

APPENDIX A

Calibration Certificates



Environmental monitoring & sampling equipment Rentals and sales.
 Tel:
 +61 8 9328 2900

 fax:
 +61 8 9328 2677

 eco@ecoenvironmental.com.au

 www.ecoenvironmental.com.au

 214 Lord St Perth WA 6000

Equipment Information

Instrument:	HLQG1
Serial Number:	Serial #: QD03320 (Display)
	Serial #: QG00445 (Sonde)

Equipment Check

(

	Enclosed	Returned	Comment
Hydrolab Display	e j		
Hydrolab Sonde	E.		
Carry Case	Ø		
Calibration Cup (Plus Cap)	Ø		
Probe Guard	I.		
Flow Cell	ত		
Instruction Manual	e e e e e e e e e e e e e e e e e e e		
Spare Batteries (Cx3)	Ø		

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Depth	⊡ Zeroed	<u>+</u> 0.1m	Ø	
pH	년, pH 4.00	<u>+</u> 0.2	⊡∕_	
	던 pH 7.00	<u>+</u> 0.2		
Conductivity	⊠_1413uS/cm	<u>+</u> 1%	E,	
	🗹 12.88mS/cm	<u>+</u> 1%		
Salinity	Auto Calibrated	<u>+</u> 1%	Ū,	
Dissolved Oxygen	☑∕ 100% Saturation	<u>+</u> 0.6mg/L > 20mg/L	V,	
	Pressure Compensation	ිටිදි8 mm/Hg	e کار	
Redox	⊠∕ <u> </u>	<u>+</u> 25mV	_ E _	. 🗖
Temperature	Factory Calibrated	<u>+</u> 0.15°C	9	

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

ECO Standard Rental Terms & Conditions apply to all equipment calibrations.

Regards

16.11.11

Equipment Specialist ECO Environmental



Environmental monitoring & sampling equipment Rentals and sales.

Tel: +61 8 9328 2900 fax: +61 8 9328 2677 eco@ecoenvironmental.com.au www.ecoenvironmental.com.au 214 Lord St Perth WA 6000

Equipment Information

Instrument:	HLQ7
Serial Number:	Serial #: QD02854 (Display)
	Serial #: QT03049 (Sonde)

Equipment Check

	Enclosed	Returned	Comment
Hydrolab Display	W.		
Hydrolab Sonde			
Carry Case	1		· · · · · · · · · · · · · · · · · · ·
Storage Cup	5		
Calibration Cup (Plus Cap)	e,		
Probe Guard	Ľ		
Flow Cell	el,		
Instruction Manual	Z.		
Spare Batteries (C x 3)	ø		· · · · · · · · · · · · · · · · · · ·

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
рН	₫ pH 4.00	<u>+</u> 0.2	ভ	
Conductivity	ਈ pH 7.00 ਈ 14134µS/cm	<u>+</u> 0.2 <u>+</u> 1%	ଟ ହ⁄	
	🗹 12.88mS/cm	<u>+</u> 1%	শ	
Salinity	Auto Calibrated	<u>+</u> 1%	El .	
Dissolved Oxygen	2 100% Saturation	<u>+</u> 0.6mg/L > 20mg/L	Ľ	
	Pressure Compensation	<u>753</u> mm/Hg	e T	
Redox	ຟ <u>22</u>ຳ m∨ at <u>25</u> °C	<u>+</u> 10mV	۲.	
Temperature	Factory Calibrated	<u>+</u> 0.15°C	Ø	
Logging Memory	Deleted all previous data		ø	

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

ECO Standard Rental Terms & Conditions apply to all equipment calibrations.

Regards

Equipment Specialist ECO Environmental

3/2/12



APPENDIX B

Chain of Custody and

Sample Receipt Notification

Samples from: 360 Environmental 22 Altona Street West Perth WA 6005 PO Box 14 West Perth WA 6872 ph: (08) 9321 0420 fax (08) 9226 0739 Project reference details: Project name: Pike Rd Project number: SWA043	Comments Comments	كالأخلاف المحالية ا
Laboratory name: MPL Laboratory address: 16-18 Hayden Court Myaree 6154 Laboratory contact number: 16-18 Hayden Court Myaree 6154 Sample delivery method: (08) 93172505 Laboratory quotation reference: Courier Laboratory quotation reference: Courier Send electronic results to: Name of samplers: Iabresults@360environmental.com.au 1 JC Kayleeprince@360environmental.com.au 1 JC Kaylee Prince Sample details verified by Kaylee Prince 1	Laboratory sample reference / - MW1 / - MW1	Relinquished by Sord Rule Signature: Date: 2 (print name): Relinquished by Sord Rule Signature: Time: Time: Contrict name): Time: Date: 2 Relinquished by Signature: Signature: Time: Date: Date: 2

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16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

SAMPLE RECEIPT ADVICE

<u>Client:</u> 360 Environmental PO Box 14 West Perth WA 6872

ph: 08 9321 0420 Fax: 08 9226 0739

Attention: K Prince

Sample log in details:	
Your reference:	SWA043
MPL Reference:	105773
Date received:	28/09/10
Date results expected to be reported:	5/10/10

Samples received in appropriate condition for analysis:	YES
No. of samples provided	7 x Water
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Purchase order number:	SWA043

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples. Perishable samples and dust filters are not retained, unless specifically requested.

Contact details:

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(print name):	Relinquished by	Relinquished by (print name):									Laboratory sample reference		Kaylee Prince	Address c	kayleeprir	labresults	Send elec	Laboratory	Sample de	Laboratory address:	Laboratory name:	Chai
3	Ъу	by KAMLEE			QC1	MW5	MW4	MW3	MW2	MW1	Sample Number		ince	Address correspondence to:	kayleeprince@360environmental.com.au	labresults@360environmental.com.au	Send electronic results to:	Laboratory quotation reference:	Sample delivery method:	address:	name:	Chain of Custody Record
				-	×	×	×	×	×	×	Water Soil Sediment			×	nental.co	tal.com.			Cot	3-5	MGT	ody
Signature:		Signature:	-	-							Sediment Z. Other Collection Method		-	Sample (sign):	om.au	-	sam	4 1	+61 3 9564 /055 Courier	3-5 Kingston Town Close, Oakleigh	H	Reco
		A'									Time			ple detail: i):		1 KP	name or samplers:		00	own Close		ord
Time:	- L	14			25/03/2010	25/03/2010	25/03/2010	25/03/2010	25/03/2010	25/03/2010	Date			Sample details verified by (sign):						, Oakleigh		
Time:	Date:	Date: 28/3/11 Time:									Comments											
name):	Received by	Received by name):									Depth (m)		-	Project number:		Project name:	Project	PO Box	360 Envi	Sample	Chain o	1
	0	2			×	×	×	×	×	×	pH, EC, DO			umber:		ame:	Project reference de	PO Box 14 West Perth WA 6872	360 Environmental	Samples from:	Chain of custody number:	
STILL	(print	torthi			×	×	×	×	×	×	Acidity						ice deta	erth WA 6	bet Dorth		ly numb	
		1 6			×	×	×	×	×	×	Nitrate as N, nitrite as N , Nitrate and Nitrite as N			SWA043		Pike Road LWMS - KP	tails:	3872			ber:	
		innig			×	×	×	×	×	×	Total Suspended Solids	Sam				NMS - KP						201.6 715
Signature:		Signature:			×	×	×	×	×	×	Phosphorus- Reactive , Phosphorus- Total as P	Sample analysis						ph: (08) 9321 0420 fax (08) 9226 0739			SWA043 -20110328-2	TOT
	1			-	×	×	×	×	×	×	Total Fe, Al	S		_				1 0420 fa			201103	-
Time:	Date:	Date: 30			×	×	×	×	×	×	Chloride, Sulfate (so4), alkalinity	2						x (08) 922			28-2	1 of 1
		5			×	×	×	×	×	×	Dissolved As, Cd, Cr, Cu, Ni,							6 0739				



Melbourne 3-5 Kingston Town Close Oakleigh Vic 3166 Phone: +61 3 9564 7055 NATA # 1261 & 1645 Site # 1254 & 14271 Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600

Sample Receipt Advice

Company name:

360 Environmental

Contact name:	ALL RESULTS/SRA/COC'S
Client job number:	PIKE ROAD LWMS-KP SWA043
COC number:	SWA043-20110328-2
Turn around time:	5 Day
Date received:	Mar 30, 2011
MGT lab reference:	294873

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Organic samples had Teflon liners.
- Sample containers for volatile analysis received with zero headspace.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Dan Thompson on Phone : +61 3 9564 7055 or by e.mail: dant@mgtenv.com.au

Results will be delivered electronically via e.mail to ALL RESULTS/SRA/COC'S - labresults@360environmental.com.au.

mgt Sample Receipt



NATA Accreditation Stack Emission Sampling & Analysis Trade Waste Sampling & Analysis Groundwater Sampling & Analysis



35Years of Environmental Analysis & Experience - fully Australian Owned

<u>Chair</u>	Chain of Custody Record	ody R	ecor		Ē								~	1 of 1	Ö.
Send samples to: Laboratory name:	ples to: name:	MPL					Chain	of custo	Chain of custody number:	er:		SWA043 -20110328-4	0110328	4	
Laboratory address:	address:	16-18 H	16-18 Hayden Court Myaree 6154	rt Myaree	6154		Sample	Samples from:							
Laboratory	Laboratory contact number:	(08) 93172505	172505				360 Env	360 Environmental							
Sample del	Sample delivery method:	Courier					22 Alton	a Street V	22 Altona Street West Perth WA 6005	NA 6005					
Laboratory	Laboratory quotation reference:						PO Box	14 West F	PO Box 14 West Perth WA 6872	872		ph: (08) 9321 0420 fax (08) 9226 0739	0420 fax (08) 9226 0	739
			Name of	of .											
Send elect	Send electronic results to:		samplers:	rs:			Projec	t referei	Project reference details:	Is:					
labresults(labresults@360environmental.com.au	al.com.au	1 KP				Project name:	name:		Pike Road LWMS - KP	MS-KP				
<u>kayleeprin</u>	kayleeprince@360environmental.com.au	ental.com.													
			Sample details verified	details ve	arified by										
Kaylee Prince	Kaylee Prince		(sign)			1	Project number:	number:		SWA043		ĺ			
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Time: Date: Time:

Signature:

(print

Received by name):

Date: 2.7 J Time: 2 2 J

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Signature:

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Relinquished by (print name):



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16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

SAMPLE RECEIPT ADVICE

<u>Client:</u> 360 Environmental PO Box 14 West Perth WA 6872

ph: 08 9388 8360 Fax: 08 9226 0739

Attention: Kaylee Prince

Sample log in details:	
Your reference:	Pike road LWMS - KP
MPL Reference:	110093
Date received:	28/3/2011
Date results expected to be reported:	4/04/11

Samples received in appropriate condition for analysis:	YES
No. of samples provided	Water
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Purchase order number:	

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples. Perishable samples and dust filters are not retained, unless specifically requested.

Contact details:

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Send samples to:	s to:	1000				1	Chain of custody number:	custody	number			SWA043 20110907-1	060110	1-1	
Laboratory name: Laboratory address: Laboratory contact number: Sample delivery method: Laboratory culoration refere	Laboratory name: Laboratory address: Laboratory contact number: Sample delivery method: Laboratory cunctation reference:		Mics 1 3-5 Kingston Tow +61 3 9564 7055 Courier	mo I 3-5 Kingston Town Close, Oakleigh 161 3 9564 7055 Courtier	e, Oakleigh		Samples from: 360 Environmental 10 Bermondsey Sti PO Box 14 West P	Samples from: 360 Environmental 10 Bermondsey Street West Lee PO Box 14 West Perth WA 6872	West Le	Samples from: 360 Environmental 10 Bermondsey Street West Leederville WA 6007 PO Box 14 West Perth WA 6872		ph: (+618) 9388 8360 fax (+618) 9381 2360	8 8360 fa	ix (+618) 9.	381 2360
Send electronic results to: labresults@360environmer	Send electronic results to: labresults@360environmental.com.au	al.com.		Name of samplers: 1 NH			Project refe	Project reference details: Project name:	details	IS: Pike Road LWMS - NH	HN - SN				
Address corre	mamnnage@souenvironmental.com.au	Ital: 60H		Sample detail	Sample details verified by (sten):		Project number:	nber:	1 15	SWA043					
Niamh Hade		I	-	1			-				Sam	Sample analysis			
-			her	Jethod	ł	-	Depth	H' EC' DO	ycidity	Vitrate as N, vitrate as N , Vitrate and Vitrate as N	Total Suspended Solids	Phosphorus- Phosphorus- Total as P	Total Fe, Al	Chloride, Sulfate (so4), alkalinity	Dissolved As, Cd, Cr, Cu, Ni, Zn, Mn, Al, Se, Fe
mv	Sample Number MW2	s	10	N	-		×	d	++	×			×	×	×
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Relinquished by (print name):			Signature:	:0:	2	Date: Time:	Received by name):	y (print	5	vicle -	ans-	Signature:		Date: Time:	19/4



Melbourne 3-5 Kingston Town Close Oakleigh Vic 3166 Phone: +61 3 9564 7055 NATA # 1261 & 1645 Site # 1254 & 14271 Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600

Sample Receipt Advice

1 5	
Contact name:	Niah Hade
Client job number:	PIKE ROAD LWMS-NH -SWA043
COC number:	Not provided
Turn around time:	5 Day
Date received:	Sep 8, 2011
MGT lab reference:	311413

360 Environmental

Sample information

Company name:

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- a All samples have been received as described on the above COC.
- @ COC has been completed correctly.
- @ Attempt to chill was evident.
- @ Appropriately preserved sample containers have been used.
- @ All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- @ Organic samples had Teflon liners.
- Sample containers for volatile analysis received with zero headspace.
- @1 Some samples have been subcontracted.
- : ¥:: Custody Seals intact (if used).

Notes

QC3 (1x vial cannot run for the requested analytes).

Contact notes

If you have any questions with respect to these samples please contact:

Dan Thompson on Phone : +61 3 9564 7055 or by e.mail: dan.thompson@mgtlabmark.com.au

Results will be delivered electronically via e.mail to Niah Hade - niamhhade@360environmental.com.au.

mgt Sample Receipt



NATA Accreditation Stack Emission Sampling & Analysis Trade Waste Sampling & Analysis Groundwater Sampling & Analysis



35Years of Environmental Analysis & Experience - fully Australian Owned

8. A C P 1 - A P		360						Dissolved As, Cd, Cr, Cu, Ni, Fe	×								
1 of 1	07-2	(08) 9381 2						Chloride, Sulfate (so4), alkalinity	×						Date: TIme:	Date: Time:	
	201109	8360 fax	;				5	lA ,9∃ letoT	×				¥.				
	SWA043 -20110907-2	phi. (08) 9388 8360 fax (08) 9381 2360					Sample analysis	Phosphorus- Phosphorus- Total as P	×						Signature:	Sicnature:	
		A 6007		HN - SMV			Sam	Total Suspended Solids	×								24022
		Samples from: 360 Environmental 10 Bermondsey Street West Leederville WA 6007 PO Box 14 West Perth WA 6872	is	Pike Road LWMS - NH		SWA043		Nitrate as V, Nitrate as V Nitrate and Nitrite as V	×								
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		16-18 Hayden C((08) 93172505 Courier	Name of samplers:		_	Sample (sign). 1		Other Collection Method			ļ				Signature:	Signature:	•
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	es to: Ime:	Idress: Intact numbe Pry method: Iotation refer	mic results	360environ	<u> 9360enviro</u>	respondenc		Sample Number	QC2						NHAMP	5	
Chain of Custoay Record	Send samples to: Laboratory name:	Laboratory address: Laboratory contact number; Sample delivery method: Laboratory quotation reference:	Send electronic results to:	labresults@360environmental.com.au	niamhhade@360environmental.com.au	Address correspondence to: Niamh Hade		Laboratory sample reference	0		Ť				Relinquished by (print name):	Relinquished by {print name):	





16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

SAMPLE RECEIPT ADVICE

Client:		
360 Environ	menta	al
PO Box 14		
West Perth	WA	6872

ph: 08 9388 8360 Fax: 08 9226 0739

Attention: Niamh Hade

Sample log in details:	
Your reference:	SWA043
MPL Reference:	114553
Date received:	7/09/11
Date results expected to be reported:	14/09/11

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 Water
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Purchase order number:	

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples. Perishable samples and dust filters are not retained, unless specifically requested.

Contact details:

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Send samples to:					Chain of	Chain of custody number:	:umber:		SV	SWA043 20111117-1	011111	7-1	
Laboratory name:	MGT	1											
Laboratory address:		3-5 Kingston Town Close, Oakleigh	, Oakleigh		Samples from:	s from:							
Laboratory contact number: Sample delivery method:		+61 3 9564 7055 Colirier			360 Environmental	onmental							
Laboratory quotation reference:					PO Box 1	PO Box 14 West Perth WA 6872	WA 6872	PO Box 14 West Perth WA 6872		nh: (+618) 9388 8360 fav (+618) 9381 2360	R R360 6	av (+618) o	381 2360
Send electronic results to:	to:	Name of samplers:			Project	Project reference details:	details:						
labresults@360environmental.com.au	<u>nental.com.au</u>	1 NH			Project name:	me:	Pike	Pike Road LWMS - NH	HN				
niamhhade@360environmental.com.au	imental.com.au	-											
Address correspondence to: Niamb Hade	e to:	Sample details verified by (sign):	s verified by		Project number:	mber:	SWA043	1043					
		-			-	L							
									Sample	e analysis			
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Laboratory sample reference Sample Number	G G Soil Sediment	Collection Method	Date	Comments	Depth (m)	н, ЕС, DO	Acidity Vitrate as N	Vitrate as N, Vitrate and Vitrite as N Total	olids blocphorus bolids	seactive , Phosphorus otal as P	IA ,93 Isto	, alkalir so4), alkalir	a bevloed A. 5d, Cr, Cu, I 1, Mn, Al, 5 6
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MW3	×		17/11/2011		×		×		×	×	×	×	×
MW4	×		17/11/2011		×		×	×	×	×	×	×	×
MW5	×		17/11/2011		×		×	×	×	×	×	×	×
QC1	×		17/11/2011		×		×		×	×	×	×	×
0C3	×		17/11/2011		×		×	×××	×	×	×	×	×
		7											
Relinquished by //////////	HMDE Signature	tures	all a	Date: 17/11/1/ Time: 3:30	Received by name):	y (print	10.1	Art	Sigr	Signature:	M	Date: 17/	11/11
Relinquished by (print name):	Signature:	ture:		Date: Time:	Received by name):	y (print	BUND	R	Sior	Signature.		Date: 18/11	1 1143



Melbourne 3-5 Kingston Town Close Oakleigh Vic 3166 Phone: +61 3 9564 7055 NATA # 1261 & 1645 Site # 1254 & 14271 Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600

Sample Receipt Advice

1 ,	
Contact name:	Niamh Hade
Client job number:	PIKE ROAD LWMS-NH SWA043
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	Nov 18, 2011 9:06 AM
MGT lab reference:	318955

360 Environmental

Sample information

Company name:

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- \square All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Organic samples had Teflon liners.
- N/A Sample containers for volatile analysis received with zero headspace.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Natalie Krasselt on Phone : (03) 9564 7055 or by e.mail: Natalie.Krasselt@mgtlabmark.com.au

Results will be delivered electronically via e.mail to Niamh Hade - niamhhade@360environmental.com.au.

mgt Sample Receipt



NATA Accreditation Stack Emission Sampling & Analysis Trade Waste Sampling & Analysis Groundwater Sampling & Analysis



35Years of Environmental Analysis & Experience - fully Australian Owned

Send samules to:						- 						1 10 1	1
				6	5	ain of c	Chain of custody number:	umber:		SWA043	SWA043 -20111117-2	.17-2	
Laboratory address: 16-18 H Laboratory contact number: (08) 931 Sample delivery method: Courier Laboratory quotation reference:	16-18 Hayden Court Myaree 6154 (08) 93172505 Courier	urt Myaree	6154		Sa 360 10 F	Samples from: 360 Environmental 16 Bermondsey Str PO Rox 14 West Pr	Samples from: 360 Environmental 10 Bermondsey Street West Lee PO Box 14 West Perth WA 6872	Samples from: 360 Environmental 10 Bermondsey Street West Leederville WA 6007 PO Rox 14 West Perth WA 6872	le WA 6007		88 8360 fee	nh- (NR) 0388 8360 fev /081 0361 2360	2280
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labresults@360environmental.com.au	au 1 NH	_			E D	Project name:	ж	Pike Ro:	Pike Road LWMS - NH				
n <u>amhhade@360environmental.com.au</u> Address correspondence to: Niamh Hade		Sample details verified by (sign):	orfied by		<u>e</u>	Project number	er:	SWA043					
	_								Sa	Sample analysis	sis		
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QC2 ×		•	17/11/2011			×	×	×	×	×	×	×	×
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16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

SAMPLE RECEIPT ADVICE

Client: 360 Environmental PO Box 14 West Perth WA 6872

ph: 08 9388 8360 Fax: 08 9226 0739

Attention: Niamh Hade

Sample log in details:	
Your reference:	Pike Road LWMS-Nh
MPL Reference:	116698
Date received:	17/11/11
Date results expected to be reported:	24/11/11

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 x Water
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Purchase order number:	

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples. Perishable samples and dust filters are not retained, unless specifically requested.

Contact details:

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07-1	ax (+618) 9381 2360					Chloride, Sulfate (so4), alkalinity Dissolved As, Cd, Cr, Cu, Ni, Zn, Mn, Al, Se, Fe	×	× ×	x x	x x	x x	_	×	Date: 3/2/12	Date: Time:
SWA043 20120207-1	ph: (+618) 9388 8360 fax (+618) 9381 2360				ole analysis	Phosphorus- Reactive , Total as P Total As P		x x	x x	x x	x x	-	×	Signature: NUCLT	
			HN - SW		Sample	Total Suspended Solids	×	×	×	×	×	×	×	Kressert	atter
er:	Leederville W 372		Pike Road LWMS - NH	SWA043		Nitrate as N, nitrite as N , Nitrate and Nitrite as N	×	×	×	×	×	× :	×		A
tody numb	m: ntal · Street West st Perth WA 68	ence detail				Acidity	×	×	×	×	×	× :	×	(print Nodalie	(print
Chain of custody number:	Samples from: 360 Environmental 10 Bermondsey Street West Leederville WA 6007 PO Box 14 West Perth WA 6872	Project reference details:	Project name:	Project number:	1	Depth (m)								Received by name):	Received by name):
						Comments								Date: 7/2/12 Time:	
	e, Oakleigh			ls verified by		Date	7/02/2012	7/02/2012	7/02/2012	7/02/2012	7/02/2012	C102/20//	102/2017	Time:	PLEASE OUTPUT TO ESDAT
		Name of samplers:	HN L	Sample details verified by (sign): 1		Collection Method T								ture:	10 A.
MGT			ital.com.au			Water Soil A Ater Other	×	×	×	×	× :	× ,	×	Here Signature.	Signature:
les to: name:	Laboratory address: Laboratory contact number: Sample delivery method: Laboratory quotation reference:	Send electronic results to:	labresults@360environmental.com.au	Address correspondence to: Niamh Hade		Sample Number	MW2	MW3	MW4	MW5	MW1	003	3	With 1	
Send samples to: Laboratory name:	Laboratory address: Laboratory contact r Sample delivery mel Laboratory quotation	Send electr	labresults@	Address corr Niamh Hade		Laboratory sample reference								Relinquished by (print name):	Relinquished by (print name):



Melbourne 3-5 Kingston Town Close Oakleigh Vic 3166 Phone: +61 3 9564 7055 NATA # 1261 & 1645 Site # 1254 & 14271 Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600

Sample Receipt Advice

Company name:

360 Environmental

Contact name:	Niamh Hade
Client job number:	PIKE ROADS LWMS-NH SWA043
COC number:	SWA043 20120201-1
Turn around time:	5 Day
Date/Time received:	Feb 9, 2012 8:38 AM
MGT lab reference:	326600

Sample information

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.
- ☑ COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Organic samples had Teflon liners.
- Sample containers for volatile analysis received with zero headspace.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Natalie Krasselt on Phone : (03) 9564 7055 or by e.mail: Natalie.Krasselt@mgtlabmark.com.au

Results will be delivered electronically via e.mail to Niamh Hade - niamhhade@360environmental.com.au.

mgt Sample Receipt



NATA Accreditation Stack Emission Sampling & Analysis Trade Waste Sampling & Analysis Groundwater Sampling & Analysis



35Years of Environmental Analysis & Experience - fully Australian Owned

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Send samples to:			that a state					101	
Laboratory name: MPL		,	Chain of custody number:	ати ура			SWA043 -2	SWA043 -20120207-2	
ss: t number: nethod: ion reference:	16-18 Hayden Court Myaree 6154 (08) 93172505 Courier	<u>µ</u> ∞ ∼ <u>∩</u>	Samples from: 360 Environmental 10 Bermondsey Street West Leederville WA 6007 PO Box 14 West Perth WA 6572	i: al Street West L Perth WA 65	.eederville WA	16007	nh- (08) 9388	nh- (08) 9388 8360 fax (081 9381 2360	123AD
	Name of samplers:	<u>a</u>	Project reference details:	ance detail	iii				
ntal.com.au	1 NH	<u> </u>	Project name:	_	Pike Road LWMS - NH	HN - SM			
<u>niamhhade@360environmental.com.au</u>	Semmle Jobule varified for								
Address correspondenco to: ()	aampre cerans vermed by (sign) 1	<u>.</u>	Project number:		SWA043				
	-				!	Samp	Sample analysis		
mple Number Sediment Trix		Comments	Depth (m)	Acidity .	Nitrate as N, nitrite as N, Nitrate and Nitrite as N	Total Suspended Solids	Phosphorus- Reactive , Total as P	Total Fe, Al Chloride, Sulfate (so4), alkalinity	Fe Dissolved As, Cd, Cr, Cu, Ni, Zn, Mn, Al, Se, Fe
QC2 ×	7/02/2012			×	×	×	×	\vdash	
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16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

SAMPLE RECEIPT ADVICE

Client:		
360 Environ	menta	al
PO Box 14		
West Perth	WA	6872

ph: 08 9388 8360 Fax: 08 9226 0739

Attention: Niamh Hade

Sample log in details:	
Your reference:	SWA043
MPL Reference:	119089
Date received:	7/02/12
Date results expected to be reported:	14/02/12

Samples received in appropriate condition for analysis:	YES
No. of samples provided	1 x Water
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Purchase order number:	

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples. Perishable samples and dust filters are not retained, unless specifically requested.

Contact details:

Chain of Custody Record Send samples to:	ody Re	ecord			Chain of cu	Chain of custody number:		1 of 1 SWA043 20120404-1
Laboratory name: Laboratory address: Laboratory contact number: Sample delivery method: Laboratory quotation reference:		MGT 3-5 Kingston Town Close, Oakleigh +61 3 9564 7055 Courier	, Oakleigh		Samples from: 360 Environmental 10 Bermondsey Sti PO Box 14 West P	Samples from: 360 Environmental 10 Bermondsey Street West Leederville WA 6007 PO Box 14 West Perth WA 6872	rile WA 6007	nh: (+618) 9388 8360 fav (+618) 9380 a
Send electronic results to:		Name of samplers:			Project refe	Project reference details:		
labresults@360environmental.com.au	ntal.com.au	HN			Project name:	Pike Ro	Pike Road LWMS - NH	
<u>niamhhade@360environmental.com.au</u> Address correspondence to: Niamh Hade		Sample details verified by (sign): 11	s verified by		Project number:	r. SWA043		
							Sa	Sample analysis
Laboratory sample Number reference Sample Number	Vitier Soli Soli Soli X Vitier	Collection Method	Date	Comments	Depth (m)	Jutrients: total itrogen, nitrate,	bns eitrin sinomm	Job No
MW2			4/04/2012			4 ^I		
MW4 MW5	××		4/04/2012			×		
MW1	××		4/04/2012			× ×		11A1 Reg - 24/48/72/80
0C1	× ,		4/04/2012					Terhp - (cool/àmbient
2	<		4/04/2012			×		Cooling - Iceride pack/flone
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PLEASE OUTPUT TO ESDAT





16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

SAMPLE RECEIPT ADVICE

Client: 360 Environmental PO Box 14 West Perth WA 6872

ph: 08 9388 8360 Fax: 08 9226 0739

Attention: Niamh Hade

Sample log in details:	
Your reference:	Pike Road LWMS - NH
MPL Reference:	121029
Date received:	4/4/12
Date results expected to be reported:	13/04/12

Samples received in appropriate condition for analysis:	YES
No. of samples provided	6 x Waters
Turnaround time requested:	Standard
Temperature on receipt	Cool
Cooling Method:	Ice Pack
Sampling Date Provided:	Yes
Purchase order number:	

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples. Perishable samples and dust filters are not retained, unless specifically requested.

Contact details:

Chain of Custody Record	ecord		1 of 1	
Send samples to: Laboratory name: MGT		Chain of custody number:	SWA043 -20120404-2	
Laboratory address: 3-5 Kingston 7 Laboratory contact number: 61395647055 Sample delivery method: Courier Laboratory duotation reference:	3-5 Kingston Town Close, Oakleigh 61395647055 Courier	Samples from: 360 Environmental 10 Bermondsey Street West Leederville WA 6007		
Send electronic results to: ahresults@380anvironmental com ou	Name of samplers:	est Perth WA 6872 erence details:	ph: (08) 9388 8360 fax (08) 9381 2360	
niamhhade@360environmental.com.au		Project name: Pike Road LWMS - NH	- HN	
Address correspondence to: Niamh Hade	Sample details verified by (sign): 11	Project number: StvA043		
		Sa	Sample analysis	
Laboratory sample Sample Number	Other Collection Time Date Date Date	ے بے بلال الالہ الالی المالی		
	4/04/2012			
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Melbourne 3-5 Kingston Town Close Oakleigh Vic 3166 Phone : +61 3 9564 7055 NATA # 1261 Site # 1254 Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 NATA # 1261 Site # 20794

Sample Receipt Advice

Niamh Hade
PIKE ROAD LWMS - NH
SWA043-20120404-2
5 Day
Apr 10, 2012 8:39 AM
333122

Sample information

Company name:

- A detailed list of analytes logged into our LIMS, is included in the attached summary table.
- All samples have been received as described on the above COC.

360 Environmental

- \square COC has been completed correctly.
- Attempt to chill was evident.
- Appropriately preserved sample containers have been used.
- \square All samples were received in good condition.
- Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
- ☑ Organic samples had Teflon liners.
- Sample containers for volatile analysis received with zero headspace.
- Some samples have been subcontracted.
- N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Natalie Krasselt on Phone : (03) 9564 7055 or by e.mail: Natalie.Krasselt@mgtlabmark.com.au

Results will be delivered electronically via e.mail to Niamh Hade - niamhhade@360environmental.com.au.

mgt Sample Receipt



NATA Accreditation Stack Emission Sampling & Analysis Trade Waste Sampling & Analysis Groundwater Sampling & Analysis



35Years of Environmental Analysis & Experience - fully Australian Owned



APPENDIX C

Laboratory Reports



16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

CERTIFICATE OF ANALYSIS 105773

Client: 360 Environmental PO Box 14 West Perth WA 6872

Attention: K Prince

Sample log in details:

Your Reference:	<u>SWA043</u>
No. of samples:	7 x Water
Date samples received:	28/09/10
Date completed instructions received:	28/09/10
Location:	Pike Road

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices. *Please refer to the last page of this report for any comments relating to the results.*

Report Details: 5/10/10 Date results requested by: 5/10/10 Date of Preliminary Report: Not issued Issue Date: 6/10/10 NATA accreditation number 9804. This document shall not be reproduced except in full. This document is issued in accordance with NATA's accreditation requirements. Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Results Approved By:

Joshua Lim Operations Supervisor

MPL Reference: Revision No:



Client Reference: SWA043

Nutrients in Water						
Our Reference:	UNITS	105773-1	105773-2	105773-3	105773-4	105773-5
Your Reference		MW1	MW2	MW3	MW4	MW5
Date Sampled		24/09/2010	24/09/2010	24/09/2010	24/09/2010	24/09/2010
Type of sample		Water	Water	Water	Water	Water
Total Nitrogen (Total N)	mg/L	2.5	8.4	34	1.3	1.2
Total Kjeldahl Nitrogen	mg/L	2.2	1.3	1.0	1.2	1.1
NOx as N	mg/L	0.28	7.1	33	0.11	0.055

Nutrients in Water			
Our Reference:	UNITS	105773-6	105773-7
Your Reference		QC1	QC3
Date Sampled		24/09/2010	24/09/2010
Type of sample		Water	Water
Total Nitrogen (Total N)	mg/L	<0.05	1.2
Total Kjeldahl Nitrogen	mg/L	<0.005	1.2
NOx as N	mg/L	<0.005	0.018

MPL Reference: Revision No:



Client Reference:

SWA043

8 Metals in Water - Low Level						
Our Reference:	UNITS	105773-1	105773-2	105773-3	105773-4	105773-5
Your Reference		MW1	MW2	MW3	MW4	MW5
Date Sampled		24/09/2010	24/09/2010	24/09/2010	24/09/2010	24/09/2010
Type of sample		Water	Water	Water	Water	Water
Arsenic-Dissolved	µg/L	2	2	<1	2	6
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	4	<1	3	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury - Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel-Dissolved	µg/L	1	<1	<1	<1	<1
Zinc-Dissolved	µg/L	4	<1	1	<1	<1

8 Metals in Water - Low Level			
Our Reference:	UNITS	105773-6	105773-7
Your Reference		QC1	QC3
Date Sampled		24/09/2010	24/09/2010
Type of sample		Water	Water
Arsenic-Dissolved	µg/L	<1	6
Cadmium-Dissolved	µg/L	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1
Copper-Dissolved	µg/L	<1	<1
Lead-Dissolved	µg/L	<1	<1
Mercury - Dissolved	µg/L	<0.1	<0.1
Nickel-Dissolved	µg/L	<1	<1
Zinc-Dissolved	µg/L	<1	<1

MPL Reference: Revision No:



Client Reference: SWA043

Method ID	Methodology Summary	
WILAB 18	Total Nitrogen by colourimetric chemistry in accordance to APHA 4500-P B5, 4500-NO3 F	
WILAB 18	TKN by calculation	
WILAB 18	NOx by colourimetric chemistry in accordance to APHA 4500-NO3 F	
Metals.22 ICP-MS	Determination of various metals by ICP-MS.	
WILAB 6	Metals by AAS	



Client Reference: SWA043								
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Nutrients in Water						Base II Duplicate II %RPD		
Total Nitrogen (Total N)	mg/L	0.05	WILAB 18	<0.05	105773-1	2.5 2.4 RPD: 4	LCS	108%
Total Kjeldahl Nitrogen	mg/L	0.005	WILAB 18	[NT]	105773-1	2.2 2.4 RPD: 9	[NR]	[NR]
NOx as N	mg/L	0.005	WILAB 18	<0.005	105773-1	0.28 <0.005	LCS	105%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
8 Metals in Water - Low Level						Base II Duplicate II %RPD		
Arsenic-Dissolved	µg/L	1	Metals.22 ICP-MS	<1	105773-1	2 1 RPD: 67	LCS	109%
Cadmium-Dissolved	µg/L	0.1	Metals.22 ICP-MS	<0.1	105773-1	<0.1 <0.1	LCS	115%
Chromium-Dissolved	µg/L	1	Metals.22 ICP-MS	<1	105773-1	<1 <1	LCS	108%
Copper-Dissolved	µg/L	1	Metals.22 ICP-MS	<1	105773-1	4 3 RPD: 29	LCS	103%
Lead-Dissolved	µg/L	1	Metals.22 ICP-MS	<1	105773-1	<1 <1	LCS	113%
Mercury - Dissolved	µg/L	0.1	WILAB 6	<0.1	105773-1	<0.1 <0.1	LCS	106%
Nickel-Dissolved	µg/L	1	Metals.22 ICP-MS	<1	105773-1	1 1 RPD: 0	LCS	105%
Zinc-Dissolved	µg/L	1	Metals.22 ICP-MS	<1	105773-1	4 4 RPD: 0	LCS	103%



Report Comments:

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform & E.coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC& ARMC 2004.

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested NS: Not specified; NEPM: National Environmental Protection Measure

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. **Duplicate**: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet of exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable. Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.

MPL Reference: Revision No:





LABORATORY REPORT

ARL Lab No: 10-5989 Date: 05 October 2010

CLIENT:	360 Environmental P O Box 14 WEST PERTH WA 6872
ATTENTION:	Kaylee Prince
SAMPLE DESCRIPTION:	One water sample as received for analysis of total nitrogen, NOx-N and metals.
DATE RECEIVED:	28 September 2010
PURCHASE ORDER:	SWA043-20100924-1

METHOD REFERENCES:

Metals in Water Total Nitrogen NOx-N in Water ARL No. 039, 402, 403 ARL No. 330 ARL No. 313

ge Rly'

Kim Rodgers Laboratory Manager

Page 1 of 4

360 Environmental ARL Lab No: 10-5789 5 October 2010

Metals Quality Control Data

	Matrix Spike	Certified Reference Material
		% Recovery
Arsenic	112%	110%
Cadmium	92%	112%
Chromium	106%	105%
Copper	99%	114%
Mercury	109%	90%
Nickel	102%	115%
Lead	86%	104%
Zinc	-	100%

Nutrients Quality Control Data

	Matrix Spike	Certified Reference Material				
	% Recovery					
NOx-N	112%	102%				
Total Nitrogen	104%	84%				

360 Environmental ARL Lab No: 10-5789 5 October 2010

<u>Nutrients</u>

Date Prepared Date Analysed	28/09/2010 29/09/2010, 01/10/2010				
ARL Lab No	Method	10-5789-1			
Sample Marks	Detection Limit	QC2			
	mg/l	mg/l			
Total Kjeldahl Nitrogen	0.2	2.6			
NOx-N	0.01	< 0.01			
Total Nitrogen	0.2	2.6			

360 Environmental ARL Lab No: 10-5789 5 October 2010

<u>Metals</u>

Date Prepared: Date Analysed:	28/09/2010 29/09/2010	
ARL Lab No	Method	10-5789-1
Sample Marks	Detection Limit	QC2
	mg/l	mg/l
Arsenic	0.001	0.007
Cadmium	0.0001	< 0.0001
Chromium	0.001	< 0.001
Copper	0.001	< 0.00
Mercury	0.0001	< 0.0001
Nickel	0.001	0.001
Lead	0.001	< 0.001
Zinc	0.005	< 0.005



360 ENVIRONMENTAL PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Attention: Kaylee Prince

Report Client Reference Received Date 294873-W PIKE ROAD LWMS-KP SWA043 Mar 30, 2011

Certificate of Analysis



NATA Accredited Accreditation Number 1261 Site Number 1254

This document is issued in accordance with NATA's accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Client Sample ID			MW1	MW2	MW3	MW4
Sample Matrix			Water	Water	Water	Water
mgt-LabMark Sample No.			M11-MA13438	M11-MA13439	M11-MA13440	M11-MA13441
Date Sampled			Mar 25, 2011	Mar 25, 2011	Mar 25, 2011	Mar 25, 2011
Test/Reference	LOR	Unit				
Acidity as CaCO3	5.0	mg/L	23	66	82	19
Chloride	5	mg/L	60	130	120	78
Conductivity	10	uS/cm	650	1100	1800	790
Dissolved Oxygen	0.01	mg/L	11	11	11	7.7
Nitrate & Nitrite (N)	0.05	mg/L	3.6	0.10	55	0.08
Nitrate (as N)	0.02	mg/L	3.5	0.10	55	0.07
Nitrite (as N)	0.02	mg/L	0.08	< 0.02	0.04	< 0.02
рН	0.1	units	7.8	7.6	7.6	7.7
Phosphate total (P)	0.05	mg/L	0.27	0.37	0.27	< 0.05
Phosphorous reactive (P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate (as SO4)	5	mg/L	61	270	420	93
Suspended Solids	1	mg/L	5900	14000	6700	6200
Alkalinity						
Bicarbonate Alkalinity-mg CaCO3/L	20	mg/L	4900	7300	7000	410
Carbonate Alkalinity-mg CaCO3/L	10	mg/L	160	49	< 10	< 10
Hydroxide Alkalinity-mg CaCO3/L	10	mg/L	< 10	< 10	< 10	< 10
Total Alkalinity as CaCO3	20	mg/L	5000	7400	7000	410
Heavy Metals						
Aluminium	0.05	mg/L	4.9	85	11	160
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.004	0.004	0.001	0.003
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.002	0.001	0.004	< 0.001
Iron	0.05	mg/L	12	170	40	500
Iron (filtered)	0.05	mg/L	0.19	0.29	0.45	0.20
Manganese (filtered)	0.005	mg/L	0.008	0.022	0.034	0.008
Nickel (filtered)	0.001	mg/L	0.002	0.001	0.002	< 0.001
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001	0.002	0.001
Zinc (filtered)	0.001	mg/L	0.094	0.046	0.043	0.056



Client Sample ID			MW5	QC1
Sample Matrix			Water	Water
mgt-LabMark Sample No.			M11-MA13442	M11-MA13443
Date Sampled			Mar 25, 2011	Mar 25, 2011
Test/Reference	LOR	Unit		
Acidity as CaCO3	5.0	mg/L	14	23
Chloride	5	mg/L	36	74
Conductivity	10	uS/cm	610	840
Dissolved Oxygen	0.01	mg/L	7.1	6.7
Nitrate & Nitrite (N)	0.05	mg/L	0.28	0.06
Nitrate (as N)	0.02	mg/L	0.21	0.02
Nitrite (as N)	0.02	mg/L	0.07	0.03
рН	0.1	units	7.8	7.6
Phosphate total (P)	0.05	mg/L	0.12	0.07
Phosphorous reactive (P)	0.05	mg/L	< 0.05	< 0.05
Sulphate (as SO4)	5	mg/L	110	99
Suspended Solids	1	mg/L	4000	5100
Alkalinity				
Bicarbonate Alkalinity-mg CaCO3/L	20	mg/L	1500	410
Carbonate Alkalinity-mg CaCO3/L	10	mg/L	< 10	< 10
Hydroxide Alkalinity-mg CaCO3/L	10	mg/L	< 10	< 10
Total Alkalinity as CaCO3	20	mg/L	1500	410
Heavy Metals				
Aluminium	0.05	mg/L	70	140
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.014	0.003
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.001	< 0.001
Iron	0.05	mg/L	140	450
Iron (filtered)	0.05	mg/L	0.14	0.17
Manganese (filtered)	0.005	mg/L	0.009	0.007
Nickel (filtered)	0.001	mg/L	< 0.001	< 0.001
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001
Zinc (filtered)	0.001	mg/L	0.12	0.064



Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description Acidity as CaCO3	Testing Site Melbourne	Extracted Mar 30, 2011	Holding Time 14 Day
- Method: APHA 2310 Acidity Chloride - Method: APHA 4500-Cl (Cl by Discrete Analyser)	Melbourne	Mar 30, 2011	28 Day
Conductivity - Method: APHA 2510 Conductivity by Direct Measurement	Melbourne	Mar 30, 2011	28 Day
Dissolved Oxygen - Method: APHA 4500-O Oxygen Dissolved	Melbourne	Mar 31, 2011	1 Day
Mitrate & Nitrite (N) - Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA	Melbourne	Mar 30, 2011	28 Day
Mitrate (as N) - Method: APHA 4500-NO3 Nitrate Nitrogen by FIA	Melbourne	Mar 31, 2011	2 Day
Mitrite (as N) - Method: APHA 4500-NO2 Nitrite Nitrogen by FIA	Melbourne	Mar 31, 2011	2 Day
рН	Melbourne	Mar 30, 2011	6 Hours
- Method: APHA 4500 pH by Direct Measurement - **pH Holding time 30mins. Samp Phosphate total (P) Method: APHA 4500 P. E. Pleashagan	Melbourne	Apr 05, 2011	2 Day
- Method: APHA 4500-P E. Phosphorous Phosphorous reactive (P) - Method: APHA4500-PO4	Melbourne	Mar 30, 2011	0 Day
Sulphate (as SO4)	Melbourne	Mar 31, 2011	28 Day
- Method: APHA 4500-SO4 Sulfate by FIA Suspended Solids	Melbourne	Mar 30, 2011	7 Day
- Method: APHA 2540D Total Suspended Solids Alkalinity	Melbourne	Mar 30, 2011	14 Day
 Method: APHA 2320 Alkalinity by Titration Heavy Metals Method: USEPA 6020 Heavy Metals & USEPA 7470/71 Mercury 	Melbourne	Mar 30, 2011	6 Month

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Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600

Received: Due: Priority: Contact name:

Mar 30, 2011 12:00 Apr 6, 2011 01:06 5 Day ALL RESULTS/SRA/COC'S

mgt-LabMark Client Manager: Dan Thompson

Order No.: Report #: Phone: Fax:

360 Environmental PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Company Name: Address:

PIKE ROAD LWMS-KP SWA043 Client Job No.:

Alkalinity		×			×	×	×	×	×	×
Zinc (filtered)		×			×	×	×	×	×	×
Suspended Solids		×			×	×	×	×	×	×
Sulphate (S)		×			×	×	×	×	×	×
Selenium (filtered)		×			×	×	×	×	×	×
Phosphorous reactive (P)		×			×	×	×	×	×	×
Phosphate total (P)		×			×	×	×	×	×	×
рН		×			×	×	×	×	×	×
Nitrate & Nitrite (N)		×			×	×	×	×	×	×
Nickel (filtered)		×			×	×	×	×	×	×
Manganese (filtered)		×			×	×	×	×	×	×
Iron (filtered)		×			×	×	×	×	×	×
Iron		×			×	×	×	×	×	×
Dissolved Oxygen		×			×	×	×	×	×	×
Copper (filtered)		×			×	×	×	×	×	×
Conductivity screen for salinity		×			×	×	×	×	×	×
Conductivity		×			×	×	×	×	×	×
Chromium (filtered)		×			×	×	×	×	×	×
Chloride		×			×	×	×	×	×	×
Cadmium (filtered)		×			×	×	×	×	×	×
Arsenic (filtered)		×			×	×	×	×	×	×
Aluminium (filtered)		×			×	×	×	×	×	×
Aluminium		×			×	×	×	×	×	×
Acidity as CaCO3		×			×	×	×	×	×	×
				LAB ID	M11-MA13438	M11-MA13439	M11-MA13440	M11-MA13441	M11-MA13442	M11-MA13443
=				Matrix	Water	Water	Water	Water	Water	Water
Sample Detail	conducted	A Site #1261	ite #1645	Sampling Time						
San	ere analysis is	oratory - NAT	Itory - NATA S	Sample Date	Mar 25, 2011					
	Laboratory where analysis is conducted	Melbourne Laboratory - NATA Site #1261	Sydney Laboratory - NATA Site #1645	Sample ID	MW1	MW2	MW3	MW4 N	MW5 N	ac1

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mgt-LabMark Internal Quality Control Review General

- 1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples
- are included in this QC report where applicable. Additional QC data may be available on request.
- 2. All soil results are reported on a dry basis, unless otherwise stated.
- 3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
- 4. Results are uncorrected for matrix spikes or surrogate recoveries.
- 5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 6. Samples were analysed on an 'as received' basis.
- 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001) For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment. If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

**NOTE: pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg:milligrams per Kilogram	mg/L:milligrams per litre
µg/l: micrograms per litre	ppm: Parts per million
ppb: Parts per billion	%: Percentage
org/100ml: Organisms per 100 millilitres	NTU: Nephelometric Turbidity Units

TERMS

LOR:Limit Of Reporting.SPIKE:Addition of the analyte to the sample and reported as percentage recovery.RPD:Relative Percent Difference between two Duplicate pieces of analysis.LCS:Laboratory Control Sample - reported as percent recovery.CRM:Certified Reference Material - reported as percent recovery.Method Blank:In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.Surr - Surroga:The addition of a like compound to the analyte target and reported as percentage recovery.Duplicate:A second piece of analysis from a sample on drejonised water.Batch Duplicate:A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.Batch SPIKE:Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.USEPA:U.S Environmental Protection AgencyAPHA:American Public Health AssociationASLP:Australian Standard Leaching Procedure (AS4439.3)TCLP:Toxicity Characteristic Leaching ProcedureCOC:Chain Of Custody	Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
RPD: Relative Percent Difference between two Duplicate pieces of analysis. LCS: Laboratory Control Sample - reported as percent recovery. CRM: Certified Reference Material - reported as percent recovery. Method Blank: In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water. Surr - Surrogate: The addition of a like compound to the analyte target and reported as percentage recovery. Duplicate: A second piece of analysis from the same sample and reported in the same units as the result to show comparison. Batch Duplicate: Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis. USEFA: U.S Environmental Protection Agency APHA: American Public Health Association ASLP: Australian Standard Leaching Procedure (AS4439.3) TCLP: Toxicity Characteristic Leaching Procedure	LOR:	Limit Of Reporting.
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	ASLP:	Australian Standard Leaching Procedure (AS4439.3)
COC: Chain Of Custody	TCLP:	Toxicity Characteristic Leaching Procedure
	COC:	Chain Of Custody
SRA: Sample Receipt Advice	SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-20%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.

- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. Organochlorine Pesticide analysis where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
- 4. Organochlorine Pesticide analysis where reporting Spike data, Toxophene is not added to the Spike.
- 5. Total Recoverable Hydrocarbons where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.

6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.

7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.

8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.

9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.

- 10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD
- eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.



Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank						-	
Obleside						Data	
Chloride Nitrate & Nitrite (N)	mg/L	< 5			5 0.05	Pass	
Nitrate & Nitrite (N) Nitrate (as N)	mg/L mg/L	< 0.05 < 0.02			0.05	Pass Pass	
Nitrite (as N)	mg/L	< 0.02			0.02	Pass	
Phosphate total (P)	mg/L	< 0.02			0.02	Pass	
Phosphorous reactive (P)	mg/L	< 0.05			0.05	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Suspended Solids	mg/L	< 1			1	Pass	
Method Blank		11					
Alkalinity APHA 2320 Alkalinity by Titi	ration						
Bicarbonate Alkalinity-mg CaCO3/L	mg/L	20			20	Pass	
Carbonate Alkalinity-mg CaCO3/L	mg/L	< 10			10	Pass	
Hydroxide Alkalinity-mg CaCO3/L	mg/L	< 10			10	Pass	
Total Alkalinity as CaCO3	mg/L	20			20	Pass	
Method Blank				Γ	T		
Heavy Metals USEPA 6020 Heavy Meta					0.07	-	
Aluminium	mg/L	< 0.05			0.05	Pass	
Aluminium (filtered)	mg/L	< 0.05			0.05	Pass	
Arsenic (filtered) Cadmium (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium (filtered) Chromium (filtered)	mg/L	< 0.0002 < 0.001			0.0002	Pass	
Copper (filtered)	mg/L mg/L	< 0.001			0.001	Pass Pass	
Iron	mg/L	< 0.001			0.001	Pass	
Iron (filtered)	mg/L	< 0.05			0.05	Pass	
Manganese (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.001			0.000	Pass	
Selenium (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc (filtered)	mg/L	< 0.001			0.001	Pass	
LCS - % Recovery							
		Result 1					
Chloride	%	107			70-130	Pass	
Nitrate & Nitrite (N)	%	97			70-130	Pass	
Nitrate (as N)	%	97			70-130	Pass	
Nitrite (as N)	%	100			70-130	Pass	
Phosphate total (P)	%	110			70-130	Pass	
Sulphate (as SO4)	%	106			70-130	Pass	
Suspended Solids	%	88			70-130	Pass	_
LCS - % Recovery		Desult 4				1	<u> </u>
Heavy Metals USEPA 6020 Heavy Metals & USE	PA 7470/71 Mer %	Result 1 89			80-120	Pass	
Aluminium Iron	%	112			80-120	Pass	
[Duplicate of M11-MA13434 - BATCH]	70	112			00-120	1 833	
		Result 1	Result 2	RPD			-
Acidity as CaCO3	mg/L	340	340	1	30%	Pass	
Chloride	mg/L	60	59	<1	30%	Pass	
Conductivity	uS/cm	1200	1200	4	30%	Pass	
Nitrate & Nitrite (N)	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Nitrate (as N)	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Nitrite (as N)	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phosphorous reactive (P)	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Sulphate (as SO4)	mg/L	61	59	3.1	30%	Pass	
Suspended Solids	mg/L	18	17	5	30%	Pass	
[Duplicate of M11-MA13434 - BATCH]		De litt	D. HC	222			
Alkalinity		Result 1	Result 2	RPD	0.00/	Dese	
Bicarbonate Alkalinity-mg CaCO3/L	mg/L	< 20	< 20	<1	30%	Pass	
Carbonate Alkalinity-mg CaCO3/L	mg/L	< 10	< 10	<1	30%	Pass	
Hydroxide Alkalinity-mg CaCO3/L Total Alkalinity as CaCO3	mg/L	< 10 1300	< 10 1300	<1	30%	Pass	
[Duplicate of M11-MA13438]	mg/L	1300	1300	1	30%	Pass	
Heavy Metals		Result 1	Result 2	RPD			
Aluminium	mg/L	4.9	4.9	2	30%	Pass	
Aluminium (filtered)	mg/L	10	9.6	6	30%	Pass	+



Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Arsenic (filtered)	mg/L	0.024	0.023	4	30%	Pass	
Cadmium (filtered)	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	mg/L	0.003	0.003	6	30%	Pass	
Copper (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iron	mg/L	12	12	1	30%	Pass	
Manganese (filtered)	mg/L	0.014	0.013	5	30%	Pass	
Nickel (filtered)	mg/L	0.011	0.01	6	30%	Pass	
Selenium (filtered)	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	mg/L	0.02	0.018	7	30%	Pass	
[Duplicate of M11-MA13589 - BATCH]							
		Result 1	Result 2	RPD			
Phosphate total (P)	mg/L	< 0.05	< 0.05	<1	30%	Pass	
[Duplicate of M11-MA13442]							
		Result 1	Result 2	RPD			
Chloride	mg/L	36	37	3.1	30%	Pass	
Sulphate (as SO4)	mg/L	110	120	<1	30%	Pass	
[Spike of M11-MA13438] - % Recovery							
		Result 1					
Chloride	%	108			70 - 130	Pass	
Nitrate & Nitrite (N)	%	95			70 - 130	Pass	
Nitrate (as N)	%	92			70 - 130	Pass	
Nitrite (as N)	%	98			70 - 130	Pass	
Phosphate total (P)	%	79			70 - 130	Pass	
Phosphorous reactive (P)	%	100			70 - 130	Pass	
Sulphate (as SO4)	%	113			70 - 130	Pass	
[Spike of M11-MA13438] - % Recovery							
Heavy Metals		Result 1					
Aluminium	%	105			75 - 125	Pass	
Aluminium (filtered)	%	81			70 - 130	Pass	
Arsenic (filtered)	%	97			70 - 130	Pass	
Cadmium (filtered)	%	100			70 - 130	Pass	
Chromium (filtered)	%	92			70 - 130	Pass	
Copper (filtered)	%	86			70 - 130	Pass	
Iron	%	96			75 - 125	Pass	
Iron (filtered)	%	87			70 - 130	Pass	
Manganese (filtered)	%	93			70 - 130	Pass	
Nickel (filtered)	%	92			70 - 130	Pass	
Selenium (filtered)	%	104			70 - 130	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

When flh.

Michael Wright NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



Part of the Envirolab Group

16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

CERTIFICATE OF ANALYSIS 110093

Client: 360 Environmental PO Box 14 West Perth WA 6872

Attention: Kaylee Prince

Sample log in details:

Your Reference: No. of samples: Date samples received: Date completed instructions received: Location:

Pike road LWMS - KP 1 Water

28/3/2011 28/3/2011

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices. *Please refer to the last page of this report for any comments relating to the results.*

Report Details:

Date results requested by:4/04/11Date of Preliminary Report:Not issuedIssue Date:4/04/11NATA accreditation number 2901. This document shall not be reproduced except in full.This document is issued in accordance with NATA's accreditation requirements.Accredited for compliance with ISO/IEC 17025.Tests not covered by NATA are denoted with *.

Results Approved By:

Joshua Lim Operations Supervisor

MPL Reference: Revision No:



Client Reference: Pike road LWMS - KP

Metals in Water - Dissolved		
Our Reference:	UNITS	110093-1
Your Reference		QC2 -
		SWA043
Date Sampled		25/03/2011
Type of sample		Water
Date prepared	-	31/3/11
Date analysed	-	31/3/11
Arsenic	mg/L	<0.001
Cadmium	mg/L	<0.002
Chromium	mg/L	<0.005
Copper	mg/L	<0.005
Nickel	mg/L	<0.005
Zinc	mg/L	0.05
Manganese	mg/L	0.008
Aluminium	mg/L	<0.02
Selenium	mg/L	<0.02
Iron	mg/L	<0.02



Pike road LWMS - KP

Total Metals in water		
Our Reference:	UNITS	110093-1
Your Reference		QC2 -
		SWA043
Date Sampled		25/03/2011
Type of sample		Water
Date prepared	-	31/3/11
Date analysed	-	31/3/11
Iron - Total	mg/L	200
Aluminium - Total	mg/L	140

MPL Reference: Revision No:



Pike road LWMS - KP

ſ	1	
Miscellaneous Inorganics		
Our Reference:	UNITS	110093-1
Your Reference		QC2 -
		SWA043
Date Sampled		25/03/2011
Type of sample		Water
Date prepared	-	29/3/11
Date analysed	-	29/3/11
pH in water	pH Units	8.0
Electrical Conductivity water	µS/cm	710
Total Suspended Solids @ 103-105 $^{\circ}$ C	mg/L	6,400
Total Alkalinity as CaCO3	mg/L	510
Acidity as CaCO ₃	mg/L	9
Dissolved Oxygen	mg/L	8.0
Chloride in water	mg/L	75
Sulphate in water	mg/L	120



Pike road LWMS - KP

Nutrients in Water		
Our Reference:	UNITS	110093-1
Your Reference		QC2 -
		SWA043
Date Sampled		25/03/2011
Type of sample		Water
NOx as N	mg/L	0.097
Nitrate as N	mg/L	0.094
Nitrite as N	mg/L	<0.005
Total Phosphorus (Total P)	mg/L	0.34
Phosphate as P	mg/L	0.006

MPL Reference: Revision No:



Client Reference: Pike road LWMS - KP

Method ID	Methodology Summary
METALS-024	Metals by GF-AAS.
METALS-020	Metals in soil and water by ICP-OES.
INORG-001	pH - Measured using pH meter and electrode in accordance with APHA 21st ED, 4500-H+.
INORG-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA 21st ED 2510 and Rayment & Higginson.
INORG-019	Suspended Solids - determined gravimetrcially by filtration of the sample, in accordance with APHA 21st ED, 2540 D.
INORG-006	Alkalinity - determined titrimetrically in accordance with APHA 21st ED, 2320 B.
INORG-079	Total Organic Carbon using APHA 21st ED 5310B. DOC is filtered prior to determination.
INORG-081	Chloride by IIon Exchange Chromatography in accordance with APHA 21st ED 4110B.
INORG-081	Sulphate by Ion Exchange Chromatography in accordance with APHA 21st ED 4110B.
INORG-055	NOx by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.
INORG-055	Nitrate by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.
INORG-055	Nitrite by colourimetric analysis in accordance with APHA 21st ED 4500-NO2 B.
INORG-060	Total Phosphorus by colourimetric analysis in accordance with APHA 21st ED 4500-P J.
INORG-060	Phosphate by colourimetric analysis in accordance with APHA 21st ED 4500-P E.



QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike %
Metals in Water - Dissolved						Base II Duplicate II %RPD		Recovery
Date prepared	-			31/3/11	[NT]	[NT]	LCS	31/3/11
Date analysed	-			31/3/11	[NT]	[NT]	LCS	31/3/11
Arsenic	mg/L	0.001	METALS-02 4	<0.001	[NT]	[NT]	LCS	92%
Cadmium	mg/L	0.002	METALS-02 0	<0.002	[NT]	[NT]	LCS	100%
Chromium	mg/L	0.005	METALS-02 0	<0.005	[NT]	[NT]	LCS	99%
Copper	mg/L	0.005	METALS-02 0	<0.005	[NT]	[NT]	LCS	100%
Nickel	mg/L	0.005	METALS-02 0	<0.005	[NT]	[NT]	LCS	97%
Zinc	mg/L	0.01	METALS-02 0	<0.01	[NT]	[NT]	LCS	97%
Manganese	mg/L	0.005	METALS-02 0	<0.005	[NT]	[NT]	LCS	104%
Aluminium	mg/L	0.02	METALS-02 0	<0.02	[NT]	[NT]	LCS	109%
Selenium	mg/L	0.02	METALS-02 0	<0.02	[NT]	[NT]	LCS	123%
Iron	mg/L	0.02	METALS-02 0	<0.02	[NT]	[NT]	LCS	92%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Total Metals in water						Base II Duplicate II %RPD		
Date prepared	-			31/3/11	[NT]	[NT]	LCS	31/3/11
Date analysed	-			31/3/11	[NT]	[NT]	LCS	31/3/11
Iron - Total	mg/L	0.02	METALS-02 0	<0.02	[NT]	[NT]	LCS	92%
Aluminium - Total	mg/L	0.02	METALS-02 0	<0.02	[NT]	[NT]	LCS	109%
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Miscellaneous Inorganics						Base II Duplicate II %RPD		
Date prepared	-			29/3/11	[NT]	[NT]	LCS	29/3/11
Date analysed	-			29/3/11	[NT]	[NT]	LCS	29/3/11
pH in water	pH Units		INORG-001	[NT]	[NT]	[NT]	LCS	107%
Electrical Conductivity water	µS/cm	1	INORG-002	<1	[NT]	[NT]	LCS	96%
Total Suspended Solids @ 103-105 ⁰ C	mg/L	1	INORG-019	<1	[NT]	[NT]	LCS	64%
Total Alkalinity as CaCO ₃	mg/L	1	INORG-006	<1	[NT]	[NT]	LCS	102%
Acidity as CaCO3	mg/L	1	INORG-006	<1	[NT]	[NT]	LCS	101%
Dissolved Oxygen	mg/L	1	INORG-079	<1.0	[NT]	[NT]	[NR]	[NR]
Chloride in water	mg/L	1	INORG-081	<1	[NT]	[NT]	LCS	93%
Sulphate in water	mg/L	1	INORG-081	<1	[NT]	[NT]	LCS	101%

MPL Reference: Revision No:



Client Reference: Pike road LWMS - KP

QUALITY CONTROL Nutrients in Water	UNITS	PQL	METHOD	Blank
NOx as N	mg/L	0.005	INORG-055	<0.005
Total Phosphorus (Total P)	mg/L	0.01	INORG-060	<0.01
Phosphate as P	mg/L	0.005	INORG-060	<0.005

MPL Reference: Revision No:



Report Comments:

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform & E.coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC& ARMC 2004.

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested NS: Not specified; NEPM: National Environmental Protection Measure

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. **Duplicate**: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike: A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample): This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet of exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable. Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.

MPL Reference: Revision No:





360 ENVIRONMENTAL PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Attention: Niah Hade

Report Client Reference Received Date 311413-W PIKE ROAD LWMS-NH -SWA043 Sep 08, 2011

Certificate of Analysis

NATA Accredited Accreditation Number 1261 Site Number 1254

NATA

WORLD RECOGNISED

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Client Sample ID			MW2	MW3	MW4	MW5
Sample Matrix			Water	Water	Water	Water
mgt-LabMark Sample No.			M11-Se04239	M11-Se04240	M11-Se04241	M11-Se04242
Date Sampled			Sep 07, 2011	Sep 07, 2011	Sep 07, 2011	Sep 07, 2011
Test/Reference	LOR	Unit				
Acidity as CaCO3	5.0	mg/L	110	77	16	36
Chloride	1	mg/L	190	120	74	27
Conductivity	10	uS/cm	2700	2000	890	970
Dissolved Oxygen	0.01	mg/L	7.0	8.7	8.5	6.0
Nitrate & Nitrite (N)	0.05	mg/L	26	53	< 0.05	0.37
Nitrate (as N)	0.02	mg/L	26	53	0.02	0.35
Nitrite (as N)	0.02	mg/L	0.21	< 0.02	0.03	0.02
рН	0.1	units	7.5	7.5	7.7	7.5
Phosphate total (P)	0.05	mg/L	< 0.05	0.70	0.32	0.08
Phosphorous reactive (P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate (as SO4)	5	mg/L	740	440	80	320
Suspended Solids	1	mg/L	14000	12000	3200	4500
Alkalinity						
Total Alkalinity as CaCO3	20	mg/L	13000	19000	440	2800
Heavy Metals						
Aluminium	0.05	mg/L	29	17	64	67
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.002	0.001	0.001	0.010
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.004	0.005	0.002	< 0.001
Iron	0.05	mg/L	89	37	79	120
Iron (filtered)	0.05	mg/L	6.4	4.7	2.0	3.1
Manganese (filtered)	0.005	mg/L	0.025	< 0.005	0.006	0.012
Nickel (filtered)	0.001	mg/L	0.012	0.009	0.004	0.005
Selenium (filtered)	0.001	mg/L	< 0.001	0.001	< 0.001	0.002
Zinc (filtered)	0.001	mg/L	0.004	0.005	0.010	0.001



Client Sample ID			QC1
Sample Matrix			Water
mgt-LabMark Sample No.			M11-Se04243
Date Sampled			Sep 07, 2011
Test/Reference	LOR	Unit	
Acidity as CaCO3	5.0	mg/L	31
Chloride	1	mg/L	26
Conductivity	10	uS/cm	980
Dissolved Oxygen	0.01	mg/L	6.2
Nitrate & Nitrite (N)	0.05	mg/L	0.72
Nitrate (as N)	0.02	mg/L	0.70
Nitrite (as N)	0.02	mg/L	< 0.02
рН	0.1	units	7.6
Phosphate total (P)	0.05	mg/L	0.11
Phosphorous reactive (P)	0.05	mg/L	< 0.05
Sulphate (as SO4)	5	mg/L	310
Suspended Solids	1	mg/L	3700
Alkalinity			
Total Alkalinity as CaCO3	20	mg/L	2600
Heavy Metals			
Aluminium	0.05	mg/L	65
Aluminium (filtered)	0.05	mg/L	< 0.05
Arsenic (filtered)	0.001	mg/L	0.010
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001
Iron	0.05	mg/L	110
Iron (filtered)	0.05	mg/L	3.0
Manganese (filtered)	0.005	mg/L	0.012
Nickel (filtered)	0.001	mg/L	0.004
Selenium (filtered)	0.001	mg/L	0.002
Zinc (filtered)	0.001	mg/L	< 0.001



Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description Acidity as CaCO3 - Method: APHA 2310 Acidity	Testing Site Melbourne	Extracted Sep 09, 2011	Holding Time 14 Day
- Method: APHA 2310 Addity Chloride - Method: APHA 4500-Cl (Cl by Discrete Analyser)	Melbourne	Sep 14, 2011	28 Day
Conductivity - Method: APHA 2510 Conductivity by Direct Measurement	Melbourne	Sep 09, 2011	28 Day
Dissolved Oxygen - Method: APHA 4500-O Oxygen Dissolved	Melbourne	Sep 12, 2011	1 Day
Nitrate & Nitrite (N) - Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA	Melbourne	Sep 09, 2011	28 Day
Nitrate (as N) - Method: APHA 4500-NO3 Nitrate Nitrogen by FIA	Melbourne	Sep 09, 2011	2 Day
Nitrite (as N) - Method: APHA 4500-NO2 Nitrite Nitrogen by FIA	Melbourne	Sep 09, 2011	2 Day
pH - Method: APHA 4500 pH by Direct Measurement - ** Samples analysed outside hold	Melbourne ing time. Analysis should be performed in situ.	Sep 09, 2011	0 Hours
Phosphate total (P) - Method: APHA 4500-P E. Phosphorous	Melbourne	Sep 12, 2011	2 Day
Phosphorous reactive (P) - Method: APHA4500-PO4	Melbourne	Sep 14, 2011	2 Day
Sulphate (as SO4) - Method: APHA 4500-SO4 Sulfate by FIA	Melbourne	Sep 14, 2011	28 Day
Suspended Solids - Method: APHA 2540D Total Suspended Solids	Melbourne	Sep 09, 2011	7 Day
Alkalinity - Method: APHA 2320 Alkalinity by Titration	Melbourne	Sep 09, 2011	14 Day
Heavy Metals - Method: USEPA 6010/6020 Heavy Metals	Melbourne	Sep 08, 2011	28 Day

6) LabMark	NVIRONMENTAL LABORATORIES

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600 Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Melbourne 3-5 Kingston Town Close Oakleigh VIC 316 Polane : +61 3 9564 7055 NATA # 1261 & 1427 Site # 1254 & 14271

web : www.mgtlabmark.com.au

e.mail : mgt@mgtenv.com.au

311413 08 9321 0420 08 9226 0739 Order No.: Report #: Phone: Fax: 360 Environmental PO BOX 141 ALTONA ST WEST PERTH W.A 6872 Company Name: Address:

Client Job No.:

mgt-LabMark Client Manager: Dan Thompson

Sep 8, 2011 8:49 AM Sep 15, 2011 4:00 PM 5 Day Niah Hade

Received: Due: Priority: Contact name:

PIKE ROAD LWMS-NH -SWA043

Arse Alur Alur Acid

Zinc (filtered)		×			×	×	×	×	×	
Total Alkalinity as CaCO3		×			×	×	×	×	×	
Suspended Solids		×			×	×	×	×	×	
Sulphate (S)		×			×	×	×	×	×	
Selenium (filtered)		×			×	×	×	×	×	
Phosphorous filterable reactive (P)		×			×	×	×	×	×	
Phosphate total (P)		×			×	×	×	×	×	
рН		×			×	×	×	×	×	
Nitrite (as N)		×			×	×	×	×	×	
Nitrate (as N)		×			×	×	×	×	×	
Nitrate & Nitrite (N)		Х			Х	×	×	×	×	
Nickel (filtered)		х			Х	×	×	×	×	
Manganese (filtered)		×			×	×	×	×	×	
Iron (filtered)		×			×	×	×	×	×	
Iron		×			×	×	×	×	×	
HOLD		×								×
Dissolved Oxygen		×			×	×	×	×	×	
Copper (filtered)		×			×	×	×	×	×	
Conductivity		×			×	×	×	×	×	
Chromium (filtered)		×			×	×	×	×	×	
Chloride		×			×	×	×	×	×	
Cadmium (filtered)		×			×	×	×	×	×	
Arsenic (filtered)		×			×	×	×	×	×	
Aluminium (filtered)		×			×	×	×	×	×	
Aluminium		×			×	×	×	×	×	
Acidity as CaCO3		×			×	×	×	×	×	
				LAB ID	M11-Se04239	M11-Se04240	M11-Se04241	M11-Se04242	M11-Se04243	M11-Se04244
Sample Detail				Matrix	Water	Water	Water	Water	Water	Water
	conducted	A Site #1261	ite #1645	Sampling Time						
Sar	ere analysis is	oratory - NAT	tory - NATA S.	Sample Date	Sep 07, 2011					
	Laboratory where analysis is conducted	Melbourne Laboratory - NATA Site #1261	Sydney Laboratory - NATA Site #1645	Sample ID	MW2	MW3	MW4 S	MW5 S	ac1 s	QC3 S



mgt-LabMark Internal Quality Control Review

General

- 1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
- 2. All soil results are reported on a dry basis, unless otherwise stated.
- 3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
- 4. Results are uncorrected for matrix spikes or surrogate recoveries.
- 5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 6. Samples were analysed on an 'as received' basis.
- 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)

For samples received on the last day of holding time, notification of testing requirements should have been received at least

6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control. **NOTE: pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg:milligrams per Kilogram	mg/L:milligrams per litre
μg/L:micrograms per litre	ppm:Parts per million
ppb:Parts per billion	%:Percentage
org/100mL:Organisms per 100 millilitres	NTU:Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands.
	In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice
CP:	Client Parent - QC was performed on samples pertaining to this report
NCP:	Non-Client Parent - QC was performed on samples not pertaining to this report, however QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. Organochlorine Pesticide analysis where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
- 4. Organochlorine Pesticide analysis where reporting Spike data, Toxophene is not added to the Spike.
- 5. Total Recoverable Hydrocarbons where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt
- 7. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- 8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
- 9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample>
- 10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

S LabMark ENVIRONMENTAL LABORATORIES

Quality Control Results

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank		· · · · ·						
Acidity as CaCO3			mg/L	< 5		5.0	Pass	
Chloride			mg/L	< 1		1	Pass	
Nitrate & Nitrite (N)			mg/L	< 0.05		0.05	Pass	
Nitrate (as N)			mg/L	< 0.02		0.02	Pass	
Nitrite (as N)			mg/L	< 0.02		0.02	Pass	
Phosphate total (P)			mg/L	< 0.05		0.05	Pass	
Phosphorous reactive (P)			mg/L	< 0.05		0.05	Pass	
Suspended Solids			mg/L	< 1		1	Pass	
Method Blank								
Alkalinity APHA 2320 Alkalinity by Ti	tration							
Total Alkalinity as CaCO3			mg/L	< 20		20	Pass	
Method Blank								
Heavy Metals USEPA 6010/6020 Heav	vy Metals							
Aluminium			mg/L	< 0.05		0.05	Pass	
Aluminium (filtered)			mg/L	< 0.05		0.05	Pass	
Arsenic (filtered)			mg/L	< 0.001		0.001	Pass	1
Cadmium (filtered)			mg/L	< 0.0002		0.0002	Pass	
Chromium (filtered)			mg/L	< 0.001	1	0.001	Pass	1
Copper (filtered)			mg/L	< 0.001		0.001	Pass	
Iron			mg/L	< 0.05		0.05	Pass	+
Iron (filtered)			mg/L	< 0.05		0.05	Pass	1
Manganese (filtered)			mg/L	< 0.005		0.005	Pass	
Nickel (filtered)			mg/L	< 0.001		0.001	Pass	+
Selenium (filtered)			mg/L	< 0.001		0.001	Pass	
Zinc (filtered)			mg/L	< 0.001		0.001	Pass	
LCS - % Recovery							1 400	
							T	
Chloride			%	97		70-130	Pass	+
Nitrate & Nitrite (N)			%	85		70-130	Pass	
Nitrate (as N)			%	85		70-130	Pass	+
Nitrite (as N)			%	100		70-130	Pass	
Phosphate total (P)			%	108		70-130	Pass	-
Sulphate (as SO4)			%	99		70-130	Pass	-
Suspended Solids			%	97		70-130	Pass	-
LCS - % Recovery			70	01		10100	1 400	
Heavy Metals USEPA 6010/6020 Heav	vy Metals						1	
Aluminium	ry motalo	1	%	119		80-120	Pass	
Aluminium (filtered)			%	119		80-120	Pass	+
Arsenic (filtered)			%	99		80-120	Pass	
Cadmium (filtered)			%	99		80-120	Pass	+
Chromium (filtered)			%	97		80-120	Pass	
Copper (filtered)			%	95 85		80-120	Pass	+
			%	85 99			Pass	+
Iron						80-120		
Iron (filtered)			%	104		80-120	Pass	
Manganese (filtered)			%	90		80-120	Pass	<u> </u>
Nickel (filtered)			%	91		80-120	Pass	<u> </u>
Selenium (filtered)			%	100		80-120	Pass	<u> </u>
Zinc (filtered)	·		%	104		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery				-				
				Result 1	1 1 -	T T		
					ļ ļ	++		
Nitrate & Nitrite (N) Nitrate (as N)	M11-Se03957 M11-Se03957	NCP NCP	%	84 83		70-130 70-130	Pass Pass	

S LabMark ENVIRONMENTAL LABORATORIES

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nitrite (as N)	M11-Se03957	NCP	%	99			70-130	Pass	
Spike - % Recovery				1	<u> </u>				
Heavy Metals				Result 1					
Aluminium	B11-Se52107	NCP	%	102			75-125	Pass	
Iron	B11-Se53646	NCP	%	103			75-125	Pass	
Iron (filtered)	B11-Se53383	NCP	%	124			70-130	Pass	
Spike - % Recovery				<u>I</u>	<u> </u>				
· · · · · ·				Result 1					
Phosphate total (P)	B11-Au63476	NCP	%	107			70-130	Pass	
Spike - % Recovery				1	1 1				
				Result 1					
Chloride	M11-Se04241	CP	%	109			70-130	Pass	
Phosphorous reactive (P)	M11-Se04347	NCP	%	94			70-130	Pass	
Sulphate (as SO4)	M11-Se04013	NCP	%	91			70-130	Pass	
Spike - % Recovery			,.		1 1				
Heavy Metals				Result 1					
Aluminium (filtered)	M11-Se04241	CP	%	99			70-130	Pass	
Arsenic (filtered)	M11-Se04241	CP	%	109			70-130	Pass	
Cadmium (filtered)	M11-Se04241	CP	%	99			70-130	Pass	
Chromium (filtered)	M11-Se04241	CP	%	95			70-130	Pass	
Copper (filtered)	M11-Se04241	CP	%	87			70-130	Pass	
Manganese (filtered)	M11-Se04241	CP	%	89			70-130	Pass	
Nickel (filtered)	M11-Se04241	CP	%	89			70-130	Pass	
Selenium (filtered)	M11-Se04241	CP	%	107			70-130	Pass	
Zinc (filtered)	M11-Se04241	CP	%	92			70-130	Pass	
Duplicate	10111-3604241	UF	/0	92			70-130	r dəə	
Duplicate				Result 1	Result 2	RPD		[
Acidity as CaCO3	M11-Se04239	CP		110	120 Result 2	2	30%	Pass	
Conductivity	M11-Se04239	NCP	mg/L uS/cm	290	280	5	30%	Pass	
Nitrate & Nitrite (N)	M11-Se04348	NCP			< 0.05		30%	Pass	
Nitrate & Nitrite (N)	M11-Se03957 M11-Se03957	NCP NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
	M11-Se03957	NCP	mg/L	< 0.02		<1		Pass	
Nitrite (as N) Suspended Solids	M11-Se03937	NCP	mg/L	42	< 0.02 46	<1 10	30% 30%	Pass	
Duplicate	10111-5e04260	NCP	mg/L	42	40	10	30%	Pass	
•				Deputed	Desult O		1		
Alkalinity	M44 C=04000	CP		Result 1	Result 2 13000	RPD	2001/	Deee	
Total Alkalinity as CaCO3	M11-Se04239	CP	mg/L	13000	13000	<1	30%	Pass	
Duplicate				Decilit	Desile	000	1		
Heavy Metals	D 4 4 0 50 407	NOD	/1	Result 1	Result 2	RPD	0.001/		0.15
Aluminium	B11-Se52107	NCP	mg/L	0.16	< 0.05	100	30%	Fail	Q15
Iron	B11-Se52107	NCP	mg/L	0.59	0.29	67	30%	Fail	Q15
Duplicate				Desult 4	Desult O	000	1		
				Result 1	Result 2	RPD			
Phosphate total (P)	M11-Se03520	NCP	mg/L	190	190	<1	30%	Pass	
Duplicate									
<u></u>		0-		Result 1	Result 2	RPD			
Chloride	M11-Se04241	CP	mg/L	74	75	1.3	30%	Pass	
Phosphorous reactive (P)	M11-Se04241	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Sulphate (as SO4)	M11-Se04241	CP	mg/L	80	81	<1	30%	Pass	
Duplicate					1		1		
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	M11-Se04241	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Arsenic (filtered)	M11-Se04241	CP	mg/L	0.001	0.001	10	30%	Pass	
Cadmium (filtered)	M11-Se04241	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M11-Se04241	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M11-Se04241	CP	mg/L	0.002	0.002	5	30%	Pass	
1 (61)	M11-Se04241	CP	mg/L	2.0	2.1	1	30%	Pass	
Iron (filtered)					-		0.001	Deee	
Manganese (filtered)	M11-Se04241	CP	mg/L	0.006	0.006	4	30%	Pass	
· · · · ·		CP CP	mg/L mg/L	0.006	0.006	4	30% 30%	Pass Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Zinc (filtered)	M11-Se04241	CP	mg/L	0.010	0.011	3	30%	Pass	



Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code Description

Q15 The RPD reported passes mgt-LabMark's Acceptance Criteria as stipulated in AS-POL-002. Refer to Glossary Page of this report for further details

Authorised By

Dan Thompson

Client Services

NATA Signatories: Huong Le Mary Makarios

Senior Analyst-Inorganic (VIC) Senior Analyst-Metal (VIC)

Whenfth.

Michael Wright National Technical Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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Part of the Envirolab Group

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CERTIFICATE OF ANALYSIS 114553

Client: 360 Environmental PO Box 14 West Perth WA 6872

Attention: Niamh Hade

Sample log in details:	
Your Reference:	SWA043
No. of samples:	1 Water
Date samples received:	7/09/11
Date completed instructions received:	7/09/11
Location:	Pike Road

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices. *Please refer to the last page of this report for any comments relating to the results.*

Report Details:	
Date results requested by:	14/09/11
Date of Preliminary Report:	Not issued
Issue Date:	14/09/11
NATA accreditation number 2901. This docume	nt shall not be reproduced except in full.
This document is issued in accordance with NA	TA's accreditation requirements.
Accredited for compliance with ISO/IEC 17025.	
Tests not covered by NATA are denoted with	۱*.

Results Approved By:

Joshua Lim Operations Supervisor

MPL Reference: Revision No: 114553 R 00



Page 1 of 9

Client Reference: SWA043

	-	
Miscellaneous Inorganics		
Our Reference:	UNITS	114553-1
Your Reference		QC2
Date Sampled		7/09/2011
Type of sample		Water
Date prepared	-	13/09/11
Date analysed	-	13/09/11
pH in water	pH Units	7.5
Electrical Conductivity water	μS/cm	880
Acidity as CaCO ₃	mg/L	14
Total Suspended Solids @ 103-105 ⁰ C	mg/L	5,200
Chloride in water	mg/L	27
Sulphate in water	mg/L	300
Total Alkalinity as CaCO3	mg/L	4,400



SWA043

	1	1
Dissolved Metals in Water		
Our Reference:	UNITS	114553-1
Your Reference		QC2
Date Sampled		7/09/2011
Type of sample		Water
Date prepared	-	12/09/11
Date analysed	-	12/09/11
Arsenic	mg/L	0.012
Cadmium	mg/L	<0.002
Chromium	mg/L	<0.005
Copper	mg/L	<0.005
Nickel	mg/L	<0.005
Zinc	mg/L	<0.01
Manganese	mg/L	0.014
Aluminium	mg/L	0.04
Selenium	mg/L	0.002
Iron	mg/L	0.02



Τ

Total Metals in water			
Our Reference:	UNITS	114553-1	
Your Reference		QC2	
Date Sampled		7/09/2011	
Type of sample		Water	
Date prepared	-	7/9/11	
Date prepared Date analysed	-	7/9/11 7/9/11	
	- - mg/L		

MPL Reference: **Revision No:**



SWA043

Nutrients in Water			
Our Reference:	UNITS	114553-1	
Your Reference		QC2	
Date Sampled		7/09/2011	
Type of sample		Water	
NOx as N	mg/L	0.98	
Nitrate as N	mg/L	0.97	
Nitrite as N	mg/L	0.007	
Total Phosphorus (Total P)	mg/L	0.24	
Phosphate as P	mg/L	0.005	



Client Reference: SWA043

MethodID	Methodology Summary					
INORG-001	pH - Measured using pH meter and electrode in accordance with APHA 21st ED, 4500-H+.					
INORG-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with API 21st ED 2510 and Rayment & Higginson.					
INORG-006	Alkalinity - determined titrimetrically in accordance with APHA 21st ED, 2320 B.					
INORG-019	Suspended Solids - determined gravimetrically by filtration of the sample, in accordance with APHA 21st ED, 2540 D.					
INORG-081	Chloride by Ion Exchange Chromatography in accordance with APHA 21st ED 4110B.					
INORG-081	Sulphate by Ion Exchange Chromatography in accordance with APHA 21st ED 4110B.					
METALS-024	Metals by GF-AAS.					
METALS-020	Metals in soil and water by ICP-OES.					
INORG-055	NOx by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.					
INORG-055	Nitrate by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.					
INORG-055	Nitrite by colourimetric analysis in accordance with APHA 21st ED 4500-NO2 B.					
INORG-060	Total Phosphorus by colourimetric analysis in accordance with APHA 21st ED 4500-P J.					
INORG-060	Phosphate by colourimetric analysis in accordance with APHA 21st ED 4500-P E.					



Client Reference: SWA043									
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery	
Miscellaneous Inorganics						Base II Duplicate II % RPD			
Date prepared	-			7/9/11	[NT]	[NT]	LCS	7/9/11	
Date analysed	-			7/9/11	[NT]	[NT]	LCS	7/9/11	
pH in water	pH Units		INORG-001	[NT]	[NT]	[NT]	LCS	114%	
Electrical Conductivity water	µS/cm	1	INORG-002	<1	[NT]	[NT]	LCS	97%	
Acidity as CaCO3	mg/L	1	INORG-006	<1	[NT]	[NT]	LCS	118%	
Total Suspended Solids @ 103-105 ⁰ C	mg/L	1	INORG-019	<1	[NT]	[NT]	LCS	94%	
Chloride in water	mg/L	1	INORG-081	<1	[NT]	[NT]	LCS	96%	
Sulphate in water	mg/L	1	INORG-081	<1	[NT]	[NT]	LCS	94%	
Total Alkalinity as CaCO3	mg/L	1	INORG-006	<1	[NT]	[NT]	LCS	93%	
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike %	
Dissolved Metals in Water						Base II Duplicate II % RPD		Recovery	
Date prepared	-			12/09/1 1	114553-1	12/09/11 12/09/11	LCS	12/09/11	
Date analysed	-			12/09/1 1	114553-1	12/09/11 12/09/11	LCS	12/09/11	
Arsenic	mg/L	0.001	METALS-02 4	<0.001	114553-1	0.012 0.011 RPD:9	LCS	84%	
Cadmium	mg/L	0.002	METALS-02 0	<0.002	114553-1	<0.002 <0.002	LCS	119%	
Chromium	mg/L	0.005	METALS-02 0	<0.005	114553-1	<0.005 <0.005	LCS	130%	
Copper	mg/L	0.005	METALS-02 0	<0.005	114553-1	<0.005 <0.005	LCS	121%	
Nickel	mg/L	0.005	METALS-02 0	<0.005	114553-1	<0.005 <0.005	LCS	119%	
Zinc	mg/L	0.01	METALS-02 0	<0.01	114553-1	<0.01 <0.01	LCS	122%	
Manganese	mg/L	0.005	METALS-02 0	<0.005	114553-1	0.014 0.014 RPD:0	LCS	123%	
Aluminium	mg/L	0.02	METALS-02 0	<0.02	114553-1	0.04 0.03 RPD:29	LCS	122%	
Selenium	mg/L	0.001	METALS-02 4	<0.001	114553-1	0.002 0.001 RPD: 67	LCS	104%	
Iron	mg/L	0.02	METALS-02 0	<0.02	114553-1	0.02 0.02 RPD: 0	LCS	122%	



	Client Reference: SWA043											
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike %				
Total Metals in water	<u> </u>	!		'		Base II Duplicate II % RPD		Recovery				
Date prepared	-	,		7/9/11	[NT]	[NT]	LCS	7/9/11				
Date analysed	-	'		7/9/11	[NT]	[NT]	LCS	7/9/11				
Iron - Total	mg/L	0.02	METALS-02 0	<0.02	[NT]	[TN]	LCS	122%				
Aluminium - Total	mg/L	0.02	METALS-02 0	<0.02	[NT]	[T/]	LCS	117%				
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery				
Nutrients in Water		<u> </u>				Base II Duplicate II % RPD						
NOx as N	mg/L	0.005	INORG-055	<0.005	[NT]	[NT]	LCS	111%				
Total Phosphorus (Total P)	mg/L	0.01	INORG-060	<0.01	[NT]	[T/]	LCS	97%				
Phosphate as P	mg/L	0.005	INORG-060	<0.005	[NT]	[NT]	LCS	106%				

MPL Reference: Revision No:



Report Comments:

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform & E.coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC& ARMC 2004.

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested NS: Not specified; NEPM: National Environmental Protection Measure

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet of exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable. Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.





360 ENVIRONMENTAL PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Attention: Niamh Hade

Report Client Reference Received Date 318955-W PIKE ROAD LWMS-NH SWA043 Nov 18, 2011

Certificate of Analysis

NATA Accredited Accreditation Number 1261 Site Number 1254

NATA

WORLD RECOGNISED

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Client Sample ID			MW2	MW3	MW4	MW5
Sample Matrix			Water	Water	Water	Water
mgt-LabMark Sample No.			M11-No11185	M11-No11186	M11-No11187	M11-No11188
Date Sampled			Nov 17, 2011	Nov 17, 2011	Nov 17, 2011	Nov 17, 2011
Test/Reference	LOR	Unit				
Acidity as CaCO3	10	mg/L	140	77	23	11
Chloride	1	mg/L	140	130	110	30
Conductivity	10	uS/cm	2200	2000	970	830
Dissolved Oxygen	0.01	mg/L	6.5	7.1	6.3	6.2
Nitrate & Nitrite (N)	0.05	mg/L	24	61	0.15	0.36
Nitrate (as N)	0.02	mg/L	24	61	0.15	0.34
Nitrite (as N)	0.02	mg/L	0.28	< 0.02	< 0.02	< 0.02
рН	0.1	units	7.3	7.5	7.6	7.6
Phosphate total (P)	0.05	mg/L	< 0.05	1.6	< 0.05	0.32
Phosphorous reactive (P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate (S)	5	mg/L	200	160	28	82
Suspended Solids	1	mg/L	9700	2500	7.0	980
Alkalinity						
Total Alkalinity as CaCO3	20	mg/L	4800	2500	270	450
Heavy Metals						
Aluminium	0.05	mg/L	16	1.7	22	6.0
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.001	< 0.001	0.001	0.007
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.003	0.007	0.002	0.003
Iron	0.05	mg/L	33	4.7	34	8.2
Iron (filtered)	0.05	mg/L	0.55	0.53	0.24	0.24
Manganese (filtered)	0.005	mg/L	0.020	< 0.005	< 0.005	0.009
Nickel (filtered)	0.001	mg/L	0.002	0.002	< 0.001	0.001
Selenium (filtered)	0.001	mg/L	< 0.001	0.001	0.001	< 0.001
Zinc (filtered)	0.001	mg/L	0.005	0.008	0.008	0.005



Client Sample ID			QC1	QC3
Sample Matrix			Water	Water
mgt-LabMark Sample No.			M11-No11189	M11-No11190
Date Sampled			Nov 17, 2011	Nov 17, 2011
Test/Reference	LOR	Unit		
Acidity as CaCO3	10	mg/L	10	< 10
Chloride	1	mg/L	36	< 1
Conductivity	10	uS/cm	770	< 10
Dissolved Oxygen	0.01	mg/L	6.0	6.8
Nitrate & Nitrite (N)	0.05	mg/L	0.83	< 0.05
Nitrate (as N)	0.02	mg/L	0.81	< 0.02
Nitrite (as N)	0.02	mg/L	0.02	< 0.02
рН	0.1	units	7.6	5.6
Phosphate total (P)	0.05	mg/L	0.11	< 0.05
Phosphorous reactive (P)	0.05	mg/L	< 0.05	< 0.05
Sulphate (S)	5	mg/L	68	< 5
Suspended Solids	1	mg/L	610	< 1
Alkalinity				
Total Alkalinity as CaCO3	20	mg/L	420	< 20
Heavy Metals				
Aluminium	0.05	mg/L	6.8	< 0.05
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05
Arsenic (filtered)	0.001	mg/L	0.007	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.002	< 0.001
Iron	0.05	mg/L	9.4	< 0.05
Iron (filtered)	0.05	mg/L	0.24	< 0.05
Manganese (filtered)	0.005	mg/L	0.009	< 0.005
Nickel (filtered)	0.001	mg/L	< 0.001	< 0.001
Selenium (filtered)	0.001	mg/L	< 0.001	< 0.001
Zinc (filtered)	0.001	mg/L	0.003	< 0.001



Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description Acidity as CaCO3 - Method: APHA 2310 Acidity	Testing Site Melbourne	Extracted Nov 18, 2011	Holding Time 14 Day
- Method: APHA 2310 Addity Chloride - Method: APHA 4500-Cl (Cl by Discrete Analyser)	Melbourne	Nov 23, 2011	28 Day
Conductivity - Method: APHA 2510 Conductivity by Direct Measurement	Melbourne	Nov 21, 2011	28 Day
Dissolved Oxygen - Method: APHA 4500-O Oxygen Dissolved	Melbourne	Nov 18, 2011	1 Day
Nitrate & Nitrite (N) - Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA	Melbourne	Nov 18, 2011	28 Day
Nitrate (as N) - Method: APHA 4500-NO3 Nitrate Nitrogen by FIA	Melbourne	Nov 18, 2011	2 Day
Nitrite (as N) - Method: APHA 4500-NO2 Nitrite Nitrogen by FIA	Melbourne	Nov 18, 2011	2 Day
pH - Method: APHA 4500 pH by Direct Measurement - ** Samples analysed outside hold	Melbourne ing time. Analysis should be performed in situ.	Nov 18, 2011	0 Hours
Phosphate total (P) - Method: APHA 4500-P E. Phosphorous	Melbourne	Nov 18, 2011	2 Day
Phosphorous reactive (P) - Method: APHA4500-PO4	Melbourne	Nov 18, 2011	2 Day
Sulphate (S) - Method: APHA 4500-SO4 (SO4 by Discrete Analyser)	Melbourne	Nov 23, 2011	28 Day
Suspended Solids - Method: APHA 2540D Total Suspended Solids	Melbourne	Nov 24, 2011	7 Day
Alkalinity - Method: APHA 2320 Alkalinity by Titration	Melbourne	Nov 18, 2011	14 Day
Heavy Metals - Method: USEPA 6010/6020 Heavy Metals	Melbourne	Nov 18, 2011	28 Day

abMark	MENTAL LABORATORIES
	ENVIRON

web : www.mgtlabmark.com.au

e.mail : mgt@mgtenv.com.au

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Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600

Melbourne 3-5 Kingston Town Close Oakleigh VIC 316 Polane : +61 3 9564 7055 NATA # 1261 & 1427 Site # 1254 & 14271

Order No.: Report #: Phone: Fax:

360 Environmental PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Company Name: Address:

mgt-LabMark Client Manager: Natalie Krasselt

Nov 18, 2011 9:06 AM Nov 25, 2011 4:00 PM 5 Day Niamh Hade

Received: Due: Priority: Contact name:

Client Job No.:

WA043	
PIKE ROAD LWMS-NH SWA043	
OAD LW	
PIKE R	

Zinc (filtered)		×			×	×	×	×	×	×
Total Alkalinity as CaCO3		×			×	×	×	×	×	×
Suspended Solids		×			×	×	×	×	×	×
Sulphate (S)		×			×	×	×	×	×	×
Selenium (filtered)		×			×	×	×	×	×	×
Phosphorous filterable reactive (P)		×			×	×	×	×	×	×
Phosphate total (P)		×			×	×	×	×	×	×
pH		×			×	×	×	×	×	×
Nitrite (as N)		×			×	×	×	×	×	×
Nitrate (as N)		×			×	×	×	×	×	×
Nitrate & Nitrite (N)		×			×	×	×	×	×	×
Nickel (filtered)		×			×	×	×	×	×	×
Manganese (filtered)		×			×	×	×	×	×	×
Iron (filtered)		×			×	×	×	×	×	×
Iron		×			×	×	×	×	×	×
Dissolved Oxygen		×			×	×	×	×	×	×
Copper (filtered)		×			×	×	×	×	×	×
Conductivity screen for salinity		×			×	×	×	×	×	×
Conductivity		×			×	×	×	×	Х	Х
Chromium (filtered)		×			×	×	×	×	Х	Х
Chloride		×			×	×	×	×	х	×
Cadmium (filtered)		×			×	×	×	×	×	×
Arsenic (filtered)		×			×	×	×	×	×	×
Aluminium (filtered)		×			×	×	×	×	×	×
Aluminium		×			×	×	×	×	×	×
Acidity as CaCO3		×			×	×	×	×	×	×
				D	185	186	187	188	189	190
				LAB ID	M11-No11185	M11-No11186	M11-No11187	M11-No11188	M11-No11189	M11-No11190
					M	M	M	M	M	M
Sample Detail				Matrix	Water	Water	Water	Water	Water	Water
		#1261	645	Sampling Time						
		Melbourne Laboratory - NATA Site #1261	Sydney Laboratory - NATA Site #1645							
ŭ	alysis	ry - NA	NATA	Sample Date	, 2011	, 2011	, 2011	, 2011	, 2011	, 2011
	ere an	orato	atory -	Samp	Nov 17, 2011					
	ory wh	ne Lal	Labor							
	Laboratory where analysis is conducted	elbour	vdney	Sample ID	MW2	MW3	MW4	MW5	5	33
	Lo	ž	S	0,	Ž	Ž	Į	Ę	QC1	QC3



mgt-LabMark Internal Quality Control Review

General

- 1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
- 2. All soil results are reported on a dry basis, unless otherwise stated.
- 3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
- 4. Results are uncorrected for matrix spikes or surrogate recoveries.
- 5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 6. Samples were analysed on an 'as received' basis.
- 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)

For samples received on the last day of holding time, notification of testing requirements should have been received at least

6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control. **NOTE: pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg:milligrams per Kilogram	mg/L:milligrams per litre
μg/L:micrograms per litre	ppm:Parts per million
ppb:Parts per billion	%:Percentage
org/100mL:Organisms per 100 millilitres	NTU:Nephelometric Turbidity Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands.
	In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice
CP:	Client Parent - QC was performed on samples pertaining to this report
NCP:	Non-Client Parent - QC was performed on samples not pertaining to this report, however QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. Organochlorine Pesticide analysis where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
- 4. Organochlorine Pesticide analysis where reporting Spike data, Toxophene is not added to the Spike.
- 5. Total Recoverable Hydrocarbons where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt
- 7. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- 8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
- 9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample>
- 10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

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Quality Control Results

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank					· · · ·		•	
Acidity as CaCO3			mg/L	< 10		10	Pass	
Chloride			mg/L	< 1		1	Pass	
Nitrate & Nitrite (N)			mg/L	< 0.05		0.05	Pass	
Nitrate (as N)			mg/L	< 0.02		0.02	Pass	
Nitrite (as N)			mg/L	< 0.02		0.02	Pass	
Phosphate total (P)			mg/L	< 0.05		0.05	Pass	
Phosphorous reactive (P)			mg/L	< 0.05		0.05	Pass	
Sulphate (S)			mg/L	< 5		5	Pass	
Suspended Solids			mg/L	< 1		1	Pass	
Method Blank				1			1	
Alkalinity APHA 2320 Alkalinity by 1	 Fitration			1			1	
Total Alkalinity as CaCO3			mg/L	< 20		20	Pass	
Method Blank			iiig/L	< 20		20	1 433	
Heavy Metals USEPA 6010/6020 Hea	avv Motale			· · · · ·		1	1	
Aluminium	ary metals	T	mg/L	< 0.05		0.05	Pass	-
			-	< 0.05				<u> </u>
Aluminium (filtered)			mg/L			0.05	Pass	
Arsenic (filtered)			mg/L	< 0.001		0.001	Pass	
Cadmium (filtered)			mg/L	< 0.0002		0.0002	Pass	
Chromium (filtered)			mg/L	< 0.001		0.001	Pass	
Copper (filtered)			mg/L	< 0.001		0.001	Pass	
Iron			mg/L	< 0.05		0.05	Pass	
Iron (filtered)			mg/L	< 0.05		0.05	Pass	
Manganese (filtered)			mg/L	< 0.005		0.005	Pass	
Nickel (filtered)			mg/L	< 0.001		0.001	Pass	
Selenium (filtered)			mg/L	< 0.001		0.001	Pass	
Zinc (filtered)			mg/L	< 0.001		0.001	Pass	
LCS - % Recovery								
Chloride			%	103		70-130	Pass	
Nitrate & Nitrite (N)			%	104		70-130	Pass	
Nitrate (as N)			%	104		70-130	Pass	
Nitrite (as N)			%	104		70-130	Pass	
Phosphate total (P)			%	100		70-130	Pass	
Sulphate (S)			%	99		70-130	Pass	
Suspended Solids			%	92		70-130	Pass	
LCS - % Recovery			70	52		70-130	1 833	
Heavy Metals USEPA 6010/6020 Hea	Natala					1	1	
Aluminium	avy INICIAIS		%	96		80-120	Pass	
Aluminium (filtered)			%	90		80-120	Pass	
Arsenic (filtered)			%	97		80-120	Pass	1
Cadmium (filtered)			%	106		80-120	Pass	ļ
Chromium (filtered)			%	95		80-120	Pass	
Copper (filtered)			%	86		80-120	Pass	ļ
Iron			%	98		80-120	Pass	ļ
Iron (filtered)			%	93		80-120	Pass	
Manganese (filtered)			%	95		80-120	Pass	
Nickel (filtered)			%	93		80-120	Pass	
Selenium (filtered)			%	101		80-120	Pass	
Zinc (filtered)			%	98		80-120	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
1631		Source	1			Linns	-mmt3	Soue
Spike - % Recovery								
				Result 1				
	M11-No10783	NCP	%	Result 1 108		70-130	Pass	

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Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Phosphorous reactive (P)	M11-No11185	CP	%	104			70-130	Pass	
Sulphate (S)	M11-No10610	NCP	%	76			70-130	Pass	
Spike - % Recovery								1	
Heavy Metals				Result 1					
Aluminium	B11-No09214	NCP	%	75			75-125	Pass	
Iron (filtered)	M11-No11790	NCP	%	107			75-125	Pass	
Spike - % Recovery								•	
Heavy Metals				Result 1					
Iron	B11-No10042	NCP	%	98			75-125	Pass	
Spike - % Recovery	·				• • •				
Heavy Metals				Result 1					
Aluminium (filtered)	M11-No11187	CP	%	80			75-125	Pass	
Arsenic (filtered)	M11-No11187	CP	%	101			75-125	Pass	
Cadmium (filtered)	M11-No11187	CP	%	102			75-125	Pass	
Chromium (filtered)	M11-No11187	CP	%	96			75-125	Pass	
Copper (filtered)	M11-No11187	CP	%	84			75-125	Pass	
Manganese (filtered)	M11-No11187	CP	%	92			75-125	Pass	
Nickel (filtered)	M11-No11187	CP	%	92			75-125	Pass	
Selenium (filtered)	M11-No11187	CP	%	104			75-125	Pass	
Zinc (filtered)	M11-No11187	CP	%	93			75-125	Pass	
Spike - % Recovery									
				Result 1					
Nitrate & Nitrite (N)	M11-No11190	CP	%	102			70-130	Pass	
Nitrate (as N)	M11-No11190	CP	%	102			70-130	Pass	
Nitrite (as N)	M11-No11190	CP	%	100			70-130	Pass	
Phosphate total (P)	M11-No11190	CP	%	94			70-130	Pass	
Duplicate								-	
				Result 1	Result 2	RPD			
Acidity as CaCO3	M11-No11185	CP	mg/L	140	130	6	30%	Pass	
Chloride	M11-No11185	CP	mg/L	140	140	<1	30%	Pass	
Phosphorous reactive (P)	M11-No11185	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Sulphate (S)	M11-No11185	CP	mg/L	200	200	1.5	30%	Pass	
Duplicate									
Alkalinity				Result 1	Result 2	RPD			
Total Alkalinity as CaCO3	M11-No11185	CP	mg/L	4800	5200	8	30%	Pass	
Duplicate								1	
Heavy Metals				Result 1	Result 2	RPD			
Aluminium	B11-No09214	NCP	mg/L	0.15	0.15	3	30%	Pass	
Iron	M11-No12602	NCP	mg/L	17	17	1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Conductivity	M11-No11186	CP	uS/cm	2000	2000	<1	30%	Pass	
Duplicate							1	r	
				Result 1	Result 2	RPD			
Chloride	M11-No11187	CP	mg/L	110	110	<1	30%	Pass	
Phosphorous reactive (P)	M11-No11187	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Sulphate (S)	M11-No11187	CP	mg/L	28	27	2.8	30%	Pass	
Duplicate							1		
Heavy Metals				Result 1	Result 2	RPD			
Aluminium (filtered)	M11-No11187	CP	mg/L	< 0.05	< 0.05	10	30%	Pass	
Arsenic (filtered)	M11-No11187	CP	mg/L	0.001	0.001	<1	30%	Pass	
Cadmium (filtered)	M11-No11187	CP	mg/L	0.0002	0.0002	<1	30%	Pass	
Chromium (filtered)	M11-No11187	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	M11-No11187	CP	mg/L	0.002	0.002	<1	30%	Pass	
Iron (filtered)	M11-No11187	CP	mg/L	0.24	0.23	<1	30%	Pass	
Manganese (filtered)	M11-No11187	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel (filtered)	M11-No11187	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Selenium (filtered)	M11-No11187	CP	mg/L	0.001	< 0.001	11	30%	Pass	
Zinc (filtered)	M11-No11187	CP	mg/L	0.008	0.008	1	30%	Pass	



Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate	·								
				Result 1	Result 2	RPD			
Dissolved Oxygen	M11-No11190	CP	mg/L	6.8	6.9	<1	30%	Pass	
Nitrate & Nitrite (N)	M11-No11190	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Nitrate (as N)	M11-No11190	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Nitrite (as N)	M11-No11190	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phosphate total (P)	M11-No11190	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Suspended Solids	M11-No11190	CP	mg/L	< 1	< 1	18	30%	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Natalie Krasselt

Client Services

NATA Signatories: Huong Le Mary Makarios

Senior Analyst-Inorganic (VIC) Senior Analyst-Metal (VIC)

Adruf the.

Michael Wright National Technical Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mg-LaMArk shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mg-LaMArk be liable for cost, east shall mg-LaMArk be liable for a structure of the samples as received. It limited to, lost profiles, damages for the single structure of the samples as received.



Part of the Envirolab Group

16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

CERTIFICATE OF ANALYSIS 116698

Client: 360 Environmental PO Box 14 West Perth WA 6872

Attention: Niamh Hade

Sample log in details:

Your Reference: No. of samples: Date samples received: Date completed instructions received: Location:

Pike Road LWMS-Nh

1 x Water 17/11/11 17/11/11

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices. *Please refer to the last page of this report for any comments relating to the results.*

Report Details: Date results requested by: 24/11/11 Date of Preliminary Report: Not issued Issue Date: 24/11/11 NATA accreditation number 2901. This document shall not be reproduced except in full. Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Results Approved By:

Todd Lee

Laboratory Manager

MPL Reference: Revision No:



Client Reference: Pike Roa

/IS-Nh
//S-Nh

Miscellaneous Inorganics		
Our Reference:	UNITS	116698-1
Your Reference		QC2
Date Sampled		17/11/2011
Type of sample		Water
Date prepared	-	18/11/11
Date analysed	-	18/11/11
pH in water	pH Units	7.4
Electrical Conductivity water	μS/cm	600
Total Suspended Solids @ 103-105 ⁰ C	mg/L	710
Acidity as CaCO3	mg/L	10
Nitrate as N	mg/L	0.56
Nitrite as N	mg/L	0.006
Total Phosphorus (Total P)	mg/L	0.62
Phosphate as P	mg/L	0.02



Pike Road LWMS-Nh

Dissolved Metals in Water		
Our Reference:	UNITS	116698-1
Your Reference		QC2
Date Sampled		17/11/2011
Type of sample		Water
Date prepared	-	21/11/11
Date analysed	-	21/11/11
Arsenic	mg/L	0.0095
Cadmium	mg/L	<0.002
Chromium	mg/L	<0.005
Copper	mg/L	<0.005
Nickel	mg/L	<0.005
Zinc	mg/L	<0.01
Manganese	mg/L	0.011
Iron	mg/L	<0.02
Aluminium	mg/L	<0.02
Selenium	mg/L	0.002

MPL Reference: Revision No:



Pike Road LWMS-Nh

Total Metals in water		
Our Reference:	UNITS	116698-1
Your Reference		QC2
Date Sampled		17/11/2011
Type of sample		Water
Date prepared	-	18/11/11
Date analysed	-	18/11/11
Aluminium - Total	mg/L	3.3
Iron - Total	mg/L	3.9

MPL Reference: Revision No:



Pike Road LWMS-Nh

Ionic Balance		
Our Reference:	UNITS	116698-1
Your Reference		QC2
Date Sampled		17/11/2011
Type of sample		Water
Bicarbonate, HCO3 as CaCO3	mg/L	530
Carbonate, CO3 ²⁻ as CaCO3	mg/L	<1
Hydroxide, OH^- as CaCO ₃	mg/L	<1
Total Alkalinity as CaCO3	mg/L	530
Chloride in water	mg/L	17
Sulphate in water	mg/L	160



Client Reference: Pike Road LWMS-Nh

MethodID	Methodology Summary
INORG-001	pH - Measured using pH meter and electrode in accordance with APHA 21st ED, 4500-H+.
INORG-002	Conductivity and Salinity - measured using a conductivity cell and dedicated meter, in accordance with APHA 21st ED 2510 and Rayment & Higginson.
INORG-019	Suspended Solids - determined gravimetrically by filtration of the sample, in accordance with APHA 21st ED, 2540 D.
INORG-006	Alkalinity - determined titrimetrically in accordance with APHA 21st ED, 2320 B.
INORG-055	Nitrate by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.
INORG-055	Nitrite by colourimetric analysis in accordance with APHA 21st ED 4500-NO2 B.
INORG-060	Total Phosphorus by colourimetric analysis in accordance with APHA 21st ED 4500-P J.
INORG-060	Phosphate by colourimetric analysis in accordance with APHA 21st ED 4500-P E.
METALS-024	Metals by GF-AAS.
METALS-020	Metals in soil and water by ICP-OES.
INORG-081	Chloride by Ion Exchange Chromatography in accordance with APHA 21st ED 4110B.
INORG-081	Sulphate by Ion Exchange Chromatography in accordance with APHA 21st ED 4110B.



		r	ent Referenc	e: Pi	ke Road LWN	IS-Nh	
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#
Miscellaneous Inorganics						Base II Duplicate II % RPD	
Date prepared	-			18/11/1 1	116698-1	18/11/11 18/11/11	LCS
Date analysed	-			18/11/1 1	116698-1	18/11/11 18/11/11	LCS
pH in water	pH Units		INORG-001	[NT]	116698-1	7.4 7.4 RPD:0	LCS
Electrical Conductivity water	µS/cm	1	INORG-002	<1	116698-1	600 610 RPD:2	LCS
Total Suspended Solids @ 103-105 ⁰ C	mg/L	1	INORG-019	<1	116698-1	710 [N/T]	LCS
Acidity as CaCO3	mg/L	1	INORG-006	<1	116698-1	10 10 RPD:0	LCS
Total Phosphorus (Total P)	mg/L	0.01	INORG-060	<0.01	116698-1	0.62 0.60 RPD: 3	LCS
Phosphate as P	mg/L	0.005	INORG-060	<0.005	116698-1	0.02 [N/T]	LCS
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#
Dissolved Metals in Water						Base II Duplicate II % RPD	
 Date prepared	-			21/11/1	[NT]	[NT]	LCS
Date analysed	-			21/11/1	[NT]	[NT]	LCS
Arsenic	mg/L	0.001	METALS- 024	<0.001	[NT]	[NT]	LCS
Cadmium	mg/L	0.002	METALS- 020	<0.002	[NT]	[NT]	LCS
Chromium	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS
Copper	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS
Nickel	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS
Zinc	mg/L	0.01	METALS- 020	<0.01	[NT]	[NT]	LCS
Manganese	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS
Iron	mg/L	0.02	METALS-	<0.02	[NT]	[NT]	LCS

<0.02

< 0.001

[NT]

[NT]

020

METALS-

020

METALS-

024

Aluminium

Selenium

mg/L

mg/L

0.02

0.001

116698 R 00



Spike % Recovery

18/11/11

18/11/11

101% 82%

92%

112% 101%

106%

21/11/11

21/11/11

99%

106%

106%

105%

104%

111%

107%

106%

105%

120%

LCS

LCS

[NT]

[NT]

Spike % Recovery

Client Reference: Pike Road LWMS-Nh									
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery	
Total Metals in water						Base II Duplicate II % RPD			
Date prepared	-			18/11/1 1	[NT]	[NT]	LCS	18/11/11	
Date analysed	-			18/11/1 1	[NT]	[NT]	LCS	18/11/11	
Aluminium - Total	mg/L	0.02	METALS- 020	<0.02	[NT]	[NT]	LCS	118%	
Iron - Total	mg/L	0.02	METALS- 020	<0.02	[NT]	[NT]	LCS	106%	
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery	
Ionic Balance						Base II Duplicate II % RPD			
Bicarbonate, HCO3 as CaCO3	mg/L	1	INORG-006	<1	[NT]	[NT]	LCS	103%	
Carbonate, CO3 ²⁻ as CaCO3	mg/L	1	INORG-006	<1	[NT]	[NT]	LCS	103%	
Total Alkalinity as CaCO3	mg/L	1	INORG-006	<1	[NT]	[NT]	LCS	103%	
Chloride in water	mg/L	1	INORG-081	<1	[NT]	[NT]	LCS	112%	
Sulphate in water	mg/L	1	INORG-081	<1	[NT]	[NT]	LCS	110%	



Report Comments:

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform & E.coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC& ARMC 2011.

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested NS: Not specified; NEPM: National Environmental Protection Measure

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. **Duplicate**: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet of exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable. Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.





360 ENVIRONMENTAL PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Attention: Niamh Hade

Report Client Reference Received Date 326600-W PIKE ROADS LWMS-NH SWA043 Feb 09, 2012

Certificate of Analysis

NATA Accredited Accreditation Number 1261 Site Number 1254

NATA

WORLD RECOGNISED

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Client Sample ID			MW2	MW3	MW4	MW5
Sample Matrix			Water	Water	Water	Water
mgt-LabMark Sample No.			M12-Fe05193	M12-Fe05194	M12-Fe05195	M12-Fe05196
Date Sampled			Feb 07, 2012	Feb 07, 2012	Feb 07, 2012	Feb 07, 2012
Test/Reference	LOR	Unit				
Acidity as CaCO3	10	mg/L	71	< 10	< 10	< 10
Chloride	1	mg/L	150	84	160	31
Nitrate & Nitrite (N)	0.05	mg/L	16	38	0.10	0.11
Nitrate (as N)	0.02	mg/L	16	38	0.10	0.11
Nitrite (as N)	0.02	mg/L	0.18	0.06	< 0.02	< 0.02
Phosphate total (P)	0.05	mg/L	0.82	1.6	< 0.05	0.27
Phosphorous reactive (P)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Sulphate (as SO4)	5	mg/L	570	480	110	160
Suspended Solids	1	mg/L	3200	72	37	120
Alkalinity						
Total Alkalinity as CaCO3	20	mg/L	3800	1300	280	910
Heavy Metals						
Aluminium	0.05	mg/L	31	5.3	8.5	26
Iron	0.05	mg/L	64	16	19	49
Nickel (filtered)	0.001	mg/L	0.003	0.003	0.002	0.002
Arsenic (filtered)	0.001	mg/L	0.002	0.001	0.001	0.005
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	0.003	0.007	0.002	0.004
Selenium (filtered)	0.001	mg/L	0.003	0.002	0.004	0.003
Zinc (filtered)	0.001	mg/L	0.006	0.009	0.009	0.005
Iron (filtered)	0.05	mg/L	2.1	1.8	1.1	0.83
Manganese (filtered)	0.005	mg/L	0.019	0.008	< 0.005	0.005
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05	< 0.05



Client Sample ID			MW1	QC1	QC3
Sample Matrix			Water	Water	Water
mgt-LabMark Sample No.			M12-Fe05197	M12-Fe05198	M12-Fe05199
Date Sampled			Feb 07, 2012	Feb 07, 2012	Feb 07, 2012
Test/Reference	LOR	Unit			
Acidity as CaCO3	10	mg/L	52	< 10	< 10
Chloride	1	mg/L	120	31	< 1
Nitrate & Nitrite (N)	0.05	mg/L	2.3	0.13	< 0.05
Nitrate (as N)	0.02	mg/L	2.3	0.13	< 0.02
Nitrite (as N)	0.02	mg/L	< 0.02	< 0.02	< 0.02
Phosphate total (P)	0.05	mg/L	0.78	0.75	< 0.05
Phosphorous reactive (P)	0.05	mg/L	< 0.05	< 0.05	< 0.05
Sulphate (as SO4)	5	mg/L	430	160	< 5
Suspended Solids	1	mg/L	520	88	< 1
Alkalinity					
Total Alkalinity as CaCO3	20	mg/L	27000	1100	< 20
Heavy Metals					
Aluminium	0.05	mg/L	74	26	< 0.05
Iron	0.05	mg/L	130	52	< 0.05
Nickel (filtered)	0.001	mg/L	0.001	< 0.001	< 0.001
Arsenic (filtered)	0.001	mg/L	< 0.001	0.005	< 0.001
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	0.004	< 0.001
Selenium (filtered)	0.001	mg/L	< 0.001	0.002	< 0.001
Zinc (filtered)	0.001	mg/L	< 0.001	0.005	< 0.001
Iron (filtered)	0.05	mg/L	< 0.05	0.28	< 0.05
Manganese (filtered)	0.005	mg/L	< 0.005	0.005	< 0.005
Aluminium (filtered)	0.05	mg/L	< 0.05	< 0.05	< 0.05



Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description Acidity as CaCO3 - Method: APHA 2310 Acidity	Testing Site Melbourne	Extracted Feb 09, 2012	Holding Time 14 Day
- Method: APHA 4500-CI (Cl by Discrete Analyser)	Melbourne	Feb 09, 2012	28 Day
Nitrate & Nitrite (N) - Method: APHA 4500-NO3/NO2 Nitrate-Nitrite Nitrogen by FIA	Melbourne	Feb 09, 2012	28 Day
Nitrate (as N) - Method: APHA 4500-NO3 Nitrate Nitrogen by FIA	Melbourne	Feb 09, 2012	2 Day
Nitrite (as N) - Method: APHA 4500-NO2 Nitrite Nitrogen by FIA	Melbourne	Feb 09, 2012	2 Day
Phosphate total (P) - Method: APHA 4500-P E. Phosphorous	Melbourne	Feb 09, 2012	2 Day
Phosphorous reactive (P) - Method: APHA4500-PO4	Melbourne	Feb 09, 2012	2 Day
Sulphate (as SO4) - Method: APHA 4500-SO4 Sulfate by FIA	Melbourne	Feb 09, 2012	28 Day
Suspended Solids - Method: APHA 2540D Total Suspended Solids	Melbourne	Feb 09, 2012	7 Day
Alkalinity - Method: APHA 2320 Alkalinity by Titration	Melbourne	Feb 09, 2012	14 Day
Heavy Metals - Method: USEPA 6010/6020 Heavy Metals	Melbourne	Feb 09, 2012	28 Day

G LabMark	ENVIRONMENTAL LABORATORIES

web : www.mgtlabmark.com.au e.mail : mgt@mgtenv.com.au ABN - 50 005 085 521

Melbourne 3-5 Kingston Town Close Oakleigh VIC 316 Polane : +61 3 9564 7055 NATA # 1261 & 1427 Site # 1254 & 14271

Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Brisbane 1/21 Smallwood Place Murarrie QLD 4172 Phone : +61 7 3902 4600

Feb 9, 2012 8:38 AM Feb 16, 2012 4:00 PM 5 Day Niamh Hade

Received: Due: Priority: Contact name:

mgt-LabMark Client Manager: Natalie Krasselt

326600 08 9321 0420 08 9226 0739 Order No.: Report #: Phone: Fax:

Client Job No.:

PIKE ROADS LWMS-NH SWA043

360 Environmental PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Company Name: Address:

Zinc (filtered)		×				×	×	×	×	×	×
Total Alkalinity as CaCO3		×				×	×	×	×	×	×
Suspended Solids		×				×	×	×	×	×	×
Sulphate (as SO4)		×				×	×	×	×	×	×
Selenium (filtered)		×				×	×	×	×	×	×
Phosphorous reactive (P)		×				×	×	×	×	×	×
Phosphate total (P)		×				×	×	×	×	×	×
Nitrite (as N)		×				×	×	×	×	×	×
Nitrate (as N)		×				×	×	×	×	×	×
Nitrate & Nitrite (N)		×				×	×	×	×	×	×
Nickel (filtered)		×				×	×	×	×	×	×
Manganese (filtered)		×				×	×	×	×	×	×
Iron (filtered)		×				×	×	×	×	×	×
Iron		×				×	×	×	×	×	×
Copper (filtered)		×				×	×	×	×	×	×
Conductivity screen for salinity		×				×	×	×	×	×	×
Chromium (filtered)		×				×	×	×	×	×	×
Chloride		×				×	×	×	×	×	×
Cadmium (filtered)		×				×	×	×	×	×	×
Arsenic (filtered)		×				×	×	×	×	×	×
Aluminium (filtered)		×				×	×	×	×	×	×
Aluminium		×				×	×	×	×	×	×
Acidity as CaCO3		×				×	×	×	×	×	×
					LAB ID	M12-Fe05193	M12-Fe05194	M12-Fe05195	M12-Fe05196	M12-Fe05197	M12-Fe05198
Sample Detail					Matrix	Water	Water	Water	Water	Water	Water
		A Site #1261	ite #1645		Sampling Time						
		Melbourne Laboratory - NATA Site #1261	Sydney Laboratory - NATA Site #1645	ratory	Sample Date	Feb 07, 2012					
	Laboratory where analysis is conducted	Melbourne Lat	Sydney Labors	External Laboratory	Sample ID	MW2	MW3	MW4	MW5 F	MW1	ac1

Page 4 of 8 Report Number: 326600-W

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M12-Fe05199

Water

Feb 07, 2012

QC3



mgt-LabMark Internal Quality Control Review

General

- 1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
- 2. All soil results are reported on a dry basis, unless otherwise stated.
- 3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
- 4. Results are uncorrected for matrix spikes or surrogate recoveries.
- 5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 6. Samples were analysed on an 'as received' basis.
- 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)

For samples received on the last day of holding time, notification of testing requirements should have been received at least

6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control. **NOTE: pH duplicates are reported as a range NOT as an RPD

UNITS mg/kg:milligrams per Kilogram µg/L:micrograms per litre ppb:Parts per billion

org/100mL:Organisms per 100 millilitres

mg/L:milligrams per litre ppm:Parts per million %:Percentage NTU:Nephelometric Turbidity Units

MPN/100mL:Most Probable Number of organisms per 100 milliltres

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands.
	In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice
CP:	Client Parent - QC was performed on samples pertaining to this report
NCP:	Non-Client Parent - QC was performed on samples not pertaining to this report, however QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. Organochlorine Pesticide analysis where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
- 4. Organochlorine Pesticide analysis where reporting Spike data, Toxophene is not added to the Spike.
- 5. Total Recoverable Hydrocarbons where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- 6. pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt
- 7. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- 8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
- 9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample>
- 10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

S LabMark ENVIRONMENTAL LABORATORIES

Quality Control Results

Test			Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Method Blank					· · · ·	•		
Acidity as CaCO3			mg/L	< 10		10	Pass	
Chloride			mg/L	< 1		1	Pass	
Nitrate & Nitrite (N)			mg/L	< 0.05		0.05	Pass	
Nitrate (as N)			mg/L	< 0.02		0.02	Pass	
Nitrite (as N)			mg/L	< 0.02		0.02	Pass	
Phosphate total (P)			mg/L	< 0.05		0.05	Pass	
Phosphorous reactive (P)			mg/L	< 0.05		0.05	Pass	
Suspended Solids			mg/L	< 1		1	Pass	
Method Blank		1					1	
Alkalinity APHA 2320 Alkalinity by Tit	ration							
Total Alkalinity as CaCO3			mg/L	< 20		20	Pass	
Method Blank			<u> </u>	-				
Heavy Metals USEPA 6010/6020 Heav	v Metals						1	
Aluminium	,		mg/L	< 0.05		0.05	Pass	1
Iron			mg/L	< 0.05		0.05	Pass	
Nickel (filtered)			mg/L	< 0.001		0.001	Pass	+
Arsenic (filtered)			mg/L	< 0.001		0.001	Pass	
Cadmium (filtered)			mg/L	< 0.0002		0.0002	Pass	
Chromium (filtered)			mg/L	< 0.0002		0.0002	Pass	
Copper (filtered)			mg/L	< 0.001		0.001	Pass	
Selenium (filtered)			-	< 0.001		0.001	Pass	
Zinc (filtered)			mg/L			0.001	Pass	
			mg/L	< 0.001				
Iron (filtered)			mg/L	< 0.05		0.05	Pass	
Manganese (filtered)			mg/L	< 0.005		0.005	Pass	
Aluminium (filtered) LCS - % Recovery]	mg/L	< 0.05		0.05	Pass	-
Chloride			%	113		70-130	Pass	1
Nitrate & Nitrite (N)			%	97		70-130	Pass	
Nitrate (as N)			%	97		70-130	Pass	
Nitrite (as N)			%	98		70-130	Pass	
Phosphate total (P)			%	103		70-130	Pass	
Suspended Solids			%	102		70-130	Pass	
LCS - % Recovery								
Heavy Metals USEPA 6010/6020 Heav	v Metals					1		
Aluminium	,		%	106		80-120	Pass	
Iron			%	100		80-120	Pass	
Nickel (filtered)			%	95		80-120	Pass	
Arsenic (filtered)			%	97		80-120	Pass	
Cadmium (filtered)			%	104		80-120	Pass	
Chromium (filtered)			%	97		80-120	Pass	+
Copper (filtered)			%	97		80-120	Pass	
Selenium (filtered)			%	94 103	<u> </u>	80-120	Pass	
Zinc (filtered)			%	103			Pass	
						80-120		
Iron (filtered)			%	104		80-120	Pass	
Manganese (filtered)			%	95		80-120	Pass	
Aluminium (filtered)	L - 1. 0 1. 1D		%	106		80-120	Pass	
	Lab Sample ID	QA Source	Units	Result 1		Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery				Rocult 1				
Chloride	M12-Fe05092	NCP	%	Result 1 115		70-130	Pass	
Nitrate & Nitrite (N) Nitrate (as N)	M12-Fe05298	NCP NCP	%	100 100		70-130	Pass	
	M12-Fe05298		1 %	1 100		70-130	Pass	

S LabMark ENVIRONMENTAL LABORATORIES

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nitrite (as N)	M12-Fe05298	NCP	%	101			70-130	Pass	
Sulphate (as SO4)	M12-Fe05193	CP	%	91			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Aluminium	M12-Fe06158	NCP	%	85			75-125	Pass	
Iron	M12-Fe07980	NCP	%	105			75-125	Pass	
Nickel (filtered)	M12-Fe05700	NCP	%	84			75-125	Pass	
Arsenic (filtered)	M12-Fe05700	NCP	%	96			75-125	Pass	
Cadmium (filtered)	M12-Fe05700	NCP	%	91			75-125	Pass	
Chromium (filtered)	M12-Fe05700	NCP	%	79			75-125	Pass	
Copper (filtered)	M12-Fe05700	NCP	%	84			75-125	Pass	
Selenium (filtered)	M12-Fe05700	NCP	%	94			75-125	Pass	
Zinc (filtered)	M12-Fe05700	NCP	%	84			75-125	Pass	
Iron (filtered)	M12-Fe05700	NCP	%	102			75-125	Pass	
Manganese (filtered)	M12-Fe05187	NCP	%	93			75-125	Pass	
Aluminium (filtered)	M12-Fe05700	NCP	%	95			75-125	Pass	
Spike - % Recovery					· I				
•				Result 1					
Phosphorous reactive (P)	M12-Fe05196	CP	%	98			70-130	Pass	
Spike - % Recovery				1	<u> </u>				
				Result 1					
Phosphate total (P)	M12-Fe05199	CP	%	105			70-130	Pass	
Duplicate				1	<u> </u>				
				Result 1	Result 2	RPD			
Acidity as CaCO3	M12-Fe05193	CP	mg/L	71	74	4.0	30%	Pass	
Chloride	M12-Fe05193	CP	mg/L	150	150	1.8	30%	Pass	
Nitrate & Nitrite (N)	M12-Fe05298	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Nitrate (as N)	M12-Fe05298	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Nitrite (as N)	M12-Fe05298	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Phosphorous reactive (P)	M12-Fe05193	CP	mg/L	< 0.05	< 0.05	6.0	30%	Pass	
Sulphate (as SO4)	M12-Fe05193	CP	mg/L	570	560	<1	30%	Pass	
Suspended Solids	M12-Fe05590	NCP	mg/L	42	45	6.0	30%	Pass	
Duplicate									
Alkalinity				Result 1	Result 2	RPD	1		
Total Alkalinity as CaCO3	M12-Fe05193	CP	mg/L	3800	3700	5.0	30%	Pass	· · · · · · · · · · · · · · · · · · ·
Duplicate		0.	g/ =		0.00	0.0	0070		
Heavy Metals				Result 1	Result 2	RPD	1		
Aluminium	M12-Fe06158	NCP	mg/L	0.17	0.17	<1	30%	Pass	· · · · · · · · · · · · · · · · · · ·
Iron	M12-Fe06158	NCP	mg/L	0.94	0.94	<1	30%	Pass	
Nickel (filtered)	M12-Fe05700	NCP	mg/L	0.027	0.027	3.0	30%	Pass	
Arsenic (filtered)	M12-Fe05700	NCP	mg/L	0.0057	0.0052	9.0	30%	Pass	
Cadmium (filtered)	M12-Fe05700	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	M12-Fe05700	NCP	mg/L	0.012	0.013	8.0	30%	Pass	+
Copper (filtered)	M12-Fe05700	NCP	mg/L	0.0012	0.0014	<1	30%	Pass	
Selenium (filtered)	M12-Fe05700	NCP	mg/L	0.0014	0.0014	1.0	30%	Pass	+
Zinc (filtered)	M12-Fe05700	NCP	mg/L	0.0023	0.0026	12	30%	Pass	+
Iron (filtered)	M12-Fe05700	NCP	mg/L	0.0023	0.0020	4.0	30%	Pass	+
Manganese (filtered)	M12-Fe05700	NCP	mg/L	0.38	0.38	2.0	30%	Pass	
Aluminium (filtered)	M12-Fe05700	NCP	mg/L	< 0.05	< 0.05	7.0	30%	Pass	+
Duplicate	1012-1 603700		ing/∟	< 0.05	< 0.05	7.0	5070	1 0 3 3	l
Dapiloato				Result 1	Result 2	RPD			
Chloride	M12-Fe05196	СР	mg/L	31	30	6.0	30%	Pass	
Phosphorous reactive (P)	M12-Fe05196	CP		< 0.05	< 0.05	0.0 <1	30%	Pass	+
Sulphate (as SO4)	M12-Fe05196	CP CP	mg/L	< 0.05 160	< 0.05	<1	30%	Pass	
Duplicate	IVI12-Fe03196	67	mg/L	100	100	<1	30%	r'ass	
Duplicate				Pocult 4	Recult 0	000			
Dhoonhoto total (D)			m ~ //	Result 1	Result 2	RPD	200/	Bass	
Phosphate total (P)	M12-Fe05199	CP	mg/L	< 0.05	< 0.05	28	30%	Pass	



Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Natalie Krasselt Huong Le Mary Makarios Client Services Senior Analyst-Inorganic (VIC) Senior Analyst-Metal (VIC)

Mohurfth. **Michael Wright**

National Technical Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.



Part of the Envirolab Group

16 - 18 Hayden Court, Myaree, Western Australia 6154 PO Box 4023 Myaree BC, Western Australia 6960 Tel: +61 8 9317 2505 / Fax: +61 8 9317 4163 email: laboratory@mpl.com.au www.envirolabservices.com.au Envirolab Services (WA) Pty Ltd ABN 53 140 099 207

CERTIFICATE OF ANALYSIS 119089

Client: 360 Environmental PO Box 14 West Perth WA 6872

Attention: Niamh Hade

Sample log in details:

Your Reference: No. of samples: Date samples received: Date completed instructions received: Location:

SWA043

1 x Water 7/02/12 7/02/12 Pike Road LWMS - NH

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices. *Please refer to the last page of this report for any comments relating to the results.*

Report Details: Date results requested by: 14/02/12 Date of Preliminary Report: Not issued Issue Date: 14/02/12 NATA accreditation number 2901. This document shall not be reproduced except in full. Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Results Approved By:

Todd Lee

Laboratory Manager

MPL Reference: Revision No:



Client Reference: SWA043

· · ·		
Miscellaneous Inorganics		
Our Reference:	UNITS	119089-1
Your Reference		QC2
Date Sampled		7/02/2012
Type of sample		Water
Date prepared	-	9/2/12
Date analysed	-	9/2/12
Acidity as CaCO ₃	mg/L	6
Total Alkalinity as CaCO3	mg/L	420
Total Suspended Solids @ 103-105 ⁰ C	mg/L	1,800
Chloride in water	mg/L	30
Sulphate in water	mg/L	150

MPL Reference: Revision No:



SWA043

Dissolved Metals in Water		
Our Reference:	UNITS	119089-1
Your Reference		QC2
Date Sampled		7/02/2012
Type of sample		Water
Date prepared	-	9/2/12
Date analysed	-	9/2/12
Arsenic	mg/L	<0.03
Cadmium	mg/L	<0.002
Chromium	mg/L	<0.005
Copper	mg/L	<0.005
Nickel	mg/L	<0.005
Zinc	mg/L	<0.01
Manganese	mg/L	0.005
Aluminium	mg/L	<0.02
Selenium	mg/L	<0.02
Iron	mg/L	<0.02



SWA043

í		
Total Metals in water		
Our Reference:	UNITS	119089-1
Your Reference		QC2
Date Sampled		7/02/2012
Type of sample		Water
Date prepared	-	10/2/12
Date analysed	-	10/2/12
Aluminium - Total	mg/L	1.0
Iron - Total	mg/L	1.5

MPL Reference: Revision No:



SWA043

Nutrients in Water		
Our Reference:	UNITS	119089-1
Your Reference		QC2
Date Sampled		7/02/2012
Type of sample		Water
NOx as N	mg/L	0.13
Nitrate as N	mg/L	0.13
Nitrite as N	mg/L	<0.005
Total Phosphorus (Total P)	mg/L	0.46
Phosphate as P	mg/L	<0.005



Client Reference: SWA043

MethodID	Methodology Summary
INORG-006	Alkalinity - determined titrimetrically in accordance with APHA 21st ED, 2320 B.
INORG-019	Suspended Solids - determined gravimetrically by filtration of the sample, in accordance with APHA 21st ED, 2540 D.
INORG-081	Chloride by Ion Exchange Chromatography in accordance with APHA 21st ED 4110B.
INORG-081	Sulphate by Ion Exchange Chromatography in accordance with APHA 21st ED 4110B.
METALS-020	Metals in soil and water by ICP-OES.
INORG-055	NOx by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.
INORG-055	Nitrate by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.
INORG-055	Nitrite by colourimetric analysis in accordance with APHA 21st ED 4500-NO2 B.
INORG-060	Total Phosphorus by colourimetric analysis in accordance with APHA 21st ED 4500-P J.
INORG-060	Phosphate by colourimetric analysis in accordance with APHA 21st ED 4500-P E.

MPL Reference: Revision No:



Client Reference: SWA043										
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike %		
Miscellaneous Inorganics						Base II Duplicate II % RPD		Recovery		
Date prepared	-			9/2/12	119089-1	9/2/12 9/2/12	LCS	9/2/12		
Date analysed	-			9/2/12	119089-1	9/2/12 9/2/12	LCS	9/2/12		
Acidity as CaCO ₃	mg/L	1	INORG-006	<1	119089-1	6 6 RPD:0	LCS	102%		
Total Alkalinity as CaCO3	mg/L	1	INORG-006	<1	119089-1	420 [N/T]	LCS	95%		
Total Suspended Solids @ 103-105 ⁰ C	mg/L	1	INORG-019	<1	119089-1	1800 [N/T]	LCS	88%		
Chloride in water	mg/L	1	INORG-081	<1	119089-1	30 [N/T]	LCS	103%		
Sulphate in water	mg/L	1	INORG-081	<1	119089-1	150 [N/T]	LCS	103%		
QUALITY CONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike %		
Dissolved Metals in Water						Base II Duplicate II % RPD		Recovery		
Date prepared	-			9/2/12	[NT]	[NT]	LCS	9/2/12		
Date analysed	-			9/2/12	[NT]	[NT]	LCS	9/2/12		
Arsenic	mg/L	0.03	METALS- 020	<0.03	[NT]	[NT]	LCS	97%		
Cadmium	mg/L	0.002	METALS- 020	<0.002	[NT]	[NT]	LCS	105%		
Chromium	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS	100%		
Copper	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS	98%		
Nickel	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS	101%		
Zinc	mg/L	0.01	METALS- 020	<0.01	[NT]	[NT]	LCS	90%		
Manganese	mg/L	0.005	METALS- 020	<0.005	[NT]	[NT]	LCS	102%		
Aluminium	mg/L	0.02	METALS- 020	<0.02	[NT]	[NT]	LCS	107%		
Selenium	mg/L	0.02	METALS- 020	<0.02	[NT]	[NT]	LCS	99%		
Iron	mg/L	0.02	METALS- 020	<0.02	[NT]	[NT]	LCS	111%		



Client Reference: SWA043								
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike %
Total Metals in water						Base II Duplicate II % RPD		Recovery
Date prepared	-			10/2/12	[NT]	[NT]	LCS	10/2/12
Date analysed	-			10/2/12	[NT]	[NT]	LCS	10/2/12
Aluminium - Total	mg/L	0.02	METALS- 020	<0.02	[NT]	[T/]	LCS	110%
Iron - Total	mg/L	0.02	METALS- 020	<0.02	[NT]	[ТИ]	LCS	109%
QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	Spike Sm#	Spike % Recovery
Nutrients in Water					ļ	Base II Duplicate II % RPD		
NOx as N	mg/L	0.005	INORG-055	<0.005	[NT]	[NT]	LCS	107%
Total Phosphorus (Total P)	mg/L	0.01	INORG-060	<0.01	[NT]	[T/]	LCS	99%
Phosphate as P	mg/L	0.005	INORG-060	<0.005	[NT]	[NT]	LCS	94%

MPL Reference: Revision No:



Report Comments:

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested NS: Not specified; NEPM: National Environmental Protection Measure

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples. **Duplicate**: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist. LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank

sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. **Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds

which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet of exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable. Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.

MPL Reference: Revision No:





Part of the Envirolab Group

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CERTIFICATE OF ANALYSIS 121029

Client: 360 Environmental PO Box 14 West Perth WA 6872

Attention: Niamh Hade

Sample log in details:

Your Reference: No. of samples: Date samples received: Date completed instructions received: Location:

Pike Road LWMS - NH

6 x Waters 4/4/12 4/4/12

Analysis Details:

Please refer to the following pages for results, methodology summary and quality control data. Samples were analysed as received from the client. Results relate specifically to the samples as received. Results are reported on a dry weight basis for solids and on an as received basis for other matrices. *Please refer to the last page of this report for any comments relating to the results.*

Report Details: Date results requested by: 13/04/12 Date of Preliminary Report: Not issued Issue Date: 12/04/12 NATA accreditation number 2901. This document shall not be reproduced except in full. Accredited for compliance with ISO/IEC 17025. Tests not covered by NATA are denoted with *.

Results Approved By:

Joshua Lim Operations Supervisor

MPL Reference: Revision No:



Client Reference: Pike Road LWMS - NH

Nutrients in Water						
Our Reference:	UNITS	121029-1	121029-2	121029-3	121029-4	121029-5
Your Reference		MW2	MW4	MW5	MVV1	QC1
Date Sampled		4/04/2012	4/04/2012	4/04/2012	4/04/2012	4/04/2012
Type of sample		Water	Water	Water	Water	Water
Total Nitrogen (Total N)	mg/L	18	0.3	0.5	1.8	0.5
	0					
Nitrate as N	mg/L	15	0.006	<0.005	0.95	<0.005
	Ŭ	15 0.088	0.006 <0.005	<0.005 <0.005	0.95 0.012	<0.005 <0.005

Nutrients in Water		
Our Reference:	UNITS	121029-6
Your Reference		QC3
Date Sampled		4/04/2012
Type of sample		Water
Total Nitrogen (Total N)	mg/L	0.1
Total Nitrogen (Total N) Nitrate as N	mg/L mg/L	0.1 <0.005
Č ()		



Client Reference: Pike Road LWMS - NH

MethodID	Methodology Summary
INORG-055	Total Nitrogen by colourimetric analysis in accordance with APHA 4500-P J, 4500-NO3 F.
INORG-055	Nitrate by colourimetric analysis and calculation in accordance with APHA 21st ED 4500-NO3 F.
INORG-055	Nitrite by colourimetric analysis in accordance with APHA 21st ED 4500-NO2 B.
INORG-057	Ammonia by colourimetric analysis in accordance with APHA 21st ED 4500-NH3 F.

MPL Reference: Revision No:



Client Reference:

Pike Road LWMS - NH

QUALITYCONTROL	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results	1 '	Spike % Recovery
Nutrients in Water						Base II Duplicate II % RPD		
Total Nitrogen (Total N)	mg/L	0.1	INORG-055	<0.1	[NT]	[NT]	LCS	118%
Ammonia as N	mg/L	0.005	INORG-057	<0.005	[NT]	[NT]	LCS	116%

MPL Reference: Revision No:



Report Comments:

INS: Insufficient sample for this test; NT: Not tested; PQL: Practical Quantitation Limit; <: Less than; >: Greater than RPD: Relative Percent Difference; NA: Test not required; LCS: Laboratory Control Sample; NR: Not requested NS: Not specified; NEPM: National Environmental Protection Measure

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sand or water) fortified with analytes representative of the analyte class. It is simply a check sample. **Surrogate Spike:** Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds

which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however were analysed at a frequency to meet of exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD a matrix spike recoveries for the sample batch were within laboratory acceptance criteria.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable. Matrix Spike and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and Speciated Phenols is acceptable. Surrogates: 60-140% is acceptable for general organics and 10-140% for SVOC and Speciated Phenols.

MPL Reference: Revision No:





360 ENVIRONMENTAL PO BOX 141 ALTONA ST WEST PERTH W.A 6872

Attention: Niamh Hade

Report Client Reference Received Date 333122-W PIKE ROAD LWMS - NH SWA043 Apr 10, 2012

Client Sample ID QC2 Sample Matrix Water mgt-LabMark Sample No. M12-Ap04445 Date Sampled Apr 04, 2012 LOR Test/Reference Unit Ammonia(N) 0.01 0.04 mg/L Nitrate (as N) 0.02 < 0.02 mg/L Nitrite (as N) 0.02 mg/L < 0.02 Total Nitrogen (as N) Total Nitrogen (N) 0.2 mg/L 0.3

Certificate of Analysis



NATA Accredited Accreditation Number 1261 Site Number 1254

Accredited for compliance with ISO/IEC 17025. The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.



Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description Ammonia(N) - Method: APHA 4500-NH3 Ammonia Nitrogen by FIA	Testing Site Melbourne	Extracted Apr 10, 2012	Holding Time 28 Day
Nitrate (as N)	Melbourne	Apr 10, 2012	2 Day
- Method: APHA 4500-NO3 Nitrate Nitrogen by FIA Nitrite (as N)	Melbourne	Apr 10, 2012	2 Day
- Method: APHA 4500-NO2 Nitrite Nitrogen by FIA Total Nitrogen (as N)	Melbourne	Apr 11, 2012	7 Day
- Method: Total Nitrogen (as N)			

© LabMark	ENVIRONMENTAL LABORATORIES

Melbourne 3-5 Kingston Town Close Oakleigh VIC 3166 Phone : +61 3 9564 7055 NATA # 1261 Site # 1254 web : www.mgtlabmark.com.au

e.mail:enviro@mgtlabmark.com.au

Sydney Unit F6, Building F 16 Mars Road Lane Cove West NSW 2066 Phone : +61 2 8215 6222 NATA # 1261 Site # 18217

Brisbane 1/21 Smallwood Place Muraric QLD 4172 Phone: +61 7 3902 4600 NATA # 1261 Site # 20794

Address:	360 Environmental PO BOX 141 ALTONA ST WEST PERTH W.A 6872

PIKE ROAD LWMS - NH Client Job No.:

333122 08 9321 0420 08 9226 0739 Order No.: Report #: Phone: Fax:

Apr 10, 2012 8:39 AM Apr 17, 2012 4:00 PM 5 Day Niamh Hade

Received: Due: Priority: Contact name:

mgt-LabMark Client Manager: Natalie Krasselt

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	Х					Х
	Х					Х
	Х					Х
	Х					Х
					LAB ID	M12-Ap04445
	& 14271				Matrix	Water
s conducted	A Site # 1254	Site # 18217	Site # 20794		Sampling Time	
ere analysis is	oratory - NAT.	atory - NATA S	ratory - NATA	atory	Sample Date	Apr 04, 2012
Laboratory wh	Melbourne Lak	Sydney Labors	Brisbane Labo	External Labor	Sample ID	QC2
	Laboratory where analysis is conducted	4 & 14271 X X X X X		1 54 & 14271 X X X X 54 & 14271 X X X X X 64 & 14271 X X X X X	1&14271 X X X X 1 X X X X	I.8.14271 X X X X X I.8.1427 X X X X X I.8.1427 X X X X X I.8.1427 X X X X X I.8.141 I.8.101 X X X X X

Page 3 of 6 Report Number: 333122-W



mgt-LabMark Internal Quality Control Review

General

- 1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
- 2. All soil results are reported on a dry basis, unless otherwise stated.
- 3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
- 4. Results are uncorrected for matrix spikes or surrogate recoveries.
- 5. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
- 6. Samples were analysed on an 'as received' basis.
- 7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001)

For samples received on the last day of holding time, notification of testing requirements should have been received at least

6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control. **NOTE: pH duplicates are reported as a range NOT as an RPD

UNITS mg/kg:milligrams per Kilogram µg/L:micrograms per litre ppb:Parts per billion

org/100mL:Organisms per 100 millilitres

mg/L:milligrams per litre ppm:Parts per million %:Percentage NTU:Nephelometric Turbidity Units

MPN/100mL:Most Probable Number of organisms per 100 milliltres

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit Of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands.
	In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the client's batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the client's batch of samples but run within the laboratory batch of analysis.
USEPA:	U.S Environmental Protection Agency
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain Of Custody
SRA:	Sample Receipt Advice
CP:	Client Parent - QC was performed on samples pertaining to this report
NCP:	Non-Client Parent - QC was performed on samples not pertaining to this report, however QC is representative of the sequence or batch that client samples were analysed within

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

- 1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
- 2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
- 3. Organochlorine Pesticide analysis where reporting LCS data, Toxophene & Chlordane are not added to the LCS.
- 4. Organochlorine Pesticide analysis where reporting Spike data, Toxophene is not added to the Spike.
- 5. Total Recoverable Hydrocarbons where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
- 6. pH and Free Chlorine analysed in the laboratory Analysis on this test must begin within 30 minutes of sampling. Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt
- 7. Recovery Data (Spikes & Surrogates) where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
- 8. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
- 9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample>
- 10. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

S LabMark ENVIRONMENTAL LABORATORIES

Quality Control Results

	Test		Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Ammonia(N)			mg/L	< 0.01			0.01	Pass	
Nitrate (as N)			mg/L	< 0.02			0.02	Pass	
Nitrite (as N)			mg/L	< 0.02			0.02	Pass	
LCS - % Recovery					1				
Ammonia(N)			%	99			70-130	Pass	
Nitrate (as N)			%	99			70-130	Pass	
Nitrite (as N)			%	101			70-130	Pass	
Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery	I	1		1	1				
				Result 1					
Ammonia(N)	M12-Ap05131	NCP	%	99			70-130	Pass	
Nitrate (as N)	M12-Ap05131	NCP	%	101			70-130	Pass	
Nitrite (as N)	M12-Ap05131	NCP	%	102			70-130	Pass	
Duplicate					•				
				Result 1	Result 2	RPD			
Ammonia(N)	M12-Ap05131	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Nitrate (as N)	M12-Ap05131	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Nitrite (as N)	M12-Ap05131	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	



Client Services

Senior Analyst-Inorganic (VIC)

Comments

Sample Integrity	
Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Natalie Krasselt Huong Le

low fth.

Michael Wright National Technical Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

mgt-LabMark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-LabMark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated othenwise, the tests were performed on the samples as received.



APPENDIX B

SEWPAC Protected Matters Tool Search Results



Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

Report created: 26/09/13 18:58:33

Summary Details Matters of NES Other Matters Protected by the EPBC Act Extra Information Caveat Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the <u>Administrative Guidelines on Significance</u>.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	16
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As <u>heritage values</u> of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A <u>permit</u> may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	8
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	3
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	36
Nationally Important Wetlands:	None
<u>Key Ecological Features (Marine)</u>	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (RAMSAR)	[Resource Information]
Name	Proximity
Becher point wetlands	Within 10km of Ramsar

Listed Threatened Ecological Communities		[Resource Information]	
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.			
Name	Status	Type of Presence	
<u>Sedgelands in Holocene dune swales of the</u> southern Swan Coastal Plain	Endangered	Community known to occur within area	
Listed Threatened Species		[Resource Information]	
Name	Status	Type of Presence	
Birds			
Calyptorhynchus banksii naso			
Forest Red-tailed Black-Cockatoo [67034]	Vulnerable	Species or species habitat may occur within area	
Calyptorhynchus baudinii			
Baudin's Black-Cockatoo, Long-billed Black- Cockatoo [769]	Vulnerable	Species or species habitat likely to occur within area	
Calyptorhynchus latirostris			
Carnaby's Black-Cockatoo, Short-billed Black- Cockatoo [59523]	Endangered	Breeding likely to occur within area	
	Vulnerable	Species or species	
	Vullerable	habitat may occur within area	
	Endangered	Species or species	
	Endangorod	habitat may occur within area	
Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	
Mammals			
Bettongia penicillata ogilbyi			
Woylie [66844]	Endangered	Species or species habitat may occur within area	
Bettongia penicillata ogilbyi	Vulnerable Endangered Vulnerable Endangered	area Species or species habitat may occur within area Species or species habitat known to occur within area Species or species habitat may occur within	

Name	Status	Type of Presence
Dasyurus geoffroii Chuditch, Western Quoll [330] Pseudocheirus occidentalis	Vulnerable	Species or species habitat likely to occur within area
Western Ringtail Possum [25911]	Vulnerable	Species or species habitat likely to occur within area
Quokka [229]	Vulnerable	Species or species habitat may occur within area
Plants		
<u>Caladenia huegelii</u> King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
<u>Centrolepis caespitosa</u> [6393]	Endangered	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950] Drakaea elastica	Endangered	Species or species habitat may occur within area
Glossy-leafed Hammer-orchid, Praying Virgin [16753]	Endangered	Species or species habitat likely to occur within area
<u>Drakaea micrantha</u> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species * Species is listed under a different scientific name on	the EPBC Act - Threatened	[Resource Information] I Species list.
Name Migratory Marine Birds	Threatened	Type of Presence
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Sterna dougallii Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Migratory Terrestrial Species <u>Haliaeetus leucogaster</u>		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species Ardea alba		
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Cattle Egret [59542]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat may occur within

area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific nam		
Name	Threatened	Type of Presence
Birds		
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Great Egret, White Egret [59541]		Species or species habitat known to occur within area
<u>Ardea ibis</u>		
Cattle Egret [59542]		Species or species habitat likely to occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna dougallii		
Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area

Extra Information

Places on the RNE		[Resource Information]
Note that not all Indigenous sites may be listed.		
Name	State	Status
Natural		
Baldivis Swamp	WA	Indicative Place
Tamworth Hill Swamp	WA	Indicative Place
Lakes Cooloongup and Walyungup and Surrounds	WA	Registered
Invasive Species		[Resource Information]
Weeds reported here are the 20 species of national signal plants that are considered by the States and Territories biodiversity. The following feral animals are reported: 0 and Cane Toad. Maps from Landscape Health Project 2001.	s to pose a particularly sig Goat, Red Fox, Cat, Rabbi , National Land and Water	with other introduced nificant threat to t, Pig, Water Buffalo Resouces Audit,
Name	Status	Type of Presence
Birds Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species
Anas platyrhynchos		habitat likely to occur within area
Mallard [974]		Species or species
		habitat likely to occur within area
Carduelis carduelis		0
European Goldfinch [403]		Species or species habitat likely to occur within area
<u>Columba livia</u> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species
		habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species
		habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species
		habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Spacios ar spacios
		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species
Sturnus vulgaris		habitat likely to occur within area
Common Starling [389]		Species or species
Turdus merula		habitat likely to occur within area
Common Blackbird, Eurasian Blackbird [596]		Species or species
		habitat likely to occur within area
Mammals Bos taurus		
Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species
		habitat likely to occur within area

within area

Name <u>Felis catus</u> Cat, House Cat, Domestic Cat [19]

Funambulus pennantii

Northern Palm Squirrel, Five-striped Palm Squirrel [129]

Mus musculus House Mouse [120]

<u>Oryctolagus cuniculus</u> Rabbit, European Rabbit [128]

Rattus norvegicus Brown Rat, Norway Rat [83]

Rattus rattus Black Rat, Ship Rat [84]

Vulpes vulpes Red Fox, Fox [18]

Plants

Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]

Brachiaria mutica Para Grass [5879]

<u>Cenchrus ciliaris</u> Buffel-grass, Black Buffel-grass [20213]

<u>Chrysanthemoides monilifera</u> Bitou Bush, Boneseed [18983]

Chrysanthemoides monilifera subsp. monilifera

Boneseed [16905]

Genista linifolia

Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]

<u>Genista sp. X Genista monspessulana</u> Broom [67538]

Lantana camara

Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Lycium ferocissimum African Boxthorn, Boxthorn [19235]

<u>Olea europaea</u> Olive, Common Olive [9160]

Opuntia spp. Prickly Pears [82753]

Status

Type of Presence

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

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Species or species habitat may occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat may occur within area

Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Pinus radiata		
Radiata Pine Monterey Pine, Insignis Pine, Wildir Pine [20780]	ng	Species or species habitat may occur within area
Rubus fruticosus aggregate		
Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron	<u>& S.x reichardtii</u>	
Willows except Weeping Willow, Pussy Willow an Sterile Pussy Willow [68497]	nd	Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla		
Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk Athel Tamarix, Desert Tamarisk, Flowering	3	Species or species habitat likely to occur

Cypress, Salt Cedar [16018] Reptiles

Asian House Gecko [1708]

Hemidactylus frenatus

Species or species habitat likely to occur within area

within area

Coordinates

-32.33284 115.79331

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales -Department of Sustainability and Environment, Victoria -Department of Primary Industries, Parks, Water and Environment, Tasmania -Department of Environment and Natural Resources, South Australia -Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts -Environmental and Resource Management, Queensland -Department of Environment and Conservation, Western Australia -Department of the Environment, Climate Change, Energy and Water -Birds Australia -Australian Bird and Bat Banding Scheme -Australian National Wildlife Collection -Natural history museums of Australia -Museum Victoria -Australian Museum -SA Museum -Queensland Museum -Online Zoological Collections of Australian Museums -Queensland Herbarium -National Herbarium of NSW -Royal Botanic Gardens and National Herbarium of Victoria -Tasmanian Herbarium -State Herbarium of South Australia -Northern Territory Herbarium -Western Australian Herbarium -Australian National Herbarium, Atherton and Canberra -University of New England -Ocean Biogeographic Information System -Australian Government, Department of Defence -State Forests of NSW -Geoscience Australia -CSIRO

-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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APPENDIX C

DSEWPaC Decision notification and completed EPBC Referral



Australian Government

Department of Sustainability, Environment, Water, Population and Communities

Notification of

REFERRAL DECISION – not controlled action Residential Development of Part Lot 601 Mandurah Road, Baldivis, Western Australia (EPBC 2013/6871).

This decision is made under Section 75 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

Proposed action

person named in the referral	Australand Holdings Limited
	ACN 008 443 696
proposed action	Clear native vegetation for the residential development on part of Lot 601 Mandurah Road, Baldivis, Western Australia [See EPBC Act referral 2013/6871].
Referral decision: No	t a controlled action
status of proposed action	The proposed action is not a controlled action.
Person authorised to	make decision
Name and position	Barbara Jones Assistant Secretary North, West and Offshore Assessment Branch
signature	A
date of decision	17 June 2013

Referral of proposed action

Project title:

Residential Development of Part Lot 601 Mandurah Road, Baldivis.

1 Summary of proposed action

1.1 Short description

Australand is seeking to develop part of Lot 601 Mandurah Road Baldivis as a residential development. The proposed subdivision will have 78 urban residential lots, a large area of Public Open Space (POS) through the centre of the site and larger lots to the north to maintain the rural interface between the subdivision and existing rural residential lots. The development will result in the clearing of 90 potential breeding trees for Black Cockatoos that greater than 500mm in diameter and the retention of 31 potential breeding trees in Public Open Space. A combined canopy cover of 1.67ha of Good foraging habitat for Black Cockatoos will be cleared and 0.67ha retained.

1.2	Latitude and longitude	The co-ordinates for the	site are from the north-west corner
	_	clockwise around the site.	
		Longitude	Latitude
		115° 47' 31.246"	-32° 19' 50.255"
		115° 47' 43.328"	-32° 19' 50.252"
		115° 47' 43.326"	-32° 19' 59.445"
		115° 47' 34.539"	-32° 19' 59.449"
		115° 47' 35.492"	-32° 19' 58.672"
		115° 47' 35.715"	-32° 19' 58.349"
		115° 47' 36.225"	-32° 19' 56.684"
		115° 47' 36.061"	-32° 19' 56.447"
		115° 47' 33.508"	-32° 19' 55.882"
		115° 47' 32.870"	-32° 19' 55.653"
		115° 47' 32.213"	-32° 19' 55.169"
		115° 47' 31.789"	-32° 19' 54.523"
		115° 47' 31.651"	-32° 19' 53.793"
		115° 47' 31.912"	-32° 19' 52.904"
		115° 47' 31.518"	-32° 19' 52.738"

1.3 Locality and property description

Lot 601 Mandurah Road, Baldivis is located approximately 42km south of the Perth central Business District and 8km south-east of Rockingham (Figure 1).

1.4 **Size of the development** footprint or work area (hectares) The total referral area of the development is 7.49ha (Figure 2).

1.5 Street address of the site Lot 601 Mandurah Road, West Baldivis, Western Australia

1.6 Lot description

Lot 601 Mandurah Road, Baldivis, Western Australia, being part of Lot 601 on Deposited Plan 300803 in Certificate of Title Volume 1654 Folio 895

1.7 Local Government Area and Council contact (if known)

The referral area is in the City of Rockingham. The City's contact for this project is Tristan Fernandez – Senior Strategic Planning Officer.

1.8 Time frame

It is anticipated that development will commence in late 2014 with development being undertaken over 4 years.

1.9			No	
	action		Yes, you must also complete section 2.2	
1.10	Alternative time frames etc	х	No	
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).	
1.11	State assessment		No	
		х	Yes, you must also complete Section 2.5	
1.12	Component of larger action		No	
		х	Yes, you must also complete Section 2.7	
1.13	Related actions/proposals	х	No	
			Yes, provide details:	
1.14	Australian Government	х	No	
	funding		Yes, provide details:	
1.15	Great Barrier Reef Marine Park	X	No Yes, you must also complete Section 3.1 (h), 3.2 (e)	

2 Detailed description of proposed action

2.1 Description of proposed action

The site is part of the Baldivis Urban Expansion Area that has been designated to accommodate the growing population in the Perth Metropolitan Region. The site has been identified in this process as urbanisation of the area fits with planned and existing networks and centres.

The proposed subdivision will have 78 urban residential lots. There is a large area of Public Open Space through the centre of the site and larger lots to the north to maintain the rural interface between the subdivision and existing rural residential lots (Attachment 1).

2.2 Alternatives to taking the proposed action

There are no alternatives to taking the proposed action as the land is zoned Urban Deferred in the Perth Metropolitan Region Scheme (MRS).

2.3 Alternative locations, time frames or activities that form part of the referred action

There are no alternative locations, time frames or activities that form part of the referred action.

2.4 Context, planning framework and state/local government requirements

Lot 601 is zoned Rural under the City of Rockingham Town Planning Scheme. The majority is zoned Urban Deferred and a small area in the north and the south-west of the referral area is zoned Rural under the Perth MRS (Figure 4).

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

Lot 601 Mandurah Road was part of an application initiated by the City of Rockingham to amend the MRS (MRS Amendment 1130/41 Baldivis Urban Area Expansion – Area 4) in 2007 (Attachment 2). The amendment was part of the broader planning for urban development in the Baldivis region. The part of Lot 601 Mandurah Road that is the subject of this referral was part of Area 4 within the amendment. A Scheme Amendment is required to be referred to the Environmental Protection Authority (EPA) under Section 48 of the Western Australian *Environmental Protection Act, 1986.* The assessment by the EPA runs concurrently with the Planning process.

The EPA assessed the rezoning as Scheme Amendment Not Assessed – Advice Given Under Section 48a(1)(A) of the *Environmental Protection Act, 1986* (EP Act) (Attachment 2). The advice from the EPA cited vegetation and flora and contamination as the environmental issues pertinent to the site. The advice for Vegetation and Flora states:

Aerial photography of the site indicates the subject land is sparsely vegetated. All native vegetation should be preserved so far as practicable during and after site clearing works and services to accommodate the proposed subsequent urban development. Measures should be taken to ensure the identification, protection and management of any significant vegetation on site worthy of retention prior to the commencement of site works.

The advice on contamination requires the developer to conduct investigations into possible sources of contamination (Attachment 2).

2.6 Public consultation (including with Indigenous stakeholders)

MRS Amendment 1130/41 that included the referral area to rezone the amendment area from Rural to Urban Deferred was advertised for public comment in 2007. Thirteen submissions on the

amendment were received - 2 contained support, 3 objected and 8 submissions contained a neutral comment only (Attachment 3).

2.7 A staged development or component of a larger project

The part of Lot 601 Mandurah Road that forms this referral is a section of a larger subdivision plan that is being developed for the Baldivis Urban Expansion Area 4. The areas outside of the referral area are almost completely cleared. Australand will be undertaking the subdivision of lots 335 and 1001 in conjunction with the referred portion of Lot 601. The combined area of 26.4 hectares is currently forecast to be developed in six stages over a four year period, commencing in late 2014.

Lots 1 and 2, shown on Attachment 1, that are not part of this referral are not owner or contracted by Australand. The development of the portions of lots 1 and 2 is outside the control of Australand and will be determined by the owners of each of these parcels.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

3.1 (a) World Heritage Properties

Description

The site does not contain any World Heritage Properties

Nature and extent of likely impact

Not Applicable

3.1 (b) National Heritage Places

Description

The Protected Matter Search Tool Report (Attachment 4) listed Baldivis Swamp and Tamworth Hill Swamp as Indicative Places on the Register of National Estate (RNE). Indicative Places on the RNE are defined by SEWPaC as:

Data provided to or obtained by the Australian Heritage Council or the former Australian Heritage Commission was entered into the RNE database however a decision on whether the place should be entered in the RNE itself was not made before the RNE was closed in 2007 (SEWPaC, 2013c).

The site Lakes Cooloongup and Walyungup and Surrounds was registered on the RNE for which SEWPaC applies the following:

The place was entered in the RNE prior to its closure in 2007. The existence of an entry for a place in the RNE does not in itself create a requirement to protect the place under Commonwealth law. Nevertheless, information in the register may continue to be current and may be relevant to statutory decisions about protection (SEWPaC, 2013c).

The Register of the National Estate was closed in 2007 and is no longer a statutory list and these sites have not been transferred to the National Heritage List or the Commonwealth Heritage List as recognised by the EPBC Act.

Therefore there are no National Heritage Places present or near the site.

Nature and extent of likely impact

Not Applicable

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

The nearest RAMSAR listed wetland is the Becher Point Wetlands which are approximately 7km to the south-west (Figure 3).

Nature and extent of likely impact

Groundwater contours in the Perth Groundwater Atlas (DoW, 2013a) show groundwater flows to the

west from the site and therefore to the north of the Becher Point Wetlands.

There are no direct or indirect surface water flows between the site and the RAMSAR site. In the proposed development stormwater will be retained and infiltrated on-site up to and including the 1 in 100 ARI.

Therefore the proposed development of the Referral Area will not impact on the Becher Point Wetlands.

3.1 (d) Listed threatened species and ecological communities

Description

Threatened Species

The Department of Sustainability, Environment, Water, Population and Communities (SEWPaC, 2013a) online EPBC Act Protected Matters search tool (Attachment 4) identified 19 Threatened Species of bird, insects, mammals, plants and reptiles as potentially occurring in the Referral Area.

Five terms for the likelihood of occurrence of species and communities are used and are defined as follows:

Known – the species was or has been observed on the site
Likely – medium to high probability that a species uses the site
Potential – suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
Unlikely – a very low to low probability that a species uses the site
No – habitat on site and in the vicinity is unsuitable for the species.

Table 1 lists the species that were identified in the Protected Matters Search Tool report potentially are present on the site and their likelihood of being present on the site.

Table 1: Threatened Species Identified in the Protected Matters Search Tool Report which are Potentially Present in the Referral Area

Species Name	Common Name	EPBC Status	Likelihood of Occurrence			
Birds						
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Vulnerable	Known			
Calyptorhynchus baudinii	Baudin's Black Cockatoo	Vulnerable	Potentially			
Calyptorhynchus latirostris	Carnaby's Black Cockatoo	Endangered	Known			
Mammals						
Dasyurus geoffroii	Chuditch, Western Quoll	Vulnerable	Unlikely			

Therefore pursuant to Section 18 and 18A of the EPBC Act *Calyptorhynchus banksii naso* (Forest Redtailed Black-Cockatoo), *Calyptorhynchus baudinii* (Baudin's Black Cockatoo) and *Calyptorhynchus latirostris* (Carnaby's Black Cockatoo) could potentially be impacted by the proposed development.

Chuditch, Western Quoll (*Dasyurus geoffroil*) is found in Jarrah forest and mixed Karri - Marri - Jarrah forest of south-west WA and creates dens in hollow logs or burrows and have also been recorded in tree hollows and cavities (SEWPaC, 2013b). The lack of understorey and disturbed nature of the site means it is unlikely the Chuditch occurs on the site. There is also a lack of other individuals recently being recorded in the vicinity.

The Referral area does not contain suitable habitat for the remaining threatened species listed on the Protected Matters Search Tool. The reasons for these conclusions are in Table 2.

Table 2: Threatened Species Identified Protected Matters Search Tool Report that WouldNot be Present in the Referral Area

Species Name	Common Name	Reason species is not considered to be in the referral area
Birds		
Botaurus poiciloptilus	Australasian Bittern	The Australasian Bittern occurs mainly in densely vegetated freshwater wetlands and, rarely, in estuaries or tidal wetlands (SEWPaC, 2013b). There is not suitable habitat on the site.
Leipoa ocellata	Malleefowl	Malleefowl are largely confined to arid and semi-arid woodland that is dominated by mallee eucalypts (DEC, 2013a) which are not present on the site.
Rostratula australis	Australian Painted Snipe	Australian Painted Snipe is a stocky wading bird that generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (SEWPaC, 2013b). There is no suitable habitat on the site.
Sternula nereis nereis	Fairy Tern (Australian)	This bird feeds on fish and there are no water- bodies present on the site (SEWPaC, 2013b).
Insects		
Synemon gratiosa	Graceful Sun Moth	<i>Lomandra hermaphrodita</i> and <i>L. maritima</i> (the two species of plant that is habitat for the Graceful Sun-Moth) (Bishop <i>et al.</i> 2011) are not likely to be present on the site as the understorey is no longer intact.
Mammals		
Bettongia penicillata ogilbyi	Woylie	The Woylie is a small marsupial that during the day shelters under patches of dense undergrowth, logs and rock-cavities and occasionally in burrows (SEWPaC, 2013b). The site is parkland cleared and does not provide habitat that is likely to sustain this species.
Phascogale calura	Red-tailed Phascogale	The red-tailed phascogale inhabits Wandoo (<i>Eucalyptus wandoo</i>) and Sheoak (<i>Allocasuarina</i> <i>huegeliana</i>) woodland associations (DEC, 2013a). These vegetation types are not present on the site.
Pseudocheirus occidentalis	Western Ringtail Possum	Western Ringtail Possums occur in and near coastal Peppermint Tree (<i>Agonis flexuosa</i>) forest and Tuart (<i>Eucalyptus gomphocephala</i>) dominated forest with a Peppermint Tree understorey (SEWPaC, 2013b). There are no peppermint trees on the site therefore this species would not be present.
Setonix brachyurus	Quokka	The Quokka has not been recently recorded on mainland Western Australia and is considered to be locally extinct (DEC, 2013a).

Species Name	Common Name	Reason species is not considered to be in the referral area
Plants		
Cladenia huegelii	King (Grand) Spider Orchid	The King Spider-orchid grows in well-drained, deep sandy soils in low mixed woodlands of Banksia, Western Sheoak and Jarrah with lush undergrowth (SEWPaC, 2013b). The site is degraded and has been parkland cleared and this species is not likely to be present.
Centrolepis caespitosa		This species grows in salt flats and wet areas (DEC, 2013b) which are not present on the site.
Diuris micrantha	Dwarf Bee Orchid	This species is found on dark, grey to blackish, sandy clay-loam substrates in winter wet depressions or swamps (DEWHA, 2008) of which there are on the site.
Diuris purdeii	Purdie's Donkey Orchid	This species prefers grey-black sand and grows in moist winter-wet swamps (DEC, 2013b) therefore there is no suitable habitat on the site.
Drakaea elastica	Glossy-leaved Hammer Orchid	Low-lying situations adjoining winter-wet swamps and this species does not survive in disturbed areas (DEC, 2013b) and the site has no swamps and is disturbed.
Drakaea micrantha	Dwarf Hammer- orchid	The Dwarf Hammer-orchid is usually found on cleared firebreaks or open sandy patches that have been disturbed, where competition from other plants has been removed (SEWPaC, 2013b). The site is weedy and the competition from these species indicates it would be highly unlikely this species occurred on the site

Threatened Ecological Communities

The Threatened Ecological Community (TEC) Sedgelands in *Holocene dune swales of the southern Swan Coastal Plain* was identified as occurring near the site on the Protected Mattes Search Tool report (Attachment 4). This TEC occurs to the west of the site on low lying dune swales (SEWPaC, 2013b). There are no Threatened Ecological Communities listed under the EPBC Act occurring on the site.

Nature and extent of likely impact

The site has been the subject of a Black Cockatoo Significant Tree Survey – Lot 601, Baldivis undertaken by 360 Environmental (Attachment 5). The site contains parkland cleared vegetation with an overstorey of trees over pasture. Development on the site in accordance with the proposed subdivision will result in clearing a number of trees as shown in Table 3 and Figure 5.

DBH	Medium: 500mm – 800mm		Large: 800mm – 1200mm		Extra Large: >1200mm		Total
Species	Cleared	Retained	Cleared	Retained	Cleared	Retained	
Tuart	11	1	18	11	33	16	90
Jarrah	5	0	5	1	9	2	22
Marri	2	0	4	0	3	0	9
Banksia	2	0	0	0	0	0	2
Sheoak	3	1	4	1	1	1	11
STAG*	1	0	4	1	4	0	10
Total	24	2	35	14	50	19	144

Table 3 Number of Trees on the Site

*STAG are Standing Dead Trees.

Development of the Referral area will involve the following impact on Black Cockatoos:

- The clearing of up to 90 trees with a diameter greater than 500mm (Marri, Jarrah and Tuart) from Completely Degraded vegetation (potential breeding and foraging).
- The clearing of 9 Standing Dead Trees.
- The clearing of 2 Banksia trees with a diameter greater than 500mm (Foraging).
- The clearing of 8 Sheoaks with a diameter greater than 500mm (Foraging).
- The retention of at least 31 individual trees with a diameter greater than 500mm (Jarrah and Tuart) and 1 STAG within Public Open Space.
- The retention of 3 Sheoaks in Public Open Space.

The level of significance of the potential impact on Black Cockatoo species is assessed below using the *EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species (Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tail Black Cockatoo)* (SEWPAC, 2011) which are referred below as the Black Cockatoo Referral Guidelines.

Foraging

According to Table 3 in the Black Cockatoo Referral Guidelines the clearing of more than 1ha of quality foraging habitat has a high risk of causing a significant impact. Degradation of more than 1ha of habitat by such things as altered hydrology or fire regimes has an uncertain risk. The significance of degradation depends on the type of degradation and the quality of the habitat.

The Black Cockatoo Significant Tree Survey reports an opportunistic sighting of evidence of foraging on the site in the northern part of the referral area (Attachment 5).

The site contains mostly of Tuart (*Eucalyptus gomphocephala*) with scattered Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*). There are small isolated areas of Banksia (*Banksia*)

attenuata) and Sheoak (*Allocasuarina fraseriana*) (Attachment 5). These species are considered to be foraging habitat for Black Cockatoos (Johnstone and Kirkby, 2012). As the site is parkland cleared, to determine the area of foraging habitat is to be cleared the area of canopy cover was determined from aerial photography (Figure 5). The canopy measured on the referral area has:

- 2.34ha in total of canopy cover;
- 1.67ha in that will be cleared for development; and
- 0.67ha in the Public Open Space area that will be retained.

The Draft Referral Guidelines do not specify what constitutes 'quality' foraging habitat apart from stating that it refers to the use of the habitat by Black Cockatoos rather than the overall quality of the vegetation which would normally be described using understorey as well as tree canopy.

A foraging value has been assigned to the vegetation in the referral based on the results of the Black Cockatoo survey. The foraging value was determined using the type of vegetation and its importance to Black Cockatoos for foraging, the condition of the vegetation and whether or not evidence for foraging had been observed. The decision matrix prepared by PGV Environmental is shown in Table 4.

Vegetation Type	Condition	Foraging Observed	Foraging Value
High Resource	VG-E	Y	Excellent
eg. Banksia woodland		N	Very Good
Marri Woodland	G	Y	Very Good
mixed Jarrah/Banksia		N	Good
mixed Jarrah/Marri		Y	Good
	D-CD	N	Good
		Y	Very Good
Medium Resource	VG-E	N	Good
eg. Jarrah woodland	G	Y	Good
Parrot Bush Heath		N	Poor
	D-CD	Y	Good
		N	Poor
	VG-E	Y	Good
Low Resource	VG-E	N	Poor
eg. Mixed Tuart/Jarrah Woodland Tuart woodland Flooded Gum woodland	G	Y	Good
		N	Poor
		Y	Good
	D-CD	Ν	Poor

Table 4: Foraging Value Matrix

Applying this matrix shows the foraging habitat on the site is a Low Resource (predominately Tuart and Jarrah) in Completely Degraded condition. There was some evidence of foraging on the site and therefore the Foraging Habitat Value is rated as Good. Therefore an area of 1.67ha of Good foraging habitat will be cleared for the subdivision. 0.67ha of Good Foraging habitat will be retained.

Breeding

According to Table 3 in the Black Cockatoo Referral Guidelines the clearing of any known nesting tree has a high risk of being a significant impact. Any known nesting tree is defined in the Guidelines as any existing tree in which breeding has been recorded or suspected. No known nesting trees occur on the site therefore there is no risk of a significant impact on a known nesting tree. The nearest known breeding site is approximately 8.4km to the south. The proposed development will not impact on this

site.

There are five trees on the site that currently have hollows present and two of these trees will be retained. These trees did not show evidence of Black Cockatoos currently breeding on the site nor did any trees show evidence of breeding in previous seasons. Furthermore given the locality within which the referral area is located outside of the Black Cockatoos known breeding range this is not unexpected.

A potential breeding tree is defined as a Jarrah, Tuart or Marri tree with a diameter greater than 500mm regardless of whether the tree has a hollow or not. The site contains 121 eucalypt trees with a diameter at breast height 500mm or greater (Attachment 5). Of these trees, 90 are Tuart, 9 are Marri and 2 are Jarrah as shown in Table 5.

Table 5: Potential Breeding Trees with a DBH greater than 500mm recorded on the site

Diameter at Breast Height	Tree Species			
(DBH)	Jarrah	Marri	Tuart	
>1200 mm	11	3	49	
800-1200 mm	6	4	29	
500-800 mm	5	2	12	
Total	22	9	90	

The development has been designed to retain trees in POS. The subdivision design retains 31 potential breeding trees. The total impact on significant trees in the subdivision is shown in Table 6.

	Jarrah	Marri	Tuart	Total	
Trees present	22	9	90	121	
Trees to be retained	3	0	28	31	
Trees to be cleared	19	9	62	90	

Table 6: Total Number of Potential Breeding Trees to be Retained and Cleared

It can be concluded that the trees on the site are not currently used as breeding habitat and the risk of a significant impact is considered Low.

Roosting

The Black Cockatoo Referral Guidelines consider the clearing of a known roosting site as a high risk of being a significant impact. The Department of Planning *Latitude/Longitude of important and known habitat sites for Carnaby's Cockatoo* (Johnstone and Kirkby, 2011) does not identify any known roosting trees in the Referral area. The nearest roosting site is approximately 3.5km from the site (Figure 3).

The risk of a significant impact on a known roosting site is therefore considered to be Low.

3.1 (e) Listed migratory species

Description

Description

The SEWPaC Protected Matters Search Tool listed 9 Migratory Species (Attachment 4) as potentially occurring in the Referral Area. These are listed in Table 7. The likelihood of each species being present and/or utilising the site was determined. The results are outlined in Table 7.

Table 7: Migratory Species in the Protected Matters Search Tool Reports as being Possibly Present on the Site.

Species Name	Common Name	EPBC Status	Likelihood of being present or utilising the site
	Migr	atory Marine Bi	rds
Apus pacificus	Fork-tailed Swift		No
Sterna dougllii	Roseate Tern		No
Pandion haliaetus	Osprey		No
	Migrato	ory Terrestrial S	pecies
Haliaeetus	White-Bellied Sea-		Unlikely
leucogaster	Eagle		May fly over the Referral area
Lainaa acallata	Malleefowl	Vulnerable	No
Leipoa ocellata			Is considered to be locally extinct
Merops ornatus	Rainbow Bee-eater		Unlikely
werops ornatus			The site is highly disturbed.
	Migrat	ory Wetland Sp	ecies
Ardea ibis	Cattle Earet		Unlikely
Aluea IDIS	Cattle Egret		May fly over the Referral area
Ardea alba	Great Egret		No
Rostratula	Dainted Spine	Vulnerable	Unlikely
benghalensis s. lat.	Painted Snipe	VUITIETADIE	May fly over the Referral area

The Referral area does not provide suitable habitat for any of the listed migratory species as there are no permanent water bodies or coastal areas on the site or nearby. Therefore these species are not likely to frequent the site.

Nature and extent of likely impact

No Listed Migratory species are likely to be impacted by the development proposed on part of Lot 601 Mandurah Road.

3.1 (f) Commonwealth marine area

Description

The site is not located in a Commonwealth Marine Area

Nature and extent of likely impact

Not Applicable

3.1 (g) Commonwealth land

Description

The site is not on Commonwealth Land

Nature and extent of likely impact

Not Applicable

3.1 (h) The Great Barrier Reef Marine Park

Description

The site is not in the Great Barrier Reef Marine Park

Nature and extent of likely impact

Not Applicable

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

Is the proposed action a nuclear action?	Х	No
		Yes (provide details below)
If yes, nature & extent of likely impact on the	he who	le environment
Not Applicable		
Is the proposed action to be taken by the Commonwealth or a Commonwealth	Х	No
agency?		Yes (provide details below)
If yes, nature & extent of likely impact on t	he who	le environment
Not Applicable		
Is the proposed action to be taken in a Commonwealth marine area?	Х	No
		Yes (provide details below)
If yes, nature & extent of likely impact o	n the \	whole environment (in addition to 3.1(
Not Applicable		
Is the proposed action to be taken on Commonwealth land?	Х	No
		Yes (provide details below)
If yes, nature & extent of likely impact on t	he who	le environment (in addition to 3.1(g))
If yes, nature & extent of intery impact of th		
Not Applicable Is the proposed action to be taken in the Great Barrier Reef Marine Park?	X	No

Not Applicable

3.3 Other important features of the environment

3.3 (a) Flora and fauna

Flora

The vegetation is Completely Degraded and consists of a parkland cleared area with individual trees of Tuart (*Eucalyptus gomphocephala*), including Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) throughout with a mid-storey of sparsely scattered Banksia (*Banksia attenuata*) and Sheoak (*Allocasuarina fraseriana*). The understorey on the site consists of pasture weeds.

Fauna

Due to the degraded nature of the majority of the Referral area, the vertebrate fauna assemblage predicted to occur on site is likely to be well represented in surrounding habitat. In addition, the proposed subdivision aims to retain a large number of existing trees in POS. As a result, the impact on the resident fauna assemblage is likely to be minimal.

3.3 (b) Hydrology, including water flows

The site is on the Carramatta Coal Measures overlain by the Leederville aquifer which is overlain by the Superficial Swan aquifer (DoW, 2013a).

Groundwater contours in the Perth Groundwater Atlas (DoW, 2013b) show groundwater flows to the west from the site and is approximately at 1.5mAHD, between 4 to 11m below ground level.

The site is highly permeable sand and therefore there are no overland flows of water. There are no wetlands mapped on the site and no low lying areas that may have wetland attributes.

3.3 (c) Soil and Vegetation characteristics

Soil

Soils on the site are representative of the Spearwood Dune System overlaying Tamala Limestone (DoW, 2013). There are two soil units on the site and these are described as:

- Spearwood 2a phase (Sp211_S2a) which are lower slopes (1-5%) of dune ridge with moderately deep to deep siliceous yellow-brown sands or pale sands with yellow-brown subsoils and minor limestone outcrop. This soil type is over the majority of the site.
- Spearwood 4a phase (Sp211_S4a) which is flat to gently undulating sandplain with shallow to moderately deep siliceous yellow-brown and grey-brown sands with minor limestone outcrop. This soil type is mapped on the eastern boundary of the site (DAFWA, 2013).

The soils are mapped as having a low risk of Acid Sulphate Soils (Landgate, 2013). Limestone soils typically do not support *Phytophthora cinnamomi* (Jarrah Dieback).

Vegetation

According to Beard's mapping (Beard, 1979), Lot 601 Mandurah Road is in the South-West province described as *Medium woodland; tuart*.

Vegetation Complex mapping by Heddle *et al.* (1980) indicates that the site has Cottesloe Complex – Central and South which is:

Mosaic woodland of Eucalyptus gomphocephala and open forest of Eucalyptus gomphocephala – Eucalyptus marginata and Corymbia calophylla; closed heath on the limestone outcrops.

3.3 (d) Outstanding natural features

There are no outstanding natural features in the referral area.

3.3 (e) Remnant native vegetation

The vegetation on the site is parkland cleared with individual trees. The understorey is completely modified and consists of pasture weeds.

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

The site is sloping to the east and is at approximately 15mAHD in the west to 5mAHD in the east.

3.3 (g) Current state of the environment

The Referral area has been extensively cleared and is considered to be poor quality. The vegetation, when rated according to the system devised by Keighery (1994) (Table 8) and described in Bush Forever (Government of Western Australia, 2000), is Completely Degraded.

Table 8: Vegetation Condition Rating Scale

Condition	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

Source: Government of Western Australia, 2000.

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

A search of the Australian Heritage Database (SEWPaC, 2013c) does not show any registered places located on or in the close vicinity of the site.

3.3 (i) Indigenous heritage values

There has been no Aboriginal Heritage Sites recorded on Lot 601 Mandurah Road, Baldivis (DIA, 2013; Attachment 6).

3.3 (j) Other important or unique values of the environment

There are no other important or unique values of the environment.

3.3 (k) Tenure of the action area (eg freehold, leasehold)

The Referral area is held in freehold title.

3.3 (I) Existing land/marine uses of area

The referral area is currently developed as a rural area.

3.3 (m) Any proposed land/marine uses of area

Not Applicable

4 Measures to avoid or reduce impacts

The following information outlines the approach to managing the Black Cockatoo habitat loss on Lot 601 Mandurah Road, Baldivis. The measures proposed to limit the impact on Black Cockatoos are avoidance measures.

The Local Structure Plan has deliberately incorporated in the Public Open Space black cockatoo potential breeding and foraging habitat. As outlined in Section 3.1 (d) the proposed development includes the retention of at least 31 individual potential breeding trees with a diameter greater than 500mm (Jarrah and Tuart) within Public Open Space. Of these trees 28 are Tuart, and 3 are Jarrah.

Sheoaks are foraging habitat and three large specimens of this species will be retained in Public Open Space. The eucalypt trees retained also provide foraging habitat with a total canopy area of 0.67ha of foraging habitat retained on the site. Within the balance of the Public Open Space and streetscape, where practicable and subject to the City of Rockingham's approval, species that are known to be fed on by Black Cockatoos will be planted to add additional foraging habitat.

As noted in Section 2.3 the staging for the residential development will occur over a four year period. The proposed action of clearing the remnant trees will occur over this timeframe. Importantly the Public Open Space will be landscaped with native vegetation / black cockatoo foraging and roosting habitat within the first 12 months, so the project has forward planned the re-vegetation / planting within the Public Open Space prior to the proposed clearing of 1.67ha.

5 Conclusion on the likelihood of significant impacts

5.1 Do you THINK your proposed action is a controlled action?

No, complete section 5.2

Х

Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Black Cockatoo Referral Guidelines

The *EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's cockatoo (endangered) Calyptorhynchus latirostris Baudin's cockatoo (vulnerable) Calyptorhynchus baudinii and Forest red-tailed black cockatoo (vulnerable) Calyptorhynchus banksii naso* (SEWPaC, 2012) (Black Cockatoo Guidelines) contain several steps that are potentially useful in assisting the determination of whether a referral is required or not.

Application of the Decision Making flowchart in Figure 1 of the Draft Black Cockatoo Guidelines is shown in sequence below as applied to the whole site.

- 1. Could the impacts of your action occur within the modelled distribution of the black cockatoos? YES
- 2. Could the impacts of your action affect any black cockatoo habitat or individuals? YES
- 3. Have you surveyed for black cockatoo habitat using the recommended methods? YES
- 4. Could your action have an impact on black cockatoos or their habitat? UNSURE
- 5. Is your impact mitigation best practice so that it may reduce the significance of your impacts on black cockatoos? YES (if required)
- 6. Could your action require a referral to the federal environment minister for significant impacts on black cockatoos? UNSURE.

RESULT – Referral Recommended.

Significant Impact Guidelines

The significance of the impact, according to the *Matters of National Environmental Significance Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999*, (SEWPaC, 2009) depends on the sensitivity, value and quality of the environment and the intensity, duration, magnitude and geographic extent of the impacts. The significant impact criteria for listed flora and fauna species and ecological communities depend on the category of listing, eg. Endangered, Vulnerable or Migratory.

For the purposes of this report the assessment will be done on the Forest Red-tail Cockatoo and Baudin's Black Cockatoo which are listed as Vulnerable, and Carnaby's Cockatoo which is listed as Endangered.

Forest Red-Tail Cockatoo, Baudin's Black Cockatoo

Assessment of the impact of clearing on Forest Red-tail Cockatoos and Baudin's Black Cockatoo against the criteria set out in these Guidelines for a significant impact on a Vulnerable species is made out below:

• lead to a long-term decrease in the size of an important population of a species

An important population is defined in the Significant Impact Guidelines 1.1 as "a population that is necessary for a species' long-term survival and recovery" and may be "key source populations either for breeding or dispersal, populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species' range".

Forest Red-tail Cockatoos occur in the humid and sub-humid zones in south-west Western Australia extending from north of Gingin to east of Albany. They predominantly occur in forested areas but also occur on the Swan Coastal Plain. The small number of birds that would use the site for foraging is not considered to meet the criteria for an important population. Baudin's Black Cockatoo are generally found to the south west and the site is not mapped within the modelled distribution in the Black Cockatoo Referral Guidelines.

Therefore, the proposed development of the site would not result in this outcome.

• reduce the area of occupancy of an important population

The small population that would use the site is not considered to meet the criteria for an important population. Therefore, the proposed development on the site would not result in this outcome.

• fragment an existing important population into two or more populations

The small population that would forage on the site is not considered to meet the criteria for an important population and the referral area would not support a population that can't forage in adjacent areas that are linked for avifauna. Therefore, the proposed development on the site would not result in this outcome.

• adversely affect habitat critical to the survival of a species

Forest Red-tail Cockatoos do not breed on the site. The low number of foraging trees on the site is not considered to be critical to the survival of the species. Therefore, the proposed development on the site would not result in this outcome.

• disrupt the breeding cycle of an important population

Forest Red-tail Cockatoos and Baudin's Black Cockatoo do not breed on the site. It is considered that the proposed development on the site would not result in this outcome.

• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

There are abundant trees for foraging including Eucalypts and Banksia woodlands within the immediate vicinity of the site in Rockingham Regional Park such that the clearing of the low number of foraging trees on the site would not cause the species to decline.

• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Clearing vegetation for a residential subdivision would not result in invasive species being introduced. Therefore, the proposed development on the site would not result in this outcome.

• introduce disease that may cause the species to decline

Clearing vegetation for a residential subdivision would not result in disease being introduced. Therefore, the proposed development on the site would not result in this outcome.

• interfere substantially with the recovery of the species

The population that would use the site is very small in comparison to the geographic distribution of the species, and is not an important population. Therefore any clearing of habitat on the site would not interfere substantially with the recovery of the species.

The conclusion in this assessment in accordance with the criteria set out in Significant Impact Guidelines 1.1 is that the proposed development of part of Lot 601 Mandurah Road would not have a significant impact on Forest Red-tail Cockatoos or Baudin's Black Cockatoo.

Carnaby's Black Cockatoo

Assessment of the impact of clearing on Carnaby's Cockatoos against the criteria set out in these Guidelines for a significant impact on an Endangered species is below:

• Lead to a long-term decrease in the size of a population

Clearing of the scattered trees on the site is unlikely to impact the whole population of Carnaby's Cockatoos such that it will lead to a long-term decrease in the size of the population. Therefore, the proposed development on the site would not result in this outcome.

• Reduce the area of occupancy of the species

Bush Forever Site 356 is nearby the proposed development (Figure 3) and the retention of the trees in Public Open Space means the area occupied by Carnaby's Cockatoo is highly unlikely to be reduced due to the small amount of clearing of trees on the site. Therefore, the proposed development on the site would not result in this outcome.

• Fragment an existing population into two or more populations

Clearing of the trees for the proposed subdivision is unlikely to fragment the populations into subpopulations as there is retained vegetation in Parks in the surrounding area. Therefore, the proposed development on the site would not result in this outcome.

• Adversely affect habitat critical to the survival of a species

Carnaby's Cockatoos do not breed on the site. The foraging habitat on the site is not considered to be critical to the survival of the species. Therefore, the proposed development on the site would not result in this outcome.

• Disrupt the breeding cycle or a population

Carnaby's Cockatoos do not breed on the site nor within close proximity. Therefore, the proposed development on the site would not result in this outcome.

• Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

There are abundant trees for foraging including Eucalypts and Banksia woodlands within the immediate vicinity of the site in Bush Forever Site 356 (Figure 3) such that clearing of trees in part of Lot 601 Mandurah Road would not cause the species to decline.

• Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

Clearing the vegetation would not result in invasive species being introduced that would be harmful to Carnaby's Black Cockatoos. Therefore, the proposed development on the site would not result in this outcome.

• Introduce disease that may cause the species to decline

Clearing vegetation for the proposed development would not result in disease being introduced. Therefore, the proposed development on the site would not result in this outcome.

• Interfere with the recovery of the species

The population that would use the site is very small in comparison to the geographic distribution of the species, and is not an important population. Therefore any clearing of habitat on the site would not interfere with the recovery of the species

The conclusion of this assessment in accordance with the criteria set out in Significant Impact Guidelines 1.1 is that the proposed development of part of Lot 601 Mandurah Road would not have a significant impact on Carnaby's Cockatoos.

5.3 Proposed action IS a controlled action

Matters likely to be impacted

World Heritage values (sections 12 and 15A)
National Heritage places (sections 15B and 15C)
Wetlands of international importance (sections 16 and 17B)
Listed threatened species and communities (sections 18 and 18A)
Listed migratory species (sections 20 and 20A)
Protection of the environment from nuclear actions (sections 21 and 22A)
Commonwealth marine environment (sections 23 and 24A)
Great Barrier Reef Marine Park (sections 24B and 24C)
Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
Protection of the environment from Commonwealth actions (section 28)
Commonwealth Heritage places overseas (sections 27B and 27C)

6 Environmental record of the responsible party

		Yes	No
6.1	Does the party taking the action have a satisfactory record of responsible environmental management?	Х	
	Provide details		
	Australand has developed approximately 220,000m2 of buildings that have achieved (or are in the process of achieving) Green Star certification (Australia's leading holistic environmental rating tool for buildings), targeting a combination of 4 and 5 star ratings. Australand has supported the Green Building Council of Australia through providing technical expertise and sponsorship of a number of Green Star rating tools and are a representative of the Property Council of Australia's National Sustainability Roundtable.		
	In Western Australia Australand has just been awarded 3 EnviroDevelopment Leaves for Port Coogee (Environment, Economic and Social). The standards required for EnviroDevelopment certification have been determined by a panel of government, industry and environmental experts and Certification in any one of the EnviroDevelopment elements is a significant achievement, with a number of elements signifying a truly outstanding sustainable development project.		
6.2	Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?		х
	If yes, provide details		
	Not Applicable		
6.3	If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?	х	
	If yes, provide details of environmental policy and planning framework		
	The action will be undertaken in accordance with the <i>Australand Environmental Risk Management Policy</i> (2011) (Attachment 7).		
6.4	Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?	Х	

Provide name of proposal and EPBC reference number (if known)

- 2013/6779 Residential Development Lots 104, 105, 541, 543, 544 & 1000 Baldivis Rd Baldivis, WA
- 2010/5694 Residential Development 870 Somerton Rd, Greenvale, VIC
- 2009/4767 Residential Development Lot 9 Abernethy Road, Byford, WA
- 2007/3935 Residential Development Shellharbour NSW
- 2006/2817 Urban and commercial Wonderland Business Park Stage 3 19 NSW
- 2005/2023 Urban and commercial development Watervale Primary School VIC
- 2005/1991 Urban and commercial development Second Ponds Creek Urban Development of Precinct 1b NSW
- 2004/1626 Urban and commercial development Wonderland Business Park Precinct, Stage 1, Lot D1 NSW
- 2004/1627 Urban and commercial development Wonderland Business Park Precinct, industrial development, Lot B1 NSW
- 2004/1622 Urban and commercial development Greenway Park Stage 3 residential subdivision NSW
- 2004/1468 Urban and commercial development St Andrews Field Residential Development & Infrastructure VIC
- 2004/1445 Urban and commercial development Clearance of 6.3ha of Cumberland Plain Woodland for industrial subdivision cnr of Old Walgrove and Walgrove Roads NSW
- 2003/1054 Urban and commercial development/Kellyville/NSW/Residential subdivision Lot 1005 Conrad Road 13 May 2003
- 2001/518 Residential Development Lot 102 DP 830738 Conrad Road NSW
- 2001/502 Urban development Botanica Park subdivision Landfill of artificial pond VIC

7 Information sources and attachments

7.1 References

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- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2011) *Environment Protection and Biodiversity Conservation Act 1999* Referral Guidelines For Three Threatened Black Cockatoo Species: Carnaby's cockatoo (endangered) *Calyptorhynchus latirostris*; Baudin's cockatoo (vulnerable) *Calyptorhynchus baudinii*; Forest red-tailed black cockatoo (vulnerable) *Calyptorhynchus banksii naso* Commonwealth of Australia Publically Available
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2013a). Protected Matters Search Tool Accessed March 2013 (http://www.environment.gov.au/apps/boobook/mapservlet?app=ert) Commonwealth of Australia Publically Available
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2013b). Species Profile and Threats (SPRAT) Database . Accessed March 2013 <u>http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl</u> Commonwealth of Australia Publically Available
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) (2013c) *Australian Heritage Database* Accessed March 2013 <u>http://www.environment.gov.au/cgi-bin/ahdb/search.pl</u> Commonwealth of Australia Publically Available
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- Western Australian Planning Commission (WAPC) (2008) *Metropolitan Region Scheme Amendment 1130/41 Baldivis Expansion Area 4 Report on Submissions.* Government of Western Australia Perth. Publically Available

7.2 Reliability and date of information

The information contained in this referral is current and to the best of our knowledge is true and accurate. It is based on site specific field investigation.

7.3 Attachments

Figure 1:	Regional Location
Figure 2:	Site Boundary and Topography
Figure 3:	Proximity of Matters of National Environmental Significance
Figure 4:	Zoning under the Perth Metropolitan Region Scheme
Figure 5:	Significant Trees
Figure 6:	Canopy Cover
Attachment 1:	Proposed Subdivision Plan
Attachment 2:	Perth Metropolitan Region Scheme Amendment Report 1130/41
Attachment 3:	Perth Metropolitan Region Scheme Amendment Report on Submissions 1130/41
Attachment 4:	Protected Matters Search Tool Report
Attachment 5:	Black Cockatoo Significant Tree Survey (360 Environmental)
Attachment 6:	Aboriginal Heritage Inquiry System Report
Attachment 7:	Australand Environmental Risk Management Policy

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	~	Figure 1 and 2
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Figure 3
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)	✓	Attachment 2 and 4
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)	√	Attachment 2
	copies of any flora and fauna investigations and surveys (section 3)	\checkmark	Attachment 5
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)	~	Attachment 5
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	\checkmark	Attachment 3

8 Contacts, signatures and declarations

Project title:	Residential Development of Part Lot 601 Mandurah Road, Baldivis.			
Name	Stuart Gardiner			
Title	Development Director			
Organisation	Australand Holdings Limited			
ACN / ABN (if applicable)	ACN 008 443 696			
Postal address	Level 2, 115 Cambridge Stre	et, West Leederville WA	6007	
Telephone	08 9214 7900			
Email	sgardiner@australand.com.au			
Declaration	I declare that to the best of my attached to this form is comple		on I have given on, or	
	I understand that giving false or misleading information is a serious offence.			
	I agree to be the proponent for this action.			
	I acknowledge that I may be lia following the introduction of co			
Signature	Sport			
Name	Stuart Gardiner	Date	17/05/2013	

8.2 Person preparing the referral information (if different from 8.1)

Name	Paul van der Moezel
Title	Managing Director
Organisation	The Trustee for Knightside Trust trading as PGV Environmental
ACN / ABN (if applicable)	44 981 725 498
	Unit 1, 61 Guthrie Street
Postal address	OSBORNE PARK WA 6017
Telephone	(08) 9202 8780
Email	paul@pgv.net.au
Declaration	I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.
	I understand that giving false or misleading information is a serious offence.
Signature	May 2013

Date 17 May 2013

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WESTERN AUSTRALIAN PLANNING COMMISSION

METROPOLITAN REGION SCHEME

AMENDMENTS WITHIN THE SOUTH WEST DISTRICT

City of Rockingham

AMENDMENT REPORT

Amendments:

- 1127/41 Lots 3 & 4 Zig Zag Road; 459-463, 510-513, 520, 521 & 709 Baldivis Road; 515-518 Sabrina Road; and 447 Telephone Lane, Baldivis
- 1128/41 Lots 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 Baldivis Road, Baldivis
- 1129/41 Lot 3 Folly Road and Lot 10 Baldivis Road, Baldivis
- 1130/41 Lot 3 Pike Road; Lots 1, 2 & Pt Lot 335 Eighty Road; and Lots 1, 2 & Pt Lot 334 Mandurah Road, Baldivis

January 2007

PERTH WESTERN AUSTRALIA





METROPOLITAN REGION SCHEME

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City of Rockingham



January 2007

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Published by the Western Australian Planning Commission, Albert Facey House, 469 Wellington Street, Perth Western Australia 6000

MRS Amendments 1127/41, 1128/41, 1129/41 & 1130/41 Amendment Report File 809-2-28-8 Pt. 1, 809-2-28-9. Pt 1, 809-2-28-10 Pt. 1 & 809-2-28-11 Pt. 1

Published January 2007

ISBN 0 7309 9598 4

Internet: http://www.wapc.wa.gov.au e-mail: corporate@wapc.wa.gov.au Phone: (08) 9264 7777 Fax: (08) 9264 7566 TTY: (08) 9264 7535

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SECTION 1	Amendment 1127/41 Lots 3 & 4 Zig Zag Road; 459-463, 510-513, 520, 521 & 709 Baldivis Road; 515-518 Sabrina Road; and 447 Telephone Lane, Baldivis
SECTION 2	<u>Amendment 1128/41</u> Lots 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 Baldivis Road, Baldivis
SECTION 3	<u>Amendment 1129/41</u> Lot 3 Folly Road and Lot 10 Baldivis Road, Baldivis
SECTION 4	<u>Amendment 1130/41</u> Lot 3 Pike Road; Lots 1, 2 & Pt Lot 335 Eighty Road; and Lots 1, 2 & Pt Lot 334 Mandurah Road, Baldivis
Appendix I	Your property and the Metropolitan Region Scheme

Appendix II Preparing a submission and for a 'hearing' presentation

THE METROPOLITAN REGION SCHEME What it is and how it is amended

PLANNING PERTH'S FUTURE

Perth has a reputation as one of the world's cleanest and greenest cities. This is largely due to good planning. It is a city anticipated to grow. As it grows, change must be well planned and well managed.

In 2001 Perth was home to nearly 1.4 million people. Each year its population is growing by about 20,000 people. By the State's Bicentenary in 2029, Perth's population is expected to have exceeded 2 million, making up 72 percent of the population of Western Australia.

Provision must be made for future housing, employment opportunities and transport needs to meet this growth. It is also necessary to set aside land for conservation and recreation.

The Metropolitan Region Scheme provides for this change, and the means by which affected landowners can be compensated for land acquired for regional public purposes.

WHAT IS THE METROPOLITAN REGION SCHEME?

The Metropolitan Region Scheme (MRS) is a large town planning scheme for land use in the Perth metropolitan area. This area stretches from south of Rockingham to north of Yanchep and east of Mundaring.

The Scheme defines the future use of land, dividing it into broad zones and reservations. It requires local government town planning schemes to provide detailed plans for their part of the region. These schemes must be consistent with the Metropolitan Region Scheme.

The MRS uses a set of maps and a scheme text. The scheme text provides planning rules for zones and reservations, which are shown on the maps in different colours and patterns.

This plan has been in operation since 1963 and provides the legal basis for planning in the Perth metropolitan region.

To plan for changing needs, the MRS is amended frequently.

WHAT IS AN AMENDMENT?

An amendment to the Metropolitan Region Scheme changes the zoning or reservation of land to allow for a different land use.

When a rezoning or a new reservation is considered, an amendment to the MRS is advertised to seek comment from the wider community and all levels of government.

The process allows for extensive community consultation and discussion in Parliament before a final decision is made.

HOW IS THE METROPOLITAN REGION SCHEME AMENDED?

The Western Australian Planning Commission (WAPC) is responsible for keeping the Metropolitan Region Scheme under review and initiating changes where they are seen to be necessary.

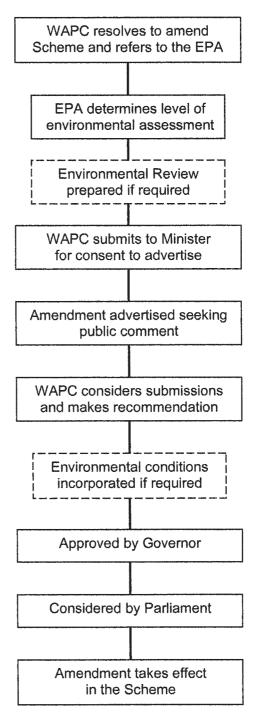
The amendment process is regulated by the *Planning and Development Act 2005*. The amendment proposed in this report is being made under the provisions of Section 41 of that act (often referred to as a 'major' amendment).

The process of a major amendment to the Metropolitan Region Scheme includes the following steps:

- Formulation of the amendment by the WAPC.
- Referral of the proposed amendment to the Environmental Protection Authority (EPA) to set the level of environmental assessment. Where the EPA requires an environmental review, this is carried out before the amendment is advertised.

- Consent by the Minister for Planning and Infrastructure to call for submissions.
- Advertising the amendment for public inspection and inviting submissions. Advertisements are placed in local and state-wide newspapers, and information made available on the WAPC Internet site. Landowners whose property is directly affected by a proposed change are contacted in writing. Where there is an environmental review, this is also made available for comment.
- WAPC receives public submissions over a period of three-months.
- WAPC considering written submissions. People who have made submissions may, if they wish, also make an oral presentation to a special committee appointed to consider and report on these submissions.
- WAPC reviewing the proposed amendment in light of submissions. The amendment may be modified before proceeding.
- Readvertising for further public submissions may be required by the Minister for Planning and Infrastructure if the amendment is substantially modified as a result of submissions.
- Minister presenting the amendment with WAPC recommendations to the Governor for approval.
- Placing of the amendment, as approved by the Governor, before each House of State Parliament, where it must remain for 12 sitting days. During this time, the amendment is again on public display with the WAPC Report on Submissions.
- In Parliament, a Member may introduce a Motion to Disallow the amendment. If this motion succeeds, the Metropolitan Region Scheme will not be amended. Otherwise, the amendment becomes legally effective in the Scheme.

The following diagram shows the main steps.



When the Metropolitan Region Scheme is amended, local town planning schemes must also be amended to match the broad zonings and reservations of the MRS. Affected local governments provide more detailed planning for each area.

Within three months of a MRS amendment being finalised, an affected local

government must initiate an amendment to its town planning scheme.

ZONES AND RESERVATIONS

Zones and reservations in the Metropolitan Region Scheme are broad categories. They are not precisely defined or limited, but the following descriptions are a guide.

ZONES

Urban: Areas in which a range of activities are undertaken, including residential, commercial recreational and light industry

Urban deferred: Land identified for future urban uses following the extension of urban services, the progressive development of adjacent urban areas, and resolution of any environmental and planning requirements relating to development.

The Western Australian Planning Commission must be satisfied that these issues have been addressed before rezoning to Urban.

Central City Area: Strategic regional centres for major retail, commercial and office facilities as well as employment, civic, business and residential uses.

Industrial and Special Industrial: Land on which manufacturing, processing, warehousing and related activities are undertaken.

Rural: Land on which a range of agricultural, extractive and conservation uses are undertaken.

Private Recreation: Areas of significance to the Region's recreation resource, which are, or are proposed to be, managed by the private sector.

Rural - Water Protection: Rural land over public groundwater areas, where land use is controlled to avoid contamination.

RESERVATIONS

Land is reserved for community purposes. It may be reserved to protect a resource or to provide areas for infrastructure. **Parks and Recreation:** Land of regional significance for ecological, recreation or landscape purposes.

Railways: Provides for public transit routes, freight rail lines and associated facilities such as marshalling yards, maintenance depots and park'n'ride stations.

Port Installations: Regional maritime shipping facilities.

State Forests: Areas of woodland located on Crown Land managed under the *Conservation and Land Management Act, 1984.*

Water Catchments: Water sources protected for high quality public water supply. These areas have strict controls on land use to avoid pollution of the water resource.

Civic and Cultural: Significant civic precincts and buildings.

Waterways: Permanent inland and coastal waters including many rivers and reservoirs.

Public Purposes: Land for public facilities such as hospitals, high schools, universities, prisons, utilities for electricity, water and treatment of wastewater, commonwealth government and other special uses.

Primary Regional Roads: These are the most important of the roads of regional significance in the planned road network, and are currently or proposed to be declared under the *Main Roads Act, 1930*.

Other Regional Roads: These are roads of regional significance in the planned road network for which the planning responsibilities are shared by the Western Australian Planning Commission and local governments.

WHAT IF MY LAND IS REZONED?

Landowners may find that an amendment seeks to rezone their property, for example from Rural to Urban or Urban Deferred. If the zoning is changed, landowners do not have to change their use of the land or lifestyle. They can stay as they are or they may set about changing their land use. For instance, some may seek approval to subdivide their land or apply to develop it in some way that suits the new zoning.

The Western Australian Planning Commission realises that many people choose their properties because they like them as they are and may not want to change from, for example, a ruralresidential lifestyle to an urban area. Others are keen to change the land use.

For these reasons, amendments to the Metropolitan Region Scheme are advertised so that all affected landowners and anyone else have time to examine the proposals and lodge a submission.

WHAT IF MY LAND IS RESERVED?

Land is reserved because it will be needed eventually for a public purpose such as Parks and Recreation or Other Regional Roads.

If your land is marked for a reservation in an advertised amendment, you can continue to use and enjoy your property. Generally, reserved land can remain in private ownership until it is needed for the purpose for which it is reserved. The Western Australian Planning Commission has reservations over many areas of land, which are privately owned.

To protect landowners, there are procedures for acquisition or compensation by the Western Australian Planning Commission. These are outlined in Your Property and the Metropolitan Region Scheme, a leaflet reproduced at the back of this report and available separately from the Department for Planning and Infrastructure.

HOW CAN MY VIEWS BE HEARD?

You can lodge a written submission on the proposed amendment during the advertised period. A submission form is available at the back of this report, from the display locations for this amendment and from the WAPC Internet site. People writing submissions may choose also to attend a hearing. This follows the submission period, where you can express your views to a hearings panel.

PUBLICATIONS

In the course of each substantial amendment to the Metropolitan Region Scheme, information is published under the following titles:

Amendment Report

This document is available from the start of the public submission period of the proposed amendment. It sets out the purpose and scope of the amendment, explains why the proposal is considered necessary, and informs people how they can comment.

Environmental Review Report

The Environmental Protection Authority considers the environmental impact of an amendment to the MRS before it is advertised. Should the EPA require formal assessment an Environmental Review is undertaken, and that information is made available for comment at the same time as the Amendment Report.

Report on Submissions

This publication documents the planning rationale, determination of submissions received, and the recommendations for final approval of the amendment made by the Western Australian Planning Commission.

Submissions

All the written submissions received on the proposed amendment are reproduced as a public record.

Transcript of Hearings

The hearings procedures are recorded and transcribed. All transcripts are published as a public record.

ABBREVIATIONS

DEP	Department of Environmental Protection (now Department of Environment)
DPI	Department for Planning and Infrastructure
EPA	Environmental Protection Authority
MRS	Metropolitan Region Scheme
WAPC	Western Australian Planning Commission

SECTION 1

Amendment 1127/41

Baldivis Urban Expansion Area 1

Lots 3 & 4 Zig Zag Road; 459-463, 510-513, 520, 521 & 709 Baldivis Road; 515-518 Sabrina Road; and 447 Telephone Lane, Baldivis

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AMENDMENT 1127/41 TO THE METROPOLITAN REGION SCHEME

BALDIVIS URBAN EXPANSION AREA 1

LOTS 3 & 4 ZIG ZAG ROAD; 459-463, 510-513, 520, 521 & 709 BALDIVIS ROAD; 515-518 SABRINA ROAD; AND 447 TELEPHONE LANE, BALDIVIS

1. PURPOSE AND PLANNING OBJECTIVE

The purpose of the amendment is to rezone land in the City of Rockingham from the Rural zone to the Urban zone in the Metropolitan Region Scheme (MRS), as shown in Figure 1. The area is bounded by:

- The Kwinana Freeway;
- Zig Zag Road; and
- Baldivis Road.

The planning objective of the amendment is to provide urban land for future communities, designed around networks and centres through detailed structure planning which will be undertaken under the local planning scheme.

2. COORDINATION OF REGION AND LOCAL PLANNING SCHEME AMENDMENTS

Section 126(3) of the *Planning and Development Act 2005* allows for the 'parallel' amendment of a local planning scheme where land is to be transferred to the Urban zone in the region scheme. If the region scheme amendment is approved, the WAPC may also transfer the land to the Development Zone in the local planning scheme.

The City of Rockingham has requested approval to include the land the subject of the region scheme amendment in the Development Zone of the local planning scheme. If this is agreed to by the WAPC, the City of Rockingham Town Planning Scheme No. 2 Amendment 39 will become effective upon the Gazettal of this MRS amendment. Once this occurs, detailed structure planning will be undertaken as part of the local planning scheme process which also includes the opportunity for further public consultation.

No subdivision and development can occur before the MRS and local scheme amendments and structure planning have been finalised.

3. BACKGROUND

This amendment is one of a group of four amendments to the Metropolitan Region Scheme, all involving additions to the existing Baldivis Urban area. The areas in the four amendments have been named Areas 1, 2, 3 and 4 for convenience in identifying them. This Amendment Report addresses Area 1.

The South West Corridor Structure Plan (1993) set out major land use and infrastructure for the corridor to guide MRS and local scheme amendments and other planning decisions.

The land included in this amendment and the Areas 2 and 3 amendments are depicted in the Structure Plan as 'Rural Areas - Landscape Attributes'. Accompanying text related to amendment Areas 1, 2 and 3 refers to them as 'Kwinana Freeway Buffer Area' and comments "*This area is mostly low lying and would not be suitable for urban development without substantial drainage works. The area includes 3 important wetlands....*".

The most recent planning document for Perth - *Network City - Community Planning Strategy for Perth and Peel* (2004) includes a 'Network City Framework' map which shows the Baldivis urban area. The comment "*Future communities will be designed around networks and centres*" is applicable to that area. The proposed amendments in this group are considered to be generally consistent with Network City in terms of the Framework and the strategy document generally as they are relatively small additions. The land required for drainage and freeway buffer will reduce the area actually available for residential development within the Urban zone.

These matters are addressed below in the Discussion section of this report.

4. ENVIRONMENTAL PROTECTION AUTHORITY ADVICE

The proposed amendment was referred to the Environmental Protection Authority (EPA) for advice on whether environmental assessment would be required.

The EPA has advised that the proposed amendment does not require formal assessment under Part IV of the *Environmental Protection Act*. It has however provided advice on the key environmental factors for the amendment. A copy of the notice from the EPA is included at **Appendix A**.

5. SCOPE AND CONTENT OF THE AMENDMENT

As stated above, this proposed amendment is one of four proposals for rezoning land adjoining the existing Baldivis Urban area from Rural to Urban.

<u>Area 1</u> - the area bounded by Zig Zag Road, Baldivis Road and the Kwinana Freeway. (Amendment 1127/41)

<u>Area 2</u> - the area bounded by Zig Zag Road, Baldivis Road, Folly Road and the Kwinana Freeway. (Amendment 1128/41)

<u>Area 3</u> - the area bounded by Folly Road, Baldivis Road and the Kwinana Freeway (Amendment 1129/41)

<u>Area 4</u> - the eastern portion of the area bounded by Pike Road, Eighty Road, Mandurah Road and the southern boundary of the lots on Chandler Ramble. (Amendment 1130/41)

The amendments will proceed as a group. If any of the individual amendments are likely to be delayed by issues affecting it and not the others, that amendment can be removed from the group allowing the others to proceed.

6. DISCUSSION

The 1993 South West Districts Structure Plan sets out a framework of land uses and other urban infrastructure for the South West corridor. The plan identifies the land in this and the Area 2 and 3 amendments as 'Rural Areas - Landscape Attributes'. The land is part of an area referred to as a 'Kwinana Freeway Buffer Area'. This area is described as *"mostly low lying and subject to inundation"* and *"not suitable for urban development without substantial drainage works"*.

Accordingly, it appears that the combination of the limited viability of the land for urban development due to need for substantial drainage works in combination with a desire for a buffer strip between the Freeway and residential development for landscape purposes resulted in its not being designated for future urban use.

With the passing of time and continued growth of the metropolitan region, the proposed amendments are considered appropriate in view of:

- continuing population growth and the desirability of providing residential land in proximity to essential urban services and major recreation resources in the South West corridor;
- . the alignment of the future South West passenger rail line and the location of its stations;
- . planning for urban infrastructure (such as neighbourhood and district centres) in the existing Baldivis urban area; and
- . drainage of land for urban purposes now being a viable proposition.

The 2004 Network City document contains a set of Key Objectives. These are quite broad and have a region wide context. All four of the MRS amendments proposed for expanding the existing Baldivis Urban area are generally consistent with these 'Key Objectives'.

The Key Objectives, and how this and the other amendments in the group meet those objectives are set out below.

- 1. Deliver urban growth management.
- 2. Accommodate urban growth primarily within a Network City pattern, incorporating communities.

As previously mentioned the four amendments are generally consistent with the Network City Framework plan's designation of Baldivis as a 'Future Community'.

- 3. Align transport systems and land use to optimise accessibility and amenity.
- 4. Deliver a safe, reliable and energy efficient transport system that provides travel choice.

Future residents of the areas in the proposed amendment area will both utilise nearby major transport infrastructure, in particular the South West passenger rail line, and contribute to the viability of that rail line.

5. Protect and enhance the natural environment, open spaces and heritage.

Not entirely applicable to the subject group of amendments as they involve areas long since modified and no longer classifiable as part of the natural environment or natural heritage. There are, however, several wetlands that will require protection as discussed below, should the Urban amendment proceed.

- 6. Deliver for all a better quality of life, building on our existing strengths.
- 7. Plan with the communities.
- 8. Ensure employment is created within centres.
- 9. Deliver a city with 'urban' energy, creativity and cultural vitality.
- 10. Provide a city plan that will be implemented, provide certainty and deliver results. Increasing the area and population of the relatively isolated Baldivis Urban area can only improve the social and economic viability of that cell by way of increased employment opportunities, more private businesses and services and government infrastructure and services. All these result in a more sustainable, vibrant community with less need to travel to other parts of the metropolitan region.

Future Development

The total area included in the amendment is approximately 191 ha. After land for non residential purposes is set aside, approximately 1800 lots could be provided in this area.

The total number of lots east of Baldivis in Areas 1, 2 and 3 would be in the vicinity of 3 900.

7. SUSTAINABILITY

Environment

The subject land contains Multiple Use management category wetlands, Resource Enhancement category wetlands and a Conservation Category Wetland. The latter two have been proposed to be included in public open space in later detailed structure planning. This is supported by the Department of Environment and Conservation which also required mechanisms to be put in place to protect the wetlands and their buffers.

Water management in any future urban areas resulting from the amendment is required to be consistent with WAPC and EPA policies.

The subject land has moderate to low risk of Acid Sulphate Soils. This matter requires further investigation later in the planning process, should the amendment proceed.

Urban development would result in the need for appropriate water management. This is required to be consistent with the relevant WAPC and EPA policies.

Measures should be taken to protect any native vegetation worthy of retention remaining on the site.

Noise issues related to the Kwinana Freeway are required to be addressed in terms of the WAPC's draft State Planning Policy 'Road and Rail Transport Noise' and the draft State Planning Policy, 'Metropolitan Freight Network'.

The location of existing land uses that have the potential for conflict with any future urban uses should be addressed in terms of the EPA's *Guidance Statement No. 3 Separation Distances Between Industrial and Sensitive Land Uses.*

If soil and/or groundwater contamination is found on the site, this should be dealt with in accordance with the Department of Environment and Conservation's *Contaminated Sites Management* series.

The Dampier to Bunbury high pressure natural gas pipeline traverses the subject land. Accordingly, detailed risk assessment and planning should be carried out in association with the Department of Consumer and Employment Protection.

Community

The subject amendment area and amendment Areas 2, 3 and 4 are well placed to both utilise and contribute to the viability of urban infrastructure and services in or planned for the existing Baldivis Urban area.

Baldivis itself is well located in relation to the proposed Warnbro railway station and to a lesser extent the Wellard station. Future residents of this amendment area and the others for Areas 2, 3 and 4 will both benefit from and contribute to the viability of the South West passenger rail line.

The existing Baldivis Urban area is somewhat isolated from the surrounding urban zones of the southern portion of the metropolitan region. Additional population in the cell as expanded by this and the associated amendments will mean more public and private urban infrastructure and services and more economic activity within the Baldivis Urban area as a whole. This in turn will make that area more economically and socially self sustaining, lessening the need for residents to travel outside the area.

Regional context

This and the associated amendments provide urban land within close proximity to existing infrastructure and services, adjoining an existing urban cell with the Perth metropolitan region without major departure from current planning strategies.

WAPC State Planning Policy No. 2: Urban Growth and Settlement has objectives relating to:

- promoting a sustainable and well planned pattern of settlement across the state with provision of land for housing and other urban uses;
- . building on existing communities to improve services and infrastructure and enhance quality of life;
- . managing the growth and development of urban areas in response to community needs, environment, heritage and community values and relevant constraints.
- . promoting sustainable and liveable neighbourhoods with reduced resource consumption, housing choice and affordability and creating an identifiable sense of place for communities; and
- co-ordinating new development with efficient, economic and timely provision of infrastructure and services.

The urban development that would result from the four proposed MRS amendments in this group does not conflict with these objectives.

8. IMPLEMENTATION

MRS rezonings are required to be followed by local scheme rezonings to a zone consistent with the MRS zone. Following that, structure plans for the amendment areas are required addressing all issues, for example, the various issues raised by Department of Environment and Conservation.

9. THE AMENDMENT PROCESS

The procedures for amending the MRS are prescribed by the *Planning and Development Act 2005.* The amendment proposed in this report is being made under the provisions of Section 41 of that Act.

In essence, this procedure for a substantial alteration to the Scheme (often referred to as a 'major' amendment) involves:

- formulation of the amendment by the WAPC;
- referral to the EPA for environmental assessment;
- completion of an Environmental Review (if required) to EPA instructions;
- public submissions being sought on the proposed amendment (including Environmental Review if required);
- consideration of submissions (including hearings where requested);
- referral of WAPC recommendations, with or without any modifications in response to submissions, to the Minister for Planning and Infrastructure;
- approval by the Governor;
- consideration by both Houses of Parliament, which can disallow the amendment;
- the amendment takes legal effect when no longer subject to disallowance after 12 sitting days.

An explanation of this process can also be found in the front of this report, entitled 'The Metropolitan Region Scheme, what it is and how it is amended'.

10. SUBMISSIONS ON THE AMENDMENT

The WAPC invites people to comment on this proposed amendment to the MRS.

The amendment is being advertised for public submissions for a period of three months from Tuesday 30 January 2007 to Friday 4 May 2007.

Copies of the amendment will be available for public inspection at:

- i) the Department for Planning and Infrastructure, Wellington Street, Perth;
- ii) the municipal offices of the Cities of Perth, Fremantle, Cockburn, Melville and Rockingham and the Towns of East Fremantle and Kwinana; and
- iii) the State Reference Library, Northbridge.

Written submissions on the amendment should be sent to:

The Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

and must be received by Friday 4 May 2007.

All submissions received by the WAPC will be acknowledged.

For your convenience a submission form (Form 41) for this amendment No.1127/41 – is attached to this report (**Appendix C**). Additional copies of this form are available from the display locations listed above and from the WAPC's Internet site www.wapc.wa.gov.au.

You should be aware that the calling for submissions is a public process, and all submissions lodged will together become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament. Advice of disclosure and access requirements is shown on side two of the submission form.

Before making your submission, it is recommended that you read the information in **Appendix II** of this report regarding preparing a submission.

11. HEARINGS

Any person making a written submission also has the opportunity to personally present the basis of their submission to a sub-committee of the WAPC. Details required for attending the hearings are on side two of the submission form.

Presentations made to the hearings committee are an extension of the submission process, and the transcript of all hearings will become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament.

Before completing your submission form, please refer to the information regarding hearings in **Appendix II** of this report.

12. MODIFICATIONS TO THE AMENDMENT

After considering any comments received from the public and Government agencies, the WAPC may make modifications to the amendment.

The recommendations of the WAPC, including any modifications, are published in a *Report* on *Submissions*. Anyone who has made a submission will receive a copy of this document

when the amendment is tabled in Parliament. The report will also be available on the WAPC's Internet site www.wapc.wa.gov.au.

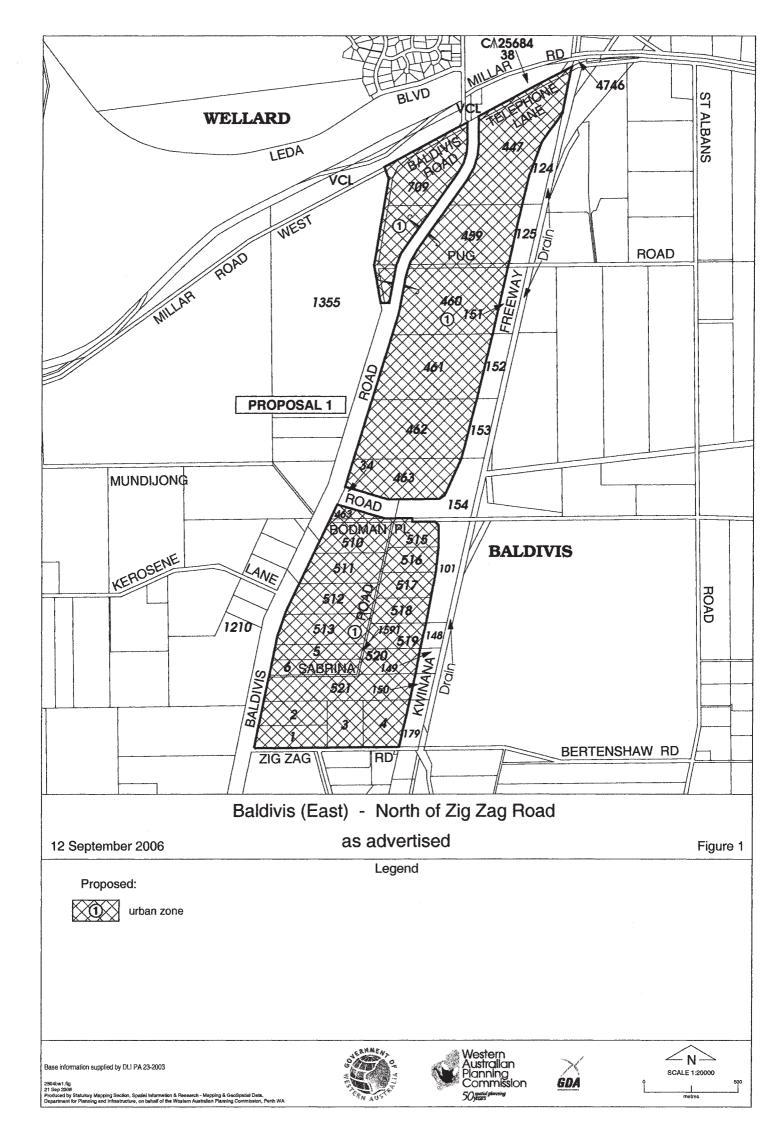
12. FINAL OUTCOME

Following consideration by both Houses of Parliament, those who made submissions will be notified of the final outcome, along with all affected landowners.

<u>AREA 1</u>

LOTS 3 & 4 ZIG ZAG ROAD; 459-463, 510-513, 520, 521 & 709 BALDIVIS ROAD; 515-518 SABRINA ROAD; AND 447 TELEPHONE LANE, BALDIVIS

FIGURE 1



APPENDIX A

NOTICE OF ENVIRONMENTAL ASSESSMENT



Environmental Protection Authority

The Atrium, Level 8, 168 St Georges Terrace, Perth, Western Australia 6000, Telephone: (08) 6364 6500. Facsimile: (08) 6364 6522.

> Postal Address: PO Box K822, Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Director General Department for Planning & Infrastructure 469-489 Wellington Street PERTH WA 6000

Our Ref Enquiries CRN220595 Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE:

SCHEME AMENDMENT LOCATION:

LOCALITY: RESPONSIBLE AUTHORITY: LEVEL OF ASSESSMENT: MRS Amendment 1127/41 Baldivis Urban Area Expansion - Area 1 Lots 3 & 4 Zig Zag Road; 459-463, 510-513, 520, 521 & 709 Baldivis Road; 515-518 Sabrina Road and 447 Telephone Lane Baldivis

Western Australian Planning Commission Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

The above scheme amendment has been referred to the Environmental Protection Authority (EPA) for assessment.

Please find enclosed a copy of the EPA's letter to the Western Australian Planning Commission dated 23 October 2006 for your information and records.

W H Tacey A/Director Environmental Impact Assessment

23 October 2006

Enc.

DEPARTMENT FOR PLANNING	
2 5 OCT 2006	
FILE 809-2-28-8	p



Environmental Protection Authority

Postal Address: PO Box K822, Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

Our Ref CRN220595 Enquiries Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE:	MRS Amendment 1127/41 Baldivis Urban Area Expansion - Area 1
SCHEME AMENDMENT LOCATION:	Lots 3 & 4 Zig Zag Road; 459-463, 510-513, 520, 521 & 709 Baldivis Road; 515-518 Sabrina Road and 447 Telephone Lane
LOCALITY:	Baldivis
RESPONSIBLE AUTHORITY:	Western Australian Planning Commission
LEVEL OF ASSESSMENT:	Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

Thank you for your letter of 26 September 2006 referring the above proposed scheme amendment.

After consideration of the information provided by you, the Environmental Protection Authority (EPA) considers that the proposed scheme amendment should not be assessed under Part IV Division 3 of the *Environmental Protection Act 1986* (EP Act) but nevertheless provides the following advice and recommendations.

ADVICE AND RECOMMENDATIONS

1. Environmental Issues

- Wetlands
- Acid Sulfate Soils
- Water Management
- Vegetation and Flora
- Noise
- Potential Land Use Conflict
- Site Contamination
- High Pressure Natural Gas Pipeline



2. Advice and recommendations regarding Environmental Issues

Wetlands

The majority of the subject site is identified as a Multiple Use wetland on the Department of Environment and Conservation's (DEC) Geomorphic Wetlands Swan Coastal Plain dataset. To the far north of the site and in the central portion of the site (Lot 462 Baldivis Road) are a number of wetlands identified as Resource Enhancement on the DEC's Geomorphic Wetlands Swan Coastal Plain dataset. Whilst no structure plan has been included in this referral, it is understood that the Resource Enhancement Wetlands on site are to be retained within areas of public open space. This is supported and it is expected that mechanisms for protecting these wetlands and their buffers will be identified as part of the further structure planning and rezoning process. Buffers should be identified using a methodology acceptable to both the DEC and Department for Planning and Infrastructure (DPI), for example the DPI's Guideline for the Determination of

Wetland Buffer Requirements, and it is recommended that a management plan be developed and implemented for the wetlands on site.

Acid Sulfate Soils

According to the Western Australian Planning Commission's (WAPC) Planning Bulletin No. 64 – Acid Sulfate Soils the subject land is mapped as having a moderate to low risk of Actual Acid Sulfate Soils and Potential Acid Sulfate Soils at depths greater than 3 metres. Regardless of the generic mapping provided, please note that investigation of local site characteristics is needed, and if these lead to the view that there is a risk of disturbing acid sulfate soils, then more detailed site investigations and management in accordance with Planning Bulletin No. 64 and the DEC's Acid Sulfate Soils Management Series are appropriate.

Water Management

The subject land is within the Peel-Harvey catchment and therefore the provisions of the *Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992* and the *Statement of Planning Policy No 2.1 - The Peel-Harvey Coastal Plain Catchment* shall apply. It is also recommended that stormwater management should be consistent with the DEC's *Stormwater Management Manual for Western Australia*.

Water management is an important issue for the locality, and the broader Peel-Harvey catchment, and the subject site contains areas of low lying land. It is recommended that site planners keep abreast of the initiatives to protect water quality in the Peel-Harvey catchment and the urban water management framework being developed for the Perth metropolitan area. The next stages of planning should be accompanied by water management plans/strategies based on adequate site monitoring and modelling consistent with the urban water management framework and advice of the DEC. In particular, it is expected that there will be negligible nutrient export. There is also an expectation that the site can be serviced by reticulated sewer.

Vegetation and Flora

Aerial photography of the site indicates the subject land is sparsely vegetated. The proponent has previously advised that existing vegetation of good condition will be retained where possible. As discussed, the subject land is located within the Peel Harvey Catchment where remaining areas of native vegetation are very important for protecting water quality and biodiversity. Under the provisions of the *Statement of Planning Policy No 2.1 - The Peel-Harvey Coastal Plain Catchment*, the proponent is encouraged to retain all areas of native vegetation and to protect them from further degradation.

All native vegetation should be preserved so far as practicable during and after clearing for site works and services to accommodate the proposed subsequent urban development. Measures should be taken to ensure the identification, protection and management of any significant vegetation on site worthy of retention prior to the commencement of site works.

Noise

The subject site abuts the Kwinana Freeway and future noise-sensitive land uses may be subject to excessive noise levels. Noise issues should be addressed at the subsequent stages of planning through compliance with the WAPC's *Draft Statement of Planning Policy Road and Rail Transport Noise* and *Draft Statement of Planning Policy Metropolitan Freight Network.*

It is also expected that appropriate studies be carried out to determine noise insulation requirement within future mixed use zones or residential zones adjacent to commercial and/or transport nodes. It should be noted that the accepted methodology for prediction of noise impacts and attenuation due to noise barriers is currently under review by Main Roads WA, and studies should be carried out in accordance with their new guidelines expected to be issued in 2006.

Potential Land Use Conflict

It is noted that the site is located in close proximity to several potentially conflicting land uses such as sand quarries, horse stables, a crematoria and poultry farms. It is considered that the resolution of potential land use conflicts is a key planning issue that planning authorities are best positioned to resolve, having regard for local planning directions and knowledge and the results of accredited technical studies, on advice from appropriate government agencies. In the absence of site specific technical studies, the Environmental Protection Authority's (EPA) *Guidance Statement No. 3 Separation Distances Between Industrial and Sensitive Land Uses* should be utilised as a guide for generic separation distances.

Site Contamination

A previously submitted report regarding the subject land indicates that there may be a possibility of soil and/or groundwater contamination as a result of historical land use. As noted in the report,

a Preliminary Site Investigation (PSI) should be carried out prior to detailed planning. If as a result of the site investigation the site is found to be contaminated, a Site Remediation and Validation Report is to be produced in consultation with the DEC.

Preliminary and detailed site investigation and subsequent management plans should be prepared and implemented in accordance with the DEC's *Contaminated Sites Management Series* and to the satisfaction of the DEC's Land and Water Quality Branch.

High Pressure Natural Gas Pipeline

The Dampier to Bunbury high pressure natural gas pipeline traverses the subject land. Detailed risk assessment and planning should be undertaken in consultation with the Department of Consumer and Employment Protection, who is the lead agency for the consideration of public risk.

3. General Advice

- For the purposes of Part IV of the EP Act, the scheme amendment is defined as an assessed scheme amendment. In relation to the implementation of the scheme amendment, please note the requirements of Part IV Division 4 of the EP Act.
- There is no appeal right in respect of the EPA's decision on the level of assessment of scheme amendments.
- A copy of this advice will be sent to the relevant authorities and will be available to the public on request.

1100 W H Tacey

A/Director Environmental Impact Assessment

23 October 2006

cc: Department for Planning & Infrastructure

APPENDIX B

LIST OF DETAIL PLANS SUPPORTING THE AMENDMENT

BALDIVIS (EAST) - NORTH OF ZIG ZAG ROAD

PROPOSED MAJOR AMENDMENT

AMENDMENT No. 1127/41

AS ADVERTISED

3.2066

DETAIL PLANS

3.2069 BALDIVIS – URBAN

APPENDIX C

SUBMISSION FORM FOR THIS AMENDMENT (Form 41)

Planning and Development Act 2005 Section 41 Amendment (Substantial)

FORM 41

SUBMISSION

METROPOLITAN REGION SCHEME AMENDMENT 1127/41

LOTS 3 & 4 ZIG ZAG ROAD; 459-463, 510-513, 520, 521 & 709 BALDIVIS ROAD; 515-518 SABRINA ROAD; AND 447 TELEPHONE LANE, BALDIVIS

To: Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000 	
Name	
(PLEASE PRINT CLEARLY)	le
Address Postcod	
Contact phone number Email address	
Submission (Please attach additional pages if required. It is preferred that any additional information b	e loose rather than bound)
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TURN OVER TO COMPLETE YOUR SUBMISSION	

Hearing of Submissions

The *Planning and Development Act 2005* provides the opportunity for people who have made a written submission to personally present the basis of their submission to a Hearings Committee.

You do not have to attend a hearing. The comments presented by you in this written submission will be considered in determining the recommendation for the proposed amendment.

For information about the submission and hearings process, please refer to the *Amendment Report* and in particular **Appendix D**, titled **'Preparing a submission and for a 'hearing' presentation**.

Please choose ONE of the following:

No, I	do not wish to speak at the hearings. (Please go to the bottom of the form and sign)
	OR
Yes,	I wish to speak at the hearings. (Please complete the following details)
	I will be represented by:
	MYSELF – My telephone number (business hours):
	OR
	A SPOKESPERSON
	Name of Spokesperson: Contact telephone number (business hours): Postal address:
	I would prefer my hearing to be conducted in:
	PUBLIC (members from the general public may attend your presentation)
	OR
	PRIVATE (only the people nominated by you or the hearings committee will be permitted to attend)

You should be aware that:

- The Western Australian Planning Commission (WAPC) is subject to the *Freedom of Information Act* 1992 (FOI Act) and as such, submissions made to the WAPC may be subject to applications for access under the FOI Act.
- In the course of the WAPC assessing submissions, or making its report on these submissions, copies of your submission or the substance of that submission, may be disclosed to third parties.
- All hearings are recorded and transcribed. The transcripts of all hearings, along with all written submissions, are tabled in Parliament and published as public records should the Governor approve the proposed amendment. The WAPC recommendations are similarly published in a *Report on Submissions* and tabled in Parliament.

TO BE SIGNED BY PERSON(S) MAKING THE SUBMISSION

Signature Date

NOTE: Submissions MUST be received by the advertised closing date, being close of business (5.00pm) on <u>4 MAY 2007</u>. Late submissions will NOT be considered.

SECTION 2

Amendment 1128/41

Baldivis Urban Expansion Area 2

Lots 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 Baldivis Road, Baldivis

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AMENDMENT 1128/41 TO THE METROPOLITAN REGION SCHEME BALDIVIS URBAN EXPANSION AREA 2

LOTS 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 BALDIVIS ROAD, BALDIVIS

1. PURPOSE AND PLANNING OBJECTIVE

The purpose of the amendment is to rezone the area shown in Figure 1 from the Rural Zone to the Urban Zone in the Metropolitan Region Scheme (MRS). The area is bounded by:

- The Kwinana Freeway;
- Folly Road;
- Zig Zag Road; and
- Baldivis Road.

The planning objective of the amendment is to provide urban land for future communities, designed around networks and centres through detailed structure planning which will be undertaken under the local planning scheme.

2. COORDINATION OF REGION AND LOCAL PLANNING SCHEME AMENDMENTS

Section 126(3) of the *Planning and Development Act 2005* allows for the 'parallel' amendment of a local planning scheme where land is to be transferred to the Urban zone in the region scheme. If the region scheme amendment is approved, the WAPC may also transfer the land to the Development Zone in the local planning scheme.

The City of Rockingham has requested approval to include the land the subject of the region scheme amendment in the Development Zone of the local planning scheme. If this is agreed to by the WAPC, the City of Rockingham Town Planning Scheme No. 2 Amendment 40 will become effective upon the Gazettal of this MRS amendment. Once this occurs, detailed structure planning will be undertaken as part of the local planning scheme process which also includes the opportunity for further public consultation.

No subdivision and development can occur before the MRS and local scheme amendments and structure planning have been finalised.

3. BACKGROUND

This amendment is one of a group of four amendments to the Metropolitan Region Scheme, all involving additions to the existing Baldivis Urban area. The areas in the four amendments have been named Areas 1, 2, 3 and 4 for convenience in identifying them. This Amendment Report addresses Area 2.

The South West Corridor Structure Plan (1993) set out major land use and infrastructure for the corridor to guide MRS and local scheme amendments and other planning decisions.

The land included in this amendment and the Areas 1 and 3 amendments are depicted in the Structure Plan as 'Rural Areas - Landscape Attributes'. Accompanying text related to

1

amendment Areas 1, 2 and 3 refers to them as 'Kwinana Freeway Buffer Area' and comments "This area is mostly low lying and would not be suitable for urban development without substantial drainage works. The area includes 3 important wetlands....".

The most recent planning document for Perth - Network City - Community Planning Strategy for Perth and Peel (2004) includes a 'Network City Framework' map which shows the Baldivis urban area. The comment "Future communities will be designed around networks and centres" is applicable to that area. The proposed amendments in this group are considered to be generally consistent with Network City in terms of the Framework and the strategy document generally as they are relatively small additions. The land required for drainage and freeway buffer will reduce the area actually available for residential development within the Urban zone.

These matters are addressed below in the Discussion section of this report.

4. ENVIRONMENTAL PROTECTION AUTHORITY ADVICE

The proposed amendment was referred to the Environmental Protection Authority (EPA) for advice on whether environmental assessment would be required.

The EPA has advised that the proposed amendment does not require formal assessment under Part IV of the *Environmental Protection Act*. It has however provided advice on the key environmental factors for the amendment. A copy of the notice from the EPA is included at **Appendix A**.

5. SCOPE AND CONTENT OF THE AMENDMENT

As stated above, this proposed amendment is one of four proposals for rezoning land adjoining the existing Baldivis Urban area from Rural to Urban.

<u>Area 1</u> - the area bounded by Zig Zag Road, Baldivis Road and the Kwinana Freeway. (Amendment 1127/41)

<u>Area 2</u> - the area bounded by Zig Zag Road, Baldivis Road, Folly Road and the Kwinana Freeway. (Amendment 1128/41)

<u>Area 3</u> - the area bounded by Folly Road, Baldivis Road and the Kwinana Freeway (Amendment 1129/41)

<u>Area 4</u> - the eastern portion of the area bounded by Pike Road, Eighty Road, Mandurah Road and the southern boundary of the lots on Chandler Ramble. (Amendment 1130/41)

The amendments will proceed as a group. If any of the individual amendments are likely to be delayed by issues affecting it and not the others, that amendment can be removed from the group allowing the others to proceed.

6. DISCUSSION

The 1993 South West Districts Structure Plan sets out a framework of land uses and other urban infrastructure for the South West corridor. The plan identifies the land in this and the Area 1 and 3 amendments as 'Rural Areas - Landscape Attributes'. The land is part of an

area referred to as a 'Kwinana Freeway Buffer Area'. This area is described as "mostly low lying and subject to inundation" and "not suitable for urban development without substantial drainage works".

Accordingly, it appears that the combination of the limited viability of the land for urban development due to the need for substantial drainage works in combination with a desire for a buffer strip between the Freeway and residential development for landscape purposes resulted in its resulted in its not being designated for future urban use.

With the passing of time and continued growth of the metropolitan region, the proposed amendments are considered appropriate in view of:

- continuing population growth and the desirability of providing residential land in proximity to essential urban services and major recreation resources in the South West corridor;
- the alignment of the future South West passenger rail line and the location of its stations;
- planning for urban infrastructure (such as neighbourhood and district centres) in the existing Baldivis urban area; and
- drainage of land for urban purposes now being a viable proposition.

The 2004 Network City document contains a set of Key Objectives. These are quite broad and have a region wide context. All four of the MRS amendments proposed for expanding the existing Baldivis Urban area are generally consistent with these 'Key Objectives'.

The Key Objectives, and how this and the other amendments in the group meet those objectives are set out below.

- 1. Deliver urban growth management.
- 2. Accommodate urban growth primarily within a Network City pattern, incorporating communities.

As previously mentioned the four amendments are generally consistent with the Network City Framework plan's designation of Baldivis as a 'Future Community'.

- 3. Align transport systems and land use to optimise accessibility and amenity.
- 4. Deliver a safe, reliable and energy efficient transport system that provides travel choice.

Future residents of the areas in the proposed amendment area will both utilise nearby major transport infrastructure, in particular the South West passenger rail line, and contribute to the viability of that rail line.

5. Protect and enhance the natural environment, open spaces and heritage.

Not entirely applicable to the subject group of amendments as they involve areas long since modified and no longer classifiable as part of the natural environment or natural heritage. There are, however, several wetlands that will require protection as discussed below, should the Urban amendment proceed.

- 6. Deliver for all a better quality of life, building on our existing strengths.
- 7. Plan with the communities.
- 8. Ensure employment is created within centres.
- 9. Deliver a city with 'urban' energy, creativity and cultural vitality.
- 10. Provide a city plan that will be implemented, provide certainty and deliver results. Increasing the area and population of the relatively isolated Baldivis Urban area can only improve the social and economic viability and of the that cell by way of increased employment opportunities, more private businesses and services and government infrastructure and services. All these result in a more sustainable, vibrant community with less need to travel to other parts of the metropolitan region.

Future Development

The total area included in the amendment is approximately 168 ha. After land for non-residential purposes is set aside, approximately 2000 lots could be provided in this area.

The total number of lots east of Baldivis in Areas 1, 2 and 3 would be in the vicinity of 3 900.

7. SUSTAINABILITY

Environment

A large proportion of the subject land contains Multiple Use category wetlands and is relatively low lying and subject to inundation. Water management in any future urban areas resulting from the amendment is required to be consistent with WAPC and EPA policies.

The subject land has moderate to low risk of Acid Sulphate Soils. This matter requires further investigation later in the planning process, should the amendment proceed.

Urban development would result in the need for appropriate water management. This is required to be consistent with the relevant WAPC and EPA policies.

Measures should be taken to protect any native vegetation worthy of retention remaining on the site.

Noise issues related to the Kwinana Freeway are required to be addressed in terms of the WAPC's draft State Planning Policy 'Road and Rail Transport Noise' and the draft State Planning Policy, 'Metropolitan Freight Network'.

The location of existing land uses that have the potential for conflict with any future urban uses should be addressed in terms of the EPA's *Guidance Statement No. 3 Separation Distances Between Industrial and Sensitive Land Uses.*

Any soil and / or groundwater contamination is found on the site, should be dealt with in accordance with the Department of Environment and Conservation *Contaminated Sites Management* series. The Department of Environment and Conservation should be contacted in relation to site samples found containing zinc.

The Dampier to Bunbury high pressure natural gas pipeline traverses the subject land. Accordingly, detailed risk assessment and planning should be carried out in association with the Department of Consumer and Employment Protection.

Community

The subject amendment area and amendment Areas 1, 3 and 4 are well placed to both utilise and contribute to the viability of urban infrastructure and services in or planned for the existing Baldivis Urban area.

Baldivis itself is well located in relation to the proposed Warnbro railway station and to a lesser extent the Wellard station. Future residents of this amendment area and the others for Areas 1, 3 and 4 will both benefit from and contribute to the viability of the South West passenger rail line.

The existing Baldivis Urban area is somewhat isolated from the surrounding urban zones of the southern portion of the metropolitan region. Additional population in the cell as expanded by this and the associated amendments will mean more public and private urban infrastructure and services and more economic activity within the Baldivis urban area as a whole. This in turn will make that area more economically and socially self sustaining, lessening the need for residents to travel outside the area.

Regional context

This and the associated amendments provide urban land within close proximity to existing infrastructure and services, adjoining an existing urban cell within the Perth metropolitan region without major departure from current planning strategies.

WAPC State Planning Policy No. 2: Urban Growth and Settlement has objectives relating to:

- promoting a sustainable and well planned pattern of settlement across the state with provision of land for housing and other urban uses;
- . building on existing communities to improve services and infrastructure and enhance quality of life;
- . managing the growth and development of urban areas in response to community needs, environment, heritage and community values and relevant constraints.
- . promoting sustainable and liveable neighbourhoods with reduced resource consumption, housing choice and affordability and creating an identifiable sense of place for communities; and
- . co-ordinating new development with efficient, economic and timely provision of infrastructure and services.

The urban development that would result from the four proposed MRS amendments in this group does not conflict with these objectives.

8. IMPLEMENTATION

MRS rezonings are required to be followed by local scheme rezonings to a zone consistent with the MRS zone. Following that, structure plans for the amendment areas are required

addressing all issues, for example, the various issues raised by Department of Environment and Conservation.

9. THE AMENDMENT PROCESS

The procedures for amending the MRS are prescribed by the *Planning and Development Act* 2005. The amendment proposed in this report is being made under the provisions of Section 41 of that Act.

In essence, this procedure for a substantial alteration to the Scheme (often referred to as a 'major' amendment) involves:

- formulation of the amendment by the WAPC;
- referral to the EPA for environmental assessment;
- completion of an Environmental Review (if required) to EPA instructions;
- public submissions being sought on the proposed amendment (including Environmental Review if required);
- consideration of submissions (including hearings where requested);
- referral of WAPC recommendations, with or without any modifications in response to submissions, to the Minister for Planning and Infrastructure;
- approval by the Governor;
- consideration by both Houses of Parliament, which can disallow the amendment;
- the amendment takes legal effect when no longer subject to disallowance after 12 sitting days.

An explanation of this process can also be found in the front of this report, entitled 'The Metropolitan Region Scheme, what it is and how it is amended'.

10. SUBMISSIONS ON THE AMENDMENT

The WAPC invites people to comment on this proposed amendment to the MRS.

The amendment is being advertised for public submissions for a period of three months from Tuesday 30 January 2007 to Friday 4 May 2007.

Copies of the amendment will be available for public inspection at:

- i) the Department for Planning and Infrastructure, Wellington Street, Perth;
- ii) the municipal offices of the Cities of Perth, Fremantle, Cockburn, Melville and Rockingham and the Towns of East Fremantle and Kwinana; and
- iii) the State Reference Library, Northbridge.

Written submissions on the amendment should be sent to:

The Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

and must be received by Friday 4 May 2007.

All submissions received by the WAPC will be acknowledged.

For your convenience a submission form (Form 41) for this amendment 1128/41 – is attached to this report (**Appendix C**). Additional copies of this form are available from the display locations listed above and from the WAPC's Internet site www.wapc.wa.gov.au.

You should be aware that the calling for submissions is a public process, and all submissions lodged will together become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament. Advice of disclosure and access requirements is shown on side two of the submission form.

Before making your submission, it is recommended that you read the information in **Appendix II** of this report regarding preparing a submission.

11. HEARINGS

Any person making a written submission also has the opportunity to personally present the basis of their submission to a sub-committee of the WAPC. Details required for attending the hearings are on side two of the submission form.

Presentations made to the hearings committee are an extension of the submission process, and the transcript of all hearings will become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament.

Before completing your submission form, please refer to the information regarding hearings in **Appendix II** of this report.

12. MODIFICATIONS TO THE AMENDMENT

After considering any comments received from the public and Government agencies, the WAPC may make modifications to the amendment.

The recommendations of the WAPC, including any modifications, are published in a *Report* on *Submissions*. Anyone who has made a submission will receive a copy of this document when the amendment is tabled in Parliament. The report will also be available on the WAPC's Internet site www.wapc.wa.gov.au.

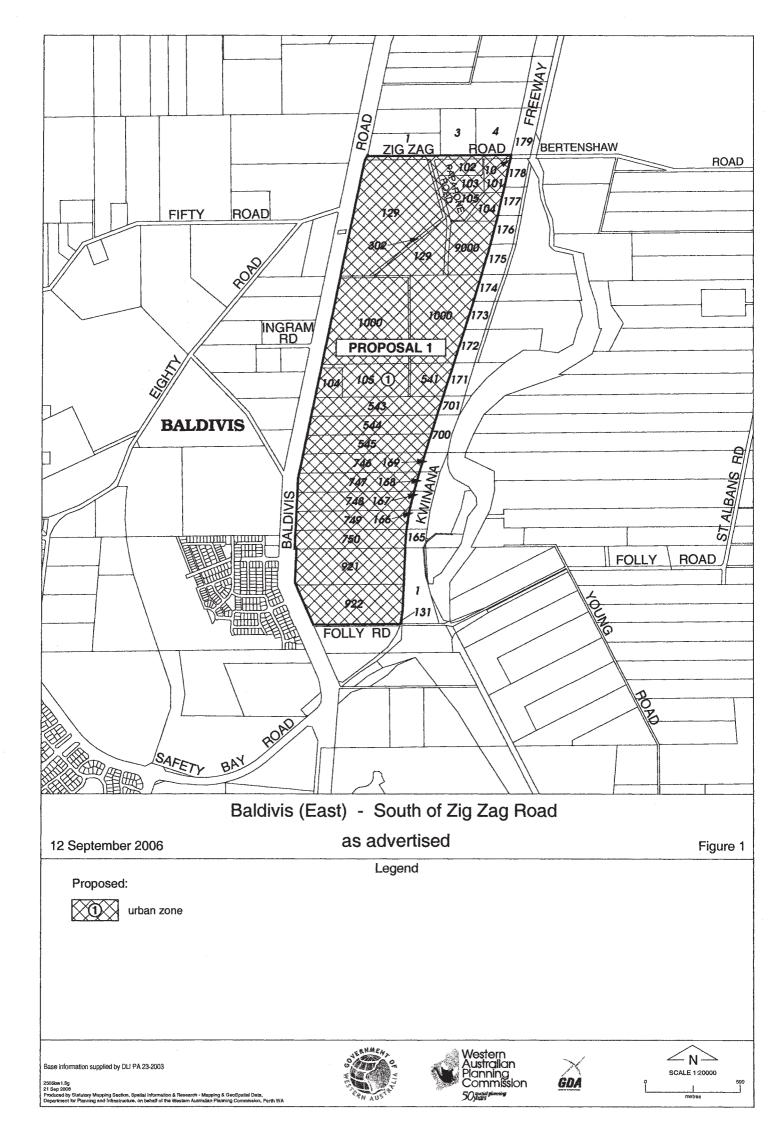
13. FINAL OUTCOME

Following consideration by both Houses of Parliament, those who made submissions will be notified of the final outcome, along with all affected landowners.

<u>AREA 2</u>

LOTS 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 BALDIVIS ROAD, BALDIVIS

FIGURE 1



APPENDIX A

NOTICE OF ENVIRONMENTAL ASSESSMENT



Environmental Protection Authority

The Atrium, Level 8, 168 St Georges Terrace, Perth, Western Australia 6000. Telephone: (08) 6364 6500. Facsimile: (08) 6364 6522.

> Postal Address: PO Box K822, Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Director General Department for Planning & Infrastructure 469-489 Wellington Street PERTH WA 6000

Our Ref Enquiries CRN220603 Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE:

SCHEME AMENDMENT LOCATION:

LOCALITY: RESPONSIBLE AUTHORITY: LEVEL OF ASSESSMENT: MRS Amendment 1128/41 Baldivis Urban Area Expansion - Area 2 Lots 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 Baldivis Road Baldivis Western Australian Planning Commission Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

The above scheme amendment has been referred to the Environmental Protection Authority (EPA) for assessment.

Please find enclosed a copy of the EPA's letter to the Western Australian Planning Commission dated 23 October 2006 for your information and records.

W H Tacey A/Director Environmental Impact Assessment

23 October 2006

Enc.

UEPARTMENT FOR PLANNING AND INFRASTRUCTURE 25 OCT 2006 78 PI FILE 809



Environmental Protection Authority

The Atrium, Level 8, 168 St Georges Terrace, Perth, Western Australia 6000. Telephone: (08) 6364 6500. Facsimile: (08) 6364 6522.

> Postal Address: PO Box K822. Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

Our Ref CRN220603 Enquiries Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE: MRS Amendment 1128/41 Baldivis Urban Area **Expansion - Area 2** SCHEME AMENDMENT LOCATION: Lots 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 Baldivis Road LOCALITY: **Baldivis RESPONSIBLE AUTHORITY:** Western Australian Planning Commission LEVEL OF ASSESSMENT: Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

Thank you for your letter of 26 September 2006 referring the above proposed scheme amendment.

After consideration of the information provided by you, the Environmental Protection Authority (EPA) considers that the proposed scheme amendment should not be assessed under Part IV Division 3 of the Environmental Protection Act 1986 (EP Act) but nevertheless provides the following advice and recommendations.

ADVICE AND RECOMMENDATIONS

1. **Environmental Issues**

- Noise
- Acid Sulfate Soils
- Water Management
- Vegetation and Flora
- Potential Land Use Conflict
- Site Contamination
- **High Pressure Natural Gas Pipeline**

2 5 OCT 200 Advice and recommendations regarding Environmental Issues

DEPARTMENT FOR PLANNING

AND IMPRASTRUCTURE

Noise

2.

The subject site abuts the Kwinana Freeway and future noise-sensitive land uses may be subject to excessive noise levels. Noise issues should be addressed at the subsequent stages of planning through compliance with the WAPC's Draft Statement of Planning Policy Road and Rail Transport Noise and Draft Statement of Planning Policy Metropolitan Freight Network.

It is also expected that appropriate studies be carried out to determine noise insulation requirement within future mixed use zones or residential zones adjacent to commercial and/or transport nodes. It should be noted that the accepted methodology for prediction of noise impacts and attenuation due to noise barriers is currently under review by Main Roads WA, and studies should be carried out in accordance with their new guidelines expected to be issued in 2006.

Acid Sulfate Soils

According to the Western Australian Planning Commission's (WAPC) Planning Bulletin No. 64 – Acid Sulfate Soils the subject land is mapped as having a moderate to low risk of Actual Acid Sulfate Soils and Potential Acid Sulfate Soils at depths greater than 3 metres. Regardless of the generic mapping provided, please note that investigation of local site characteristics is needed, and if these lead to the view that there is a risk of disturbing acid sulfate soils, then more detailed site investigations and management in accordance with *Planning Bulletin No. 64* and the DEC's Acid Sulfate Soils Management Series are appropriate.

Water Management

A large portion of the subject site is identified as a Multiple Use wetland on the DEC's Geomorphic Wetlands Swan Coastal Plain dataset and is relatively low-lying and subject to seasonal inundation.

The subject land is within the Peel-Harvey catchment and the provisions of the Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992 and the Statement of Planning Policy No 2.1 - The Peel-Harvey Coastal Plain Catchment shall apply. Careful management of stormwater, nutrients, other contaminants and retention of native vegetation is expected consistent with these policies. There shall not be any direct stormwater discharge into any rural drains or wetlands. Stormwater management should be consistent with the DEC's Stormwater Management Manual for Western Australia.

Water management is an important issue for the locality, and the broader Peel-Harvey catchment, and the subject site contains areas of low lying land. It is recommended that site planners keep abreast of the initiatives to protect water quality in the Peel-Harvey catchment and the urban water management framework being developed for the Perth metropolitan area. The next stages of planning should be accompanied by water management plans/strategies based on adequate site monitoring and modelling consistent with the urban water management framework and advice of the DEC. In particular, it is expected that there will be negligible nutrient export. There is also an expectation that the site can be serviced by reticulated sewer.

Vegetation and Flora

Aerial photography of the site indicates the subject land is sparsely vegetated. Existing vegetation, including mature trees, of good condition should be retained within the proposed development where possible. As discussed, the subject land is located within the Peel Harvey Catchment where remaining areas of native vegetation are very important for protecting water quality and biodiversity. Under the provisions of the *Statement of Planning Policy No 2.1 - The Peel-Harvey Coastal Plain Catchment*, the proponent is encouraged to retain all areas of native vegetation and to protect them from further degradation.

All native vegetation should be preserved so far as practicable during and after clearing for site works and services to accommodate the proposed subsequent urban development. Measures should be taken to ensure the identification, protection and management of any significant vegetation on site worthy of retention prior to the commencement of site works. It is noted that the proponent proposes to maintain existing hollow-bearing trees as potential habitat for the Carnaby's Black Cockatoo.

Potential Land Use Conflict

It is noted that the site is located in close proximity to several potentially conflicting land uses including a poultry farm and nursery. It is considered that the resolution of potential land use conflicts is a key planning issue that planning authorities are best positioned to resolve, having regard for local planning directions and knowledge and the results of accredited technical studies, on advice from appropriate government agencies. In the absence of site specific technical studies, the EPA's *Guidance Statement No. 3 Separation Distances Between Industrial and Sensitive Land Uses* should be utilised as a guide for generic separation distances.

It is noted that the subject site is located within the generic separation distances for both the poultry farm and the nursery. With regard to managing potential adverse impacts from the poultry farm, the WAPC's *Statement of Planning Policy No 4.3 – Poultry Farms Policy* should be utilised. Assumptions regarding the size and intended operations of the poultry farm should not be relied upon however, and an assessment should be carried out to demonstrate that any potential impacts can be managed. It is considered that any potential impacts from the nursery can be adequately managed and addressed at the next stages of planning.

Site Contamination

A previously submitted report regarding the subject land indicates that there may be a possibility of soil and/or groundwater contamination as a result of historical land use. It is noted that

a Preliminary Site Investigation (PSI) has been carried out which indicates that samples from the site contain zinc at concentrations greater than the environmental investigation levels and petroleum hydrocarbons at a concentration greater than the human health investigation levels. Accordingly, the proponent should be advised to liaise with the DEC's Land and Water Quality Branch and a Site Remediation and Validation Report should be produced in consultation with the DEC's Land and Water Quality Branch.

Preliminary and detailed site investigation and subsequent management plans should be prepared and implemented in accordance with the DEC's *Contaminated Sites Management Series* and to the satisfaction of the DEC's Land and Water Quality Branch.

High Pressure Natural Gas Pipeline

It is noted that the Dampier to Bunbury high pressure natural gas pipeline is located in close proximity to the subject land. Further advice should be sought from the Department of Consumer and Employment Protection, who is the lead agency for the consideration of public risk.

3. General Advice

- For the purposes of Part IV of the EP Act, the scheme amendment is defined as an assessed scheme amendment. In relation to the implementation of the scheme amendment, please note the requirements of Part IV Division 4 of the EP Act.
- There is no appeal right in respect of the EPA's decision on the level of assessment of scheme amendments.
- A copy of this advice will be sent to the relevant authorities and will be available to the public on request.

Yours faithfully

W H Tacey

A/Director Environmental Impact Assessment

23 October 2006

cc: Department for Planning & Infrastructure

APPENDIX B

LIST OF DETAIL PLANS SUPPORTING THE AMENDMENT

BALDIVIS (EAST) - SOUTH OF ZIG ZAG ROAD

PROPOSED MAJOR AMENDMENT

AMENDMENT No. 1128/41

AS ADVERTISED

3.2067

DETAIL PLANS

3.2070 BALDIVIS – URBAN

APPENDIX C

SUBMISSION FORM FOR THIS AMENDMENT (Form 41)

Planning and Development Act 2005 Section 41 Amendment (Substantial) FORM 41

SUBMISSION

METROPOLITAN REGION SCHEME AMENDMENT 1128/41

LOTS 104 & 105, 532-538, 540 & 541, 543-545, 746-750, 921 & 922 **BALDIVIS ROAD, BALDIVIS**

		OFFICE USE ONLY
To:	Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000	SUBMISSION NUMBER
Na	ne	
Ade	dress Postcode	9
Co	ntact phone number	
Su	bmission (Please attach additional pages if required. It is preferred that any additional information be	loose rather than bound)
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TURN OVER TO COMPLETE YOUR SUBMISSION

Hearing of Submissions

The Planning and Development Act 2005 provides the opportunity for people who have made a written submission to personally present the basis of their submission to a Hearings Committee.

You do not have to attend a hearing. The comments presented by you in this written submission will be considered in determining the recommendation for the proposed amendment.

For information about the submission and hearings process, please refer to the Amendment Report and in particular Appendix D, titled 'Preparing a submission and for a 'hearing' presentation.

Please choose ONE of the following:

	No , 10	do not wish to speak at the hearings. (Please go to the bottom of the form and sign)
L		OR
	Yes,	I wish to speak at the hearings. (Please complete the following details)
		I will be represented by:
		MYSELF – My telephone number (business hours):
		OR
		A SPOKESPERSON
		Name of Spokesperson: Contact telephone number (business hours): Postal address:
		I would prefer my hearing to be conducted in:
		PUBLIC (members from the general public may attend your presentation)
		OR
		PRIVATE (only the people nominated by you or the hearings committee will be permitted to attend)

You should be aware that:

- The Western Australian Planning Commission (WAPC) is subject to the Freedom of Information Act 1992 (FOI Act) and as such, submissions made to the WAPC may be subject to applications for access under the FOI Act.
- In the course of the WAPC assessing submissions, or making its report on these submissions, copies of your submission or the substance of that submission, may be disclosed to third parties.
- All hearings are recorded and transcribed. The transcripts of all hearings, along with all written submissions, are tabled in Parliament and published as public records should the Governor approve the proposed amendment. The WAPC recommendations are similarly published in a Report on Submissions and tabled in Parliament.

TO BE SIGNED BY PERSON(S) MAKING THE SUBMISSION

Signature Date

NOTE: Submissions MUST be received by the advertised closing date, being close of business (5.00pm) on <u>4 MAY 2007</u>. Late submissions will NOT be considered.

Contacts: Telephone - (08) 9264 7777; Fax - (08) 9264 7566; Email - mrs@wapc.wa.gov.au; Internet - http://www.wapc.wa.gov.au

SECTION 3

Amendment 1129/41

Baldivis Urban Expansion Area 3

Lot 3 Folly Road and Lot 10 Baldivis Road, Baldivis

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Appendix A	Notice of Environmental Assessment
Appendix B	List of detail plans supporting the amendment
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AMENDMENT 1129/41 TO THE METROPOLITAN REGION SCHEME BALDIVIS URBAN EXPANSION AREA 3 LOT 3 FOLLY ROAD AND LOT 10 BALDIVIS ROAD, BALDIVIS

1. PURPOSE AND PLANNING OBJECTIVE

The purpose of the amendment is to rezone the area shown in Figure 1 from the Rural Zone to the Urban Zone in the Metropolitan Region Scheme (MRS). The area is bounded by:

- The Kwinana Freeway;
- Folly Road; and
- Baldivis Road.

The planning objective of the amendment is to provide urban land for future communities, designed around networks and centres through detailed structure planning which will be undertaken under the local planning scheme.

2. COORDINATION OF REGION AND LOCAL PLANNING SCHEME AMENDMENTS

Section 126(3) of the *Planning and Development Act 2005* allows for the 'parallel' amendment of a local planning scheme where land is to be transferred to the Urban zone in the region scheme. If the region scheme amendment is approved, the WAPC may also transfer the land to the Development Zone in the local planning scheme.

The City of Rockingham has requested approval to include the land the subject of the region scheme amendment in the Development Zone of the local planning scheme. If this is agreed to by the WAPC, the City of Rockingham Town Planning Scheme No. 2 Amendment 41 will become effective upon the Gazettal of this MRS amendment. Once this occurs, detailed structure planning will be undertaken as part of the local planning scheme process which also includes the opportunity for further public consultation.

No subdivision and development can occur before the MRS and local scheme amendments and structure planning have been finalised.

3. BACKGROUND

This amendment is one of a group of four amendments to the Metropolitan Region Scheme, all involving additions to the existing Baldivis Urban area. The areas in the four amendments have been named Areas 1, 2, 3 and 4 for convenience in identifying them. This Amendment Report addresses Area 3.

The South West Corridor Structure Plan (1993) set out major land use and infrastructure for the corridor to guide MRS and local scheme amendments and other planning decisions.

The land included in this amendment and the Areas 1 and 2 amendments are depicted in the Structure Plan as 'Rural Areas - Landscape Attributes'. Accompanying text related to amendment Areas 1, 2 and 3 refers to them as 'Kwinana Freeway Buffer Area' and comments "This area is mostly low lying and would not be suitable for urban development without substantial drainage works. The area includes 3 important wetlands....".

The most recent planning document for Perth - Network City - Community Planning Strategy for Perth and Peel (2004) includes a 'Network City Framework' map which shows the Baldivis urban area. The comment "Future communities will be designed around networks and centres" is applicable to that area. The proposed amendments in this group are considered to be generally consistent with Network City in terms of the Framework and the strategy document generally as they are relatively small additions. The land required for drainage and freeway buffer will reduce the area actually available for residential development within the Urban zone.

These matters are addressed below in the Discussion section of this report.

4. ENVIRONMENTAL PROTECTION AUTHORITY ADVICE

The proposed amendment was referred to the Environmental Protection Authority (EPA) for advice on whether environmental assessment would be required.

The EPA has advised that the proposed amendment does not require formal assessment under Part IV of the *Environmental Protection Act*. It has however provided advice on the key environmental factors for the amendment. A copy of the notice from the EPA is included at **Appendix A**.

5. SCOPE AND CONTENT OF THE AMENDMENT

As stated above, this proposed amendment is one of four proposals for rezoning land adjoining the existing Baldivis Urban area from Rural to Urban.

<u>Area 1</u> - the area bounded by Zig Zag Road, Baldivis Road and the Kwinana Freeway. (Amendment 1127/41)

<u>Area 2</u> - the area bounded by Zig Zag Road, Baldivis Road, Folly Road and the Kwinana Freeway. (Amendment 1128/41)

<u>Area 3</u> - the area bounded by Folly Road, Baldivis Road and the Kwinana Freeway (Amendment 1129/41)

<u>Area 4</u> - the eastern portion of the area bounded by Pike Road, Eighty Road, Mandurah Road and the southern boundary of the lots on Chandler Ramble. (Amendment 1130/41)

The amendments will proceed as a group. If any of the individual amendments are likely to be delayed by issues affecting it and not the others, that amendment can be removed from the group allowing the others to proceed.

6. DISCUSSION

The 1993 South West Districts Structure Plan sets out a framework of land uses and other urban infrastructure for the South West corridor. The plan identifies the land in this and the Area 1 and 2 amendments as 'Rural Areas - Landscape Attributes'. The land is part of an area referred to as a 'Kwinana Freeway Buffer Area'. This area is described as "mostly low lying and subject to inundation" and "not suitable for urban development without substantial drainage works".

Accordingly, it appears that the combination of the limited viability of the land for urban development due to the need for substantial drainage works combination with a desire for a buffer strip between the Freeway and residential development for landscape purposes resulted in its not being designated for future urban use.

With the passing of time and continued growth of the metropolitan region, the proposed amendments are considered appropriate in view of:

- . continuing population growth and the desirability of providing residential land in proximity to essential urban services and major recreation resources in the South West corridor;
- . the alignment of the future South West passenger rail line and the location of its stations;
- . planning for urban infrastructure (such as neighbourhood and district centres) in the existing Baldivis urban area; and
- . drainage of land for urban purposes now being a viable proposition.

The Key Objectives, and how this and the other amendments in the group meet those objectives are set out below.

- 1. Deliver urban growth management.
- 2. Accommodate urban growth primarily within a Network City pattern, incorporating communities.

As previously mentioned the four amendments are generally consistent with the Network City Framework plan's designation of Baldivis as a 'Future Community'.

- 3. Align transport systems and land use to optimise accessibility and amenity.
- 4. Deliver a safe, reliable and energy efficient transport system that provides travel choice.

Future residents of the areas in the proposed amendment area will both utilise nearby major transport infrastructure, in particular the South West passenger rail line, and contribute to the viability of that rail line.

5. Protect and enhance the natural environment, open spaces and heritage.

Not entirely applicable to the subject group of amendments as they involve areas long since modified and no longer classifiable as part of the natural environment or natural heritage. There are, however, several wetlands that will require protection as discussed below, should the Urban amendment proceed.

- 6. Deliver for all a better quality of life, building on our existing strengths.
- 7. Plan with the communities.
- 8. Ensure employment is created within centres.
- 9. Deliver a city with 'urban' energy, creativity and cultural vitality.

10. Provide a city plan that will be implemented, provide certainty and deliver results.

Increasing the area and population of the relatively isolated Baldivis Urban area can only improve the social and economic viability and of the that cell by way of increased employment opportunities, more private businesses and services and government infrastructure and services. All these result in a more sustainable, vibrant community with less need to travel to other parts of the metropolitan region.

- continuing population growth and the desirability of providing residential land in proximity to essential urban services and major recreation resources in the South West corridor;
- the alignment of the future South West passenger rail line and the location of its stations;
- . planning for urban infrastructure (such as neighbourhood and district centres) in the existing Baldivis urban area; and
- . drainage of the land for urban purposes now being a viable proposition.

Future Development

Area 3 comprises Lots 3 (5.4 ha) and 10 (2.35 ha). The number of lots created could be approximately 100, depending on how much of the land is required by structure planning for non-residential uses.

The total number of lots east of Baldivis in Areas 1, 2 and 3 would be in the vicinity of 3 900.

7. SUSTAINABILITY

Environment

Noise issues related to the Kwinana Freeway are required to be addressed in terms of the WAPC's draft State Planning Policy 'Road and Rail Transport Noise' and the draft State Planning Policy 'Metropolitan Freight Network'.

Community

The subject amendment area and amendment Areas 1, 2 and 4 are well placed to both utilise and contribute to the viability of urban infrastructure and services in or planned for the existing Baldivis Urban area.

Baldivis itself is well located in relation to the proposed Warnbro railway station and to a lesser extent the Wellard station. Future residents of this amendment area and the others for Areas 1, 2 and 4 will both benefit from and contribute to the viability of the South West passenger rail line.

The existing Baldivis Urban area is somewhat isolated from the surrounding urban zones of the southern portion of the metropolitan region. Additional population in the cell as expanded by this and the associated amendments will mean more public and private urban infrastructure and services and more economic activity within the Baldivis urban area as a whole. This in turn will make that area more economically and socially self sustaining, lessening the need for residents to travel outside the area.

Regional context

This and the associated amendments provide urban land within close proximity to existing infrastructure and services, adjoining an existing urban cell within the Perth metropolitan region without major departure from current planning strategies.

WAPC State Planning Policy No. 2: Urban Growth and Settlement has objectives relating to: promoting a sustainable and well planned pattern of settlement across the state with provision of land for housing and other urban uses;

- . building on existing communities to improve services and infrastructure and enhance quality of life;
- . managing the growth and development of urban areas in response to community needs, environment, heritage and community values and relevant constraints.
- . promoting sustainable and liveable neighbourhoods with reduced resource consumption, housing choice and affordability and creating an identifiable sense of place for communities; and
- . co-ordinating new development with efficient, economic and timely provision of infrastructure and services.

The urban development that would result from the four proposed MRS amendments in this group does not conflict with these objectives.

8. IMPLEMENTATION

MRS rezonings are required to be followed by local scheme rezonings to a zone consistent with the MRS zone. Following that, structure plans for the amendment areas are required addressing all issues, for example, the various issues raised by Department of Environment and Conservation.

9. THE AMENDMENT PROCESS

The procedures for amending the MRS are prescribed by the *Planning and Development Act 2005.* The amendment proposed in this report is being made under the provisions of Section 41 of that Act.

In essence, this procedure for a substantial alteration to the Scheme (often referred to as a 'major' amendment) involves:

- formulation of the amendment by the WAPC;
- referral to the EPA for environmental assessment;
- completion of an Environmental Review (if required) to EPA instructions;
- public submissions being sought on the proposed amendment (including

Environmental Review if required);

- consideration of submissions (including hearings where requested);
- referral of WAPC recommendations, with or without any modifications in response to submissions, to the Minister for Planning and Infrastructure;
- approval by the Governor;
- consideration by both Houses of Parliament, which can disallow the amendment;
- the amendment takes legal effect when no longer subject to disallowance after 12 sitting days.

An explanation of this process can also be found in the front of this report, entitled 'The *Metropolitan Region Scheme, what it is and how it is amended*'.

10. SUBMISSIONS ON THE AMENDMENT

The WAPC invites people to comment on this proposed amendment to the MRS.

The amendment is being advertised for public submissions for a period of three months from Tuesday 30 January 2007 to Friday 4 May 2007.

Copies of the amendment will be available for public inspection at:

- i) the Department for Planning and Infrastructure, Wellington Street, Perth;
- ii) the municipal offices of the Cities of Perth, Fremantle, Cockburn, Melville and Rockingham and the Towns of East Fremantle and Kwinana; and
- iii) the State Reference Library, Northbridge.

Written submissions on the amendment should be sent to:

The Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

and must be received by Friday 4 May 2007.

All submissions received by the WAPC will be acknowledged.

For your convenience a submission form (Form 41) for this amendment No.1129/41 – is attached to this report (**Appendix C**). Additional copies of this form are available from the display locations listed above and from the WAPC's Internet site www.wapc.wa.gov.au.

You should be aware that the calling for submissions is a public process, and all submissions lodged will together become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament. Advice of disclosure and access requirements is shown on side two of the submission form.

Before making your submission, it is recommended that you read the information in **Appendix II** of this report regarding preparing a submission.

11. HEARINGS

Any person making a written submission also has the opportunity to personally present the basis of their submission to a sub-committee of the WAPC. Details required for attending the hearings are on side two of the submission form.

Presentations made to the hearings committee are an extension of the submission process, and the transcript of all hearings will become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament.

Before completing your submission form, please refer to the information regarding hearings in **Appendix II** of this report.

12. MODIFICATIONS TO THE AMENDMENT

After considering any comments received from the public and Government agencies, the WAPC may make modifications to the amendment.

The recommendations of the WAPC, including any modifications, are published in a *Report* on *Submissions*. Anyone who has made a submission will receive a copy of this document when the amendment is tabled in Parliament. The report will also be available on the WAPC's Internet site www.wapc.wa.gov.au.

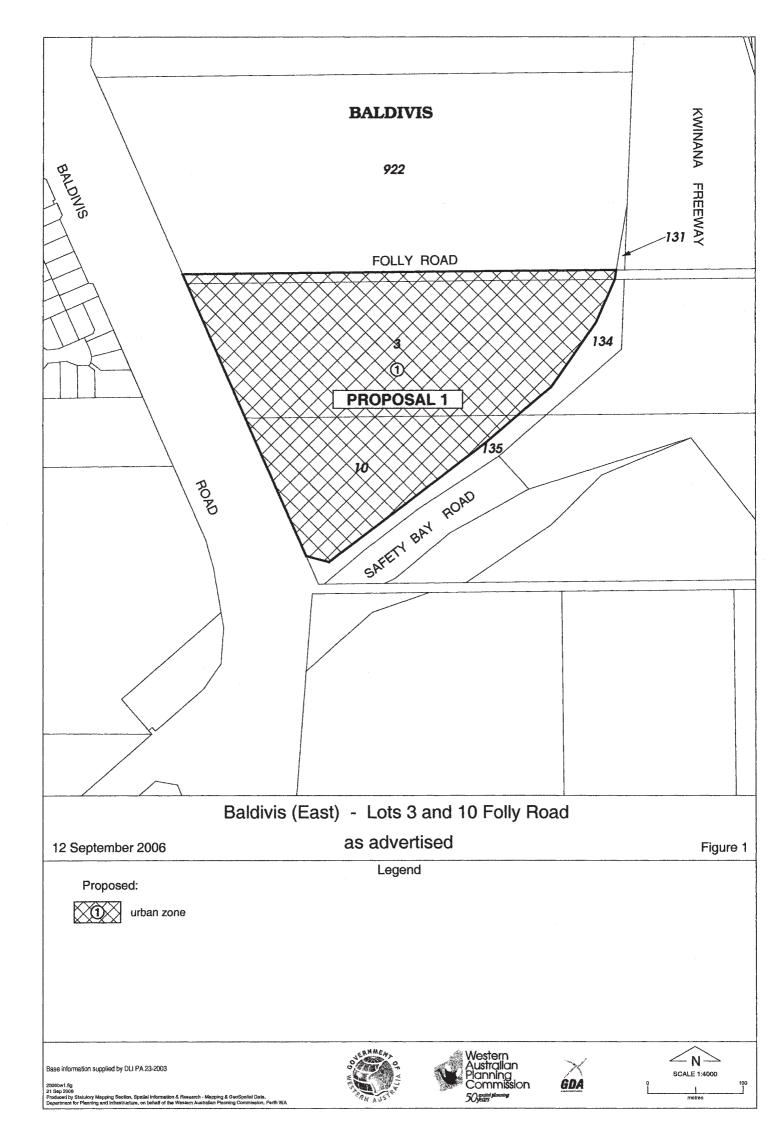
13. FINAL OUTCOME

Following consideration by both Houses of Parliament, those who made submissions will be notified of the final outcome, along with all affected landowners.

AREA 3

LOT 3 FOLLY ROAD AND LOT 10 BALDIVIS ROAD, BALDIVIS

FIGURE 1



APPENDIX A

NOTICE OF ENVIRONMENTAL ASSESSMENT



Environmental Protection Authority

Postal Address: PO Box K822, Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Director General Department for Planning & Infrastructure 469-489 Wellington Street PERTH WA 6000

Our Ref Enquiries CRN220604 Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE:

SCHEME AMENDMENT LOCATION: LOCALITY: RESPONSIBLE AUTHORITY: LEVEL OF ASSESSMENT: MRS Amendment 1129/41Baldivis Urban Area Expansion - Area 3 Lot 3 Folly Road and Lot 10 Baldivis Road Baldivis Western Australian Planning Commission Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

The above scheme amendment has been referred to the Environmental Protection Authority (EPA) for assessment.

Please find enclosed a copy of the EPA's letter to the Western Australian Planning Commission dated 23 October 2006 for your information and records.

W H Tacey A/Director Environmental Impact Assessment

23 October 2006

Enc.

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE	
2 5 OCT 2006	
FILE 209-2-28-9	P1



Environmental Protection Authority

The Atrium, Level 8, 168 St Georges Terrace, Perth, Western Australia 6000. Telephone: (08) 6364 6500. Facsimile: (08) 6364 6522.

> Postal Address: PO Box K822, Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

Our Ref CRN220604 *Enquiries* Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE:

SCHEME AMENDMENT LOCATION: LOCALITY: RESPONSIBLE AUTHORITY: LEVEL OF ASSESSMENT: MRS Amendment 1129/41Baldivis Urban Area Expansion - Area 3 Lot 3 Folly Road and Lot 10 Baldivis Road Baldivis Western Australian Planning Commission Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

Thank you for your letter of 26 September 2006 referring the above proposed scheme amendment.

After consideration of the information provided by you, the Environmental Protection Authority (EPA) considers that the proposed scheme amendment should not be assessed under Part IV Division 3 of the *Environmental Protection Act 1986* (EP Act) but nevertheless provides the following advice and recommendations.

ADVICE AND RECOMMENDATIONS

1. Environmental Issues

- Noise
- Acid Sulfate Soils
- Water Management
- Vegetation and Flora
- Site Contamination

DEPARTMENT FOR PLANNING AUCHARASTRUCTURE 2 5 OCT 2006 FILE 809 - 2-28-9 PT

2. Advice and recommendations regarding Environmental Issues

Noise

The subject site abuts the Kwinana Freeway and future noise-sensitive land uses may be subject to excessive noise levels. Noise issues should be addressed at the subsequent stages of planning through compliance with the WAPC's *Draft Statement of Planning Policy Road and Rail Transport Noise* and *Draft Statement of Planning Policy Metropolitan Freight Network*.

It is also expected that appropriate studies be carried out to determine noise insulation requirement within future mixed use zones or residential zones adjacent to commercial and/or transport nodes. It should be noted that the accepted methodology for prediction of noise impacts and attenuation due to noise barriers is currently under review by Main Roads WA, and studies should be carried out in accordance with their new guidelines expected to be issued in 2006.

Acid Sulfate Soils

According to the Western Australian Planning Commission's (WAPC) Planning Bulletin No. 64 – Acid Sulfate Soils the subject land is mapped as having a moderate to low risk of Actual Acid Sulfate Soils and Potential Acid Sulfate Soils at depths greater than 3 metres. Regardless of the generic mapping provided, please note that investigation of local site characteristics is needed, and if these lead to the view that there is a risk of disturbing acid sulfate soils, then more detailed

site investigations and management in accordance with *Planning Bulletin No. 64* and the DEC's *Acid Sulfate Soils Management Series* are appropriate.

Water Management

The subject land is within the Peel-Harvey catchment and the provisions of the Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992 and the Statement of Planning Policy No 2.1 - The Peel-Harvey Coastal Plain Catchment shall apply. Careful management of stormwater, nutrients, other contaminants and retention of native vegetation is expected consistent with these policies. There shall not be any direct stormwater discharge into any rural drains or wetlands. Stormwater management should be consistent with the DEC's Stormwater Management Manual for Western Australia.

Water management is an important issue for the locality, and the broader Peel-Harvey catchment, and the subject site contains areas of low lying land. It is recommended that site planners keep abreast of the initiatives to protect water quality in the Peel-Harvey catchment and the urban water management framework being developed for the Perth metropolitan area. The next stages of planning should be accompanied by water management plans/strategies based on adequate site monitoring and modelling consistent with the urban water management framework and advice of the DEC. In particular, it is expected that there will be negligible nutrient export. There is also an expectation that the site can be serviced by reticulated sewer.

Vegetation and Flora

Aerial photography of the site indicates the subject land is sparsely vegetated. Existing vegetation, including mature trees, of good condition should be retained within the proposed development where possible. As discussed, the subject land is located within the Peel Harvey Catchment where remaining areas of native vegetation are very important for protecting water quality and biodiversity. Under the provisions of the *Statement of Planning Policy No 2.1 - The Peel-Harvey Coastal Plain Catchment*, the proponent is encouraged to retain all areas of native vegetation.

All native vegetation should be preserved so far as practicable during and after clearing for site works and services to accommodate the proposed subsequent urban development. Measures should be taken to ensure the identification, protection and management of any significant vegetation on site worthy of retention prior to the commencement of site works.

Site Contamination

A previously submitted report regarding the subject land indicates that there may be a possibility of soil and/or groundwater contamination as a result of historical land use. It is noted that a Preliminary Site Investigation (PSI) has been carried out which indicates the absence of any contaminants, although it is not known if this has been reviewed by the DEC's Land and Water Quality Branch. Preliminary and detailed site investigation and subsequent management plans should be prepared and implemented in accordance with the DEC's *Contaminated Sites Management Series* and to the satisfaction of the DEC's Land and Water Quality Branch.

3. General Advice

- For the purposes of Part IV of the EP Act, the scheme amendment is defined as an assessed scheme amendment. In relation to the implementation of the scheme amendment, please note the requirements of Part IV Division 4 of the EP Act.
- There is no appeal right in respect of the EPA's decision on the level of assessment of scheme amendments.
- A copy of this advice will be sent to the relevant authorities and will be available to the public on request.

W H Tacey A/Director Environmental Impact Assessment

23 October 2006

cc: Department for Planning & Infrastructure

APPENDIX B

LIST OF DETAIL PLANS SUPPORTING THE AMENDMENT

BALDIVIS (EAST) – LOTS 3 AND 10 FOLLY ROAD

PROPOSED MAJOR AMENDMENT

AMENDMENT No. 1129/41

AS ADVERTISED

3.2068

DETAIL PLANS

3.2071 BALDIVIS – URBAN

APPENDIX C

SUBMISSION FORM FOR THIS AMENDMENT (Form 41)

Planning and Development Act 2005 Section 41 Amendment (Substantial)

FORM 41

SUBMISSION

METROPOLITAN REGION SCHEME AMENDMENT 1129/41

LOT 3 FOLLY ROAD AND LOT 10 BALDIVIS ROAD, BALDIVIS

OFFICE USE ONLY SUBMISSION NUMBER

To:	Secretary Western Australian Planning Commission
	469 Wellington Street PERTH WA 6000

Name	(PLEASE PRINT CLEARLY)
	Postcode
Contact phone	e number Email address
Submission	(Please attach additional pages if required. It is preferred that any additional information be loose rather than bound)
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TURN OVER TO COMPLETE YOUR SUBMISSION

Hearing of Submissions

The Planning and Development Act 2005 provides the opportunity for people who have made a written submission to personally present the basis of their submission to a Hearings Committee.

You do not have to attend a hearing. The comments presented by you in this written submission will be considered in determining the recommendation for the proposed amendment.

For information about the submission and hearings process, please refer to the Amendment Report and in particular Appendix D, titled 'Preparing a submission and for a 'hearing' presentation.

Please choose ONE of the following:

No , I do not wish to speak at the hearings. (Please go to the bottom of the form and sign)		
	OR	
Yes, I wish to speak at the hearings. (Please complete the following details)		
	I will be represented by: MYSELF – My telephone number (business hours): OR A SPOKESPERSON	
	A SPORESPERSON Name of Spokesperson: Contact telephone number (business hours): Postal address:	
	I would prefer my hearing to be conducted in: PUBLIC (members from the general public may attend your presentation) OR PRIVATE (only the people nominated by you or the hearings committee will be	
 	permitted to attend)	

You should be aware that:

- The Western Australian Planning Commission (WAPC) is subject to the Freedom of Information Act 1992 (FOI Act) and as such, submissions made to the WAPC may be subject to applications for access under the FOI Act.
- In the course of the WAPC assessing submissions, or making its report on these submissions, copies of your submission or the substance of that submission, may be disclosed to third parties.
- All hearings are recorded and transcribed. The transcripts of all hearings, along with all written submissions, are tabled in Parliament and published as public records should the Governor approve the proposed amendment. The WAPC recommendations are similarly published in a Report on Submissions and tabled in Parliament.

TO BE SIGNED BY PERSON(S) MAKING THE SUBMISSION

Signature Date

NOTE: Submissions MUST be received by the advertised closing date, being close of business (5.00pm) on 4 MAY 2007. Late submissions will NOT be considered.

Contacts: Telephone - (08) 9264 7777; Fax - (08) 9264 7566; Email - mrs@wapc.wa.gov.au; Internet - http://www.wapc.wa.gov.au

SECTION 4

Amendment 1130/41

Baldivis Urban Expansion Area 4

Lot 3 Pike Road; Lots 1, 2 & Pt Lot 335 Eighty Road; and Lots 1, 2 & Pt Lot 334 Mandurah Road, Baldivis

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Appendix A	Notice of Environmental Assessment
Appendix B	List of detail plans supporting the amendment
Appendix C	Submission form for this amendment (form 41)

AMENDMENT 1130/41 TO THE METROPOLITAN REGION SCHEME BALDIVIS URBAN EXPANSION AREA 4

LOT 3 PIKE ROAD; LOTS 1, 2 & PT LOT 335 EIGHTY ROAD; AND LOTS 1, 2 & PT LOT 334 MANDURAH ROAD, BALDIVIS

1. PURPOSE AND PLANNING OBJECTIVE

The purpose of the amendment is to rezone the area shown in Figure 1 from the Rural Zone to the Urban Zone in the Metropolitan Region Scheme (MRS). The area includes the eastern 2/3 (approximately) of the area bounded by:

- Eighty Road;
- Pike Road; and
- Mandurah Road.

The planning objective of the amendment is to provide urban land for future communities, designed around networks and centres through detailed structure planning which will be undertaken under the local planning scheme.

2. COORDINATION OF REGION AND LOCAL PLANNING SCHEME AMENDMENTS

Section 126(3) of the *Planning and Development Act 2005* allows for the 'parallel' amendment of a local planning scheme where land is to be transferred to the Urban zone in the region scheme. If the region scheme amendment is approved, the WAPC may also transfer the land to the Development Zone in the local planning scheme.

The City of Rockingham has requested approval to include the land the subject of the region scheme amendment in the Development Zone of the local planning scheme. If this is agreed to by the WAPC, the City of Rockingham Town Planning Scheme No. 2 Amendment 42 will become effective upon the Gazettal of this MRS amendment. Once this occurs, detailed structure planning will be undertaken as part of the local planning scheme process which also includes the opportunity for further public consultation.

No subdivision and development can occur before the MRS and local scheme amendments and structure planning have been finalised.

3. BACKGROUND

This amendment is one of a group of four amendments to the Metropolitan Region Scheme involving additions to the existing Baldivis Urban area. The areas in the 4 amendments have been named Areas 1, 2, 3 and 4 for convenience of identifying them. This Amendment Report addresses Area 4.

The South West Corridor Structure Plan (1993) set out major land use and infrastructure for the corridor to guide MRS and local scheme amendments and other planning decisions.

The land included in this amendment and the Areas 1, 2 and 3 amendments are depicted in the Structure Plan as 'Rural Areas - Landscape Attributes'. Accompanying text related to

1

West Baldivis, within which the Area 4 amendment sits, states "the area includes several wetlands and a limestone ridge adjacent to Old Mandurah Road which requires protection". In addition, "....drainage and sewerage of such a narrow area would be difficult because of drainage into wetlands".

The most recent planning document for Perth - Network City - Community Planning Strategy for Perth and Peel (2004) includes a 'Network City Framework' map which shows the Baldivis urban area. The comment "Future communities will be designed around networks and centres" is applicable to that area. The proposed amendments in this group are considered to be generally consistent with Network City in terms of the Framework and the strategy document generally as they are relatively small additions. Further, the land required for drainage and freeway buffer will reduce the area actually available for residential development within the Urban zone.

These matters are addressed below in the Discussion section of this report.

4. ENVIRONMENTAL PROTECTION AUTHORITY ADVICE

The proposed amendment was referred to the Environmental Protection Authority (EPA) for advice on whether environmental assessment would be required.

The EPA has advised that the proposed amendment does not require formal assessment under Part IV of the *Environmental Protection Act*. It has however provided advice on the key environmental factors for the amendment. A copy of the notice from the EPA is included at **Appendix A**.

5. SCOPE AND CONTENT OF THE AMENDMENT

As stated above, this proposed amendment is one of four proposals for rezoning land adjoining the existing Baldivis Urban area from Rural to Urban.

<u>Area 1</u> - the area bounded by Zig Zag Road, Baldivis Road and the Kwinana Freeway. (Amendment 1127/41)

<u>Area 2</u> - the area bounded by Zig Zag Road, Baldivis Road, Folly Road and the Kwinana Freeway. (Amendment 1128/41)

<u>Area 3</u> - the area bounded by Folly Road, Baldivis Road and the Kwinana Freeway (Amendment 1129/41)

<u>Area 4</u> - the eastern portion of the area bounded by Pike Road, Eighty Road, Mandurah Road and the southern boundary of the lots on Chandler Ramble. (Amendment 1130/41)

The amendments will proceed as a group. If any of the individual amendments are likely to be delayed by issues affecting it and not the others, that amendment can be removed from the group allowing the others to proceed.

6. DISCUSSION

The 1993 South West Districts Structure Plan sets out a framework of land uses and other urban infrastructure for the South West corridor. The plan identifies the land in this and the

Areas 1, 2 and 3 amendments as 'Rural Areas - Landscape Attributes'. Area 4 is within an area (West Baldivis) described as "mostly low lying and subject to inundation" and "not suitable for urban development without substantial drainage works".

With the passing of time and continued growth of the metropolitan region, the proposed amendments are considered appropriate in view of:

- continuing population growth and the desirability of providing residential land in proximity to essential urban services and major recreation resources in the South West corridor;
- the alignment of the future South West passenger rail line and the location of its stations;
- planning for urban infrastructure (such as neighbourhood and district centres) in the existing Baldivis urban area; and
- . drainage of the land for urban purposes now being a viable proposition.

The 2004 Network City document contains a set of Key Objectives. These are quite broad and have a region wide context. All four of the MRS amendments proposed for expanding the existing Baldivis Urban area are generally consistent with these 'Key Objectives'.

The Key Objectives, and how this and the other amendments in the group meet those objectives are set out below.

- 1. Deliver urban growth management.
- 2. Accommodate urban growth primarily within a Network City pattern, incorporating communities.

As previously mentioned the four amendments are generally consistent with the Network City Framework plan's designation of Baldivis as a 'Future Community'.

- 3. Align transport systems and land use to optimise accessibility and amenity.
- 4. Deliver a safe, reliable and energy efficient transport system that provides travel choice.

Future residents of the areas in the proposed amendment will both utilise nearby major transport infrastructure, in particular the South West passenger rail line, and contribute to the viability of that rail line.

5. Protect and enhance the natural environment, open spaces and heritage.

Not entirely applicable to the subject group of amendments as they involve areas long since modified and no longer classifiable as part of the natural environment or natural heritage. There are, however, several wetlands that will require protection as discussed below, should the Urban amendment proceed.

- 6. Deliver for all a better quality of life, building on our existing strengths.
- 7. Plan with the communities.
- 8. Ensure employment is created within centres.

- 9. Deliver a city with 'urban' energy, creativity and cultural vitality.
- 10. Provide a city plan that will be implemented, provide certainty and deliver results.

Increasing the area and population of the relatively isolated Baldivis Urban area can only improve the social and economic viability and of the that cell by way of increased employment opportunities, more private businesses and services and government infrastructure and services. All these result in a more sustainable, vibrant community with less need to travel to other parts of the metropolitan region.

Future Development

The total area included in the amendment is approximately 20 ha. Approximately 320 residential lots could be provided in this area.

7. SUSTAINABILITY

Environment

The subject land contains and Environmentally Sensitive Area, classified as a Threatened Ecological Community and associated chain of wetlands. Accordingly the Department of Environment and Conservation advises that to minimise the impact of development, the removal of existing vegetation from the site should be limited to the minimum required for building purposes. Further, any vegetation clearance is subject to the relevant legislation.

Community

The subject amendment area and amendment Areas 1, 2 and 3 are well placed to both utilise and contribute to the viability of urban infrastructure and services in or planned for the existing Baldivis Urban area.

Future residents within this amendment area will utilise and improve the viability of infrastructure in Wellard (southern portion of Kwinana townsite).

The existing Baldivis Urban zone is well located in relation to the Warnbro railway station and to a lesser extent the Wellard station. Future residents of this amendment area and the others for Areas 1, 2 and 3 will both benefit from and contribute to the viability of the South West passenger rail line.

Baldivis itself is somewhat isolated from the surrounding urban zones of the southern portion of the metropolitan region. Additional population in the cell as expanded by this and the associated amendments will mean more public and private urban infrastructure and services and more economic activity within the Baldivis urban area as a whole. This in turn will make that area more economically and socially self sustaining, lessening the need for residents to travel outside the area.

Regional context

This and the associated amendments provide urban land within close proximity to existing infrastructure and services, adjoining an existing urban cell with the Perth metropolitan region without major departure from current planning strategies.

WAPC State Planning Policy No. 2: Urban Growth and Settlement has objectives relating to:

- . promoting a sustainable and well planned pattern of settlement across the state with provision of land for housing and other urban uses;
- . building on existing communities to improve services and infrastructure and enhance quality of life;
- . managing the growth and development of urban areas in response to community needs, environment, heritage and community values and relevant constraints.
- . promoting sustainable and liveable neighbourhoods with reduced resource consumption, housing choice and affordability and creating an identifiable sense of place for communities; and
- . co-ordinating new development with efficient, economic and timely provision of infrastructure and services.

The urban development that would result from the 4 proposed MRS amendments in this group does not conflict with these objectives.

8. IMPLEMENTATION

MRS rezonings are required to be followed by local scheme rezonings to a zone consistent with the MRS zone. Following that, structure plans for the amendment areas are required addressing all issues, for example, the various issues raised by Department of Environment and Conservation.

9. THE AMENDMENT PROCESS

The procedures for amending the MRS are prescribed by the *Planning and Development Act* 2005. The amendment proposed in this report is being made under the provisions of Section 41 of that Act.

In essence, this procedure for a substantial alteration to the Scheme (often referred to as a 'major' amendment) involves:

- formulation of the amendment by the WAPC;
- referral to the EPA for environmental assessment;
- completion of an Environmental Review (if required) to EPA instructions;
- public submissions being sought on the proposed amendment (including Environmental Review if required);
- consideration of submissions (including hearings where requested);
- referral of WAPC recommendations, with or without any modifications in response to submissions, to the Minister for Planning and Infrastructure;
- approval by the Governor;

- consideration by both Houses of Parliament, which can disallow the amendment;
- the amendment takes legal effect when no longer subject to disallowance after 12 sitting days.

An explanation of this process can also be found in the front of this report, entitled '*The Metropolitan Region Scheme, what it is and how it is amended*'.

10. SUBMISSIONS ON THE AMENDMENT

The WAPC invites people to comment on this proposed amendment to the MRS.

The amendment is being advertised for public submissions for a period of three months from Tuesday 30 January 2007 to Friday 4 May 2007.

Copies of the amendment will be available for public inspection at:

- i) the Department for Planning and Infrastructure, Wellington Street, Perth;
- ii) the municipal offices of the Cities of Perth, Fremantle, Cockburn, Melville and Rockingham and the Towns of East Fremantle and Kwinana; and
- iii) the State Reference Library, Northbridge.

Written submissions on the amendment should be sent to:

The Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

and must be received by Friday 4 May 2007.

All submissions received by the WAPC will be acknowledged.

For your convenience a submission form (Form 41) for this amendment 1130/41 - is attached to this report (**Appendix C**). Additional copies of this form are available from the display locations listed above and from the WAPC's Internet site www.wapc.wa.gov.au.

You should be aware that the calling for submissions is a public process, and all submissions lodged will together become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament. Advice of disclosure and access requirements is shown on side two of the submission form.

Before making your submission, it is recommended that you read the information in **Appendix II** of this report regarding preparing a submission.

11. HEARINGS

Any person making a written submission also has the opportunity to personally present the basis of their submission to a sub-committee of the WAPC. Details required for attending the hearings are on side two of the submission form.

Presentations made to the hearings committee are an extension of the submission process, and the transcript of all hearings will become a public document. It will be published and made available when the amendment is presented to both Houses of Parliament.

Before completing your submission form, please refer to the information regarding hearings in **Appendix II** of this report.

12. MODIFICATIONS TO THE AMENDMENT

After considering any comments received from the public and Government agencies, the WAPC may make modifications to the amendment.

The recommendations of the WAPC, including any modifications, are published in a *Report* on *Submissions*. Anyone who has made a submission will receive a copy of this document when the amendment is tabled in Parliament. The report will also be available on the WAPC's Internet site www.wapc.wa.gov.au.

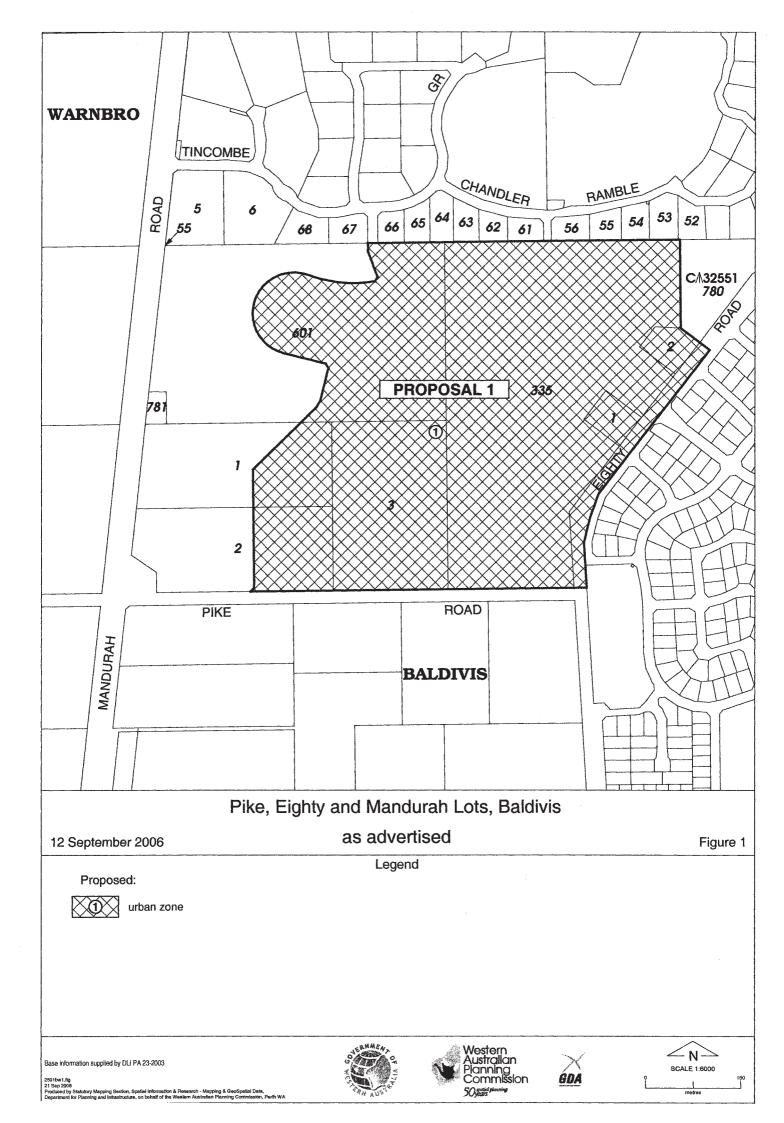
13. FINAL OUTCOME

Following consideration by both Houses of Parliament, those who made submissions will be notified of the final outcome, along with all affected landowners.

AREA 4

LOT 3 PIKE ROAD; LOTS 1, 2 & PT LOT 335 EIGHTY ROAD; AND LOTS 1, 2 & PT LOT 334 MANDURAH ROAD, BALDIVIS

FIGURE 1



APPENDIX A

NOTICE OF ENVIRONMENTAL ASSESSMENT



Environmental Protection Authority

The Atrium, Level 8, 168 St Georges Terrace, Perth, Western Australia 6000. Telephone: (08) 6364 6500. Facsimile: (08) 6364 6522.

> Postal Address: PO Box K822, Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Director General Department for Planning & Infrastructure 469-489 Wellington Street PERTH WA 6000

Our Ref Enquiries CRN220605 Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE:

SCHEME AMENDMENT LOCATION:

LOCALITY: RESPONSIBLE AUTHORITY: LEVEL OF ASSESSMENT: MRS Amendment 1130/41 Baldivis Urban Area Expansion - Area 4 Lot 3 Pike Road; Lots 1, 2 & Pt Lot 335 Eighty Road and Lots 1, 2 & Pt Lot 334 Mandurah Road Baldivis Western Australian Planning Commission Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

The above scheme amendment has been referred to the Environmental Protection Authority (EPA) for assessment.

Please find enclosed a copy of the EPA's letter to the Western Australian Planning Commission dated 23 October 2006 for your information and records.

W H Tacey A/Director Environmental Impact Assessment

23 October 2006

Enc.

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE 25 OCT 2006 1PI FILE SCA



Environmental Protection Authority

The Atrium, Level 8, 168 St Georges Terrace, Perth, Western Australia 6000. Telephone: (08) 6364 6500. Facsimile: (08) 6364 6522.

> Postal Address: PO Box K822, Perth, Western Australia 6842. Website: www.epa.wa.gov.au

Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

Our Ref CRN220605 *Enquiries* Glen McLeod-Thorpe

SCHEME AMENDMENT TITLE:	MRS Amendment 1130/41 Baldivis Urban Area Expansion - Area 4
SCHEME AMENDMENT LOCATION:	Lot 3 Pike Road; Lots 1, 2 & Pt Lot 335 Eighty Road and Lots 1, 2 & Pt Lot 334 Mandurah Road
LOCALITY:	Baldivis
RESPONSIBLE AUTHORITY:	Western Australian Planning Commission
LEVEL OF ASSESSMENT:	Scheme Amendment Not Assessed - Advice Given Under Section 48a(1)(A) (no appeals)

Thank you for your letter of 26 September 2006 referring the above proposed scheme amendment.

After consideration of the information provided by you, the Environmental Protection Authority (EPA) considers that the proposed scheme amendment should not be assessed under Part IV Division 3 of the *Environmental Protection Act 1986* (EP Act) but nevertheless provides the following advice and recommendations.

ADVICE AND RECOMMENDATIONS

- 1 ADVICE AND RECOMMENDATIONS
- 1. Environmental Issues
- Vegetation and Flora
- Site Contamination

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE 25 OCT 2006 FILE 809-2-28-11 PI

2. Advice and recommendations regarding Environmental Issues

Vegetation and Flora

Aerial photography of the site indicates the subject land is sparsely vegetated. All native vegetation should be preserved so far as practicable during and after clearing for site works and services to accommodate the proposed subsequent urban development. Measures should be taken to ensure the identification, protection and management of any significant vegetation on site worthy of retention prior to the commencement of site works.

Site Contamination

Given the current zoning of the subject land there may be a possibility of soil and/or groundwater contamination as a result of historical land use. A Preliminary Site Investigation (PSI) should be carried out prior to detailed planning. If as a result of the site investigation the site is found to be contaminated, a Site Remediation and Validation Report is to be produced in consultation with the DEC. Preliminary and detailed site investigation and subsequent management plans should be prepared and implemented in accordance with the DEC's *Contaminated Sites Management Series* and to the satisfaction of the DEC's Land and Water Quality Branch.

3. General Advice

- For the purposes of Part IV of the EP Act, the scheme amendment is defined as an assessed scheme amendment. In relation to the implementation of the scheme amendment, please note the requirements of Part IV Division 4 of the EP Act.
- There is no appeal right in respect of the EPA's decision on the level of assessment of scheme amendments.
- A copy of this advice will be sent to the relevant authorities and will be available to the public on request.

PIN.

W H Tacey A/Director Environmental Impact Assessment

23 October 2006

cc: Department for Planning & Infrastructure

APPENDIX B

LIST OF DETAIL PLANS SUPPORTING THE AMENDMENT

PIKE, EIGHTY AND MANDURAH LOTS, BALDIVIS

PROPOSED MAJOR AMENDMENT

AMENDMENT No. 1130/41

AS ADVERTISED

3.2065

DETAIL PLANS

1.5558 BALDIVIS – URBAN

APPENDIX C

SUBMISSION FORM FOR THIS AMENDMENT (Form 41)

Planning and Development Act 2005 Section 41 Amendment (Substantial) FORM 41

SUBMISSION

METROPOLITAN REGION SCHEME AMENDMENT 1130/41

LOT 3 PIKE ROAD; LOTS 1, 2 & PT LOT 335 EIGHTY ROAD; AND LOTS 1, 2 & PT LOT 334 MANDURAH ROAD, BALDIVIS

		OFFICE USE ONLY
To:	Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000	SUBMISSION NUMBER
Na	ne	
Ado	dress Postcoo	de
Co	ntact phone number	
Su	bmission (Please attach additional pages if required. It is preferred that any additional information b	be loose rather than bound)
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TURN OVER TO COMPLETE YOUR SUBMISSION

Hearing of Submissions

The *Planning and Development Act 2005* provides the opportunity for people who have made a written submission to personally present the basis of their submission to a Hearings Committee.

You do not have to attend a hearing. The comments presented by you in this written submission will be considered in determining the recommendation for the proposed amendment.

For information about the submission and hearings process, please refer to the *Amendment Report* and in particular **Appendix D**, titled **'Preparing a submission and for a 'hearing' presentation**.

Please choose ONE of the following:

No , I do not wish to speak at the hearings. (Please go to the bottom of the form and sign)		
	OR	
Yes, I wish to speak at the hearings. (Please complete the following details)		
	I will be represented by:	
	MYSELF – My telephone number (business hours):	
	OR	
	A SPOKESPERSON	
	Name of Spokesperson: Contact telephone number (business hours): Postal address:	
	I would prefer my hearing to be conducted in:	
	PUBLIC (members from the general public may attend your presentation)	
	OR	
	PRIVATE (only the people nominated by you or the hearings committee will be permitted to attend)	

You should be aware that:

- The Western Australian Planning Commission (WAPC) is subject to the *Freedom of Information Act* 1992 (FOI Act) and as such, submissions made to the WAPC may be subject to applications for access under the FOI Act.
- In the course of the WAPC assessing submissions, or making its report on these submissions, copies of your submission or the substance of that submission, may be disclosed to third parties.
- All hearings are recorded and transcribed. The transcripts of all hearings, along with all written submissions, are tabled in Parliament and published as public records should the Governor approve the proposed amendment. The WAPC recommendations are similarly published in a *Report on Submissions* and tabled in Parliament.

TO BE SIGNED BY PERSON(S) MAKING THE SUBMISSION

Signature Date

NOTE: Submissions MUST be received by the advertised closing date, being close of business (5.00pm) on <u>4 MAY 2007</u>. Late submissions will NOT be considered.

Contacts: Telephone - (08) 9264 7777; Fax - (08) 9264 7566; Email - mrs@wapc.wa.gov.au; Internet - http://www.wapc.wa.gov.au

APPENDIX I

YOUR PROPERTY AND THE METROPOLITAN REGION SCHEME

YOUR PROPERTY AND THE METROPOLITAN REGION SCHEME Landowners rights to compensation in relation to reserved land

If land is reserved in the Metropolitan Region Scheme

Land which is affected by a reservation in the Metropolitan Region Scheme (MRS) will ultimately be acquired by the Government, but generally can remain in private ownership until it is actually needed for the public purpose.

There are several options available to the owners of reserved land:

- Retain ownership and continue with the quiet enjoyment of the property until it is needed for the public purpose. You may complete any development or subdivision of the property that was approved prior to the reservation coming into effect.
- Sell the property on the open market to another person(s). The Western Australian Planning Commission (WAPC) recognises that due to the reservation this may be difficult and, subject to acquisition priorities and the availability of funds, would be willing to consider the purchase of a reserved property if an owner is unable to achieve a private sale on the open market.
- Offer the property for sale to the WAPC. Subject to acquisition priorities and the availability of funds, the WAPC would be willing to consider the early acquisition of a reserved property. In such cases the property is purchased at the current market value had the property not been affected by the reservation, with the value being determined by independent valuations of the property.
- Make a claim for compensation for injurious affection following the WAPC's refusal of a development application or approval of a development application subject to conditions that are unacceptable to the applicant. In such cases the WAPC may elect to purchase the property instead of paying compensation with the purchase price being determined in the same way as a negotiated purchase.

Am I entitled to compensation?

If your land is reserved in the MRS, you may be able to make a claim for compensation for injurious affection if:

- you are the owner of the property when it is first reserved in the MRS and you wish to sell the property on the open market at a reduced price;
 - or
- the WAPC has either refused a development application over the property or has approved a development application over the property subject to conditions that are unacceptable to the applicant.

How do I claim compensation?

1. If you have chosen to sell the property on the open market at a reduced price, complete a Notice of Intention to Sell form which is available at the Department for Planning and Infrastructure. The department will establish the extent of the reservation and forward the notice to the Board of Valuers.

The Board of Valuers will determine the sworn unaffected and affected values of the property. You may wish to meet with the Board to raise any matters you believe are relevant to the value of the property.

Following the determination by the Board:

- you will be notified of the unaffected value of the property.
- you pay a valuation fee to the WAPC, after which you will be notified of the affected value of the property - this will represent the minimum sale price.
- you then arrange the sale of the property (either privately or through an agent). Note the sale price must not be less than the affected value determined by the Board.

- when the property is sold, you may make a claim for compensation for injurious affection for the difference between the sale price and the unaffected value as determined by the Board.
- If the property does not sell within one year of the Board's valuation, you may ask the Board for a revaluation of the property. The sale process is then repeated.
- Once compensation has been paid, a caveat will be lodged on the Certificate of Title to identify that compensation has been paid. Please note that compensation is only payable once.

Alternatively, you may ask the WAPC to purchase the property, as you have been unable to sell the property privately.

2. If the WAPC has refused your development application or approved it subject to unacceptable conditions **and** the property is reserved in the MRS, you may make a claim for compensation for injurious affection within six months of the WAPC's decision on the application.

In such a case the WAPC will either pay compensation or may elect to purchase the property in lieu of paying compensation.

If the WAPC elects to purchase the property, valuations are obtained for the market value of the property as at the date of the election to purchase had the property not been reserved in the MRS. Please note that the date of valuation is fixed at the date of election to purchase.

What is compulsory acquisition?

A situation may arise where a property is needed as a priority for a public purpose and the owner is unwilling to sell the property to the WAPC.

In such a case, the property may be compulsorily acquired (or "resumed") for that public purpose.

Where a property has been resumed by the WAPC, you have the right to make a claim for compensation in respect of the land resumed.

The WAPC will have the resumed land valued and following the checking of the compensation claim will make you an offer of compensation for the resumed land.

Should you have any queries concerning the matters raised in this brochure, please do not hesitate to contact the Western Australian Planning Commission, Land Asset Management Branch.

APPENDIX II

PREPARING A SUBMISSION AND FOR A 'HEARING' PRESENTATION

PREPARING A SUBMISSION AND FOR A 'HEARING' PRESENTATION

The Western Australian Planning Commission (WAPC) welcomes comment on proposed amendments to the Metropolitan Region Scheme from interested individuals, groups and organisations.

What is a submission?

A submission is a way to express your opinion and provide information. It is an opportunity to explain why the amendment should be supported, withdrawn or modified. Suggestions of alternative courses of action are also welcomed.

Making a submission is not the same as voting in an election. The number of submissions received for or against a proposal will not in itself determine the result. Rather, it is the reasoned argument of why a particular thing should or should not be done. Your submission will assist the WAPC in reviewing its planning proposal before proceeding.

Advertised proposals are often modified in response to the public submission process.

What should I say?

Your comments should focus on the particular issues that arise from the proposed amendment. If there are a number of components in the amendment, please indicate exactly which ones you are addressing.

It is important that you state your point of view clearly. Give reasons for your conclusions and recommendations. These may include an alternative approach or other ways for the WAPC to improve the amendment or make it more acceptable. Indicate the source of your information or argument where applicable.

If you prefer not to write your own comments, you may consider joining a group interested in making a submission on similar issues. Joint submissions can increase the pool of ideas and information.

Before lodging your submission

Please remember to complete the Submission Form (Form 41 – **Appendix C**). Include your name and full postal address on side one, and information related to the hearings on side two. It is preferred that any attachments be loose rather than bound.

The closing date for submissions and where they should be lodged is shown on the Form 41 and in the 'Submissions on the Amendment' section of the Amendment Report. To be eligible to make a presentation to the hearing committee, your written submission must be received by the closing date.

Some amendments may be subject to an Environmental Review. Under these circumstances, the WAPC will forward a copy of any submission raising environmental issues to the Environmental Protection Authority.

You should be aware that all submissions lodged with the WAPC are subject to regulations on disclosure and access, and will together become a public document. Presentations made to the hearings committee are an extension of the submission process, and the transcript of all hearings also becomes a public document.

Do you want a hearing?

The *Planning and Development Act 2005* provides the opportunity for people who have made a written submission to also personally present the basis of their submission to a subcommittee of the WAPC. You do not have to attend a hearing. The comments presented by you in your submission will be considered in determining the recommendation for the proposed amendment.

Hearings are arranged so that the Western Australian Planning Commission can listen to a person should they wish to explain or expand upon their written submission. A hearing is intended for listening to points of view and planning rationale, and is not a forum of general public debate. In the case of a group, a spokesperson must be appointed to represent the group. The time allocated for a hearing is usually 15 minutes, which includes time for questions the committee may have of the presenter.

The hearings committee is appointed by the WAPC, and is usually comprised of two WAPC committee members and one other person with planning knowledge and expertise related to issues raised in submissions.

You may choose to have your presentation conducted in 'public' or 'private'. A public hearing allows other persons, including the media, to attend. In a private hearing only those persons nominated by you and by the hearings committee may attend.

All hearings, 'public' and 'private', are recorded and transcribed. The transcripts, along with the written submissions, are published as public records. The WAPC recommendations are also published in a *Report on Submissions*.

Metropolitan Region Scheme Amendment 1130/41

Baldivis Urban Expansion Area 4

City of Rockingham

Report on Submissions & Submissions

November 2008

Perth Western Australia WESTERN AUSTRALIA Laid on the Table of the Legislative Ascenibly

- 4 DEC 2008

This paper should not be removed from the Chamber

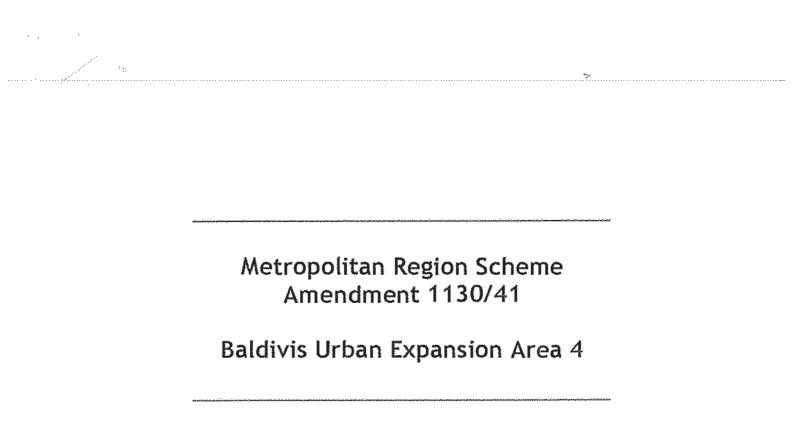






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Report on Submissions & Submissions

City of Rockingham



November 2008



Published by the Western Australian Planning Commission. Albert Facey House, 469 Wellington Street, Perth Western Australia 6000

MRS Amendment 1130/41 File 809-2-28-11 Pt. 1 & 2 Published November 2008 Report on Submissions and Submissions

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ISBN 0 7309 XXXX X

Internet: http://www.wapc.wa.gov.au e-mail: corporate@wapc.wa.gov.au Phone: (08) 9264 7777 Fax: (08) 9264 7566 TTY: (08) 9264 7535

Copies of this document are available in alternative formats on application to the disability services co-ordinator.

The Western Australian Planning Commission (WAPC) is responsible for keeping the Metropolitan Region Scheme under review and initiating changes where they are seen as necessary.

The Metropolitan Region Scheme (MRS) sets out the broad pattern of land use for the whole Perth metropolitan region. The MRS is constantly under review to best reflect regional planning and development needs.

An amendment proposal to change land use reservations and zones in the MRS is regulated by the *Planning and Development Act 2005*. That legislation provides for public submissions to be made on proposed amendments.

For a substantial amendment, often referred to as a major amendment (made under section 41 of the Act), the WAPC considers all the submissions lodged, and publishes its recommendations in a report on submissions. This report is presented to the Minister for Planning and to the Governor for approval. Both Houses of Parliament must then scrutinise the amendment before it can take legal effect.

In the process of making a substantial amendment to the MRS, information is published as a public record under the following titles:

Amendment report

This document is available from the start of the public advertising period of the proposed amendment. It sets out the purpose and scope of the proposal, explains why the amendment is considered necessary, and informs people how they can comment through the submission process.

Environmental review report

The Environmental Protection Authority must consider the environmental impact of an amendment to the MRS before it can be advertised. Should it require formal assessment, an environmental review is undertaken and made available for information and comment at the same time as the amendment report.

Report on submissions

The planning rationale, determination of submissions and the WAPC's recommendations for final approval of the amendment, with or without modification, is documented in this report.

Submissions

This document contains a reproduction of all written submissions received by the WAPC on the proposed amendment.

Transcript of hearings

A person who has made a written submission may also choose to appear before a hearings committee to express their views. The hearings proceedings are recorded and transcribed, and the transcripts of all hearings are reproduced in this volume.



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Submissions

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Report on submissions

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AMENDMENT 1130/41 TO THE METROPOLITAN REGION SCHEME

BALDIVIS URBAN EXPANSION AREA 4

Lot 3 Pike Road, Lots 1, 2 & Pt Lot 335 Eighty Road And Lots 1, 2 & Pt Lot 334 Mandurah Road, Baldivis

REPORT ON SUBMISSIONS

1 Introduction

At its August 2006 meeting the Metropolitan Region Planning Committee (MRPC) acting under delegated authority from the Western Australian Planning Commission (WAPC) resolved to proceed with this amendment to the Metropolitan Region Scheme (MRS) in accordance with the provisions of Section 41 of the *Planning and Development Act 2005*.

2 The advertised amendment

The amendment as advertised proposed the subject land, being an area of land on the south east corner of the intersection of Baldivis and Pike Roads, Baldivis is transferred from the rural zone to the urban zone in the MRS as shown in Schedule 3 - The Amendment Figure as Advertised.

This amendment is one of a group of 4 being progressed as a group as they all adjoin the existing Baldivis urban area:

Amendment 1127/41	Area 1 -	Baldivis north east	211ha
Amendment 1128/41	Area 2 -	Baldivis east	166ha
Amendment 1129/41	Area 3 -	Baldivis east	8.2ha

total north-east and east of Balvidis = 385.2ha

Amendment 1130/41 Area 4 - Baldivis west 31.5ha

total all 4 amendments = 416.7ha

3 Environmental Protection Authority advice

The amendment was referred to the Environmental Protection Authority (EPA) to determine whether environmental assessment was required pursuant to the *Environmental Protection Act* 1986.

The EPA advised that the amendment did not require formal assessment. It has however, provided advice on several key environmental factors for the amendment which must be addressed by the Local Government, responsible state government agencies and landowners at the appropriate stages of the planning process. A copy of the notice from the EPA was included in the previously published Amendment Report.

4 Public submission period

The amendment was made available for public inspection from 2 February to 2 May 2007 during ordinary business hours at:

- i) the Department for Planning and Infrastructure, Perth;
- ii) the offices of the Cities of Perth, Fremantle, Cockburn, Melville and Rockingham and the Towns of East Fremantle and Kwinana; and
- iii) the State Reference Library, Northbridge.

During the public advertising period, notice of the amendment was published in the West Australian and the Sunday Times newspapers and relevant local newspapers circulating in the locality of the amendment.

Landowners affected by the amendment were advised in writing, sent a copy of the plans showing the proposed changes and advised of the opportunity and procedures for making submissions.

5 Submissions

Thirteen submissions on the amendment were received - 2 contained support, 3 objected and 8 submissions contained a neutral comment only (submissions 3 and 5 contained support and comment).

An alphabetical index of all persons and organisations lodging submissions is at Schedule 1. Schedule 2 contains a summary of all submissions with WAPC comments and determinations. A full copy of all written submissions can be found later in this document.

6 Main issues raised in submissions

The main issues raised in favour of the amendment were limited to Lot 334 and were that the land is generally suitable for residential development being close to transport infrastructure and the land is not environmentally sensitive or otherwise low-lying.

The main issues raised in objections to the amendment are set out below, with WAPC responses and indication of modifications recommended.

i) Water Corporation - insufficient waster water treatment capacity

The Water Corporation advised that the amendment area is within the area to be serviced by the proposed East Rockingham Waste Water Treatment Plant (WWTP), currently estimated to become operational in 2015.

Currently the amendment area is in the Baldivis North Sewer District and is serviced by the Kwinana Waste Water Treatment Plant (WWTP), which will reach capacity in 2009 and is currently being upgraded. Baldivis south is serviced by the Point Peron WWTP along with Rockingham and suburbs further south.

The Point Peron WWTP will be at capacity by 2012, following which Baldivis south will be serviced by the upgraded Kwinana WWTP.

However the Point Peron plant will be closed by 2015 and Rockingham and surrounding suburbs and Baldivis north and south will be serviced by the proposed East Rockingham WWTP. The Kwinana plant will only service the Kwinana urban area.

Point Peron and Kwinana WWTP's only have the capacity to serve some 70% to 75% of the currently zoned lots in Baldivis. Therefore the Water Corporation considers that it is not appropriate to rezone more land to urban in the Baldivis locality which cannot be serviced until the East Rockingham WWTP becomes operational in 2015. Such a rezoning gives landowners the expectation that the land can be subdivided and serviced when in fact that is not the case and it is not possible to service all the existing urban land. The Water Corporation also notes that the amendment sites have been designated as rural and special rural in the MRS and local scheme for many years and that it has based its forward planning and commitments to existing urban/urban deferred land on that premise.

A site for the proposed East Rockingham WWTP is currently reserved in the MRS. However, that site was deemed unable to be developed for the intended purpose for environmental reasons, largely related to Commonwealth Government requirements. Although a replacement site has now been identified for the treatment plant (part of which overlaps the existing site), the new site is itself subject to State and Commonwealth Government environmental assessment.

Accordingly, there is not total certainty at this point in time what the outcome of environmental assessment will be and whether the new treatment plant site will prove entirely acceptable. If environmental assessment results in the new site being acceptable, the 2015 date should be achievable.

It is currently anticipated that the required environmental approvals will be obtained in 2010 - 2011. Preliminary design and definition will occur in 2011 and awarding of the contract in 2012. Final design and construction would occur through 2015 and commissioning would occur at the end of 2015.

The Water Corporation suggests that an appropriate time to initiate an urban zone for the subject amendment areas would be closer to the currently estimated operational date of 2015 of the treatment plant.

WAPC response

In these circumstances the subject land is not recommended to be transferred to the urban zone at this point in time. Without capacity in the waste water treatment infrastructure to service the proposed urban land and what capacity there is only able to service part of the existing urban and urban deferred zones in Baldivis, the Water Corporation's position is agreed with. Existing urban/urban deferred land, long planned for development should have access to what infrastructure is available.

The submissions suggesting possible ways of addressing the situation (for example by referring to calculations of possible rates of lot production in Baldivis in relation to the capacity of the Kwinana Wastewater Treatment Plant) are not accepted by the Water Corporation

However, an alternative to the urban zone in the subject circumstances is to transfer the amendment site to the urban deferred zone.

This will allow for planning of the area to continue up to 2015 and at the appropriate time the urban deferment can be lifted and the land transferred to the urban zone.

The exact timing of the commencement of operation of the treatment plant, with consideration of the lead time for residential lots to be ready for the market can influence the exact time that the urban deferment can be lifted.

Given this amendment has completed a substantial portion of the lengthy MRS amendment process, it would be a waste of resources to terminate this amendment, leave the land as rural zone and then commence another urban amendment in 4-5 years (or thereabouts) time. Any lifting of urban deferment would be subject to the Water Corporation advising the WAPC that such action was acceptable, in terms of the availability of waste water infrastructure.

ii) Water Corporation - Drainage requirements

The Water Corporation advises the amendment area is within the Mundijong Drainage District within which construction is to rural standards only. The cost of upgrading to urban standards would be prohibitive. Advice from the Department of Water (DoW) should be sought on this matter.

The Water Corporation does not support development in the Mundijong Drainage District until the Department of Water has developed an Arterial Drainage Scheme for the drainage of any further urban development, prescribes standard for the level of service required, resolves the issues of development within wetlands and floodplains of the main drains and identifies the responsibilities of the various stakeholders.

WAPC response

The Water Corporation's comments in this regard are consistent with its position on the Jandakot Structure Plan amendments to the north, that is, that the land be zoned urban deferred while detailed drainage management and other planning was occurring and upon successful incorporation of the outcomes and requirements of that planning being incorporated into structure planning, the urban deferred zone can be lifted.

Accordingly, an urban deferred zone for the subject is consistent with the Jandakot Structure Plan amendments.

iii) Department of Water - requirement for drainage planning

The DoW advised that the subject land is in an area where it has commenced a substantial drainage project - the Baldivis/Karnup Water Management Strategy (completion 2008). The strategy is required to be endorsed by EPA, DPI, Water Corporation and City of Rockingham. As the proposed sites are heavily constrained by drainage issues, the DoW considers these issues are addressed prior to initiation of the MRS amendment.

Accordingly, DoW considers that the amendment should be deferred until the above strategy is endorsed to ensure that town planning scheme amendments and structure plans comply with the drainage strategy and that rezoning to urban is appropriate in respect to drainage constraints on the land.

If the WAPC decides to proceed prior to completion of the drainage strategy, DoW recommends an urban deferred zone, moving to urban once the strategy has been completed.

WAPC response

The DoW comments in this regard are consistent with the other MRS amendments in this group. However, later clarification was that the DoW may be able to consider this amendment separately from the others if appropriate technical information can be provided.

iv) The Combined Swan River and Swan Coastal Plains Native Title Holders and Traditional Owners

The group wishes to meet with the relevant WAPC persons on site to discuss concerns and to come to agreements (in writing). It is not intended to stop "progress" however, religion, culture and human rights need to be considered and protected. The main concern is to preserve places of significance to the group, possibly with the assistance of an anthropologist, archaeologist and/or facilitator/mediator.

WAPC response

The main concern of the writers is that places of significance to it be identified and preserved. That is, that such places are not disturbed, destroyed or otherwise dealt with contrary to the group's wishes. However, the imposition of an urban or urban deferred itself does not give permission for any subdivision and or development or associated works over and above what may already be allowed under the existing MRS and local scheme zones. That is, the MRS rezoning has no effect on sites of significance to Aboriginal people.

The appropriate time for the concerns of the group to be determined and then addressed is in the context of the structure plan for the area. This is because the structure plan is the document that will guide the actual subdivision and development of the area. The preparation of the local structure plan addresses issues with land use ramifications in detail and how or whether they should be accommodated in the plan. The MRS is not the correct vehicle to resolve those issues.

Any places of significance that may eventually be identified at a future date will be covered by the urban zone. They will not be retained in small pockets of the existing rural zone. Consideration can be given during structure planning as to whether the areas of significance need to be reflected in some way in the local town planning scheme.

It is not the intention that the group's concerns be ignored, but that they be addressed at the appropriate and most relevant stage of the planning process, that it is, local structure planning for which the City of Rockingham is ultimately responsible. It is expected that the group's concerns will be addressed in whatever is the usual legislative, policy and practice context that is applicable for taking Indigenous groups concerns into account in local structure planning.

In view of the above, meeting on site with the writers cannot result in the concerns of the writers being addressed. That is, the concerns need to be addressed at the appropriate stage of the planning process and in accordance with the relevant legislation.

Note: This amendment was initiated prior to the WAPC considering the document "Consulting with Custodians" June 2007.

v) ASPO (Australian Association for the Study of Peak Oil and Gas)

Residential development of the amendment area would bring a population to the area that is remote from other urban areas and service, highly dependent on private transport and therefore extremely vulnerable to hardship from oil shortage.

In the foreseeable future, population growth in metropolitan Perth can be accommodated by consolidation and redevelopment of areas already urbanised or by land already zoned urban, therefore this rezoning is not needed.

WAPC response

The amendment area is an addition to the existing Baldivis urban area which is a rapidly developing area, well located in the south west corridor in relation to the Kwinana Freeway and Southern Suburbs rail line. Rockingham regional centre and the coast. It is arguable that the area could be considered "remote" from other urban areas in these circumstances.

While acknowledging the important issues raised, there are a variety of reasons why it is not possible to accommodate the entire future population growth of Perth in already urbanised areas such as community and local government opposition to higher residential densities, high land and construction costs on smaller and more constrained building sites and the smaller internal and external dimensions of the resultant dwellings which may not suit all household types.

These factors are also not consistent with provision of a wide variety of dwelling types and affordable housing for different income groups in the community. Accordingly, it is essential that new urban land be made available as well as encouraging greater residential densities in the established urban zone, which is already being promoted by the State Government by way of "Network City". Infill urban development is occurring in many areas throughout the established suburbs, however, there is limited land available for this purpose.

7 Hearings

Following preliminary consideration of matters raised in submissions, the MRPC resolved to form a Hearings Committee to hear submissions. The Committee comprised

Ms Verity Allen	Chair
Cr Richard Graham	South West Districts Planning Committee
Mr Barry Sanders	Independent person

All persons who made submissions were invited to present their submission to the Hearings Committee, either in public or in private.

The Hearings were held on 14 March 2008. Four submissions requested hearings. Three of these were objections to the amendment and the remaining one included support and comment. The written submissions that were supported by a verbal submission are noted under those submissions in Schedule 2.

8 Determinations

The determinations on each of the 13 submission received are in Schedule 2. The determinations are based on the responses to the main issues raised in submissions in Section 6 earlier and can be summarised as follows:

- noted
 7
- dismissed
 2
- upheld
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9 Modifications

It is recommended the amendment be modified by transferring the subject land to the urban deferred zone and not the urban zone, in view of the comments of the Water Corporation.

In addition, the upholding of the City of Rockingham submission means that the northern boundary of the proposed urban deferred zone need to be modified to align with the local structure plan proposal depicting special residential lots along that boundary.

10 Coordination of region and local planning scheme amendments

Section 126(3) of the *Planning and Development Act* provides that when land is proposed to be transferred to the urban zone in the MRS, the WAPC can concurrently approve a local scheme amendment for that land, if requested by the Local Government and if considered appropriate by the WAPC.

This would usually be in circumstances where the land in question is proposed to be designated an urban/residential development zone of some form for the purpose of residential and associated development requiring preparation of a local structure plan with public consultation as part of that process.

However, as the subject land is proposed as urban deferred, Section 126(3) is not applicable.

11 Conclusion and recommendation

This report summarises the background to Amendment No. 1130/41 and examines the various submissions made on it.

The WAPC, after considering the submissions, is satisfied that the amendment, incorporating the modifications referred in Section 8 above and otherwise as shown in Schedule 4 - Amendment Figure as Modified, and in detail on the MRS Amendment Plans listed in Appendix 2 - Detailed Plans as Modified should be approved and finalised.

Having regard to the above, the WAPC recommends that the Minister for Planning approves the amendment, as modified.

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Schedule 1

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Alphabetical listing of submissions

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Alphabetical Listing of Submissions

MRS Amendment 1130/41

Lot 3 Pike Road; Lots 1, 2 & Pt Lot 335 Eighty Road; and Lots 1, 2 & Pt Lot 334 Mandurah Road, Baldivis

Submission Number	Name
8	ASPO Australia
9	Borlaug, Jane Odna
3	Cardno BSD
1	Combined Swan River and Swan Coastal Plains Native Title Holders and Traditional Owners, The
12	Education and Training, Department of
2	Environment and Sustainability, DPI
4	Gray & Lewis Land Use Planners (on behalf of the owners)
7	Industry and Resources, Department of
11	Main Roads Western Australia
5	Rockingham, City of
6	Water Corporation
10	Water, Department of

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Schedule 2

Summary of submissions and determinations

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Submission:

1

Submitted by: The Combined Swan River and Swan Coastal Plains Native Title Holders and Traditional Owners

Summary of Submission:

OBJECTION

- 1. The group wishes to meet with the relevant WAPC persons on site to discuss concerns and to come to agreements (in writing).
- 2. It is not intended to stop "progress", however, religion, culture and human rights need to be considered and protected.
- 3. The main concern is to preserve places of significance to the group, possibly with the assistance of an anthropologist, archaeologist and/or facilitator/mediator.

The submission was elaborated on before the Hearings Committee.

Planning Comment:

Refer to Section 6 (iv) of the main body of this report "Main Issues Raised in Submissions".

Submission noted.				
2				
Bush Forever Office				
Submission noted.				

Submission:

3

Submitted by: Cardno BSD for landowners

Summary of Submission:

SUPPORT / COMMENT

The recommendation of the City of Rockingham for retention of a strip of MRS Rural zoned land covering special residential lots between the subject land and Woodleigh Grove estate is supported.

The submission was elaborated on before the Hearings Committee.

 Planning Comment:

 Comment supported.

 Determination:

 Submission upheld.

 Submission:
 4

 Submitted by:
 Gray and Lewis for the owners of several properties south of Pike Road, Baldivis

Summary of Submission:

COMMENT

Several lots south of Pike Road should be included in this amendment and rezoned from Rural to Urban on the basis of the City of Rockingham Baldivis Rural Wedge Study, Pike Road being an arbitrary edge to urban development, suitable land capability and physical environment and availability of services.

Planning Comment:

The proposal described represents a separate proposal to that under consideration in this amendment. It needs to be considered by local and state government prior to being considered by the WAPC as an amendment to the MRS. The fact that the proposal put forward in the submission may be generally consistent with the Baldivis Rural Wedge Study does not mean that the proposal is automatically accepted by the WAPC.

The proposal should be lodged as a separate submission.

Determination:

Submission dismissed.

Submission:

5

Submitted by: City of Rockingham

Summary of Submission:

SUPPORT/COMMENT

Preliminary structure planning for the area has determined the need for a row of special residential lots between the proposed urban zone and the special residential area to the north. That area should be retained in the Rural zone and not rezoned to Urban.

Planning Comment:

Modification to amendment supported.

Determination:

Submission upheld.

Submission:

6

Submitted by:

Water Corporation

Summary of Submission:

OBJECTION

Wastewater

- 1. The area is in the Baldivis North Sewer District. The area is able to eventually be serviced with appropriate gravity mains and pump station upgrading and relocations. However, within the Baldivis North Sewer District, the amendment area falls within the proposed East Rockingham Wastewater Treatment Plant Catchment Area.
- 2. Although the site for the East Rockingham Plant has been finalised, an MRS amendment to secure the site has not been commenced. The plant will require environmental approvals, expected in 2010. Following that, estimated operational date of the plant is 2015. Any development of the amendment site prior to that date would require the advancement of the commissioning of the East Rockingham Plant. There is currently no action in government for any such advancement to occur.
- Accordingly the Water Corporation advises that the amendment should not proceed until the East Rockingham Wastewater Treatment Plant becomes operational in 2015.
- 4. If an interim development time frame was to be proposed, alternative treatment facilities would be required. However, the closest available treatment plant is the Kwinana WWTP. However, the proposed capacity upgrading there is already committed to the existing Baldivis Urban/Urban Deferred zone.

Drainage

- 5. The amendment is within the Mundijong Drainage District within which construction is to rural standards only. The cost of upgrading to urban standards would be prohibitive. Advice from the Department of Water should be sought on this matter.
- 6. The Water Corporation does not support development in the Mundijong Drainage District until the Department of Water has developed an Arterial Drainage Scheme for rhe drainage of any further urban development, prescribes standard for the level of service required, resolves the issues of development within wetlands and floodplains of the main drains and identifies the responsibilities of the various stakeholders.

The submission was elaborated on before the Hearings Committee.

Planning Comment:

Refer to Section 6 (i) and (ii) of the main body of this report "Main Issues Raised in Submissions".

Determination:

Submission upheld.

Submission:	7				
Submitted by:	Department of Industry and Resources				
Summary of Submission:					
COMMENT					
The DOIR submission does not relate to this amendment.					
Planning Comment:					
Noted					
Determination:					
Submission noted.					
Submission:	8				
Submitted by:	Australian Association for the Study of Peak Oil and Gas (ASPO)				
Summary of Submission:					

OBJECTION

1. Residential development of the amendment area would bring a population to the area that is remote from other urban areas and service, highly dependent on private transport and therefore extremely vulnerable to hardship from oil shortage. Submission:

12

Submitted by: Department of Education and Training

Summary of Submission:

COMMENT

A primary school site is required in the amendment site.

Planning Comment:

This is a matter for consideration during detailed local structure planning by the Local Government.

Determination:

Submission noted.

Submission:

Late

Submitted by: Department of Indigenous Affairs

Summary of Submission:

COMMENT

- 1. The Department advises that prior to any development occurring on land within the amendment sites appropriate ethnological and archaeological surveys, including Aboriginal interest group consultation, is required to ensure that no site is damaged or altered (an offence under Section 17 of the *Aboriginal Heritage Act* 1972).
- 2. The Department prefers that any development plans are modified to avoid damaging or altering any site. If this is not possible the approval of the Minister for Indigenous Affairs is required.

Planning Comment:

Comment noted.

Determination:

Submission noted.

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As the proposed sites are heavily constrained by drainage issues, the DoW considers it imperative that these issues are addressed prior to initiation of the MRS amendment.

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- The amendment should be deferred until the above strategy is endorsed to ensure the following occurs:
 - town planning scheme amendments and structure plans comply with the drainage strategy; and
 - that rezoning to Urban is appropriate in respect to drainage constraints on the land.
- 3. If the WAPC decides to proceed prior to completion of the drainage strategy, DoW recommends an Urban Deferred zone, moving to Urban once the strategy has been completed.
- 4. A dewatering management Plan or Operating Strategy will be required.
- 5. WAPC policy 2.1 "Peel-Harvey Coastal Plain Catchment" will apply.

Planning Comment:

- 1-3. Refer to Section 6 (iii) of the main body of this report "Main Issues Raised in Submissions".
- 4,5. Noted
- 6. The acid sulphate soil issues are regularly addressed with DEC involvement at subdivision assessment stage.

Determination:

Submission upheld.

Submission:

11

Submitted by:

Main Roads WA

Summary of Submission:

COMMENT

The submission contains a number of comments relevant to structure planning and eventual subdivision of the amendment area.

Planning Comment:

Comments noted.

Determination:

Submission noted

2. In the foreseeable future, population growth in metropolitan Perth can be accommodated by consolidation and redevelopment of areas already urbanised or by land already zoned Urban. This rezoning is not needed.

The submission was elaborated on before the Hearings Committee.

Planning Comment:

Refer to Section 6 (v) of the main body of this report "Main Issues Raised in Submissions".

Determination:

Submission dismissed.

Submission:

Submitted by: J Borlaug, Baldivis

Summary of Submission:

SUPPORT

- 1. Part Lot 334 Mandurah Road is not low lying as stated in the Amendment Report.
- 2. There is a need for feeder bus services to the proposed railway station.

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- 3. There are no wetlands in the amendment area.
- 4. There are no environmental constraints to subdivision of the land .
- 5. Lot sizes in the amendment are will be complementary to existing surrounding lot sizes.

Planning Comment:

Comments noted.

Determination:

Submission noted.

Submission:

10

Submitted by:

Department of Water

Summary of Submission:

OBJECTION

 The subject land in an area where the DoW has commenced a substantial drainage project entitles the Baldivis/Karnup Water Management Strategy, due to be completed in 2008. The strategy is required to be endorsed by EPA, DPI, Water Corporation and City of Rockingham.

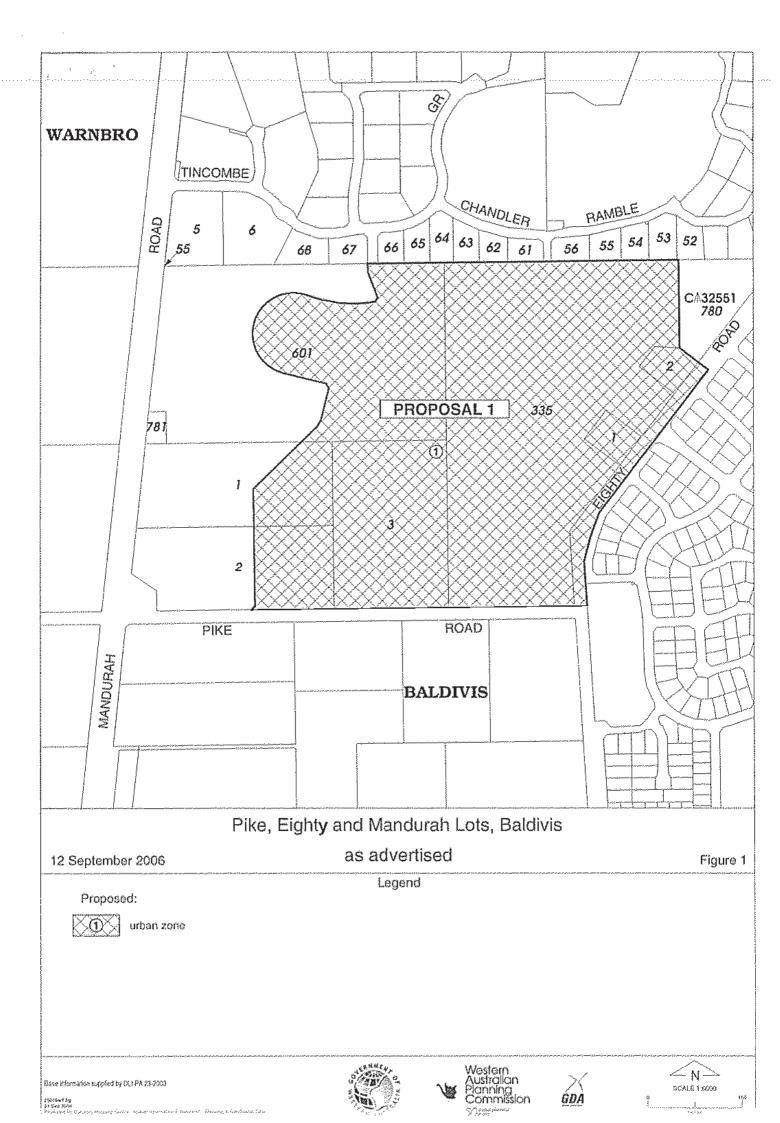
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Schedule 3

The amendment figure as advertised

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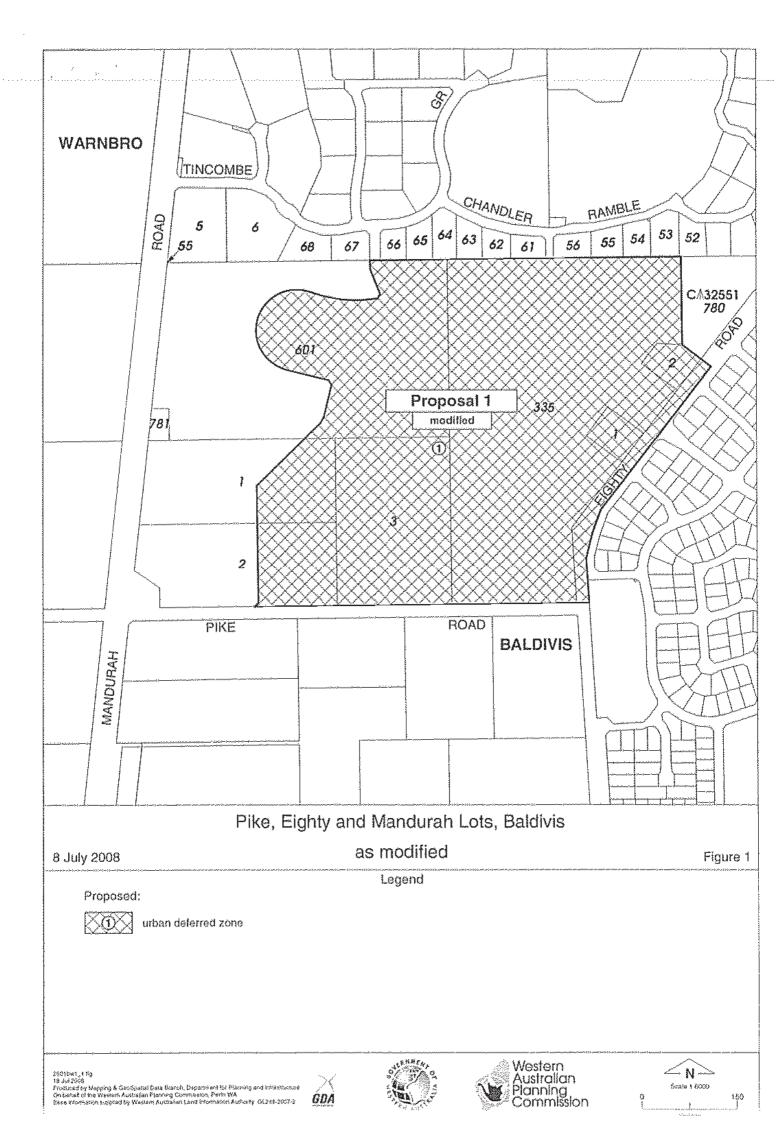
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Schedule 4

The amendment figure as modified

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Appendix 1

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List of detail plans as advertised

PIKE, EIGHTY AND MANDURAH LOTS, BALDIVIS

PROPOSED MAJOR AMENDMENT

AMENDMENT No. 1130/41

AS ADVERTISED

3.2065

DETAIL PLANS

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1.5558 BALDIVIS - URBAN

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Appendix 2

List of detail plans as modified

PIKE, EIGHTY AND MANDURAH LOTS, BALDIVIS

PROPOSED MAJOR AMENDMENT

AMENDMENT No. 1130/41

AS MODIFIED

3.2065/1

DETAIL PLANS

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1.5558/1 BALDIVIS - URBAN DEFERRED

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Submissions

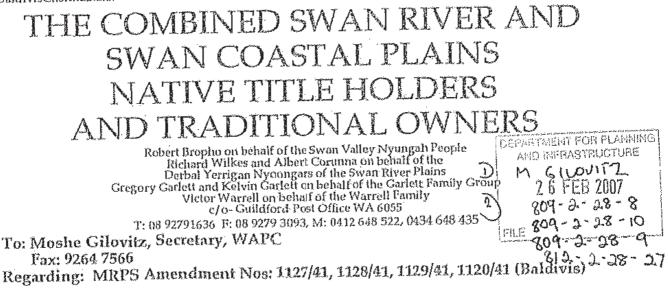
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BaldivisCasta23.2.07



We are writing to you as the Indigenous Elders and People with knowledge and ties and links and associations with the area of the Swan River, Swan Valley and Swan Coastal Plains. Our Native Title Claim is made up of many Nyungah Families and Family Clans.

Nyungah Elders would like to meet with you and your body to discuss our concerns in the area of your proposals.

* We would like to meet on site on the grounds that you meet with us in good faith.

We would also like both parties to undertake that they will attempt to come to agreement when we meet. We would like an agreement of what we agree on to be put in writing and signed by both parties.

Our record speaks for itself that we are not trying to stop your "progress" in the white society but at the same time and token, we have a right to protect our Sacred Things also – the protection of our Religion and Culture and our human rights. We don't sell our Sacredness or our Religion and Culture.

There has got to be a balance in what both parties want.

We are the Nyungah Elders who speak for this Area by Nyungah Laws and Customs, and we are the only qualified experts who can give you this advice and assistance from the indigenous side, not government departments. We have been authorisd by our People through the Registration Test of the Native Title Act.

Our main concern is saving and preserving places of serious concern to us. We are not here to stop your development but we are here in good faith with our concerns. It may be necessary to have the assistance of an anthropologist, archeologist, and/or facilitator/mediator – all who must be acceptable to us and to you. Please consult with us first before you appoint anyone. We will need a draft copy of any ethnographic report to be sent to us for checking before it is finalised.

We have already reached agreement on these lines with many developers, mining companies, and local and state authorities.

If you agree to meet with us in this way, please put this in writing and contact Nyungah Elder, Richard Wilkes (0434-648-435), and arrangements will be made for a meeting. Normal consultation expenses for each Elder must be covered and they in turn are responsible for whoever they bring with them. This is our standard process we have followed for many years.

This letter is our Official Objection until the consultation process as outlined above is undertaken in the proper way and agreement is reached.

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Combined Swan River and Swan Coastal Plains Native Title Holdets & Traditional Owners Date: 23 February, 2007



Department for Planning and Infrastructure Government of Western Australia Bush Forever Office

Memo

Submission 2

TO: AITON SHEPARD

WAPC Ref No: 809-2-28-8Pt1

FROM: Rachel Doherty

DATE: 8 February 2007

Metropolitan Region Scheme Amendment Nos: 1127/41, 1128/41, 1129/41, and 1130/41

As requested please find below Bush Forever Office comments regarding the proposed amendments to the Metropolitan Region Scheme to rezone land adjoining the existing Baldivis urban area from Rural to Urban.

MRS Amendment Nos - 1127/41, 1128/41, 1129/41 are close to Bush Forever site 418, but will not have any impact on regionally significant vegetation. MRS Amendment No - 1130/41 is near Bush Forever Site 356, but will not have any impact on the regionally significant bushtand. As such, the Bush Forever Office has no objections to this proposed amendments

I trust the above information will assist your assessment of these proposed amendments, however should you require any additional information, please call extension 7772.

Yours sincerely

KIND

Rachel Doherty Environmental Planner

enior Environmental Planner



Our Ref P5013 :LKV

Contact Lauren Vidler

3 May 2007

The Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

Dear Sir

PROPOSED AMENDMENTS TO THE METROPOLITAN REGION SCHEME - NO. 1130/41 - LOT 601, LOT 1 AND LOT 2 MANDURAH ROAD AND PT LOT 335 EIGHTY ROAD.

Further to the City of Rockingham's letter regarding Metropolitan Region Scheme Amendment 1130/41 (30/4/07 – see attached), Cardno BSD lodges this submission in support of the recommendation made by the City of Rockingham.

Cardno BSD acts on behalf of the S, K and A Grubelich, O Borlaug, G Zanotti and C. Blacklock, the proprietors of the lots affected by Amendment 1130/41. The recommendation of the City of Rockingham to exclude the Special Residential lots identified along the northern boundary of the Draft Structure Plan from the 'Urban' zone under the MRS and the 'Development' zone under the City of Rockingham Town Planning Scheme No. 2 is supported by the landowners.

The proposed modification to Amendment 1130/41 will ensure that an interface is maintained under a 'Rural' MRS zone between Woodleigh Grove Estate and the future urban development of the Amendment Area.

Thankyou for your attention to this matter. If you have any queries or require additional information, please do not hesitate to contact Andrew Williams or the undersigned at your convenience.

Mr Andrew Williams would like to attend the

Yours faithfully

Lauren Vieller

Lauren Vidler Town Planner for Cardno BSD

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Enc: City of Rockingham Letter

cc: Peter Ricci - City of Rockingham

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE - 7 MAY 2007 FILE 809-2-28-11 PO





Shaping the Future

Cardno 85D Pty Ltd A8N 77 000 110 000

Cordno BSD Centre 2 Bagot Road, Subiaco WA 6008 PO Box 155, Subiaco Western Austrelia 6904 Australia Telephone: 08 9273 3888 Facsimile: 08 9388 3831 International: +61 8 9273 3888 reception@cardno.com.au wWw.cardno.com.au

Cardeo Offices Brisbane Sydney Canberra Melbourne Perth Darwin

Cairns Townsville Mackay Rockhampton Hervey Bay Sunshine Coast Toowoomba Gold Coast Gostord Baulkham Hills Woltongong Busselton

Papua New Guinea Indonesia Vietnam China Kenya United Arab Emirates United Kingdom United States





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Our Ref: TP1-3-1-33

Your Ref:

Enquiries to: Mr Ricci

30th April 2007

The Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

RECEIVED SITY CE Kingham
Subiaco Office - 2 MAY 2007
SIGNED

Dear Sir

Re: Proposed Amendments to Metropolitan Region Scheme - Nos. 1127/41 and 1130/41

I refer to the above proposed amendments to the Metropolitan Region Scheme for which comments are being invited and provide a submission on behalf of the City of Rockingham.

Amendment No. 1127/41

Amendment No. 1127/41 seeks to zone land bounded by Zig Zag Road, Kwinana Freeway, Folly Road and Baldivis Road from 'Rural' to 'Urban'. It is also proposed to simultaneously zone the land from 'Rural to 'Development' under the City's Town Planning Scheme No. 2, pursuant to s126(3) of the Planning and Development Act 2005.

The City submits that the implications of the 'Development' zoning under TPS2, as it affects particular lots, must be resolved prior to the rezoning being progressed.

In this regard, Lots 101-105, 129, 1000 and 9000 Eighty Road, Zig Zag Road and Paparone Road and zoned 'Special Rural' under TPS2 and contained in Schedule No.4 - Portions of Planning Unit 5 of the Rural Land Strategy. The landholding is referenced in Item 5(i) of the subject Schedule, albeit under former lot numbers.

At this time, only Lots 101-105 have been subdivided to a 'Special Rural' density.

With respect to Lots 101-105, the City is concerned that a 'Development' zoning will render the land management requirements within the subject Schedule of TPS2 as unenforceable despite the land potentially being used for ongoing 'Special Rural' purposes.

Furthermore, Lot 9000 is currently the subject of Amendment No. 15 to TPS2 which seeks to zone the land to 'Special Use - Freeway Service Centre' to enable the site to accommodate a Freeway Service Centre as described under WAPC Policy No. DC 1.10. The Council has adopted the Amendment for Final Approval and it is currently before the Minister for Planning and Infrastructure.

Civic Boulevard Rockingham Western Australia

PO Box 2142 Rockingham DC Western Australia 6967 -

Telephone (08) 9528 0333

Facsimile (08) 9592 1705

As such, it is recommended that the 'Development' zoning not be applied over Lot 9000.

Amendment No. 1130/41

The landholding affected by the above amendment has been the subject of preliminary local structure planning which has determined the extent of the proposed zoning. The draft structure plan provides for a 'Special Residential' interface between the abutting northern precinct ('Woodleigh Grove Estate') and the proposed residential density over the balance of the land.

The proposed 'Special Residential' lots will be included as part of Schedule No. 5 - Portions of Planning Unit 4 of the Rural Land Strategy in TPS2.

It is therefore recommended that the row of 'Special Residential' lots be excluded from the 'Urban' zone under the MRS and the 'Development' zone under TPS2.

A copy of the draft structure plan is attached for your information.

Should you have any enquiries with respect to this advice, please do not hesitate to contact the undersigned on 9528 0341.

Yours faithfully

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P RICCI MANAGER, STRATEGIC PLANNING & ENVIRONMENT

cc Mr Frank Arangio, Development Planning Strategies Mr Greg Rowe, Greg Rowe & Associates Mr Andrew Williams, Cardno BSD



Our Ref: 100492 Your Ref: Amendment 1130/41 Date: 27 April 2007

Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

- 1 MAY 2007

Dear Sir,

SUBMISSION ON MRS AMENDMENT 1130/41 – BALDIVIS URBAN EXPANSION AREA 4 EIGHTY ROAD, PIKE ROAD AND MANDURAH ROAD

We act on behalf of the owners of Lots 50-53, 56, 8 and 783 Mandurah and Pike Roads, Baldivis.

The proposed 'Urban' zoning under the Metropolitan Region Scheme is supported, however should also be extended to the south side of Pike Road, Baldivis (east of the ridge). In support of this submission, we advise as follows;

1. City of Rockingham Baldivis Rural Wedge Study

The City of Rockingham Baldivis Rural Wedge Study is comprehensive and was completed in November 2004. The Study examines:

- physical and biological features:
- cultural and social characteristics;
- infrastructure and servicing; and
- opportunities and constraints.

The Study is used as a basis to identify urban development potential within the Rural Wedge Study Area. The Study map is divided into three areas and our clients land is included in Area 1. Area 1 is identified as 'the most suitable for some form of urban development' and is recognised as having links to existing urban areas.

The Study includes an opportunities and constraints map showing urban potential over Lots 3, 335, 783 and 56 Pike Road to the east of the ridgeline. Extension of the Urban Zone to the south of Pike Road would therefore be consistent with the Study – this already forms the basis for the existing MRS Amendment for land to the north of Pike Road.

2. Streetscape

Utilisation of Pike Road as a hard edge to the proposed Urban Zone is arbitrary, and conflicts with the recommendations shown on the opportunities and constraints map that forms part of the City's Rural Wedge Study.



From a planning perspective, it is common practice to maintain consistent zonings on both sides of any street. The inclusion of land to the south (east of the ridge) within the Urban Zone would ensure that there is a consistent urban streetscape along this section of Pike Road.

This is considered more desirable than creating an urban interface with the existing 'Rural' lots and associated landuses.

3. Land Capability

Our clients land is located in close proximity to existing residential areas which is recognised in the comprehensive City of Rockingham Baldivis Rural Wedge Study. The land immediately to the north of Pike Road is earmarked for Urban Development and forms part of the existing MRS Amendment. The land to the east has already been developed.

A thorough land capability and geotechnical assessment has been completed for Lots 50-53, 56, 8 and 783 Mandurah and Pike Roads, Baldivis to identify the potential of the site for rural residential living. The report findings concluded that subdivision would not have any significant environmental impacts and is compatible with nearby landuses. Based on the information contained in the land Capability report, we are confident that the land can support urban development as its characteristics are not dissimilar from land located to the north of Pike Road.

The majority of vegetation on these lots has been cleared and only scattered vegetation remains. All flora and fauna on site has been assessed and the vegetation on site is completely degraded.

Whilst the City of Rockingham wishes to retain larger 1 hectare lots to the west of the ridge, there is no impediment to any urban zoning to the east of the ridge. Any future subdivision design could cater for some larger transitional lots between the urban zoning and the larger lots.

We can provide the Commission with a copy of the land capability report if it would be of assistance. The Land Capability report has already been lodged with the City of Rockingham and has been accepted by their Environmental Officer and Planning Department.

4. Physical Environment

Geology and Soils

As part of the land capability assessment the soils were surface mapped and soil auger test holes were drilled as necessary.

Landform Research has identified that the site is underlain by the Tamala Limestone which is an aeolian calcarenite originating from beach sands. The limestone is covered by shallow, brown, calcareous loamy sands. Predominantly the soils are classified as Cottesloe soils.

The limestone approaches the surface on the ridge to the south west and centre. In other locations across the subject land, limestone remains below the surface with no outcrops.

Ground Water

The land capability report identifies no evidence of standing surface water and concluded that the soils are well drained. The report also states that there is separation of at least 1.3 metres to the highest known water table applied only to the extreme eastern edge of the site.



Wetlands

There are two nearby wetlands being Lake Walyungup (Conservation Category Wetland) and Pike Road Swamp (Resource Enhancement Wetland).

In Figure 7.1 of the City of Rockingham Rural Wedge Study, a 50 metre buffer is identified for the Pike Road Swamp. Inclusion of the east portions of Lots 50-53, 56, 8 and 783 Mandurah and Pike Roads, Baldivis in the MRS Amendment would not cause any encroachment within the buffer.

5. Services

The owners engaged a consultant engineer to examine service availability in the area. If portions of our clients lots were included in the Urban zone, they can be fully serviced with water, sewer, stormwater, gas and telecommunications.

Conclusion

In conclusion, we recommend that the Urban Zone proposed under MRS Amendment 1130/41 be extended south to include Lots 50-53, 56, 8 and 783 Mandurah and Pike Roads, Baldivis (to the east of the ridge) consistent with the Rural Wedge Study.

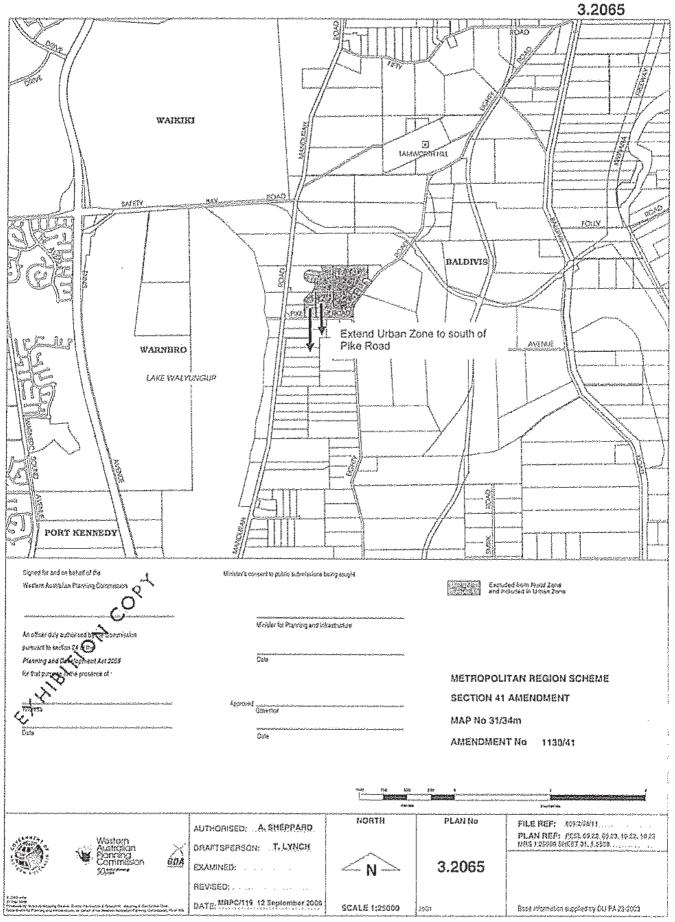
The Rural Wedge can still be protected through retention of larger lots, and lot sizes can be staggered so there is a transition between the ridge and smaller urban lots further to the east. We have already had preliminary discussions regarding these lots with the City of Rockingham Planning Department.

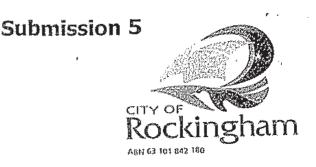
We would be grateful for any support that you can provide in regards to this matter, and look forward to receiving favourable consideration of this submission. If I can be of any assistance, please do not hesitate to contact me.

Yours faithfully, GRAY & LEWIS

LIZ BUSHBY

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Our Ref: TP1-3-1-33

Your Ref:

Enquiries to: Mr Ricci

30th April 2007

The Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

AND INFRASTRUCTURE - 2 MAY 2007 BCA · Q · Q · B P 2 FILE BCA · 2 · 28 - 8 P 2

DEPARTMENT FOR PLANNING

Dear Sir

Re: Proposed Amendments to Metropolitan Region Scheme - Nos. 1127/41 and 1130/41

I refer to the above proposed amendments to the Metropolitan Region Scheme for which comments are being invited and provide a submission on behalf of the City of Rockingham.

Amendment No. 1127/41

Amendment No. 1127/41 seeks to zone land bounded by Zig Zag Road, Kwinana Freeway, Folly Road and Baldivis Road from 'Rural' to 'Urban'. It is also proposed to simultaneously zone the land from 'Rural to 'Development' under the City's Town Planning Scheme No. 2, pursuant to s126(3) of the Planning and Development Act 2005.

The City submits that the implications of the 'Development' zoning under TPS2, as it affects particular lots, must be resolved prior to the rezoning being progressed.

In this regard, Lots 101-105, 129, 1000 and 9000 Eighty Road, Zig Zag Road and Paparone Road and zoned 'Special Rural' under TPS2 and contained in Schedule No.4 - Portions of Planning Unit 5 of the Rural Land Strategy. The landholding is referenced in Item 5(i) of the subject Schedule, albeit under former lot numbers.

At this time, only Lots 101-105 have been subdivided to a 'Special Rural' density.

With respect to Lots 101-105, the City is concerned that a 'Development' zoning will render the land management requirements within the subject Schedule of TPS2 as unenforceable despite the land potentially being used for ongoing 'Special Rural' purposes.

Furthermore, Lot 9000 is currently the subject of Amendment No. 15 to TPS2 which seeks to zone the land to 'Special Use - Freeway Service Centre' to enable the site to accommodate a Freeway Service Centre as described under WAPC Policy No. DC 1.10. The Council has adopted the Amendment for Final Approval and it is currently before the Minister for Planning and Infrastructure.

Civic Boulevard Rockingham Western Australia PO Box 2142 Rockingham DC Western Australia 6967. • Telephone (08) 9528 0333 ' Facsimile (08) 9592 17 Email council@rockingham.wa.gov.au • Website www.rockingham.wa.gov.au ÷/ 4

<u>8</u>-

As such, it is recommended that the 'Development' zoning not be applied over Lot 9000.

Amendment No. 1130/41

The landholding affected by the above amendment has been the subject of preliminary local structure planning which has determined the extent of the proposed zoning. The draft structure plan provides for a 'Special Residential' interface between the abutting northern precinct ('Woodleigh Grove Estate') and the proposed residential density over the balance of the land.

The proposed 'Special Residential' lots will be included as part of Schedule No. 5 - Portions of Planning Unit 4 of the Rural Land Strategy in TPS2.

It is therefore recommended that the row of 'Special Residential' lots be excluded from the 'Urban' zone under the MRS and the 'Development' zone under TPS2.

A copy of the draft structure plan is attached for your information.

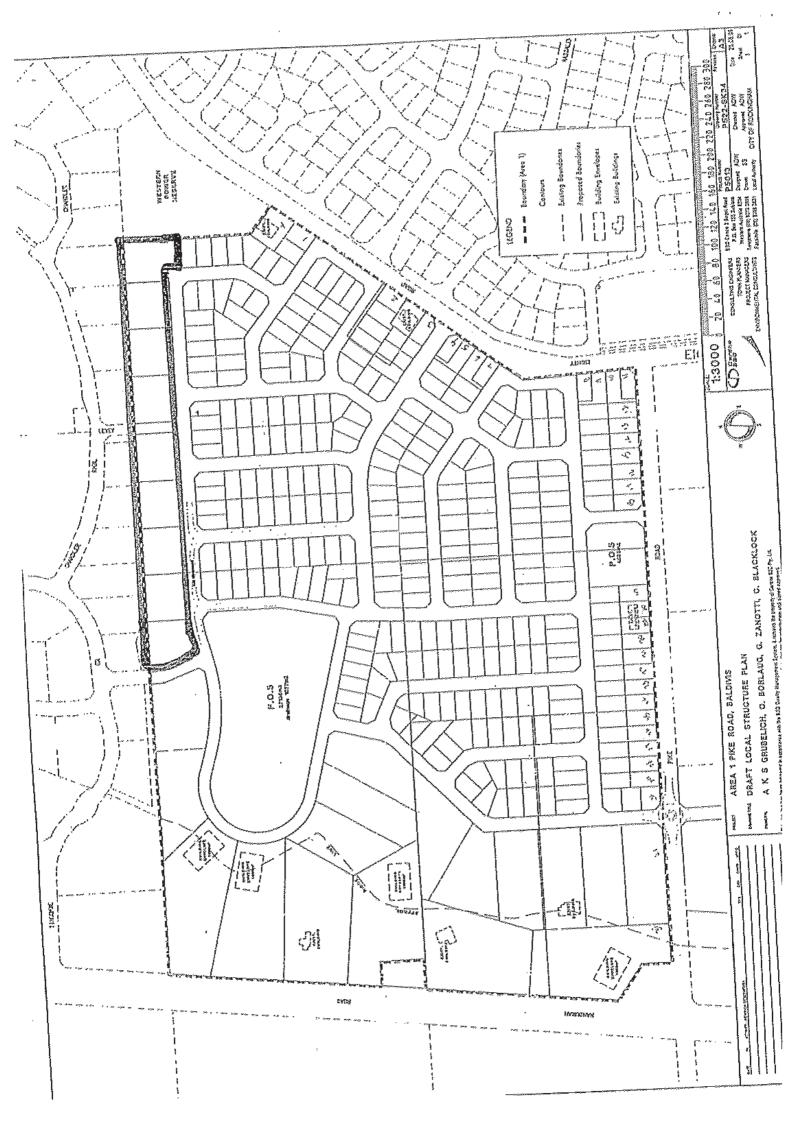
Should you have any enquiries with respect to this advice, please do not hesitate to contact the undersigned on 9528 0341.

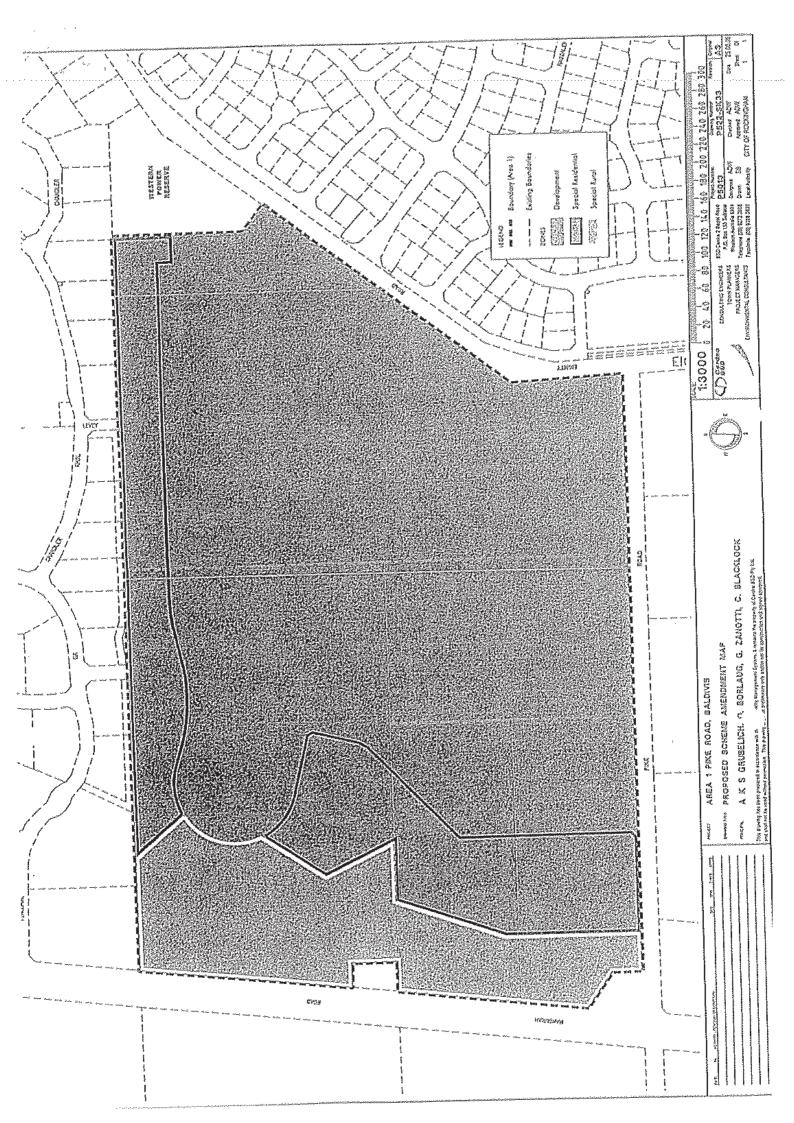
Yours faithfully

AR_,"

P RICCI MANAGER, STRATEGIC PLANNING & ENVIRONMENT

cc Mr Frank Aranglo, Development Planning Strategies Mr Greg Rowe, Greg Rowe & Associates Mr Andrew Williams, Cardno BSD







Your Rel: 309-2-28-8 Pt1 (9 Pt1, 10 Pt1, 11 Pt1) Out Rel: JT1 2007 03193 V01 Enguistics: Ross Crockett Phone: 08 9420 2013 Facsimile 08 9420 3193

Secretary Western Australian Planning Commission Albert Facey House 469 Wellington Street Perth WA 6000 529 Newcasda Sereet Leedernille 5007 Western Australia

PO Bax 100 Laederville 6902 Peych Western Australia

Col (+61 8) 9420 2420

www.wittercorporation.com.or AGM 38 003 434 817

1⁴¹ May 2007

Attn: Aiton Shepard

Re: City of Rockingham Proposed MRS Rezoning's – Rural to Urban 1127/41, 1128/41, 1129/41 and 1130/41 Baldivis

I refer to your letter dated the 29th January 2007, requesting comments on the above proposal from this Corporation. Thank you for giving the Water Corporation the opportunity to comment.

With respect to the proposed rezoning the Water Corporation <u>"Currently Objects"</u> to this proposed rezoning of land in the Baldivis area from rural to urban until such time as the East Rockingham Wastewater Treatment Plant (WWTP) has obtained all required environmental approvals from the Department of Environment and Conservation and the site has been made available for this purpose. It is envisaged that this approval will not occur until 2010 with the WWTP being operational by 2015. The proposed enhancements to the existing WWTP's capacity is insufficient to provide wastewater treatment beyond the capacity of the land already zoned Urban / Urban deferred in this area.

The area is located within the Mundijong Drainage District and within the flood plain of the Peel Main Drain. Rural drainage standards under the licence issued by the Economic Regulatory Authority allow flooding for up to three days, or longer if the physical form of the land does not readily facilitate drainage.

The Corporation <u>does not support</u> development within the Mundijong Drainage District until the Department of Water has developed an Arterial Drainage Scheme for the drainage of any future urban development, prescribes standards for the level of service required, resolves the issue of development within the wetlands and the floodplain of the Main Drains and identifies the responsibilities of the various stakeholders.



Water Supply

The area is within the existing Tamworth-Karnup System boundary. The future infrastructure to support full development of this area as identified in the ultimate system planning is:

- 300m of 900S from Tamworth Reservoir;
- 1615m of 500S along Eighty Road near Fifty Road; and
- 1122m of 300P.

The Development can therefore be supplied with water subject to funding being available.

Wastewater

The area is in the Baldivis North Sewer District. The subject area can be serviced, with associated and necessary gravity mains, and gravity mains and pump station upgrading and relocations. Within the Baldivis North Sewer District Boundary, the subject area falls within the proposed East Rockingham Wastewater Treatment Plant Catchment area. The treatment plant is expected to be commissioned by 2015. For an interim development timeframe, alternative treatment facilities will be required. The closest available treatment plant is the Kwinana WWTP. The proposed treatment capacity upgrading at the Kwinana WWTP is currently committed, in meeting expected urban development of the surrounding area (other than the subject area). Any development of the subject land prior to 2015, with a requirement to provide a reticulated sewer system/treatment capacity will require the advancement of the proposed East Rockingham WWTP commissioning date. A site is still to be finalised and acquired, necessary environmental approvals obtained, the design, building and commissioning etc. to be undertaken. Currently there is insufficient treatment capacity within the area to accommodate the residential development of the subject land area.

Drainage

The area is within the Mundijong Drainage District. The Mundijong Drainage District has been constructed to rural drainage standards, which provide a very minimal level of service, the cost of upgrading this system to urban standards would be prohibitive. The stormwater flows required to be compensated for on site, are for the 1 in 100 year ARI storm event and advice should be sought from the Department of the Water. Existing culverts under the Kwinana Freeway shall not be enlarged. The following issues should also be noted:

- Direct drainage connection to the Peel Main Drain is not permitted.
- At this point in time drainage headwork's contributions and drainage rates are not applicable as this is a rural drainage area.
- Water Resources, Strategic Drainage and Water Quality issues need to be taken up with the Department of Environmental Protection, the Department of the Water and the City of Rockingham.

Funding

The principle followed by the Water Corporation for the funding of subdivision, development or redevelopment is one of user pays and the developer is expected to provide all water and sewerage reticulation and to contribute for headwork's. In addition the developer may be required to fund new works or the upgrading of existing works to provide for the increase demand resulting from the development.

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If you have any further queries on these comments please phone Ross Crockett on (08) 9420 2013

- Frenki Hall

Frank Kroll Senior Development Planner Development Services Branch Customer Services Division



 Your Ref:
 809-2-28-8 Pt1 (-9Pt1; -10 Pt1; -11 Pt1)

 Our Ref:
 JT 2007 03193 VO1

 Enquiries:
 Steve Hiller

 Phone:
 9420-2023

6 August 2007

Chairman Western Australian Planning Commission Albert Facey House 469 Wellington Street PERTH WA 6000

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE 10 AUG 2007 809-2-28-8 P 1 FILE 809-2-28-9 P 1

409.2.20-10 PI

629 Newcastle Street Leederville 6007 Western Australia PO Box 100 Leederville 6902 Perth Western Australia Tel (+61 8) 9420 2420 www.watercorporation.com.a ABN 28 003 434 917

Attention: Moshe Gilovitz, Secretary

Proposed Metropolitan Region Scheme Amendments - South West Districts, Baldivis Amendments: 1127/41, 1128/41, 1129/41 and 1130/41

I refer to your letter of 29 January 2007 inviting comment on the proposed rezoning of various landholdings in the Baldivis area from 'Fural' to 'Urban', and the Water Corporation's submission on the proposed amendments dated 1 May 2007.

Interested parties have recently approached the Water Corporation seeking explanations as to the Corporation's lack of support for the rezoning proposals. The purpose of this letter is to clarify and reinforce some aspects of the Corporation's previous submission objecting to the proposed Urban zoning of land in the Baldivis area, and to highlight some concerns with the land use planning process that create difficulties for the Water Corporation and other infrastructure providers when planning for new plant and system upgrades to meet projected increases in demand.

Introduction

Water and sewerage works are inherently capital intensive. The Corporation makes substantial investments in infrastructure on the basis of projected long term land use planning. Many of the Corporation's major assets have expected lives of 50 years or more and it is therefore imperative for the Corporation to be able to plan new infrastructure and upgrades with some confidence in the planned growth in demand.

The need for reliable long term planning is particularly acute in the case of major infrastructure such as water catchment dams, bulk pipelines and regional wastewater treatment facilities, which are difficult and costly to establish and which cannot easily be staged or upgraded incrementally as demand increases. The Corporation aims to optimize the timing of major capital expenditure on new major infrastructure while maximizing the operational and financial efficiency of existing infrastructure.

Reasonably reliable land use planning and adequate lead-times are therefore crucial to the efficient and cost-effective provision of major infrastructure. In this regard the Corporation relies heavily on land use plans, including the Metropolitan Region Scheme, Peel Region Scheme, regional structure plans (corridor and district structure plans), local planning schemes and other non-statutory planning processes such as the Metropolitan Development Program and Country Land Development Program as a basis to forecast increased demand for water wastewater services.

The Corporation's planning for major infrastructure in the South-West corridor in general and the Baldivis area in particular, is based on various planning documents relevant to the area.

South-West Corridor Structure Plan (1993)

The SW Corridor Structure Plan aims to provide a comprehensive approach to planning and development in the southern part of the South-West Corridor between Rockingham and Gordon Road in Mandurah and to guide more detailed local planning for the area.

The Structure Plan identifies the land that the subject of these MRS amendments as "Rural -Landscape Attributes" and acknowledges that most of this land is low lying and would be unsuitable for urban development without substantial drainage works.

Metropolitan Development Program (MDP)

The MDP provides a valuable base of information to support planning and promote coordination of water, sewerage, electricity, transport and other major community infrastructure on a whole-of-government basis. The MDP is an important growth management tool for the Perth metropolitan region.

Successive MDP's, including the most recent MDP published in January 2006 for the 2005/2006 to 2009/2010 planning horizon, have identified most of the subject land as "Rural". A small portion of the Amendment 1128/41 area to the south of Zig Zag Road (MDP area SW184) is earmarked as "Special Rural" and anticipated for release by 2009/2010.

Importantly, to date none of the land in the amendment area has been identified for possible future urban development.

Network City

Network City is the new the metropolitan strategy for the Perth and Peel regions and supersedes Metroplan. Network City includes an action plan and a diagrammatic spatial framework indicating how the principles of the plan could be applied. The Network City draft State Planning Policy (SPP) was advertised from March to May 2006. Once adopted, Network City will be taken into account in preparing regional and local planning strategies and planning schemes and amendments and will be given appropriate weight in statutory decision making.

Network City acknowledges that the corridor structure plans, the Metropolitan and Peel Region Schemes, local planning schemes, district and local structure plans and other relevant WAPC policies will need to be modified over time to accord with and support Network City. In this regard the Network City SPP implementation measures indicate that the WAPC will soon commence a comprehensive review of its policies and planning instruments.

Staging infrastructure provision with land development, both spatially and temporally, is an important component of the planning process and is acknowledged as a key principle of the *Network City* spatial framework. Reflecting *Network City* in strategic plans and other planning documents is vital to the timely and efficient delivery of infrastructure, such as water and wastewater services.

The Network City spatial framework is diagrammatic and should not be used as a basis to promote Urban rezoning of new areas prior to it being considered in more detail through the revision of the corridor structure plans.

Previous working versions of the *Network City* spatial framework (as recent as 2004) showed the sites of the proposed MRS amendments as "Rural/Special Rural". The most recent version of the framework shows Amendment Proposal 1130/41 (Pike Road) and most of Amendment Proposal 1127/41 (north of Zig Zag Road) as "Rural and Resource areas including Natural Vegetation". Amendment Proposals 1128/41 and 1129/41 (south of Zig Zag Road) are included within the larger Baldivis development area, referred to as "Future Communities to be designed around networks and centres". No justification has been provided for this in the various Network City studies and reports produced to date.

Proposed East Rockingham Wastewater Treatment Plant

At present, the Corporation's three largest wastewater treatment plants (WWTP's) at Beenyup, Subiaco and Woodman Point receive and treat most of the wastewater generated in the Perth metropolitan region. Planning and approvals are well advanced for the new Alkimos WWTP, which will serve much of the north-west urban corridor.

In the late 1980's the then Water Authority of WA conducted wastewater planning for the south-west corridor and identified the need for a major WWTP in the vicinity of East Rockingham. This plant would eventually replace Point Peron WWTP and Kwinana WWTP, which were deemed to be unsuitable for major upgrading (the Point Peron site is too small and environmentally constrained and the Kwinana site is inappropriately located in the catchment, relatively elevated and distant from possible ocean outfalls opportunities).

A new WWTP site in the East Rockingham area is preferred for a variety of reasons, including operational and cost considerations. The new WWTP has been planned to service a large catchment that includes: Meadow Springs (north Mandurah), Madora, Singleton, Golden Bay, Secret Harbour, Warnbro, Port Kennedy, Rockingham, Rockingham East, Kwinana, Baldivis and Karnup, as well as the proposed Amarillo development to the south-west and land in the Byford-Mundijong area some 20km to the east.

In 1988 the then Water Authority of WA purchased a site for the proposed East Rockingham WWTP at Lots 2259 and 52 Day Road, Challenger (East Rockingham). However, due to the presence of native vegetation on the site and a caravan park/retirement village that was subsequently established in close proximity, the then Minister for Water Resources directed the Corporation to find an alternative site.

In an effort to secure a viable site the Water Corporation entered into negotiations with Landcorp to identify and purchase a site within the MRS Industrial zone to the north of Day Road (also known as 'IP14'). In 1998 a suitable site (Lot 9001) was identified and agreed with other government agencies, reflected in structure planning for the IP14 area and subsequently reserved in the MRS for 'Public Purposes – WSD'. Investment in wastewater conveyance (main sewers and sewer pump stations) since that time has been based on the establishment of the WWTP at this site. In 2002 the Water Corporation concluded negotiations with Landcorp over the acquisition of the reserved site and paid a substantial deposit to Landcorp.

In 2002 and 2004 CALM and the then DoE expressed increasing interest in vegetation in the IP14 area and advised that much of the land (including the site reserved for the WWTP) should be set aside for conservation purposes. In mid-2004 Landcorp initiated a Strategic Environmental Assessment process with the EPA in order to clarify and resolve the conservation values over the land. This process has not been finalized and a suitable alternative site for the East Rockingham WWTP has therefore not yet been identified or secured.

Provided the Corporation is able to secure an acceptable site for the WWTP and its planned odour buffer in the near future and the necessary environmental and other approvals are obtained, it is expected that the new East Rockingham plant can be commissioned by 2015.

Wastewater from developments on land in the Baldivis area that is already zoned Urban is currently collected, conveyed and treated at the Point Peron (southern portion of Baldivis) and Kwinana (northern portion of Baldivis) treatment plants on an interim basis until the East Rockingham WWTP is operational.

Because of the rapid pace of development in the area the Point Peron WWTP will reach full capacity by 2012 and the Kwinana WWTP will reach full capacity by 2008/09. Environmental and capacity constraints at Point Peron will see this plant de-commissioned before 2015. This plant was originally planned to be de-commissioned earlier (2012) due to the nature of wastewater treatment at the plant (primary treatment only). The Corporation had originally planned to commission the proposed East Rockingham WWTP to overcome the treatment and capacity deficiencies at the Point Peron and Kwinana plants. However, in view of the difficulties in securing a site for the East Rockingham plant, the interim arrangement is to undertake a significant upgrade at the Kwinana plant (new treatment process and increase capacity to 12ML/day) to accommodate forecast growth in the catchment until about 2015.

This contingency plan is based on the current forecasts of development derived from land already zoned Urban and Urban Deferred in the MRS. Much of the planned treatment capacity has already been committed to meet the expected demand that will be generated by ongoing subdivision in the Baldivis catchment area on land that is already zoned Urban in the MRS. It is likely that only some of the existing Urban land in the Baldivis area will be able to serviced until the proposed East Rockingham WWTP becomes operational.

The proposed MRS amendments are located within the sewer catchment area for the proposed East Rockingham WWTP. The additional 430ha of land proposed in this amendment has not been included in the catchment growth forecasts. The subject land therefore cannot be provided with wastewater services until the East Rockingham WWTP is commissioned, which is likely to be 2015 at the earliest, assuming no further delays in securing the site. The Water Corporation does not support the proposed rezoning of the land from 'Rural' to 'Urban' at this time.

Given that a significant proportion of the land within the existing urban zone in Baldivis is presently undeveloped but has been identified and planned for future development, it is not clear why additional land is proposed to be zoned that is difficult to service. The Corporation is concerned that the Metropolitan Region Scheme rezoning process may be working against proper and orderly planning because of high land acquisition costs, multiple land ownership and physical development constraints within the existing zoned areas.

Steve Hiller Manager Development Services Customer Services Division

From: Sent: To: Subject:

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Trevor, Andrew Thursday, 3 May 2007 3:02 PM Bubanic, Marija FW: MRS Amendment Comments for 1127/41, 1128/41, 1129/41 & 1130/41

2.2



----Original Message----From: Ross Crockett (mailto:Ross.Crockett@WaterCorporation.com.au) Sent: Thursday, 3 May 2007 3:00 PM To: Trevor, Andrew Subject: FW: MRS Amendment Comments for 1127/41, 1128/41, 1129/41 & 1130/41

Andrew

Attached are the Water Corporations comments for the MRS amendments 1127/41, 1128/41, 1129/41 & 1130/41 that is due on the 4th May 2007

The original is in the mail.

Regards Ross

Ross Crockett Development Planer Development Services Branch Customer Services Division Water Corporation (- 61 08 9420 2013 Fax - 61 08 9420 3193 * ross.crockett@watercorporation.com.au OSmile, you will feel better. "This Electronic Mail Message and its attachments are confidential. If you are not the intended recipient, you may not disclose or use the information contained in it. If you have received this Electronic Mail Message in error, please advise the sender immediately by replying to the e-mail and delete the message and any associated attachments. Whilst every care is taken, it is recommended that you scan any attachments for viruses."

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Submission 7

 From:
 ORMSBY, Warren [Warren.Ormsby@doir.wa.gov.au]

 Sent:
 Friday, 4 May 2007 4:48 PM

 To:
 mrs

 Subject:
 Metropolitan Region Scheme Proposed Amendments 1127/41, 1128/41, 1129/41, and 1130/41

Please find attached the Department of Industry and Resource's submission on the above proposed amendments.

regards

Warren Ormsby Senior Geologist, Mineral Resources Group Geological Survey DEPARTMENT OF INDUSTRY AND RESOURCES Postal Address: 100 Plain Street, East Perth, Western Australia 6004 Street Address: 100 Plain Street, East Perth, Western Australia 6004 Telephone: +61 8 9222-3571, Facsimile: +61 8 9222-3633 warren.ormsby@doir.wa.gov.au www.doir.wa.gov.au <<DoIR_text_15807.PDF>> <<Figure1_15807.pdf>> <<Figure2_15807.PDF>> This corporate message has been saved as 000264.Warren.Ormsby.htm and placed on file A0158/200701.

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Before you take any action based upon advice and/or information contained in this email you should carefully consider the advice and information and consider obtaining relevant independent advice.

 Your ref:
 809-2-28-8 Pt 1, 809-2-28-9 Pt 1, 609-2-28-10 Pt 1 & 809-2-28-11 Pt 1

 Our ref:
 A0158/200701

 Enquiries:
 Warren Ormsby - Ph 9222 3571 Fax 9222 3633

 Email:
 warren.ormsby@dolr.wa.gov.au

Moshe Gilovitz Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000

Dear Sir/Madam

METROPOLITAN REGION SCHEME PROPOSED AMENDMENTS

Thank you for the invitation to comment on the proposed amendment No.'s: 1127/41, 1128/41, 1129/41, and 1130/41.

The Department of Industry and Resources (DoIR) has no objection to, nor comment on amendment No.'s 1128/41, 1129/41 and 1130/41. We do however, draw your attention to a number of Priority Resource Locations for basic raw materials that are potentially impacted by proposal 1127/41 (figure 1). These areas are defined on the "Resource protection working plans of Perth metropolitan region and outer areas – 2002 map" as published by the Department for Planning and Infrastructure (see figure 2).

Specifically, Amendment No. 1127/41 – Baldivis east – North of Zig Zag Road – is located between Priority Resource Locations for clay and sand, and close to a Priority Resource Location for limestone and limesand. WAPC Statement of Planning Policy No. 2.4 (SPP2.4), section 6.1.1 states that Priority Resource Locations "...are the locations of regionally significant resources which should not be constrained by incompatible uses or development". In this context, the proposal for residential housing adjacent to these areas does suggest potential for future land use conflicts.

In examining the Priority Resource Locations in detail:

1) Priority Resource Location for sand.

Sand is currently being extracted from this site by Italia Limestone Company, on land owned by the Metropolitan Cemeteries Board. Italia advise that they expect to have completed sand extraction in 2 to 3 years time. Baldivis Road is currently being used for access for trucks by Italia. Consistent with recent State Government initiatives to facilitate the supply of basic raw materials, particularly sand south of Perth, and SPP2.4, DoIR believe that residential development should not take place adjacent to this site until sand mining is completed. This will avoid exposing residents to any noise and dust and heavy vehicle traffic that may be created by the mining, and consequently any action to prematurely cease operations from this locality.

2) Priority Resource Location for clay.

The entire eastern side of the proposed amendment area adjoins this clay resource. Alcoa appears to be the only company currently extracting clay on an intermittent basis in this area, and expect to continue these operations for a further 10 to 20 years. The working area for Alcoa is in the southern part of the Priority Resource Location, over 500 m to the east of the Kwinana Freeway, behind wetlands that were created from previous mining activity. Alcoa do not anticipate there to be any noise (over and above the freeway) or dust related issues due to their operations which do not operate at night. Alcoa do however point out that they use the freeway for transporting the clay, but only operate during weekdays for three months during summer.

DoIR points out that there is a clay area adjacent to the freeway to the north of Alcoa's clay pits that is not currently being exploited, and may possibly be sterilized if residential subdivision was to take place.

3) Priority Resource Location for limestone/limesand

This area is located about 400 m from its closest point to the amendment area, and hosts a comparatively long-life mine for limestone and sand operated by WA Limestone Company. WA Limestone estimate about 15 years of mining remains at this locality. Future mining will take place towards the north, which is over 500 m west of the proposed amendment area, and will probably be partly shielded from the proposed residential area by topography.

In summary, no current operator has expressed strong concerns about the proposed amendment, but DoIR would like to reiterate the planning implications for such a development under WAPC SPP2.4. In particular, DoIR draws the attention of any proponent for residential development to Section 6.3.3 which states "There should be a presumption against the introduction of sensitive land uses which could be adversely affected by existing or potential future extractive industries unless appropriate measures can be taken to ameliorate the adverse impacts".

DoIR's strong preference is for sequential land use in which basic raw material extraction is followed by development. Given the cluster of extractive industries in this area, perhaps Industrial development would be a more appropriate rezoning. The Metropolitan Region Scheme and Town Planning Schemes are important tools for managing this transition.

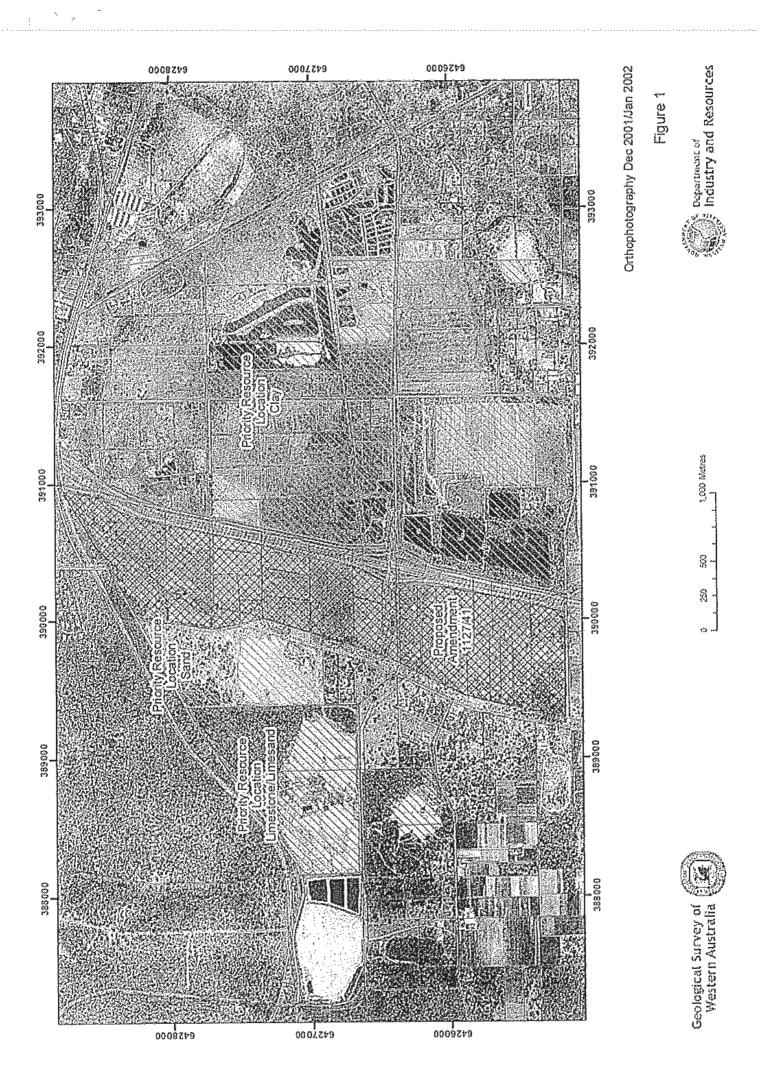
Yours sincerely

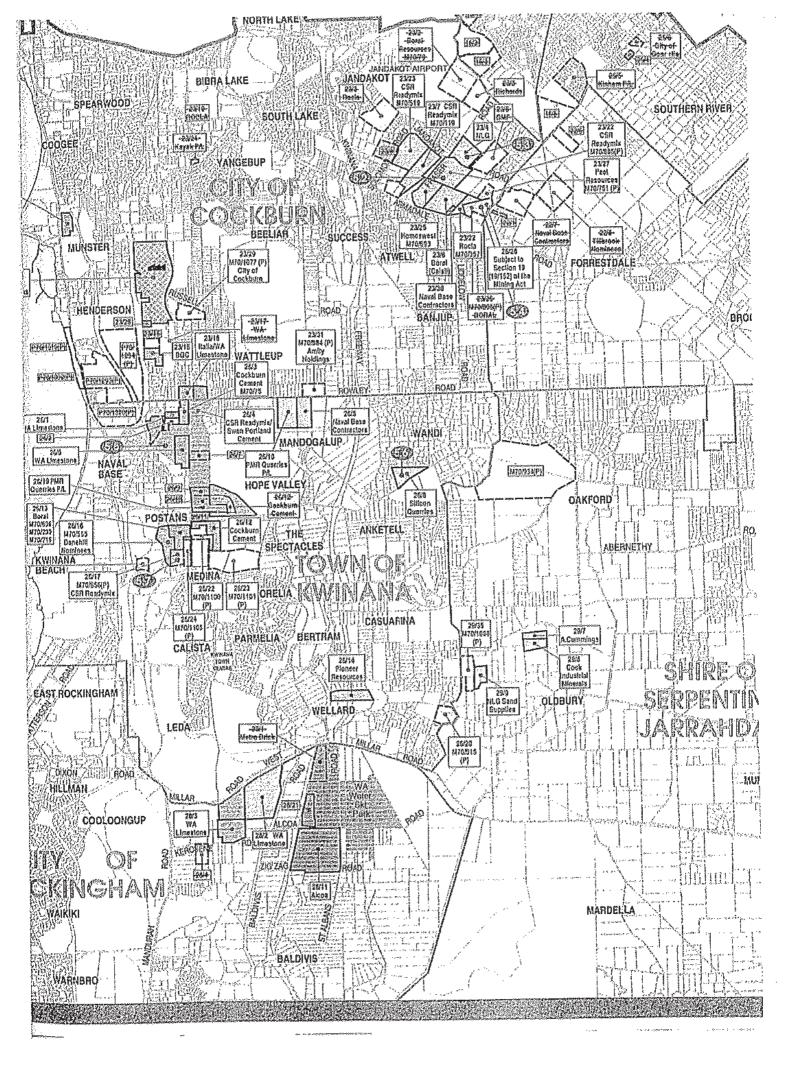
GAT Tim Griffin Director GEOLOGICAL SURVEY WESTERN AUSTRALIA

4 May 2007

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Encl







Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6027

4th May 2007

Dear Sir

6 6

Metropolitan Region Scheme Amendments 1127/41, 1128/41, 1129/41, 1130/41 Submission by ASPO Australia

The Australian Association for the Study of Peak Oil and Gas is a nationwide network of professionals working to reduce our oil vulnerability.

The essence of Peak Oil is that there is a strong likelihood of worldwide oil supplies falling short of demand in the very near future. It appears unlikely that alternative energy technologies will be ready (or even able) to fill the gap between oil demand and available supplies. As Perth's transport system is car dominated, we are already vulnerable to hardship as a result of oil shortage or price escalation.

This submission asks that the Western Australian Planning Commission decide not to proceed to finalisation of the amendments. The submission uses the following two lines of argument.

- Development of the subject land for urban uses would bring a population to the area that is remote from other urban areas and services, highly dependent upon private transport and therefore extremely vulnerable to hardship from oil shortage. This rezoning increases risk to our community.
- In the foreseeable future, population growth in Metropolitan Perth can be accommodated by consolidation or redevelopment of areas already urbanised or by land already zoned urban. This re-zoning is not needed.

Members of ASPO Australia would welcome the opportunity to speak to the Hearings Committee considering these amendments.

Yours sincerely

Bruce Robinson, Convenor ASPO-Áustralia 2 Barsden St, Cottesloe WA 6011 9384-7409 0427 398 708

Metropolitan Region Scheme Amendments 1127/41, 1128/41, 1129/41, 1130/41 Detailed submission by ASPO Australia

Background

The Australian Association for the Study of Peak Oil and Gas is a nationwide network of professionals working to reduce our oil vulnerability. We aim to bring the probabilities, risks and opportunities that Peak Oil presents to the attention of decision-makers.

An excellent balanced view of the credibility of Peak Oil is provided in the Senate Rural and Regional Affairs and Transport Committee report on Australia's future oil supply and alternative transport fuels¹. The extract quoted below indicates that Peak Oil is credible.

'Early peak' commentators have criticised what they regard as overoptimistic official estimates of future oil supply with detailed and plausible arguments. The Committee is not aware of any official agency publications which attempt to rebut peak oil arguments in similar detail. (3.133)

The Committee noted many estimates of when Peak Oil might occur. Of the 25 estimates printed, 16 were at or before 2015. After extensive investigation, the Committee did not find a clear alternative fuel mix that might replace declining oil production and meet Australia's transport demand.

The Committee made the following pertinent comments.

The essence of the peak oil problem is risk management. (3.135)

In view of the enormous changes that will be required to move to a less oil dependent future, Australia should be planning for it now. (3.137)

...the policies that reduce our dependence on oil are the same policies that reduce our exposure to supply disruptions. Many of them are the same policies that reduce greenhouse gas emissions. (3.142)

Oil Vulnerability as it relates to these proposed amendments (The negative argument)

Technical papers by Dodson and Sipe^{2s, 2b} have attempted to map our spatial vulnerability to oil price rises and supply shocks. This submission will focus on one of the two known indices.

The VIPER index looks from the point of view of

- Dependence upon private car transport and therefore dependence upon fuel supply and price.
- Surplus income available to pay for higher priced fuel.

Construction of the VIPER Index is tabulated below. The sum of the component columns creates a score between 0 and 20. A score of 20 will indicate very high car dependence and a very low ability to absorb increasing fuel prices.

Percentile	SEIFA	Car Own .GE. 2	JTW by car
100	0	5	5
90	2	4	4
75	4	3	3
50	6	2	2
25	8	1	1
10	10	0	0

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The map shown at Figure 1 is a locally produced and slightly enhanced interpretation of the Dodson & Sipe VIPER index for metropolitan Perth.

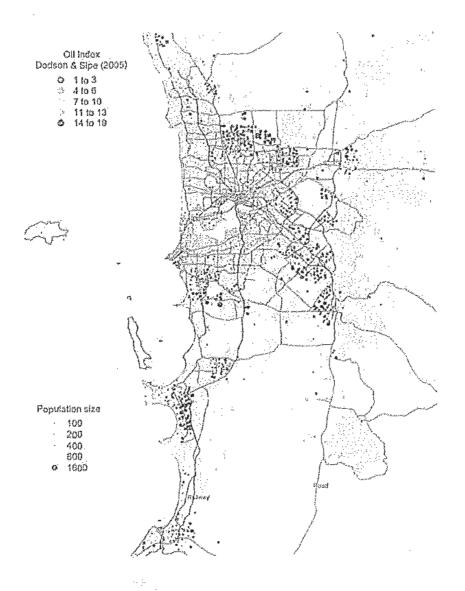


Figure 1 VIPER index map for metropolitan Perth

Residents and businesses on land that these amendments propose as urban will be highly vulnerable to oil shortage or price escalation. People who eventually live in the proposed urban area will be highly dependent upon private car transport for most of their daily needs. This view is reinforced by the observations below.

- The proposed urban areas are remote from access to any station on the Perth to Mandurah railway. They are separated by 2 km of conservation estate plus an extent of land that might not be easily traversed.
- Walk on access to the railway station is nowhere near feasible because of the distance.
- Bus services to feed railway stations serve a relatively small proportion of rail patrons in Perth.
- Mass bicycle access from the proposed urban area to a railway station is not a practical option due to poor facilities and significant distance.
- The proposed urban area is remote from substantial employment areas and public transport services are only likely to cater for a small proportion of the transport need.
- Non motorised transport (walk or bicycle) to any significant destinations will have little feasibility because of distance.

In the event of an oil shortage, residents in this area would suffer from the combined effects of high fuel prices and having no real alternative to private car transport. Substantial consequences would flow through the community.

Alternative approaches

(The positive argument)

Figure 2 indicates that as fuel becomes more expensive, we are likely to respond by reducing our trip lengths. Figure 2 also indicates that the more compact the land use in the city, the more we will be able to reduce trip distances. Consolidating, rather than expanding metropolitan Perth has substantial benefits in building robustness against oil shortage and in economically accommodating a growing population.

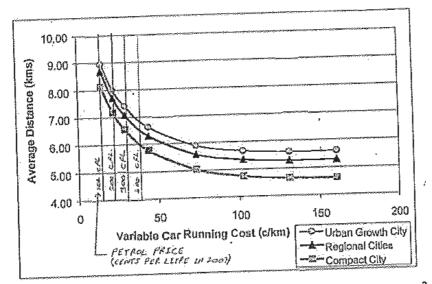


Figure 2 – Average car trip distance Vs Car operating cost ³

It can be mathematically proven that accommodating population growth by redevelopment (rather than expansion) can have remarkably little effect on existing urban area. The tables below indicate what the effect might be of accommodating 100% of population growth within existing (developed) residential areas. While the tables indicate a range of possibilities, the central columns (average 2.5 to 3 new dwellings per redevelopment) are proposed as the most reasonable.

Year 2021 Medium Population Polet	ast nor min		mennigo ov	<u>, , , , , , , , , , , , , , , , , , , </u>
Average dwellings created from redevelopment of an existing dwelling	2	2.5	3	3.5
Number of dwellings redeveloped	159 0 00	106 000	79 000	64 000
Number of dwellings untouched	532 000	585 000	612 000	627 000
Percentage of dwellings redeveloped	23%	15%	11%	9%

Year 2021 Medium Population Forecast 1.87 million⁴ Total dwellings 850 000

Year 2031 Medium Population Forecast 2.08 million⁴ Total dwellings 945 000

Average dwellings created from redevelopment of an existing dwelling	2	2.5	3	3,5
Number of dwellings redeveloped	254 00 0	169 000	127 000	102 000
Number of dwellings untouched	437 000	522 000	564 000	589 000
Percentage of dwellings redeveloped	37%	24%	18%	15%

The tables indicate that accommodating Perth's entire projected 2031 population by redevelopment would only require redevelopment of around 1 property in 5. The number of redevelopments would be even less if redevelopment of old industrial land (such as Cockburn Coast) and land already zoned urban were included.

Population growth to 2031 can easily be accommodated in existing developed or already zoned urban areas. The area proposed to be re-zoned in these amendments is not needed.

Conclusion

4 e

ASPO Australia is primarily concerned with Peak Oil and mitigation of its potential impacts. This is an opportune time when urban and regional planning can reduce risks posed by potential oil shortage.

We submit that finalising this amendment would be poor risk management. Allowing further urban expansion in Baldivis is condemning future residents to suffer the worst affects of likely oil shortages.

We submit that there are options for providing housing that do not require re-zoning this rural land to urban. These options can have relatively low impact.

We ask that the WAPC decide not to proceed with MRS Amendments numbered 1127/41, 1128/41, 1129/41 and 1130/41

References

 Australian Senate Rural and Regional affairs and Transport Committee Report, Australia's future oil supply and alternative transport fuels Final Report, February 2007

- 2. (a) Dodson, J & Sipe N, Oil Vulnerability in the Australian City, Griffith University, December 2005 <u>http://www.griffith.edu.au/centre/urp/urp_publications/research_papers/URP_RP6</u> <u>OilVulnerability_Final.pdf</u>
 (b) Dodson, L and Sipe N, Shocking the Suburbs: Urban location, housing debt and oil vulnerability in the Australian City, Griffith University, July 2006 <u>www.griffith.edu.au/centre/urp/urp_publications/research_papers/URP_RP8_Mortg</u> <u>ageVulnerability_Final.pdf</u>
- 3. Future Perth Strategic Transport Evaluation Outcomes Report, February 2003
- Western Australian Planning Commission, Population Report No 4, Population Projections for the Statistical Divisions, Planning Regions and Local Government areas of Western Australia.
- ASPO-Australia Working Group on Urban Planning and Transport. Submission to the Senate Inquiry into Australia's Future Oil Supplies, 2006 www.aph.gov.au/senate/committee/rrat_ctte/oil_supply/submissions/sub133.pdf

and

CRUDE OIL: Uncertainty about Future Oil Supply Makes It Important to Develop a Strategy for Addressing a Peak and Decline in Oil Production United States Government Accountability Office February 2007

"Federal Agencies Do Not Have a Coordinated Strategy to Address Peak Oil Issues" www.gao.gov/cgi-bin/getrpt?GAO-07-283.

The Peak Oil Debate: Will global oil production start its final decline soon, or not?, a general summary from an Australian perspective

http://www.aspo-australia.org.au/References/Bruce/Energy-Security-Conf-Oct-2006-paper.pdf

Peak Oil and Australia; Probable impacts and possible options is a recent invited paper to an international geophysics conference in Kyoto. It focuses on the demand side options for reducing the potential impacts of Peak Oil when it does come.

http://www.aspo-australia.org.au/References/Bruce/Japan/Kyoto-paper-Robinson-Mayo-2006v8f.pdf,

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		and Development Act 2005 Amendment (Substantial) FORM 41	
	S	UBMISSION	
	-	ION SCHEME AMENDMENT 113	0/41
		1, 2 & PT LOT 335 EIGHTY ROA 334 MANDURAH ROAD, BALDIV [DEPARTMENT FOR PLANNING]	
		AND INFRASTRUCTURE	OFFICE USE ONLY
To:	Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000	- 4 MAY 2007 FILE 809-12-28-11 P2-	Submission 9
- Na		RINT CLEARLY)	
A			
	Idress 117.5. MANDURAH. RD.,BALDI		
Co	ontact phone number	Email address	* * * * * * * * * * * * * * * * * * * *
Su	ibmission (Please attach additional pages if required.	. It is preferred that any additional information b	e loose rather than bound)
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TURN OVER TO COMPLETE YOUR SUBMISSION

Hearing of Submissions

The *Planning and Development Act 2005* provides the opportunity for people who have made a written submission to personally present the basis of their submission to a Hearings Committee.

You do not have to attend a hearing. The comments presented by you in this written submission will be considered in determining the recommendation for the proposed amendment.

For information about the submission and hearings process, please refer to the Amendment Report and in particular Appendix D, titled 'Preparing a submission and for a 'hearing' presentation.

Please choose ONE of the following:

	No, L	to not wish to speak at the hearings. (Please go to the bottom of the form and sign
<u>.</u>		OR
	Yes, i	wish to speak at the hearings. (Please complete the following details)
		I will be represented by:
I		MYSELF – My telephone number (business hours):
		OR
		A SPOKESPERSON
		Name of Spokesperson:
		Contact telephone number (business hours):
		Postal address:
		I would prefer my hearing to be conducted in:
		PUBLIC (members from the general public may attend your presentation)
		OR
		PRIVATE (only the people nominated by you or the hearings committee will be permitted to attend)

You should be aware that:

- The Western Australian Planning Commission (WAPC) is subject to the *Freedom of Information Act* 1992 (FOI Act) and as such, submissions made to the WAPC may be subject to applications for access under the FOI Act.
- In the course of the WAPC assessing submissions, or making its report on these submissions, copies of your submission or the substance of that submission, may be disclosed to third parties.
- All hearings are recorded and transcribed. The transcripts of all hearings, along with all written submissions, are tabled in Parliament and published as public records should the Governor approve the proposed amendment. The WAPC recommendations are similarly published in a *Report on Submissions* and tabled in Parliament.

TO BE SIGNED BY PERSON(S) MAKING THE SUBMISSION

Signature ... NOTE: Submissions MUST be received by the advertised closing date, being close of business (5.00pm) on 4 MAY 2007. Late submissions will NOT be considered.

Planning and Development Act 2005 Section 41 Amendment (Substantial) FORM 41

S. K. S.

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SUBMISSION

METROPOLITAN REGION SCHEME AMENDMENT 1130/41

LOT 3 PIKE ROAD; LOTS 1, 2 & PT LOT 335 EIGHTY ROAD; AND LOTS 1, 2 & PT LOT 334 MANDURAH ROAD, BALDIVIS

	OFFICE USE ONLY
To: Secretary Western Australian Planning Commission 469 Wellington Street PERTH WA 6000	Submission 10
Name Adrian Parker Department of Wa (PLEASE PRINT CLEARLY) Address P.O. Box 332 Mondurah WA 6210	Postcode
Contact phone number955042.22 Email addres	
Submission (Please attach additional pages if required, it is preferred that any add	С
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TURN OVER TO COMPLETE YOUR SUBMISSION

Hearing of Submissions

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Please choose ONE of the following:

U	No, Io	to not wish to speak at the hearings. (Please go to the bottom of the form and sign)
		OR
	Yes,	wish to speak at the hearings. (Please complete the following details)
:		I will be represented by:
		MYSELF - My telephone number (business hours):
		OR
		A SPOKESPERSON
		Name of Spokesperson:
		Contact telephone number (business hours):Postal address:
		I would prefer my hearing to be conducted in:
		PUBLIC (members from the general public may attend your presentation)
		OR
		PRIVATE (only the people nominated by you or the hearings committee will be permitted to attend)

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TO BE SIGNED BY PERSON(S) MAKING THE SUBMISSION

Date ... Signature

NOTE: Submissions MUST be received by the advertised closing date, being close of business (5.00pm) on <u>4 MAY 2007</u>. Late submissions will NOT be considered.



Department of Water Government of Western Australia

Your ref: 1127/41, 1128/41, 1129/41, 113/41 Our ref: RF1346

Enquiries: Jane Sturgess

2 May 2007

Secretary Western Australian Planning Commission 469 Wellington Street Perth WA 6000

Attn: Secretary

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE - 4 MAY 2007 209.2.28.8 PD FILE 809. 2: 28-10. P2 809.2.28-9 P2 209.7.28-1102-

Dear Sir/Madam

RE: METROPOLITAN REGION SCHEME AMENDMENT 1127/41, 1128/41, 1129/41 and 1130/41 – VARIOUS LOTS, BALDIVIS.

Thank you for the opportunity to provide comments in regard to the Metropolitan Scheme Amendment for the above mentioned lots. The Department of Water (DoW) has reviewed the information provided and has some concerns with the proposal in its current form, with particular reference to the following:

Drainage Management

The subject land is located in the Baldivis area where the Department has commenced a substantial drainage project entitled Baldivis/Karnup Water Management Strategy and is due to be completed in 2008. The Strategy is then to be endorsed by all parties, but in particular the EPA, Department of Planning and Infrastructure, Water Corporation and the City of Rockingham. As the proposed sites are heavily constrained by drainage issues, the Department considers it imperative that these issues are addressed prior to initiation of the Amendment.

The approval of the Amendment should be deferred until such time that the Strategy is endorsed to ensure the following occurs:

- any future planning such as Town Planning Scheme Amendments, Outline Development Plans and Structure Planning complies with the approved Strategy and is demonstrated within future planning documents;
- rezoning from 'Rural' to 'Urban' is suitable for the subject land due to drainage contraints.

If, however, the Western Australian Planning Commission decides to proceed with the rezoning prior to the completion and endorsement, the DoW recommends that the subject land be rezoned to 'Urban Deferred' in the first instance, and then to 'Urban' once the Strategy has been completed. Also, the DoW recommends that the next stage of planning (i.e. Town Planning Scheme Amendments and Outline Development Plans, Structure Planning) should not proceed until the Strategy is complete. Furthermore, the DoW would like to offer the following advice:

Dewatering

Under the provisions of the *Rights in Water & Irrigation Act 1914 (RIWI)* a 26D Licence to construct a well/soak and a 5C Licence to Take Water is required for dewatering purposes. Dewatering has the potential to cause significant impact on water table decline and associated environmental factors including groundwater dependant ecosystems, wetlands and/or acid sulfate soils. A Dewatering Management Plan or Operating Strategy will be required. For further information regarding licensing requirements, please contact the Department of Water - Water Resource Use team in the Kwinana Office on 9411 1788.

Peel Harvey Catchment

The subject land is within the Peel-Harvey Catchment and the provisions of the EPA's *Environmental Protection* (Peel Inlet-Harvey Estuary) Policy (1992) and the Western Australian Planning Commission's *Statement of Planning Policy No* 2.1 (1992) - The Peel-Harvey Coastal Plain Catchment shall apply.

Other

It appears that there is remnant native vegetation on the subject land. Also, Acid Sulfate Soil (ASS) Risk mapping indicates class 2 risk. Therefore, this proposal must be referred to the Land Use Planning Section at the Department of Environment and Conservation Swan Region (PO Box 1167, Bentley Delivery Centre, 6983) for comment.

If you wish to discuss this issue further, please contact Jane Sturgess on 9550 4222.

Yours Sincerely

Adrian Parker A/Program Manager – NRM and Waterways Kwinana Peel Region

Cc: Glen McLeod-Thorpe (EPA Service Unit)

Submission 11

ABN: 50 860 676 021

ESTERN AUSTRALIA

4 May 2007



Government of Western Australia

Enquirles:Lang Fong on (08) 9323 4244Our Ref:07/559Your Ref:809-2-28-8 Pt 1; 809-2-28-9 Pt 1; 809-2-28-10 Pt 1; 809-2-28-11 Pt 1;

Secretary Western Australian Planning Commission Albert Facey House 469 Wellington Street PERTH WA 6000

ATTENTION: AITON SHEPPARD

DEPARTMENT FOR PLANNING AND INFRASTRUCTURE - 8 MAY 2007 809.2.28-8 PI FILE 809. 8-28-10 PI 809-2-28-9 PI 809 - 2- 26 -11 P)

Dear Sir

METROPOLITAN REGION SCHEME AMENDMENTS WITHIN THE SOUTH WEST DISTRICT AMENDMENT NUMBERS 1127/41, 1128/41, 1129/41 AND 1130/41

Thank you for your letter dated 29 January 2007 inviting Main Roads Western Australia (Main Roads) to comments on the above Metropolitan Region Scheme Amendments.

Main Roads would like provide the following comments with regards to Amendments 1127/41, 1128/41 and 1129/41;

- 1. For all land adjacent to Kwinana Freeway noise is an issue and hence, all future proposed developments should comply with the Western Australian Planning Commission's Draft Statement on Planning Policy Road and Rail Transport Noise.
- 2. No direct access is permitted onto Kwinana Freeway or its reserve from all land abutting the Kwinana Freeway road reserve.
- 3. To ensure safe and efficient traffic management at our freeway interchanges, it is undesirable to allow any access onto Mundijong and Safety Bay Roads between Baldivis Road and Kwinana Freeway. All accesses from future developments within these land shall be via Baldivis Road.
- 4. Main Roads should be consulted on any drainage management plan proposed within these land as it may have a detrimental impact on Kwinana Freeway.
- 5. Main Roads is currently in negotiation with Freeway Stops Australia on the establishment of a freeway service centre adjacent to Kwinana Freeway between Mundijong Road and Safety Bay Road within the area of Amendment 1128/41. This proposal will involve the development of a service centre on both sides of the Kwinana Freeway with direct access via on and off ramps.

Main Roads has no comments to make with regards to Amendment 1130/41.

If you require any further information please contact Lang Fong on (08) 9323 4244. In reply please quote file reference 07/559.

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Yours faithfully

Kindsay Breadhurst ACTING/MANAGER ROAD & TRAFFIC ENGINEERING

And state of the s	
From:	WIJAY Sharmini [Asset Services] [Sharmini.Wijay@det.wa.edu.au]

Sent: Thursday, 10 May 2007 3:53 PM

To: Bubanic, Marija

Cc: Trevor, Andrew

Subject: MRS Amendment - South West District - 1127/41, 1128/42, 1129/41, 1130/41

Hi Maria,

Thank you for the opportunity to comment on the above scheme amendments.

The Department has considered these amendments and would like to make the following comments:

MRS Amendments - 1127/41, 1128/42, 1129/41

The 367 hectares covered by these amendments is expected to yield about 3900 residential lots at full development. The Department of Education and Training will require two to three primary schools to cater for the students from this development.

The Department will also require a high school site to serve the North Baldivis area which is bound by Safety Bay Road, Kwinana Freeway, Mundijong Road and Mandurah Road. The students from the four to five primary schools (Byford Primary School and the proposed schools at Baldivis North West and 2 to 3 schools in the current MRS amendment area) in Baldivis North will attend this high School.

We are currently in discussions with the Developers of the MRS amendment area to find a location for the high school. While they are willing to consider the requirement for primary schools, they are resisting the placement of a high school site within their development. The Developers are currently investigating the possibility of finding a location for the high school outside their development. The Department would like to continue this process with the Developers and if it is unsuccessful, then request a reservation (under MRS) for a high school site in the MRS amendment area. We would like to discuss the process for reservation of the high school site (Do we have to do this as part of the current MRS or can it be done separately?) and the timing with the Department of Planning.

MRS Amendments - 1130/41

The 20 hectares covered by this amendment is expected to yield about 320 residential lots at full development. Settlers Primary school (the closest school to this development) has an existing school catchment of 2100 residential lots and will not be able to cater for the students from this new development. The Department will require a two hectare school site in this area to provide additional primary facilities to cater for the students from this development.

If you require more information or wish to discuss this further, please contact me on 9264 4183 at the Asset Planning Branch of the Department of Education and Training

Regards,

Page 2 of 2



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Sharmini Wijay Senior Consultant Asset Planning

Asset Planning Branch Department of Education and Training 151, Royal Street East Perth 6004

Phone 08 9264 4183

Late Submission



Department of Indigenous Affairs Government of Western Australia



OUR REF: 07/0114-07

YOUR REF: 809-2-28- pt 1, 809-2-28-9 pt 1, 809-2-28-10 pt 1 & 809-2-28-11 pt 1

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Ms Aiton Shepard Albert Facey House 469 Wellington Street Perth Western Australia 6000

DC 1 809-2-28-8 P=1 809-2-28-(0P1 809-2-28-9 P.1 809-2-28-11P.1

Dear Ms Aiton Shepard

RE: REQUEST FOR INFORMATION FROM THE REGISTER SYSTEM METROPOLITAN REGION SCHEME AMENDMENT NUMBERS, 1127/41, 1128/41, 1129/41, 1130/41

Thank you for your correspondence dated 29 January 2007, regarding Metropolitan Region Scheme Amendment numbers, 1127/41, 1128/41, 1129/41, 1130/41.

A search of the electronic portion of the Register of Aboriginal Sites has been undertaken, the results of which are attached.

It is possible that there are sites that have not yet been entered on the Register of Aboriginal Sites. The *Aboriginal Heritage Act 1972* ("the Act") protects all Aboriginal sites in Western Australia whether they are known to the Department of Indigenous Affairs ("DIA") or not.

Please note that the provision of this information is not to be considered as a clearance (as DIA does not have the power to give approvals; rather DIA's role is to ensure that all the heritage issues have been addressed). The procedures to enable all relevant parties to follow the requirements of the Act are outlined below.

Prior to any proposed development/activity, so that no site is damaged or altered (which would result in an offence under section 17 of the Act) it is recommended that suitably qualified consultants be engaged to conduct ethnographic and archaeological surveys of the area. This should ensure that all Aboriginal interest groups are consulted so that all sites on the designated land are avoided or identified. Such a survey would involve archival research, consultations and on the ground inspections. A survey should also ensure that the provisions of the Act are met. Although DIA is not able to recommend individual consultants, contact details of the professional associations whose members conduct surveys are attached.

It is DIA's preference that any development plans are modified to avoid damaging or altering any site. If this is not possible, and in order to avoid committing an offence under the Act, the landowner should seek the Minister for Indigenous Affairs' prior written consent to use the land. This is done by submitting a notice in writing under section 18 of the Act ("a section 18 Notice") to the Aboriginal Cultural Material Committee. Guidelines for lodging a section 18 Notice are available from DIA's website at http://www.dia.wa.gov.au/Heritage/Standardsweb/s18Notice/s18Toc.aspx.

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I apologise for the delay in our response.

Please do not hesitate to contact Mr Andrew Pepper, of our Perth office, if we can be of further assistance.

Yours sincerely

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Kim Miller A/Heritage Information Officer 29 May 2007

- att: Professional Anthropological and Archaeological Organisations in WA. Register of Aboriginal Sites report.
- Andrew Pepper, Manager Heritage & Family Information Unit, Department of Indigenous Affairs, PO BOX 7770, CLOISTERS SQ, PERTH, WA 6850
 Phone: (08) 9235 8000

ANTHROPOLOGICAL AND ARCHAEOLOGICAL ORGANISATIONS IN WESTERN AUSTRALIA

FOR ADVICE ON CONSULTANTS TO UNDERTAKE ABORIGINAL HERITAGE ASSESSMENT SURVEYS

Please note:

- DIA does not accept any responsibility for the choice of consultant or outcomes
- For advice on the conduct of surveys, including legislative requirements, contact the Department of Indigenous Affairs or refer to the web page at <u>www.dia.wa.gov.au</u>.

Anthropological Society of Western Australia Inc. - Professional Section

CONTACT: An alphabetical list of consultants who are members of ASWA can be found at the ASWA website under the heading Consultants: http://www.anthropsocwa.org/consultants.htm

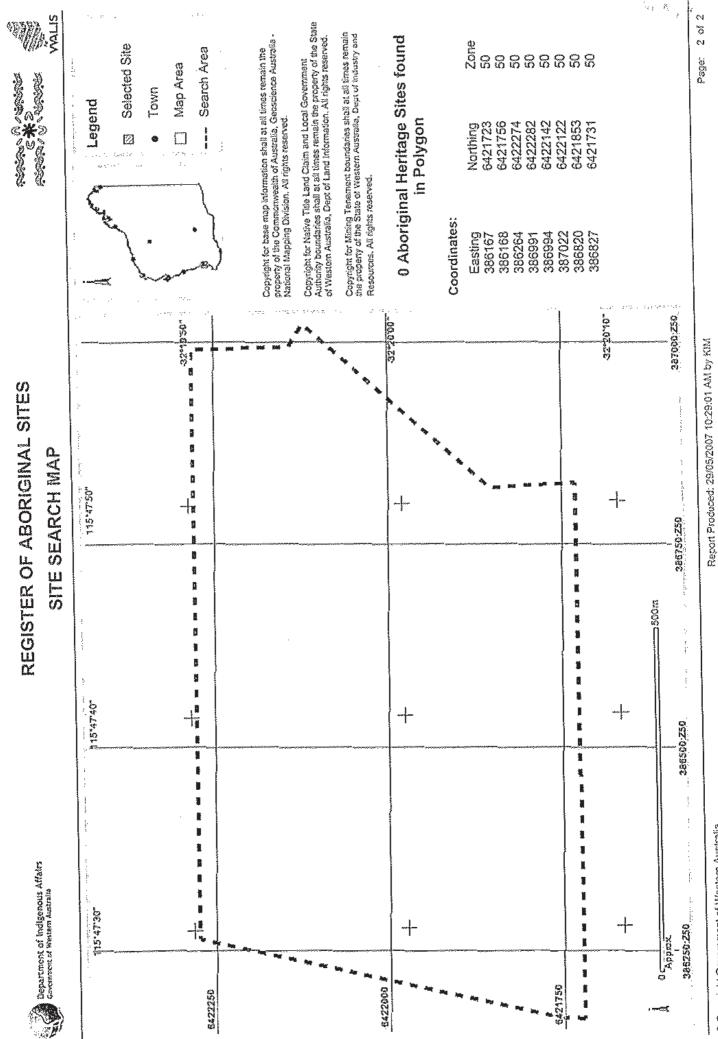
Australian Association of Consulting Archaeologists Inc. - WA Chapter

CONTACT: Ms Gaye Nayton 10 Princeton Court THORNLIE WA 6108 Ph: (08) 9459 6203 E-mail: <u>gnavton@cygnus.uwa.edu.au</u> Internet: http://www.aacai.com.au

Australasian Association of Professional and Consulting Anthropologists and Archaeologists Inc.

CONTACT: Ms Jacqueline Harris 26 Camelia Street NORTH PERTH WA 6006 Ph: (08) 9328 7973 Fax: (08) 9328 7973 Internet: <u>http://aapcaa.asn.au</u>

Revised August 2006

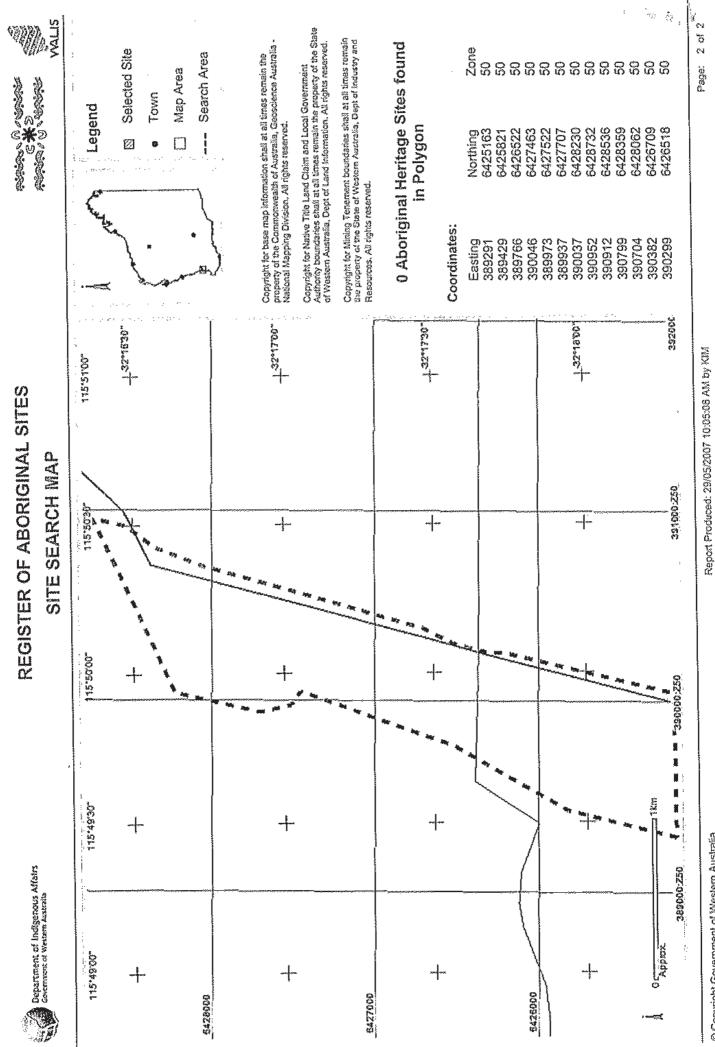


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Search Criteria Easting: 36929 tmE; Northing: 6425163mN; Zone: 50 Easting: 36929 tmE; Northing: 6425622mN; Zone: 50 Easting: 399046mE; Northing: 6427452mN; Zone: 50 Easting: 399077mE; Northing: 64277422mN; Zone: 50 Easting: 390977mE; Northing: 6427707mN; Zone: 50 Easting: 390977mE; Northing: 6427722mN; Zone: 50 Easting: 390977mE; Northing: 6428732mN; Zone: 50 Easting: 390972mE; Northing: 6428732mN; Zone: 50 Easting: 390972mE; Northing: 6428732mN; Zone: 50 Easting: 390972mE; Northing: 6428556mN; Zone: 50 Easting: 39037mE; Northing: 6428556mN; Zone: 50 Easting: 39037mE; Northing: 6428578mN; Zone: 50 Easting: 39037mE; Northing: 6428578mN; Zone: 50 Easting: 390287mE; Northing: 6428578mN; Zone: 50 Easting: 390287mE; Northing: 6428578mN; Zone: 50 Easting: 3902877mE; Northing: 6428578mN; Zone: 50 Easting: 39028777mE; Northing: 64285787mN; Zone: 50 Easting: 390287777mE; Northing: 64285787mN; Zone: 50 Easting: 3902877777mE; Northing: 64285787mN; Zone: 50 Easting: 39002877777mE; Northing: 64285787mN; Zone: 50 Easting: 3900277777777777777777777777777777777777	Disclaimer Copyright in the information contained herein is and shall remain the property of the Government of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Places and Objects (often known as the 'Sites Register') established and maintained under the Aboriginal Haritage Act 1972 (AHA). Aboriginal sites exist that are not recorded on the Sites Register, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.
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Site ID Status Acc Res Site Name Resolution II 05	. ?? .
	NO SITES FOUND WITHIN SPECIFIED AREA

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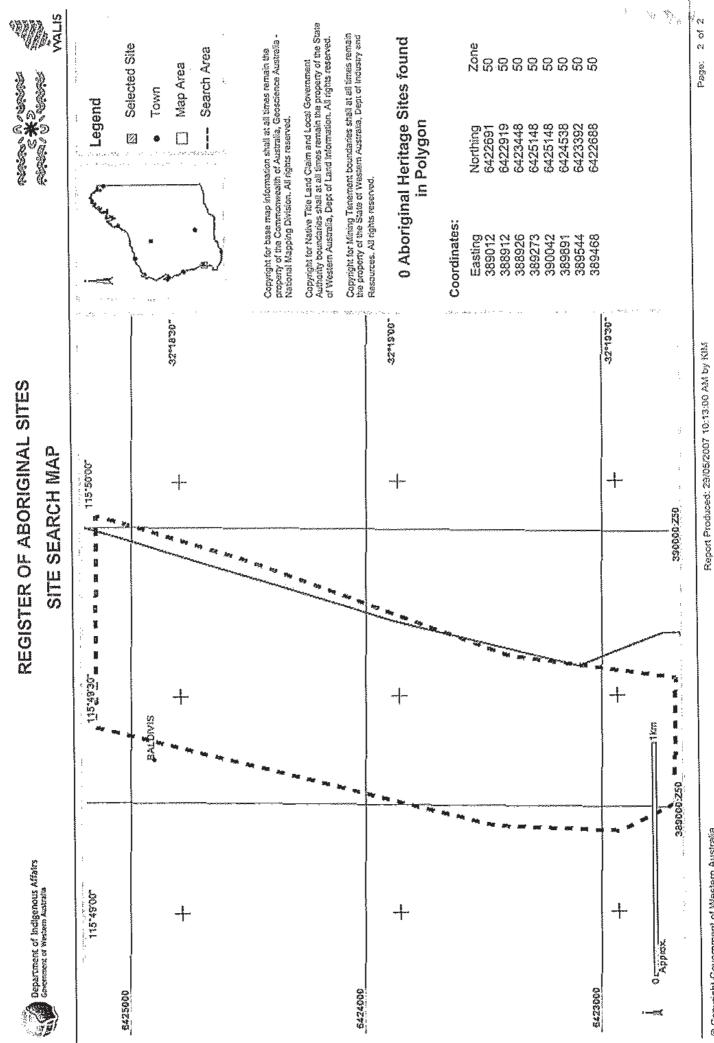
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REGISTER OF ABORIGINAL SITES

RPGSR November Reference No: AUD-361148 Reference No: AUD-361148

Search Criteria Easting: 389012mE; Northing: 6422691mN; Zone: 50 Easting: 388912mE; Northing: 6422919mN; Zone: 50 Easting: 389325mE; Northing: 6423446mN; Zone: 50 Easting: 399012mE; Northing: 6425148mN; Zone: 50 Easting: 399042mE; Northing: 6425148mN; Zone: 50 Easting: 399042mE; Northing: 6424538mN; Zone: 50 Easting: 389991mE; Northing: 64243320N; Zone: 50 Easting: 389991mE; Northing: 642343287mN; Zone: 50	Dísclaimer Copyright in the information contained herein is and shalk remain the property of the Government of Western Australia. All rights reserved. This Copyright in the information contained herein is and shalk remain the property of the Government of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Places and Objects (often known as the 'Sites Register') established and maintained under the Aboriginal Heritage Act 1972 (AHA). Aboriginal sites exist that are not recorded on the Sites Register, and some registered sites may no longer exist. Consultation with Aboriginal Aboriginal sites exist that are not recorded on the Sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.
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Site ID Status Acc Res Site Name Resolution IV 05 39	5 39 Site Type Additional Informants Recorders Easting Field Code Site No.

NO SITES FOUND WITHIN SPECIFIED AREA



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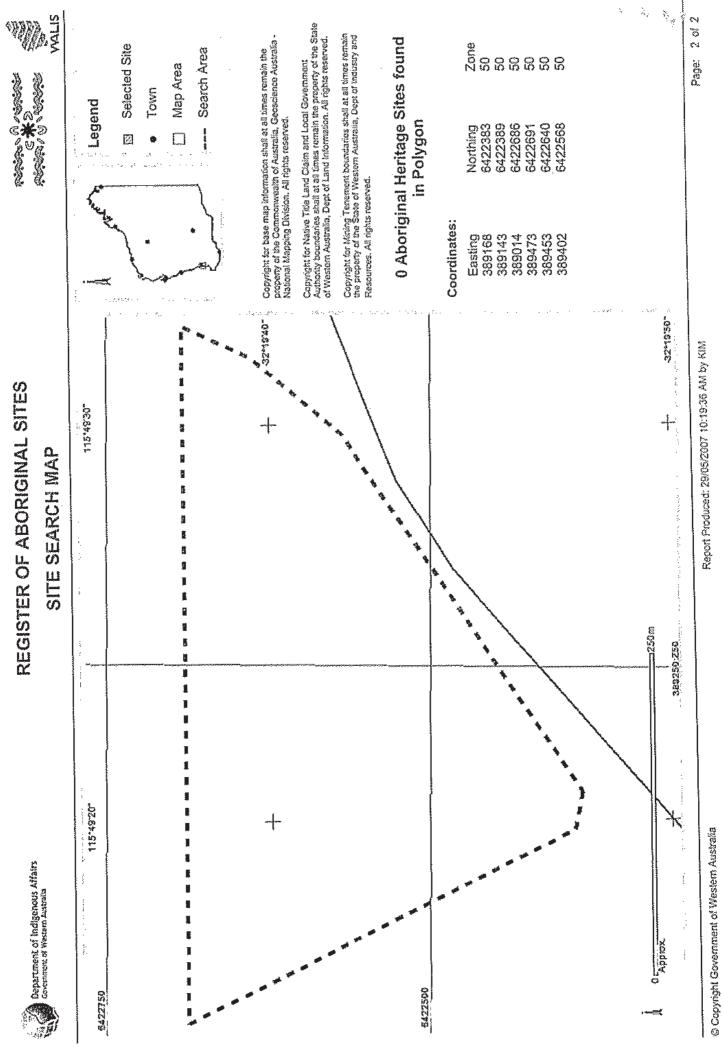


REGISTER OF ABORIGINAL SITES

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Easting: 389168mE; Northing: 6422383mN; Zone: 50 Easting: 389143mE; Northing: 6422383mN; Zone: 50 Easting: 389014mE; Northing: 6422685mN; Zone: 50 Easting: 389473mE; Northing: 6422695mN; Zone: 50 Easting: 389402mE; Northing: 6422668mN; Zone: 50	ia Northing: 64223 Northing: 64223 Northing: 64223 Northing: 64223 Northing: 64228 Northing: 64228	83.mM; Zone: 50 889mM; Zone: 50 386mM; Zone: 50 991mM; Zone: 50 940MN; Zone: 50 88mM; Zone: 50	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	Disclaimer Copyright in the information contained herein is and shall remain the property of the Government of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Placos and Objects (often known as the 'Skes Register') established and maintained under the Aboriginal Hentage Act 1972 (AHA). Aboriginal sites exist that are not recorded on the Sites Register, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.
Legend Status	Access ("Acc")	Access ("Acc") Restriction ("Res")	ANN N	Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (LaVLong) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000.250' means Easting-5000000, Zone=50.
1 Interim P Permanent S Stored Data	C Closed O Open V Vulnerabie	N No Restriction M Male Only F Female Only	li Insufficient Info NA Not a Site	Reliable ("R") - The spatial information recorded in the site file is deemed to be reliable, due to methods of capture. Unreliable ("U") - The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

NO SITES FOUND WITHIN SPECIFIED AREA



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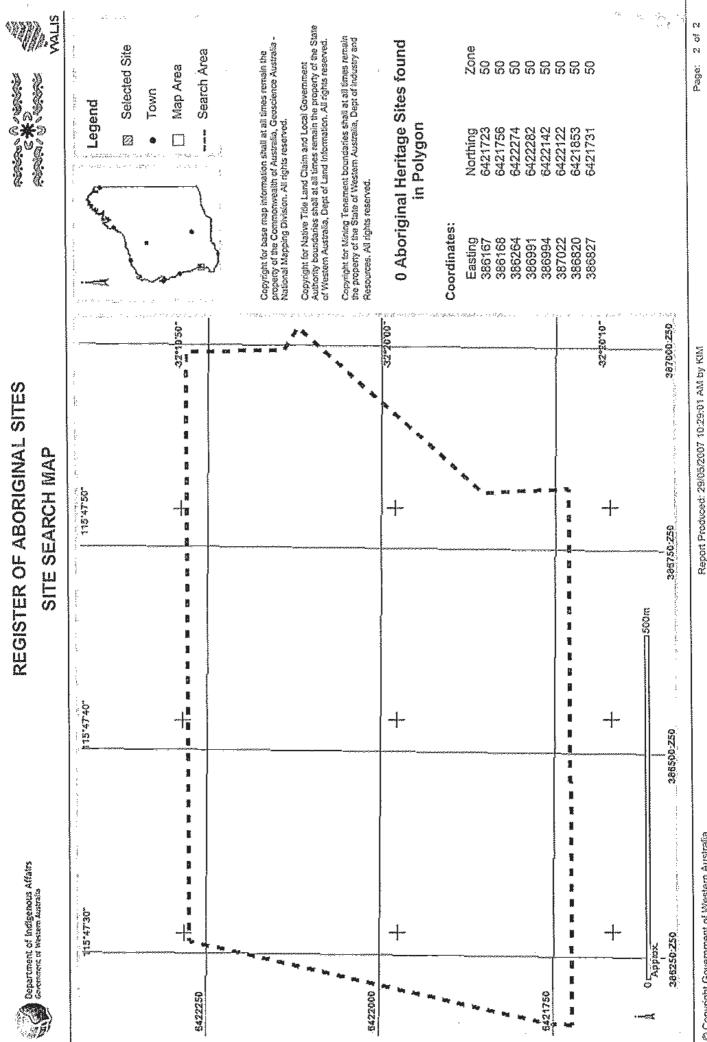
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REGISTER OF ABORIGINAL SITES

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21723mN, Zone: 50 21723mN, Zone: 50 22224mN, Zone: 50 222142mN, Zone: 50 22142mN, Zone: 50 22142mN, Zone: 50 22142mN, Zone: 50 22142mN, Zone: 50 221731mN, Zone: 50 22177777777777777777777777777777777777	Screenwork of Western Australia	
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Site Name Resolution IV 05 39 Site Type Additional Informants Recorders Northing	C Closed N No Restriction C Closed N No Restriction O Open M Male Only V M. Manerha F Female Only	
Site Name Resolution 11 05 39 Site Type Information Informants Recorders Northing	A Adistraction	Easting
	Site ID Status Acc. Res. Site Name Resolution VA	Site Type Auditional Informants Recorders Northing

NO SITES FOUND WITHIN SPECIFIED AREA



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Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about <u>Environment Assessments</u> and the EPBC Act including significance guidelines, forms and application process details.

Report created: 17/05/13 16:47:19

Summary Details Matters of NES Other Matters Protected by the EPBC Act Extra Information Caveat Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the <u>Administrative Guidelines on Significance</u>.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	17
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As <u>heritage values</u> of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate.

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A <u>permit</u> may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	8
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

Place on the RNE:	3
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	36
Nationally Important Wetlands:	None
<u>Key Ecological Features (Marine)</u>	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (RAMSAR)	[Resource Information]
Name	Proximity
Becher point wetlands	Within 10km of Ramsar

Listed Threatened Ecological Communities		[Resource Information]	
For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.			
Name	Status	Type of Presence	
<u>Sedgelands in Holocene dune swales of the</u> southern Swan Coastal Plain	Endangered	Community known to occur within area	
Listed Threatened Species		[Resource Information]	
Name	Status	Type of Presence	
Birds			
Calyptorhynchus banksii naso			
Forest Red-tailed Black-Cockatoo [67034]	Vulnerable	Species or species habitat may occur within area	
Calyptorhynchus baudinii			
Baudin's Black-Cockatoo, Long-billed Black- Cockatoo [769]	Vulnerable	Species or species habitat likely to occur within area	
Calyptorhynchus latirostris			
Carnaby's Black-Cockatoo, Short-billed Black- Cockatoo [59523] Leipoa ocellata	Endangered	Breeding likely to occur within area	
Malleefowl [934]	Vulnerable	Species or species	
	Valiorabio	habitat may occur within area	
Rostratula australis	Vulnerable	Spacios or operios	
Australian Painted Snipe [77037]	vunerable	Species or species habitat may occur within area	
Sternula nereis nereis			
Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	
Insects			
Synemon gratiosa			
Graceful Sun Moth [66757]	Endangered	Species or species habitat may occur within area	

Name	Status	Type of Presence
Mammals		
Bettongia penicillata ogilbyi		
Woylie [66844]	Endangered	Species or species habitat may occur within area
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Pseudocheirus occidentalis Western Ringtail Possum [25911]	Vulnerable	Species or species habitat likely to occur within area
<u>Setonix brachyurus</u> Quokka [229]	Vulnerable	Species or species habitat may occur within area
Plants		
Caladenia huegelii King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
<u>Centrolepis caespitosa</u> [6393]	Endangered	Species or species habitat likely to occur within area
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
Drakaea elastica Glossy-leafed Hammer-orchid, Praying Virgin [16753]	Endangered	Species or species habitat likely to occur within area
<u>Drakaea micrantha</u> Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area
Listed Migratory Species		[Resource Information]
 Species is listed under a different scientific name on t Name 	Threatened	Type of Presence
Migratory Marine Birds	Threatened	Type of Tresence
<u>Apus pacificus</u>		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
<u>Sterna dougallii</u> Roseate Tern [817]		Foraging, feeding or related behaviour likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur

Name	Threatened	Type of Presence
		within area
<u>Ardea ibis</u>		
Cattle Egret [59542]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on		
Name	Threatened	Type of Presence
Birds		
<u>Apus pacificus</u>		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Great Egret, White Egret [59541]		Species or species
Ardea ibis		habitat known to occur within area
Cattle Egret [59542]		Spacios or spacios
		Species or species habitat likely to occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Merops ornatus		.
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Osprey [952]		Species or species habitat likely to occur within area
<u>Rostratula benghalensis (sensu lato)</u>		
Painted Snipe [889] Sterna dougallii	Vulnerable*	Species or species habitat may occur within area
Roseate Tern [817]		Forgaing fooding or
		Foraging, feeding or related behaviour likely to occur within area

Extra Information

Places on the RNE		[Resource Information]
Note that not all Indigenous sites may be listed.		
Name	State	Status
Natural		
Baldivis Swamp	WA	Indicative Place
Tamworth Hill Swamp	WA	Indicative Place
Lakes Cooloongup and Walyungup and Surrounds	WA	Registered
Invasive Species		[Resource Information]
Weeds reported here are the 20 species of national signal plants that are considered by the States and Territories biodiversity. The following feral animals are reported: 0 and Cane Toad. Maps from Landscape Health Project 2001.	s to pose a particularly sig Goat, Red Fox, Cat, Rabbi , National Land and Water	with other introduced nificant threat to t, Pig, Water Buffalo Resouces Audit,
Name	Status	Type of Presence
Birds Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species
Anas platyrhynchos		habitat likely to occur within area
Mallard [974]		Species or species
		habitat likely to occur within area
Carduelis carduelis		0
European Goldfinch [403]		Species or species habitat likely to occur within area
<u>Columba livia</u> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species
		habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species
		habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species
		habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Spacios ar spacios
		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species
Sturnus vulgaris		habitat likely to occur within area
Common Starling [389]		Species or species
Turdus merula		habitat likely to occur within area
Common Blackbird, Eurasian Blackbird [596]		Species or species
		habitat likely to occur within area
Mammals Bos taurus		
Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species
		habitat likely to occur within area

within area

Name <u>Felis catus</u> Cat, House Cat, Domestic Cat [19]

Funambulus pennantii

Northern Palm Squirrel, Five-striped Palm Squirrel [129]

Mus musculus House Mouse [120]

<u>Oryctolagus cuniculus</u> Rabbit, European Rabbit [128]

Rattus norvegicus Brown Rat, Norway Rat [83]

Rattus rattus Black Rat, Ship Rat [84]

Vulpes vulpes Red Fox, Fox [18]

Plants

Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]

Brachiaria mutica Para Grass [5879]

<u>Cenchrus ciliaris</u> Buffel-grass, Black Buffel-grass [20213]

<u>Chrysanthemoides monilifera</u> Bitou Bush, Boneseed [18983]

Chrysanthemoides monilifera subsp. monilifera

Boneseed [16905]

Genista linifolia

Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]

<u>Genista sp. X Genista monspessulana</u> Broom [67538]

Lantana camara

Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Lycium ferocissimum African Boxthorn, Boxthorn [19235]

<u>Olea europaea</u> Olive, Common Olive [9160]

Opuntia spp. Prickly Pears [82753]

Status

Type of Presence

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

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Species or species habitat likely to occur within area

Species or species habitat likely to occur within area

Species or species habitat may occur within area

Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Pinus radiata		
Radiata Pine Monterey Pine, Insignis Pine, Wildir Pine [20780]	ng	Species or species habitat may occur within area
Rubus fruticosus aggregate		
Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron	<u>& S.x reichardtii</u>	
Willows except Weeping Willow, Pussy Willow an Sterile Pussy Willow [68497]	nd	Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla		
Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk Athel Tamarix, Desert Tamarisk, Flowering	3	Species or species habitat likely to occur

Cypress, Salt Cedar [16018] Reptiles

Asian House Gecko [1708]

Hemidactylus frenatus

Species or species habitat likely to occur within area

within area

Coordinates

-32.33063 115.79147

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Department of Environment, Climate Change and Water, New South Wales -Department of Sustainability and Environment, Victoria -Department of Primary Industries, Parks, Water and Environment, Tasmania -Department of Environment and Natural Resources, South Australia -Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts -Environmental and Resource Management, Queensland -Department of Environment and Conservation, Western Australia -Department of the Environment, Climate Change, Energy and Water -Birds Australia -Australian Bird and Bat Banding Scheme -Australian National Wildlife Collection -Natural history museums of Australia -Museum Victoria -Australian Museum -SA Museum -Queensland Museum -Online Zoological Collections of Australian Museums -Queensland Herbarium -National Herbarium of NSW -Royal Botanic Gardens and National Herbarium of Victoria -Tasmanian Herbarium -State Herbarium of South Australia -Northern Territory Herbarium -Western Australian Herbarium -Australian National Herbarium, Atherton and Canberra -University of New England -Ocean Biogeographic Information System -Australian Government, Department of Defence -State Forests of NSW -Geoscience Australia -CSIRO

-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

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Black Cockatoo Significant Tree Survey – Lot 601, Baldivis

Prepared for: Australand Property Group

January 2013

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Document Reference	Revision	Prepared by	Reviewed by	Submitted to Client	
				Copies	Date
EBS201AB	A INTERNAL DRAFT	JR/AH	FD	-	19/12/12
EBS201AB	B CLIENT REPORT	АН	Client	1 Electronic (email)	7/01/12

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Executive Summary

360 Environmental Pty Ltd (360 Environmental) was commissioned by Australand Property Group to undertake a Significant Tree Survey at a 12.8 hectare (ha) section of Lot 601 along Mandurah Road, Baldivis (the Site) (Figure 1 and Figure 2 in Appendix A). The survey involved a Black Cockatoo Significant Tree Survey and opportunistic records of Black Cockatoo Foraging Habitat, Breeding Habitat and observations within the Site. The Site is predominantly cleared with some remnant trees remaining, including Tuart (*Eucalyptus gomphocephala*), Jarrah (*Eucalyptus marginata*), Marri (*Corymbia calophylla*), Sheoak (*Allocasuarina fraseriana*) and Banksia (*Banksia attenuata*) present throughout.

A search of the Environment Protection and Biodiversity Conservation (EPBC) database and EPBC Act referral guidelines for the three threatened Black Cockatoo species revealed that the Endangered Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) and the Vulnerable Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii*) are likely to occur within the area.

The Black Cockatoo Significant Tree Survey undertaken as part of this scope of work revealed that the Site contains mature trees. Most trees within the Site have reached a size that the Department of Environment, Water, Population and Communities (SEWPaC) would consider potential breeding habitat. In total, 157 Tuart, 40 Jarrah and nine Marri trees were recorded within the Site which met SEWPaC's criteria of >500 millimetres (mm) trunk Diameter Breast Height (DBH) (Figure 3). These trees are considered potential breeding trees for Black Cockatoo species as they may contain hollows or have the potential to form hollows suitable for Black Cockatoo in the future. The presence of larger Tuart trees within the Site suggests that there is the potential for the Site to be of breeding significance to Black Cockatoo species in the future with several trees containing hollows greater than 12 centimetres (cm) in diameter (Figure 3). The proposed Development Concept for the Site is displayed in relation to the significant tree data in Figure 4. This indicates that 50 Tuart, 16 Jarrah and 3 Marri trees of a size that SEWPaC would consider potential breeding habitat may be removed from the Site. Therefore a commonwealth referral will be required to be submitted to SEWPaC for the Site before any development can occur.

In addition to the Black Cockatoo Significant Tree Survey an opportunistic Breeding and Foraging Assessment was also undertaken. This assessment found no evidence of Black Cockatoo breeding within the Site, however several hollows were observed that may be suitable for Black Cockatoo (Figure 3). The site contained suitable feeding species (Marri and Banksia) for Black Cockatoo. During the survey, two locations showed evidence of Forest Red-tailed Black Cockatoo feeding on Marri seeds, there were no locations found which showed evidence of Carnaby's Black Cockatoo feeding. In additional two Forest Red-tailed Black Cockatoo observations were made during the reconnaissance survey. This included a single male observed feeding within a large Marri



tree and a pair of birds observed flying between trees in the centre of the Site (Figure 5). These observations suggest that although not extensively utilised, Forest Red-tailed Black Cockatoo do at least utilise the Site for foraging and with the presence of several hollows may also use the Site for breeding.

As a result of the scope of work undertaken, the following is recommended:

- Due to the size and age of the significant trees within the Site it is recommended that these be retained were practicable. Particularly the large Tuart trees that already contain large hollows. Hollows develop and enlarge over time, therefore any significant tree on Site has the potential to develop hollows in the future; and
- Under the EPBC Act and in accordance with the SEWPaC 'EPBC Act referral guidelines for three threatened Black Cockatoo species' a referral submission should be made as there is a high risk the development will result in a significant impact to Black Cockatoo species.

As part of the referral it is recommended:

- A detailed breeding and foraging assessment be undertaken by a Black Cockatoo specialist to further assess the hollows and foraging evidence within the Site in detail to determine the Sites value to Black Cockatoo species; and
- The presence of feral bees at the Site indicates that it is likely that some of the recorded hollows have been rendered unusable by native fauna species. It is recommended that feral bees be controlled within any areas that are likely to be put aside as an environmental offset. This should be done with the aim of maintaining the offset potential of the area for avian fauna breeding habitat.



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1 Introduction

1.1 Background

Three species of Black Cockatoo occur in the south-west of Western Australia. All three species are protected under the following State and Commonwealth legislation:

- The Wildlife Conservation Act 1950 (WC Act), Western Australia; and
- The Environment Protection and Biodiversity Conservation Act1999 (EPBC Act), Commonwealth.

The Carnaby's Black Cockatoo (*Calyptorhynchus latirostris*) is listed as Endangered under the EPBC Act. The Red-tailed Black Cockatoo (*Calyptorhynchus banksii*) and Baudin's Black Cockatoo (*Calyptorhynchus baudinii*) are classified as Vulnerable. Both Carnaby's Black Cockatoo and Baudin's Black Cockatoo are listed as Endangered under the WC Act and the Forest Red-tailed Black Cockatoo is listed as Vulnerable.

360 Environmental Pty Ltd was commissioned to undertake a Black Cockatoo Significant Tree Survey within Lot 601 on Mandurah Road, Baldivis (the Site) (Figure 1 and Figure 2 in Appendix A). The survey involved a Significant Tree Survey and opportunistic observations of Black Cockatoo, breeding evidence, roosting evidence or foraging evidence within the Site.

The Site is approximately 12.8 hectares and is predominately cleared, with large scattered trees throughout the area which were the focus of the study. The Site is located between Mandurah Road and Pike Road in Baldivis (Figure 2 in Appendix A).

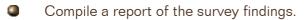
1.2 Objective

The objective of the Black Cockatoo Significant Tree Survey was to determine the existence of trees suitable for use as breeding habitat for threatened Black Cockatoo species.

1.3 Scope of the Study

In order to meet the objective, the following scope of work was undertaken:

 Carry out a site assessment of the designated area to verify if Black Cockatoo breeding habitat exists within the site boundaries; and



A Significant Tree Survey was undertaken to meet the scope of work above, this included:





- On site Black Cockatoo Significant Tree Assessment (raw measurement data provided by McMullen Nolan Group);
- Opportunistic on site Black Cockatoo Breeding Assessment;
- Opportunistic on site Black Cockatoo Foraging Assessment; and
- On site Black Cockatoo Opportunistic Observations.



2 Site Description

2.1 Site Location

The Site is bounded by Mandurah Road to the west, residential housing to the north, agricultural land to the east and remnant bushland to the south. Ultimately the Site is proposed to be developed for residential housing and is predominantly cleared, with some remnant bushland making up less than 50% of the area. It is understood that Australand is currently in the process of lifting the urban deferment zoning of the Site.

2.2 Broad Habitat Assessment

The site is located within the 'Swan Coastal Plain' Heddle Vegetation Complex (DEC 2009a; DEP 2000). It is composed of Woodland and open forest and closed heath.

The vegetation habitat of the Site can generally be described as Tuart Woodland (*Eucalyptus gomphocephala*), including Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) throughout with a mid-storey of Banksia (*Banksia attenuata*) and Sheoak (*Allocasuarina fraseriana*) and an understorey of annual weed species (Appendix B, Plate 1).



3 Methods

3.1 Background Research

The background research is designed to gather existing data on known locations of breeding and feeding for Black Cockatoo. The background research and desktop study included review of the following:

DEC's and SEWPaC's websites on Black Cockatoos;

SEWPaC's EPBC Act referral guidelines; and

Reports of previous studies undertaken in the area.

3.2 Black Cockatoo Significant Tree Survey Methodology

3.2.1 Survey Personnel

A tree survey was conducted on 2 August 2012 by McMullen Nolan Group. Measurements for each tree within the eastern two thirds of the Lot were taken during the survey. 360 Environmental collected tree measurements across the western portion of the site and confirmed tree species identifications across the entire area on the 13 December 2012.

3.2.2 Site Survey

The Black Cockatoo Significant Tree Survey was undertaken to determine trees within the Site that were of a certain size, as outlined by SEWPaC, that have the potential in the future to develop hollows suitable for Black Cockatoo breeding. The survey comprised of recording the location, species, tree trunk diameter at breast height (DBH) and any other important descriptive information about each tree located within the Site boundary.

Approximately 40 m wide walking transects were designed across the Site. Every tree within a survey transect was assessed based on the Black Cockatoo significant tree criteria (below). Each transect ran parallel or perpendicular to another transect to ensure all trees within the Site were included within a transect line. Tree details were individually recorded electronically using a Differential Global Positioning System (DGPS).

3.2.3 Black Cockatoo Significant Tree Criteria

Trees exceeding 500 mm trunk DBH (~1.5 m above ground level) were considered significant for Black Cockatoo species for the purposes of this survey based on criteria used by SEWPaC to define Black Cockatoo 'breeding habitat'.



3.2.3.1 Tree Location (using DGPS)

Each significant tree was individually recorded using a DGPS to obtain Perth Coastal Grid (PCG 94) coordinates. These coordinates were then converted to Universal Transverse Mercator (UTM) GDA 94 Zone 50.

3.2.3.2 Tree Species

Each significant tree was individually recorded according to its species, as either:

- Tuart (Eucalyptus gomphocephala);
- Jarrah (Eucalyptus marginata);
- Marri (Corymbia calophylla);
- Sheoak (Allocasuarina fraseriana);
- Banksia (Banksia attenuata); or
- Stag (standing dead tree).

The trees outlined above have the potential to provide foraging material or breeding hollows. The species with the potential to develop hollows were then mapped to visually represent the tree species with the potential to be of breeding significance to Black Cockatoos.

3.2.3.3 Trunk Diameter at Breast Height

Each significant tree was individually recorded and mapped according to its trunk DBH, as either:

- Medium: 500 mm to 800 mm;
- Large: 800 mm to 1,200 mm; and
- Very Large: 1,200 mm+.

3.3 Opportunistic Black Cockatoo Breeding and Foraging Assessment Methodology

3.3.1 Survey Personnel

The opportunistic survey was undertaken by Senior Environmental Scientist Andrew Hide on 13 December 2012. Andrew is the Team Leader of the Environmental and Biological Services Team at 360 Environmental. His degree in Natural Resource Management (Honours) is complemented with extensive field experience with threatened fauna monitoring and conservation, along with fauna habitat assessments throughout Western Australia. He has been involved in detailed studies of many of Australia's endangered and threatened species and has led group expeditions in the South-west, Pilbara, Gascoyne, Midwest, Wheatbelt and Perth metropolitan area.

3.3.2 Black Cockatoo Breeding Site Assessment

This assessment involved opportunistic observation of suitably sized trees with the potential for hollows to be present. If hollows were present each was assessed with the



use of binoculars to determine its suitability for use by Black Cockatoo species as a breeding hollow. Any suitable hollows that were located were assessed to determine if they were being utilised by Black Cockatoo species as a breeding hollow. The assessment method takes into consideration the size and shape of the hollow, chew marks around the entrance, feathers nearby or any other signs that indicate that Black Cockatoo may potentially utilise the hollow.

3.3.3 Black Cockatoo Foraging Site Assessment

Andrew Hide undertook a half day site visit to conduct an opportunistic observational site survey and feeding assessment across the survey area to determine the extent of foraging habitat for Black Cockatoos at the same time as the opportunistic breeding assessment was undertaken. The observational and foraging assessment included:

- General habitat suitability of the Site;
 - Analysis of dentition marks in seed and nut material;
- Opportunistic observations of Black Cockatoos within the Site; and
- Casual opportunistic observations of potential breeding habitat.

Feeding trees and opportunistic observations were recorded and located using a hand held DGPS unit (Appendix C).



4 Results

The following summarises the results of the Significant Tree Survey and opportunistic evidence of Black Cockatoo including breeding and foraging evidence.

4.1 Background Research Results

A search of the EPBC database revealed that the Vulnerable Forest Red-tailed Black Cockatoo and the Endangered Carnaby's Black Cockatoo are likely to occur within the area. There is a possibility that Baudin's Black Cockatoo may also occur occasionally within the Site. Only three species of Black Cockatoo occur within the South-west of Western Australia. Each is described below in detail.

4.1.1 Carnaby's Black Cockatoo

Carnaby's Black Cockatoo is a large, Black Cockatoo with a white patch on its cheek, white bands on its tail, and a strong curved bill. Carnaby's Black Cockatoo is also known as the Short-billed Cockatoo. In males, the bill is black and the eye-ring dark-pink. Females have a light grey bill, grey eye-ring, and the cheek patch is less distinctive.

Carnaby's Black Cockatoo is endemic to the South-west of Western Australia, extending from the Murchison River to Esperance, and inland to Coorow, Kellerberrin and Lake Cronin (DEC 2009b). There is evidence the species is currently expanding its breeding range westward and south into the Jarrah-Marri forests of the Darling Range and into the Tuart forests of the Swan Coastal Plain (Johnstone and Kirkby 2006).

Carnaby's Black Cockatoos are believed to breed mostly in the wheatbelt region of Western Australia (DEC 2009b). After breeding, Carnaby's Cockatoo disperse to the higher rainfall coastal areas of the South-west of Western Australia to feed in late December to July (DEC 2009b).

Carnaby's Black Cockatoo display strong pair bonds. They occur in uncleared or remnant areas of Eucalypt woodland, principally Salmon gum (*Eucalyptus salmonophloia*) or Wandoo (*E. wandoo*), and shrubland or kwongan heath dominated by Hakea and Banksia species. Carnaby's Black Cockatoo nest in the hollows of live or dead smooth-barked Eucalypts (Salmon Gum and Wandoo) but also in Red Morrell (*E. longicornis*), York Gum (*E. loxophleba*), Marri and Tuart (Johnstone and Storr, 1998).

On the Swan Coastal Plain, the birds feed on a large variety of plants including the Proteaceae (Banksia and Grevillea), Marri nuts and introduced species – notably Pines (DEC 2009b).

Carnaby's Black Cockatoo has undergone a dramatic decline in recent years, declining by 50 percent in the past 45 years, one of the main contributing factors being land clearing (DEC 2009b). The long-term survival and recovery of this species is linked to the survival of its habitat – both in breeding areas in the Wheatbelt and non-breeding areas



such as the Swan Coastal Plain (DEC 2009b). In addition, clearing of heathland near breeding sites has reduced the availability of food for breeding pairs and their young (DEC 2009b).

4.1.2 Forest Red-tailed Black Cockatoo

The Forest Red-tailed Black Cockatoo is 55–60 cm in length and weighs between 570 - 870 g (Higgins 1999). Males can be distinguished by broad red tail panels that are only visible when taking off or alighting (Higgins 1999). Females on the other hand can be distinguished by yellow or whitish spots on the feathers of the head and upper wing coverts. Their tail feathers are bright red and orange, grading to yellow on the inner margins, and have variable black horizontal barring.

This species is endemic to the South-west humid and semi-humid zones of Western Australia. It inhabits dense Jarrah, Karri and Marri forests which receive more than 600 mm average annual rainfall (SEWPaC 2012). Although most records are in Jarrah-Marri forests, the Forest Red-tailed Black Cockatoo has been observed in a range of other forest and woodland types, including Blackbutt (*E. patens*), Wandoo (*E. wandoo*), Tuart (*E. gomphocephala*), Albany Blackbutt, Yate (*E. cornuta*), and Flooded Gum (*E. rudis*) (Abbott 1998a,b).

Forest Red-tailed Black Cockatoos feed predominantly on the seeds of Jarrah and Marri fruits. The other species used for feeding include Blackbutt, Albany Blackbutt (*E. staeri*), Forest Sheoak, Snottygobble and the non-indigenous native Spotted Gum (*E. maculata*) and Cape Lilac (Johnstone and Kirkby 1999).

The Forest Red-tailed Black Cockatoo has declined in range by 25–30% as a result of clearing of the margins of the forests for agriculture in the early 1900s (Mawson and Johnstone 1997) and is projected to further decline by 30% or more between 2005 and 2015 (Chapman 2005).

Key threats to the Forest Red-tailed Black Cockatoo are habitat loss, nest hollow shortage and competition for available nest hollows from other species, and injury or death from the European Honeybee (*Apis mellifera*), illegal shooting (Chapman 2005) and fire (CALM 2006).

4.1.3 Baudin's Black Cockatoo

Baudin's Black Cockatoo is a large black cockatoo which measures 50–57 cm in length, with a wingspan of approximately 110 cm, and a mass of 560–770 g. It is mostly dull black in colour, with pale whitish margins on the feathers, large, rounded patches on the ear coverts, and rectangular white panels in the tail. It has a large bill that is coloured black in the male and whitish-grey with a black tip in the female. It also features a dark brown iris that is surrounded by a reddish-pink eye-ring in the male and a grey eye-ring in the female (Higgins 1999; Johnstone and Storr 1998)



This species is only found in the extreme South-west of Western Australia. It occurs in areas of high rainfall and usually in heavily forested locations dominated by Marri, Karri or Jarrah. However, it also occurs in woodlands of Wandoo (*E. wandoo*), Blackbutt (*E. patens*), Flooded Gum (*E. rudis*), Yate (*E. cornuta*) and in orchards, and is occasionally recorded in farmland and grasslands (Johnstone and Kirkby 2008).

The diet of Baudin's Black Cockatoo consists mostly of Eucalyptus seeds (e.g. Marri and Jarrah) and occasionally insect larvae and the seeds of other plants such as *Banksia*, *Dryandra*, *Erodium*, *Hakea*, *Malus sylvestris* (apple) and *Pyrus communis* (pear), and occasionally with nectar from Marri or other plants (Higgins 1999).

Baudin's Black-Cockatoo is gregarious. It is usually seen in groups of three (comprising the adult pair and a single dependent young) or in small parties, but will occasionally gather in large flocks of up to 300 birds during the non-breeding season, usually at sites where food is abundant (Higgins 1999). During the breeding season, adults nest in solitary pairs.

4.2 Black Cockatoo Significant Tree Assessment

A summary of the results of the Black Cockatoo Significant Tree Assessment undertaken for the Site are presented in Table 2 and displayed in Figure 3 (Appendix A). The raw survey data for the survey is located in Appendix C.

The Black Cockatoo Significant Tree Assessment found that the dominant tree species was Tuart.

Other species were also common throughout the Site, including:

- Jarrah;
- Marri;
- Banksia attenuata;
- Sheoak; and
- Stag (standing dead tree).

According to the SEWPaC Black Cockatoo EPBC Act referral guidelines, only Tuart, Jarrah, Marri and Stags within the Site can be considered as significant potential breeding trees as they provide breeding habitat for all three Black Cockatoo Species, in contrast to Banksia and Sheoak which only provide feeding habitat and do not form hollows suitable for Black Cockatoo (SEWPaC 2012).

In total, 157 Tuart, 40 Jarrah, 9 Marri and 18 stag trees were recorded on the Site with a trunk DBH greater than 500 mm, which meet the SEWPaC guidelines as large significant trees with the potential to provide breeding habitat for Black Cockatoo species.



TRUNK SIZE (DBH)	TUART	JARRAH	Marri	STAG
Medium: 500mm – 800mm	34	10	2	6
Large: 800mm – 1200mm	60	18	6	9
Extra Large: >1200mm	63	12	1	3
Total	157	40	9	18

Table 1: Black Cockatoo Significant Tree Survey Results

The proposed development at the Site is likely to impact a large number of significant trees within the Site. The areas likely to be impacted have been outlined in Figure 4. This predicts that the development may potentially impact 50 Tuart, 16 Jarrah and 3 Marri trees with a DBH greater than 500 mm. Therefore a commonwealth referral will be required to be submitted to SEWPaC for the Site before any development can occur.

During the opportunistic observations of breeding and foraging evidence, trees were assessed by 360 Environmental to determine if they contained hollows and if they have the potential to be utilised by Black Cockatoo species for breeding. A total of 15 trees with hollows were recorded opportunistically within the Site. Several trees contained three or more hollows, therefore increasing the breeding potential of the Site. Feral bees were observed to have hives in some hollows within the Site.

The hollows located within the Site were not investigated and assessed in detail at the time of the survey for the use by Black Cockatoo species. However several of the hollows were large and have potential to be utilised by Black Cockatoo species (Plate 2). It is recommended that this assessment be undertaken, along with a detailed breeding assessment, to confirm if any tree species are currently being utilised within the Site by Black Cockatoo or have a significant potential of being utilised by Black Cockatoo species for breeding in the near future.

4.3 Opportunistic Black Cockatoo Breeding Assessment

No trees were observed within the Site to contain hollows that were utilised for breeding by Black Cockatoo species at the time of the survey on the 13 December 2012. A detailed breeding assessment would need to be undertaken to determine any breeding hollows located within the Site.

4.4 Opportunistic Black Cockatoo Foraging Assessment

The entire Site was mainly composed of Tuart woodland including Jarrah and Marri with a mid-storey of Banksia. Both Marri and Banksia are regularly utilised by Black Cockatoo species as a foraging resource.



No evidence of Carnaby's Black Cockatoo feeding was observed during the survey. *Banksia attenuata* was present within the Site but only in small isolated areas.

A significant amount of feeding on Marri seeds by Forest red-tailed Black Cockatoo was observed within the Site underneath two large Marri trees. A single male Forest Redtailed Black Cockatoo was observed feeding within one of these large Marri trees on Marri seeds. The feeding evidence observed was very fresh and obviously recently fed on by the observed bird (Plate 3). In addition, there was a significant amount of older Forest Red-tailed Black Cockatoo feeding evidence observed underneath the same tree (Plate 4). Another large Marri tree was observed with a significant amount of past foraging evidence surrounding the tree.

Table 2 provides a summary of all feeding evidence observed at the Site during the foraging assessment. Appendix B illustrates Forest Red-tailed Black Cockatoo feeding evidence on the seeds of Marri (Plate 3 and 4). Both photographs were taken by Andrew Hide.

EVIDENCE	EASTING	NORTHING
Forest red-tailed Black Cockatoo observed feeding on Marri seeds	386402	6422206
Recent and older evidence of feeding on seeds from Marri by Forest red-tailed Black Cockatoo	386405	6422218
Old evidence of feeding on seeds from Marri by Forest red- tailed Black Cockatoo	386431	6422257

Table 2: Evidence of Foraging Activity (Carnaby's Black Cockatoo)

4.5 Black Cockatoo Opportunistic Observations

Two opportunistic observations of Forest Red-tailed Black Cockatoo were made during the reconnaissance survey on the 13 December 2012. This included a single male observed feeding within a large Marri tree (E386402; N6422206) and a pair of birds observed flying between trees in the centre of the Site (E386320; N6422205) (Figure 5).



5 Conclusion and Recommendations

Across the survey area, 225 trees were recorded which met SEWPaC's criteria of >500 mm DBH and were of a species that have the potential to develop suitable hollows for the Black Cockatoo species (Figure 3). A total of 15 trees containing hollows with a diameter >12 cm were recorded within the Site. Several tree species were recorded on Site that were capable of supporting hollows, this included Tuart, Jarrah and Marri. Several of these hollows appeared to be large enough for Black Cockatoo species and may have the potential to be utilised by Black Cockatoo for breeding (Figure 3). Due to the large number of Significant Trees on the Site and the significant amount of trees with large hollows it is recommended that a commonwealth referral will be required before any development can take place at the Site. As part of this it is recommended a Black Cockatoo specialist assess the Site in detail to determine if any of the hollows located have the potential to be utilised or are currently being utilised by Black Cockatoo species for breeding. Regardless of the results of this assessment, given the large size of the trees present on Site they are defined by SEWPaC based on the Black Cockatoo referral guidelines, as Black Cockatoo 'breeding habitat' and therefore should be treated as such.

The occurrence of suitable feeding species primarily Marri but also sparse amounts of *Banksia attenuata* were observed during the field survey. Evidence of feeding debris was recorded within two Marri trees during the field survey. Also two observations of Forest Red-tailed Black Cockatoo were made during the survey suggesting that although not currently extensively utilised, Forest Red-tailed Black Cockatoo do at least occasionally use the Site for foraging and feeding. However, while there was opportunistic evidence of Forest Red-tailed Black Cockatoo feeding, there were no locations which showed evidence of Carnaby's Black Cockatoo or Baudin's Black Cockatoo feeding.

The results of the Black Cockatoo Significant Tree Survey suggest that the Site contains medium to good quality Black Cockatoo habitat due to the presence of some forging species but primarily due to the significant amount of large potential breeding trees, several of which contained large hollows. Based on the Development Concept for the Site it would appear a large number of significant trees may be removed as part of the development (Figure 4). Based on this information it is recommended a commonwealth referral, under the EPBC Act, will be required for the Site as part of the development process.

As a result of the scope of work undertaken, the following is recommended:

Due to the size and age of the significant trees within the Site it is recommended that these be retained were practicable. Particularly the large Tuart trees that already contain large hollows. Hollows develop and enlarge over time, therefore any significant tree on Site has the potential to develop hollows in the future; and



Under the EPBC Act and in accordance with the SEWPaC 'EPBC Act referral guidelines for three threatened Black Cockatoo species' a referral submission should be made as there is a high risk the development will result in a significant impact to Black Cockatoo species.

As part of the referral it is recommended:

- A detailed breeding and foraging assessment be undertaken by a Black Cockatoo specialist to further assess the hollows and foraging evidence within the Site in detail to determine the Sites value to Black Cockatoo species; and
- The presence of feral bees at the Site indicates that it is likely that some of the recorded hollows have been rendered unusable by native fauna species. It is recommended that feral bees be controlled within any areas that are likely to be put aside as an environmental offset. This should be done with the aim of maintaining the offset potential of the area for avian fauna breeding habitat.

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6 Limitations

This report is produced strictly in accordance with the scope of services set out in the contract or otherwise agreed in accordance with the contract. 360 Environmental makes no representations or warranties in relation to the nature and quality of biological results other than the visual observation and analytical data in this report.

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It is important to recognise that site conditions, including the extent and concentration of contaminants, can change with time. This is particularly relevant if this report, including the data, opinions, conclusions and recommendations it contains, are to be used a considerable time after it was prepared. In these circumstances, further investigation of the Site may be necessary.

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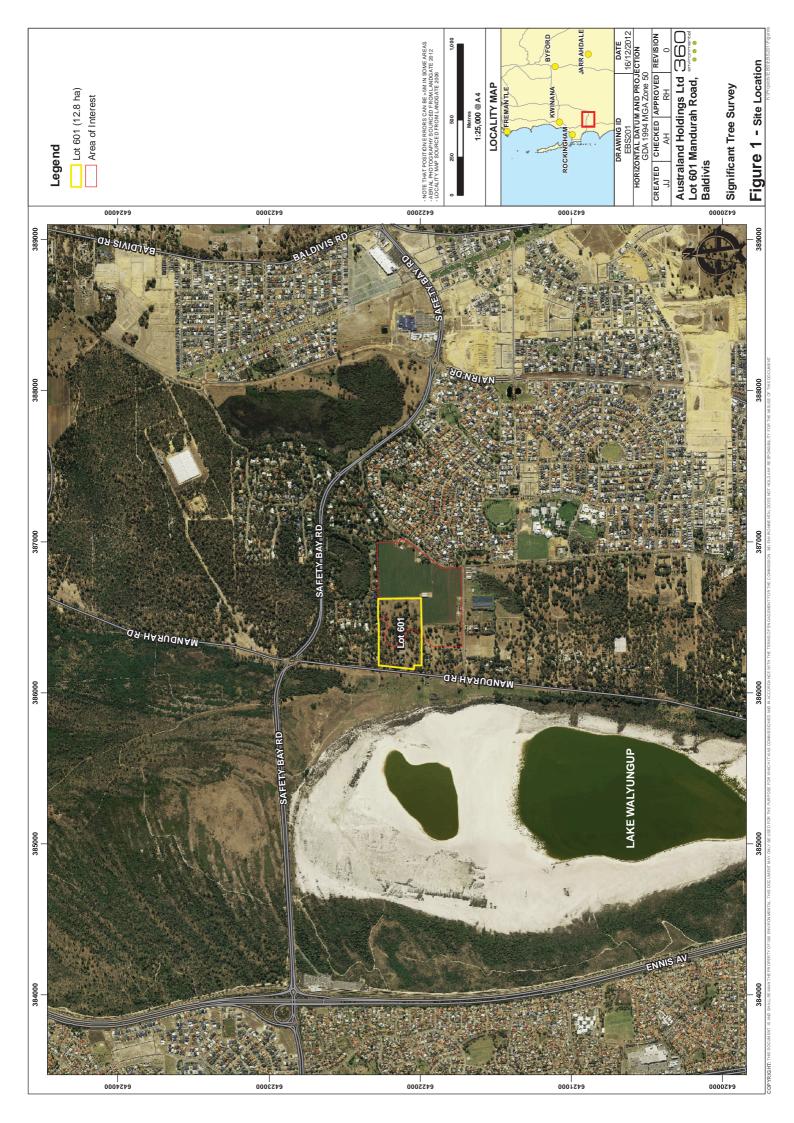
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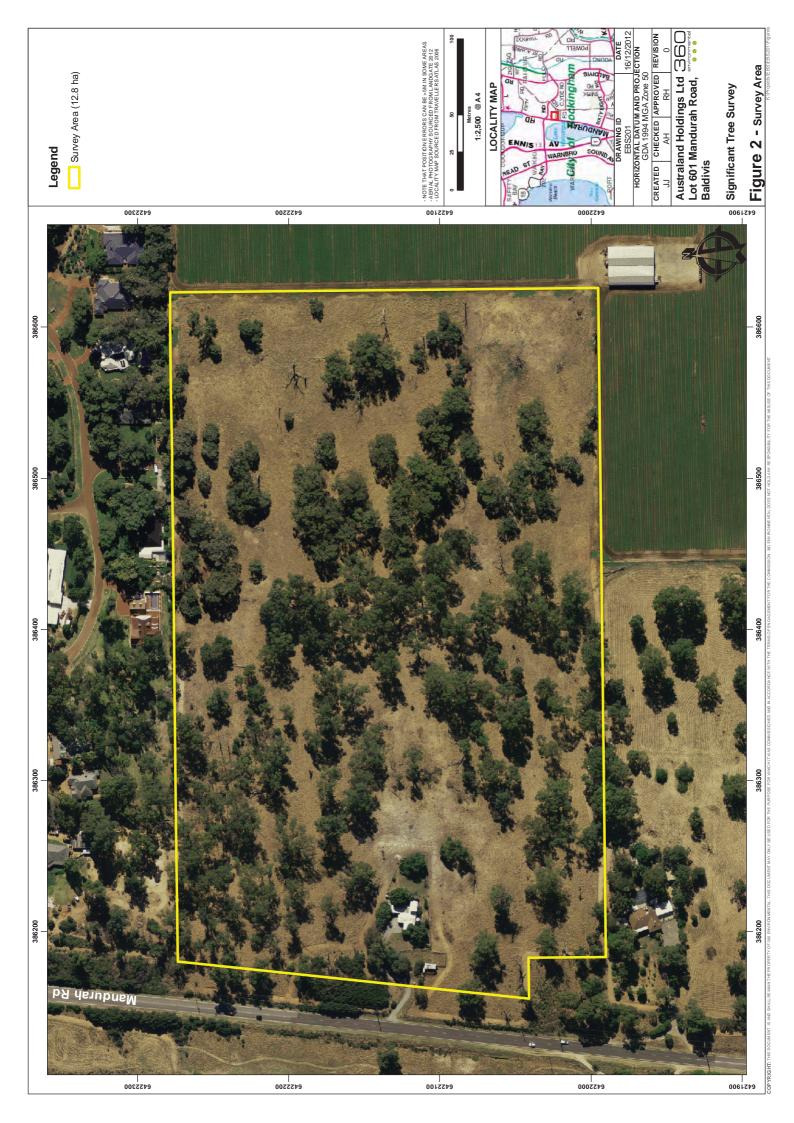


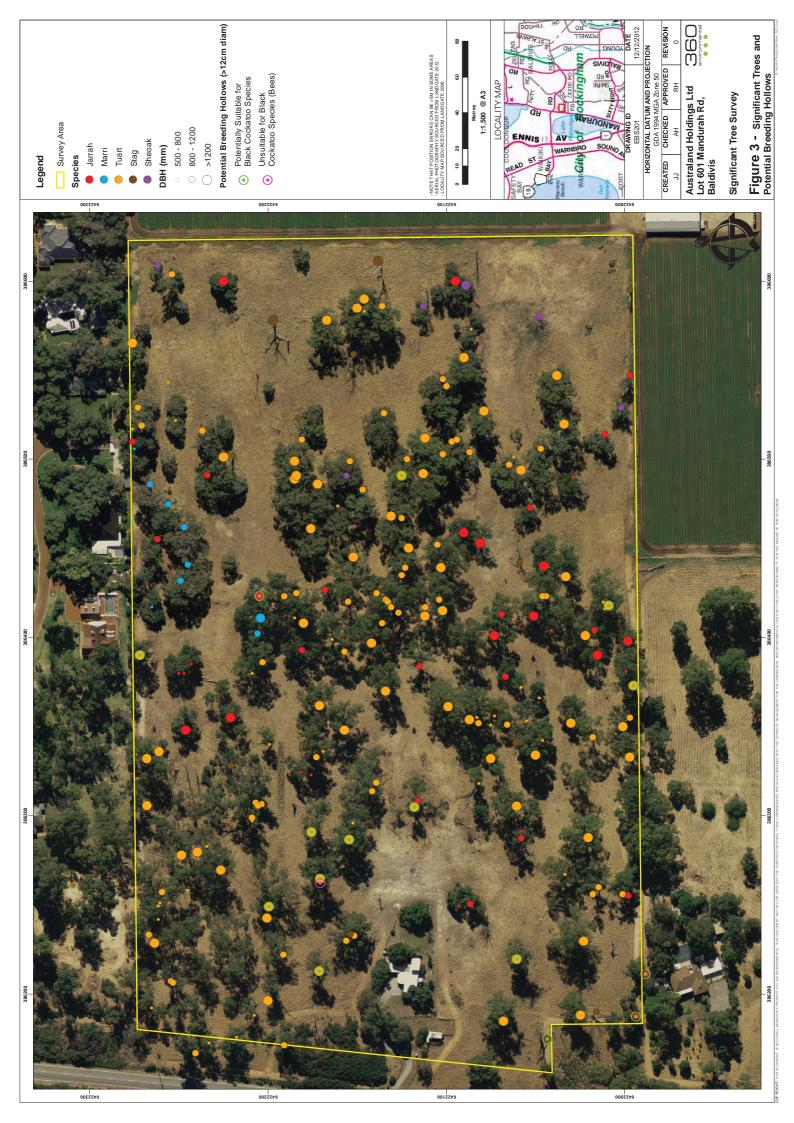
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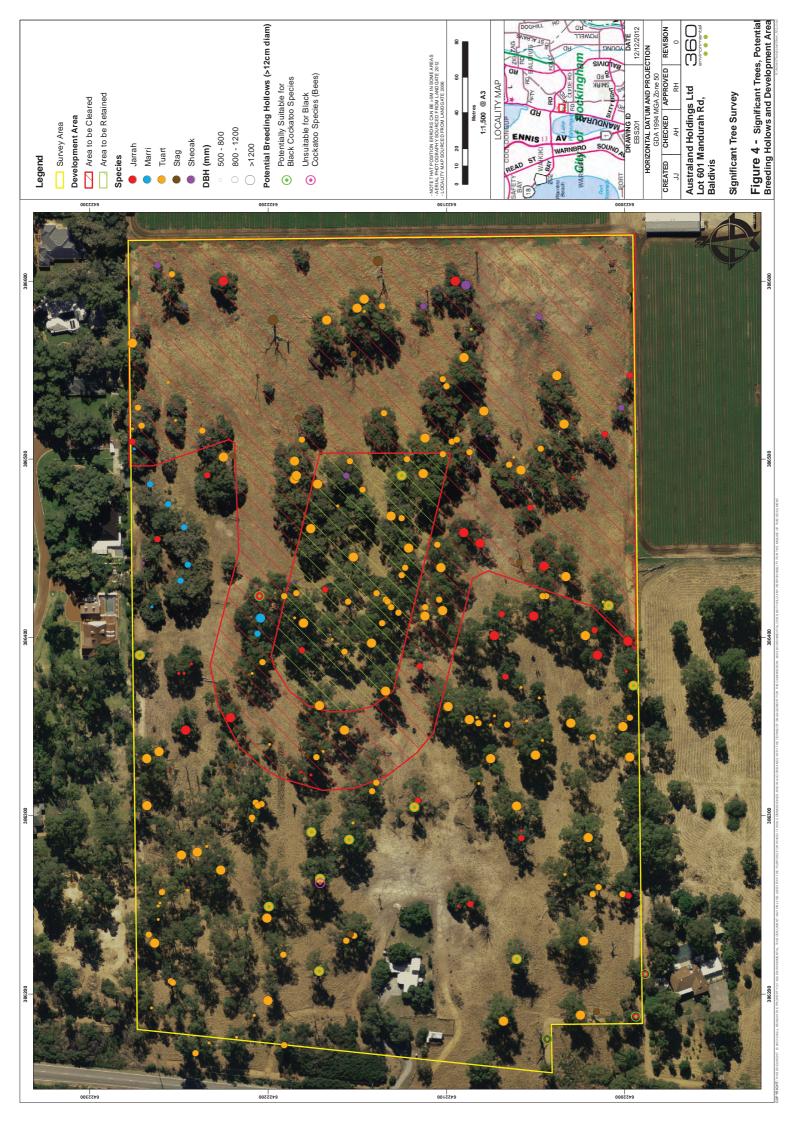


APPENDIX A Figures











APPENDIX B

Plates





Plate 1: Typical Floral Assemblages at the Site (large trees through degraded paddock)



Plate 2: An example of a large Tuart tree hollow from within the Site





Plate 3: Recent Evidence of Forest Red-tailed Black Cockatoo Feeding on Marri Seeds



Plate 4: Older Evidence of Forest Red-tailed Black Cockatoo Feeding on Marri Seeds



APPENDIX C

Black Cockatoo Significant Tree Data



			MGA	ZONE 50
TREE ID	Species	DBH мм	EASTINGS	Northings
1	Jarrah	800	386490	6422029
2	Jarrah	1000	386514	6422011
3	Sheoak	900	386529	6422002
4	Jarrah	1100	386547	6421997
5	Dead	1200	386595	6421997
6	Sheoak	1200	386580	6422048
7	Tuart	2000	386547	6422038
8	Tuart	1500	386520	6422034
9	Tuart	1200	386506	6422047
10	Tuart	1300	386494	6422058
11	Tuart	1200	386497	6422065
12	Tuart	800	386501	6422062
13	Sheoak	700	386513	6422077
14	Tuart	1800	386527	6422079
15	Tuart	1200	386541	6422100
16	Tuart	1200	386545	6422102
17	Tuart	2000	386557	6422090
18	Tuart	600	386573	6422086
19	Sheoak	1400	386598	6422089
20	Jarrah	1400	386600	6422095
21	Dead	800	386616	6422083
22	Jarrah	1000	386473	6422053
23	Dead	900	386442	6422059
24	Jarrah	1300	386440	6422045
25	Tuart	1600	386434	6422033
26	Tuart	2200	386418	6422009
27	Tuart	800	386416	6422011
28	Tuart	500	386420	6422012
29	Jarrah	900	386404	6422017
30	Jarrah	1500	386398	6421998
31	Tuart	1500	386401	6422022
32	Tuart	1100	386423	6422044
33	Tuart	1000	386423	6422046
34	Jarrah	1500	386412	6422051
35	Jarrah	800	386404	6422041
36	Jarrah	1300	386390	6422015
37	Jarrah	700	386381	6421999



			MGA	Zone 50
TREE ID	Species	DBH мм	EASTINGS	Northings
38	Tuart	1800	386373	6421995
39	Tuart	1200	386355	6421997
40	Jarrah	2000	386401	6422073
41	Jarrah	1000	386413	6422069
42	Tuart	2500	386415	6422102
43	Tuart	1100	386421	6422104
44	Tuart	1500	386439	6422103
45	Tuart	1200	386452	6422105
46	Jarrah	1800	386459	6422090
47	Jarrah	1500	386453	6422081
48	Tuart	2000	386492	6422113
49	Tuart	1500	386491	6422125
50	Tuart	1000	386500	6422122
51	Tuart	1500	386512	6422112
52	Tuart	1200	386503	6422102
53	Tuart	1200	386510	6422097
54	Tuart	1000	386511	6422094
55	Tuart	1200	386504	6422087
56	Tuart	1500	386350	6422001
57	Tuart	2500	386333	6421997
58	Tuart	1000	386344	6422018
59	Tuart	1500	386352	6422030
60	Tuart	500	386342	6422046
61	Tuart	2000	386334	6422050
62	Dead	1000	386341	6422061
63	Tuart	2000	386332	6422075
64	Tuart	800	386353	6422055
65	Tuart	700	386366	6422048
66	Tuart	500	386372	6422058
67	Jarrah	1000	386378	6422067
68	Tuart	1000	386351	6422066
69	Tuart	600	386356	6422073
70	Dead	600	386353	6422073
71	Tuart	500	386351	6422075
72	Tuart	1200	386352	6422082
73	Tuart	800	386355	6422083
74	Tuart	1300	386354	6422087



			MGA	Zone 50
TREE ID	Species	DBH мм	EASTINGS	Northings
75	Tuart	1500	386361	6422099
76	Banksia	600	386331	6422139
77	Banksia	600	386328	6422144
78	Tuart	1100	386333	6422173
79	Tuart	500	386336	6422169
80	Tuart	1300	386348	6422157
81	Tuart	3000	386362	6422171
82	Tuart	1500	386370	6422134
83	Jarrah	1200	386384	6422115
84	Tuart	1300	386412	6422112
85	Tuart	900	386417	6422112
86	Tuart	1000	386435	6422125
87	Tuart	1200	386439	6422123
88	Tuart	2000	386450	6422121
89	Tuart	1100	386467	6422125
90	Tuart	1300	386468	6422131
91	Tuart	1200	386425	6422139
92	Tuart	1100	386421	6422134
93	Tuart	900	386420	6422133
94	Tuart	1000	386417	6422131
95	Tuart	900	386414	6422127
96	Tuart	900	386408	6422136
97	Tuart	2000	386397	6422142
98	Tuart	1200	386483	6422147
99	Tuart	800	386474	6422161
100	Sheoak	1000	386491	6422156
101	Tuart	1100	386499	6422154
102	Tuart	1300	386486	6422172
103	Tuart	1800	386489	6422185
104	Tuart	1800	386491	6422184
105	Tuart	1300	386499	6422185
106	Tuart	900	386511	6422181
107	Dead	1000	386523	6422183
108	Dead	800	386547	6422206
109	Sheoak	1000	386609	6422262
110	Tuart	1200	386604	6422254
111	Sheoak	500	386586	6422247



			MGA	ZONE 50
TREE ID	SPECIES	DBH мм	EASTINGS	Northings
112	Jarrah	1300	386600	6422225
113	Dead	1300	386578	6422197
114	Sheoak	800	386596	6422105
115	Dead	800	386594	6422111
116	Sheoak	900	386586	6422113
117	Dead	1800	386611	6422138
118	Tuart	1200	386586	6422136
119	Tuart	1500	386590	6422146
120	Tuart	1300	386585	6422150
121	Tuart	500	386583	6422146
122	Dead	1000	386559	6422152
123	Tuart	1500	386578	6422167
124	Tuart	1800	386565	6422276
125	Tuart	1000	386529	6422273
126	Tuart	1000	386519	6422271
127	Tuart	500	386517	6422276
128	Jarrah	1000	386510	6422276
129	Marri	500	386506	6422275
130	Tuart	500	386522	6422252
131	Tuart	500	386543	6422256
132	Tuart	1200	386516	6422237
133	Dead	1200	386502	6422220
134	Tuart	2000	386501	6422225
135	Jarrah	1200	386491	6422234
136	Tuart	1200	386526	6422135
137	Marri	1000	386486	6422266
138	Marri	900	386475	6422256
139	Marri	1100	386462	6422247
140	Jarrah	1200	386455	6422262
141	Sheoak	500	386442	6422270
142	Marri	1000	386441	6422245
143	Marri	1200	386432	6422249
144	Marri	500	386417	6422265
145	Tuart	1800	386390	6422272
146	Jarrah	700	386380	6422250
147	Jarrah	600	386380	6422247
148	Jarrah	500	386385	6422243



			MGA	ZONE 50
TREE ID	SPECIES	DBH мм	EASTINGS	Northings
149	Tuart	800	386380	6422209
150	Tuart	1000	386386	6422203
151	Jarrah	1000	386393	6422181
152	Tuart	900	386392	6422157
153	Tuart	800	386399	6422164
154	Tuart	900	386420	6422155
155	Tuart	2000	386445	6422152
156	Tuart	1300	386461	6422176
157	Sheoak	600	386431	6422186
158	Tuart	1000	386425	6422184
159	Tuart	1000	386423	6422191
160	Tuart	800	386411	6422185
161	Tuart	2000	386408	6422180
162	Jarrah	1800	386423	6422205
163	Marri	1800	386411	6422204
164	Marri	1200	386402	6422206
165	Jarrah	2000	386355	6422221
166	Tuart	800	386340	6422199
167	Dead	500	386337	6422182
168	Jarrah	1500	386348	6422246
169	Tuart	1300	386336	6422261
170	Tuart	1500	386332	6422268
171	Dead	500	386326	6422255
172	Dead	1000	386328	6422221
173	Jarrah	900	386427	6422168
174	Tuart	821	386256	6422018
175	Tuart	920	386256	6422001
176	Jarrah	668	386325	6422182
177	Tuart	1337	386286	6422155
178	Tuart	828	386314	6422142
179	Tuart	1337	386305	6422118
180	Jarrah	828	386308	6422116
181	Tuart	637	386318	6422082
182	Tuart	1356	386305	6422060
183	Jarrah	637	386291	6422058
184	Jarrah	987	386287	6422058
185	Tuart	1432	386288	6422020



			MGA	ZONE 50
TREE ID	SPECIES	DBH мм	EASTINGS	NORTHINGS
186	Tuart	700	386267	6422033
187	Tuart	955	386260	6422015
188	Jarrah	955	386255	6421998
189	Jarrah	1124	386211	6421988
190	Jarrah	1019	386187	6421994
191	Dead	955	386190	6422016
192	Tuart	1528	386188	6422025
193	Dead	1388	386175	6422043
194	Tuart	3000	386185	6422068
195	Tuart	1961	386220	6422061
196	Tuart	1528	386229	6422023
197	Jarrah	859	386250	6422086
198	Jarrah	764	386249	6422093
199	Tuart	818	386318	6422139
200	Tuart	525	386296	6422152
201	Tuart	1592	386286	6422155
202	Tuart	1273	386291	6422176
203	Jarrah	716	386323	6422176
204	Tuart	1031	386306	6422204
205	Tuart	818	386307	6422207
206	Tuart	859	386305	6422206
207	Tuart	844	386299	6422209
208	Tuart	796	386297	6422209
209	Tuart	573	386283	6422234
210	Tuart	1241	386280	6422240
211	Tuart	1464	386306	6422268
212	Tuart	1305	386278	6422249
213	Tuart	1464	386269	6422226
214	Tuart	700	386258	6422245
215	Tuart	834	386257	6422260
216	Tuart	637	386251	6422261
217	Tuart	605	386249	6422262
218	Tuart	700	386242	6422262
219	Tuart	917	386233	6422267
220	Tuart	1401	386229	6422264
221	Tuart	923	386207	6422255
222	Tuart	1114	386206	6422253



			MGA	Zone 50
TREE ID	SPECIES	DBH мм	EASTINGS	Northings
223	Tuart	764	386192	6422265
224	Tuart	1082	386167	6422241
225	Tuart	637	386172	6422233
226	Tuart	668	386175	6422218
227	Tuart	732	386188	6422208
228	Tuart	1241	386196	6422200
229	Tuart	891	386171	6422191
230	Tuart	1241	386213	6422171
231	Tuart	828	386222	6422191
232	Tuart	1305	386242	6422201
233	Tuart	1623	386249	6422200
234	Tuart	1751	386264	6422171
235	Dead	891	386234	6422154
236	Tuart	923	386230	6422156
237	Tuart	955	386233	6422152

Search Criteria	G			
0 Registered A 386679.36mE,	0 Registered Aboriginal Sites in Custom search area; 386679.36mE, 6422299.31mN (zone 50)	n Custom se I (zone 50)	earch area; 386132.54mE, 6421966.77mN (zone 50)	(zone 50) :
Disclaimer				
Aboriginal sites exi identify additional s	st that are not reco	rded on the Reg ects all Aborigin	gister of Aboriginal Sites, and some registered sites n ial sites in Western Australia whether or not they are	Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registerd.
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Coordinate Accuracy	curacy			
Accuracy is sho	wn as a code ii	n brackets fo	Accuracy is shown as a code in brackets following the site coordinates.	
Reliable	The spatial info	ormation reco	The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.	le, due to methods of capture.
Unreliable Status	The spatial informatic information recorded.	ormation reco	orded in the site file is deemed to be unreli	The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information recorded.
Lodged			ACMC Decision Made	
Information lodged, awaiting assessment	odged, ssment	↑	Registered Site Insufficient Information Stored Data	
Spatial Accuracy	cy	_		
Index coordinates (Lat/Long) and (Ea i.e. '500000:250'	are indicative locati tsting/Northing) are means Easting=500	ons and may no based on the G 00000, Zone=50	ot necessarily represent the centre of the sites, espec 3DA 94 datum. The Easting/Northing map grid can bc 0.	Index coordinates are indicative locations and may not necessarily represent the centre of the sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (LavLong) and (Easting/Northing) are based on the GDA 94 datum. The Easting/Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '500000:250' means Easting=500000, Zone=50.
Sites Shown on Maps	n Maps			
Site boundaries me	Site boundaries may not appear on maps at low zoom levels.	aps at low zoom	n levels.	

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Identifier: 4549

by: Public User

Report created: 08/04/2013 10:51:55

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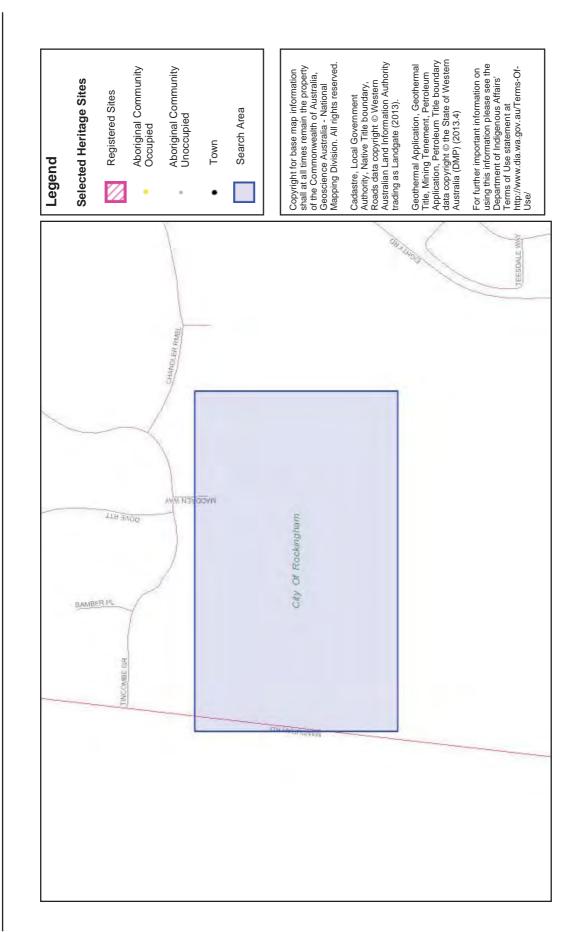
Aboriginal Sites Database

List of Registered Aboriginal Sites with Map

No Results

Government of Western Australia Department of Indigenous Affairs

Aboriginal Sites Database



Identifier: 4549

Page: 3

Department of Indigenous Affairs	Hairs Heritage Survey Database
Search Criteria	
1 Heritade Survevs containi	d 1 Survev Areas in Custom search area: 386104.31mE.
6421941.36mN (zone 50) :	6421941.36mN (zone 50) : 386665.97mE, 6422322.09mN (zone 50)
Disclaimer	
Heritage Surveys have been map; except at large scales. Reports sh may not be held at DIA. Please co	Heritage Surveys have been mapped using information from the reports and / or other relevant data sources. Heritage Surveys consisting of small discrete areas may not be visible except at large scales. Reports shown and more areas may not be visible may not be held at DIA. Please consult report holder for more information. Refer to www.dia.wa.gov.au/heritage for information on requesting reports held by DIA.
Copyright Copyright in the information contai Register of Aboriginal Sites establi	Copyright Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Aboriginal Sites established under and maintained under the Aboriginal Heritage Act 1972 (AHA).
Legend	
Access	
Some reports are restricted. The ty	Some reports are restricted. The type of restriction is shown as a code in brackets following the catalogue number. No code indicates an unrestricted report.
[CLOSED]	Closed
[OWE]	Open with exception
[TBD]	To be determined
[RESTRICTED PENDING]	Restricted pending
Spatial Accuracy The following legend strictly applie	Spatial Accuracy The following legend strictly applies to the spatial accuracy of heritage survey boundaries as captured by DIA.
Very Good	Boundaries captured from surveyed titles, GPS (2001 onwards) submitted maps georeferenced to within 20m accuracy.
Good	Boundaries captured from GPS (pre 2001) submitted maps georeferenced to within 250m accuracy.
Moderate	
Unreliable	Boundaries captured from submitted maps georeferenced to an accuracy exceeding 250m.
Indeterminate	Surveys submitted with insufficient information to allow boundary capture.

Heritage Survey Database

Survey 2274		
Project	The Perth Area.	
Start Date	Wednesday, April 01, 1970	1970
Proponents	University of Western Australia	Australia
Consultants	University of Western Australia	Australia
Survey Types	Archaeological	Archaeological and Ethnographic
Aboriginal People Consulted? No	No	

Related Reports for Survey 2274

Report ID	Report Catalogue Number ID	Title	Recorders	Held at
104023		An Archaeological Survey Project. The Perth Arch. Area. Western Australia Report no.4 April 1971.	Unknown H. Polach	DIA
103564	03564 HSR MW 1972 UWA	An Archaeological Survey Project: The Perth Area, Western Australia. Apr 1972.	Unknown H. Polach	DIA

Heritage Survey Database

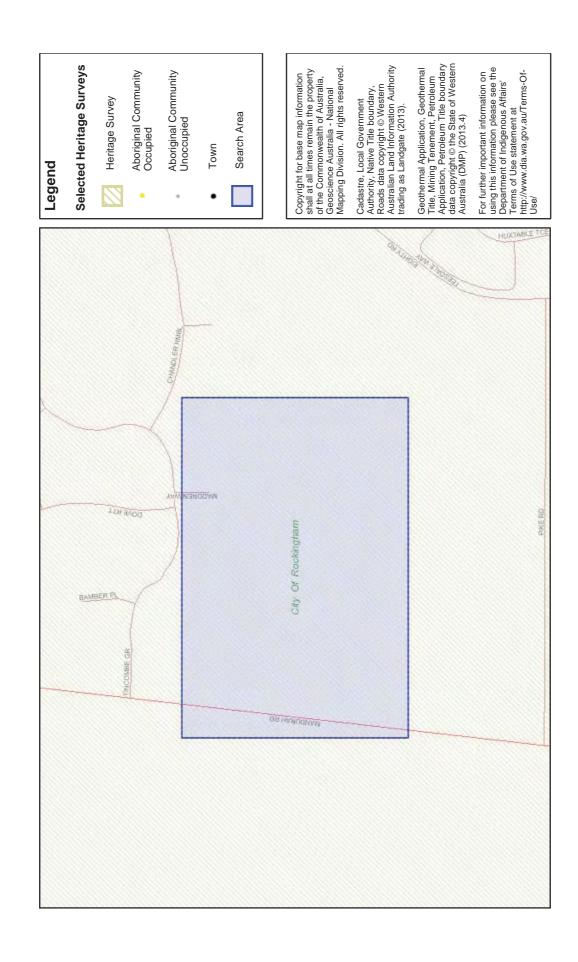
Related Survey Areas for Survey 2274

Area Number	Area Survey Type Number	Area Description	Survey Methodology	Spatial Accuracy	Field / Desktop
-	Archaeological	The Perth Area. 103 site locations in 67 site groups were Site investigated.	Site Identification	Indeterminate Field and Desktop	Field and Desktop
7	Archaeological	The Perth Area. Sites included id's 3350, 4404, 3846	Site Identification	Unreliable	Field and Desktop
ო	Archaeological and Ethnographic	The Perth Area. Closed site id 2887	Site Identification	Indeterminate Field and Desktop	Field and Desktop

Government of Western Australia Department of Indigenous Affairs

Aboriginal Heritage Inquiry System

Heritage Survey Database



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Search Criteria	Ø			
0 Registered A 386679.36mE,	0 Registered Aboriginal Sites in Custom search area; 386679.36mE, 6422299.31mN (zone 50)	n Custom se I (zone 50)	arch area; 386132.54mE, 6421966.77mN (zone 50)	(zone 50) :
Disclaimer				
Aboriginal sites exi identify additional s	st that are not reco	rded on the Reg ects all Aborigin	gister of Aboriginal Sites, and some registered sites rr ial sites in Western Australia whether or not they are	Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registerd.
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Coordinate Accuracy	curacy			
Accuracy is sho	wn as a code ii	n brackets fo	Accuracy is shown as a code in brackets following the site coordinates.	
Reliable	The spatial info	ormation reco	The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.	le, due to methods of capture.
Unreliable Status	The spatial informatic information recorded.	ormation reco	orded in the site file is deemed to be unreli	The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information recorded.
Lodged			ACMC Decision Made	
Information lodged, awaiting assessment	odged, ssment	↑	Registered Site Insufficient Information Stored Data	
Spatial Accuracy	cy	_		
Index coordinates (Lat/Long) and (Ea i.e. '500000:250'	are indicative locati tsting/Northing) are means Easting=500	ons and may no based on the G 00000, Zone=50	ot necessarily represent the centre of the sites, espec 5DA 94 datum. The Easting/Northing map grid can be 0.	Index coordinates are indicative locations and may not necessarily represent the centre of the sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (LavLong) and (Easting/Northing) are based on the GDA 94 datum. The Easting/Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '500000:250' means Easting=500000, Zone=50.
Sites Shown on Maps	n Maps			
Site boundaries me	Site boundaries may not appear on maps at low zoom levels.	aps at low zoom	l levels.	

Page: 1

Identifier: 4549

by: Public User

Report created: 08/04/2013 10:51:55

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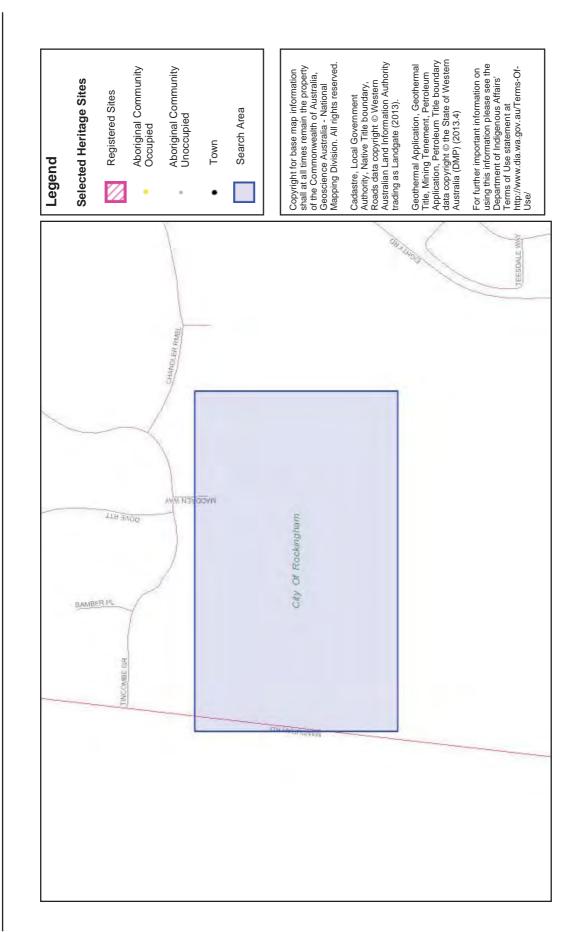
Aboriginal Sites Database

List of Registered Aboriginal Sites with Map

No Results

Government of Western Australia Department of Indigenous Affairs

Aboriginal Sites Database



Identifier: 4549

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Department of Indigenous Affairs	s Affairs Heritage Survey Database
Search Criteria	
1 Heritade Survevs containi	id 1 Survev Areas in Custom search area: 386104.31mE.
6421941.36mN (zone 50) :	6421941.36mN (zone 50) : 386665.97mE, 6422322.09mN (zone 50)
Disclaimer	
Heritage Surveys have been map; except at large scales. Reports sh may not be held at DIA. Please co	Heritage Surveys have been mapped using information from the reports and / or other relevant data sources. Heritage Surveys consisting of small discrete areas may not be visible except at large scales. Reports shown and makes the structure areas may not be visible may not be held at DIA. Please consult report holder for more information. Refer to www.dia.wa.gov.au/heritage for information on requesting reports held by DIA.
Copyright Copyright in the information contai Register of Aboriginal Sites establi	Copyright Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved. This includes, but is not limited to, information from the Register of Aboriginal Sites established under and maintained under the Aboriginal Heritage Act 1972 (AHA).
Legend	
Access	
Some reports are restricted. The ty	Some reports are restricted. The type of restriction is shown as a code in brackets following the catalogue number. No code indicates an unrestricted report.
[CLOSED]	Closed
[OWE]	Open with exception
[TBD]	To be determined
[RESTRICTED PENDING]	Restricted pending
Spatial Accuracy The following legend strictly applie	Spatial Accuracy The following legend strictly applies to the spatial accuracy of heritage survey boundaries as captured by DIA.
Very Good	Boundaries captured from surveyed titles, GPS (2001 onwards) submitted maps georeferenced to within 20m accuracy.
Good	Boundaries captured from GPS (pre 2001) submitted maps georeferenced to within 250m accuracy.
Moderate	
Unreliable	Boundaries captured from submitted maps georeferenced to an accuracy exceeding 250m.
Indeterminate	Surveys submitted with insufficient information to allow boundary capture.

Heritage Survey Database

Survey 2274		
Project	The Perth Area.	
Start Date	Wednesday, April 01, 1970	1970
Proponents	University of Western Australia	Australia
Consultants	University of Western Australia	Australia
Survey Types	Archaeological	Archaeological and Ethnographic
Aboriginal People Consulted? No	No	

Related Reports for Survey 2274

Report ID	Report Catalogue Number ID	Title	Recorders	Held at
104023		An Archaeological Survey Project. The Perth Arch. Area. Western Australia Report no.4 April 1971.	Unknown H. Polach	DIA
103564	03564 HSR MW 1972 UWA	An Archaeological Survey Project: The Perth Area, Western Australia. Apr 1972.	Unknown H. Polach	DIA

Heritage Survey Database

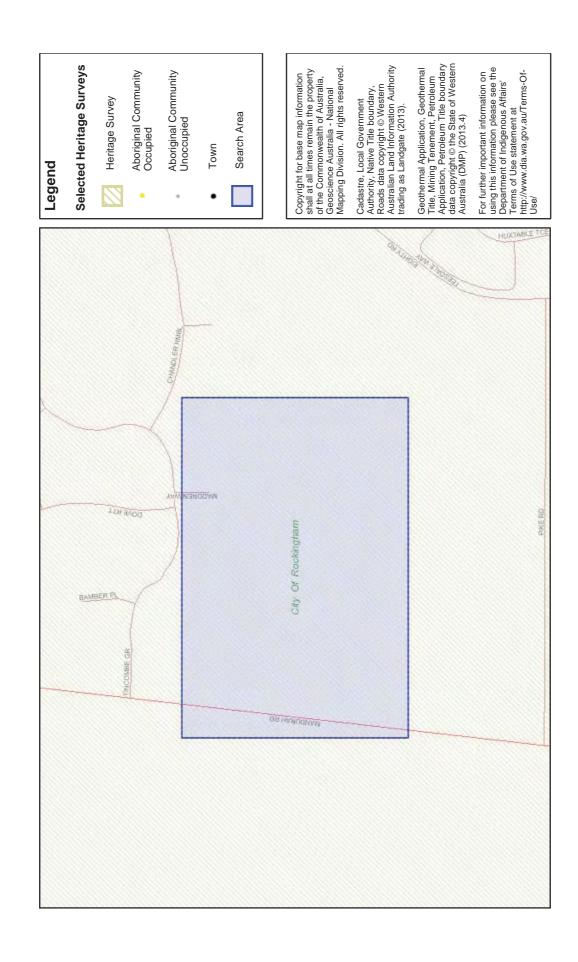
Related Survey Areas for Survey 2274

Area Number	Area Survey Type Number	Area Description	Survey Methodology	Spatial Accuracy	Field / Desktop
-	Archaeological	The Perth Area. 103 site locations in 67 site groups were Site investigated.	Site Identification	Indeterminate Field and Desktop	Field and Desktop
7	Archaeological	The Perth Area. Sites included id's 3350, 4404, 3846	Site Identification	Unreliable	Field and Desktop
ო	Archaeological and Ethnographic	The Perth Area. Closed site id 2887	Site Identification	Indeterminate Field and Desktop	Field and Desktop

Government of Western Australia Department of Indigenous Affairs

Aboriginal Heritage Inquiry System

Heritage Survey Database



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approved policy

Effective Date23 June 2011Policy RefB. 10Approved ByBoard of Directors

australand

Environmental Risk Management

Purpose

Australand is committed to a philosophy of reduction of pollution and will apply this philosophy in practical terms to all its operations to reduce all forms of pollution, minimise waste and limit the Group's carbon footprint.

Policy

This is achieved at all levels of the organisation through:

- The enhancement of skills;
- The gathering and sharing of knowledge; and
- The ongoing commitment of our employees.

Australand aims to:

- Develop a culture that encourages employees to demonstrate work practices that are consistent with the objectives of this policy.
- Comply with all relevant environmental legislation, regulations, codes of practice and industry best practice.
- Provide relevant employees with the appropriate skills, resources and support to enable them to carry out their work with due consideration to the environment.
- Monitor and record relevant parameters to provide objective evidence of environmental risk management performance and improvement.
- Reinforce individual responsibility for environmental risk management to relevant employees.

To achieve these objectives Australand will maintain an Environment Risk Management System complying with all relevant standards and will regularly review and report to the Risk & Compliance Committee on the performance of this system.



As Managing Director of Australand Holdings Limited, I am personally committed to the continued improvement of the environmental performance of the Group and I require that all employees, contractors and suppliers associated with our operations to recognise and abide by this commitment.

Bob Johnston Managing Director

23 June 2011 B. 10 Board of Directors



APPENDIX D

Site Photographs





Plate 1: Looking east from the southern portion of Lot 601



Plate 2: Looking east from the eastern portion of Lot 601







Plate 3: Looking west into Lot 601 from the western boundary of Lot 335 (2010)



Plate 4: Vulnerable Forest Red-tailed black cockatoo recorded in Lot 601 (central)

Environmental Assessment Report Various Lots, Eighty Road, Pike Road, and Mandurah Road, Baldivis Australand Property Group





Plate 5: Potential breeding hollows for conservation significant avian fauna



Plate 6: Evidence of foraging by Vulnerable Forest Red-tailed Black Cockatoos.