

Rainwater Tank Testing Super Hornet Public Environment Report

- Final
- 3 February 2010



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Contents

1. Executive Summary	1
2. Introduction	2
3. Methodology	4
3.1. Sampling Locations	4
3.2. Tank Information	5
3.3. Sampling Technique	5
4. Results	7
4.1. Metals	7
4.2. Polynuclear Aromatic Hydrocarbons	7
4.3. Petroleum Hydrocarbons	7
4.4. Aldehydes	7
5. Conclusions	12
Appendix A Raw Data	13

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1. Executive Summary

This report has been prepared in response to the commitment made by the Department of Defence (Defence) in November 2009 as part of the Australian Super Hornet Supplementary Report, to undertake rain water tank water quality testing to improve understanding of impacts from aircraft operations. Defence committed to undertaking two rounds of testing to understand the current (baseline) situation and any impacts following the arrival of the Super Hornets in 2012. This report reflects the outcomes of the first round of testing..

Testing was undertaken at twelve rain water tanks between the 9 – 10, December 2009. Seven of these tanks were located within the vicinity of RAAF Base Amberley while five control tanks were located away from the Base in the western and northern suburbs of Brisbane.

The water quality study was undertaken to investigate current levels of contaminants within water contained in rainwater tanks. Results obtained identified water samples from every rainwater tank were well within Australian Drinking Water (Health) Guidelines for the parameters measured. Water samples collected from rainwater tanks in close proximity to the Base typically had fewer contaminants and lower concentrations of contaminants than rainwater tanks in the Brisbane region.

2. Introduction

The F-111 is being withdrawn from service at the end of 2010. In order to reduce the risk of a temporary loss of capability from the F-111 to the future air combat capability, the Australian Government decided in March 2007 to purchase 24 FA-18F Super Hornets.

In 2009 a Draft Public Environment Report (PER) was prepared to address the requirements of the *Environment Protection and Biodiversity Act 1999* (EPBC Act). The Draft PER was released for public consultation between 26 August and 6 October 2009. Twenty-eight (28) formal submissions were received during the consultation period and responded to within a Supplementary Report, released to the public in November 2009.

Within the 28 formal submissions, several issues were raised regarding fuel dumping and additional flight movements may have impacts on water quality. Issues included concerns that many residents to the south, west and north of the RAAF Base Amberley, only have access to water tanks as a source of drinking, and dams for stock irrigation.

The Super Hornet is capable of releasing fuel during flight in order to reduce the weight of the aircraft for a safe landing. This is only done in emergency situations and in accordance with strict procedures. Fuel dumping is completed no lower than 6,000 ft (1,820 m) above ground level, preferably over the sea. Fuel jettisoned at these heights vaporises almost immediately and disperses into the air.

Potential impacts to water quality in rainwater tanks from military aircraft operations have been studied previously, for example at RAAF Base Williamtown. At Williamtown, water samples were taken from 20 tanks near the flight paths and three control samples away from the area. These samples were tested for hydrocarbons (essentially kerosene) present in fuel, metals and formaldehyde. All of the water sampled was within guidelines for suitability for drinking. No petroleum hydrocarbons were detected, suggesting there is no detectable contamination of rainwater tank water from hydrocarbons present in aircraft fuel and exhaust emissions. Metals, at low concentrations, were found in some samples but there was no correlation between their presence and aircraft flight paths.

Although this previous study found no relationship between aircraft overflight and quality of water in rainwater tanks, Defence recognised the concerns of the community around RAAF Base Amberley. To address these concerns, Defence committed to undertaking two rounds of testing to understand the current (baseline) situation and any impacts following the arrival of the Super Hornets in 2012. This report reflects the outcomes of the first round of testing to establish baseline conditions.



Literature searches of likely contaminants that could emanate from combustion of aircraft fuel was undertaken and a list of organic (hydrocarbons and aldehydes) and inorganic contaminants (metals) were targeted in this investigation.

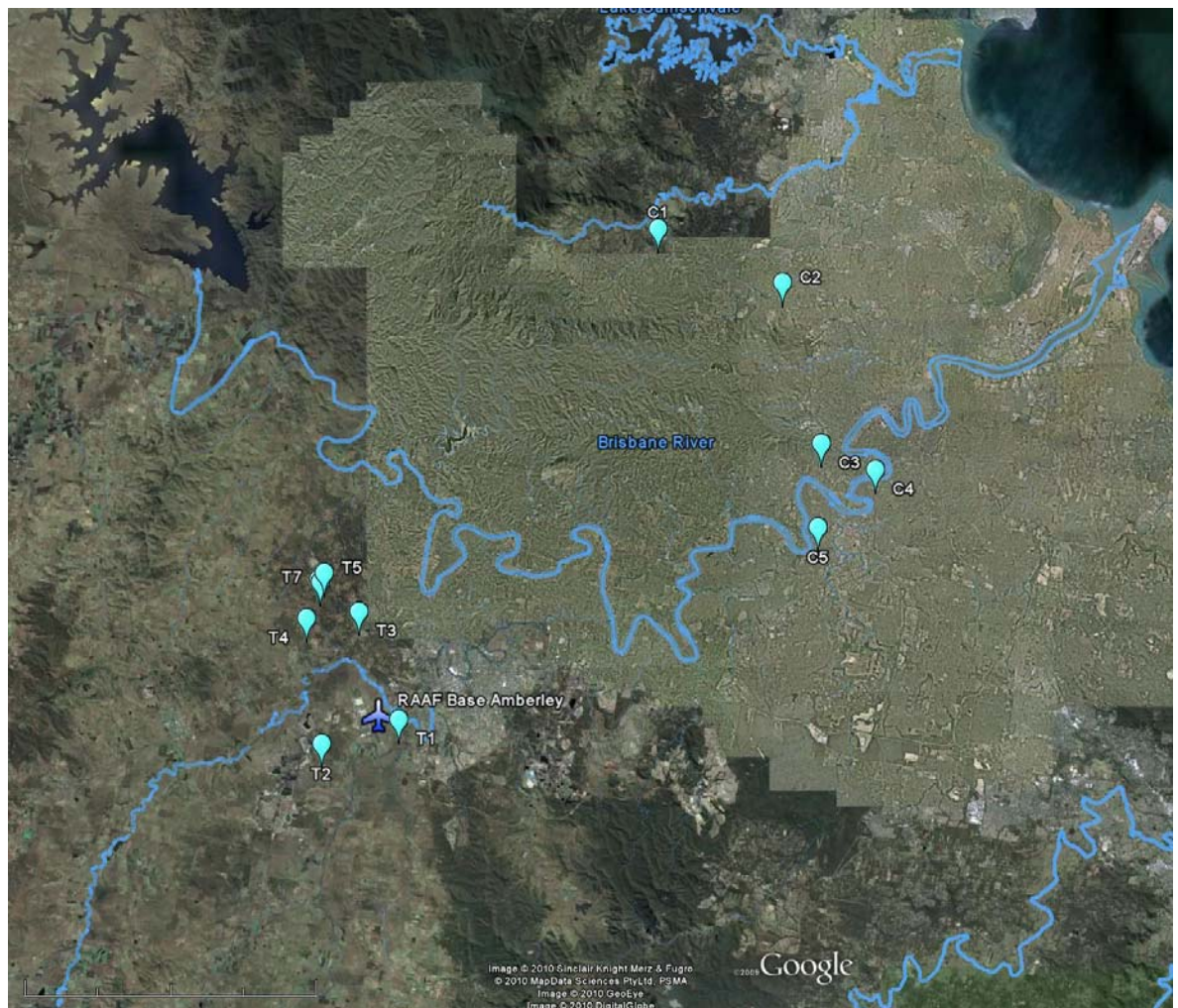
Rainwater tanks tested were volunteered by owners in the vicinity of RAAF Base Amberley (between 2-8 km radius of RAAF Base) and by rainwater tank owners from the western and northern suburbs of Brisbane (between 27-35 km radius of RAAF Base). A diversity of tank types (metal, plastic, fibreglass and concrete) were chosen to cover the spectrum of tank types likely to be used. All sampling was carried out over a two day period following a no-rain period of six days. Water quality results are compared regionally to one another and to the Australian Drinking Water Guidelines (2004).

3. Methodology

3.1. Sampling Locations

Water samples were collected from seven tanks in the vicinity of RAAF Base Amberley (between 2-8 km radius of RAAF Base) and five control tanks away from the area in the western and northern suburbs of Brisbane (between 27-35 km radius of RAAF Base) (see **Figure 3-1**).

Rainwater tanks tested were volunteered by owners and subsequently chosen sites were largely dependent on the location of residents willing to participate.



- **Figure 3-1 Location of seven test sites in the vicinity of the Amberley RAAF Base (T1 - T7) and control tanks in the western and northern suburbs of Brisbane (C1 – C5).**

3.2. Tank Information

Twelve rainwater tanks in total were sampled comprising a range of tank construction materials (metal, plastic, fibreglass and concrete), ages (2.5 – 32 years) and volumes (2000 – 30,000 litres) (Refer to **Table 3-1**). The majority of tanks received rainwater from metals roofs (two from concrete tile roofs) that ranged in age from 4 – 73 years.

- **Table 3-1 Location of rainwater tanks sampled and information on roof and tank age, construction material and tank volume.**

	Tank	Roof Material	Roof Age	Tank Material	Tank Age	Tank Volume (L)
Test Tanks	T1	Metal	73 yrs	Fibreglass	32 yrs	~30,000
	T2	Metal	14 yrs	Metal	14 yrs	22,000
	T3	Metal	20 yrs	Concrete	20 yrs	20,000
	T4	Metal	19 yrs	Metal	19 yrs	10,000
	T5	Concrete Tile	25 yrs	Metal	25 yrs	19,000
	T6	Metal	16 yrs	Concrete	16 yrs	10,000
	T7	Metal	20 yrs	Concrete	20 yrs	10,000
Control Tanks	C1	Concrete Tile	30 yrs	Concrete	30 yrs	10,000
	C2	Metal	4 yrs	Plastic	4 yrs	3,000
	C3	Metal	25 yrs	Plastic	2.5 yrs	2,000
	C4	Metal	~20-30 yrs	Metal	2 yrs	2,000
	C5	Metal	15 yrs	Metal	1 yr	8,000

3.3. Sampling Technique

All sampling was completed within a two day period during dry-weather conditions and with a no-rain period of six days prior to sampling. Consultation with the owners of the tanks included the completion of a field sheet covering the following items:

- the age of the tank;
- taste and odour issues encountered;
- type of tank (materials of construction);
- roofing material and age; and
- a general inspection of roof and gutters.

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A standard sampling procedure was employed at each location comprising the following steps:

- 1) a 9 L bucket was filled with tank water from the access point (i.e. tap) in order to flush the access point of any surface contaminants;
- 2) following the flush, triplicate water samples were collected directly into the sample containers with care taken to ensure the mouth of the sampling container did not come in contact with the access point or other sources of contamination (e.g. hands); and
- 3) samples were chilled in a cooler box with crushed ice and immediately delivered to Queensland Health Scientific and Forensic Laboratories for storage prior to analysis.

Analysis was performed for the following contaminants:

- Total and dissolved metals (Arsenic, Beryllium, Cadmium, Chromium, Nickel, Lead, Zinc);
- Aldehydes (acetaldehyde, formaldehyde, gluteraldehyde);
- Total Petroleum Hydrocarbons (nC_{10} - C_{14} , nC_{15} - nC_{28} , nC_{29} - nC_{36}); and
- Polynuclear Aromatic Hydrocarbons (benzo[ghi]perylene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene, benzo[a]pyrene, benzo[b+k]fluoranthene, chrysene, benz[a]anthracene, pyrene, fluoranthene, anthracene, phenanthrene, fluorene, acenaphthene, acenaphthylene).

Results were assessed against the Australian Drinking Water Guidelines (National Health and Medical Research Council and Agriculture and Resource Management Council of Australia and New Zealand, 2004) differences between test and control tanks compared.

4. Results

4.1. Metals

Despite positive detections of total and dissolved cadmium, chromium, nickel and zinc in most test tanks, all metals were typically an order of magnitude below relevant Australian Drinking Water Guidelines for health.

Control tanks had positive detections for a greater number of total and dissolved metals including arsenic, cadmium, chromium, nickel, lead and zinc. All detected metals were below relevant Australian Drinking Water Guidelines for health.

4.2. Polynuclear Aromatic Hydrocarbons

All test and control tank samples were below laboratory limits of reporting for polynuclear aromatic hydrocarbons.

4.3. Petroleum Hydrocarbons

Test tanks 1, 2 and 3 (sites closest to RAAF Base Amberley) had positive detections for total petroleum hydrocarbons (**Table 4-1**). There are no guidelines for petroleum hydrocarbons present in the Australian Drinking Water Guidelines (2004). It should be noted that this positive detection was only for a single replicate for each of test tanks 1 and 3 with the other two replicates for each tank below laboratory reporting limits. There were positive detections in two of the replicates from test tank 2 with one replicate below laboratory reporting limits (**Appendix A**). The combined positive and negative detections within replicates indicate that rainwater contamination from petroleum hydrocarbons is not conclusive.

It should be noted that laboratory reporting limits for petroleum hydrocarbons in this study were lower (more sensitive) than limits reported in the RAAF Base Williamtown study where no petroleum hydrocarbons were reported. Test tanks 4, 5, 6 and 7 did not have any positive detections for petroleum hydrocarbons. Results for total petroleum hydrocarbons from the control tanks displayed similar patterns of positive and negative detections within replicates in a couple of tanks (C1 and C2 from northern Brisbane) with no detections of total petroleum hydrocarbons in tanks C3-C5 (**Table 4-2**).

4.4. Aldehydes

All test and control tank samples were below laboratory limits of reporting for all assessed aldehydes.

■ Table 4-1 Water quality results from test tank samples

Parameter	ADWG 2004 (mg/L)	T1		T2		T3		T4		T5		T6		T7	
		Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE
Metals															
Total Arsenic	0.007	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000
Total Beryllium	ID	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000
Total Cadmium	0.002	0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	< 0.0001	0.0000	0.0001	0.0000
Total Chromium	0.05	0.0004	0.0000	0.0027	0.0002	0.0003	0.0000	0.0020	0.0000	0.0010	0.0000	0.0085	0.0003	0.0047	0.0004
Total Nickel	0.02	0.0001	0.0000	0.0004	0.0001	0.0004	0.0001	0.0010	0.0001	0.0006	0.0001	0.0006	0.0002	0.0001	0.0000
Total Lead	0.01	0.0007	0.0000	0.0085	0.0001	0.0019	0.0005	0.0055	0.0001	0.0029	0.0000	0.0042	0.0002	0.0003	0.0000
Total Zinc	<3*	0.7777	0.0026	0.1593	0.0009	0.0810	0.0010	0.4647	0.0162	1.4230	0.0083	0.3933	0.0038	0.0727	0.0038
Dissolved Arsenic	0.007	< 0.0003	< 0.0003	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000	< 0.0003	0.0000
Dissolved Beryllium	ID	< 0.0001	< 0.0001	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000	< 0.0001	0.0000
Dissolved Cadmium	0.002	0.0001	0.0000	< 0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	< 0.0001	0.0000	< 0.0002	0.0000
Dissolved Chromium	0.05	0.0003	0.0000	0.0018	0.0000	0.0002	0.0000	0.0018	0.0001	0.0007	0.0000	0.0071	0.0001	0.0036	0.0000
Dissolved Nickel	0.02	0.0004	0.0003	0.0004	0.0001	0.0003	0.0000	0.0015	0.0000	0.0005	0.0000	0.0004	0.0000	0.0002	0.0000
Dissolved Lead	0.01	0.0011	0.0001	0.0079	0.0001	0.0009	0.0002	0.0068	0.0004	0.0020	0.0000	0.0032	0.0000	0.0012	0.0001
Dissolved Zinc	<3*	0.7863	0.0151	0.1573	0.0003	0.0650	0.0021	0.5543	0.0121	1.3890	0.0101	0.3717	0.0012	0.0653	0.0003
POLYNUCLEAR AROMATIC HYDROCARBONS															
Benzo[ghi]perylene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Dibenz[a,h]anthracene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Indeno[1,2,3-cd]pyrene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Benzo[a]pyrene	0.01	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Benzo[b+k]fluoranthene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Chrysene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Benz[a]anthracene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Pyrene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Fluoranthene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Anthracene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Phenanthrene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Fluorene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Acenaphthene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Acenaphthylene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00

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Parameter	ADWG 2004 (mg/L)	T1		T2		T3		T4		T5		T6		T7	
		Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE
Naphthalene	ID	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
TOTAL PETROLEUM HYDROCARBONS															
nC ₁₀ -nC ₁₄	-	<0.005	0	0.048	0.046	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000
nC ₁₅ -nC ₂₈	-	0.004	0.0015	0.078	0.071	0.009	0.006	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000
nC ₂₉ -nC ₃₆	-	<0.005	0	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000
ALDEHYDES															
Acetaldehyde	-	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Formaldehyde	0.5	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00
Gluteraldehyde	-	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00	<0.01	0.00

* AWDG – Australian Drinking Water Guidelines

* SE – Standard Errors

* DI – Insufficient Data

* No health guideline available; aesthetic AWDG guideline used.

N.B. means and standard errors (SE) calculated by using half the laboratory reporting limit (where applicable)

■ Table 4-2 Water quality results from control tank samples

Parameter	ADWG 2004 (mg/L)	C1		C2		C3		C4		C5	
		Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE
Metals											
Total Arsenic	0.007	0.0001	0.0000	0.0006	0.0000	0.0002	0.0000	0.0002	0.0000	0.0003	0.0000
Total Beryllium	ID	<0.0001	0.0000	<0.0001	0.0000	<0.0001	0.0000	<0.0001	0.0000	<0.0001	0.0000
Total Cadmium	0.002	<0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000
Total Chromium	0.05	0.0001	0.0000	0.0002	0.0000	0.0003	0.0000	0.0001	0.0000	0.0015	0.0000
Total Nickel	0.02	0.0001	0.0000	0.0057	0.0000	0.0091	0.0002	0.0054	0.0001	0.0017	0.0004
Total Lead	0.01	0.0001	0.0000	0.0017	0.0000	0.0010	0.0000	0.0005	0.0000	0.0018	0.0002
Total Zinc	<3*	0.0050	0.0000	0.0363	0.0003	0.5760	0.0023	0.8783	0.0041	0.6680	0.0040
Dissolved Arsenic	0.007	0.0001	0.0000	0.0006	0.0000	0.0003	0.0000	0.0003	0.0000	0.0003	0.0000
Dissolved Beryllium	ID	<0.0001	0.0000	<0.0001	0.0000	<0.0001	0.0000	<0.0001	0.0000	<0.0001	0.0000
Dissolved Cadmium	0.002	<0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0002	0.0001
Dissolved Chromium	0.05	0.0001	0.0000	0.0002	0.0000	0.0003	0.0000	0.0001	0.0000	0.0013	0.0000
Dissolved Nickel	0.02	0.0001	0.0000	0.0052	0.0001	0.0097	0.0002	0.0074	0.0001	0.0046	0.0011
Dissolved Lead	0.01	0.0001	0.0000	0.0022	0.0002	0.0016	0.0001	0.0005	0.0000	0.0102	0.0034
Dissolved Zinc	<3*	0.0060	0.0006	0.1367	0.0819	0.5917	0.0067	0.8630	0.0068	0.6527	0.0038
POLYNUCLEAR AROMATIC HYDROCARBONS											
Benzo[ghi]perylene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Dibenz[a,h]anthracene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Indeno[1,2,3-cd]pyrene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Benzo[a]pyrene	0.01	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Benzo[b+k]fluoranthene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Chrysene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Benz[a]anthracene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Pyrene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Fluoranthene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Anthracene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Phenanthrene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Fluorene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Acenaphthene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Acenaphthylene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00

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Parameter	ADWG 2004 (mg/L)	C1		C2		C3		C4		C5	
		Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE	Mean (mg/L)	SE
Naphthalene	ID	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
TOTAL PETROLEUM HYDROCARBONS											
nC ₁₀ -nC ₁₄	-	<0.005	0	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000
nC ₁₅ -nC ₂₈	-	0.0035	0.0010	0.0063	0.0038	<0.005	0.000	<0.005	0.000	<0.005	0.000
nC ₂₉ -nC ₃₆	-	0.0033	0.0008	<0.005	0.000	<0.005	0.000	<0.005	0.000	<0.005	0.000
ALDEHYDES											
Acetaldehyde	-	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Formaldehyde	0.5	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00
Gluteraldehyde	-	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00	<0.0001	0.00

* AWDG – Australian Drinking Water Guidelines

* SE – Standard Errors

* DI – Insufficient Data

* No health guideline available; aesthetic AWDG guideline used.

N.B. means and standard errors (SE) calculated by using half the laboratory reporting limit (where applicable)

5. Conclusions

This report has been prepared in response to the commitment made by the Defence in November 2009 as part of the Australian Super Hornet Supplementary Report, to undertake rain water tank water quality testing to improve understanding of impacts from aircraft operations. Defence committed to undertaking two rounds of testing to understand the current (baseline) situation and any impacts following the arrival of the Super Hornets in 2012. Below is a summary of key findings from the first round of testing undertaken between the 9 – 10 December 2009.

- a) This water quality study of twelve rainwater tanks within and outside the vicinity of the RAAF Base Amberley, identified all tanks contained water that was well within Australian Drinking Water (Health) Guidelines for the parameters measured;
- b) Rainwater tanks near RAAF Base Amberley had fewer positive metal detections and typically lower concentrations of metals compared to the control tanks in western and northern Brisbane. The suite of metals detected reflected and added to those identified in the RAAF Base Williamstown study in 2002, though this is likely due to the increased sensitivity of laboratory reporting limits used in this study compared to the Williamstown study (typically and order of magnitude more sensitive in this study). Metals detected are likely to emanate from roofing materials and atmospheric deposition which may explain greater detections in control sites due to proximity to a large urban centre (Brisbane);
- c) No polynuclear aromatic hydrocarbons (PAHs) were reported in any of the samples;
- d) The majority of samples collected from control and test tanks had no detectable levels of total petroleum hydrocarbons (TPHs). Where detections were observed, in three test tanks and two control tanks, there was no consistency between replicates with no tank having positive detections for all three replicates. This suggests water collected was not homogenous (well mixed) and/or samples were contaminated in some way. It should be noted that laboratory reporting limits for total petroleum hydrocarbons were 10-20 times more sensitive in this study compared to the Williamstown study which largely did not detect any hydrocarbons in rainwater tanks; and
- e) No aldehydes (including formaldehyde) were reported in any of the samples.

Defence has committed to undertaking a second round of water quality sampling following the introduction of the Super Hornets in 2012.



Appendix A Raw Data

Forensic and Scientific Services

A Clinical and Statewide Service



**Queensland
Government**

Queensland Health

27 January 2010

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QHFSS Reference: 09KE8598-8612:SBC
SSP20888
Client Reference: QE09512.800
Rainwater Tank

SIMON COSTANZO
SINCLAIR KNIGHT MERZ
32 CORDELIA ST
SOUTH BRISBANE QLD 4101

LABORATORY REPORT

DATE RECEIVED 10/12/2009

DATE COMMENCED 15/12/2009

REASON FOR SUBMISSION Total Petroleum Hydrocarbon (TPH)
Polycyclic Aromatic Hydrocarbons (PAH)
Formaldehyde

METHOD OF ANALYSIS TPH: Liquid-liquid extraction. GCMS analysis using m/z 57
ion for quantitation
PAH: Liquid-liquid extraction. GCMS analysis (QIS 16647)
Formaldehyde analysis is outsourced to SGS Australia Pty Ltd in
Coburg, Victoria

COMMENT

Due to problems with the GC-FID the total petroleum hydrocarbons were analysed using gas chromatography – mass spectrometry (GCMS) with quantitation based on the m/z 57 ion. The presence of the m/z 57 ion in the mass spectrometer is indicative of hydrocarbons. TPH is normally analysed using gas chromatography with flame ionization detection.

Results on the attached page have been approved by the following analyst.

Stewart Carswell
Analyst

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RESULTS OF ANALYSIS

Client Reference		C1A	C1B	C1C	C2A	C2B	C2C	Reporting Limit
QHFS Reference	Units	09KE8598	09KE8599	09KE8600	09KE8601	09KE8602	09KE8603	
POLYNUCLEAR AROMATIC HYDROCARBONS								
Benzo[ghi]perylene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Dibenz[a,h]anthracene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Indeno[1,2,3-cd]pyrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benzo[a]pyrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benzo[b+k]fluoranthene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Chrysene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benz[a]anthracene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Pyrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Fluoranthene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Anthracene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Phenanthrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Fluorene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Acenaphthene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Acenaphthylene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Naphthalene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
TOTAL PETROLEUM HYDROCARBONS								
nC ₁₀ -nC ₁₄	µg/L	<5	<5	<5	<5	<5	<5	5
nC ₁₅ -nC ₂₈	µg/L	<5	<5	5.6	14	<5	<5	5
nC ₂₉ -nC ₃₆	µg/L	<5	<5	5.0	<5	<5	<5	5
ALDEHYDES								
Acetaldehyde	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Formaldehyde	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Gluteraldehyde	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1

Client Reference		C3A	C3B	C3C	C4A	C4B	C4C	Reporting Limit
QHSS Reference	Units	09KE8604	09KE8605	09KE8606	09KE8607	09KE8608	09KE8609	
POLYNUCLEAR AROMATIC HYDROCARBONS								
Benzo[ghi]perylene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Dibenz[a,h]anthracene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Indeno[1,2,3-cd]pyrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benzo[a]pyrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benzo[b+k]fluoranthene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Chrysene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Benz[a]anthracene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Pyrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Fluoranthene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Anthracene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Phenanthrene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Fluorene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Acenaphthene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Acenaphthylene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Naphthalene	µg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
TOTAL PETROLEUM HYDROCARBONS								
nC ₁₀ -nC ₁₄	µg/L	<5	<5	<5	<5	<5	<5	5
nC ₁₅ -nC ₂₈	µg/L	<5	<5	<5	<5	<5	<5	5
nC ₂₉ -nC ₃₆	µg/L	<5	<5	<5	<5	<5	<5	5
ALDEHYDES								
Acetaldehyde	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Formaldehyde	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Gluteraldehyde	mg/L	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1

Client Reference		C5A	C5B	C5C	Reporting Limit
QHFSS Reference	Units	09KE8610	09KE8611	09KE8612	
POLYNUCLEAR AROMATIC HYDROCARBONS					
Benzo[ghi]perylene	µg/L	<0.01	<0.01	<0.01	0.01
Dibenz[a,h]anthracene	µg/L	<0.01	<0.01	<0.01	0.01
Indeno[1,2,3-cd]pyrene	µg/L	<0.01	<0.01	<0.01	0.01
Benzo[a]pyrene	µg/L	<0.01	<0.01	<0.01	0.01
Benzo[b+k]fluoranthene	µg/L	<0.01	<0.01	<0.01	0.01
Chrysene	µg/L	<0.01	<0.01	<0.01	0.01
Benz[a]anthracene	µg/L	<0.01	<0.01	<0.01	0.01
Pyrene	µg/L	<0.01	<0.01	<0.01	0.01
Fluoranthene	µg/L	<0.01	<0.01	<0.01	0.01
Anthracene	µg/L	<0.01	<0.01	<0.01	0.01
Phenanthrene	µg/L	<0.01	<0.01	<0.01	0.01
Fluorene	µg/L	<0.01	<0.01	<0.01	0.01
Acenaphthene	µg/L	<0.01	<0.01	<0.01	0.01
Acenaphthylene	µg/L	<0.01	<0.01	<0.01	0.01
Naphthalene	µg/L	<0.01	<0.01	<0.01	0.01
TOTAL PETROLEUM HYDROCARBONS					
nC ₁₀ -nC ₁₄	µg/L	<5	<5	<5	5
nC ₁₅ -nC ₂₈	µg/L	<5	<5	<5	5
nC ₂₉ -nC ₃₆	µg/L	<5	<5	<5	5
ALDEHYDES					
Acetaldehyde	mg/L	<0.1	<0.1	<0.1	0.1
Formaldehyde	mg/L	<0.1	<0.1	<0.1	0.1
Gluteraldehyde	mg/L	<0.1	<0.1	<0.1	0.1

	Package Number	Inorganics LabNum	Client Reference	Client	Sample Description	Sample Description	Collected Date	Received Date	Commenced Date	Reported Date	Sample	Order No.	Total Beryllium	Total Arsenic	Total Cadmium	Total Chromium	Total Nickel	Total Lead	Total Zinc	Dissolved Beryllium mg/L	Dissolved Arsenic mg/L	Dissolved Cadmium mg/L	Dissolved Chromium mg/L	Dissolved Nickel mg/L	Dissolved Lead mg/L	Dissolved Zinc mg/L
													mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L							
81157-4932	SSP0020873	09NA16496	T1AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	< 0.0001	0.0001	0.0004	0.0001	0.0007	0.778							
81157-4943	SSP0020873	09NA16497	T1BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	< 0.0001	0.0001	0.0004	0.0001	0.0006	0.788							
81157-4959	SSP0020873	09NA16498	T1CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	< 0.0001	0.0001	0.0004	0.0002	0.0007	0.782							
81157-4965	SSP0020873	09NA16499	T2AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0023	0.0003	0.0084	0.158							
81157-4976	SSP0020873	09NA16500	T2BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.003	0.0005	0.0086	0.161							
81157-4987	SSP0020873	09NA16501	T2CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0027	0.0004	0.0086	0.159							
81157-4998	SSP0020873	09NA16502	T3AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0002	< 0.0001	0.0003	0.0005	0.0014	0.079							
81157-5006	SSP0020873	09NA16503	T3BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0002	< 0.0001	0.0003	0.0003	0.0014	0.082							
81157-5015	SSP0020873	09NA16504	T3CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0002	< 0.0001	0.0004	0.0003	0.0028	0.082							
81157-5029	SSP0020873	09NA16505	T4AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	0.0001	0.0021	0.0011	0.0054	0.493							
81157-5038	SSP0020873	09NA16506	T4BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	0.0002	0.002	0.001	0.0056	0.464							
81157-5047	SSP0020873	09NA16507	T4CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	0.0001	0.002	0.0009	0.0054	0.437							
81157-5051	SSP0020873	09NA16508	T5AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	0.0001	0.001	0.0007	0.0029	1.407							
81157-5060	SSP0020873	09NA16509	T5BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	0.0001	0.001	0.0005	0.003	1.427							
81157-5074	SSP0020873	09NA16510	T5CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	0.0001	0.001	0.0005	0.0029	1.435							
81157-5083	SSP0020873	09NA16511	T6AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0079	0.0004	0.0041	0.387							
81157-5092	SSP0020873	09NA16512	T6BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0089	0.0004	0.004	0.393							
81157-5104	SSP0020873	09NA16513	T6CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0086	0.0009	0.0045	0.4							
81157-5110	SSP0020873	09NA16514	T7AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0002	0.0001	0.0054	0.0001	0.0004	0.079							
81157-5121	SSP0020873	09NA16515	T7BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0046	0.0001	0.0003	0.073							
81157-5132	SSP0020873	09NA16516	T7CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0042	0.0001	0.0003	0.066							
81157-5143	SSP0020873	09NA16517	T1AF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	< 0.0001	0.0002	0.0003	0.0011	0.0013	0.789
81157-5159	SSP0020873	09NA16518	T1BF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	< 0.0001	0.0001	0.0003	0.0001	0.001	0.759
81157-5165	SSP0020873	09NA16519	T1CF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	< 0.0001	0.0001	0.0003	0.0001	0.0011	0.811
81157-5176	SSP0020873	09NA16520	T2AF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	< 0.0001	0.0018	0.0004	0.0076	0.157
81157-5187	SSP0020873	09NA16521	T2BF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	< 0.0001	0.0018	0.0005	0.008	0.158
81157-5198	SSP0020873	09NA16522	T2CF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	< 0.0001	0.0018	0.0003	0.008	0.157
81157-5203	SSP0020873	09NA16523	T3AF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0002	0.0001	0.0002	0.0002	0.001	0.062
81157-5214	SSP0020873	09NA16524	T3BF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0002	< 0.0001	0.0002	0.0003	0.0006	0.064
81157-5220	SSP0020873	09NA16525	T3CF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0002	< 0.0001	0.0002	0.0003	0.0012	0.069
81157-5231	SSP0020873	09NA16526	T4AF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	0.0001	0.0017	0.0015	0.0071	0.578
81157-5242	SSP0020873	09NA16527	T4BF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	0.0001	0.0018	0.0015	0.006	0.547
81157-5258	SSP0020873	09NA16528	T4CF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	0.0001	0.002	0.0015	0.0074	0.538
81157-5269	SSP0020873	09NA16529	T5AF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	0.0001	0.0007	0.0005	0.0019	1.409
81157-5275	SSP0020873	09NA16530	T5BF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	0.0001	0.0007	0.0005	0.002	1.376
81157-5286	SSP0020873	09NA16531	T5CF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	0.0001	0.0007	0.0004	0.002	1.382
81157-5297	SSP0020873	09NA16532	T6AF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	< 0.0001	0.0071	0.0004	0.0032	0.374
81157-5305	SSP0020873	09NA16533	T6BF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	< 0.0001	0.0072	0.0004	0.0032	0.371
81157-5319	SSP0020873	09NA16534	T6CF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	< 0.0001	0.007	0.0004	0.0032	0.37
81157-5328	SSP0020873	09NA16535	T7AF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0002	< 0.0001	0.0036	0.0002	0.0013	0.066
81157-5337	SSP0020873	09NA16536	T7BF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0001	< 0.0001	0.0036	0.0002	0.001	0.065
81157-5346	SSP0020873	09NA16537	T7CF	Sinclair Knight Merz Pty Ltd	FILTERED	Rainwater Tank	09-Dec-09	10-Dec-09	10-Dec-09	13-Jan-10	Water	QE09512800								< 0.0001	0.0002	< 0.0001	0.0036	0.0002	0.0013	0.065
81157-6877	SSP0020888	09NA16559	C1AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	10-Dec-09	10-Dec-09	10-Dec-10	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0001	0.0001	0.0001	0.005							
81157-6888	SSP0020888	09NA16560	C1BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	10-Dec-09	10-Dec-09	10-Dec-10	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0001	0.0001	0.0002	0.005							
81157-6899	SSP0020888	09NA16561	C1CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	10-Dec-09	10-Dec-09	10-Dec-10	13-Jan-10	Water	QE09512800	< 0.0001	0.0001	< 0.0001	0.0002	0.0001	0.0001	0.005							
81157-6902	SSP0020888	09NA16562	C2AT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	10-Dec-09	10-Dec-09	10-Dec-10	13-Jan-10	Water	QE09512800	< 0.0001	0.0006	0.0001	0.0002	0.0016	0.0057	0.037							
81157-6913	SSP0020888	09NA16563	C2BT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	10-Dec-09	10-Dec-09	10-Dec-10	13-Jan-10	Water	QE09512800	< 0.0001	0.0006	< 0.0001	0.0002	0.0017	0.0056	0.036							
81157-6924	SSP0020888	09NA16564	C2CT	Sinclair Knight Merz Pty Ltd	TOTAL	Rainwater Tank	10-Dec-09	10-Dec-09	10-Dec-10	13-Jan-10	Water	QE09512800	< 0.0001	0.0006	< 0.0001	0.0002	0.0017	0.0057	0.036							
81157-6930	SSP0020888	09NA16																								