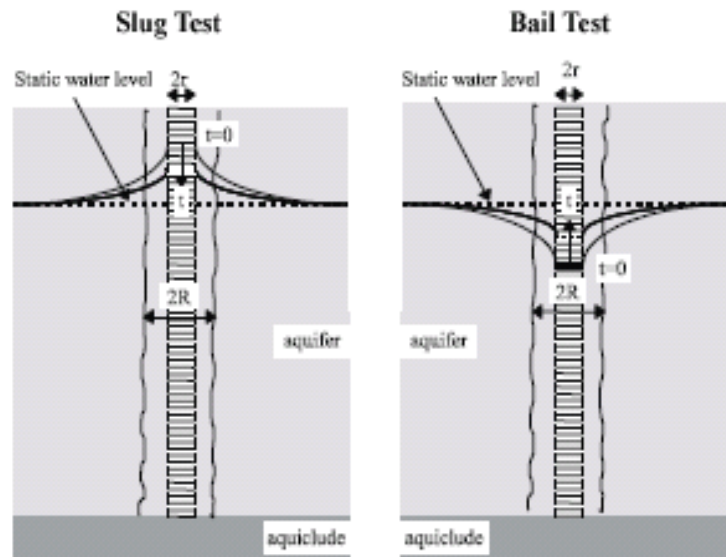
The data are plotted with time on a linear X axis and h_t/h_0 on a logarithmic Y axis.

The effective piezometer radius, r , should be specified as the radius of the piezometer, unless the water level falls within the screened portion of the aquifer during the slug test.

If the water level is in the well screen, the effective radius may be calculated as follows:

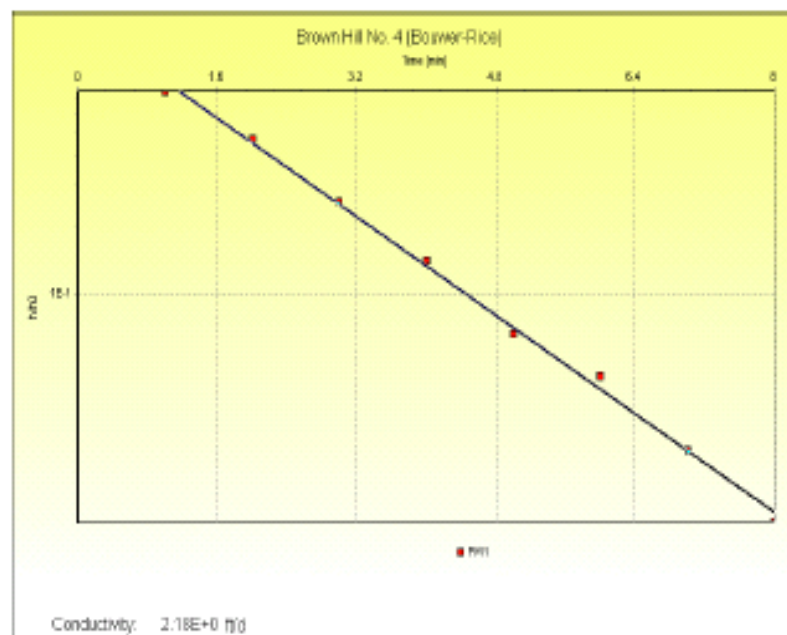
$$r_{\text{eff}} = \left[r^2 (1 - n) + nR^2 \right]^{1/2}$$

where n is the porosity of the gravel pack around the well screen.



In cases where the water level drops within the screened interval, the plot of h/h_0 vs. t will often have an initial slope and a shallower slope at later time. In this case, the fit should be obtained for the second straight line portion (Bouwer, 1989).

An example of a Bouwer-Rice analysis graph has been included below:



The Bouwer-Rice solution assumes the following:

- Unconfined or leaky-confined aquifer (with vertical drainage from above) of “apparently” infinite extent
- Homogeneous, isotropic aquifer of uniform thickness
- Water table is horizontal prior to the test
- Instantaneous change in head at start of test
- Inertia of water column and non-linear well losses are negligible
- Fully or partially penetrating well
- The well storage is not negligible, thus it is taken into account.
- The flow to the well is in a steady state
- There is no flow above the water table

The data requirements for the Bouwer-Rice solution are:

- Drawdown / recovery vs. time data at a pumping well
- Observations beginning from time zero onward (the value recorded at $t=0$ is used as the initial displacement value, H_0 , by AquiferTest and thus it must be a non-zero value)

Hvorslev Slug Test (confined or unconfined aquifer, fully or partially penetrating well)

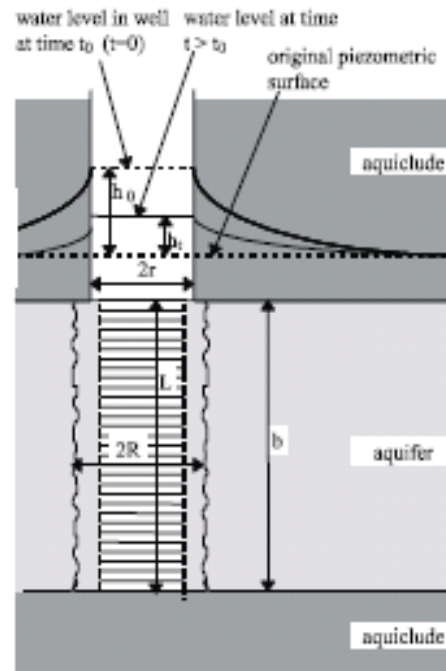
The Hvorslev (1951) slug test is designed to estimate the hydraulic conductivity of an aquifer. With the slug test, the portion of the aquifer “sampled” for hydraulic conductivity is small compared to a pumping test, and is limited to a cylindrical area of small radius (r) immediately around the well screen.

In a slug test, a solid “slug” is lowered into the piezometer, instantaneously raising the water level in the piezometer. In a bail test, water is removed, instantaneously lowering the water level in the piezometer.

The rate of inflow or outflow, q , at the piezometer tip at any time t is proportional to K of the soil and the unrecoverable head difference:

$$q(t) = \pi r^2 \frac{dh}{dt} = FK(H-h)$$

The following figure illustrates the mechanics of a slug test:



Hvorslev defined the *time lag*, T_L (the time required for the initial pressure change induced by the injection/extraction to dissipate, assuming a constant flow rate) as:

$$T_L = \frac{\pi r^2}{FK}$$

where:

r is the effective radius of the piezometer

F is a shape factor that depends on the dimensions of the piezometer intake (see Hvorslev (1951) for an explanation of shape factors)

K is the bulk hydraulic conductivity within the radius of influence

Substituting the time lag into the initial equation results in the following solution:

$$K = \frac{\pi r^2 \left(\ln \frac{h_t}{h_0} \right)}{F T_L}$$

where:

h_t is the displacement as a function of time

h_0 is initial displacement.

The field data are plotted with $\log h_t / h_0$ on the Y axis and time on the X axis. The value of T_L is taken as the time which corresponds to $h_t / h_0 = 0.37$, and K is determined from the equation above. Hvorslev evaluated F for the most common piezometers, where the length of the intake is greater than eight times the screen radius, and produced the following general solution for K :

$$K = \frac{r^2 \ln(L / R)}{2 L T_L}$$

where:

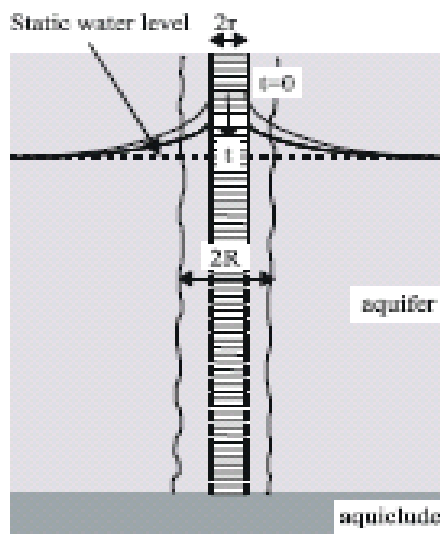
L is the screen length

R is the radius of the well including the gravel pack

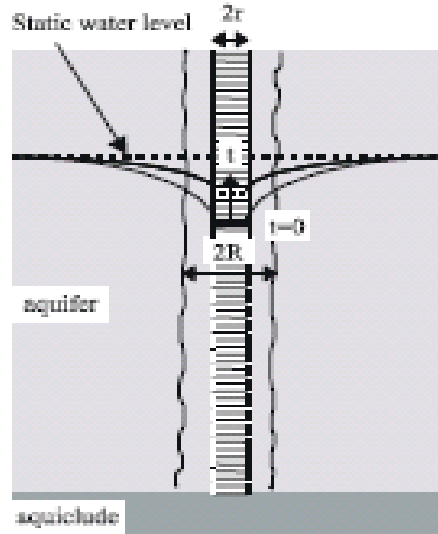
T_L is the time lag when $h_t / h_0 = 0.37$

The effective piezometer radius, r , should be specified as the radius of the piezometer.

Slug Test

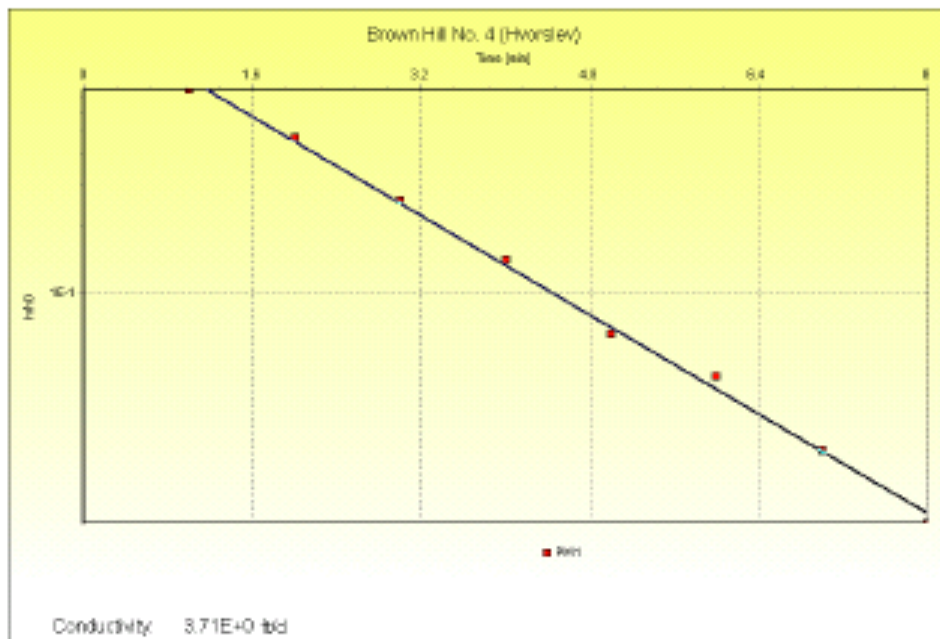


Bail Test



In cases where the water level drops within the screened interval, the plot of h_t/h_0 vs. t will often have an initial slope and a smaller slope at later time (known in the literature as the “double straight line effect”). In this case, you should manually fit the line to the second straight-line portion of the data (Bouwer, 1989). It is not necessary for the line to go through (0,0).

An example of a Hvorslev analysis graph has been included below:



The Hvorslev solution assumes the following:

- Non-leaky confined aquifer of “apparently” infinite extent
- Homogeneous, isotropic aquifer of uniform thickness
- Water table is horizontal prior to the test
- Instantaneous injection/withdrawal of a volume of water results in an instantaneous change in water level
- Inertia of water column and non-linear well losses are negligible
- Fully or partially penetrating well
- The well is considered to be of an infinitesimal width
- Flow is horizontal toward or away from the well

The data requirements for the Hvorslev solution are:

- Drawdown / recovery vs. time data at a pumping well
- Observations beginning from time zero onward (the observation at $t=0$ is taken as the initial displacement value, H_0 , and thus it must be a non-zero value)

Well ID	BH3
Description	Eastern
Piezo Details	
Total Well Depth	21.7m
Piezo Height above G.S.	0.86m
saturated aquifer thickness	10.33

Date	Time	Elapsed time (s)	GWL (m)	Change in Water level (m)	Comments	Inflow volume (L)	Inflow rate (L/hr)
2/4/2008	9:15		11.37				
2/4/2008	9:29	0.00	20.05	8.68	after pumping		
	9:30	60.00	19.54	8.17		1.099	65.96
	9:31	120.00	19.34	7.97		0.431	25.87
	9:32	180.00	19.07	7.7		0.582	34.92
	9:33	240.00	18.88	7.51		0.410	24.57
	9:34	300.00	18.6	7.23		0.604	36.21
	9:35	360.00	18.43	7.06		0.366	21.99
	9:36	420.00	18.2	6.83		0.496	29.74
	9:37	480.00	17.96	6.59		0.517	31.04
	9:38	540.00	17.75	6.38		0.453	27.16
	9:39	600.00	17.55	6.18		0.431	25.87
	9:40	660.00	17.35	5.98		0.431	25.87
	9:41	720.00	17.17	5.8		0.388	23.28
	9:42	780.00	17	5.63		0.366	21.99
	9:43	840.00	16.84	5.47		0.345	20.69
	9:44	900.00	16.66	5.29		0.388	23.28
	9:45	960.00	16.52	5.15		0.302	18.11
	9:46	1020.00	16.34	4.97		0.388	23.28
	9:47	1080.00	16.15	4.78		0.410	24.57
	9:48	1140.00	15.96	4.59		0.410	24.57
	9:49	1200.00	15.79	4.42		0.366	21.99
	9:50	1260.00	15.66	4.29		0.280	16.81
	9:51	1320.00	15.53	4.16		0.280	16.81
	9:52	1380.00	15.39	4.02		0.302	18.11
	9:53	1440.00	15.27	3.9		0.259	15.52
	9:54	1500.00	15.13	3.76		0.302	18.11
	9:55	1560.00	15.03	3.66		0.216	12.93
	9:56	1620.00	14.9	3.53		0.280	16.81
	9:57	1680.00	14.81	3.44		0.194	11.64
	9:58	1740.00	14.7	3.33		0.237	14.23
	9:59	1800.00	14.59	3.22		0.237	14.23
	10:00	1860.00	14.46	3.09		0.280	16.81
	10:01	1920.00	14.39	3.02		0.151	9.05
	10:02	1980.00	14.31	2.94		0.172	10.35
	10:03	2040.00	14.21	2.84		0.216	12.93
	10:04	2100.00	14.12	2.75		0.194	11.64
	10:05	2160.00	14.06	2.69		0.129	7.76
	10:06	2220.00	13.99	2.62		0.151	9.05
	10:07	2280.00	13.91	2.54		0.172	10.35
	10:08	2340.00	13.85	2.48		0.129	7.76
	10:09	2400.00	13.77	2.4		0.172	10.35
	10:10	2460.00	13.7	2.33		0.151	9.05
	10:11	2520.00	13.65	2.28		0.108	6.47
	10:12	2580.00	13.58	2.21		0.151	9.05
	10:13	2640.00	13.52	2.15		0.129	7.76
	10:14	2700.00	13.47	2.1		0.108	6.47
	10:15	2760.00	13.4	2.03		0.151	9.05
	10:16	2820.00	13.35	1.98		0.108	6.47
	10:17	2880.00	13.31	1.94		0.086	5.17
	10:18	2940.00	13.28	1.91		0.065	3.88
	10:19	3000.00	13.24	1.87		0.086	5.17
	10:20	3060.00	13.18	1.81		0.129	7.76
	10:21	3120.00	13.11	1.74		0.151	9.05
	10:22	3180.00	13.06	1.69		0.108	6.47
	10:23	3240.00	13.02	1.65		0.086	5.17
	10:24	3300.00	12.97	1.6		0.108	6.47
	10:25	3360.00	12.91	1.54		0.129	7.76
	10:26	3420.00	12.85	1.48		0.129	7.76
	10:27	3480.00	12.79	1.42		0.129	7.76
	10:28	3540.00	12.75	1.38		0.086	5.17
	10:29	3600.00	12.72	1.35		0.065	3.88
	10:30	3660.00	12.69	1.32		0.065	3.88
	10:31	3720.00	12.66	1.29		0.065	3.88
	10:32	3780.00	12.63	1.26		0.065	3.88
	10:33	3840.00	12.6	1.23		0.065	3.88
	10:34	3900.00	12.58	1.21		0.043	2.59
	10:35	3960.00	12.56	1.19		0.043	2.59
	10:36	4020.00	12.54	1.17		0.043	2.59
	10:37	4080.00	12.51	1.14		0.065	3.88
	10:38	4140.00	12.49	1.12		0.043	2.59
	10:39	4200.00	12.47	1.1		0.043	2.59

10:40	4260.00	12.45	1.08	0.043	2.59
10:41	4320.00	12.43	1.06	0.043	2.59
10:42	4380.00	12.4	1.03	0.065	3.88
10:43	4440.00	12.38	1.01	0.043	2.59
10:44	4500.00	12.36	0.99	0.043	2.59
10:45	4560.00	12.34	0.97	0.043	2.59
10:46	4620.00	12.32	0.95	0.043	2.59
10:47	4680.00	12.31	0.94	0.022	1.29
10:48	4740.00	12.29	0.92	0.043	2.59
10:49	4800.00	12.27	0.9	0.043	2.59
10:50	4860.00	12.25	0.88	0.043	2.59
10:51	4920.00	12.23	0.86	0.043	2.59
10:52	4980.00	12.22	0.85	0.022	1.29
10:53	5040.00	12.2	0.83	0.043	2.59
10:54	5100.00	12.19	0.82	0.022	1.29
10:55	5160.00	12.18	0.81	0.022	1.29
10:56	5220.00	12.16	0.79	0.043	2.59
10:57	5280.00	12.14	0.77	0.043	2.59
10:58	5340.00	12.13	0.76	0.022	1.29
10:59	5400.00	12.12	0.75	0.022	1.29
11:00	5460.00	12.11	0.74	0.022	1.29
11:01	5520.00	12.1	0.73	0.022	1.29
11:02	5580.00	12.09	0.72	0.022	1.29
11:03	5640.00	12.08	0.71	0.022	1.29
11:04	5700.00	12.07	0.7	0.022	1.29
11:05	5760.00	12.06	0.69	0.022	1.29
11:06	5820.00	12.05	0.68	0.022	1.29
11:07	5880.00	12.04	0.67	0.022	1.29
11:08	5940.00	12.03	0.66	0.022	1.29
11:09	6000.00	12.02	0.65	0.022	1.29
11:10	6060.00	12.01	0.64	0.022	1.29
11:11	6120.00	12	0.63	0.022	1.29
11:12	6180.00	11.99	0.62	0.022	1.29
11:13	6240.00	11.98	0.61	0.022	1.29
11:14	6300.00	11.97	0.6	0.022	1.29
11:15	6360.00	11.96	0.59	0.022	1.29
11:16	6420.00	11.95	0.58	0.022	1.29
11:17	6480.00	11.94	0.57	0.022	1.29
11:18	6540.00	11.93	0.56	0.022	1.29
11:19	6600.00	11.92	0.55	0.022	1.29
11:20	6660.00	11.91	0.54	0.022	1.29
11:21	6720.00	11.9	0.53	0.022	1.29
11:22	6780.00	11.89	0.52	0.022	1.29
11:23	6840.00	11.88	0.51	0.022	1.29
11:24	6900.00	11.87	0.5	0.022	1.29
11:25	6960.00	11.86	0.49	0.022	1.29
11:26	7020.00	11.85	0.48	0.022	1.29
11:27	7080.00	11.84	0.47	0.022	1.29
11:28	7140.00	11.83	0.46	0.022	1.29
11:29	7200.00	11.82	0.45	0.022	1.29
11:30	7260.00	11.81	0.44	0.022	1.29
11:31	7320.00	11.8	0.43	0.022	1.29
11:32	7380.00	11.79	0.42	0.022	1.29
11:33	7440.00	11.78	0.41	0.022	1.29
11:34	7500.00	11.78	0.41	0.000	0.00
11:35	7560.00	11.77	0.4	0.022	1.29
11:36	7620.00	11.77	0.4	0.000	0.00
11:37	7680.00	11.76	0.39	0.022	1.29
11:38	7740.00	11.76	0.39	0.000	0.00
11:39	7800.00	11.75	0.38	0.022	1.29
11:40	7860.00	11.75	0.38	0.000	0.00
11:41	7920.00	11.74	0.37	0.022	1.29
11:42	7980.00	11.74	0.37	0.000	0.00
11:43	8040.00	11.73	0.36	0.022	1.29
11:44	8100.00	11.73	0.36	0.000	0.00
11:45	8160.00	11.72	0.35	0.022	1.29
11:46	8220.00	11.72	0.35	0.000	0.00
11:47	8280.00	11.71	0.34	0.022	1.29
11:48	8340.00	11.71	0.34	0.000	0.00
11:49	8400.00	11.7	0.33	0.022	1.29
11:50	8460.00	11.7	0.33	0.000	0.00
11:51	8520.00	11.69	0.32	0.022	1.29
11:52	8580.00	11.69	0.32	0.000	0.00
11:53	8640.00	11.69	0.32	0.000	0.00
11:54	8700.00	11.68	0.31	0.022	1.29
11:55	8760.00	11.68	0.31	0.000	0.00
11:56	8820.00	11.68	0.31	0.000	0.00
11:57	8880.00	11.67	0.3	0.022	1.29
11:58	8940.00	11.67	0.3	0.000	0.00
11:59	9000.00	11.67	0.3	0.000	0.00

Average 7.22

Hydraulic Testing Field Form

Well ID
Description
Piezo Details
Total Well Depth
Piezo Height above G.S.
saturated aquifer thickness

BH5
Western
41.6m
0.8m
35.02

Date	Time	Elapsed time (s)	GWL (m)	Change in Water level (m)	Comments	Inflow volume (L)	Inflow rate (L/hr)
2/4/2008	13:33		6.58				
2/4/2008	13:48	0.00	18.84	12.26	after pumping		
	13:49	60.00	18.51	11.93		0.711	42.68
	13:50	120.00	18.23	11.65		0.604	36.21
	13:51	180.00	17.92	11.34		0.668	40.09
	13:52	240.00	17.77	11.19		0.323	19.40
	13:53	300.00	17.65	11.07		0.259	15.52
	13:54	360.00	17.52	10.94		0.280	16.81
	13:55	420.00	17.38	10.8		0.302	18.11
	13:56	480.00	17.22	10.64		0.345	20.69
	13:57	540.00	17.09	10.51		0.280	16.81
	13:58	600.00	16.96	10.38		0.280	16.81
	13:59	660.00	16.83	10.25		0.280	16.81
	14:00	720.00	16.71	10.13		0.259	15.52
	14:01	780.00	16.57	9.99		0.302	18.11
	14:02	840.00	16.46	9.88		0.237	14.23
	14:03	900.00	16.36	9.78		0.216	12.93
	14:04	960.00	16.26	9.68		0.216	12.93
	14:05	1020.00	16.16	9.58		0.216	12.93
	14:06	1080.00	16.05	9.47		0.237	14.23
	14:07	1140.00	15.94	9.36		0.237	14.23
	14:08	1200.00	15.83	9.25		0.237	14.23
	14:09	1260.00	15.73	9.15		0.216	12.93
	14:10	1320.00	15.62	9.04		0.237	14.23
	14:11	1380.00	15.52	8.94		0.216	12.93
	14:12	1440.00	15.47	8.89		0.108	6.47
	14:13	1500.00	15.3	8.72		0.366	21.99
	14:14	1560.00	15.2	8.62		0.216	12.93
	14:15	1620.00	15.1	8.52		0.216	12.93
	14:16	1680.00	15	8.42		0.216	12.93
	14:17	1740.00	14.9	8.32		0.216	12.93
	14:18	1800.00	14.81	8.23		0.194	11.64
	14:19	1860.00	14.72	8.14		0.194	11.64
	14:20	1920.00	14.63	8.05		0.194	11.64
	14:21	1980.00	14.54	7.96		0.194	11.64
	14:22	2040.00	14.45	7.87		0.194	11.64
	14:23	2100.00	14.36	7.78		0.194	11.64
	14:24	2160.00	14.27	7.69		0.194	11.64
	14:25	2220.00	14.18	7.6		0.194	11.64
	14:26	2280.00	14.09	7.51		0.194	11.64
	14:27	2340.00	14	7.42		0.194	11.64
	14:28	2400.00	13.91	7.33		0.194	11.64
	14:29	2460.00	13.82	7.24		0.194	11.64
	14:30	2520.00	13.73	7.15		0.194	11.64
	14:31	2580.00	13.65	7.07		0.172	10.35
	14:32	2640.00	13.57	6.99		0.172	10.35
	14:33	2700.00	13.49	6.91		0.172	10.35
	14:34	2760.00	13.41	6.83		0.172	10.35
	14:35	2820.00	13.33	6.75		0.172	10.35
	14:36	2880.00	13.25	6.67		0.172	10.35
	14:37	2940.00	13.17	6.59		0.172	10.35
	14:38	3000.00	13.09	6.51		0.172	10.35
	14:39	3060.00	13.01	6.43		0.172	10.35
	14:40	3120.00	12.92	6.34		0.194	11.64
	14:41	3180.00	12.83	6.25		0.194	11.64
	14:42	3240.00	12.74	6.16		0.194	11.64
	14:43	3300.00	12.65	6.07		0.194	11.64
	14:44	3360.00	12.58	6		0.151	9.05
	14:45	3420.00	12.5	5.92		0.172	10.35
	14:46	3480.00	12.45	5.87		0.108	6.47
	14:47	3540.00	12.37	5.79		0.172	10.35
	14:48	3600.00	12.31	5.73		0.129	7.76
	14:49	3660.00	12.21	5.63		0.216	12.93
	14:50	3720.00	12.16	5.58		0.108	6.47
	14:51	3780.00	12.09	5.51		0.151	9.05
	14:52	3840.00	12.02	5.44		0.151	9.05

14:53	3900.00	11.95	5.37	0.151	9.05
14:54	3960.00	11.87	5.29	0.172	10.35
14:55	4020.00	11.8	5.22	0.151	9.05
14:56	4080.00	11.73	5.15	0.151	9.05
14:57	4140.00	11.66	5.08	0.151	9.05
14:58	4200.00	11.59	5.01	0.151	9.05
14:59	4260.00	11.53	4.95	0.129	7.76
15:00	4320.00	11.47	4.89	0.129	7.76
15:01	4380.00	11.41	4.83	0.129	7.76
15:02	4440.00	11.36	4.78	0.108	6.47
15:03	4500.00	11.3	4.72	0.129	7.76
15:04	4560.00	11.24	4.66	0.129	7.76
15:05	4620.00	11.18	4.6	0.129	7.76
15:06	4680.00	11.12	4.54	0.129	7.76
15:07	4740.00	11.06	4.48	0.129	7.76
15:08	4800.00	11	4.42	0.129	7.76
15:09	4860.00	10.94	4.36	0.129	7.76
15:10	4920.00	10.88	4.3	0.129	7.76
15:11	4980.00	10.83	4.25	0.108	6.47
15:12	5040.00	10.77	4.19	0.129	7.76
15:13	5100.00	10.71	4.13	0.129	7.76
15:14	5160.00	10.66	4.08	0.108	6.47
15:15	5220.00	10.61	4.03	0.108	6.47
15:16	5280.00	10.55	3.97	0.129	7.76
15:17	5340.00	10.49	3.91	0.129	7.76
15:18	5400.00	10.44	3.86	0.108	6.47
15:19	5460.00	10.39	3.81	0.108	6.47
15:20	5520.00	10.34	3.76	0.108	6.47
17:44	5580.00	6.88	0.3	7.458	3.11
17:45	5640.00	6.87	0.29	0.022	1.29
17:46	5700.00	6.86	0.28	0.022	1.29
17:47	5760.00	6.85	0.27	0.022	1.29
17:48	5820.00	6.84	0.26	0.022	1.29
17:49	5880.00	6.83	0.25	0.022	1.29

Average 11.31

Hydraulic Testing Field Form

Well ID	BH6
Description	Southern
Piezo Details	
Total Well Depth	22.0m
Piezo Height above G.S.	1.17m
Saturated aquifer thickness	17.07

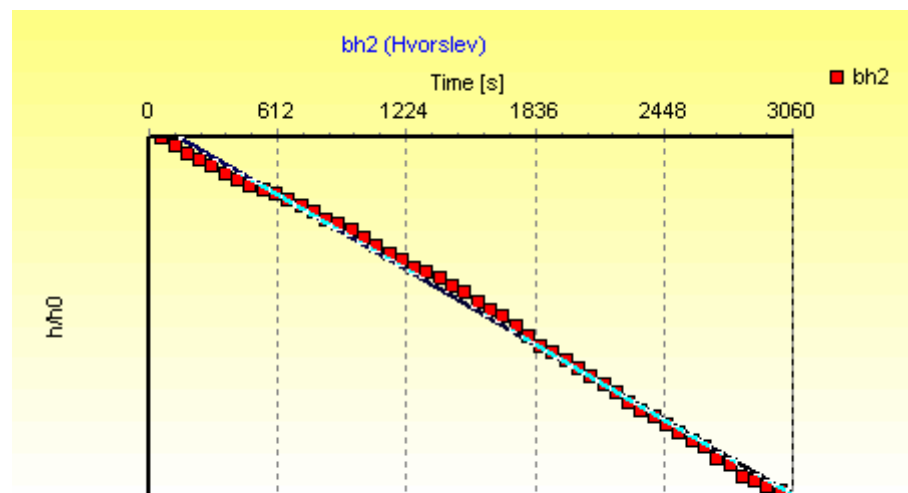
Date	Time	elapsed time (s)	GWL	Change in Water level (m)	Comments	Inflow volume (L)	Inflow rate (L/hr)
2/4/2008	11:05		4.93				
2/4/2008	11:20	0.00	22.23	17.3	after pumping		
	11:21	60.00	22.15	17.22		0.172	10.35
	11:22	120.00	22.10	17.17		0.108	6.47
	11:23	180.00	22.07	17.14		0.065	3.88
	11:24	240.00	22.03	17.1		0.086	5.17
	11:25	300.00	21.98	17.05		0.108	6.47
	11:26	360.00	21.95	17.02		0.065	3.88
	11:27	420.00	21.91	16.98		0.086	5.17
	11:28	480.00	21.88	16.95		0.065	3.88
	11:29	540.00	21.85	16.92		0.065	3.88
	11:30	600.00	21.82	16.89		0.065	3.88
	11:31	660.00	21.79	16.86		0.065	3.88
	11:32	720.00	21.76	16.83		0.065	3.88
	11:33	780.00	21.73	16.8		0.065	3.88
	11:34	840.00	21.71	16.78		0.043	2.59
	11:35	900.00	21.68	16.75		0.065	3.88
	11:36	960.00	21.65	16.72		0.065	3.88
	11:37	1020.00	21.62	16.69		0.065	3.88
	11:38	1080.00	21.59	16.66		0.065	3.88
	11:39	1140.00	21.56	16.63		0.065	3.88
	11:40	1200.00	21.52	16.59		0.086	5.17
	11:41	1260.00	21.48	16.55		0.086	5.17
	11:42	1320.00	21.45	16.52		0.065	3.88
	11:43	1380.00	21.43	16.5		0.043	2.59
	11:44	1440.00	21.41	16.48		0.043	2.59
	11:45	1500.00	21.39	16.46		0.043	2.59
	11:46	1560.00	21.36	16.43		0.065	3.88
	11:47	1620.00	21.34	16.41		0.043	2.59
	11:48	1680.00	21.31	16.38		0.065	3.88
	11:49	1740.00	21.28	16.35		0.065	3.88
	11:50	1800.00	21.25	16.32		0.065	3.88
	11:51	1860.00	21.22	16.29		0.065	3.88
	11:52	1920.00	21.19	16.26		0.065	3.88
	11:53	1980.00	21.16	16.23		0.065	3.88
	11:54	2040.00	21.14	16.21		0.043	2.59
	11:55	2100.00	21.11	16.18		0.065	3.88
	11:56	2160.00	21.08	16.15		0.065	3.88
	11:57	2220.00	21.05	16.12		0.065	3.88
	11:58	2280.00	21.02	16.09		0.065	3.88
	11:59	2340.00	20.99	16.06		0.065	3.88
	12:00	2400.00	20.96	16.03		0.065	3.88
	12:01	2460.00	20.93	16		0.065	3.88
	12:02	2520.00	20.90	15.97		0.065	3.88
	12:03	2580.00	20.87	15.94		0.065	3.88
	12:04	2640.00	20.85	15.92		0.043	2.59
	12:05	2700.00	20.83	15.9		0.043	2.59
	12:06	2760.00	20.80	15.87		0.065	3.88
	12:07	2820.00	20.77	15.84		0.065	3.88
	12:08	2880.00	20.74	15.81		0.065	3.88
	12:09	2940.00	20.71	15.78		0.065	3.88
	12:10	3000.00	20.68	15.75		0.065	3.88
	12:11	3060.00	20.65	15.72		0.065	3.88
	12:12	3120.00	20.62	15.69		0.065	3.88
	12:13	3180.00	20.60	15.67		0.043	2.59
	12:14	3240.00	20.57	15.64		0.065	3.88
	12:15	3300.00	20.55	15.62		0.043	2.59
	12:16	3360.00	20.52	15.59		0.065	3.88
	12:17	3420.00	20.49	15.56		0.065	3.88
	12:18	3480.00	20.46	15.53		0.065	3.88
	12:19	3540.00	20.43	15.5		0.065	3.88
	12:20	3600.00	20.40	15.47		0.065	3.88
	12:21	3660.00	20.37	15.44		0.065	3.88
	12:22	3720.00	20.34	15.41		0.065	3.88
	12:23	3780.00	20.31	15.38		0.065	3.88
	12:24	3840.00	20.28	15.35		0.065	3.88

12:25	3900.00	20.25	15.32	0.065	3.88
12:26	3960.00	20.22	15.29	0.065	3.88
12:27	4020.00	20.19	15.26	0.065	3.88
12:28	4080.00	20.16	15.23	0.065	3.88
12:29	4140.00	20.13	15.2	0.065	3.88
12:30	4200.00	20.10	15.17	0.065	3.88
12:31	4260.00	20.07	15.14	0.065	3.88
12:32	4320.00	20.04	15.11	0.065	3.88
12:33	4380.00	20.01	15.08	0.065	3.88
12:34	4440.00	19.97	15.04	0.086	5.17
12:35	4500.00	19.94	15.01	0.065	3.88
12:36	4560.00	19.91	14.98	0.065	3.88
12:37	4620.00	19.88	14.95	0.065	3.88
12:38	4680.00	19.85	14.92	0.065	3.88
12:39	4740.00	19.82	14.89	0.065	3.88
12:40	4800.00	19.79	14.86	0.065	3.88
12:41	4860.00	19.76	14.83	0.065	3.88
12:42	4920.00	19.73	14.8	0.065	3.88
12:43	4980.00	19.70	14.77	0.065	3.88
12:44	5040.00	19.67	14.74	0.065	3.88
12:45	5100.00	19.64	14.71	0.065	3.88
12:46	5160.00	19.61	14.68	0.065	3.88
12:47	5220.00	19.58	14.65	0.065	3.88
12:48	5280.00	19.55	14.62	0.065	3.88
12:49	5340.00	19.52	14.59	0.065	3.88
12:50	5400.00	19.49	14.56	0.065	3.88
12:51	5460.00	19.46	14.53	0.065	3.88
12:52	5520.00	19.43	14.5	0.065	3.88
12:53	5580.00	19.40	14.47	0.065	3.88
12:54	5640.00	19.37	14.44	0.065	3.88
12:55	5700.00	19.34	14.41	0.065	3.88
12:56	5760.00	19.31	14.38	0.065	3.88
12:57	5820.00	19.28	14.35	0.065	3.88
12:58	5880.00	19.25	14.32	0.065	3.88
12:59	5940.00	19.22	14.29	0.065	3.88
13:00	6000.00	19.19	14.26	0.065	3.88
13:01	6060.00	19.16	14.23	0.065	3.88
13:02	6120.00	19.13	14.2	0.065	3.88
13:03	6180.00	19.10	14.17	0.065	3.88
13:04	6240.00	19.07	14.14	0.065	3.88
13:05	6300.00	19.04	14.11	0.065	3.88
13:06	6360.00	19.01	14.08	0.065	3.88
13:07	6420.00	18.98	14.05	0.065	3.88
13:08	6480.00	18.95	14.02	0.065	3.88
13:09	6540.00	18.92	13.99	0.065	3.88
13:10	6600.00	18.89	13.96	0.065	3.88
13:11	6660.00	18.86	13.93	0.065	3.88
13:12	6720.00	18.83	13.9	0.065	3.88
13:13	6780.00	18.79	13.86	0.086	5.17
13:14	6840.00	18.76	13.83	0.065	3.88
13:15	6900.00	18.73	13.8	0.065	3.88
13:16	6960.00	18.70	13.77	0.065	3.88
13:17	7020.00	18.67	13.74	0.065	3.88
13:18	7080.00	18.64	13.71	0.065	3.88
13:19	7140.00	18.61	13.68	0.065	3.88
13:20	7200.00	18.58	13.65	0.065	3.88
13:21	7260.00	18.55	13.62	0.065	3.88
13:22	7320.00	18.51	13.58	0.086	5.17
13:23	7380.00	18.48	13.55	0.065	3.88
13:24	7440.00	18.45	13.52	0.065	3.88
15:26	7500.00	15.06	10.13	7.307	3.54
15:27	7560.00	15.04	10.11	0.043	2.59
15:28	7620.00	15.02	10.09	0.043	2.59
15:29	7680.00	15.00	10.07	0.043	2.59
15:30	7740.00	14.98	10.05	0.043	2.59
17:35	7800.00	12.18	7.25	6.035	2.90
17:36	7860.00	12.16	7.23	0.043	2.59
17:37	7920.00	12.14	7.21	0.043	2.59
17:38	7980.00	12.13	7.2	0.022	1.29
17:39	8040.00	12.11	7.18	0.043	2.59
17:40	8100.00	12.10	7.17	0.022	1.29

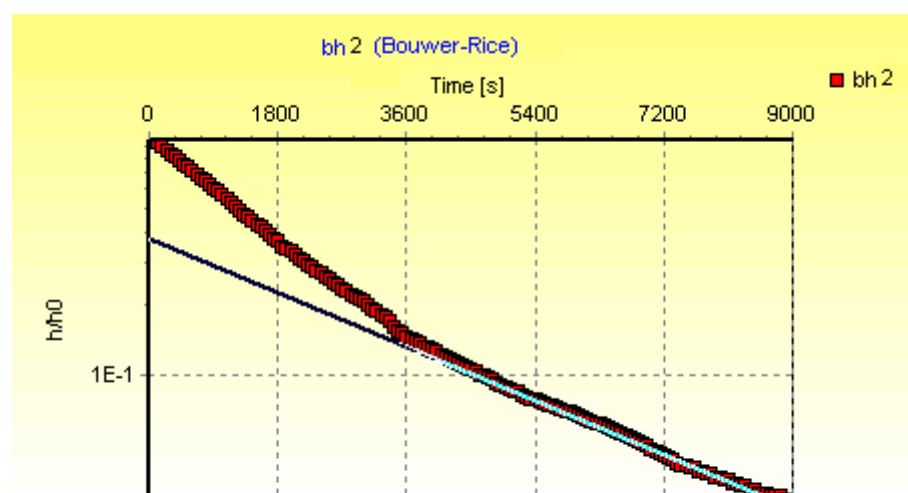
Average 3.82

Annex F

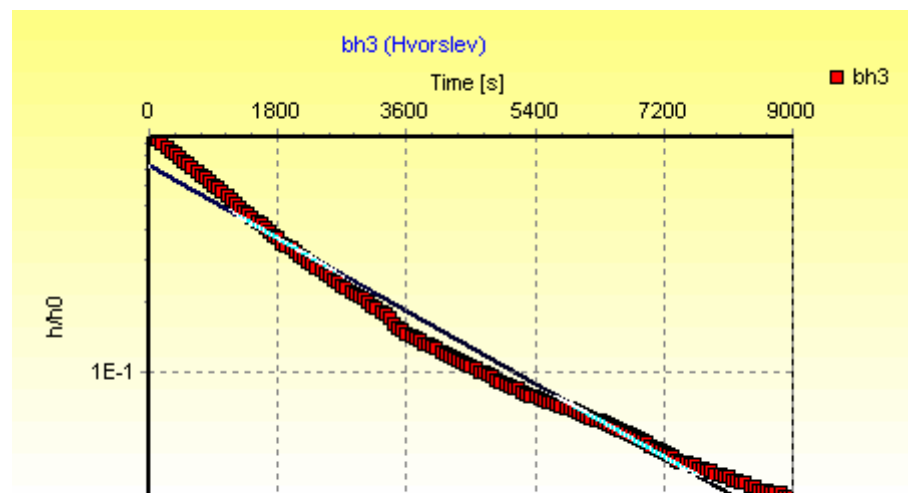
AquiferTest™ Graphical Output



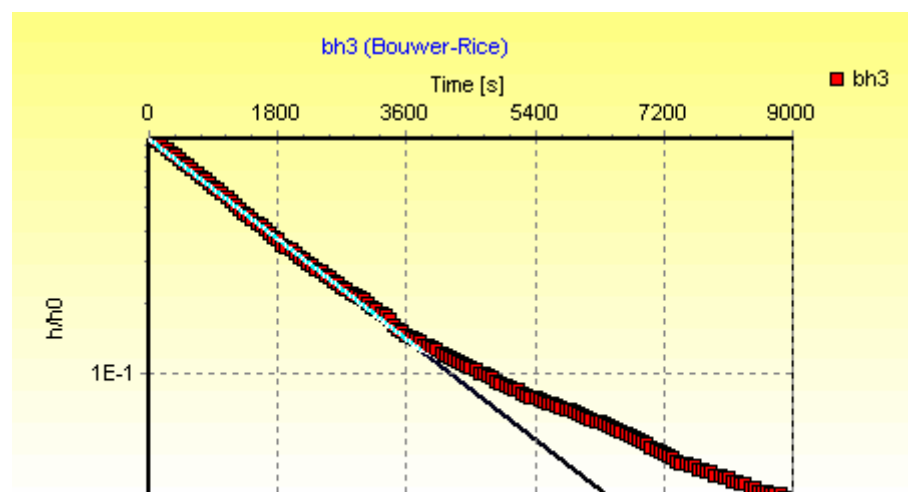
Conductivity: $2.83\text{E-}8$ m/s



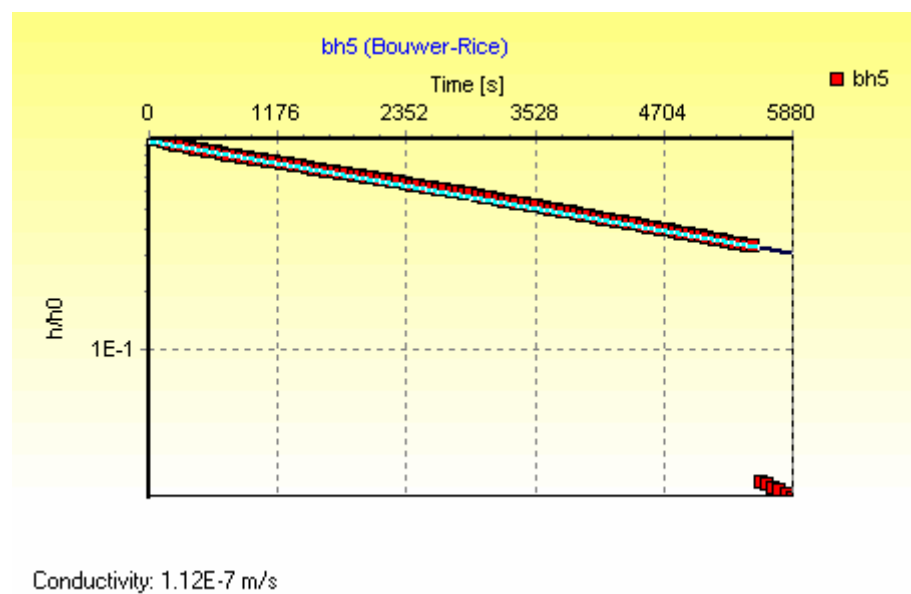
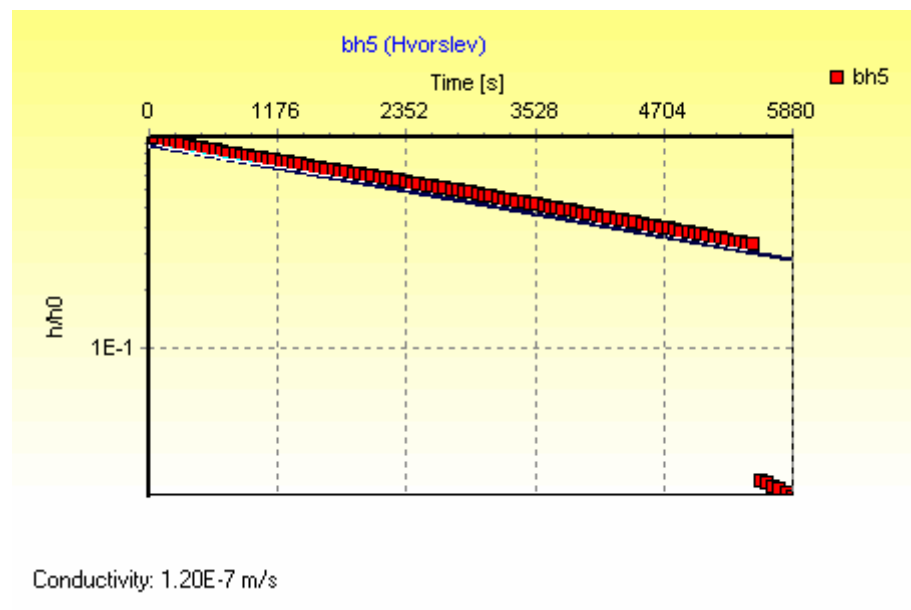
Conductivity: $1.24\text{E-}7$ m/s

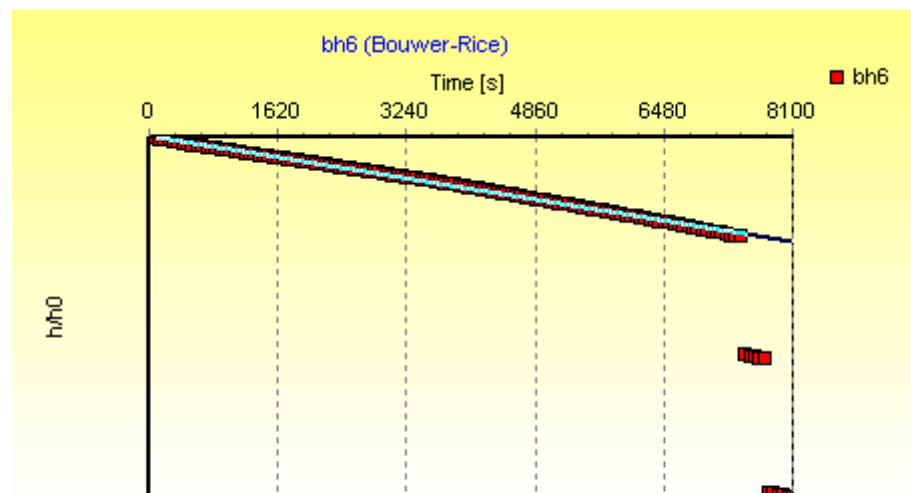


Conductivity: $2.15E-7$ m/s

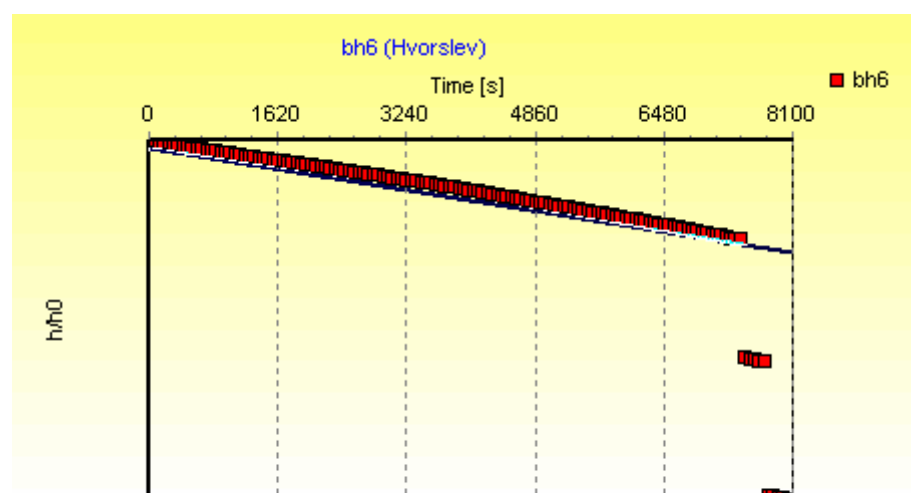


Conductivity: $2.30E-7$ m/s





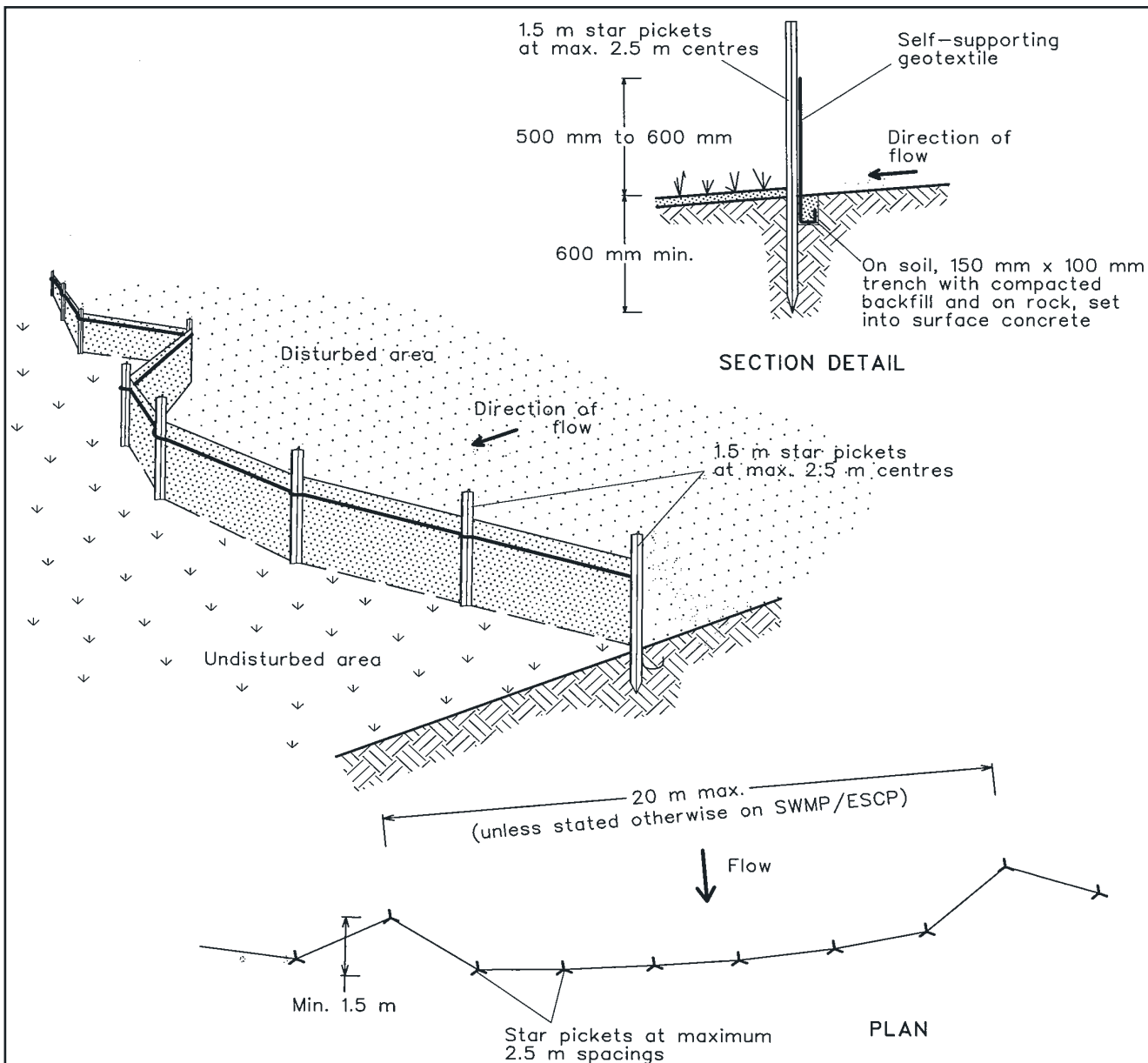
Conductivity: $1.55\text{E-}8$ m/s



Conductivity: $1.83\text{E-}8$ m/s

Annex G

Erosion Sediment Control Measures

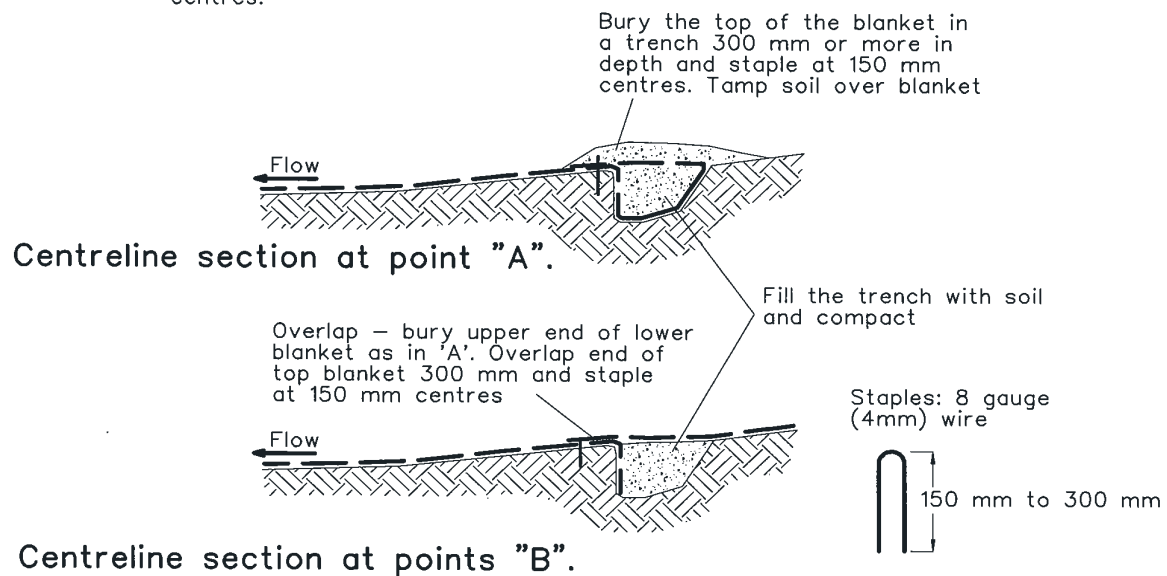
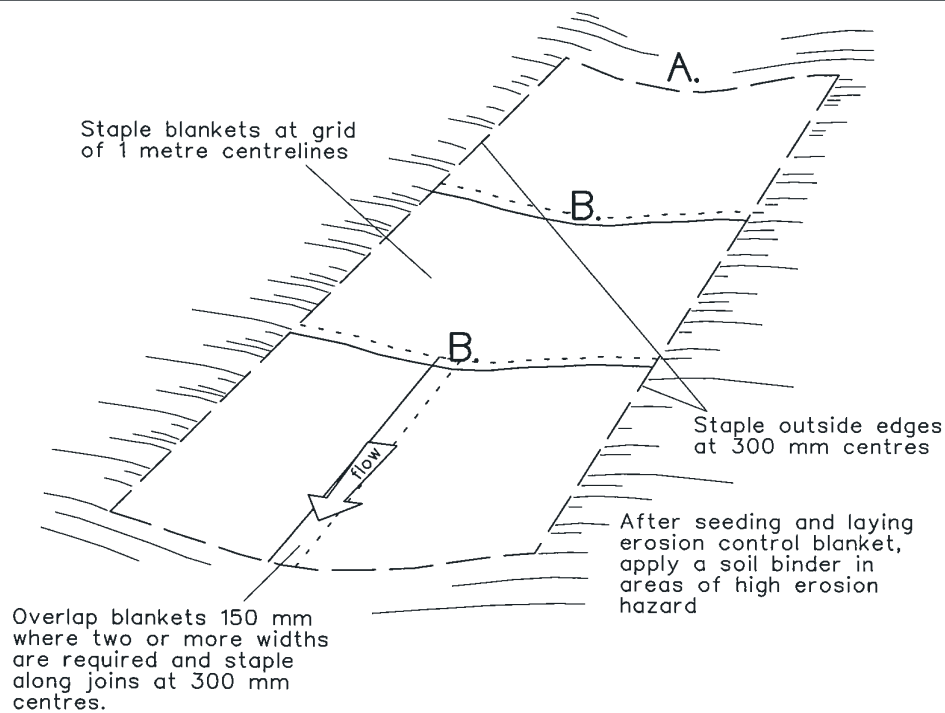


Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

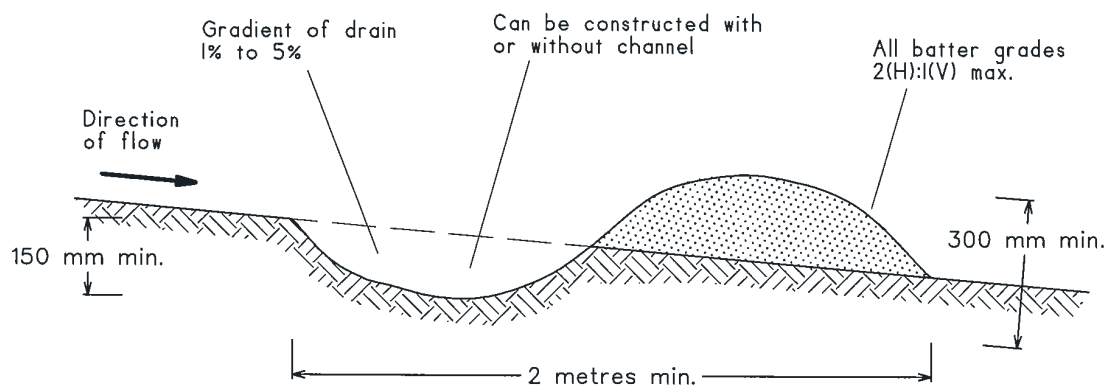
SEDIMENT FENCE

SD 6-8



Construction Notes

1. Remove any rocks, clods, sticks or grass from the surface before laying matting
2. Ensure that topsoil is at least 75 mm deep.
3. Complete fertilising and seeding before laying the matting.
4. Ensure fabric will be continuously in contact with the soil by grading the surface carefully first.
5. Lay the fabric in "shingle-fashion", with the end of each upstream roll overlapping those downstream. Ensure each roll is anchored properly at its upslope end (Standard Drawing 5-7b).
6. Ensure that the full width of flow in the channel is covered by the matting up to the design storm event, usually in the 10-year ARI time of concentration storm event.
7. Divert water from the structure until vegetation is stabilised properly.



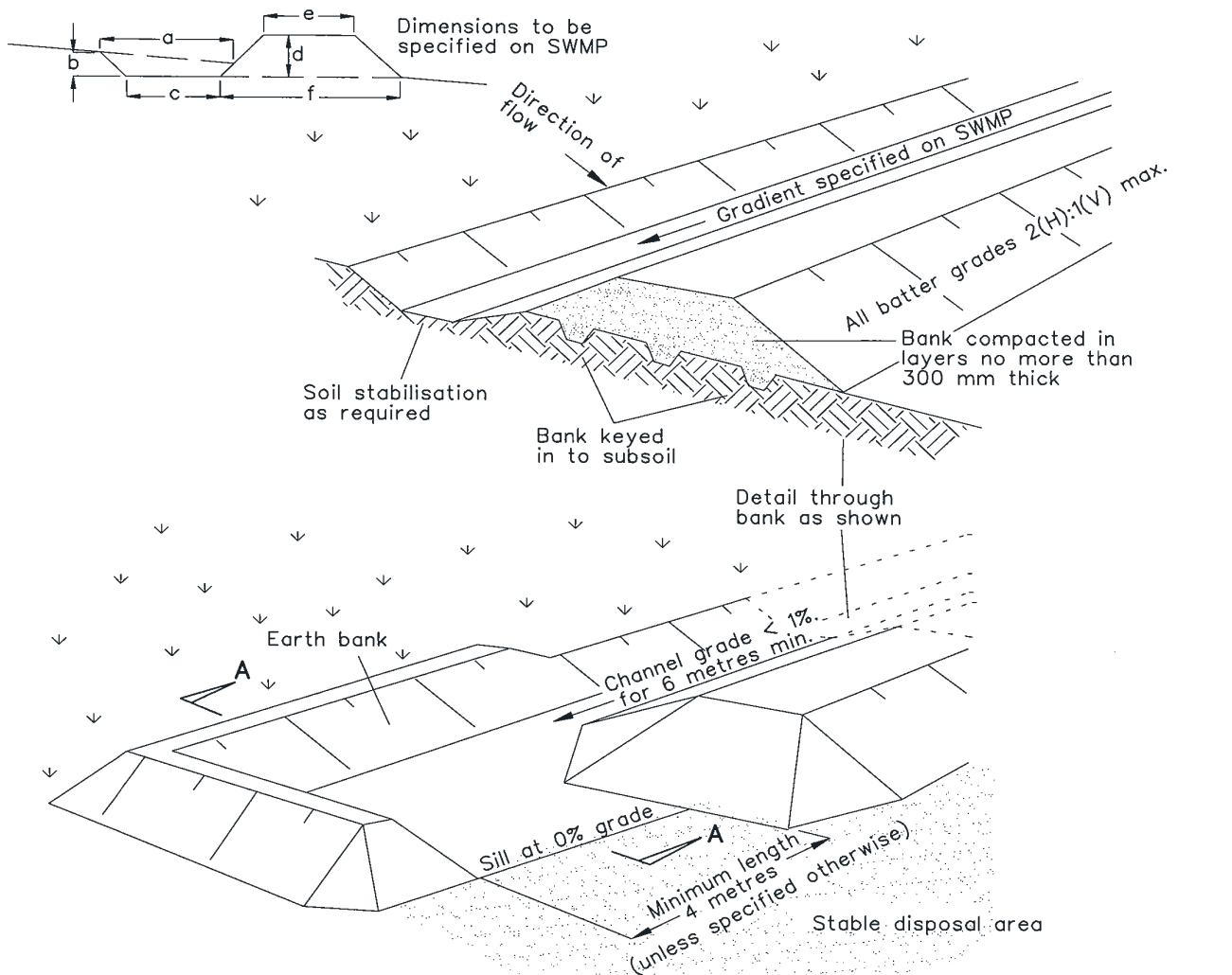
NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

EARTH BANK (LOW FLOW)

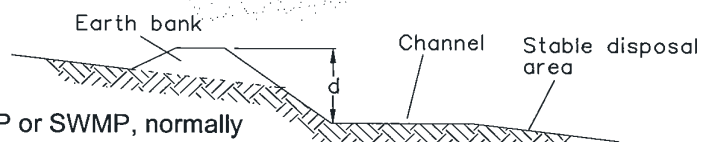
SD 5-5



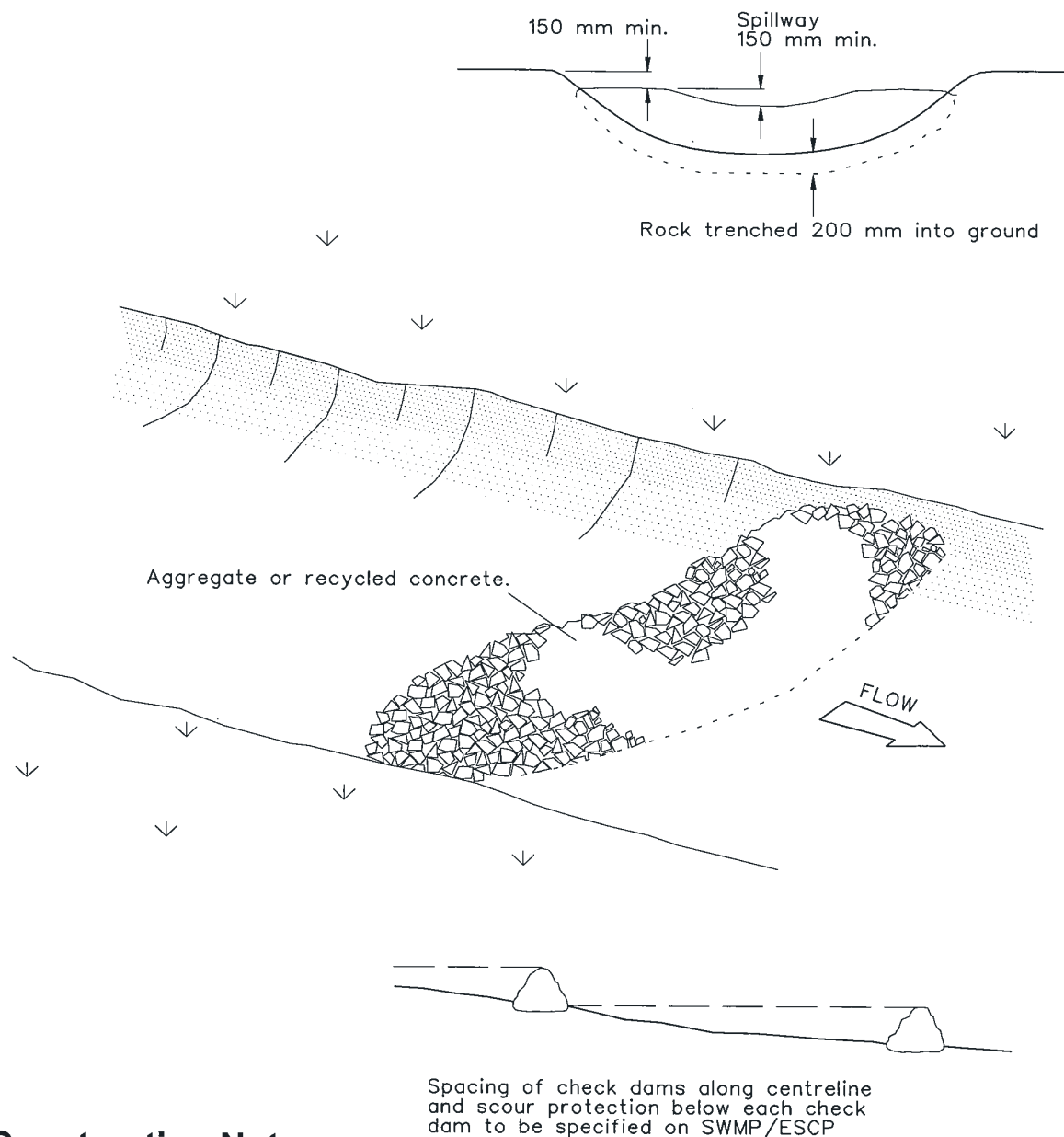
Level Spreader (or Sill)

Construction Notes

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.



Section AA

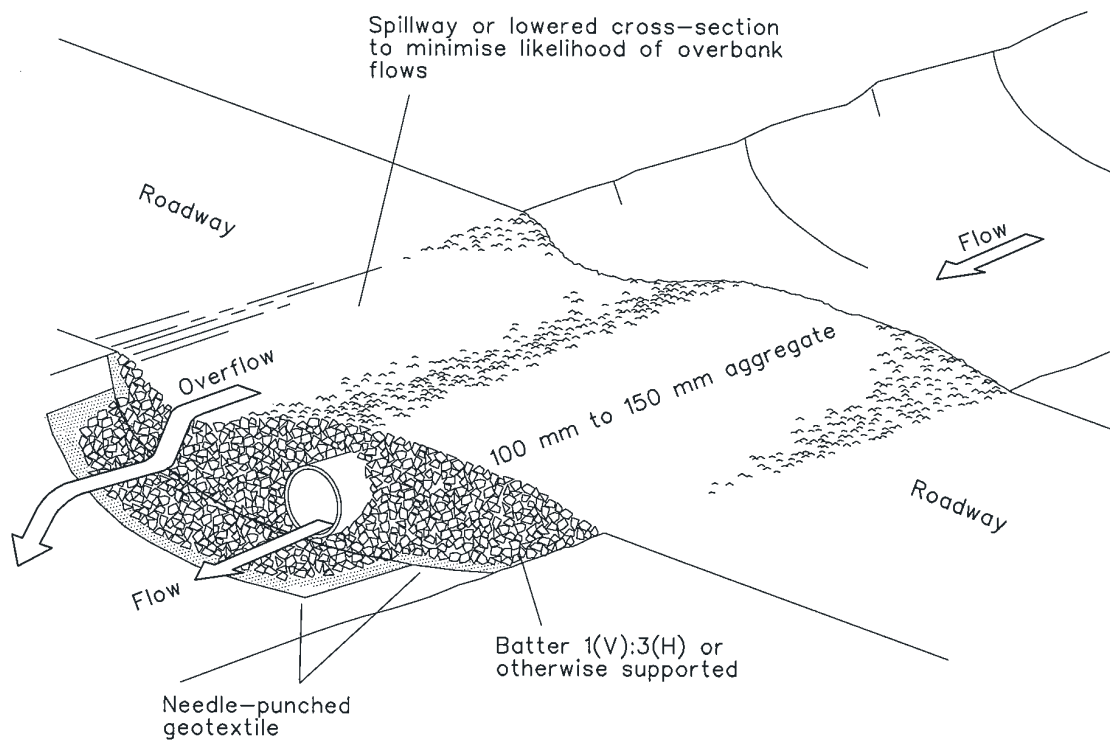


Construction Notes

1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

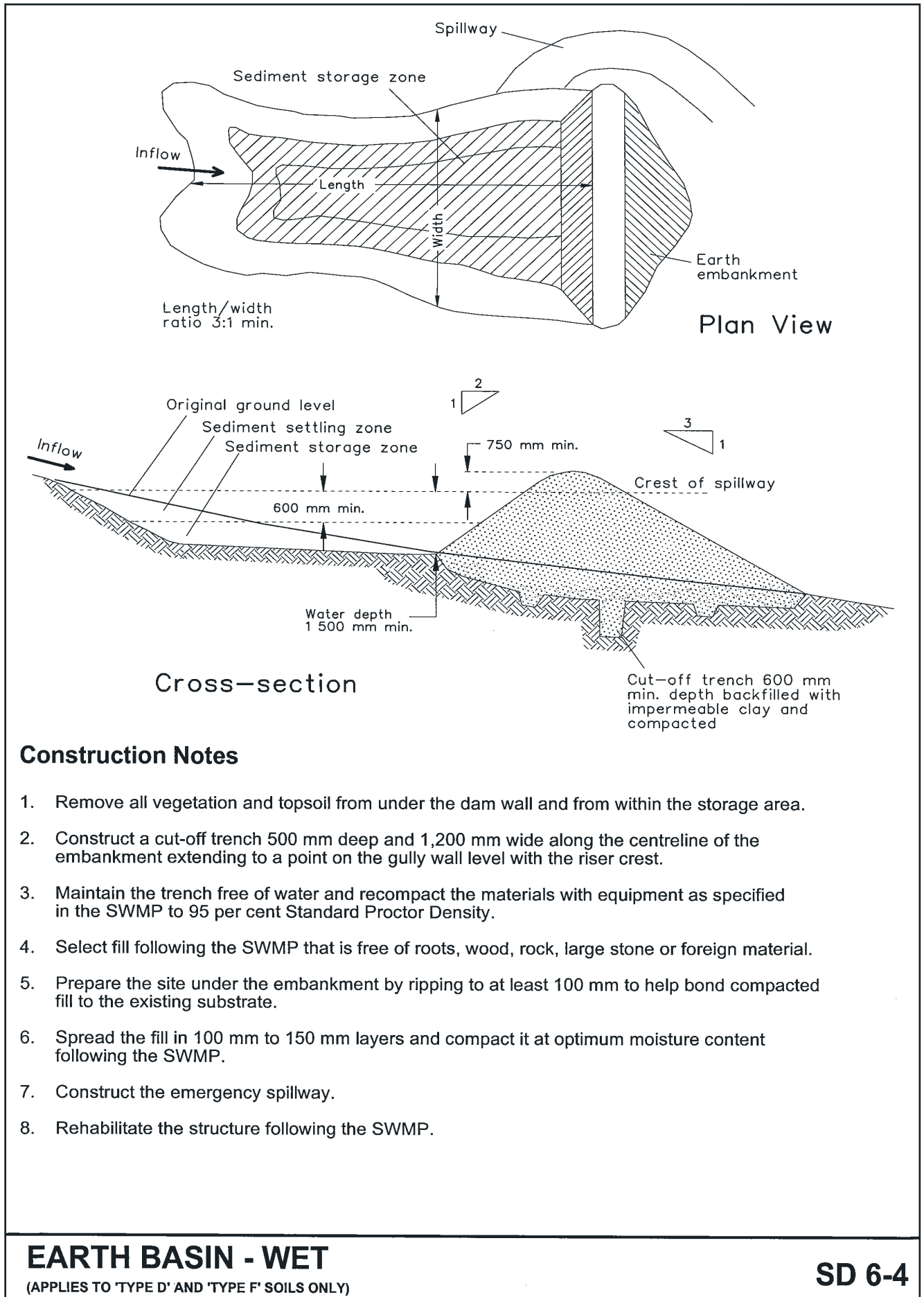
ROCK CHECK DAM

SD 5-4



Construction Notes

1. Prohibit all traffic until the access way is constructed.
2. Strip any topsoil and place a needle-punched textile over the base of the crossing.
3. Place clean, rigid, non polluting aggregate or gravel in the 100 mm to 150 mm size class over the fabric to a minimum depth of 200 mm.
4. Provide a 3-metre wide carriageway with sufficient length of culvert pipe to allow less than a 3(H): 1 (V) slope on side batters.
5. Install a lower section to act as an emergency spillway in greater than design storm events.
6. Ensure that culvert outlets extend beyond the toe of fill embankments.



Annex H

EAL Laboratory Analytical Reports

RESULTS OF WATER ANALYSIS (Page 1 of 1)

4 groundwater samples collected by EAL for Champions Quarry on the 29th January, 2008 - Lab. Job No. E8661

Analysis requested by Geoff Champion - **Your Project: Predevelopment Monitoring**

PARAMETER	METHODS REFERENCE	Sample 1 BH 2	Sample 2 BH 3	Sample 3 BH 5	Sample 4 BH 6
	<i>Job No.</i>	<i>E8661/1</i>	<i>E8661/2</i>	<i>E8661/3</i>	<i>E8661/4</i>
Water Depth (m from top of piezo)	field	TBA			
Redox (mV)	field	-10.7	323.6	55.3	137.2
pH	APHA 4500-H ⁺ -B	6.20	3.84	6.18	5.51
CONDUCTIVITY (EC) (dS/m)	APHA 2510-B	0.21	0.34	0.42	0.12
TOTAL DISSOLVED SALTS (mg/L)	calculation using EC x 680	141	233	285	83
TOTAL SUSPENDED SOLIDS (mg/L)	GFC equiv. filter - APHA 2540-D	16	2	<0.5	11
WATER HARDNESS (mg/L CaCO ₃ equivalent)	** using Ca&Mg calculation	17	22	22	4
TOTAL PHOSPHORUS (mg/L P)	APHA 4500 P-H	0.06	0.02	0.04	0.09
ORTHOPHOSPHATE (mg/L P)	APHA 4500 P-G	0.01	0.01	0.03	0.03
TOTAL NITROGEN (mg/L N)	APHA 4500 N-C	7.49	1.11	0.52	3.00
TOTAL KJELDAHL NITROGEN (mg/L N)	CALCULATION: TN - NO _x	7.48	1.01	0.48	2.98
NITRATE (mg/L N)	APHA 4500 NO ₃ ⁻ -F	0.012	0.086	0.030	0.025
NITRITE (mg/L N)	APHA 4500 NO ₂ ⁻ -C	0.003	0.009	0.003	0.001
AMMONIA (mg/L N)	APHA 4500 NH ₃ -H	<0.005	0.129	<0.005	0.016
SODIUM (mg/L)	** APHA 3120 ICPOES ^{*note 2}	25.1	29.7	62.7	17.5
POTASSIUM (mg/L)	** APHA 3120 ICPOES ^{*note 2}	1.8	1.5	1.4	1.0
CALCIUM (mg/L)	** APHA 3120 ICPOES ^{*note 2}	1.6	1.4	4.4	0.2
MAGNESIUM (mg/L)	** APHA 3120 ICPOES ^{*note 2}	3.3	4.5	2.8	0.8
SODIUM ABSORPTION RATIO	BY CALCULATION	2.6	2.7	5.8	3.9
CHLORIDE (mg/L)	** APHA 4500-Cl ⁻	37	47	56	19
SULPHATE (mg/L SO ₄ ²⁻)	** APHA 3120 ICPOES ^{*note 2}	9	38	49	10
CHLORIDE/ SULPHATE RATIO	Calculation	4.0	1.2	1.1	1.9
SILVER (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	<0.001	<0.001	<0.001	<0.001
ALUMINIUM (mg/L)	** APHA 3120 ICPMS/OES ^{*note 1&2}	1.061	0.385	0.056	0.665
ARSENIC (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	<0.001	<0.001	<0.001	<0.001
CADMIUM (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	<0.001	<0.001	<0.001	0.002
CHROMIUM (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	0.004	0.001	<0.001	0.003
COPPER (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	0.009	0.007	<0.001	0.005
IRON (mg/L)	** APHA 3120 ICPMS/OES ^{*note 1&2}	7.660	3.495	1.857	2.715
MANGANESE (mg/L)	** APHA 3120 ICPMS/OES ^{*note 1&2}	0.454	1.929	0.734	0.185
NICKEL (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	0.011	0.008	0.002	0.011
LEAD (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	0.004	0.006	<0.001	0.002
SELENIUM (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	<0.001	0.002	0.002	<0.001
ZINC (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	0.102	0.080	0.015	0.063
MERCURY (mg/L)	** APHA 3120 ICPMS ^{*note 1&2}	<0.001	<0.001	<0.001	<0.001
BTEX					
Benzene (µg/L)	subcontracted - results attached	<1	<1	<1	<1
Toluene (µg/L)	subcontracted - results attached	2	<1	<1	<1
Ethylbenzene (µg/L)	subcontracted - results attached	<1	<1	<1	<1
Meta-And-Para-Xylene (µg/L)	subcontracted - results attached	<2	<2	<2	<2
Ortho-Xylene (µg/L)	subcontracted - results attached	<1	<1	<1	<1
Volatile Halogenated Compounds (VHC's)	subcontracted - results attached	N.D	N.D	N.D	N.D
Bis (2-ethylhexyl) phthalate (SVOC) (µg/L)	subcontracted - results attached	80	<20	<20	<20
Semivolatile Organic Compounds (SVOC's)	subcontracted - results attached	N.D	N.D	N.D	N.D
Total Petroleum Hydrocarbons (TPH)					
C10-C14 Fraction (µg/L)	subcontracted - results attached	47,700	190	<50	690
C15-C28 Fraction (µg/L)	subcontracted - results attached	28,800	<200	<200	420
C28-C36 Fraction (µg/L)	subcontracted - results attached	4,450	80	<50	110
SUM C10-C36 (µg/L)		80,950	270	..	1,220

Notes:

- 1a. Total Available metals - samples acidified with nitric acid and then filtered through 0.45µm cellulose acetate
2. Metals/ salts analysed by ICP-MS (Inductively Coupled Plasma - Mass Spectrometry) or ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry)
3. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre)= 1000 ppb (part per billion)
4. For conductivity - 1 dS/m = 1 mS/cm = 1000 µS/cm
5. No other pesticides occurred above reportable levels for chemicals screened in the attached list
6. For Bacteria - cfu= colony forming unit
7. Analysis performed according to APHA, 1998, "Standard Methods for the Examination of Water & Wastewater", 20th Edition, except where stated otherwise.
8. Analysis conducted between sample arrival date and Report provision date
9. ** denotes these test procedures are as yet not NATA registered but quality control data is available
10. N.D = Not detected



RESULTS OF WATER ANALYSIS (Page 1 of 1)

4 surface water samples collected by EAL for Champions Quarry on the 1st February, 2008 - Lab. Job No. E8684

Analysis requested by Geoff Champion - Your Project: Predevelopment Monitoring

PARAMETER	METHODS REFERENCE	Sample 1 SW1	Sample 2 SW2	Sample 3 SW3	Sample 4 SW4
	Job No.	E8684/1	E8684/2	E8684/3	E8684/4
Redox (mV)	field	216.8	214.8	113.0	-55.1
pH	Field meter	6.42	6.44	5.80	6.16
CONDUCTIVITY (EC) (dS/m)	Field meter	0.13	0.13	0.20	0.32
TOTAL DISSOLVED SALTS (mg/L)	calculation using EC x 680	88	88	136	215
DISSOLVED OXYGEN (mg/L O ₂)	Field meter	6.0	7.1	1.0	1.3
TURBIDITY (ntu)	Field meter	4.3	7.5	139.0	46
TOTAL SUSPENDED SOLIDS (mg/L)	GFC equiv. filter - APHA 2540-D	4	4	26	16
WATER HARDNESS (mg/L CaCO ₃ equivalent)	** using Ca&Mg calculation	22	22	30	29
TOTAL PHOSPHORUS (mg/L P)	APHA 4500 P-H	0.08	0.07	0.13	0.18
ORTHOPHOSPHATE (mg/L P)	APHA 4500 P-G	0.01	0.01	0.01	<0.01
TOTAL NITROGEN (mg/L N)	APHA 4500 N-C	0.34	0.31	1.49	1.59
TOTAL KJELDAHL NITROGEN (mg/L N)	CALCULATION: TN - NO _x	0.31	0.28	1.48	1.58
NITRATE (mg/L N)	APHA 4500 NO ₃ -F	0.023	0.029	0.010	0.001
NITRITE (mg/L N)	APHA 4500 NO ₂ -C	0.001	0.003	<0.001	0.007
AMMONIA (mg/L N)	APHA 4500 NH ₃ -H	0.018	0.014	0.009	0.009
SODIUM (mg/L)	** APHA 3120 ICPOES ^{note 2}	15.9	16.0	19.1	29.0
POTASSIUM (mg/L)	** APHA 3120 ICPOES ^{note 2}	1.1	0.8	1.2	3.1
CALCIUM (mg/L)	** APHA 3120 ICPOES ^{note 2}	3.5	3.6	4.8	3.3
MAGNESIUM (mg/L)	** APHA 3120 ICPOES ^{note 2}	3.1	3.2	4.4	4.9
SODIUM ABSORPTION RATIO	BY CALCULATION	1.5	1.5	1.5	2.4
CHLORIDE (mg/L)	** APHA 4500-Cl ⁻	23	22	32	47
SULPHATE (mg/L SO ₄ ²⁻)	** APHA 3120 ICPOES ^{note 2}	3	3	4	3
CHLORIDE/ SULPHATE RATIO	Calculation	7.5	7.3	8.0	15.8
SILVER (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	<0.001	<0.001
ALUMINIUM (mg/L)	** APHA 3120 ICPMS/OES ^{note 1&2}	0.046	0.056	0.194	0.255
ARSENIC (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	0.001	0.002
CADMIUM (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	<0.001	0.002
CHROMIUM (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	0.001	0.002
COPPER (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	<0.001	<0.001
IRON (mg/L)	** APHA 3120 ICPMS/OES ^{note 1&2}	2.264	2.340	15.940	56.280
MANGANESE (mg/L)	** APHA 3120 ICPMS/OES ^{note 1&2}	0.086	0.068	1.756	1.081
NICKEL (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	<0.001	0.001
LEAD (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	0.004	0.006	<0.001	0.002
SELENIUM (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	<0.001	0.001
ZINC (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	0.009	0.003	0.005	0.023
MERCURY (mg/L)	** APHA 3120 ICPMS ^{note 1&2}	<0.001	<0.001	<0.001	<0.001
BTEX					
Benzene (µg/L)	subcontracted - results attached	<1	<1	<1	<1
Toluene (µg/L)	subcontracted - results attached	<1	<1	<1	30
Ethylbenzene (µg/L)	subcontracted - results attached	<1	<1	<1	<1
Meta-And-Para-Xylene (µg/L)	subcontracted - results attached	<2	<2	<2	<2
Ortho-Xylene (µg/L)	subcontracted - results attached	<1	<1	<1	<1
Volatile Halogenated Compounds (VHC's)	subcontracted - results attached	N.D	N.D	N.D	N.D
Semivolatile Organic Compounds (SVOC)	subcontracted - results attached	N.D	N.D	N.D	N.D
Total Petroleum Hydrocarbons (TPH)					
C10-C14 Fraction (µg/L)	subcontracted - results attached	<50	<50	9,180	<50
C15-C28 Fraction (µg/L)	subcontracted - results attached	<200	<200	60,300	<200
C28-C36 Fraction (µg/L)	subcontracted - results attached	<50	<50	740	120
SUM C10-C36 (µg/L)		..	..	70,220	120

Notes:

- 1a. Total Available metals - samples acidified with nitric acid and then filtered through 0.45µm cellulose acetate
2. Metals/ salts analysed by ICP-MS (Inductively Coupled Plasma - Mass Spectrometry) or ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry)
3. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre) = 1000 ppb (part per billion)
4. For conductivity - 1 dS/m = 1 mS/cm = 1000 µS/cm
5. No other pesticides occurred above reportable levels for chemicals screened in the attached list
6. For Bacteria - cfu= colony forming unit
7. Analysis performed according to APHA, 1998, "Standard Methods for the Examination of Water & Wastewater", 20th Edition, except where stated otherwise.
8. Analysis conducted between sample arrival date and Report provision date
9. ** denotes these test procedures are as yet not NATA registered but quality control data is available
10. N.D = Not detected



RESULTS OF WATER ANALYSIS (Page 1 of 1)

6 samples collected by EAL for Champions Quarry on the 20th February, 2008 - Lab. Job No. E8792
Analysis requested by Geoff Champion - Your Project: Confirmation Sampling

PARAMETER	METHODS REFERENCE	Sample 1 Hazlemount Ln Culvert	Sample 2 SW3	Sample 3 S4	Sample 4 BH2	Sample 3 BH3	Sample 4 BH6
	Job No.	E8792/1	E8792/2	E8792/3	E8792/4	E8792/5	E8792/6
Total Petroleum Hydrocarbons (TPH)							
C10-C14 Fraction (µg/L)	subcontracted - results attached	<50	<50	<50	<50	90	<50
C15-C28 Fraction (µg/L)	subcontracted - results attached	<200	<200	<200	<200	<200	<200
C28-C36 Fraction (µg/L)	subcontracted - results attached	<50	<50	<50	70	<50	<50
SUM C10-C36 (µg/L)		..	..	..	70	90	..

Notes:

- 1 a. Total Available metals - samples acidified with nitric acid and then filtered through 0.45µm cellulose acetate
2. Metals/ salts analysed by ICP-MS (Inductively Coupled Plasma - Mass Spectrometry) or ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry)
3. 1 mg/L (milligram per litre) = 1 ppm (part per million) = 1000 µg/L (micrograms per litre)= 1000 ppb (part per billion)
4. For conductivity - 1 dS/m = 1 mS/cm = 1000 µS/cm
5. No other pesticides occurred above reportable levels for chemicals screened in the attached list
6. For Bacteria - cfu= colony forming unit
7. Analysis performed according to APHA, 1998, "Standard Methods for the Examination of Water & Wastewater", 20th Edition, except where stated otherwise.
8. Analysis conducted between sample arrival date and Report provision date
9. ** denotes these test procedures are as yet not NATA registered but quality control data is available
10. N.D = Not detected



Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Quarantine Approved Premises
criteria 5.1 for quarantine
containment level 1 (QCI) facilities.
Class five criteria cover premises
utilised for research, analysis and
testing of biological material, soil,
animal, plant and human products.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E036145
Client Name: Environmental Analysis Laboratory
Client Reference: Soil and Water analysis
Contact Name: Graham Lancaster
Chain of Custody No: na
Sample Matrix: SOIL & WATER

Cover Page 1 of 4
plus Sample Results

Date Received: 06/02/2008
Date Reported: 14/02/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occurred within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy: matrix spike: 1 in first 5-20, then 1 every 20 samples
lcs, crm, method: 1 per analytical batch
surrogate spike: addition per target organic method

Precision: laboratory duplicate: 1 in first 5-10, then 1 every 10 samples

laboratory triplicate: re-extracted & reported when duplicate
RPD values exceed acceptance criteria

Holding Times: soils, waters: Refer to LabMark Preservation & THT
table
VOC's 14 days water / soil
VAC's 7 days water or 14 days acidified
VAC's 14 days soil
SVOC's 7 days water, 14 days soil
Pesticides 7 days water, 14 days soil
Metals 6 months general elements
Mercury 28 days

Confirmation: target organic analysis: GC/MS, or confirmatory column

Sensitivity: EQL: Typically 2-5 x Method Detection Limit
(MDL)

QUALITY CONTROL

GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy: spike, lcs, crm general analytes 70% - 130% recovery
surrogate: phenol analytes 50% - 130% recovery
organophosphorous pesticide analytes
60% - 130% recovery
phenoxy acid herbicides, organotin
50% - 130% recovery

anion/cation bal: +/- 10% (0-3 meq/l),
+/- 5% (>3 meq/l)

Precision: method blank: not detected >95% of the reported EQL
duplicate lab 0-30% (>10xEQL), 0-75% (5-10xEQL)
RPD (metals): 0-100% (<5xEQL)
duplicate lab 0-50% (>10xEQL), 0-75% (5-10xEQL)
RPD: 0-100% (<5xEQL)

QUALITY CONTROL

ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy: spike, lcs, crm analyte specific recovery data
surrogate: <3xsd of historical mean

Uncertainty: spike, lcs: measurement calculated from
historical analyte specific control
charts

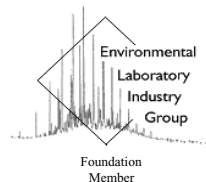
RESULT ANNOTATION

Data Quality Objective	s: matrix spike recovery	p: pending	bcs: batch specific lcs
Data Quality Indicator	d: laboratory duplicate	lcs: laboratory control sample	bmb: batch specific mb
Estimated Quantitation Limit	t: laboratory triplicate	crm: certified reference material	
not applicable	r: RPD relative % difference	mb: method blank	

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Laboratory Report: E036145

Cover Page 2 of 4

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

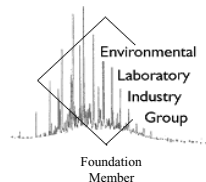
- A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.
- B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.
- C. Laboratory QA/QC samples are specific to this project.
- D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.
- E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.
- F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.
- G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomalous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.
- H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.
- I. LabMark shall maintain an official copy of this Certificate of Analysis for all traceable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

- A. SRN issued to client upon sample receipt & login verification.
- B. Preservation & sampling date details specified on COC and SRN, unless noted.
- C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

- A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).
- B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.
- C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.



Laboratory Report: E036145

Cover Page 3 of 4

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

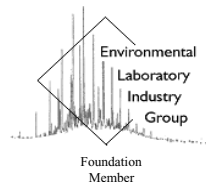
Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
2	Petroleum Hydrocarbons (TPH)	1	0	0%	0	0	0%
6	Organochlorine Pesticides (OC)	14	2	14%	0	1	7%
10	Organophosphorus Pesticides (OP)	6	1	17%	0	1	17%
13	Polychlorinated Biphenyls (PCB)	2	0	0%	0	0	0%
20	Moisture	14	--	--	--	--	--

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	4	0	0%	0	0	0%
3	Petroleum Hydrocarbons (TPH)	4	0	0%	0	0	0%
4	Volatile Halogenated Compounds (VHC)	4	0	0%	0	0	0%
9	Organochlorine Pesticides (OC)	3	0	0%	0	0	0%
12	Organophosphorus Pesticides (OP)	3	0	0%	0	0	0%
14	Semivolatile Organic Compounds (SVOC)	4	0	0%	0	0	0%

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).



Laboratory Report: E036145

Cover Page 4 of 4

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

- A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.
- B. SVOC (water) matrix spike recovery for LCS (extraction date 08/02/08) is 31% - 129%.
- C. SVOC (water) sample surrogates recovery range 25% - 109%, corresponding LCS recovery range is 32% - 92%; MB is 30% - 102%
- D. Refer to LabMark historical control chart recovery range data. QA/QC (SVOC) results reported within 3sd of the historical analyte specific mean results, and therefore considered acceptable for laboratory release.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

HISTORICAL CONTROL CHART DATA - QA/QC

Sydney

Analyte mean and standard deviation

SVOC_W

For the period: 01/01/2007 12:00:00 AM to 31/12/2007 11:59:59 PM

SPIKES

Analyte Name	n	Mean	1 SD	Range	2 SD	Range	3 SD	Range
1,2,4,5-tetrachlorobenzene	13	85	20	65 to 105	40	45 to 125	60	25 to 145
1,2,4-trichlorobenzene	13	88	17	71 to 105	34	54 to 122	51	37 to 139
1,2-dichlorobenzene	13	86	14	72 to 100	28	58 to 114	42	44 to 128
1,3-dichlorobenzene	13	85	14	71 to 99	28	57 to 113	42	43 to 127
1,4-dichlorobenzene	13	86	20	66 to 106	40	46 to 126	60	26 to 146
1,4-dinitrobenzene	13	93	15	78 to 108	30	63 to 123	45	48 to 138
1-naphthylamine	11	60	21	39 to 81	42	18 to 102	63	0 to 123
2,3,4,6-tetrachlorophenol	12	82	16	66 to 98	32	50 to 114	48	34 to 130
2,4,5-trichlorophenol	13	87	20	67 to 107	40	47 to 127	60	27 to 147
2,4,6-trichlorophenol	12	88	12	76 to 100	24	64 to 112	36	52 to 124
2,4-dichlorophenol	12	92	13	79 to 105	26	66 to 118	39	53 to 131
2,4-dimethylphenol	12	94	17	77 to 111	34	60 to 128	51	43 to 145
2,4-dinitrotoluene	13	89	13	76 to 102	26	63 to 115	39	50 to 128
2,6-dichlorophenol	12	94	17	77 to 111	34	60 to 128	51	43 to 145
2,6-dinitrotoluene	13	93	14	79 to 107	28	65 to 121	42	51 to 135
2-(acetylamino) fluorene	12	93	18	75 to 111	36	57 to 129	54	39 to 147
2-chloronaphthalene	13	92	14	78 to 106	28	64 to 120	42	50 to 134
2-chlorophenol	13	90	17	73 to 107	34	56 to 124	51	39 to 141
2-FBP (Surr @ 25ug/l)	13	88	13	75 to 101	26	62 to 114	39	49 to 127
2-FP (Surr @ 25ug/l)	12	57	15	42 to 72	30	27 to 87	45	12 to 102
2-methylnaphthalene	13	92	14	78 to 106	28	64 to 120	42	50 to 134
2-methylphenol	12	80	10	70 to 90	20	60 to 100	30	50 to 110
2-naphthylamine	12	86	26	60 to 112	52	34 to 138	78	8 to 164
2-nitroaniline	13	94	18	76 to 112	36	58 to 130	54	40 to 148
2-nitrophenol	13	93	17	76 to 110	34	59 to 127	51	42 to 144
3-&4-methylphenol	12	79	15	64 to 94	30	49 to 109	45	34 to 124
3-methylcholanthrene	12	106	16	90 to 122	32	74 to 138	48	58 to 154
3-nitroaniline	12	73	14	59 to 87	28	45 to 101	42	31 to 115
4,4-DDD	13	103	14	89 to 117	28	75 to 131	42	61 to 145
4,4-DDE	13	96	12	84 to 108	24	72 to 120	36	60 to 132
4,4-DDT	13	77	27	50 to 104	54	23 to 131	81	0 to 158
4-(dimethylamino) azobenzene	12	85	20	65 to 105	40	45 to 125	60	25 to 145
4-aminobiphenyl	12	96	13	83 to 109	26	70 to 122	39	57 to 135
4-bromophenyl phenyl ether	13	93	14	79 to 107	28	65 to 121	42	51 to 135
4-chloro-3-methylphenol	12	93	13	80 to 106	26	67 to 119	39	54 to 132
4-chloroaniline	12	83	31	52 to 114	62	21 to 145	93	0 to 176
4-chlorophenyl phenyl ether	13	91	13	78 to 104	26	65 to 117	39	52 to 130
4-nitroaniline	12	81	21	60 to 102	42	39 to 123	63	18 to 144
5-nitro-o-toluidine	13	96	14	82 to 110	28	68 to 124	42	54 to 138
7,12-dimethylbenz(a)anthracene	12	71	24	47 to 95	48	23 to 119	72	0 to 143
a-BHC	13	94	16	78 to 110	32	62 to 126	48	46 to 142
Acenaphthene	13	96	15	81 to 111	30	66 to 126	45	51 to 141
Acenaphthylene	13	90	11	79 to 101	22	68 to 112	33	57 to 123
Acetophenone	13	92	18	74 to 110	36	56 to 128	54	38 to 146
Aldrin	13	92	17	75 to 109	34	58 to 126	51	41 to 143

Aniline	12	54	22	32 to 76	44	10 to 98	66	0 to 120
Anthracene	13	91	18	73 to 109	36	55 to 127	54	37 to 145
Azinophos methyl	12	100	24	76 to 124	48	52 to 148	72	28 to 172
Azobenzene	13	89	12	77 to 101	24	65 to 113	36	53 to 125
b-BHC	13	91	15	76 to 106	30	61 to 121	45	46 to 136
Benz(a)anthracene	13	95	11	84 to 106	22	73 to 117	33	62 to 128
Benzo(a) pyrene	13	94	27	67 to 121	54	40 to 148	81	13 to 175
Benzo(b)&(k)fluoranthene	13	99	16	83 to 115	32	67 to 131	48	51 to 147
Benzo(g,h,i)perylene	13	101	17	84 to 118	34	67 to 135	51	50 to 152
Benzyl alcohol	10	85	25	60 to 110	50	35 to 135	75	10 to 160
Bis(2-chloroethoxy) methane	13	91	18	73 to 109	36	55 to 127	54	37 to 145
Bis(2-chloroethyl)ether	13	80	23	57 to 103	46	34 to 126	69	11 to 149
Bis(2-chloroisopropyl) ether	13	92	14	78 to 106	28	64 to 120	42	50 to 134
Bis(2-ethylhexyl) phthalate	13	106	17	89 to 123	34	72 to 140	51	55 to 157
Butyl benzyl phthalate	13	99	15	84 to 114	30	69 to 129	45	54 to 144
Carbazole	13	96	10	86 to 106	20	76 to 116	30	66 to 126
Chlorpyrifos	13	97	14	83 to 111	28	69 to 125	42	55 to 139
Chrysene	13	96	11	85 to 107	22	74 to 118	33	63 to 129
cis-chlordane	13	95	12	83 to 107	24	71 to 119	36	59 to 131
Coumaphos	13	98	18	80 to 116	36	62 to 134	54	44 to 152
d-BHC	13	97	13	84 to 110	26	71 to 123	39	58 to 136
Demeton-O	12	92	13	79 to 105	26	66 to 118	39	53 to 131
Demeton-S	12	94	14	80 to 108	28	66 to 122	42	52 to 136
Di-n-butyl phthalate	13	100	12	88 to 112	24	76 to 124	36	64 to 136
Di-n-octyl phthalate	13	100	12	88 to 112	24	76 to 124	36	64 to 136
Diazinon	13	93	13	80 to 106	26	67 to 119	39	54 to 132
Dibenz(a,h)anthracene	13	101	17	84 to 118	34	67 to 135	51	50 to 152
Dibenzofuran	13	91	13	78 to 104	26	65 to 117	39	52 to 130
Dichlorvos	13	102	14	88 to 116	28	74 to 130	42	60 to 144
Dieldrin	13	99	16	83 to 115	32	67 to 131	48	51 to 147
Diethylphthalate	13	94	12	82 to 106	24	70 to 118	36	58 to 130
Dimethoate	13	84	19	65 to 103	38	46 to 122	57	27 to 141
Dimethyl phthalate	13	97	13	84 to 110	26	71 to 123	39	58 to 136
Diphenylamine	12	96	13	83 to 109	26	70 to 122	39	57 to 135
Disulfoton	12	91	12	79 to 103	24	67 to 115	36	55 to 127
Endosulfan I	13	89	14	75 to 103	28	61 to 117	42	47 to 131
Endosulfan II	13	98	13	85 to 111	26	72 to 124	39	59 to 137
Endosulfan sulphate	13	95	14	81 to 109	28	67 to 123	42	53 to 137
Endrin	13	95	21	74 to 116	42	53 to 137	63	32 to 158
Endrin aldehyde	13	92	18	74 to 110	36	56 to 128	54	38 to 146
Endrin ketone	13	90	20	70 to 110	40	50 to 130	60	30 to 150
EPN	13	94	15	79 to 109	30	64 to 124	45	49 to 139
Ethoprop	12	94	12	82 to 106	24	70 to 118	36	58 to 130
Ethyl methanesulfonate	13	83	18	65 to 101	36	47 to 119	54	29 to 137
Fenitrothion	13	93	15	78 to 108	30	63 to 123	45	48 to 138
Fensulfothion	12	91	20	71 to 111	40	51 to 131	60	31 to 151
Fenthion	13	92	15	77 to 107	30	62 to 122	45	47 to 137
Fluoranthene	13	99	12	87 to 111	24	75 to 123	36	63 to 135
Fluorene	13	91	13	78 to 104	26	65 to 117	39	52 to 130
g-BHC (Lindane)	13	96	13	83 to 109	26	70 to 122	39	57 to 135
Heptachlor	13	93	20	73 to 113	40	53 to 133	60	33 to 153
Heptachlor epoxide	13	94	15	79 to 109	30	64 to 124	45	49 to 139
Hexachlorobenzene	13	90	21	69 to 111	42	48 to 132	63	27 to 153

Hexachlorobutadiene	13	85	15	70 to 100	30	55 to 115	45	40 to 130
Hexachlorocyclopentadiene	13	58	27	31 to 85	54	4 to 112	81	0 to 139
Hexachloroethane	13	80	16	64 to 96	32	48 to 112	48	32 to 128
Hexachloropropene	13	77	26	51 to 103	52	25 to 129	78	0 to 155
Indeno(1,2,3-c,d)pyrene	13	100	16	84 to 116	32	68 to 132	48	52 to 148
Isophorone	13	93	15	78 to 108	30	63 to 123	45	48 to 138
Isosafrole	13	90	22	68 to 112	44	46 to 134	66	24 to 156
Malathion	13	93	14	79 to 107	28	65 to 121	42	51 to 135
Methoxychlor	13	81	23	58 to 104	46	35 to 127	69	12 to 150
Methyl methanesulfonate	13	57	14	43 to 71	28	29 to 85	42	15 to 99
Methyl parathion	13	94	16	78 to 110	32	62 to 126	48	46 to 142
Mevinphos (Phosdrin)	13	89	19	70 to 108	38	51 to 127	57	32 to 146
N-nitrosodi-n-butylamine	13	93	16	77 to 109	32	61 to 125	48	45 to 141
N-nitrosodi-n-propylamine	13	90	17	73 to 107	34	56 to 124	51	39 to 141
N-nitrosodiethylamine	12	89	21	68 to 110	42	47 to 131	63	26 to 152
N-nitrosomorpholine	13	62	12	50 to 74	24	38 to 86	36	26 to 98
N-nitrosopiperidine	13	88	19	69 to 107	38	50 to 126	57	31 to 145
N-nitrosopyrrolidine	13	81	19	62 to 100	38	43 to 119	57	24 to 138
Naled (Dibrom)	13	61	28	33 to 89	56	5 to 117	84	0 to 145
Naphthalene	13	86	23	63 to 109	46	40 to 132	69	17 to 155
NB-d5 (Surr @ 25ug/l)	13	90	15	75 to 105	30	60 to 120	45	45 to 135
Nitrobenzene	13	90	14	76 to 104	28	62 to 118	42	48 to 132
o-toluidine	13	75	24	51 to 99	48	27 to 123	72	3 to 147
Parathion	13	94	9	85 to 103	18	76 to 112	27	67 to 121
Pentachlorobenzene	13	89	12	77 to 101	24	65 to 113	36	53 to 125
Pentachloroethane	13	80	16	64 to 96	32	48 to 112	48	32 to 128
Pentachloronitrobenzene	13	94	12	82 to 106	24	70 to 118	36	58 to 130
Pentachlorophenol	12	85	28	57 to 113	56	29 to 141	84	1 to 169
Phenacetin	12	88	11	77 to 99	22	66 to 110	33	55 to 121
Phenanthrene	13	98	14	84 to 112	28	70 to 126	42	56 to 140
Phenol	12	47	10	37 to 57	20	27 to 67	30	17 to 77
Phenol-d5 (Surr @ 25ug/l)	12	34	6	28 to 40	12	22 to 46	18	16 to 52
Phorate	13	88	15	73 to 103	30	58 to 118	45	43 to 133
Profenofos	13	95	18	77 to 113	36	59 to 131	54	41 to 149
Prothiofos	13	94	14	80 to 108	28	66 to 122	42	52 to 136
Pyrene	13	98	13	85 to 111	26	72 to 124	39	59 to 137
Ronnel	13	93	12	81 to 105	24	69 to 117	36	57 to 129
Safrole	13	92	16	76 to 108	32	60 to 124	48	44 to 140
Stirophos	12	97	16	81 to 113	32	65 to 129	48	49 to 145
Sulfotepp	13	91	14	77 to 105	28	63 to 119	42	49 to 133
TP-d14 (Surr @ 25ug/l)	13	94	13	81 to 107	26	68 to 120	39	55 to 133
trans-chlordane	13	96	13	83 to 109	26	70 to 122	39	57 to 135
Trichloronate	13	95	12	83 to 107	24	71 to 119	36	59 to 131

LCS_W

Analyte Name	n	Mean	1 SD	Range	2 SD	Range	3 SD	Range
1,2,4,5-tetrachlorobenzene	67	76	18	58 to 94	36	40 to 112	54	22 to 130
1,2,4-trichlorobenzene	68	82	12	70 to 94	24	58 to 106	36	46 to 118
1,2-dichlorobenzene	68	78	12	66 to 90	24	54 to 102	36	42 to 114
1,3-dichlorobenzene	68	76	13	63 to 89	26	50 to 102	39	37 to 115
1,4-dichlorobenzene	68	78	14	64 to 92	28	50 to 106	42	36 to 120
1,4-dinitrobenzene	67	89	15	74 to 104	30	59 to 119	45	44 to 134
1-naphthylamine	67	103	22	81 to 125	44	59 to 147	66	37 to 169
2,3,4,6-tetrachlorophenol	68	78	13	65 to 91	26	52 to 104	39	39 to 117

2,4,5-trichlorophenol	68	81	12	69 to 93	24	57 to 105	36	45 to 117
2,4,6-trichlorophenol	68	85	12	73 to 97	24	61 to 109	36	49 to 121
2,4-dichlorophenol	68	88	12	76 to 100	24	64 to 112	36	52 to 124
2,4-dimethylphenol	68	88	14	74 to 102	28	60 to 116	42	46 to 130
2,4-dinitrotoluene	67	84	11	73 to 95	22	62 to 106	33	51 to 117
2,6-dichlorophenol	68	88	11	77 to 99	22	66 to 110	33	55 to 121
2,6-dinitrotoluene	67	91	12	79 to 103	24	67 to 115	36	55 to 127
2-(acetylamino) fluorene	67	86	19	67 to 105	38	48 to 124	57	29 to 143
2-chloronaphthalene	67	88	12	76 to 100	24	64 to 112	36	52 to 124
2-chlorophenol	68	88	14	74 to 102	28	60 to 116	42	46 to 130
2-FBP (Surr @ 25ug/l)	68	87	10	77 to 97	20	67 to 107	30	57 to 117
2-FP (Surr @ 25ug/l)	68	61	13	48 to 74	26	35 to 87	39	22 to 100
2-methylnaphthalene	67	87	11	76 to 98	22	65 to 109	33	54 to 120
2-methylphenol	68	76	12	64 to 88	24	52 to 100	36	40 to 112
2-naphthylamine	66	107	23	84 to 130	46	61 to 153	69	38 to 176
2-nitroaniline	67	89	13	76 to 102	26	63 to 115	39	50 to 128
2-nitrophenol	68	88	15	73 to 103	30	58 to 118	45	43 to 133
3-&4-methylphenol	68	78	16	62 to 94	32	46 to 110	48	30 to 126
3-methylcholanthrene	67	93	14	79 to 107	28	65 to 121	42	51 to 135
3-nitroaniline	67	83	13	70 to 96	26	57 to 109	39	44 to 122
4,4-DDD	67	96	12	84 to 108	24	72 to 120	36	60 to 132
4,4-DDE	67	95	12	83 to 107	24	71 to 119	36	59 to 131
4,4-DDT	67	90	20	70 to 110	40	50 to 130	60	30 to 150
4-(dimethylamino) azobenzene	67	89	13	76 to 102	26	63 to 115	39	50 to 128
4-aminobiphenyl	67	91	10	81 to 101	20	71 to 111	30	61 to 121
4-bromophenyl phenyl ether	67	89	10	79 to 99	20	69 to 109	30	59 to 119
4-chloro-3-methylphenol	68	85	12	73 to 97	24	61 to 109	36	49 to 121
4-chloroaniline	67	94	21	73 to 115	42	52 to 136	63	31 to 157
4-chlorophenyl phenyl ether	67	89	10	79 to 99	20	69 to 109	30	59 to 119
4-nitroaniline	67	94	13	81 to 107	26	68 to 120	39	55 to 133
5-nitro-o-toluidine	67	88	10	78 to 98	20	68 to 108	30	58 to 118
7,12-dimethylbenz(a)anthracene	67	83	17	66 to 100	34	49 to 117	51	32 to 134
a-BHC	67	99	12	87 to 111	24	75 to 123	36	63 to 135
Acenaphthene	68	88	10	78 to 98	20	68 to 108	30	58 to 118
Acenaphthylene	68	87	10	77 to 97	20	67 to 107	30	57 to 117
Acetophenone	67	90	13	77 to 103	26	64 to 116	39	51 to 129
Aldrin	67	92	11	81 to 103	22	70 to 114	33	59 to 125
Aniline	67	58	22	36 to 80	44	14 to 102	66	0 to 124
Anthracene	68	91	9	82 to 100	18	73 to 109	27	64 to 118
Azinophos methyl	67	84	20	64 to 104	40	44 to 124	60	24 to 144
Azobenzene	67	88	11	77 to 99	22	66 to 110	33	55 to 121
b-BHC	67	90	13	77 to 103	26	64 to 116	39	51 to 129
Benz(a)anthracene	68	93	11	82 to 104	22	71 to 115	33	60 to 126
Benzo(a) pyrene	68	94	13	81 to 107	26	68 to 120	39	55 to 133
Benzo(b)&(k)fluoranthene	68	94	12	82 to 106	24	70 to 118	36	58 to 130
Benzo(g,h,i)perylene	68	92	12	80 to 104	24	68 to 116	36	56 to 128
Benzyl alcohol	67	69	25	44 to 94	50	19 to 119	75	0 to 144
Bis(2-chloroethoxy) methane	67	91	12	79 to 103	24	67 to 115	36	55 to 127
Bis(2-chloroethyl)ether	67	88	17	71 to 105	34	54 to 122	51	37 to 139
Bis(2-chloroisopropyl) ether	67	89	11	78 to 100	22	67 to 111	33	56 to 122
Bis(2-ethylhexyl) phthalate	67	100	16	84 to 116	32	68 to 132	48	52 to 148
Butyl benzyl phthalate	67	92	12	80 to 104	24	68 to 116	36	56 to 128
Carbazole	67	94	9	85 to 103	18	76 to 112	27	67 to 121

Chlorpyrifos	67	92	10	82 to 102	20	72 to 112	30	62 to 122
Chrysene	68	94	11	83 to 105	22	72 to 116	33	61 to 127
cis-chlordane	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Coumaphos	67	92	19	73 to 111	38	54 to 130	57	35 to 149
d-BHC	67	92	9	83 to 101	18	74 to 110	27	65 to 119
Demeton-O	67	85	12	73 to 97	24	61 to 109	36	49 to 121
Demeton-S	67	87	12	75 to 99	24	63 to 111	36	51 to 123
Di-n-butyl phthalate	67	96	10	86 to 106	20	76 to 116	30	66 to 126
Di-n-octyl phthalate	67	92	14	78 to 106	28	64 to 120	42	50 to 134
Diazinon	67	91	12	79 to 103	24	67 to 115	36	55 to 127
Dibenz(a,h)anthracene	68	92	14	78 to 106	28	64 to 120	42	50 to 134
Dibenzofuran	67	88	10	78 to 98	20	68 to 108	30	58 to 118
Dichlorvos	67	95	14	81 to 109	28	67 to 123	42	53 to 137
Dieldrin	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Diethylphthalate	67	92	10	82 to 102	20	72 to 112	30	62 to 122
Dimethoate	67	82	12	70 to 94	24	58 to 106	36	46 to 118
Dimethyl phthalate	67	95	12	83 to 107	24	71 to 119	36	59 to 131
Diphenylamine	67	91	10	81 to 101	20	71 to 111	30	61 to 121
Disulfoton	67	88	10	78 to 98	20	68 to 108	30	58 to 118
Endosulfan I	67	96	12	84 to 108	24	72 to 120	36	60 to 132
Endosulfan II	67	95	11	84 to 106	22	73 to 117	33	62 to 128
Endosulfan sulphate	67	93	13	80 to 106	26	67 to 119	39	54 to 132
Endrin	67	89	16	73 to 105	32	57 to 121	48	41 to 137
Endrin aldehyde	67	88	18	70 to 106	36	52 to 124	54	34 to 142
Endrin ketone	67	92	13	79 to 105	26	66 to 118	39	53 to 131
EPN	67	87	17	70 to 104	34	53 to 121	51	36 to 138
Ethoprop	67	91	10	81 to 101	20	71 to 111	30	61 to 121
Ethyl methanesulfonate	67	89	19	70 to 108	38	51 to 127	57	32 to 146
Fenitrothion	67	87	12	75 to 99	24	63 to 111	36	51 to 123
Fensulfothion	67	75	14	61 to 89	28	47 to 103	42	33 to 117
Fenthion	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Fluoranthene	68	93	10	83 to 103	20	73 to 113	30	63 to 123
Fluorene	68	87	10	77 to 97	20	67 to 107	30	57 to 117
g-BHC (Lindane)	67	91	13	78 to 104	26	65 to 117	39	52 to 130
Heptachlor	67	89	11	78 to 100	22	67 to 111	33	56 to 122
Heptachlor epoxide	68	93	10	83 to 103	20	73 to 113	30	63 to 123
Hexachlorobenzene	68	87	13	74 to 100	26	61 to 113	39	48 to 126
Hexachlorobutadiene	68	76	13	63 to 89	26	50 to 102	39	37 to 115
Hexachlorocyclopentadiene	68	56	21	35 to 77	42	14 to 98	63	0 to 119
Hexachloroethane	68	72	12	60 to 84	24	48 to 96	36	36 to 108
Hexachloropropene	68	70	14	56 to 84	28	42 to 98	42	28 to 112
Indeno(1,2,3-c,d)pyrene	68	92	13	79 to 105	26	66 to 118	39	53 to 131
Isophorone	67	91	14	77 to 105	28	63 to 119	42	49 to 133
Isosafrole	67	89	11	78 to 100	22	67 to 111	33	56 to 122
Malathion	67	90	11	79 to 101	22	68 to 112	33	57 to 123
Methoxychlor	67	88	21	67 to 109	42	46 to 130	63	25 to 151
Methyl methanesulfonate	67	57	14	43 to 71	28	29 to 85	42	15 to 99
Methyl parathion	67	86	14	72 to 100	28	58 to 114	42	44 to 128
Mevinphos (Phosdrin)	67	88	17	71 to 105	34	54 to 122	51	37 to 139
N-nitrosodi-n-butylamine	67	90	13	77 to 103	26	64 to 116	39	51 to 129
N-nitrosodi-n-propylamine	67	89	14	75 to 103	28	61 to 117	42	47 to 131
N-nitrosodiethylamine	67	91	20	71 to 111	40	51 to 131	60	31 to 151
N-nitrosomorpholine	67	62	11	51 to 73	22	40 to 84	33	29 to 95

N-nitrosopiperidine	67	89	14	75 to 103	28	61 to 117	42	47 to 131
N-nitrosopyrrolidine	67	80	19	61 to 99	38	42 to 118	57	23 to 137
Naled (Dibrom)	67	79	23	56 to 102	46	33 to 125	69	10 to 148
Naphthalene	68	83	14	69 to 97	28	55 to 111	42	41 to 125
NB-d5 (Surr @ 25ug/l)	68	90	11	79 to 101	22	68 to 112	33	57 to 123
Nitrobenzene	67	91	14	77 to 105	28	63 to 119	42	49 to 133
o-toluidine	67	85	22	63 to 107	44	41 to 129	66	19 to 151
Parathion	67	89	14	75 to 103	28	61 to 117	42	47 to 131
Pentachlorobenzene	68	85	10	75 to 95	20	65 to 105	30	55 to 115
Pentachloroethane	67	75	11	64 to 86	22	53 to 97	33	42 to 108
Pentachloronitrobenzene	67	88	9	79 to 97	18	70 to 106	27	61 to 115
Pentachlorophenol	68	68	20	48 to 88	40	28 to 108	60	8 to 128
Phenacetin	67	82	11	71 to 93	22	60 to 104	33	49 to 115
Phenanthrene	68	91	9	82 to 100	18	73 to 109	27	64 to 118
Phenol	68	46	12	34 to 58	24	22 to 70	36	10 to 82
Phenol-d5 (Surr @ 25ug/l)	68	39	11	28 to 50	22	17 to 61	33	6 to 72
Phorate	67	90	10	80 to 100	20	70 to 110	30	60 to 120
Profenofos	66	90	13	77 to 103	26	64 to 116	39	51 to 129
Prothiofos	67	92	11	81 to 103	22	70 to 114	33	59 to 125
Pyrene	68	93	11	82 to 104	22	71 to 115	33	60 to 126
Ronnel	67	92	10	82 to 102	20	72 to 112	30	62 to 122
Safrole	67	89	12	77 to 101	24	65 to 113	36	53 to 125
Stirophos	67	88	13	75 to 101	26	62 to 114	39	49 to 127
Sulfotepp	67	91	11	80 to 102	22	69 to 113	33	58 to 124
TP-d14 (Surr @ 25ug/l)	68	96	9	87 to 105	18	78 to 114	27	69 to 123
trans-chlordane	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Trichloronate	67	93	10	83 to 103	20	73 to 113	30	63 to 123

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08			
Laboratory Analysis Date		8/2/08	8/2/08	8/2/08	8/2/08	7/2/08	7/2/08			
Method : E002.1 BTEx by P&T										
Benzene Toluene Ethylbenzene meta- & para-Xylene ortho-Xylene Total Xylene 4-BFB (Surr @ 100ug/l)	EQL									
	1	<1	<1	<1	<1	96%	<1			
	1	<1	<1	<1	30	98%	<1			
	1	<1	<1	<1	<1	89%	<1			
	2	<2	<2	<2	<2	90%	<2			
	1	<1	<1	<1	<1	92%	<1			
		--	--	--	--	--	--			
		99%	100%	100%	100%	105%	80%			

Results expressed in ug/l unless otherwise specified

Comments:

E002.1: Direct injection into P&T/GC/PID/MSD.

Laboratory Identification		139956	les	mb									
Sample Identification		E8698/1	QC	QC									
Depth (m)		--	--	--									
Sampling Date recorded on COC		4/2/08	--	--									
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08									
Laboratory Analysis Date		8/2/08	7/2/08	7/2/08									
Method : E006.2													
Petroleum Hydrocarbons (TPH)		EQL											
C10 - C14 Fraction		50	--	<50									
C15 - C28 Fraction		100	89%	<100									
C29 - C36 Fraction		100	--	<100									
Sum of TPH C10 - C36		--	--	--									

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		11/2/08	11/2/08	11/2/08	11/2/08	12/2/08	12/2/08			
Method : E004.1										
Petroleum Hydrocarbons (TPH)										
C10-C14 Fraction		<50	<50	9180	<50	--	<50			
C15-C28 Fraction		<200	<200	60300	<200	93%	<200			
C29-C36 Fraction		<50	<50	740	120	--	<50			
Sum of TPH C10 - C36		--	--	70220	120	--	--			

Results expressed in ug/l unless otherwise specified

Comments:

E004.1: Triple extraction with DCM. Analysis by GC/FID.

Laboratory Identification		139944	139945	139946	139947	ics	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08			
Laboratory Analysis Date		8/2/08	8/2/08	8/2/08	8/2/08	7/2/08	7/2/08			
Method : E010.1										
Volatile Halogenated Compounds (VHC)										
Dichlorodifluoromethane	EQL	<50	<50	<50	<50	85%	<50			
Chloromethane	50	<50	<50	<50	<50	90%	<50			
Vinyl chloride	50	<50	<50	<50	<50	92%	<50			
Bromomethane	50	<50	<50	<50	<50	72%	<50			
Chloroethane	50	<50	<50	<50	<50	71%	<50			
Trichlorofluoromethane	50	<50	<50	<50	<50	91%	<50			
1,1-dichloroethene	5	<5	<5	<5	<5	92%	<5			
trans-1,2-dichloroethene	5	<5	<5	<5	<5	93%	<5			
1,1-dichloroethane	5	<5	<5	<5	<5	92%	<5			
cis-1,2-dichloroethene	5	<5	<5	<5	<5	92%	<5			
2,2-dichloropropane	5	<5	<5	<5	<5	82%	<5			
Chloroform	5	<5	<5	<5	<5	92%	<5			
1,1,1-trichloroethane	5	<5	<5	<5	<5	93%	<5			
1,2-dichloroethane	5	<5	<5	<5	<5	95%	<5			
1,1-dichloropropene	5	<5	<5	<5	<5	91%	<5			
Carbon tetrachloride	1	<1	<1	<1	<1	92%	<1			
Trichloroethene	5	<5	<5	<5	<5	95%	<5			
1,2-dichloropropane	5	<5	<5	<5	<5	91%	<5			
Dibromomethane	5	<5	<5	<5	<5	92%	<5			
Bromodichloromethane	5	<5	<5	<5	<5	92%	<5			
cis-1,3-dichloropropene	5	<5	<5	<5	<5	92%	<5			
trans-1,3-dichloropropene	5	<5	<5	<5	<5	91%	<5			
1,1,2-trichloroethane	5	<5	<5	<5	<5	92%	<5			
1,3-dichloropropane	5	<5	<5	<5	<5	91%	<5			
Chlorodibromomethane	5	<5	<5	<5	<5	92%	<5			
Tetrachloroethene	5	<5	<5	<5	<5	93%	<5			
1,2-dibromoethane	5	<5	<5	<5	<5	92%	<5			

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08			
Laboratory Analysis Date		8/2/08	8/2/08	8/2/08	8/2/08	7/2/08	7/2/08			
Method : E010.1										
Volatile Halogenated Compounds (VHC)										
Chlorobenzene	EQL	<5	<5	<5	<5	91%	<5			
1,1,1,2-tetrachloroethane	5	<5	<5	<5	<5	92%	<5			
Bromoform	5	<5	<5	<5	<5	92%	<5			
1,1,2,2-tetrachloroethane	5	<5	<5	<5	<5	84%	<5			
1,2,3-trichloropropane	5	<5	<5	<5	<5	90%	<5			
1,3-dichlorobenzene	5	<5	<5	<5	<5	91%	<5			
1,4-dichlorobenzene	5	<5	<5	<5	<5	91%	<5			
1,2-dichlorobenzene	5	<5	<5	<5	<5	90%	<5			
1,2-dibromo-3-chloropropane	5	<5	<5	<5	<5	91%	<5			
Hexachlorobutadiene	5	<5	<5	<5	<5	92%	<5			
1,2-DCE-d4 (Surr @ 100ug/l)	--	99%	100%	100%	100%	99%	114%			
Toluene-d8 (Surr @ 100ug/l)	--	74%	73%	75%	75%	100%	99%			
4-BFB (Surr @ 100ug/l)	--	93%	92%	93%	93%	100%	96%			

Results expressed in ug/l unless otherwise specified

Comments:

E010.1: Direct injection into P&T/GC/MS. (NB) Dichloromethane not reported unless requested.

Laboratory Identification		139939	139940	139948	139949	139950	139951	139952	139953	139954	139955
Sample Identification		E8682/1	E8682/2	E8693/1	E8693/2	E8694/1	E8694/2	E8694/3	E8694/4	E8695/1	E8695/2
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		1/2/08	1/2/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08
Laboratory Analysis Date		9/2/08	9/2/08	9/2/08	9/2/08	9/2/08	9/2/08	9/2/08	9/2/08	9/2/08	9/2/08
Method : E013.2											
Organochlorine Pesticides (OC)		EQL									
a-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Hexachlorobenzene		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
b-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
g-BHC (Lindane)		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
d-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Aldrin		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
trans-chlordane		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan I		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
cis-chlordane		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Dieldrin		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4-DDE		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endrin		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan II		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4-DDD		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Endosulfan sulphate		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4,4-DDT		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Methoxychlor		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
DBC (Surr @ 0.2mg/kg)		--	99%	105%	101%	105%	102%	102%	104%	104%	102%

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

This report supercedes reports issued on: N/A

Laboratory Identification		139956	139957	139958	139959	139948d	139948r	139958d	139958r	139959s	ics
Sample Identification		E8698/1	E8706/1	E8706/2	E8706/3	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		4/2/08	5/2/08	5/2/08	5/2/08	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	--	7/2/08	--	7/2/08	7/2/08
Laboratory Analysis Date		9/2/08	9/2/08	9/2/08	9/2/08	9/2/08	--	9/2/08	--	12/2/08	8/2/08
Method : E013.2											
Organochlorine Pesticides (OC)		EQL									
a-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	98%	93%
Hexachlorobenzene		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	107%	98%
b-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	101%	96%
g-BHC (Lindane)		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	98%	96%
d-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	102%	93%
Heptachlor		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	99%	102%
Aldrin		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	97%	93%
Heptachlor epoxide		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	96%	91%
trans-chlordane		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	99%	95%
Endosulfan I		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	99%	96%
cis-chlordane		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	99%	97%
Dieldrin		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	108%	97%
4,4-DDE		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	108%	101%
Endrin		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	101%	97%
Endosulfan II		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	97%	96%
4,4-DDD		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	99%	97%
Endosulfan sulphate		<0.05	<0.05	<0.05	<0.05	<0.05	--	<0.05	--	75%	97%
4,4-DDT		<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	--	97%	94%
Methoxychlor		<0.2	<0.2	<0.2	<0.2	<0.2	--	<0.2	--	100%	100%
DBC (Surr @ 0.2mg/kg)		103%	114%	103%	103%	105%	0%	105%	2%	105%	99%

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

This report supercedes reports issued on: N/A

Laboratory Identification																					
Sample Identification										QC											
Depth (m)										--											
Sampling Date recorded on COC										--											
Laboratory Extraction (Preparation) Date										7/2/08											
Laboratory Analysis Date										8/2/08											
Method : E013.2																					
Organochlorine Pesticides (OC)										EQL											
a-BHC										0.05	<0.05										
Hexachlorobenzene										0.05	<0.05										
b-BHC										0.05	<0.05										
g-BHC (Lindane)										0.05	<0.05										
d-BHC										0.05	<0.05										
Heptachlor										0.05	<0.05										
Aldrin										0.05	<0.05										
Heptachlor epoxide										0.05	<0.05										
trans-chlordane										0.05	<0.05										
Endosulfan I										0.05	<0.05										
cis-chlordane										0.05	<0.05										
Dieldrin										0.05	<0.05										
4,4-DDE										0.05	<0.05										
Endrin										0.05	<0.05										
Endosulfan II										0.05	<0.05										
4,4-DDD										0.05	<0.05										
Endosulfan sulphate										0.05	<0.05										
4,4-DDT										0.2	<0.2										
Methoxychlor										0.2	<0.2										
DBC (Surr @ 0.2mg/kg)										--	100%										

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10 g soil extracted with 20 ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		139941	139942	139943	lcs	mb			
Sample Identification		E8683/1	E8683/2	E8683/3	QC	QC			
Depth (m)		--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		7/2/00	7/2/08	7/2/08	7/2/08	7/2/08			
Laboratory Analysis Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Method : E013.1									
Organochlorine Pesticides (OC)									
Method : E013.1 Organochlorine Pesticides (OC) a-BHC Hexachlorobenzene g-BHC (Lindane) b-BHC d-BHC Heptachlor Aldrin Heptachlor epoxide trans-chlordane Endosulfan I cis-chlordane Dieldrin 4,4-DDE Endrin Endosulfan II 4,4-DDD Endosulfan sulphate 4,4-DDT Methoxychlor DBC (Surr @ 10ug/l)	EQL	<0.5	<0.5	<0.5	103%	<0.5			
	0.5	<0.5	<0.5	<0.5	107%	<0.5			
	0.5	<0.5	<0.5	<0.5	94%	<0.5			
	0.5	<0.5	<0.5	<0.5	87%	<0.5			
	0.5	<0.5	<0.5	<0.5	93%	<0.5			
	0.5	<0.5	<0.5	<0.5	95%	<0.5			
	0.5	<0.5	<0.5	<0.5	96%	<0.5			
	0.5	<0.5	<0.5	<0.5	93%	<0.5			
	0.5	<0.5	<0.5	<0.5	97%	<0.5			
	0.5	<0.5	<0.5	<0.5	108%	<0.5			
	0.5	<0.5	<0.5	<0.5	111%	<0.5			
	0.5	<0.5	<0.5	<0.5	96%	<0.5			
	0.5	<0.5	<0.5	<0.5	100%	<0.5			
	0.5	<0.5	<0.5	<0.5	101%	<0.5			
	0.5	<0.5	<0.5	<0.5	99%	<0.5			
	0.5	<0.5	<0.5	<0.5	107%	<0.5			
	0.5	<0.5	<0.5	<0.5	96%	<0.5			
	2	<2	<2	<2	105%	<2			
	2	<2	<2	<2	98%	<2			
	--	72%	71%	71%	79%	75%			

Results expressed in ug/l unless otherwise specified

Comments:

E013.1: Triple extraction with hexane. Analysis by GC/dual ECD.

Laboratory Identification		139939	139940	139956	139957	139958	139959	139958d	139958r	139959s	ics
Sample Identification		E8682/1	E8682/2	E8698/1	E8706/1	E8706/2	E8706/3	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		1/2/08	1/2/08	4/2/08	5/2/08	5/2/08	5/2/08	--	--	--	--
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	--	7/2/08	7/2/08
Laboratory Analysis Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	--	8/2/08	8/2/08
Method : E014.2											
Organophosphorus Pesticides (OP)		EQL									
Dichlorvos		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	120%	122%
Mevinphos (Phosdrin)		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	94%	110%
Demeton (total)		<1	<1	<1	<1	<1	<1	<1	--	117%	123%
Ethoprop		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	115%	117%
Monocrotophos		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	73%	129%
Phorate		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	113%	113%
Dimethoate		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	105%	125%
Diazinon		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	111%	111%
Disulfoton		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	111%	118%
Methyl parathion		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	104%	91%
Ronnel		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	111%	108%
Fenitrothion		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	106%	99%
Malathion		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	123%	125%
Chlorpyrifos		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	110%	110%
Fenthion		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	127%	128%
Parathion		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	115%	97%
Stirofos		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	130%	128%
Prothiofos		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	117%	122%
Azinophos methyl		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	104%	125%
Coumaphos		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	--	129%	130%
TPP (Surr @ 2mg/kg)		90%	92%	83%	106%	88%	98%	95%	8%	92%	89%

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E014.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MSD.

Laboratory Identification		mb																
Sample Identification		QC																
Depth (m)		--																
Sampling Date recorded on COC		--																
Laboratory Extraction (Preparation) Date		7/2/08																
Laboratory Analysis Date		8/2/08																
Method : E014.2																		
Organophosphorus Pesticides (OP)		EQL																
Dichlorvos		0.5	<0.5															
Mevinphos (Phosdrin)		0.5	<0.5															
Demeton (total)		1	<1															
Ethoprop		0.5	<0.5															
Monocrotophos		0.5	<0.5															
Phorate		0.5	<0.5															
Dimethoate		0.5	<0.5															
Diazinon		0.5	<0.5															
Disulfoton		0.5	<0.5															
Methyl parathion		0.5	<0.5															
Ronnol		0.5	<0.5															
Fenitrothion		0.5	<0.5															
Malathion		0.5	<0.5															
Chlorpyrifos		0.5	<0.5															
Fenthion		0.5	<0.5															
Parathion		0.5	<0.5															
Stirofos		0.5	<0.5															
Prothiofos		0.5	<0.5															
Azinophos methyl		0.5	<0.5															
Coumaphos		0.5	<0.5															
TPP (Surr @ 2mg/kg)		--	94%															

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E014.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MSD.

Laboratory Identification		139941	139942	139943	lcs	mb			
Sample Identification		E8683/1	E8683/2	E8683/3	QC	QC			
Depth (m)		--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		13/2/08	13/2/08	13/2/08	12/2/08	12/2/08			
Method : E014.1									
Organophosphorus Pesticides (OP)									
Dichlorvos Mevinphos (Phosdrin) Demeton (total) Ethoprop Phorate Dimethoate Diazinon Disulfoton Methyl parathion Ronnol Fenitrothion Malathion Chlorpyrifos Fenthion Parathion Prothiofos Azinophos methyl Coumaphos <i>TPP (Surr @ 10ug/l)</i>	EQL	<2	<2	<2	76%	<2			
	2	<2	<2	<2	76%	<2			
	2	<4	<4	<4	72%	<4			
	4	<2	<2	<2	74%	<2			
	2	<2	<2	<2	75%	<2			
	2	<2	<2	<2	71%	<2			
	2	<2	<2	<2	74%	<2			
	2	<2	<2	<2	73%	<2			
	2	<2	<2	<2	75%	<2			
	2	<2	<2	<2	83%	<2			
	2	<2	<2	<2	100%	<2			
	2	<2	<2	<2	82%	<2			
	2	<2	<2	<2	85%	<2			
	2	<2	<2	<2	86%	<2			
	2	<2	<2	<2	87%	<2			
	2	<2	<2	<2	78%	<2			
	2	<2	<2	<2	84%	<2			
	2	<2	<2	<2	115%	<2			
	--	110%	111%	121%	88%	109%			

Results expressed in ug/l unless otherwise specified

Comments:

E014.1: Triple extraction with DCM. Analysis by GC/MSD.

Laboratory Identification		139939	139940	lcs	mb				
Sample Identification		E8682/1	E8682/2	QC	QC				
Depth (m)		--	--	--	--				
Sampling Date recorded on COC		1/2/08	1/2/08	--	--				
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08				
Laboratory Analysis Date		9/2/08	9/2/08	8/2/08	8/2/08				
Method : E013.2									
Polychlorinated Biphenyls (PCB)		EQL							
Arochlor 1016		<0.5	<0.5	--	<0.5				
Arochlor 1232		<0.5	<0.5	--	<0.5				
Arochlor 1242		<0.5	<0.5	--	<0.5				
Arochlor 1248		<0.5	<0.5	--	<0.5				
Arochlor 1254		<0.5	<0.5	92%	<0.5				
Arochlor 1260		<0.5	<0.5	--	<0.5				
Sum of reported PCBs		--	--	--	--				
DBC (Surr @ 0.2mg/kg)		100%	99%	101%	100%				

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		14/2/08	14/2/08	14/2/08	14/2/08	14/2/08	14/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)										
Phenols		EQL								
Phenol	2	<2	<2	<2	2	31%	<2			
2-chlorophenol	2	<2	<2	<2	<2	87%	<2			
2-methylphenol	2	<2	<2	<2	<2	73%	<2			
3-&4-methylphenol	4	<4	<4	<4	23	111%	<4			
2-nitrophenol	2	<2	<2	<2	<2	82%	<2			
2,4-dimethylphenol	2	<2	<2	<2	<2	86%	<2			
2,4-dichlorophenol	2	<2	<2	<2	<2	89%	<2			
2,6-dichlorophenol	2	<2	<2	<2	<2	87%	<2			
4-chloro-3-methylphenol	2	<2	<2	<2	<2	85%	<2			
2,4,6-trichlorophenol	2	<2	<2	<2	<2	85%	<2			
2,4,5-trichlorophenol	2	<2	<2	<2	<2	82%	<2			
2,3,4,6-tetrachlorophenol	2	<2	<2	<2	<2	77%	<2			
Pentachlorophenol	4	<4	<4	<4	<4	78%	<4			
Polynuclear Aromatic Hydrocarbons										
Naphthalene	2	<2	<2	<2	<2	53%	<2			
2-methylnaphthalene	2	<2	<2	<2	<2	87%	<2			
2-chloronaphthalene	2	<2	<2	<2	<2	88%	<2			
Acenaphthylene	2	<2	<2	<2	<2	100%	<2			
Acenaphthene	2	<2	<2	<2	<2	91%	<2			
Fluorene	2	<2	<2	<2	<2	89%	<2			
Phenanthrene	2	<2	<2	<2	<2	91%	<2			
Anthracene	2	<2	<2	<2	<2	92%	<2			
Fluoranthene	2	<2	<2	<2	<2	97%	<2			
Pyrene	2	<2	<2	<2	<2	98%	<2			
2-(acetylamino) fluorene	2	<2	<2	<2	<2	90%	<2			
Benz(a)anthracene	2	<2	<2	<2	<2	95%	<2			

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08					
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		14/2/08	14/2/08	14/2/08	14/2/08	14/2/08	14/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
Chrysene		2	<2	<2	<2	98%	<2			
Benzo(b)&(k)fluoranthene		4	<4	<4	<4	95%	<4			
7,12-dimethylbenz(a)anthracene		2	<2	<2	<2	78%	<2			
Benzo(a) pyrene		2	<2	<2	<2	96%	<2			
3-methylcholanthrene		2	<2	<2	<2	94%	<2			
Indeno(1,2,3-c,d)pyrene		2	<2	<2	<2	94%	<2			
Dibenz(a,h)anthracene		2	<2	<2	<2	94%	<2			
Benzo(g,h,i)perylene		2	<2	<2	<2	94%	<2			
Phthalates										
Dimethyl phthalate		2	<2	<2	<2	93%	<2			
Diethylphthalate		2	<2	<2	<2	94%	<2			
Di-n-butyl phthalate		2	<2	<2	<2	104%	<2			
Butyl benzyl phthalate		2	<2	<2	<2	98%	<2			
Bis(2-ethylhexyl) phthalate		20	<20	<20	<20	108%	<20			
Di-n-octyl phthalate		2	<2	<2	<2	92%	<2			
Nitrosamines										
N-nitrosodiethylamine		2	<2	<2	<2	89%	<2			
N-nitrosopyrrolidine		4	<4	<4	<4	71%	<4			
N-nitrosomorpholine		2	<2	<2	<2	57%	<2			
N-nitrosodi-n-propylamine		2	<2	<2	<2	80%	<2			
N-nitrosopiperidine		2	<2	<2	<2	85%	<2			
N-nitrosodi-n-butylamine		2	<2	<2	<2	87%	<2			
Diphenylamine		2	<2	<2	<2	94%	<2			
4-aminobiphenyl		2	<2	<2	<2	94%	<2			
Organochlorine Pesticides										
a-BHC		2	<2	<2	<2	99%	<2			
b-BHC		2	<2	<2	<2	96%	<2			

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		14/2/08	14/2/08	14/2/08	14/2/08	14/2/08	14/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
d-BHC		<2	<2	<2	<2	95%	<2			
g-BHC (Lindane)		<2	<2	<2	<2	96%	<2			
Heptachlor		<2	<2	<2	<2	94%	<2			
Aldrin		<2	<2	<2	<2	94%	<2			
Heptachlor epoxide		<2	<2	<2	<2	98%	<2			
Endosulfan I		<2	<2	<2	<2	96%	<2			
trans-chlordane		<2	<2	<2	<2	95%	<2			
cis-chlordane		<2	<2	<2	<2	96%	<2			
4,4-DDE		<2	<2	<2	<2	98%	<2			
Dieldrin		<2	<2	<2	<2	98%	<2			
Endrin		<2	<2	<2	<2	83%	<2			
Endosulfan II		<2	<2	<2	<2	99%	<2			
4,4-DDD		<2	<2	<2	<2	96%	<2			
Endosulfan sulphate		<2	<2	<2	<2	96%	<2			
Endrin aldehyde		<2	<2	<2	<2	90%	<2			
Endrin ketone		<2	<2	<2	<2	98%	<2			
4,4-DDT		<4	<4	<4	<4	96%	<4			
Methoxychlor		<2	<2	<2	<2	95%	<2			
Organophosphorus Pesticides										
Dichlorvos		<2	<2	<2	<2	107%	<2			
Mevinphos (Phosdrin)		<2	<2	<2	<2	57%	<2			
Demeton-O		<2	<2	<2	<2	75%	<2			
Ethoprop		<2	<2	<2	<2	102%	<2			
Naled (Dibrom)		<2	<2	<2	<2	84%	<2			
Phorate		<2	<2	<2	<2	99%	<2			
Demeton-S		<2	<2	<2	<2	102%	<2			
Dimethoate		<2	<2	<2	<2	92%	<2			

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08					
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		14/2/08	14/2/08	14/2/08	14/2/08	14/2/08	14/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
Diazinon		2	<2	<2	<2	89%	<2			
Sulfotepp		2	<2	<2	<2	104%	<2			
Disulfoton		2	<2	<2	<2	98%	<2			
Methyl parathion		2	<2	<2	<2	88%	<2			
Ronnol		2	<2	<2	<2	103%	<2			
Malathion		2	<2	<2	<2	99%	<2			
Fenitrothion		2	<2	<2	<2	97%	<2			
Fenthion		2	<2	<2	<2	112%	<2			
Chlorpyrifos		2	<2	<2	<2	107%	<2			
Parathion		2	<2	<2	<2	106%	<2			
Trichloronate		2	<2	<2	<2	96%	<2			
EPN		2	<2	<2	<2	91%	<2			
Stirophos		2	<2	<2	<2	103%	<2			
Prothiofos		2	<2	<2	<2	105%	<2			
Profenofos		2	<2	<2	<2	109%	<2			
Fensulfothion		2	<2	<2	<2	72%	<2			
Azinophos methyl		2	<2	<2	<2	95%	<2			
Coumaphos		2	<2	<2	<2	100%	<2			
Nitroaromatics and Ketones										
Acetophenone		2	<2	<2	<2	92%	<2			
Isophorone		2	<2	<2	<2	97%	<2			
Nitrobenzene		2	<2	<2	<2	87%	<2			
1,4-dinitrobenzene		2	<2	<2	<2	80%	<2			
2,6-dinitrotoluene		4	<4	<4	<4	82%	<4			
2,4-dinitrotoluene		4	<4	<4	<4	79%	<4			
5-nitro-o-toluidine		2	<2	<2	<2	92%	<2			
Azobenzene		2	<2	<2	<2	87%	<2			

Laboratory Identification		139944	139945	139946	139947	ics	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08					
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		14/2/08	14/2/08	14/2/08	14/2/08	14/2/08	14/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
4-(dimethylamino) azobenzene		2	<2	<2	<2	<2	<2	89%	<2	
Phenacetin		2	<2	<2	<2	<2	<2	81%	<2	
Pentachloronitrobenzene		2	<2	<2	<2	<2	<2	88%	<2	
Anilines and Benzedines										
Aniline		2	<2	<2	<2	<2	<2	71%	<2	
4-chloroaniline		2	<2	<2	<2	<2	<2	129%	<2	
2-nitroaniline		4	<4	<4	<4	<4	<4	83%	<4	
3-nitroaniline		4	<4	<4	<4	<4	<4	72%	<4	
4-nitroaniline		2	<2	<2	<2	<2	<2	89%	<2	
Dibenzofuran		2	<2	<2	<2	<2	<2	92%	<2	
Carbazole		2	<2	<2	<2	<2	<2	95%	<2	
o-toluidine		2	<2	<2	<2	<2	<2	76%	<2	
1-naphthylamine		2	<2	<2	<2	<2	<2	85%	<2	
2-naphthylamine		2	<2	<2	<2	<2	<2	129%	<2	
Chlorinated Hydrocarbons										
1,3-dichlorobenzene		2	<2	<2	<2	<2	<2	76%	<2	
1,4-dichlorobenzene		2	<2	<2	<2	<2	<2	67%	<2	
1,2-dichlorobenzene		2	<2	<2	<2	<2	<2	79%	<2	
1,2,4-trichlorobenzene		2	<2	<2	<2	<2	<2	78%	<2	
1,2,4,5-tetrachlorobenzene		2	<2	<2	<2	<2	<2	75%	<2	
Pentachlorobenzene		2	<2	<2	<2	<2	<2	85%	<2	
Hexachlorobenzene		2	<2	<2	<2	<2	<2	91%	<2	
Pentachloroethane		2	<2	<2	<2	<2	<2	74%	<2	
Hexachloroethane		2	<2	<2	<2	<2	<2	71%	<2	
Hexachloropropene		2	<2	<2	<2	<2	<2	62%	<2	
Hexachlorobutadiene		2	<2	<2	<2	<2	<2	71%	<2	
Hexachlorocyclopentadiene		4	<4	<4	<4	<4	<4	91%	<4	

Laboratory Identification		139944	139945	139946	139947	lcs	mb			
Sample Identification		E8684/1	E8684/2	E8684/3	E8684/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		1/2/08	1/2/08	1/2/08	1/2/08	--	--			
Laboratory Extraction (Preparation) Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08			
Laboratory Analysis Date		14/2/08	14/2/08	14/2/08	14/2/08	14/2/08	14/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
Haloethers										
Bis(2-chloroethyl)ether		<2	<2	<2	<2	93%	<2			
Bis(2-chloroisopropyl) ether		<2	<2	<2	<2	90%	<2			
Bis(2-chloroethoxy) methane		<2	<2	<2	<2	90%	<2			
4-chlorophenyl phenyl ether		<2	<2	<2	<2	92%	<2			
4-bromophenyl phenyl ether		<2	<2	<2	<2	91%	<2			
Miscellaneous Compounds										
Methyl methanesulfonate		<2	<2	<2	<2	42%	<2			
Ethyl methanesulfonate		<2	<2	<2	<2	81%	<2			
Benzyl alcohol		<2	<2	<2	<2	50%	<2			
Safrole		<2	<2	<2	<2	89%	<2			
Isosafrole		<2	<2	<2	<2	89%	<2			
Surrogate Standards										
2-FP (Surr @ 25ug/l)		41%	48%	48%	43%	52%	51%			
Phenol-d5 (Surr @ 25ug/l)		25%	29%	31%	29%	32%	30%			
NB-d5 (Surr @ 25ug/l)		70%	84%	87%	87%	86%	88%			
2-FBP (Surr @ 25ug/l)		72%	81%	87%	76%	78%	80%			
TP-d14 (Surr @ 25ug/l)		94%	94%	109%	84%	92%	102%			

Results expressed in ug/l unless otherwise specified

Comments:

E017.1: Base/neutral and acidic extraction with DCM. Analysis by GC/MS.

Laboratory Identification		139939	139940	139948	139949	139950	139951	139952	139953	139954	139955
Sample Identification		E8682/1	E8682/2	E8693/1	E8693/2	E8694/1	E8694/2	E8694/3	E8694/4	E8695/1	E8695/2
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		1/2/08	1/2/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08	31/1/08
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	7/2/08
Laboratory Analysis Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	8/2/08
Method : E005.2											
Moisture											
Moisture	EQL --	18	22	18	22	17	15	16	17	27	20

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Laboratory Identification		139956	139957	139958	139959	139948d	139948r	139958d	139958r		
Sample Identification		E8698/1	E8706/1	E8706/2	E8706/3	QC	QC	QC	QC		
Depth (m)		--	--	--	--	--	--	--	--		
Sampling Date recorded on COC		4/2/08	5/2/08	5/2/08	5/2/08	--	--	--	--		
Laboratory Extraction (Preparation) Date		7/2/08	7/2/08	7/2/08	7/2/08	7/2/08	--	7/2/08	--		
Laboratory Analysis Date		8/2/08	8/2/08	8/2/08	8/2/08	8/2/08	--	8/2/08	--		
Method : E005.2											
Moisture											
Moisture	EQL --	10	21	24	23	20	11%	26	8%		

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.

Sample Receipt Notice (SRN) for E036145



Quality, Service, Support

Client Details		Laboratory Reference Information	
Client Name: Environmental Analysis Laboratory Client Phone: 02 6620 3678 Client Fax: 02 6620 3957 Contact Name: Graham Lancaster Contact Email: glancast@scu.edu.au Client Address: Southern Cross University Military Rd East Lismore NSW 2480 Project Name: Soil and Water analysis Project Number: - Not provided - CoC Serial Number: - Not provided - Purchase Order: - Not provided - Surcharge: No surcharge applied (results by 6:30pm on due date) Sample Matrix: SOIL & WATER		Please have this information ready when contacting Labmark. Laboratory Report: E036145 Quotation Number: Q0295.ES Laboratory Address: Unit 1, 8 Leighton Pl. Asquith NSW 2077 Phone: 61 2 9476 6533 Fax: 61 2 9476 8219 Sample Receipt Contact: Jakleen El Galada Email: jakleen.galada@labmark.com.au Reporting Contact: Jyothi Lal Email: jyothi.lal@labmark.com.au	
Date Sampled (earliest date): 31/01/2008 Date Samples Received: 06/02/2008 Date Sample Receipt Notice issued: 06/02/2008 Date Preliminary Report Due: 14/02/2008		NATA Accreditation: 13542 TGA GMP License: 185-336 (Sydney) APVMA License: 6105 (Sydney) AQIS Approval: NO356 (Sydney) AQIS Entry Permit: 200521534 (Sydney)	

Reporting Requirements: Electronic Data Download required: No

Invoice Number: 30332

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals intact .
Sample container & chemical preservation suitable .

Comments:

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of \$1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur \$5.00/ sample/ 3 months. Additional refrigerated storage shall incur \$30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

VOC E010.1: Dichloromethane not reported unless requested.

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Sample Receipt Notice (SRN) for E036145



Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis															
No.	Date	Depth	Client Sample ID	BTEX by P&T	Moisture	Organochlorine Pesticides (OC)	Organochlorine Pesticides (OC)	Organophosphorus Pesticides (OP)	Organophosphorus Pesticides (OP)	Polychlorinated Biphenyls (PCB)	PREP Not Reported	PREP Not Reported	Semivolatile Organic Compounds (SVOC)	Petroleum Hydrocarbons (TPH)	Petroleum Hydrocarbons (TPH)	Volatile Halogenated Compounds (VHC)			
139939	01/02		E8682/1		●	●		●		●	●								
139940	01/02		E8682/2		●	●		●		●	●								
139941	01/02		E8683/1				●		●			●							
139942	01/02		E8683/2				●		●			●							
139943	01/02		E8683/3				●		●			●							
139944	01/02		E8684/1	●								●	●		●	●			
139945	01/02		E8684/2	●								●	●		●	●			
139946	01/02		E8684/3	●								●	●		●	●			
139947	01/02		E8684/4	●								●	●		●	●			
139948	31/01		E8693/1		●	●					●								
139949	31/01		E8693/2		●	●					●								
139950	31/01		E8694/1		●	●					●								
139951	31/01		E8694/2		●	●					●								
139952	31/01		E8694/3		●	●					●								
139953	31/01		E8694/4		●	●					●								
139954	31/01		E8695/1		●	●					●								
139955	31/01		E8695/2		●	●					●								
139956	04/02		E8698/1		●	●		●			●			●					
139957	05/02		E8706/1		●	●		●			●								
139958	05/02		E8706/2		●	●		●			●								
139959	05/02		E8706/3		●	●		●			●								
Totals:				4	14	14	3	6	3	2	14	7	4	1	4	4			

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

CHAIN OF CUSTODY

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Quality, Service & Support
NATA 13542, AQIS 749

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Facsimile: 0419
After hours (DB): 0419
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E-mail:
Web page:

Dispatch samples to:
Geoff Weir
Unit 12/18 Leighton Place
Asquith NSW 2077

Client Details

Client Name: **EAL- Southern Cross Uni** Tel: 0419 984 088
Client Address: **Military Rd, East Lismore, 2480** Fx: 02 66203957
Contact Name: **Graham Lancaster** Date Required:
Project Ref: **Lab. Quote No: Q0295.ES**

Global Specifications I require:

1. Urgent TAT required? (please circle: 1 day 2 days 3 days days ')
2. Fast TAT Guarantee required? (surcharge may apply)
3. Do you wish any sediment layer present in waters to be excluded from extractions?
4. Additional QA/QC reported where sample batches submitted are < 10 samples?
5. % extraneous material removed from samples to be reported as per NEPM 5.1.1?
6. "EasyQ" QA/QC assessment report?
7. "RemLab" Remediation bench scale project, please contact me for further details?

Note1: Additional water sample must be submitted for lab. duplicate & spike analysis.
Note2: Contact lab if consolidating multiple analyses into a single sample container.

Lab. Number	Sample ID	Sample Depth	Sampling Date	Matrix			Preservation			Container (No. & type)
				soil	water	other	filtered	acid	ice	
139939	E8682/1	-	1/2/8							glass jar
139940	E8682/2	-	1/2/8							bottle
139941	E8683/1	-	"							"
139942	E8683/2	-	"							"
139943	E8683/3	-	"							bottle + vial
139944	E8684/1	-	"							"
139945	E8684/2	-	"							"
139946	E8684/3	-	"							"
139947	E8684/4	-	"							"
139948	E8693/1	-	31/1/8							jar
139949	E8693/2	-	"							"
139950	E8694/1	-	"							"

Analysis Request

Volatile sample required 125g	Semi- & Non-Volatile sample required 125g (max. 4 tests)					Leachate	Other
	244 ml	244 ml	244 ml	500 ml	500 ml		
BTEX+VTPH (C6-9) E002/3 PT							
VHC							
SVOC							
TPH (C10-36) E004/6							
OCP E013 GC/ECD							
OPP E014 GC/MS							
PCB E013 GC/ECD							
PAH's E007 GC/MS							

Comments (Highly contaminated samples, e-mail required):

* Metals to analyse (please circle):
As Cd Cr Cu Ni Pb Zn Hg Other

Relinquished by (print): **Christine** Signed: **CH** Date: **5.2.08** Received By: **SH** Date: **6/2/08**

Relinquished by (print): Signed: Date:

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E036068
Client Name: Environmental Analysis Laboratory
Client Reference: Water and Soil
Contact Name: Graham Lancaster
Chain of Custody No: na
Sample Matrix: SOIL & WATER

Cover Page 1 of 4
plus Sample Results

Date Received: 01/02/2008
Date Reported: 11/02/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occurred within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy: matrix spike: 1 in first 5-20, then 1 every 20 samples
lcs, crm, method: 1 per analytical batch
surrogate spike: addition per target organic method

Precision: laboratory duplicate: 1 in first 5-10, then 1 every 10 samples

laboratory triplicate: re-extracted & reported when duplicate RPD values exceed acceptance criteria

Holding Times: soils, waters: Refer to LabMark Preservation & THT table
VOC's 14 days water / soil
VAC's 7 days water or 14 days acidified
VAC's 14 days soil
SVOC's 7 days water, 14 days soil
Pesticides 7 days water, 14 days soil
Metals 6 months general elements
Mercury 28 days

Confirmation: target organic analysis: GC/MS, or confirmatory column

Sensitivity: EQL: Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL

GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy: spike, lcs, crm general analytes 70% - 130% recovery
surrogate: phenol analytes 50% - 130% recovery
organophosphorous pesticide analytes 60% - 130% recovery
phenoxy acid herbicides, organotin 50% - 130% recovery

anion/cation bal: +/- 10% (0-3 meq/l),
+/- 5% (>3 meq/l)

Precision: method blank: not detected >95% of the reported EQL
duplicate lab 0-30% (>10xEQL), 0-75% (5-10xEQL)
RPD (metals): 0-100% (<5xEQL)
duplicate lab 0-50% (>10xEQL), 0-75% (5-10xEQL)
RPD: 0-100% (<5xEQL)

QUALITY CONTROL

ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy: spike, lcs, crm analyte specific recovery data
surrogate: <3xsd of historical mean

Uncertainty: spike, lcs: measurement calculated from historical analyte specific control charts

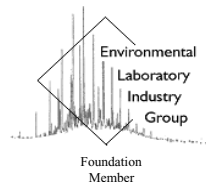
RESULT ANNOTATION

Data Quality Objective	s: matrix spike recovery	p: pending	bcs: batch specific lcs
Data Quality Indicator	d: laboratory duplicate	lcs: laboratory control sample	bmb: batch specific mb
Estimated Quantitation Limit	t: laboratory triplicate	crm: certified reference material	
not applicable	r: RPD relative % difference	mb: method blank	

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Laboratory Report: E036068

Cover Page 2 of 4

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

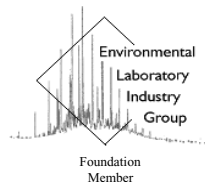
- A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.
- B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.
- C. Laboratory QA/QC samples are specific to this project.
- D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.
- E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.
- F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.
- G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomalous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.
- H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.
- I. LabMark shall maintain an official copy of this Certificate of Analysis for all traceable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

- A. SRN issued to client upon sample receipt & login verification.
- B. Preservation & sampling date details specified on COC and SRN, unless noted.
- C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

- A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).
- B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.
- C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.



Laboratory Report: E036068

Cover Page 3 of 4

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

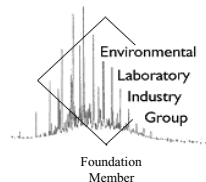
Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
5	Organochlorine Pesticides (OC)	8	1	13%	0	1	13%
8	Organophosphorus Pesticides (OP)	4	0	0%	0	0	0%
10	Polychlorinated Biphenyls (PCB)	4	0	0%	0	0	0%
17	Moisture	8	--	--	--	--	--

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	4	0	0%	0	0	0%
1	Volatile TPH by P&T (vTPH)	4	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	4	0	0%	0	0	0%
3	Volatile Halogenated Compounds (VHC)	4	0	0%	0	0	0%
7	Organochlorine Pesticides (OC)	2	0	0%	0	0	0%
9	Organophosphorus Pesticides (OP)	2	0	0%	0	0	0%
11	Semivolatile Organic Compounds (SVOC)	4	0	0%	0	0	0%

GLOSSARY:

- #d number of discrete duplicate extractions/analyses performed.
- %d-ratio NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
- #t number of triplicate extractions/analyses performed.
- #s number of spiked samples analysed.
- %s-ratio USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).



Laboratory Report: E036068

Cover Page 4 of 4

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

- A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535., unless indicated below.
- B. SVOC (water) LCS (extraction date 04/02/08) recovery range is 29% - 129%
- C. SVOC (water) sample surrogates recovery range of 30% - 128%, corresponding LCS recovery range is 27% - 90%, MB is 36% - 99%.
- D. Refer to LabMark historical control chart recovery range data. QA/QC (SVOC) results reported within 3sd of the historical analyte specific mean results, and therefore considered acceptable for laboratory release.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

HISTORICAL CONTROL CHART DATA - QA/QC

Sydney

Analyte mean and standard deviation

SVOC_W

For the period: 01/01/2007 12:00:00 AM to 31/12/2007 11:59:59 PM

SPIKES

Analyte Name	n	Mean	1 SD	Range	2 SD	Range	3 SD	Range
1,2,4,5-tetrachlorobenzene	13	85	20	65 to 105	40	45 to 125	60	25 to 145
1,2,4-trichlorobenzene	13	88	17	71 to 105	34	54 to 122	51	37 to 139
1,2-dichlorobenzene	13	86	14	72 to 100	28	58 to 114	42	44 to 128
1,3-dichlorobenzene	13	85	14	71 to 99	28	57 to 113	42	43 to 127
1,4-dichlorobenzene	13	86	20	66 to 106	40	46 to 126	60	26 to 146
1,4-dinitrobenzene	13	93	15	78 to 108	30	63 to 123	45	48 to 138
1-naphthylamine	11	60	21	39 to 81	42	18 to 102	63	0 to 123
2,3,4,6-tetrachlorophenol	12	82	16	66 to 98	32	50 to 114	48	34 to 130
2,4,5-trichlorophenol	13	87	20	67 to 107	40	47 to 127	60	27 to 147
2,4,6-trichlorophenol	12	88	12	76 to 100	24	64 to 112	36	52 to 124
2,4-dichlorophenol	12	92	13	79 to 105	26	66 to 118	39	53 to 131
2,4-dimethylphenol	12	94	17	77 to 111	34	60 to 128	51	43 to 145
2,4-dinitrotoluene	13	89	13	76 to 102	26	63 to 115	39	50 to 128
2,6-dichlorophenol	12	94	17	77 to 111	34	60 to 128	51	43 to 145
2,6-dinitrotoluene	13	93	14	79 to 107	28	65 to 121	42	51 to 135
2-(acetylamino) fluorene	12	93	18	75 to 111	36	57 to 129	54	39 to 147
2-chloronaphthalene	13	92	14	78 to 106	28	64 to 120	42	50 to 134
2-chlorophenol	13	90	17	73 to 107	34	56 to 124	51	39 to 141
2-FBP (Surr @ 25ug/l)	13	88	13	75 to 101	26	62 to 114	39	49 to 127
2-FP (Surr @ 25ug/l)	12	57	15	42 to 72	30	27 to 87	45	12 to 102
2-methylnaphthalene	13	92	14	78 to 106	28	64 to 120	42	50 to 134
2-methylphenol	12	80	10	70 to 90	20	60 to 100	30	50 to 110
2-naphthylamine	12	86	26	60 to 112	52	34 to 138	78	8 to 164
2-nitroaniline	13	94	18	76 to 112	36	58 to 130	54	40 to 148
2-nitrophenol	13	93	17	76 to 110	34	59 to 127	51	42 to 144
3-&4-methylphenol	12	79	15	64 to 94	30	49 to 109	45	34 to 124
3-methylcholanthrene	12	106	16	90 to 122	32	74 to 138	48	58 to 154
3-nitroaniline	12	73	14	59 to 87	28	45 to 101	42	31 to 115
4,4-DDD	13	103	14	89 to 117	28	75 to 131	42	61 to 145
4,4-DDE	13	96	12	84 to 108	24	72 to 120	36	60 to 132
4,4-DDT	13	77	27	50 to 104	54	23 to 131	81	0 to 158
4-(dimethylamino) azobenzene	12	85	20	65 to 105	40	45 to 125	60	25 to 145
4-aminobiphenyl	12	96	13	83 to 109	26	70 to 122	39	57 to 135
4-bromophenyl phenyl ether	13	93	14	79 to 107	28	65 to 121	42	51 to 135
4-chloro-3-methylphenol	12	93	13	80 to 106	26	67 to 119	39	54 to 132
4-chloroaniline	12	83	31	52 to 114	62	21 to 145	93	0 to 176
4-chlorophenyl phenyl ether	13	91	13	78 to 104	26	65 to 117	39	52 to 130
4-nitroaniline	12	81	21	60 to 102	42	39 to 123	63	18 to 144
5-nitro-o-toluidine	13	96	14	82 to 110	28	68 to 124	42	54 to 138
7,12-dimethylbenz(a)anthracene	12	71	24	47 to 95	48	23 to 119	72	0 to 143
a-BHC	13	94	16	78 to 110	32	62 to 126	48	46 to 142
Acenaphthene	13	96	15	81 to 111	30	66 to 126	45	51 to 141
Acenaphthylene	13	90	11	79 to 101	22	68 to 112	33	57 to 123
Acetophenone	13	92	18	74 to 110	36	56 to 128	54	38 to 146
Aldrin	13	92	17	75 to 109	34	58 to 126	51	41 to 143

Aniline	12	54	22	32 to 76	44	10 to 98	66	0 to 120
Anthracene	13	91	18	73 to 109	36	55 to 127	54	37 to 145
Azinophos methyl	12	100	24	76 to 124	48	52 to 148	72	28 to 172
Azobenzene	13	89	12	77 to 101	24	65 to 113	36	53 to 125
b-BHC	13	91	15	76 to 106	30	61 to 121	45	46 to 136
Benz(a)anthracene	13	95	11	84 to 106	22	73 to 117	33	62 to 128
Benzo(a) pyrene	13	94	27	67 to 121	54	40 to 148	81	13 to 175
Benzo(b)&(k)fluoranthene	13	99	16	83 to 115	32	67 to 131	48	51 to 147
Benzo(g,h,i)perylene	13	101	17	84 to 118	34	67 to 135	51	50 to 152
Benzyl alcohol	10	85	25	60 to 110	50	35 to 135	75	10 to 160
Bis(2-chloroethoxy) methane	13	91	18	73 to 109	36	55 to 127	54	37 to 145
Bis(2-chloroethyl)ether	13	80	23	57 to 103	46	34 to 126	69	11 to 149
Bis(2-chloroisopropyl) ether	13	92	14	78 to 106	28	64 to 120	42	50 to 134
Bis(2-ethylhexyl) phthalate	13	106	17	89 to 123	34	72 to 140	51	55 to 157
Butyl benzyl phthalate	13	99	15	84 to 114	30	69 to 129	45	54 to 144
Carbazole	13	96	10	86 to 106	20	76 to 116	30	66 to 126
Chlorpyrifos	13	97	14	83 to 111	28	69 to 125	42	55 to 139
Chrysene	13	96	11	85 to 107	22	74 to 118	33	63 to 129
cis-chlordane	13	95	12	83 to 107	24	71 to 119	36	59 to 131
Coumaphos	13	98	18	80 to 116	36	62 to 134	54	44 to 152
d-BHC	13	97	13	84 to 110	26	71 to 123	39	58 to 136
Demeton-O	12	92	13	79 to 105	26	66 to 118	39	53 to 131
Demeton-S	12	94	14	80 to 108	28	66 to 122	42	52 to 136
Di-n-butyl phthalate	13	100	12	88 to 112	24	76 to 124	36	64 to 136
Di-n-octyl phthalate	13	100	12	88 to 112	24	76 to 124	36	64 to 136
Diazinon	13	93	13	80 to 106	26	67 to 119	39	54 to 132
Dibenz(a,h)anthracene	13	101	17	84 to 118	34	67 to 135	51	50 to 152
Dibenzofuran	13	91	13	78 to 104	26	65 to 117	39	52 to 130
Dichlorvos	13	102	14	88 to 116	28	74 to 130	42	60 to 144
Dieldrin	13	99	16	83 to 115	32	67 to 131	48	51 to 147
Diethylphthalate	13	94	12	82 to 106	24	70 to 118	36	58 to 130
Dimethoate	13	84	19	65 to 103	38	46 to 122	57	27 to 141
Dimethyl phthalate	13	97	13	84 to 110	26	71 to 123	39	58 to 136
Diphenylamine	12	96	13	83 to 109	26	70 to 122	39	57 to 135
Disulfoton	12	91	12	79 to 103	24	67 to 115	36	55 to 127
Endosulfan I	13	89	14	75 to 103	28	61 to 117	42	47 to 131
Endosulfan II	13	98	13	85 to 111	26	72 to 124	39	59 to 137
Endosulfan sulphate	13	95	14	81 to 109	28	67 to 123	42	53 to 137
Endrin	13	95	21	74 to 116	42	53 to 137	63	32 to 158
Endrin aldehyde	13	92	18	74 to 110	36	56 to 128	54	38 to 146
Endrin ketone	13	90	20	70 to 110	40	50 to 130	60	30 to 150
EPN	13	94	15	79 to 109	30	64 to 124	45	49 to 139
Ethoprop	12	94	12	82 to 106	24	70 to 118	36	58 to 130
Ethyl methanesulfonate	13	83	18	65 to 101	36	47 to 119	54	29 to 137
Fenitrothion	13	93	15	78 to 108	30	63 to 123	45	48 to 138
Fensulfothion	12	91	20	71 to 111	40	51 to 131	60	31 to 151
Fenthion	13	92	15	77 to 107	30	62 to 122	45	47 to 137
Fluoranthene	13	99	12	87 to 111	24	75 to 123	36	63 to 135
Fluorene	13	91	13	78 to 104	26	65 to 117	39	52 to 130
g-BHC (Lindane)	13	96	13	83 to 109	26	70 to 122	39	57 to 135
Heptachlor	13	93	20	73 to 113	40	53 to 133	60	33 to 153
Heptachlor epoxide	13	94	15	79 to 109	30	64 to 124	45	49 to 139
Hexachlorobenzene	13	90	21	69 to 111	42	48 to 132	63	27 to 153

Hexachlorobutadiene	13	85	15	70 to 100	30	55 to 115	45	40 to 130
Hexachlorocyclopentadiene	13	58	27	31 to 85	54	4 to 112	81	0 to 139
Hexachloroethane	13	80	16	64 to 96	32	48 to 112	48	32 to 128
Hexachloropropene	13	77	26	51 to 103	52	25 to 129	78	0 to 155
Indeno(1,2,3-c,d)pyrene	13	100	16	84 to 116	32	68 to 132	48	52 to 148
Isophorone	13	93	15	78 to 108	30	63 to 123	45	48 to 138
Isosafrole	13	90	22	68 to 112	44	46 to 134	66	24 to 156
Malathion	13	93	14	79 to 107	28	65 to 121	42	51 to 135
Methoxychlor	13	81	23	58 to 104	46	35 to 127	69	12 to 150
Methyl methanesulfonate	13	57	14	43 to 71	28	29 to 85	42	15 to 99
Methyl parathion	13	94	16	78 to 110	32	62 to 126	48	46 to 142
Mevinphos (Phosdrin)	13	89	19	70 to 108	38	51 to 127	57	32 to 146
N-nitrosodi-n-butylamine	13	93	16	77 to 109	32	61 to 125	48	45 to 141
N-nitrosodi-n-propylamine	13	90	17	73 to 107	34	56 to 124	51	39 to 141
N-nitrosodiethylamine	12	89	21	68 to 110	42	47 to 131	63	26 to 152
N-nitrosomorpholine	13	62	12	50 to 74	24	38 to 86	36	26 to 98
N-nitrosopiperidine	13	88	19	69 to 107	38	50 to 126	57	31 to 145
N-nitrosopyrrolidine	13	81	19	62 to 100	38	43 to 119	57	24 to 138
Naled (Dibrom)	13	61	28	33 to 89	56	5 to 117	84	0 to 145
Naphthalene	13	86	23	63 to 109	46	40 to 132	69	17 to 155
NB-d5 (Surr @ 25ug/l)	13	90	15	75 to 105	30	60 to 120	45	45 to 135
Nitrobenzene	13	90	14	76 to 104	28	62 to 118	42	48 to 132
o-toluidine	13	75	24	51 to 99	48	27 to 123	72	3 to 147
Parathion	13	94	9	85 to 103	18	76 to 112	27	67 to 121
Pentachlorobenzene	13	89	12	77 to 101	24	65 to 113	36	53 to 125
Pentachloroethane	13	80	16	64 to 96	32	48 to 112	48	32 to 128
Pentachloronitrobenzene	13	94	12	82 to 106	24	70 to 118	36	58 to 130
Pentachlorophenol	12	85	28	57 to 113	56	29 to 141	84	1 to 169
Phenacetin	12	88	11	77 to 99	22	66 to 110	33	55 to 121
Phenanthrene	13	98	14	84 to 112	28	70 to 126	42	56 to 140
Phenol	12	47	10	37 to 57	20	27 to 67	30	17 to 77
Phenol-d5 (Surr @ 25ug/l)	12	34	6	28 to 40	12	22 to 46	18	16 to 52
Phorate	13	88	15	73 to 103	30	58 to 118	45	43 to 133
Profenofos	13	95	18	77 to 113	36	59 to 131	54	41 to 149
Prothiofos	13	94	14	80 to 108	28	66 to 122	42	52 to 136
Pyrene	13	98	13	85 to 111	26	72 to 124	39	59 to 137
Ronnel	13	93	12	81 to 105	24	69 to 117	36	57 to 129
Safrole	13	92	16	76 to 108	32	60 to 124	48	44 to 140
Stirophos	12	97	16	81 to 113	32	65 to 129	48	49 to 145
Sulfotepp	13	91	14	77 to 105	28	63 to 119	42	49 to 133
TP-d14 (Surr @ 25ug/l)	13	94	13	81 to 107	26	68 to 120	39	55 to 133
trans-chlordane	13	96	13	83 to 109	26	70 to 122	39	57 to 135
Trichloronate	13	95	12	83 to 107	24	71 to 119	36	59 to 131

LCS_W

Analyte Name	n	Mean	1 SD	Range	2 SD	Range	3 SD	Range
1,2,4,5-tetrachlorobenzene	67	76	18	58 to 94	36	40 to 112	54	22 to 130
1,2,4-trichlorobenzene	68	82	12	70 to 94	24	58 to 106	36	46 to 118
1,2-dichlorobenzene	68	78	12	66 to 90	24	54 to 102	36	42 to 114
1,3-dichlorobenzene	68	76	13	63 to 89	26	50 to 102	39	37 to 115
1,4-dichlorobenzene	68	78	14	64 to 92	28	50 to 106	42	36 to 120
1,4-dinitrobenzene	67	89	15	74 to 104	30	59 to 119	45	44 to 134
1-naphthylamine	67	103	22	81 to 125	44	59 to 147	66	37 to 169
2,3,4,6-tetrachlorophenol	68	78	13	65 to 91	26	52 to 104	39	39 to 117

2,4,5-trichlorophenol	68	81	12	69 to 93	24	57 to 105	36	45 to 117
2,4,6-trichlorophenol	68	85	12	73 to 97	24	61 to 109	36	49 to 121
2,4-dichlorophenol	68	88	12	76 to 100	24	64 to 112	36	52 to 124
2,4-dimethylphenol	68	88	14	74 to 102	28	60 to 116	42	46 to 130
2,4-dinitrotoluene	67	84	11	73 to 95	22	62 to 106	33	51 to 117
2,6-dichlorophenol	68	88	11	77 to 99	22	66 to 110	33	55 to 121
2,6-dinitrotoluene	67	91	12	79 to 103	24	67 to 115	36	55 to 127
2-(acetylamino) fluorene	67	86	19	67 to 105	38	48 to 124	57	29 to 143
2-chloronaphthalene	67	88	12	76 to 100	24	64 to 112	36	52 to 124
2-chlorophenol	68	88	14	74 to 102	28	60 to 116	42	46 to 130
2-FBP (Surr @ 25ug/l)	68	87	10	77 to 97	20	67 to 107	30	57 to 117
2-FP (Surr @ 25ug/l)	68	61	13	48 to 74	26	35 to 87	39	22 to 100
2-methylnaphthalene	67	87	11	76 to 98	22	65 to 109	33	54 to 120
2-methylphenol	68	76	12	64 to 88	24	52 to 100	36	40 to 112
2-naphthylamine	66	107	23	84 to 130	46	61 to 153	69	38 to 176
2-nitroaniline	67	89	13	76 to 102	26	63 to 115	39	50 to 128
2-nitrophenol	68	88	15	73 to 103	30	58 to 118	45	43 to 133
3-&4-methylphenol	68	78	16	62 to 94	32	46 to 110	48	30 to 126
3-methylcholanthrene	67	93	14	79 to 107	28	65 to 121	42	51 to 135
3-nitroaniline	67	83	13	70 to 96	26	57 to 109	39	44 to 122
4,4-DDD	67	96	12	84 to 108	24	72 to 120	36	60 to 132
4,4-DDE	67	95	12	83 to 107	24	71 to 119	36	59 to 131
4,4-DDT	67	90	20	70 to 110	40	50 to 130	60	30 to 150
4-(dimethylamino) azobenzene	67	89	13	76 to 102	26	63 to 115	39	50 to 128
4-aminobiphenyl	67	91	10	81 to 101	20	71 to 111	30	61 to 121
4-bromophenyl phenyl ether	67	89	10	79 to 99	20	69 to 109	30	59 to 119
4-chloro-3-methylphenol	68	85	12	73 to 97	24	61 to 109	36	49 to 121
4-chloroaniline	67	94	21	73 to 115	42	52 to 136	63	31 to 157
4-chlorophenyl phenyl ether	67	89	10	79 to 99	20	69 to 109	30	59 to 119
4-nitroaniline	67	94	13	81 to 107	26	68 to 120	39	55 to 133
5-nitro-o-toluidine	67	88	10	78 to 98	20	68 to 108	30	58 to 118
7,12-dimethylbenz(a)anthracene	67	83	17	66 to 100	34	49 to 117	51	32 to 134
a-BHC	67	99	12	87 to 111	24	75 to 123	36	63 to 135
Acenaphthene	68	88	10	78 to 98	20	68 to 108	30	58 to 118
Acenaphthylene	68	87	10	77 to 97	20	67 to 107	30	57 to 117
Acetophenone	67	90	13	77 to 103	26	64 to 116	39	51 to 129
Aldrin	67	92	11	81 to 103	22	70 to 114	33	59 to 125
Aniline	67	58	22	36 to 80	44	14 to 102	66	0 to 124
Anthracene	68	91	9	82 to 100	18	73 to 109	27	64 to 118
Azinophos methyl	67	84	20	64 to 104	40	44 to 124	60	24 to 144
Azobenzene	67	88	11	77 to 99	22	66 to 110	33	55 to 121
b-BHC	67	90	13	77 to 103	26	64 to 116	39	51 to 129
Benz(a)anthracene	68	93	11	82 to 104	22	71 to 115	33	60 to 126
Benzo(a) pyrene	68	94	13	81 to 107	26	68 to 120	39	55 to 133
Benzo(b)&(k)fluoranthene	68	94	12	82 to 106	24	70 to 118	36	58 to 130
Benzo(g,h,i)perylene	68	92	12	80 to 104	24	68 to 116	36	56 to 128
Benzyl alcohol	67	69	25	44 to 94	50	19 to 119	75	0 to 144
Bis(2-chloroethoxy) methane	67	91	12	79 to 103	24	67 to 115	36	55 to 127
Bis(2-chloroethyl)ether	67	88	17	71 to 105	34	54 to 122	51	37 to 139
Bis(2-chloroisopropyl) ether	67	89	11	78 to 100	22	67 to 111	33	56 to 122
Bis(2-ethylhexyl) phthalate	67	100	16	84 to 116	32	68 to 132	48	52 to 148
Butyl benzyl phthalate	67	92	12	80 to 104	24	68 to 116	36	56 to 128
Carbazole	67	94	9	85 to 103	18	76 to 112	27	67 to 121

Chlorpyrifos	67	92	10	82 to 102	20	72 to 112	30	62 to 122
Chrysene	68	94	11	83 to 105	22	72 to 116	33	61 to 127
cis-chlordane	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Coumaphos	67	92	19	73 to 111	38	54 to 130	57	35 to 149
d-BHC	67	92	9	83 to 101	18	74 to 110	27	65 to 119
Demeton-O	67	85	12	73 to 97	24	61 to 109	36	49 to 121
Demeton-S	67	87	12	75 to 99	24	63 to 111	36	51 to 123
Di-n-butyl phthalate	67	96	10	86 to 106	20	76 to 116	30	66 to 126
Di-n-octyl phthalate	67	92	14	78 to 106	28	64 to 120	42	50 to 134
Diazinon	67	91	12	79 to 103	24	67 to 115	36	55 to 127
Dibenz(a,h)anthracene	68	92	14	78 to 106	28	64 to 120	42	50 to 134
Dibenzofuran	67	88	10	78 to 98	20	68 to 108	30	58 to 118
Dichlorvos	67	95	14	81 to 109	28	67 to 123	42	53 to 137
Dieldrin	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Diethylphthalate	67	92	10	82 to 102	20	72 to 112	30	62 to 122
Dimethoate	67	82	12	70 to 94	24	58 to 106	36	46 to 118
Dimethyl phthalate	67	95	12	83 to 107	24	71 to 119	36	59 to 131
Diphenylamine	67	91	10	81 to 101	20	71 to 111	30	61 to 121
Disulfoton	67	88	10	78 to 98	20	68 to 108	30	58 to 118
Endosulfan I	67	96	12	84 to 108	24	72 to 120	36	60 to 132
Endosulfan II	67	95	11	84 to 106	22	73 to 117	33	62 to 128
Endosulfan sulphate	67	93	13	80 to 106	26	67 to 119	39	54 to 132
Endrin	67	89	16	73 to 105	32	57 to 121	48	41 to 137
Endrin aldehyde	67	88	18	70 to 106	36	52 to 124	54	34 to 142
Endrin ketone	67	92	13	79 to 105	26	66 to 118	39	53 to 131
EPN	67	87	17	70 to 104	34	53 to 121	51	36 to 138
Ethoprop	67	91	10	81 to 101	20	71 to 111	30	61 to 121
Ethyl methanesulfonate	67	89	19	70 to 108	38	51 to 127	57	32 to 146
Fenitrothion	67	87	12	75 to 99	24	63 to 111	36	51 to 123
Fensulfothion	67	75	14	61 to 89	28	47 to 103	42	33 to 117
Fenthion	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Fluoranthene	68	93	10	83 to 103	20	73 to 113	30	63 to 123
Fluorene	68	87	10	77 to 97	20	67 to 107	30	57 to 117
g-BHC (Lindane)	67	91	13	78 to 104	26	65 to 117	39	52 to 130
Heptachlor	67	89	11	78 to 100	22	67 to 111	33	56 to 122
Heptachlor epoxide	68	93	10	83 to 103	20	73 to 113	30	63 to 123
Hexachlorobenzene	68	87	13	74 to 100	26	61 to 113	39	48 to 126
Hexachlorobutadiene	68	76	13	63 to 89	26	50 to 102	39	37 to 115
Hexachlorocyclopentadiene	68	56	21	35 to 77	42	14 to 98	63	0 to 119
Hexachloroethane	68	72	12	60 to 84	24	48 to 96	36	36 to 108
Hexachloropropene	68	70	14	56 to 84	28	42 to 98	42	28 to 112
Indeno(1,2,3-c,d)pyrene	68	92	13	79 to 105	26	66 to 118	39	53 to 131
Isophorone	67	91	14	77 to 105	28	63 to 119	42	49 to 133
Isosafrole	67	89	11	78 to 100	22	67 to 111	33	56 to 122
Malathion	67	90	11	79 to 101	22	68 to 112	33	57 to 123
Methoxychlor	67	88	21	67 to 109	42	46 to 130	63	25 to 151
Methyl methanesulfonate	67	57	14	43 to 71	28	29 to 85	42	15 to 99
Methyl parathion	67	86	14	72 to 100	28	58 to 114	42	44 to 128
Mevinphos (Phosdrin)	67	88	17	71 to 105	34	54 to 122	51	37 to 139
N-nitrosodi-n-butylamine	67	90	13	77 to 103	26	64 to 116	39	51 to 129
N-nitrosodi-n-propylamine	67	89	14	75 to 103	28	61 to 117	42	47 to 131
N-nitrosodiethylamine	67	91	20	71 to 111	40	51 to 131	60	31 to 151
N-nitrosomorpholine	67	62	11	51 to 73	22	40 to 84	33	29 to 95

N-nitrosopiperidine	67	89	14	75 to 103	28	61 to 117	42	47 to 131
N-nitrosopyrrolidine	67	80	19	61 to 99	38	42 to 118	57	23 to 137
Naled (Dibrom)	67	79	23	56 to 102	46	33 to 125	69	10 to 148
Naphthalene	68	83	14	69 to 97	28	55 to 111	42	41 to 125
NB-d5 (Surr @ 25ug/l)	68	90	11	79 to 101	22	68 to 112	33	57 to 123
Nitrobenzene	67	91	14	77 to 105	28	63 to 119	42	49 to 133
o-toluidine	67	85	22	63 to 107	44	41 to 129	66	19 to 151
Parathion	67	89	14	75 to 103	28	61 to 117	42	47 to 131
Pentachlorobenzene	68	85	10	75 to 95	20	65 to 105	30	55 to 115
Pentachloroethane	67	75	11	64 to 86	22	53 to 97	33	42 to 108
Pentachloronitrobenzene	67	88	9	79 to 97	18	70 to 106	27	61 to 115
Pentachlorophenol	68	68	20	48 to 88	40	28 to 108	60	8 to 128
Phenacetin	67	82	11	71 to 93	22	60 to 104	33	49 to 115
Phenanthrene	68	91	9	82 to 100	18	73 to 109	27	64 to 118
Phenol	68	46	12	34 to 58	24	22 to 70	36	10 to 82
Phenol-d5 (Surr @ 25ug/l)	68	39	11	28 to 50	22	17 to 61	33	6 to 72
Phorate	67	90	10	80 to 100	20	70 to 110	30	60 to 120
Profenofos	66	90	13	77 to 103	26	64 to 116	39	51 to 129
Prothiofos	67	92	11	81 to 103	22	70 to 114	33	59 to 125
Pyrene	68	93	11	82 to 104	22	71 to 115	33	60 to 126
Ronnel	67	92	10	82 to 102	20	72 to 112	30	62 to 122
Safrole	67	89	12	77 to 101	24	65 to 113	36	53 to 125
Stirophos	67	88	13	75 to 101	26	62 to 114	39	49 to 127
Sulfotepp	67	91	11	80 to 102	22	69 to 113	33	58 to 124
TP-d14 (Surr @ 25ug/l)	68	96	9	87 to 105	18	78 to 114	27	69 to 123
trans-chlordane	67	93	10	83 to 103	20	73 to 113	30	63 to 123
Trichloronate	67	93	10	83 to 103	20	73 to 113	30	63 to 123

Laboratory Identification		139296	139299	139300	139301	lcs	mb		
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC		
Depth (m)		--	--	--	--	--	--		
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08	--	--		
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08		
Laboratory Analysis Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08		
Method : E002.1 BTEX by P&T Benzene Toluene Ethylbenzene meta- & para-Xylene ortho-Xylene Total Xylene 4-BFB (Surr @ 100ug/l)		<1 2 <1 <2 <1 -- 105%	<1 <1 <1 <2 <1 -- 104%	<1 <1 <1 <2 <1 -- 103%	<1 <1 <1 <2 <1 -- 104%	106% 99% 101% 97% 100% -- 112%	<1 <1 <1 <2 <1 -- 111%		
Method : E003.1 Volatile TPH by P&T (vTPH) C6-C9		<50	<50	<50	<50	98%	<50		
EQL		50							

Results expressed in ug/l unless otherwise specified

Comments:

E002.1: Direct injection into P&T/GC/PID/MSD.

E003.1: Direct injection into P&T/GC/FID.

Laboratory Identification		139296	139299	139300	139301	lcs	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08			
Method : E004.1										
Petroleum Hydrocarbons (TPH)										
C10-C14 Fraction	EQL	47700	190	<50	690	--	<50			
C15-C28 Fraction	50	28800	<200	<200	420	99%	<200			
C29-C36 Fraction	200	4450	80	<50	110	--	<50			
Sum of TPH C10 - C36	50	80950	270	--	1220	--	--			
	--									

Results expressed in ug/l unless otherwise specified

Comments:

E004.1: Triple extraction with DCM. Analysis by GC/FID.

This report supercedes reports issued on: N/A

Laboratory Identification		139296	139299	139300	139301	ics	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08					
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Method : E010.1										
Volatile Halogenated Compounds (VHC)										
Dichlorodifluoromethane Chloromethane Vinyl chloride Bromomethane Chloroethane Trichlorofluoromethane 1,1-dichloroethene trans-1,2-dichloroethene 1,1-dichloroethane cis-1,2-dichloroethene 2,2-dichloropropane Chloroform 1,1,1-trichloroethane 1,2-dichloroethane 1,1-dichloropropene Carbon tetrachloride Trichloroethene 1,2-dichloropropane Dibromomethane Bromodichloromethane cis-1,3-dichloropropene trans-1,3-dichloropropene 1,1,2-trichloroethane 1,3-dichloropropane Chlorodibromomethane Tetrachloroethene 1,2-dibromoethane	EQL	<50	<50	<50	<50	82%	<50			
	50	<50	<50	<50	<50	78%	<50			
	50	<50	<50	<50	<50	83%	<50			
	50	<50	<50	<50	<50	101%	<50			
	50	<50	<50	<50	<50	84%	<50			
	50	<50	<50	<50	<50	86%	<50			
	5	<5	<5	<5	<5	88%	<5			
	5	<5	<5	<5	<5	86%	<5			
	5	<5	<5	<5	<5	86%	<5			
	5	<5	<5	<5	<5	87%	<5			
	5	<5	<5	<5	<5	89%	<5			
	5	<5	<5	<5	<5	87%	<5			
	5	<5	<5	<5	<5	87%	<5			
	1	<1	<1	<1	<1	86%	<1			
	5	<5	<5	<5	<5	89%	<5			
	5	<5	<5	<5	<5	89%	<5			
	5	<5	<5	<5	<5	88%	<5			
	5	<5	<5	<5	<5	88%	<5			
	5	<5	<5	<5	<5	89%	<5			
	5	<5	<5	<5	<5	102%	<5			
	5	<5	<5	<5	<5	92%	<5			
	5	<5	<5	<5	<5	92%	<5			
	5	<5	<5	<5	<5	94%	<5			
	5	<5	<5	<5	<5	93%	<5			
	5	<5	<5	<5	<5	92%	<5			

Laboratory Identification		139296	139299	139300	139301	ics	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Method : E010.1										
Volatile Halogenated Compounds (VHC)										
Chlorobenzene	EQL	<5	<5	<5	<5	88%	<5			
1,1,1,2-tetrachloroethane	5	<5	<5	<5	<5	88%	<5			
Bromoform	5	<5	<5	<5	<5	91%	<5			
1,1,2,2-tetrachloroethane	5	<5	<5	<5	<5	85%	<5			
1,2,3-trichloropropane	5	<5	<5	<5	<5	86%	<5			
1,3-dichlorobenzene	5	<5	<5	<5	<5	86%	<5			
1,4-dichlorobenzene	5	<5	<5	<5	<5	88%	<5			
1,2-dichlorobenzene	5	<5	<5	<5	<5	86%	<5			
1,2-dibromo-3-chloropropane	5	<5	<5	<5	<5	87%	<5			
Hexachlorobutadiene	5	<5	<5	<5	<5	88%	<5			
1,2-DCE-d4 (Surr @ 100ug/l)	--	105%	104%	103%	103%	96%	96%			
Toluene-d8 (Surr @ 100ug/l)	--	103%	103%	103%	110%	118%	102%			
4-BFB (Surr @ 100ug/l)	--	94%	96%	90%	92%	98%	94%			

Results expressed in ug/l unless otherwise specified

Comments:

E010.1: Direct injection into P&T/GC/MS. (NB) Dichloromethane not reported unless requested.

Laboratory Identification		139302	139303	139304	139305	139306	139307	139308	139309	139303d	139303r
Sample Identification		E8663/1	E8663/2	E8663/3	E8664/1	E8664/2	E8664/3	E8664/4	E8676	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		30/1/08	30/1/08	30/1/08	29/1/08	29/1/08	29/1/08	29/1/08	29/1/08	--	--
Laboratory Extraction (Preparation) Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	--
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	--
Method : E013.2											
Organochlorine Pesticides (OC)		EQL									
a-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Hexachlorobenzene		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
b-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
g-BHC (Lindane)		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
d-BHC		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Heptachlor		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Aldrin		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Heptachlor epoxide		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
trans-chlordane		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Endosulfan I		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
cis-chlordane		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Dieldrin		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	<0.05	--
4,4-DDE		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Endrin		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Endosulfan II		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
4,4-DDD		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
Endosulfan sulphate		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	--
4,4-DDT		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--
Methoxychlor		<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	--
DBC (Surr @ 0.2mg/kg)		129%	104%	92%	97%	89%	91%	93%	106%	116%	11%

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		139306s	lcs	mb						
Sample Identification		QC	QC	QC						
Depth (m)		--	--	--						
Sampling Date recorded on COC		--	--	--						
Laboratory Extraction (Preparation) Date		5/2/08	5/2/08	5/2/08						
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08						
Method : E013.2										
Organochlorine Pesticides (OC)		EQL								
a-BHC		0.05	109%	103%	<0.05					
Hexachlorobenzene		0.05	112%	108%	<0.05					
b-BHC		0.05	105%	103%	<0.05					
g-BHC (Lindane)		0.05	103%	101%	<0.05					
d-BHC		0.05	107%	105%	<0.05					
Heptachlor		0.05	92%	90%	<0.05					
Aldrin		0.05	100%	97%	<0.05					
Heptachlor epoxide		0.05	98%	91%	<0.05					
trans-chlordane		0.05	98%	96%	<0.05					
Endosulfan I		0.05	106%	101%	<0.05					
cis-chlordane		0.05	106%	99%	<0.05					
Dieldrin		0.05	98%	96%	<0.05					
4,4-DDE		0.05	100%	97%	<0.05					
Endrin		0.05	105%	103%	<0.05					
Endosulfan II		0.05	95%	93%	<0.05					
4,4-DDD		0.05	127%	123%	<0.05					
Endosulfan sulphate		0.05	106%	92%	<0.05					
4,4-DDT		0.2	94%	119%	<0.2					
Methoxychlor		0.2	84%	116%	<0.2					
DBC (Surr @ 0.2mg/kg)		--	95%	93%	88%					

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		139310	139311	lcs	mb					
Sample Identification		E8677/1	E8677/2	QC	QC					
Depth (m)		--	--	--	--					
Sampling Date recorded on COC		31/1/08	31/1/08							
Laboratory Extraction (Preparation) Date		5/2/08	5/2/08	5/2/08	5/2/08					
Laboratory Analysis Date		7/2/08	7/2/08	7/2/08	7/2/08					
Method : E013.1										
Organochlorine Pesticides (OC)		EQL								
a-BHC		0.5	<0.5	101%	<0.5					
Hexachlorobenzene		0.5	<0.5	99%	<0.5					
g-BHC (Lindane)		0.5	<0.5	93%	<0.5					
b-BHC		0.5	<0.5	87%	<0.5					
d-BHC		0.5	<0.5	90%	<0.5					
Heptachlor		0.5	<0.5	95%	<0.5					
Aldrin		0.5	<0.5	93%	<0.5					
Heptachlor epoxide		0.5	<0.5	95%	<0.5					
trans-chlordane		0.5	<0.5	95%	<0.5					
Endosulfan I		0.5	<0.5	104%	<0.5					
cis-chlordane		0.5	<0.5	108%	<0.5					
Dieldrin		0.5	<0.5	95%	<0.5					
4,4-DDE		0.5	<0.5	98%	<0.5					
Endrin		0.5	<0.5	98%	<0.5					
Endosulfan II		0.5	<0.5	96%	<0.5					
4,4-DDD		0.5	<0.5	99%	<0.5					
Endosulfan sulphate		0.5	<0.5	93%	<0.5					
4,4-DDT		2	<2	92%	<2					
Methoxychlor		2	<2	94%	<2					
DBC (Surr @ 10ug/l)		--	93%	95%	80%					

Results expressed in ug/l unless otherwise specified

Comments:

E013.1: Triple extraction with hexane. Analysis by GC/dual ECD.

Laboratory Identification		139302	139303	139304	139309	ics	mb			
Sample Identification		E8663/1	E8663/2	E8663/3	E8676	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		30/1/08	30/1/08	30/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08			
Method : E014.2										
Organophosphorus Pesticides (OP)										
Dichlorvos Mevinphos (Phosdrin) Demeton (total) Ethoprop Monocrotophos Phorate Dimethoate Diazinon Disulfoton Methyl parathion Ronnel Fenitrothion Malathion Chlorpyrifos Fenthion Parathion Stirofos Prothiofos Azinophos methyl Coumaphos TPP (Surr @ 2mg/kg)	EQL									
	0.5	<0.5	<0.5	<0.5	<0.5	82%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	101%	<0.5			
	1	<1	<1	<1	<1	124%	<1			
	0.5	<0.5	<0.5	<0.5	<0.5	118%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	106%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	113%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	103%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	103%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	110%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	109%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	98%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	108%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	114%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	104%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	118%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	118%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	72%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	98%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	75%	<0.5			
	0.5	<0.5	<0.5	<0.5	<0.5	112%	<0.5			
	--	113%	112%	119%	125%	95%	95%			

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E014.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MSD.

Laboratory Identification		139310	139311	lcs	mb					
Sample Identification		E8677/1	E8677/2	QC	QC					
Depth (m)		--	--	--	--					
Sampling Date recorded on COC		31/1/08	31/1/08							
Laboratory Extraction (Preparation) Date		5/2/08	5/2/08	5/2/08	5/2/08					
Laboratory Analysis Date		6/2/08	6/2/08	6/2/08	6/2/08					
Method : E014.1										
Organophosphorus Pesticides (OP)										
Organophosphorus Pesticides (OP) Dichlorvos Mevinphos (Phosdrin) Demeton (total) Ethoprop Phorate Dimethoate Diazinon Disulfoton Methyl parathion Ronnol Fenitrothion Malathion Chlorpyrifos Fenthion Parathion Prothiofos Azinophos methyl Coumaphos <i>TPP (Surr @ 10ug/l)</i>	EQL									
	2	<2	<2	89%	<2					
	2	<2	<2	89%	<2					
	4	<4	<4	81%	<4					
	2	<2	<2	95%	<2					
	2	<2	<2	88%	<2					
	2	<2	<2	87%	<2					
	2	<2	<2	94%	<2					
	2	<2	<2	78%	<2					
	2	<2	<2	100%	<2					
	2	<2	<2	90%	<2					
	2	<2	<2	100%	<2					
	2	<2	<2	101%	<2					
	2	<2	<2	96%	<2					
	2	<2	<2	101%	<2					
	2	<2	<2	103%	<2					
	2	<2	<2	98%	<2					
	2	<2	<2	127%	<2					
	2	<2	<2	95%	<2					
	--	124%	122%	111%	93%					

Results expressed in ug/l unless otherwise specified

Comments:

E014.1: Triple extraction with DCM. Analysis by GC/MSD.

Laboratory Identification		139302	139303	139304	139309	lcs	mb			
Sample Identification		E8663/1	E8663/2	E8663/3	E8676	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		30/1/08	30/1/08	30/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08			
Method : E013.2										
Polychlorinated Biphenyls (PCB)		EQL								
Arochlor 1016		0.5	<0.5	<0.5	<0.5	--	<0.5			
Arochlor 1232		0.5	<0.5	<0.5	<0.5	--	<0.5			
Arochlor 1242		0.5	<0.5	<0.5	<0.5	--	<0.5			
Arochlor 1248		0.5	<0.5	<0.5	<0.5	--	<0.5			
Arochlor 1254		0.5	<0.5	<0.5	<0.5	106%	<0.5			
Arochlor 1260		0.5	<0.5	<0.5	<0.5	--	<0.5			
Sum of reported PCBs		--	--	--	--	--	--			
DBC (Surr @ 0.2mg/kg)		--	129%	92%	106%	98%	88%			

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		139296	139299	139300	139301	ics	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08					
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	4/2/08	4/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)										
Phenols										
Phenol	EQL	9	<2	<2	<2	39%	<2			
2-chlorophenol		<2	<2	<2	<2	74%	<2			
2-methylphenol		<2	<2	<2	<2	68%	<2			
3-&4-methylphenol		7	<4	<4	<4	51%	<4			
2-nitrophenol		<2	<2	<2	<2	79%	<2			
2,4-dimethylphenol		<2	<2	<2	<2	78%	<2			
2,4-dichlorophenol		<2	<2	<2	<2	79%	<2			
2,6-dichlorophenol		<2	<2	<2	<2	78%	<2			
4-chloro-3-methylphenol		<2	<2	<2	<2	69%	<2			
2,4,6-trichlorophenol		<2	<2	<2	<2	76%	<2			
2,4,5-trichlorophenol		<2	<2	<2	<2	69%	<2			
2,3,4,6-tetrachlorophenol		<2	<2	<2	<2	86%	<2			
Pentachlorophenol		<4	<4	<4	<4	66%	<4			
Polynuclear Aromatic Hydrocarbons										
Naphthalene		<2	<2	<2	<2	48%	<2			
2-methylnaphthalene		<2	<2	<2	<2	78%	<2			
2-chloronaphthalene		<2	<2	<2	<2	81%	<2			
Acenaphthylene		<2	<2	<2	<2	91%	<2			
Acenaphthene		<2	<2	<2	<2	82%	<2			
Fluorene		<2	<2	<2	<2	83%	<2			
Phenanthrene		<2	<2	<2	<2	85%	<2			
Anthracene		<2	<2	<2	<2	88%	<2			
Fluoranthene		<2	<2	<2	<2	92%	<2			
Pyrene		<2	<2	<2	<2	93%	<2			
2-(acetylamino) fluorene		<2	<2	<2	<2	88%	<2			
Benz(a)anthracene		<2	<2	<2	<2	91%	<2			

Laboratory Identification		139296	139299	139300	139301	ics	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	4/2/08	4/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
Chrysene	2	<2	<2	<2	<2	93%	<2			
Benzo(b)&(k)fluoranthene	4	<4	<4	<4	<4	92%	<4			
7,12-dimethylbenz(a)anthracene	2	<2	<2	<2	<2	78%	<2			
Benzo(a) pyrene	2	<2	<2	<2	<2	90%	<2			
3-methylcholanthrene	2	<2	<2	<2	<2	88%	<2			
Indeno(1,2,3-c,d)pyrene	2	<2	<2	<2	<2	89%	<2			
Dibenz(a,h)anthracene	2	<2	<2	<2	<2	88%	<2			
Benzo(g,h,i)perylene	2	<2	<2	<2	<2	89%	<2			
Phthalates										
Dimethyl phthalate	2	<2	<2	<2	<2	92%	<2			
Diethylphthalate	2	<2	<2	<2	<2	90%	<2			
Di-n-butyl phthalate	2	<2	<2	<2	<2	95%	<2			
Butyl benzyl phthalate	2	<2	<2	<2	<2	96%	<2			
Bis(2-ethylhexyl) phthalate	20	80	<20	<20	20	114%	<20			
Di-n-octyl phthalate	2	<2	<2	<2	<2	87%	<2			
Nitrosamines										
N-nitrosodiethylamine	2	<2	<2	<2	<2	68%	<2			
N-nitrosopyrrolidine	4	<4	<4	<4	<4	63%	<4			
N-nitrosomorpholine	2	<2	<2	<2	<2	51%	<2			
N-nitrosodi-n-propylamine	2	<2	<2	<2	<2	71%	<2			
N-nitrosopiperidine	2	<2	<2	<2	<2	74%	<2			
N-nitrosodi-n-butylamine	2	<2	<2	<2	<2	75%	<2			
Diphenylamine	2	<2	<2	<2	<2	88%	<2			
4-aminobiphenyl	2	<2	<2	<2	<2	88%	<2			
Organochlorine Pesticides										
a-BHC	2	<2	<2	<2	<2	98%	<2			
b-BHC	2	<2	<2	<2	<2	86%	<2			

Laboratory Identification		139296	139299	139300	139301	ics	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	4/2/08	4/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
d-BHC		<2	<2	<2	<2	88%	<2			
g-BHC (Lindane)		<2	<2	<2	<2	86%	<2			
Heptachlor		<2	<2	<2	<2	90%	<2			
Aldrin		<2	<2	<2	<2	89%	<2			
Heptachlor epoxide		<2	<2	<2	<2	90%	<2			
Endosulfan I		<2	<2	<2	<2	91%	<2			
trans-chlordane		<2	<2	<2	<2	85%	<2			
cis-chlordane		<2	<2	<2	<2	85%	<2			
4,4-DDE		<2	<2	<2	<2	93%	<2			
Dieldrin		<2	<2	<2	<2	89%	<2			
Endrin		<2	<2	<2	<2	93%	<2			
Endosulfan II		<2	<2	<2	<2	89%	<2			
4,4-DDD		<2	<2	<2	<2	91%	<2			
Endosulfan sulphate		<2	<2	<2	<2	90%	<2			
Endrin aldehyde		<2	<2	<2	<2	98%	<2			
Endrin ketone		<2	<2	<2	<2	94%	<2			
4,4-DDT		<4	<4	<4	<4	92%	<4			
Methoxychlor		<2	<2	<2	<2	89%	<2			
Organophosphorus Pesticides										
Dichlorvos		<2	<2	<2	<2	103%	<2			
Mevinphos (Phosdrin)		<2	<2	<2	<2	61%	<2			
Demeton-O		<2	<2	<2	<2	82%	<2			
Ethoprop		<2	<2	<2	<2	96%	<2			
Naled (Dibrom)		<2	<2	<2	<2	76%	<2			
Phorate		<2	<2	<2	<2	90%	<2			
Demeton-S		<2	<2	<2	<2	90%	<2			
Dimethoate		<2	<2	<2	<2	88%	<2			

Laboratory Identification		139296	139299	139300	139301	ics	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08					
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	4/2/08	4/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
Diazinon		2	<2	<2	<2	86%	<2			
Sulfotepp		2	<2	<2	<2	97%	<2			
Disulfoton		2	<2	<2	<2	92%	<2			
Methyl parathion		2	<2	<2	<2	83%	<2			
Ronnol		2	<2	<2	<2	96%	<2			
Malathion		2	<2	<2	<2	102%	<2			
Fenitrothion		2	<2	<2	<2	93%	<2			
Fenthion		2	<2	<2	<2	103%	<2			
Chlorpyrifos		2	<2	<2	<2	100%	<2			
Parathion		2	<2	<2	<2	103%	<2			
Trichloronate		2	<2	<2	<2	89%	<2			
EPN		2	<2	<2	<2	88%	<2			
Stirophos		2	<2	<2	<2	104%	<2			
Prothiofos		2	<2	<2	<2	97%	<2			
Profenofos		2	<2	<2	<2	109%	<2			
Fensulfothion		2	<2	<2	<2	69%	<2			
Azinophos methyl		2	<2	<2	<2	87%	<2			
Coumaphos		2	<2	<2	<2	90%	<2			
Nitroaromatics and Ketones										
Acetophenone		2	<2	<2	<2	82%	<2			
Isophorone		2	<2	<2	<2	87%	<2			
Nitrobenzene		2	<2	<2	<2	74%	<2			
1,4-dinitrobenzene		2	<2	<2	<2	82%	<2			
2,6-dinitrotoluene		4	<4	<4	<4	85%	<4			
2,4-dinitrotoluene		4	<4	<4	<4	74%	<4			
5-nitro-o-toluidine		2	<2	<2	<2	82%	<2			
Azobenzene		2	<2	<2	<2	87%	<2			

Laboratory Identification		139296	139299	139300	139301	ics	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	4/2/08	4/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)		EQL								
4-(dimethylamino) azobenzene		<2	<2	<2	<2	90%	<2			
Phenacetin		<2	<2	<2	<2	76%	<2			
Pentachloronitrobenzene		<2	<2	<2	<2	82%	<2			
Anilines and Benzedines										
Aniline		<2	<2	<2	<2	76%	<2			
4-chloroaniline		<2	<2	<2	<2	125%	<2			
2-nitroaniline		<4	<4	<4	<4	76%	<4			
3-nitroaniline		<4	<4	<4	<4	74%	<4			
4-nitroaniline		<2	<2	<2	<2	89%	<2			
Dibenzofuran		<2	<2	<2	<2	84%	<2			
Carbazole		<2	<2	<2	<2	89%	<2			
o-toluidine		<2	<2	<2	<2	129%	<2			
1-naphthylamine		<2	<2	<2	<2	90%	<2			
2-naphthylamine		<2	<2	<2	<2	126%	<2			
Chlorinated Hydrocarbons										
1,3-dichlorobenzene		<2	<2	<2	<2	65%	<2			
1,4-dichlorobenzene		<2	<2	<2	<2	67%	<2			
1,2-dichlorobenzene		<2	<2	<2	<2	67%	<2			
1,2,4-trichlorobenzene		<2	<2	<2	<2	69%	<2			
1,2,4,5-tetrachlorobenzene		<2	<2	<2	<2	64%	<2			
Pentachlorobenzene		<2	<2	<2	<2	75%	<2			
Hexachlorobenzene		<2	<2	<2	<2	83%	<2			
Pentachloroethane		<2	<2	<2	<2	61%	<2			
Hexachloroethane		<2	<2	<2	<2	59%	<2			
Hexachloropropene		<2	<2	<2	<2	58%	<2			
Hexachlorobutadiene		<2	<2	<2	<2	61%	<2			
Hexachlorocyclopentadiene		<4	<4	<4	<4	29%	<4			

Laboratory Identification		139296	139299	139300	139301	lcs	mb			
Sample Identification		E8661/1	E8661/2	E8661/3	E8661/4	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		29/1/08	29/1/08	29/1/08	29/1/08	--	--			
Laboratory Extraction (Preparation) Date		4/2/08	4/2/08	4/2/08	4/2/08	4/2/08	4/2/08			
Laboratory Analysis Date		5/2/08	5/2/08	5/2/08	5/2/08	4/2/08	4/2/08			
Method : E017.1										
Semivolatile Organic Compounds (SVOC)										
Haloethers										
Bis(2-chloroethyl)ether		<2	<2	<2	<2	76%	<2			
Bis(2-chloroisopropyl) ether		<2	<2	<2	<2	77%	<2			
Bis(2-chloroethoxy) methane		<2	<2	<2	<2	80%	<2			
4-chlorophenyl phenyl ether		<2	<2	<2	<2	84%	<2			
4-bromophenyl phenyl ether		<2	<2	<2	<2	82%	<2			
Miscellaneous Compounds										
Methyl methanesulfonate		<2	<2	<2	<2	31%	<2			
Ethyl methanesulfonate		<2	<2	<2	<2	71%	<2			
Benzyl alcohol		<2	<2	<2	<2	33%	<2			
Safrole		<2	<2	<2	<2	79%	<2			
Isosafrole		<2	<2	<2	<2	85%	<2			
Surrogate Standards										
2-FP (Surr @ 25ug/l)		67%	51%	49%	49%	44%	49%			
Phenol-d5 (Surr @ 25ug/l)		41%	34%	30%	31%	27%	36%			
NB-d5 (Surr @ 25ug/l)		128%	81%	79%	90%	76%	77%			
2-FBP (Surr @ 25ug/l)		115%	91%	87%	96%	78%	80%			
TP-d14 (Surr @ 25ug/l)		109%	96%	99%	105%	90%	99%			

Results expressed in ug/l unless otherwise specified

Comments:

E017.1: Base/neutral and acidic extraction with DCM. Analysis by GC/MS.

Laboratory Identification		139302	139303	139304	139305	139306	139307	139308	139309	139303d	139303r
Sample Identification		E8663/1	E8663/2	E8663/3	E8664/1	E8664/2	E8664/3	E8664/4	E8676	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		30/1/08	30/1/08	30/1/08	29/1/08	29/1/08	29/1/08	29/1/08	29/1/08	--	--
Laboratory Extraction (Preparation) Date		5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	5/2/08	--
Laboratory Analysis Date		6/2/08	6/2/08	6/2/08	6/2/08	6/2/08	6/2/08	6/2/08	6/2/08	6/2/08	--
Method : E005.2											
Moisture											
EQL		18	42	25	40	35	25	24	87	53	23%

Results expressed in % w/w unless otherwise specified

Comments:

E005.2: Moisture by gravimetric analysis. Results are in % w/w.



Quality, Service, Support

Report Date : 1/02/2008
Report Time : 11:20:57AM

Sample Receipt Notice (SRN) for E036068



Client Details		Laboratory Reference Information	
Client Name: Environmental Analysis Laboratory Client Phone: 02 6620 3678 Client Fax: 02 6620 3957 Contact Name: Graham Lancaster Contact Email: glancast@scu.edu.au Client Address: Southern Cross University Military Rd East Lismore NSW 2480 Project Name: Water and Soil Project Number: - Not provided - CoC Serial Number: - Not provided - Purchase Order: - Not provided - Surcharge: No surcharge applied (results by 6:30pm on due date) Sample Matrix: SOIL & WATER		Please have this information ready when contacting Labmark. Laboratory Report: E036068 Quotation Number: - Not provided, standard prices apply Laboratory Address: Unit 1, 8 Leighton Pl. Asquith NSW 2077 Phone: 61 2 9476 6533 Fax: 61 2 9476 8219 Sample Receipt Contact: Jakleen El Galada Email: jakleen.galada@labmark.com.au Reporting Contact: Jyothi Lal Email: jyothi.lal@labmark.com.au	
Date Sampled (earliest date): 29/01/2008 Date Samples Received: 01/02/2008 Date Sample Receipt Notice issued: 01/02/2008 Date Preliminary Report Due: 11/02/2008		NATA Accreditation: 13542 TGA GMP License: 185-336 (Sydney) APVMA License: 6105 (Sydney) AQIS Approval: NO356 (Sydney) AQIS Entry Permit: 200521534 (Sydney)	

Reporting Requirements: Electronic Data Download required: No

Invoice Number: 30236

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not used .
Sample container & chemical preservation suitable .

Comments:

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of \$1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur \$5.00/ sample/ 3 months. Additional refrigerated storage shall incur \$30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

VOC E010.1: Dichloromethane not reported unless requested.

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au



Report Date : 1/02/2008
Report Time : 11:20:57AM

Sample Receipt Notice (SRN) for E036068



Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis																						
No.	Date	Depth	Client Sample ID	BTEX by P&T	Moisture	Organochlorine Pesticides (OC)	Organochlorine Pesticides (OC)	Organophosphorus Pesticides (OP)	Organophosphorus Pesticides (OP)	Polychlorinated Biphenyls (PCB)	PREP Not Reported	PREP Not Reported	Semivolatile Organic Compounds (SVOC)	Petroleum Hydrocarbons (TPH)	Volatlie Halogenated Compounds (VHC)	Volatlie TPH by P&T (VTPH)										
139296	29/01		E8661/1	●								●	●	●	●	●										
139299	29/01		E8661/2	●								●	●	●	●	●										
139300	29/01		E8661/3	●								●	●	●	●	●										
139301	29/01		E8661/4	●								●	●	●	●	●										
139302	30/01		E8663/1		●	●		●		●	●															
139303	30/01		E8663/2		●	●		●		●	●															
139304	30/01		E8663/3		●	●		●		●	●															
139305	29/01		E8664/1		●	●					●															
139306	29/01		E8664/2		●	●					●															
139307	29/01		E8664/3		●	●					●															
139308	29/01		E8664/4		●	●					●															
139309	29/01		E8676		●	●		●		●	●															
139310	31/01		E8677/1				●		●			●														
139311	31/01		E8677/2				●		●			●														
Totals:				4	8	8	2	4	2	4	8	6	4	4	4	4										

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Dispatch samples to:
Geoff Weir
Unit12/18 Leighton Place
Asquith NSW 2077

Telephone: 0011-61-2-9476 8219
0100 110001
689300
labmark@ozemail.com.au
www.labmark.com.au

Facsimile: 0011-61-2-9476 6533
After hours (DB):
After hours (IP): 0419
E-mail:
Web page:

Client Name: **EAL - Southern Cross Uni** Tel: 0419 984 088
 Client Address: **Military Rd, East Lismore, 2480**
 Contact Name: **Graham Lancaster** Fx: 02 66203957
 Project Ref: Date Required:

Global Specifications I require:

1. Urgent TAT required? (please circle:)	1 day	2 days	3 days		days')
2. Fast TAT Guarantee required? (surcharge may apply)					
3. Do you wish any sediment layer present in waters to be excluded from extractions?					
4. Additional QA/QC reported where sample batches submitted are < 10 samples?					
5. % extraneous material removed from samples to be reported as per NEPM 5.1.1?					
6. "EasyQ" QA/QC assessment report?					
7. "RemLab" Remediation bench scale project, please contact me for further details?					

	Lab. Quote NO. Q02331E3
	Analysis Request

1. Urgent TAT required? (please circle: 1 day 2 days 3 days days)
2. Fast TAT Guarantee required? (surcharge may apply)
3. Do you wish any sediment layer present in waters to be excluded from extractions?
4. Additional QA/QC reported where sample batches submitted are < 10 samples?
5. % extraneous material removed from samples to be reported as per NEPM 5.1.1?
6. "EasyQ" QA/QC assessment report?
7. "RemLab" Remediation bench scale project, please contact me for further details?

[illegible]

Notes: Additional water sample must be submitted for lab. duplicate & spike analysis.
Contact lab if consolidating multiple analyses into a single sample container.

[illegible]

Lab. Number	Sample ID	Sample Depth	Sampling Date	Matrix			Preservation					
				soil	water	other	filtered	acid	ice	other		
139296	E8661/1	~	29-1-08		X						X	
139299	" 2	~	29-1-08		X						X	
139300	" 3	~	29-1-08		X						X	
139301	E8661/4	~	29-1-08		X						X	
139302	E8663/1	~	30-1-08		X	X					X	
139303	E8663/2	~	30-1-08		X						X	
139304	E8663/3	~	30-1-08		X						X	
139305	E8664/1	~	29-1-08		X						X	
139306	" 2	~	"		X						X	
139307	" 3	~	"		X						X	
139308	E8664/4	~	29-1-08		X						X	
139309	E8676	<	29-1-08			X					X	

* Metals to analyse (please circle):

As Cd Cr Cu Ni Pb Zn Hg Other

Comments (Highly contaminated sample)

[illegible]

Relinquished by (print): Christine Signed: [Signature]
Relinquished by (print): _____ Signed: _____

Date: 31.1.08 Received By: *[Signature]* Date: 1/2/08

[illegible]

Date: _____ Received By: _____ Date: _____

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No: E036372
Client Name: Environmental Analysis Laboratory
Client Reference: Sample analysis
Contact Name: Graham Lancaster
Chain of Custody No: na
Sample Matrix: SOIL & WATER

Cover Page 1 of 4
plus Sample Results

Date Received: 22/02/2008
Date Reported: 05/03/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occurred within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy: matrix spike: 1 in first 5-20, then 1 every 20 samples
lcs, crm, method: 1 per analytical batch
surrogate spike: addition per target organic method

Precision: laboratory duplicate: 1 in first 5-10, then 1 every 10 samples

laboratory triplicate: re-extracted & reported when duplicate RPD values exceed acceptance criteria

Holding Times: soils, waters: Refer to LabMark Preservation & THT table
VOC's 14 days water / soil
VAC's 7 days water or 14 days acidified
VAC's 14 days soil
SVOC's 7 days water, 14 days soil
Pesticides 7 days water, 14 days soil
Metals 6 months general elements
Mercury 28 days

Confirmation: target organic analysis: GC/MS, or confirmatory column

Sensitivity: EQL: Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL

GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy: spike, lcs, crm surrogate: general analytes 70% - 130% recovery
phenol analytes 50% - 130% recovery
organophosphorous pesticide analytes 60% - 130% recovery
phenoxy acid herbicides, organotin 50% - 130% recovery

anion/cation bal: +/- 10% (0-3 meq/l),
+/- 5% (>3 meq/l)
Precision: method blank: not detected >95% of the reported EQL
duplicate lab 0-30% (>10xEQL), 0-75% (5-10xEQL)
RPD (metals): 0-100% (<5xEQL)
duplicate lab 0-50% (>10xEQL), 0-75% (5-10xEQL)
RPD: 0-100% (<5xEQL)

QUALITY CONTROL

ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy: spike, lcs, crm surrogate: analyte specific recovery data
<3xsd of historical mean

Uncertainty: spike, lcs: measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

DQO: Data Quality Objective	s: matrix spike recovery	p: pending
DQI: Data Quality Indicator	d: laboratory duplicate	lcs: laboratory control sample
EQL: Estimated Quantitation Limit	t: laboratory triplicate	crm: certified reference material
--: not applicable	r: RPD relative % difference	mb: method blank

David Burns
Quality Control (Report signatory)
david.burns@labmark.com.au

Geoff Weir
Authorising Chemist (NATA signatory)
geoff.weir@labmark.com.au

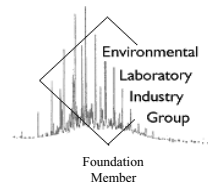
Simon Mills
Authorising Chemist (NATA signatory)
simon.mills@labmark.com.au

This document is issued in accordance with NATA's accreditation requirements.

LabMark PTY LTD ABN 27 079 798 397

* SYDNEY: Unit 1, 8 Leighton Place Asquith NSW 2077
* Telephone: (02) 9476 6533 * Fax: (02) 9476 8219

* MELBOURNE: 116 Moray Street, South Melbourne VIC 3205
* Telephone: (03) 9686 8344 * Fax: (03) 9686 7344



Laboratory Report: E036372

Cover Page 2 of 4

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

- A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.
- B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.
- C. Laboratory QA/QC samples are specific to this project.
- D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.
- E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.
- F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.
- G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomalous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.
- H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.
- I. LabMark shall maintain an official copy of this Certificate of Analysis for all traceable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

- A. SRN issued to client upon sample receipt & login verification.
- B. Preservation & sampling date details specified on COC and SRN, unless noted.
- C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

- A. NATA accreditation held for each method and sample matrix type reported, unless noted below.
- B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.
- C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.

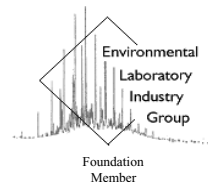
This document is issued in accordance with NATA's accreditation requirements.

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Form QS0144, Rev. 1 : Date Issued 06/02/08



Laboratory Report: E036372

Cover Page 3 of 4

4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
3	Organochlorine Pesticides (OC)	4	0	0%	0	0	0%
5	Organophosphorus Pesticides (OP)	4	0	0%	0	0	0%

Matrix: **WATER**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	Petroleum Hydrocarbons (TPH)	6	1	17%	0	1	17%
4	Organochlorine Pesticides (OC)	2	0	0%	0	0	0%

GLOSSARY:

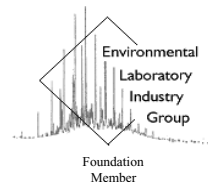
- #d number of discrete duplicate extractions/analyses performed.
- %d-ratio NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
- #t number of triplicate extractions/analyses performed.
- #s number of spiked samples analysed.
- %s-ratio USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

This document is issued in accordance with NATA's accreditation requirements.

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Laboratory Report: E036372

Cover Page 4 of 4

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

This document is issued in accordance with NATA's accreditation requirements.

LabMark PTY LTD ABN 27 079 798 397

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* MELBOURNE: 116 Moray Street, South Melbourne VIC 3205

* Telephone: (03) 9686 8344 * Fax: (03) 9686 7344

Laboratory Identification		142615	142616	142617	142618	142619	142620	142615d	142615r	142616s	1cs
Sample Identification		E8792/1	E8792/2	E8792/3	E8792/4	E8792/5	E8792/6	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		20/2/08	20/2/08	20/2/08	20/2/08	20/2/08	20/2/08	--	--	--	--
Laboratory Extraction (Preparation) Date		25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	--	25/2/08	25/2/08
Laboratory Analysis Date		25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	--	25/2/08	25/2/08
Method : E004.1											
Petroleum Hydrocarbons (TPH)											
C10-C14 Fraction		<50	<50	<50	<50	90	<50	<50	--	--	--
C15-C28 Fraction		<200	<200	<200	<200	<200	<200	<200	--	97%	101%
C29-C36 Fraction		<50	<50	<50	70	<50	<50	<50	--	--	--
Sum of TPH C10 - C36		--	--	--	70	90	--	--	--	--	--

Results expressed in ug/l unless otherwise specified

Comments:

E004.1: Triple extraction with DCM. Analysis by GC/FID.

Laboratory Identification		mb																
Sample Identification		QC																
Depth (m)		--																
Sampling Date recorded on COC		--																
Laboratory Extraction (Preparation) Date		25/2/08																
Laboratory Analysis Date		25/2/08																
Method : E004.1		EQL																
Petroleum Hydrocarbons (TPH)		50																
C10-C14 Fraction		200																
C15-C28 Fraction		50																
C29-C36 Fraction		--																
Sum of TPH C10 - C36		--																

Results expressed in ug/l unless otherwise specified

Comments:

E004.1: Triple extraction with DCM. Analysis by GC/FID.

Laboratory Identification		142613	142614	142621	142622	les	mb		
Sample Identification		E8791/1	E8791/2	E8798/1	E8798/2	QC	QC		
Depth (m)		--	--	--	--	--	--		
Sampling Date recorded on COC		20/2/08	20/2/08	20/2/08	20/2/08	--	--		
Laboratory Extraction (Preparation) Date		25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	25/2/08		
Laboratory Analysis Date		1/3/08	1/3/08	1/3/08	1/3/08	26/2/08	26/2/08		
Method : E013.2									
Organochlorine Pesticides (OC)		EQL							
a-BHC		<0.05	<0.05	<0.05	<0.05	119%	<0.05		
Hexachlorobenzene		<0.05	<0.05	<0.05	<0.05	122%	<0.05		
b-BHC		<0.05	<0.05	<0.05	<0.05	114%	<0.05		
g-BHC (Lindane)		<0.05	<0.05	<0.05	<0.05	112%	<0.05		
d-BHC		<0.05	<0.05	<0.05	<0.05	115%	<0.05		
Heptachlor		<0.05	<0.05	<0.05	<0.05	111%	<0.05		
Aldrin		<0.05	<0.05	<0.05	<0.05	115%	<0.05		
Heptachlor epoxide		<0.05	<0.05	<0.05	<0.05	107%	<0.05		
trans-chlordane		<0.05	<0.05	<0.05	<0.05	113%	<0.05		
Endosulfan I		<0.05	<0.05	<0.05	<0.05	122%	<0.05		
cis-chlordane		<0.05	<0.05	<0.05	<0.05	122%	<0.05		
Dieldrin		0.16	0.17	<0.05	<0.05	117%	<0.05		
4,4-DDE		<0.05	<0.05	<0.05	<0.05	116%	<0.05		
Endrin		<0.05	<0.05	<0.05	<0.05	100%	<0.05		
Endosulfan II		<0.05	<0.05	<0.05	<0.05	111%	<0.05		
4,4-DDD		<0.05	<0.05	<0.05	<0.05	114%	<0.05		
Endosulfan sulphate		<0.05	<0.05	<0.05	<0.05	111%	<0.05		
4,4-DDT		<0.2	<0.2	<0.2	<0.2	113%	<0.2		
Methoxychlor		<0.2	<0.2	<0.2	<0.2	71%	<0.2		
DBC (Surr @ 0.2mg/kg)		--	82%	95%	97%	92%	76%		

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E013.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/dual ECD.

Laboratory Identification		142623	142624	lcs	mb				
Sample Identification		E8799/1	E8799/2	QC	QC				
Depth (m)		--	--	--	--				
Sampling Date recorded on COC		21/2/08	21/2/08						
Laboratory Extraction (Preparation) Date		27/2/08	27/2/08	27/2/08	27/2/08				
Laboratory Analysis Date		29/2/08	29/2/08	29/2/08	29/2/08				
Method : E013.1									
Organochlorine Pesticides (OC)		EQL							
a-BHC		<0.5	<0.5	96%	<0.5				
Hexachlorobenzene		<0.5	<0.5	99%	<0.5				
g-BHC (Lindane)		<0.5	<0.5	98%	<0.5				
b-BHC		<0.5	<0.5	99%	<0.5				
d-BHC		<0.5	<0.5	95%	<0.5				
Heptachlor		<0.5	<0.5	102%	<0.5				
Aldrin		<0.5	<0.5	100%	<0.5				
Heptachlor epoxide		<0.5	<0.5	98%	<0.5				
trans-chlordane		<0.5	<0.5	100%	<0.5				
Endosulfan I		<0.5	<0.5	100%	<0.5				
cis-chlordane		<0.5	<0.5	104%	<0.5				
Dieldrin		<0.5	<0.5	103%	<0.5				
4,4-DDE		<0.5	<0.5	103%	<0.5				
Endrin		<0.5	<0.5	107%	<0.5				
Endosulfan II		<0.5	<0.5	99%	<0.5				
4,4-DDD		<0.5	<0.5	96%	<0.5				
Endosulfan sulphate		<0.5	<0.5	81%	<0.5				
4,4-DDT		<2	<2	97%	<2				
Methoxychlor		<2	<2	103%	<2				
DBC (Surr @ 10ug/l)		89%	87%	98%	109%				

Results expressed in ug/l unless otherwise specified

Comments:

E013.1: Triple extraction with hexane. Analysis by GC/dual ECD.

Laboratory Identification		142613	142614	142621	142622	ics	mb			
Sample Identification		E8791/1	E8791/2	E8798/1	E8798/2	QC	QC			
Depth (m)		--	--	--	--	--	--			
Sampling Date recorded on COC		20/2/08	20/2/08	20/2/08	20/2/08	--	--			
Laboratory Extraction (Preparation) Date		25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	25/2/08			
Laboratory Analysis Date		25/2/08	25/2/08	25/2/08	25/2/08	25/2/08	25/2/08			
Method : E014.2										
Organophosphorus Pesticides (OP)		EQL								
Dichlorvos		0.5	<0.5	<0.5	<0.5	98%	<0.5			
Mevinphos (Phosdrin)		0.5	<0.5	<0.5	<0.5	127%	<0.5			
Demeton (total)		1	<1	<1	<1	111%	<1			
Ethoprop		0.5	<0.5	<0.5	<0.5	102%	<0.5			
Monocrotophos		0.5	<0.5	<0.5	<0.5	110%	<0.5			
Phorate		0.5	<0.5	<0.5	<0.5	108%	<0.5			
Dimethoate		0.5	<0.5	<0.5	<0.5	109%	<0.5			
Diazinon		0.5	<0.5	<0.5	<0.5	115%	<0.5			
Disulfoton		0.5	<0.5	<0.5	<0.5	110%	<0.5			
Methyl parathion		0.5	<0.5	<0.5	<0.5	116%	<0.5			
Ronnol		0.5	<0.5	<0.5	<0.5	102%	<0.5			
Fenitrothion		0.5	<0.5	<0.5	<0.5	104%	<0.5			
Malathion		0.5	<0.5	<0.5	<0.5	111%	<0.5			
Chlorpyrifos		0.5	<0.5	<0.5	<0.5	103%	<0.5			
Fenthion		0.5	<0.5	<0.5	<0.5	111%	<0.5			
Parathion		0.5	<0.5	<0.5	<0.5	115%	<0.5			
Stirofos		0.5	<0.5	<0.5	<0.5	100%	<0.5			
Prothiofos		0.5	<0.5	<0.5	<0.5	107%	<0.5			
Azinophos methyl		0.5	<0.5	<0.5	<0.5	112%	<0.5			
Coumaphos		0.5	<0.5	<0.5	<0.5	110%	<0.5			
TPP (Surr @ 2mg/kg)		--	114%	101%	88%	102%	103%			

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E014.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MSD.

Sample Receipt Notice (SRN) for E036372



Quality, Service, Support

Client Details		Laboratory Reference Information	
Client Name: Environmental Analysis Laboratory Client Phone: 02 6620 3678 Client Fax: 02 6620 3957 Contact Name: Graham Lancaster Contact Email: glancast@scu.edu.au Client Address: Southern Cross University Military Rd East Lismore NSW 2480 Project Name: Sample analysis Project Number: - Not provided - CoC Serial Number: - Not provided - Purchase Order: - Not provided - Surcharge: No surcharge applied (results by 6:30pm on due date) Sample Matrix: SOIL & WATER		Please have this information ready when contacting Labmark. Laboratory Report: E036372 Quotation Number: Q0295.Es Laboratory Address: Unit 1, 8 Leighton Pl. Asquith NSW 2077 Phone: 61 2 9476 6533 Fax: 61 2 9476 8219 Sample Receipt Contact: Jakleen El Galada Email: jakleen.galada@labmark.com.au Reporting Contact: Jyothi Lal Email: jyothi.lal@labmark.com.au	
Date Sampled (earliest date): 20/02/2008 Date Samples Received: 22/02/2008 Date Sample Receipt Notice issued: 22/02/2008 Date Preliminary Report Due: 03/03/2008		NATA Accreditation: 13542 TGA GMP License: 185-336 (Sydney) APVMA License: 6105 (Sydney) AQIS Approval: NO356 (Sydney) AQIS Entry Permit: 200521534 (Sydney)	

Reporting Requirements: Electronic Data Download required: No

Invoice Number: 30577

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals intact .
Sample container & chemical preservation suitable .

Comments:

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of \$1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur \$5.00/ sample/ 3 months. Additional refrigerated storage shall incur \$30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

Sample Receipt Notice (SRN) for E036372



Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis															
No.	Date	Depth	Client Sample ID	Organochlorine Pesticides (OC)	Organochlorine Pesticides (OC)	Organophosphorus Pesticides (OP)	PREP Not Reported	PREP Not Reported	Petroleum Hydrocarbons (TPH)										
142613	20/02		E8971/1	●		●	●												
142614	20/02		E8791/2	●		●	●												
142615	20/02		E8792/1					●	●										
142616	20/02		E8792/2					●	●										
142617	20/02		E8792/3					●	●										
142618	20/02		E8792/4					●	●										
142619	20/02		E8792/5					●	●										
142620	20/02		E8792/6					●	●										
142621	20/02		E8798/1	●		●	●												
142622	20/02		E8798/2	●		●	●												
142623	21/02		E8799/1		●			●											
142624	21/02		E8799/2		●			●											
Totals:				4	2	4	4	8	6										

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing Labmark to analyse your project samples.
Additional information on www.labmark.com.au

CHAIN OF CUSTODY

LABMARK

Quality, Service & Support
NATA 13542, AQIS 748

Dispatch samples to:
Geoff Weir
Unit 12/18 Leighton Place
Asquith NSW 2077

Telephone: 0011-61-2-9476 6533
0011-61-2-9476 8219
0800 110004
689300
labmark@ozemail.com.au
www.labmark.com.au

Facsimile:
After hours (DB): 0419
After hours (IP): 0419
E-mail:
Web page:

Client Name: **EAL- Southern Cross Uni**
Client Address: **Military Rd, East Lismore, 2480**
Contact Name: **Graham Lancaster**
Project Ref:

Tel: 0419 984 088
Fax: 02 66203957
Date Required:
Lab. Quote No: **Q0295.ES**

Global Specifications I require:

1. Urgent TAT required? (please circle: 1 day 2 days 3 days days')

2. Fast TAT Guarantee required? (surcharge may apply)

3. Do you wish any sediment layer present in waters to be excluded from extractions?

4. Additional QA/QC reported where sample batches submitted are < 10 samples?

5. % extraneous material removed from samples to be reported as per NEPM 5.1.1?

6. "EasyQ" QA/QC assessment report?

7. "RemLab" Remediation bench scale project, please contact me for further details?

Note1: Additional water sample must be submitted for lab. duplicate & spike analysis.
Note2: Contact lab if consolidating multiple analyses into a single sample container.

Lab. Number	Sample ID	Sample Depth	Sampling Date	Matrix			Preservation			Container (No. & type)
				soil	water	other	filled	acid	ice	
sludge	E8791/1	-	20/2/8		X				X	glass jar
sludge	E8791/2	-	"		X				X	glass jar
	E8792/1 x 2 jars		20/2/8		X					glass bottles
	2	-			X					
	3	-			X					
	4	-			X					
	5	-			X					
	E8792/6	-	20/2/8		X					
	E8798/1	-			X					
	E8798/2	-			X					
	E8799/1	-	21/2/8							
	E8799/2	-	21/2/8							

* Metals to analyse (please circle):
As Cd Cr Cu Ni Pb Zn Hg Other

Comments (Highly contaminated samples, e-mail required):

Relinquished by (print): **Christine T**
Relinquished by (print):

Signed: **CA**
Signed:

Date: **21/2/08**
Date:

Received By: **8**
Received By:

Date: **22/2/08**
Date:

Lab. Report No. **E036372**
Esky ID

Date: **22/2/08**
Date:

850

Annex I

Soil And Water Quality Information

COPY



Centre for Resource and Environmental Studies
The Australian National University
Canberra ACT 0200 Australia

Mr Jeff Champion Consultant
Hazlemont Lane
Tucki NSW 2480

Fax (02) 6624 3780

Re: Quarry Expansion and pH of Runoff

Dear Mr Champion

Thank you for your Fax of 29 March 2005 concerning Development Application DA 05/999 relating to a quarry expansion near Lismore. I apologise for the delay in replying. I have been overseas in Japan and France.

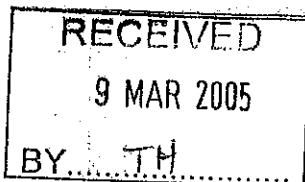
I have examined the map, soil and quarry analyses, and the letters from the Lismore City Council and NSW Department of Natural Resources (DNR) regarding Development Assessment.

Both the Hazlemont and Sandy Hills sites have high exchangeable percentages of Calcium and Magnesium and low to zero exchangeable Aluminium. With this composition I do not expect that surface waters draining from these soils will have a harmful impact on aquatic ecosystems. Their pH as 1:5 CaCl₂ extracts are between 4.9 and 5.1. I would expect that soilwaters within these soils and interflow draining from them to surface streams would have similar pH. The guidelines are very clear about this situation. In the case of non neutral soils, pH of runoff should be within ± 1 pH of the ambient conditions. The adjustment of pH to 6.5 to 8.5 may cause unintended changes to ecosystems that have evolved in these acid conditions.

Yours sincerely

Ian White FTSE
Professor of Water Resources
Centre for Resource and Environmental Studies
Tel +61 (0)2 6125 0660
Fax +61 (0)2 6125 0757
Mob +61 (0)416 249 809
Email: ian.white@anu.edu.au

15 May 2006



COPY

SOILTEC

SOIL AND PLANT ANALYSIS

2/37 OWENS CR (PO BOX 374) ALSTONVILLE NSW 2477
PHONE 02 66281411 FAX 02 66285868 EMAIL : chemist@soiltec.com.au

Soil Test Report #s03-0636 (1)

Client: **NRRBS** Sample Received: 28.2.05
Account: **M&J Champion** Report Reply: 4.3.05

Hazelmount Ln
Tucki Tucki NSW 2480

SAMPLE I.D: Sandy Hills

INTENDED USE: pasture

	RESULT	OPTIMAL
Conductivity (dS/m)(1:5 water)	0.09	<0.15
pH (1:5 CaCl ₂)	4.94	5.2-5.5
Exchangeable Cations: (Measured)		
Calcium (Ca)(meq/100g)	1.07	See Percentage
Magnesium: (Mg)(meq/100g)	0.45	See Percentage
Potassium: (K)(meq/100g)	0.18	0.5-1.0
Sodium: (Na)(meq/100g)	0.25	Zero
Aluminium: (Al)(meq/100g)	0.09	Zero
Total Cation Exchange Capacity (CEC):	2.04	
Exchangeable Cations (as a % of Total)		
Calcium:	52.36	65-80%
Magnesium:	22.20	15-20%
Potassium:	9.00	2-5%
Sodium:	12.22	<3%
Aluminium:	4.23	<5%
Phosphorus: (mg/kg) (Bray-1)	23.1	18-22
Sulphur (mg/kg) (KCl 40 S)	10.5	8-10
Nitrate Nitrogen(mg/kg) (water extract)	2.3	At least 10
Organic Carbon (%) (Walkely & Black)	0.4	2% or more
Trace Elements		
Copper (mg/kg) (DTPA)	0.2	
Zinc (mg/kg) (DTPA)	0.7	
Manganese (mg/kg) (DTPA)	3.3	
Iron (mg/kg) (DTPA)	83.2	
Boron (mg/kg) (Hot CaCl)	0.3	
Calculations:		
Lime Requirement (Cregan)	0.11	(see notes on page 2)
Calcium/Magnesium Ratio:	2.36	3-5

~ASPAC~

WE ARE PROUD MEMBERS OF THE AUSTRALASIAN SOIL AND PLANT ANALYSIS COUNCIL

s03-0636 (1)
NRRBS
M&J Champion
Sandy Hills

Chemists Comments:

This soil is non saline, moderately acid, low in calcium, marginally high in magnesium, low in potassium, with high sodium, and satisfactory aluminium. Phosphorus is adequate, sulphur is adequate and organic carbon is deficient. Nitrate nitrogen is deficient. Copper levels are deficient, zinc is adequate, manganese is low, iron is adequate and boron is low.

Recommendations:

Sodium levels here are high for most pastures, this will limit root growth and species selection for improved pastures. Potassium levels are low and will require a boost as will zinc, copper, boron and manganese. Phosphorus and sulfur are satisfactory and require maintenance only.

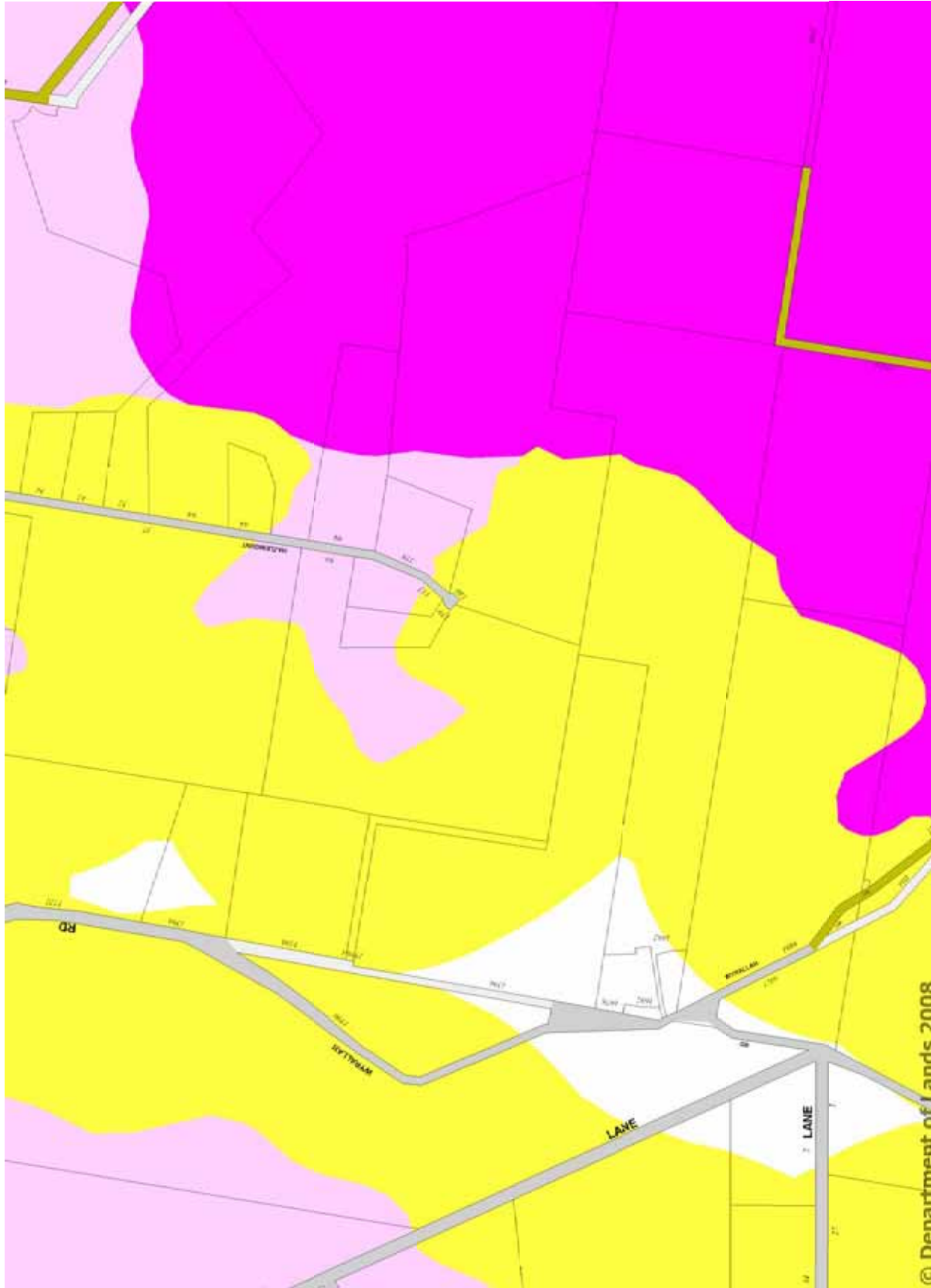
An application of fine ag lime broadcast at 3t/ha and incorporated to a depth of 300mm will help reduce sodium over time however this may not be feasible. Top dress with zinc coated DAP plus sulfur at 90kg/ha with muriate of potash at 100kg/ha. An application of manganese sulfate at 15kg/ha with copper sulfate at 20kg/ha and borax at 10kg/ha will boost soil TE levels but may not give a commercial response.

Explanations:

1. The figure on the first page quoting a lime requirement is an indication of the amount of 100% available ag lime to reduce available aluminium to zero. This figure is only a guide as additional lime may be needed for individual crops &/or circumstances.
2. Since we have no control over your farming practices our liability is limited to the cost of this test.
3. We fully encourage you to RING & DISCUSS your results with us. As we are independent of fertiliser companies we can suggest the best blends to suit you, not us! Further, our aim is to assist you to farm sustainably & profitably.
4. An excellent reference for growers in all areas is "Soil Sense: Soil Management for North Coast Farmers", a joint NSW Agriculture/SCS & CaLM publication, & is available from your local NSW Agriculture or Soil Conservation office.
6. Nitrate nitrogen values are reliable only if soil sample is air dried immediately after sampling.

Annex J

Lismore City Council Pass Mapping



Acid Sulphate Legend

1 Any Works

2 Works below the ground surface; works by which the waterable is likely to be lowered.

3 Works beyond 1m below the natural ground surface; Works where the waterable is likely to be lowered beyond 2m below the natural surface.

4 Works beyond 2m below the natural ground surface; Works where the waterable is likely to be lowered beyond 2m below the natural surface.

5 Works within 500m of adjacent class 1, 2, 3 or 4 and which are likely to lower the waterable below 1m AHD in class 1, 2, 3 or 4 land.

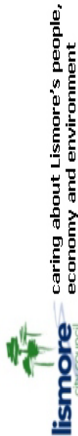


Created on Wednesday, 3 September 2008
by shereec

Map Scale:
1:14,010

© Dept. of Lands 2007

Exponent Enquiry



About this Document

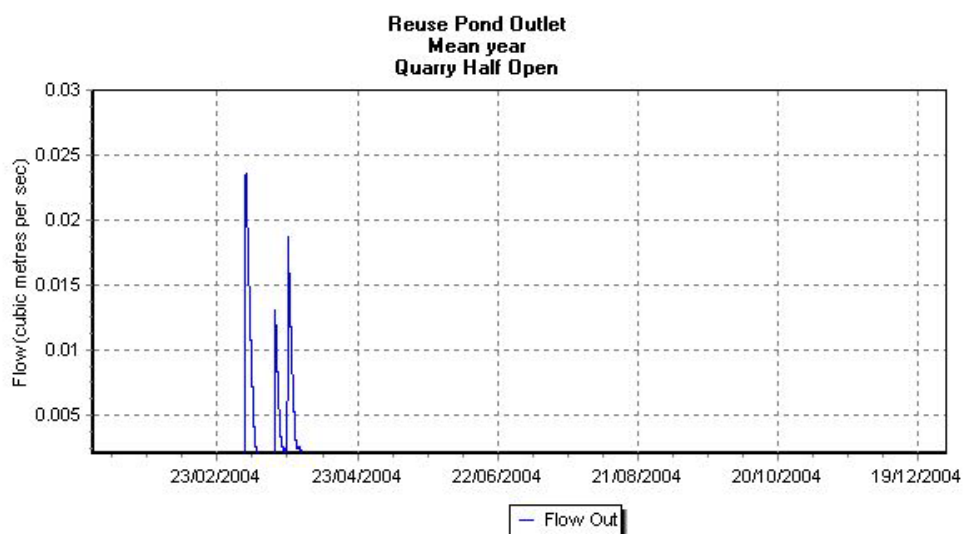
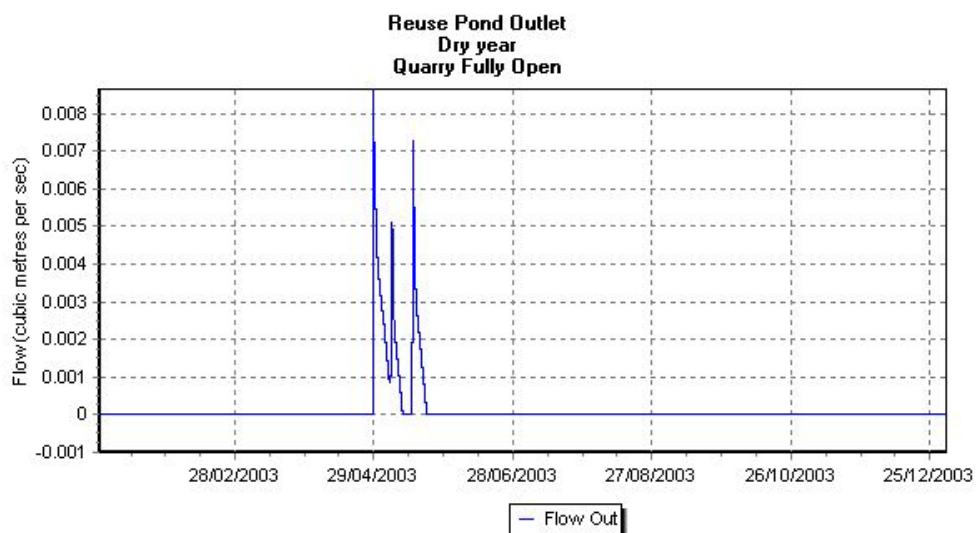
This map has been created for the purpose of showing basic locality information. Property boundary line network data is supplied by State Government. Any error should be reported to Lismore City Council (council@lismore.nsw.gov.au).

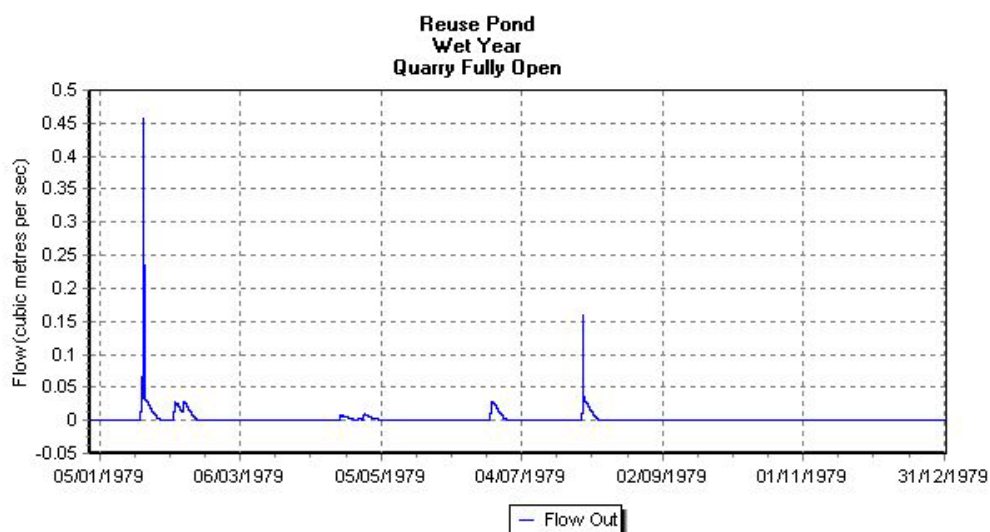
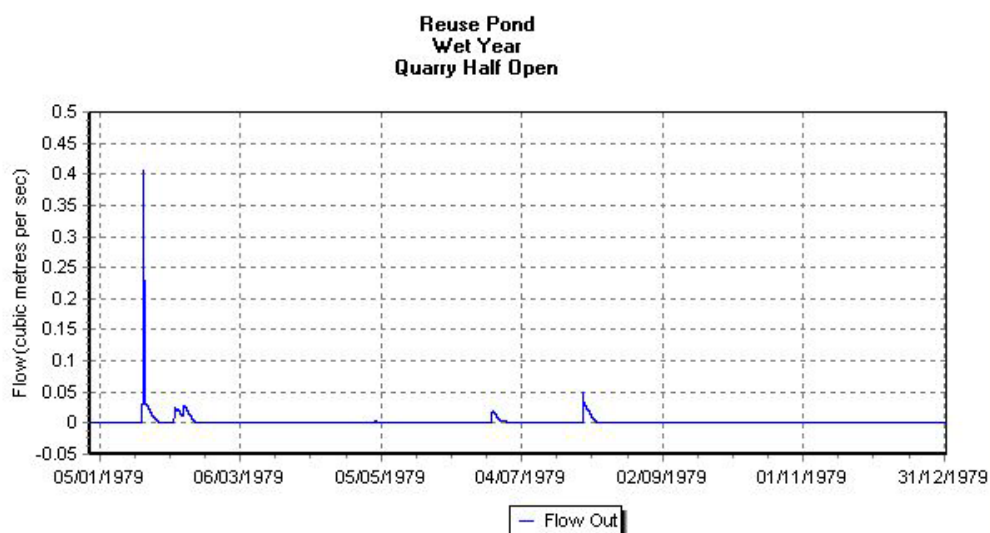
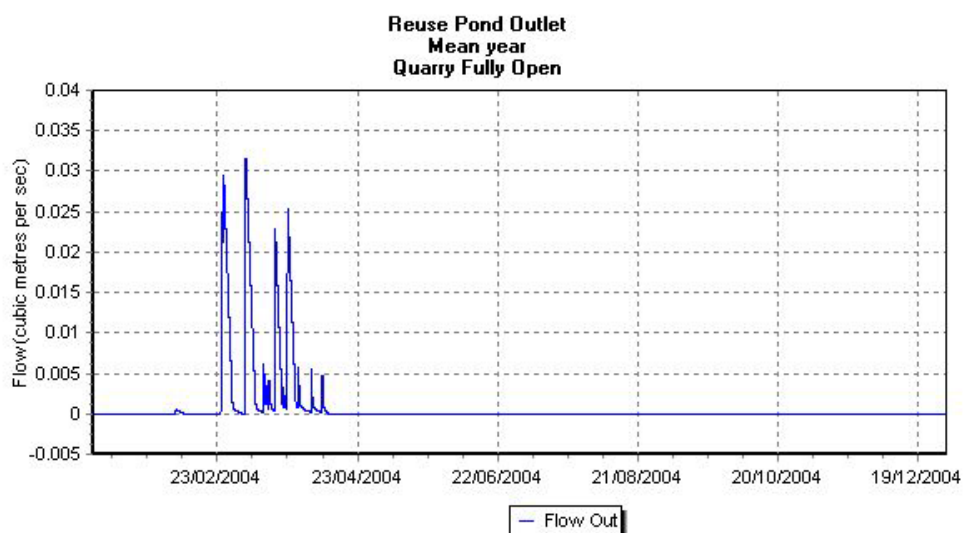
Disclaimer

This map is a representation of the information currently held. While every effort has been made to ensure the accuracy of the product, we accept no responsibility for any errors or omissions.

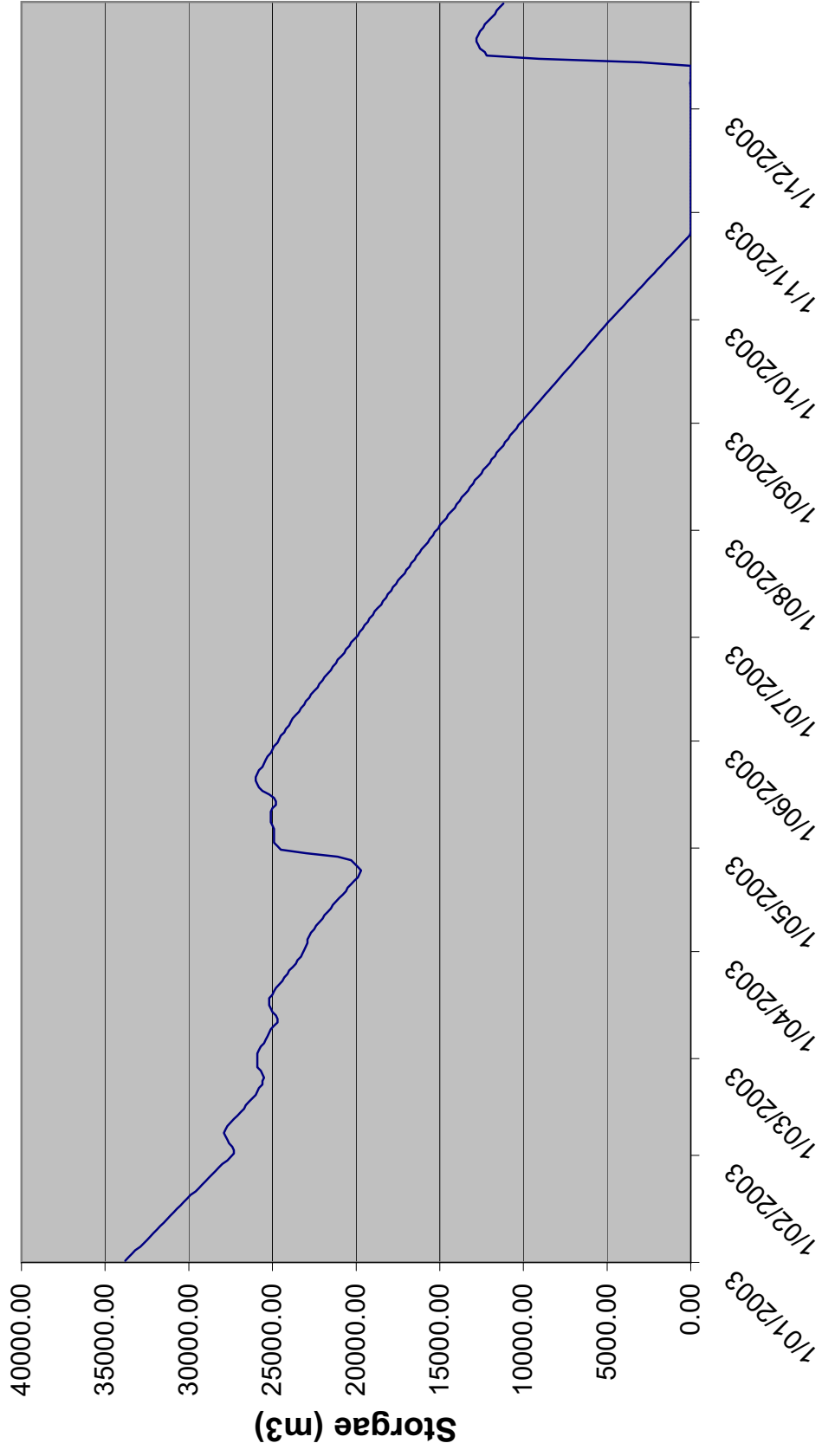
Annex K

Water Modelling Results

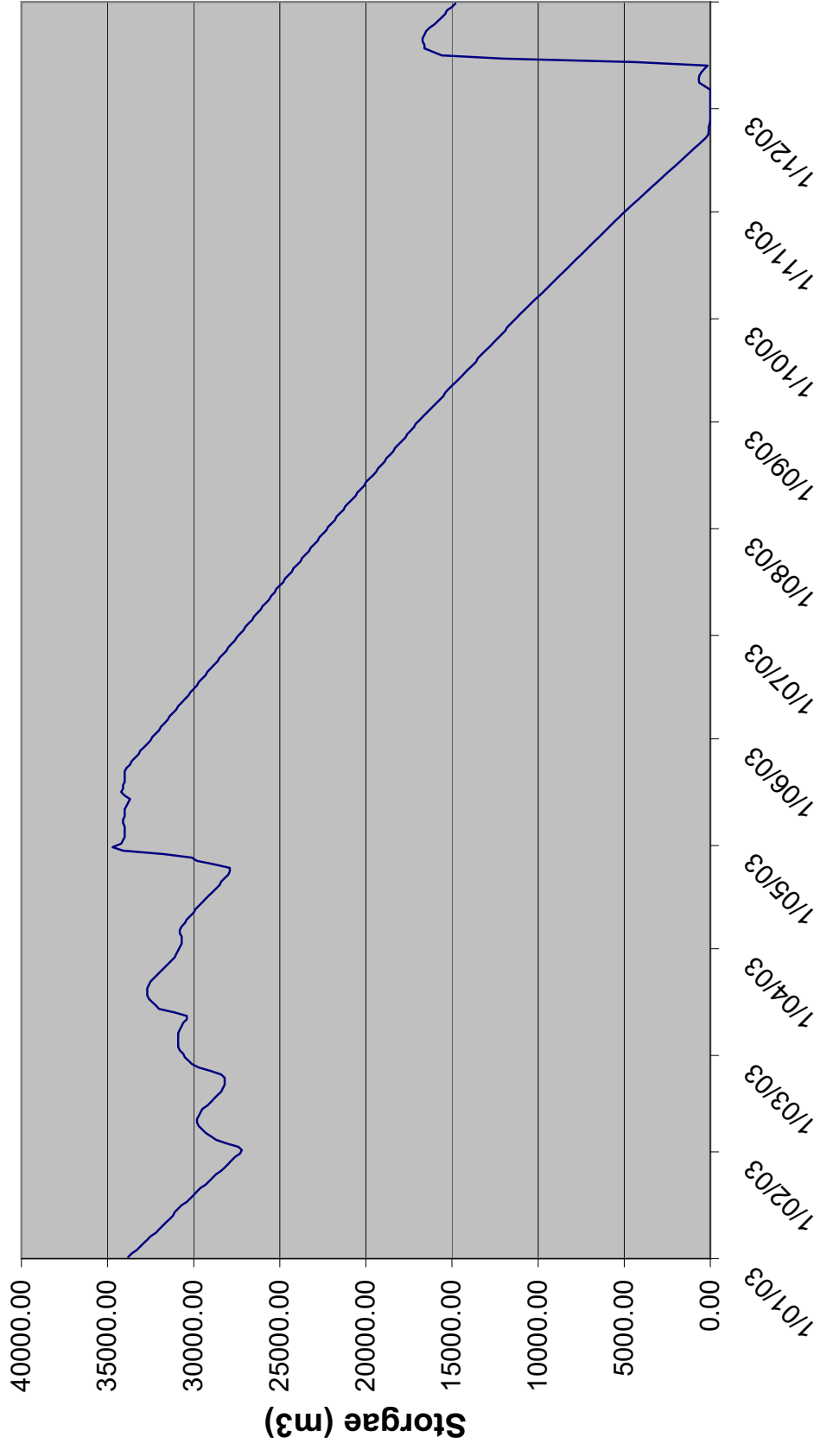




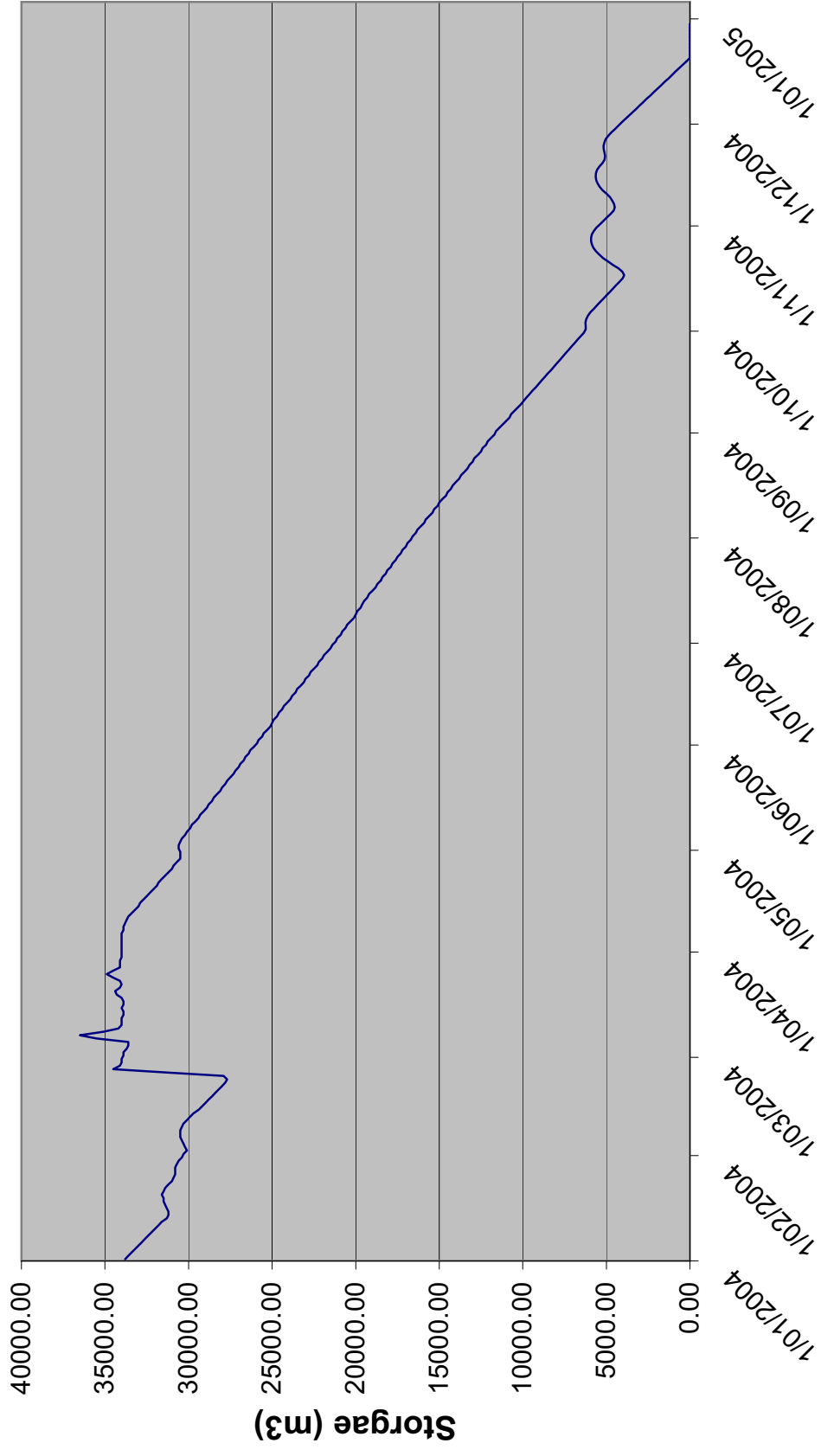
Pond Storage
DRY YEAR 4.5 ha Open Quarry



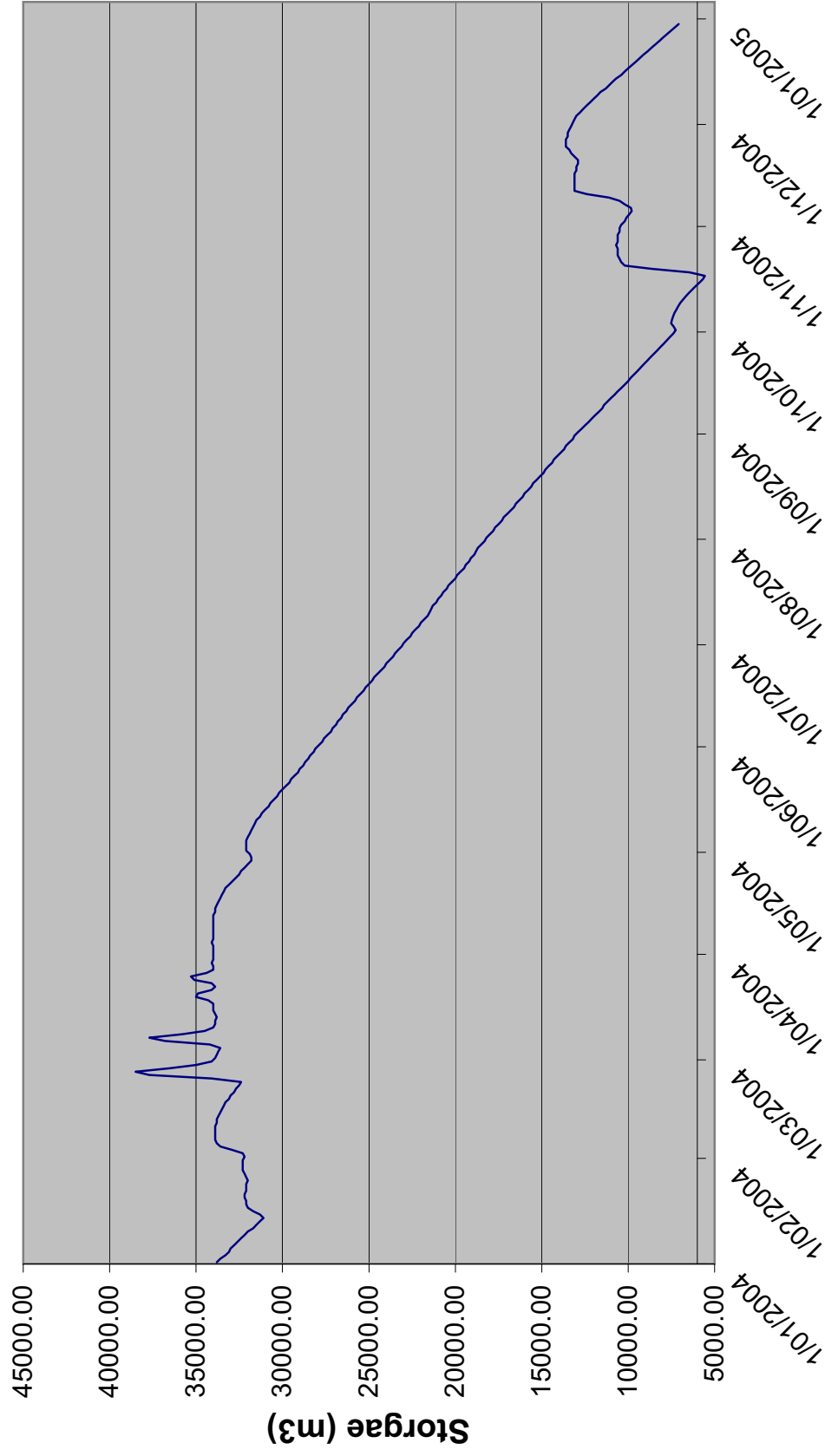
Pond Storage
DRY YEAR FULL QUARRY OPEN



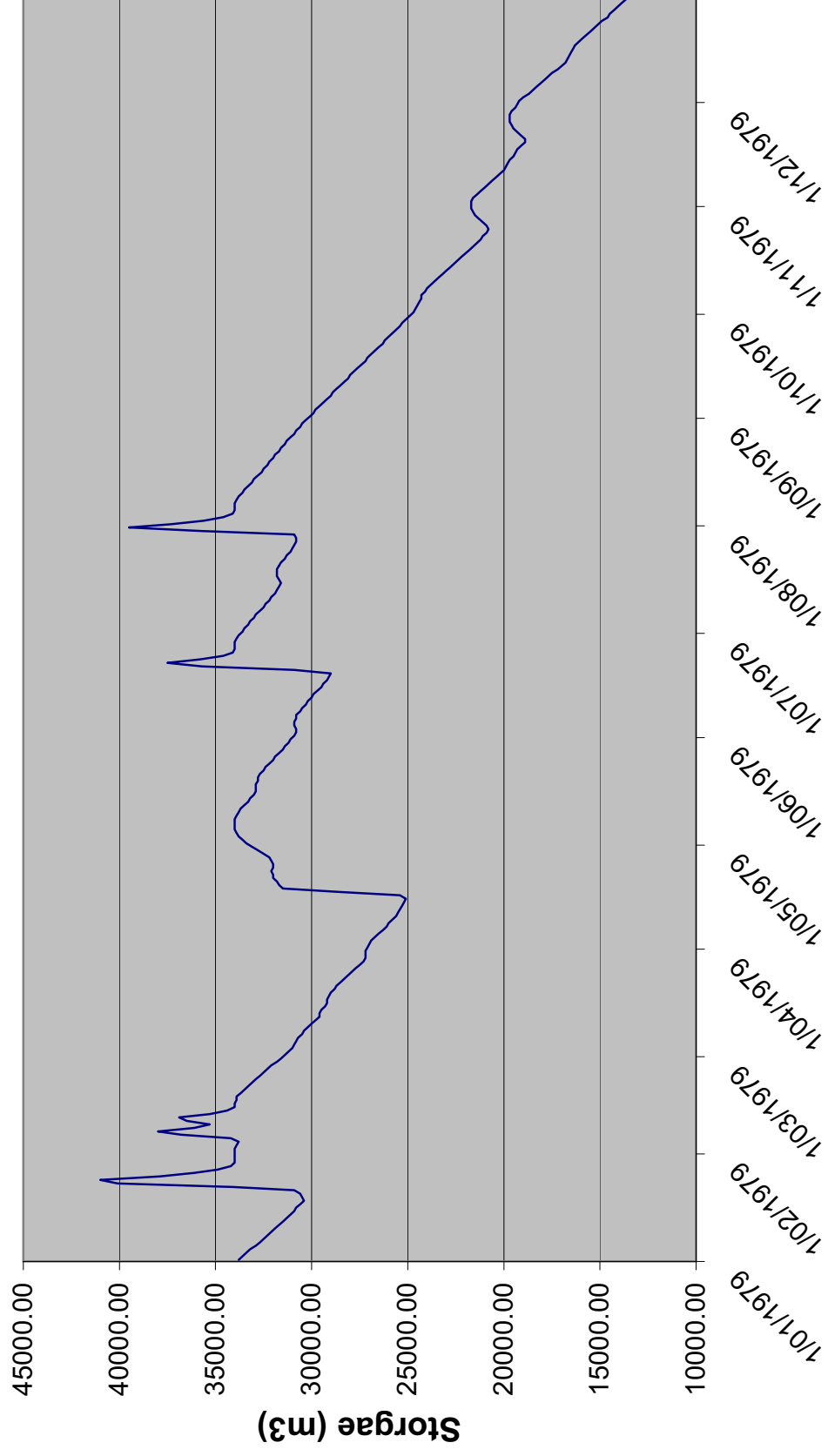
Pond Storage
MEAN YEAR 4.5 ha Open Quarry



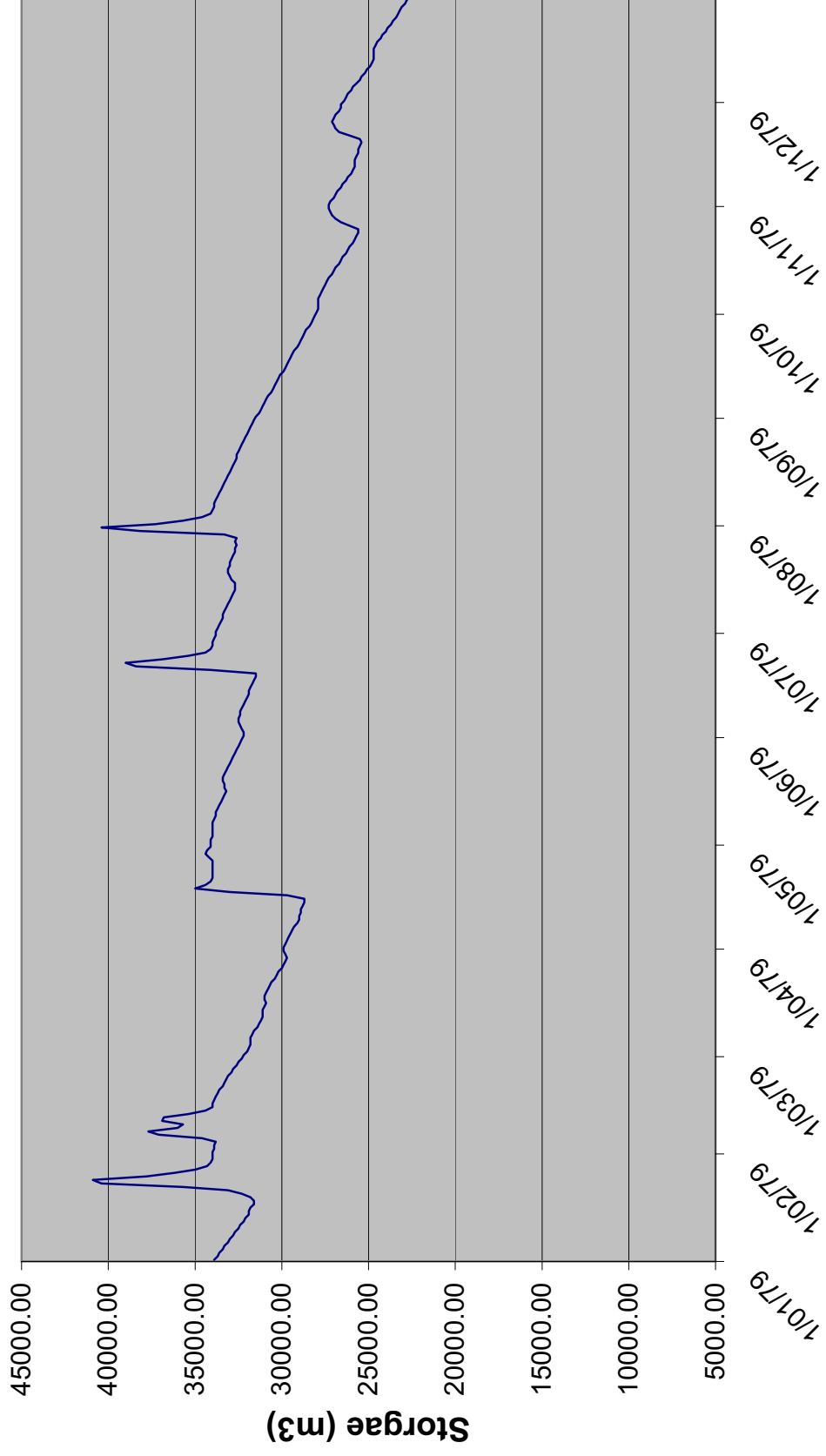
**Pond Storage
MEAN YEAR FULL QUARRY OPEN**



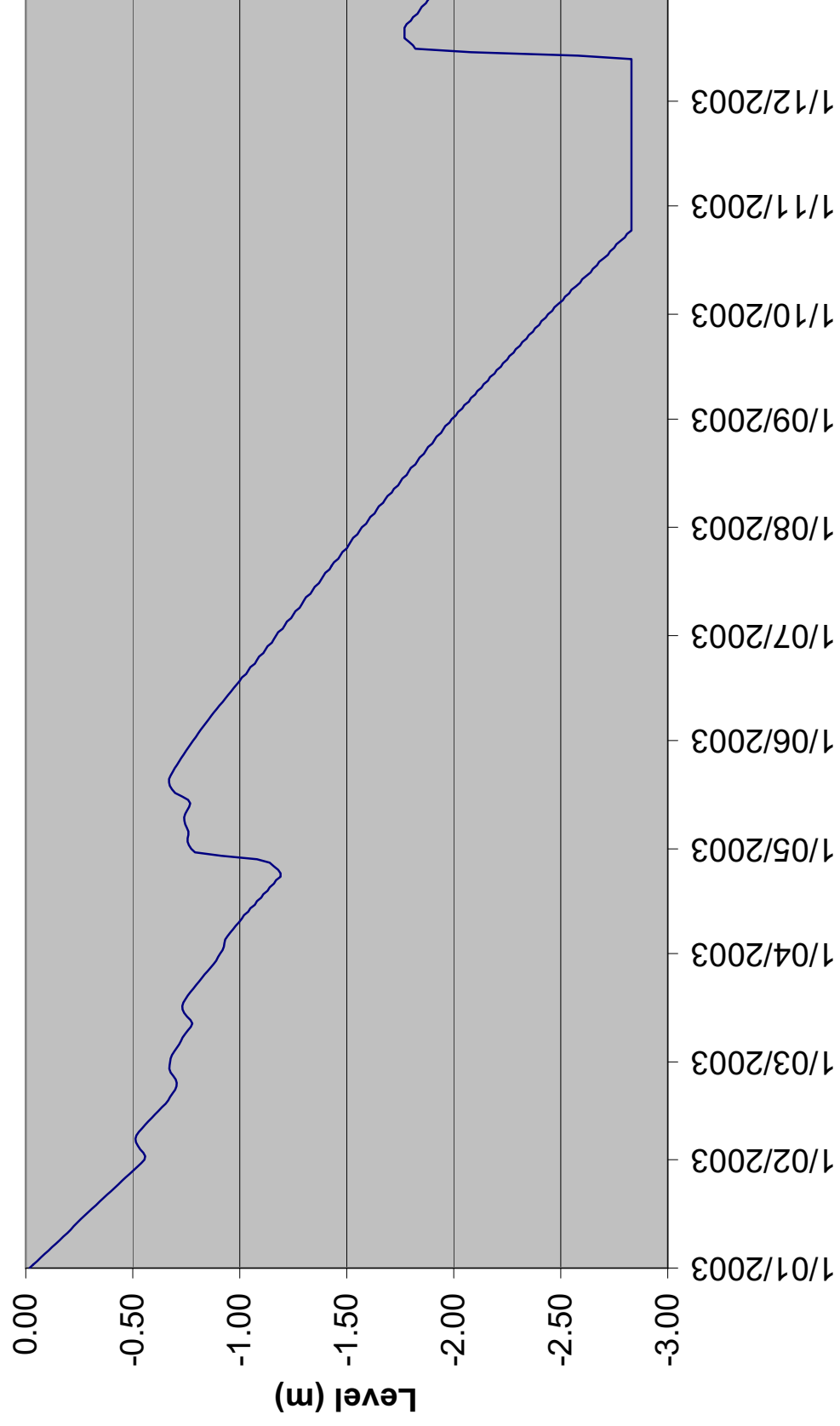
Pond Storage
WET YEAR 4.5 ha Open Quarry



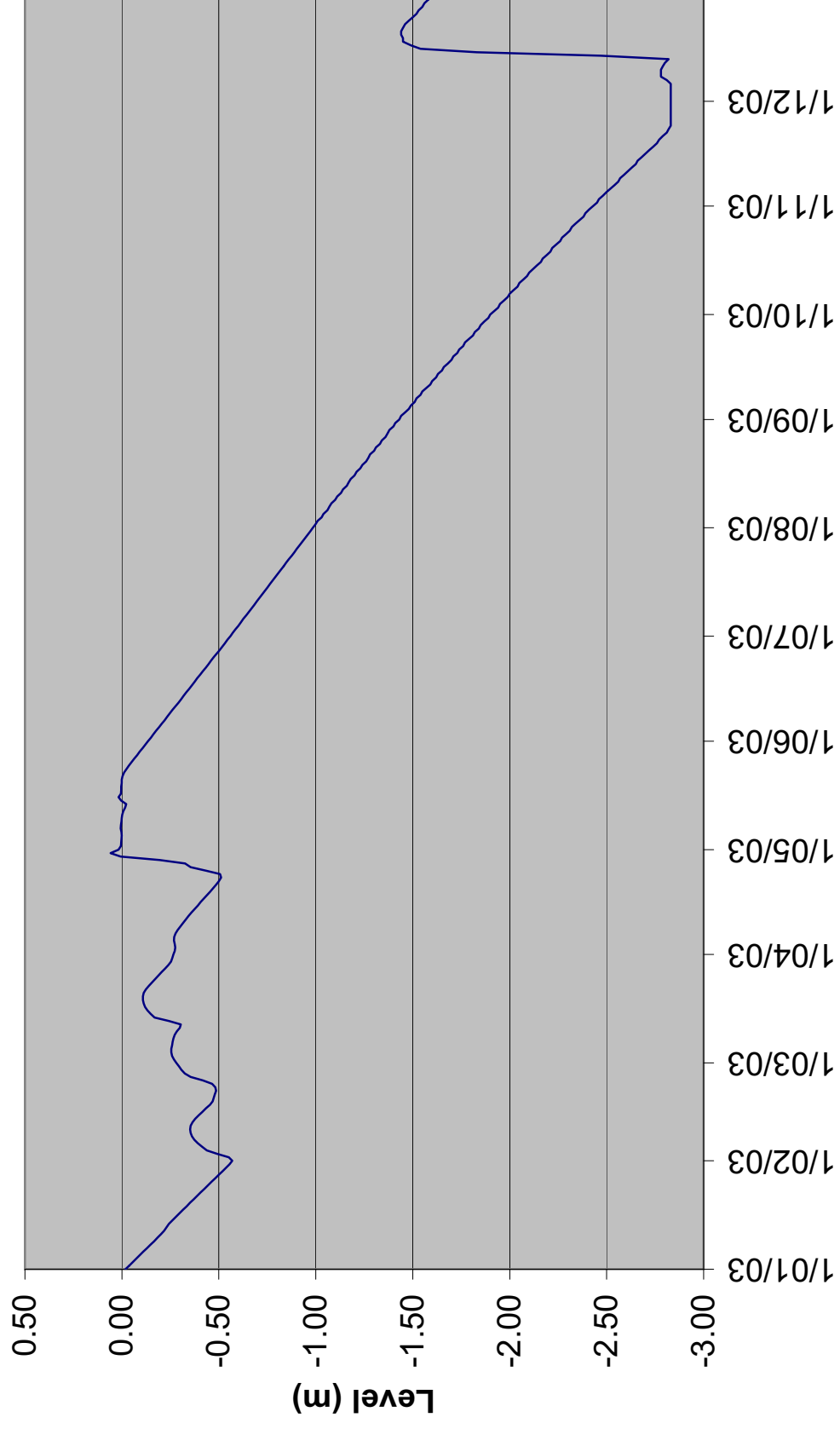
Pond Storage
WET YEAR FULL QUARRY OPEN



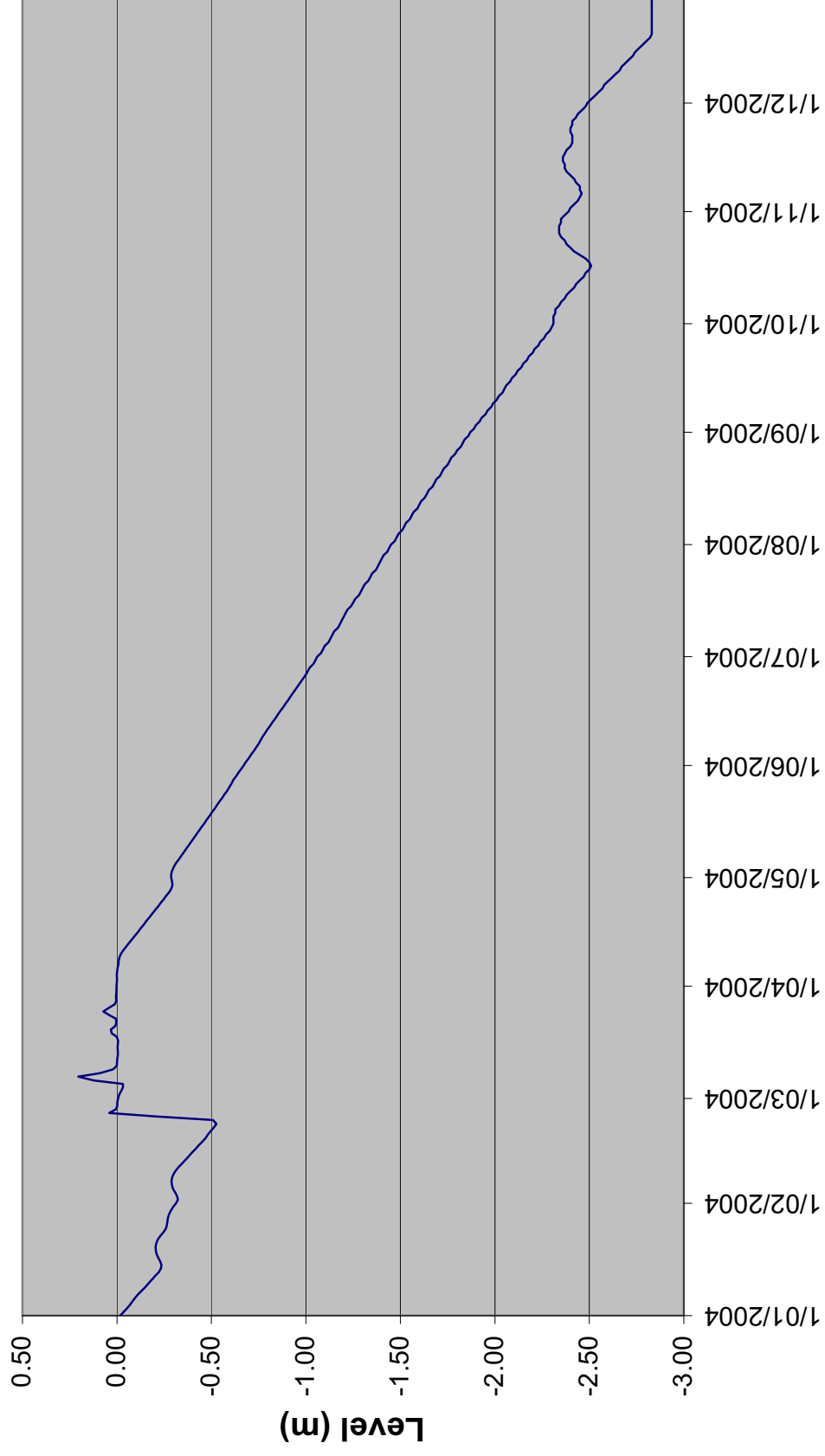
Pond Level
DRY YEAR 4.5 ha Open Quarry
(relative to top of permanent storage level)



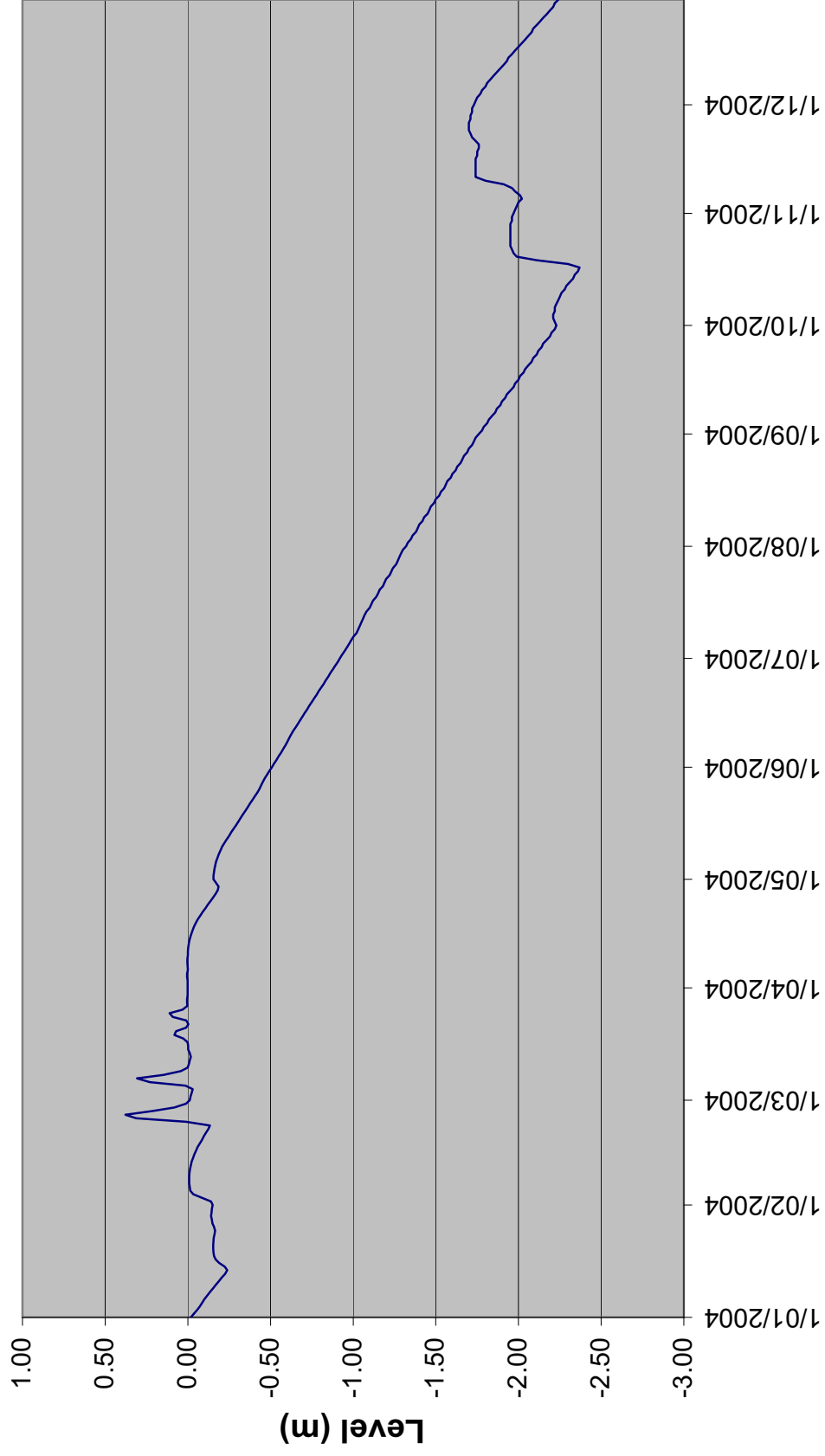
Pond Level
DRY YEAR FULL QUARRY OPEN
(relative to top of permanent storage level)



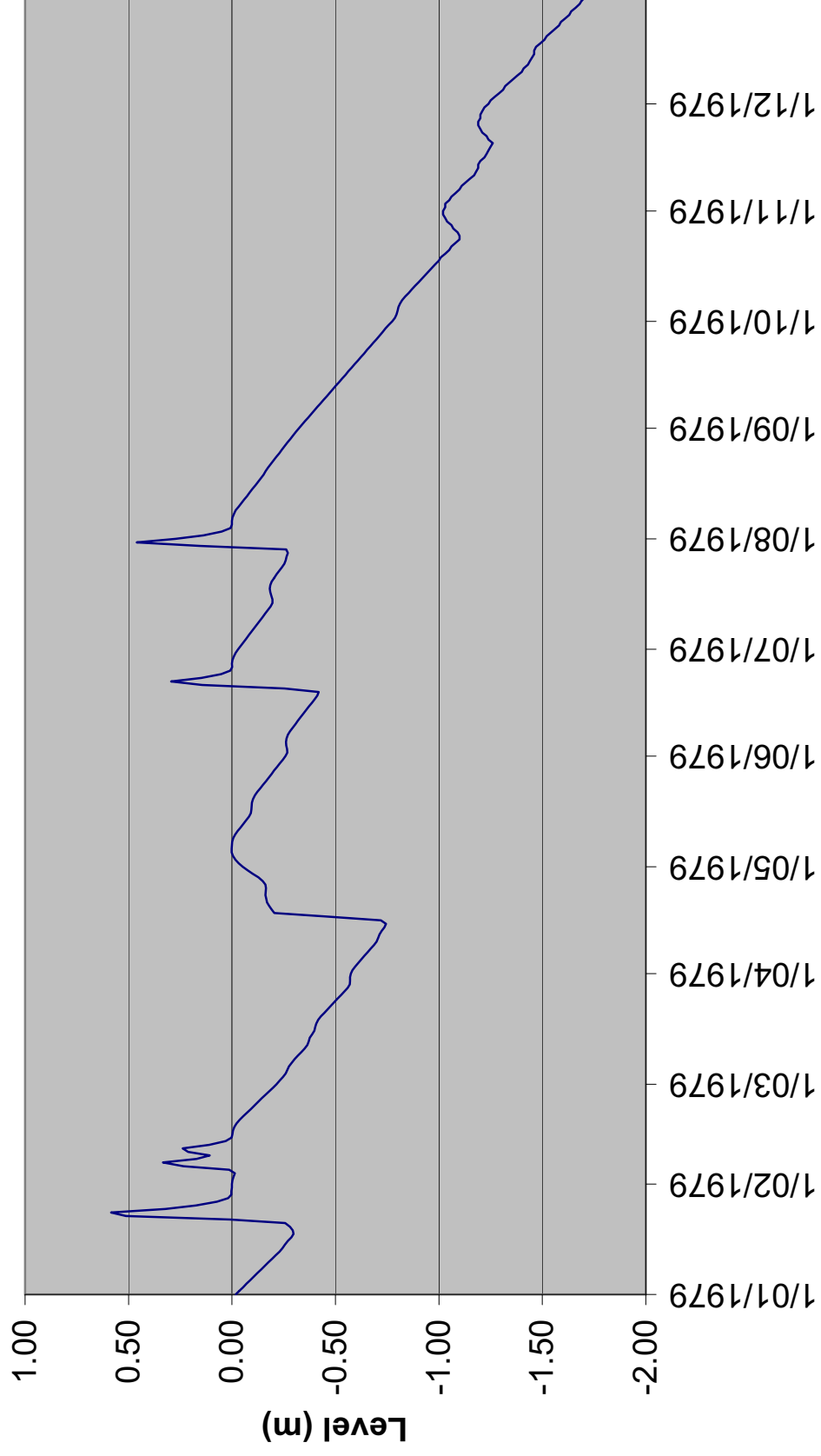
Pond Level
MEAN YEAR 4.5 ha Open Quarry
(relative to top of permanent storage level)



Pond Level
MEAN YEAR FULL QUARRY OPEN
(relative to top of permanent storage level)



Pond Level
WET YEAR 4.5 ha Open Quarry
(relative to top of permanent storage level)



Pond Level
WET YEAR FULL QUARRY OPEN
(relative to top of permanent storage level)

