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Senator Alex Gallacher  
Chair, Foreign Affairs, Defence and Trade Committee  
Department of the Senate  
PO Box 6100  
Parliament Houses  
CANBERRA ACT 2600

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Dear Senator

**Responses to Questions on Notice: Inquiry into the contamination caused by firefighting foams at RAAF Base Williamtown and other sites**

In addition to a written submission I provided evidence on behalf of Hunter Water Corporation to the Foreign Affairs, Defence and Trade References Committee Inquiry into the Contamination caused by firefighting foams at RAAF Base Williamtown and other sites held at the Newcastle City Hall on Tuesday 22 December 2015.

In providing detailed evidence to address a number of questions that were asked by Senators, I opted to take two questions on notice in order to provide appropriate detail. A number of additional written questions were received from Senator Black and Senator Rhiannon. The purpose of this letter is to address these questions.

**Question 1:** Question from the Deputy Chair, Senator Back, regarding the result of Hunter Water's 2009 sample of groundwater tested for perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA).

**Response:** As per evidence provided at the hearing, Hunter Water sampled Pump Station 9 for PFOA and PFOS in October 2009 as a proactive exercise following the addition of PFOS to the Stockholm Convention's Annex. Hunter Water routinely samples for emergent chemicals in drinking water, including herbicides and pesticides, heavy metals, and hydrocarbons.

A single sample from Pump Station 9 was tested on Hunter Water's behalf by a National Association of Testing Authorities (NATA) certified laboratory on 9 October 2009. PFOA was found to be below the limit of detection (a nil result) and PFOS was found to be at a concentration of 0.03 micrograms per litre ( $\mu\text{g/L}$ ). This is marginally above the limit of detection of 0.02  $\mu\text{g/L}$ .

Hunter Water is licenced to meet the Australian Drinking Water Guidelines (ADWGs) as issued by the National Health and Medical Research Council (NHMRC). The current ADWGs do not include guidelines on appropriate exposure levels for PFOA or PFOS. In instances such as this, it is standard practice to refer to international guidelines. In January

2009 the United States Environmental Protection Agency's Office of Water established a provisional health advisory guideline of 0.2 micrograms per litre ( $\mu\text{g/L}$ ) for short-term exposure to PFOS through drinking water, an order of magnitude greater than that detected at Pump Station 9.

In 2009 Hunter Water was not aware of any evidence of groundwater or surface water contamination due to PFOS/PFOA at the Williamstown RAAF. PFOS is a chemical that has a wide range of applications. Given the detection was at such a low level and there was no risk to drinking water supplies no further action was taken.

In May 2012 Defence advised Hunter Water that fire fighting foams containing PFOS/PFOA were used on the base and there was the potential for contamination. In response to this advice Hunter Water tested all of its bores in the Tomago Borefield field for PFOS/PFOA on 22 May 2012. All samples, including the sample from Station 9, returned nil detects for PFOS/PFOA. In May 2013 Defence advised Hunter Water that detectable levels of PFOS/PFOA were found in groundwater across the RAAF Base but groundwater samples from off-site returned nil detects for PFOS/PFOA. Based on the risk of drawing PFOS/PFOA towards Hunter Water borelines Hunter Water made the decision to embargo the use of Pump Stations 7 and 9 for water supply purposes in September 2014.

**Question 2:** Question from Senator Dastyari regarding when Hunter Water's Board of Directors were notified of the decision to embargo Pump Stations 7 and 9 of the Tomago Sandbeds.

**Response:** Under the *Hunter Water Act 1991* and the *State Owned Corporations Act (NSW)* the Hunter Water's Board of Directors is responsible for guiding and overseeing the Corporation's performance, while the Managing Director (Chief Executive Officer) is responsible for the day-to-day operational management of the Corporation.

The decision to embargo bores due to possible contamination following notification from the Department of Defence is operational in nature and was made under delegation by executive management, in consultation with officers of the NSW Ministry of Health (NSW Health) to remove any risk of impacting the Lower Hunter's drinking water supply.

The Hunter Water Board were first advised of the decision to embargo pump stations 7 & 9 in September of 2015.

**Question 3:** Written question from Senator Back: Could you provide information regarding Hunter Water on water drawings from all bores in the Tomago sand beds but especially bores 5, 7, and 9 between 2009 and 2015?

**Response:** Table 1 in Attachment 1 appended to this letter contains information on total annual potable water production volumes from each boreline in the Tomago Sandbeds from 1999 to 2015, including Pump Stations 5, 7 and 9.

**Question 4:** Written question from Senator Back: How many days in each year was each bore harvested for potable water and what % of total Hunter Water Corporation water supply did each contribute in each of those years?

**Response:** Table 2 in Attachment 1 appended to this letter contains information on the number of days of potable water production for each boreline in the Tomago Sandbeds from 1999 to 2015.

Table 3 in Attachment 1 appended to this letter contains information on the total annual potable water production from each boreline in the Tomago Sandbeds from 1999 to 2015, expressed as a percentage of total annual system water supply. Borefield production represented between 1% and 29% of total annual water supply during this period, with individual borelines contributing up to 2.8% of total annual water supply.

**Question 5:** Written question from Senator Back: Are they significant contributors to water demand?

**Response:** The Tomago Sandbeds is primarily a valuable drought reserve, and is relied on to supplement supplies from other sources during a drought. The Tomago Sandbeds have the capacity to supply approximately 20% of the Lower Hunter's drinking water on an ongoing basis, although peak production capacity can be much higher on a short term basis when needed to meet demand.

Pump Stations 5, 7 and 9 contribute approximately 1.5 gigalitres (billion litres), equivalent to 10% of the Tomago Sandbed's total yield, or 2% of Hunter Water's total reserves. Pump Stations 5, 7 and 9 contribute around 15% of the peak production capacity of the Tomago Sandbeds. Under certain operating circumstances, loss of peak production capacity from the Tomago Sandbeds can impact Hunter Water's ability to supply enough drinking water when demand is high.

As stated in my previous written submission, loss of long term production capacity of the Tomago Sandbeds will have an impact on when a new water source will be required as the region grows into the future. It is estimated that this loss will bring forward the required timing of a new water source by 2 to 3 years. The cost of bringing forward the next source augmentation is in the order of tens of millions of dollars to our customer base.

**Question 6:** Written question from Senator Rhiannon: What communication did Hunter Water have with the NSW Environmental Protection Authority or Defence about their 2009 tests?

In 2009 Hunter Water was not aware of any evidence of groundwater or surface water contamination due to PFOS/PFOA at the Williamstown RAAF. PFOS is a chemical that has a wide range of applications. Given the detection was at such a low level there could have been multiple sources to explain its detection. There was no risk to drinking water supplies at the concentration detected. Given these factors there was no communication with the EPA or the Department of Defence at the time regarding the test of bore station 9 taken in 2009.

I trust that this letter addresses the outstanding questions of the Committee.

Yours Sincerely

DARREN CLEARY  
Chief Operating Officer

Attached: *Attachment 1 - Annual Potable Water Production from Borelines in the Tomago Sandbeds*



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**Attachment 1 - Annual Potable Water Production from Borelines in the Tomago Sandbeds**

**Table 1: Total Annual Potable Water Production for Each Boreline (Megalitres)**

Year	1	2	3	4	5	6	7	7A	8	9	9A	10	11	12	13	14	15	16/17	18	19	20	21	22	23	24	25	26	27	
	Pump station (boreline) name																												
1999	140	642	21	1598	413	0	713	117	675	597	492	949	775	688	0	1004	809	760	1001	0	543	0	988	0	0	0	0	0	0
2000	0	268	586	525	741	0	550	16	110	971	469	306	900	1240	0	812	655	790	805	0	151	405	671	156	83	0	0	0	0
2001	0	421	716	995	1192	0	817	0	1173	311	108	1575	1381	1200	0	1063	770	815	1163	0	1155	1350	570	234	908	2046	583	583	
2002	0	459	399	395	527	0	666	0	768	444	0	452	782	157	0	647	837	1355	461	0	1084	1068	891	186	478	1343	717	717	
2003	0	612	302	570	746	0	482	0	280	688	0	358	421	323	0	521	459	932	380	0	883	405	543	110	456	837	995	995	
2004	98	515	361	840	141	0	872	0	699	383	0	334	391	394	0	755	88	1158	840	0	407	1058	227	0	230	886	656	656	
2005	406	720	0	866	161	0	891	0	425	95	0	339	698	0	0	318	39	820	5	0	828	1318	0	0	506	513	464	464	
2006	16	408	0	547	282	0	565	0	574	241	0	24	419	450	0	539	191	810	0	0	636	821	0	0	274	496	715	715	
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	774	0	0	0	345	0	0	0	0	0	0	0
2008	0	135	0	170	24	0	151	0	165	0	0	0	89	0	0	177	0	837	0	0	156	462	0	0	43	156	0	0	0
2009	0	288	0	394	0	0	0	0	388	298	0	189	310	223	0	438	0	690	0	0	531	1400	0	0	134	336	159	159	
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	724	0	0	0	414	0	0	0	0	0	0	0
2011	0	0	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	764	0	0	0	216	0	0	0	0	0	0	0
2012	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	743	0	0	0	651	0	0	0	0	0	0	0
2013	0	0	126	0	233	0	40	0	45	0	0	0	0	0	0	170	0	780	0	0	0	620	0	0	115	107	143	143	
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	814	0	0	0	0	0	0	0	0	0	0	0
2015	0	30	579	0	858	0	0	0	510	0	0	120	205	271	0	433	566	804	0	0	31	1385	0	0	318	702	0	249	

**Table 2: Number of Days of Potable Water Production Each Year for Each Boreline**

Year	Pump station (boreline) name																												
	1	2	3	4	5	6	7	7A	8	9	9A	10	11	12	13	14	15	16/17	18	19	20	21	22	23	24	25	26	27	
1999	28	123	21	184	104	0	166	120	125	104	149	179	143	135	0	210	156	362	129	0	186	0	211	0	0	0	0	0	0
2000	0	128	136	127	184	0	121	15	19	142	129	61	159	173	0	137	122	365	97	0	29	168	180	180	27	0	0	0	0
2001	0	198	257	271	197	0	178	0	211	50	29	282	233	215	0	208	135	365	132	0	252	285	214	255	260	288	85	85	
2002	0	93	155	149	126	0	108	0	130	72	0	73	125	24	0	113	134	365	54	0	174	182	197	186	159	189	157	157	
2003	0	116	113	153	142	0	85	0	47	112	0	85	73	62	0	98	84	365	84	0	121	62	117	124	149	145	161	161	
2004	24	110	149	148	73	0	144	0	123	73	0	86	80	88	0	155	19	365	161	0	50	160	82	0	90	158	87	87	
2005	136	110	0	160	65	0	142	0	79	16	0	93	118	0	0	47	7	365	0	0	132	156	0	0	159	131	74	74	
2006	7	98	0	112	109	0	101	0	102	51	0	7	95	109	0	99	35	365	0	0	106	112	0	0	106	111	112	112	
2007	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	365	0	0	0	118	0	0	0	0	0	0	
2008	0	27	0	27	19	0	27	0	27	0	0	0	21	0	0	27	0	365	0	0	27	70	0	0	27	27	0	0	
2009	0	68	0	69	0	0	0	0	70	70	0	48	71	61	0	69	0	363	0	0	67	251	0	0	46	62	58	58	
2010	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	363	0	0	0	109	0	0	0	0	0	0	
2011	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	363	0	0	0	68	0	0	0	0	0	0	
2012	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	365	0	0	0	178	0	0	0	0	0	0	
2013	0	0	34	0	29	0	7	0	7	0	0	0	0	0	0	25	0	365	0	0	0	187	0	0	35	27	25	25	
2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	365	0	0	0	0	0	0	0	0	0	0	
2015	0	4	102	0	110	0	0	0	90	0	0	69	71	67	0	72	92	365	0	0	4	258	0	0	102	102	0	56	

**Table 3: Total Annual Potable Water Production for Each Boreline as a Percentage of Total System Water Supply**

Year	Pump station (boreline) name																												
	1	2	3	4	5	6	7	7A	8	9	9A	10	11	12	13	14	15	16/17	18	19	20	21	22	23	24	25	26	27	
1999	0.2	0.9	0.0	2.2	0.6	0.0	1.0	0.2	0.9	0.8	0.7	1.3	1.1	0.9	0.0	1.4	1.1	1.0	1.4	0.0	0.7	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0
2000	0.0	0.4	0.8	0.7	1.0	0.0	0.7	0.0	0.1	1.3	0.6	0.4	1.2	1.7	0.0	1.1	0.9	1.1	1.1	0.0	0.2	0.6	0.9	0.2	0.1	0.0	0.0	0.0	
2001	0.0	0.6	1.0	1.4	1.6	0.0	1.1	0.0	1.6	0.4	0.1	2.2	1.9	1.6	0.0	1.5	1.1	1.1	1.6	0.0	1.6	1.8	0.8	0.3	1.2	2.8	0.8	0.8	
2002	0.0	0.6	0.5	0.5	0.7	0.0	0.9	0.0	1.0	0.6	0.0	0.6	1.1	0.2	0.0	0.9	1.1	1.8	0.6	0.0	1.5	1.5	1.2	0.3	0.6	1.8	1.0	1.0	
2003	0.0	0.8	0.4	0.7	1.0	0.0	0.6	0.0	0.4	0.9	0.0	0.5	0.5	0.4	0.0	0.7	0.6	1.2	0.5	0.0	1.1	0.5	0.7	0.1	0.6	1.1	1.3	1.3	
2004	0.1	0.7	0.5	1.2	0.2	0.0	1.2	0.0	1.0	0.5	0.0	0.5	0.5	0.5	0.0	1.0	0.1	1.6	1.2	0.0	0.6	1.5	0.3	0.0	0.3	1.2	0.9	0.9	
2005	0.6	1.0	0.0	1.2	0.2	0.0	1.2	0.0	0.6	0.1	0.0	0.5	1.0	0.0	0.0	0.4	0.1	1.1	0.0	0.0	1.2	1.8	0.0	0.0	0.7	0.7	0.6	0.6	
2006	0.0	0.6	0.0	0.8	0.4	0.0	0.8	0.0	0.8	0.3	0.0	0.0	0.6	0.6	0.0	0.7	0.3	1.1	0.0	0.0	0.9	1.1	0.0	0.0	0.4	0.7	1.0	1.0	
2007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
2008	0.0	0.2	0.0	0.3	0.0	0.0	0.2	0.0	0.2	0.0	0.0	0.0	0.1	0.0	0.0	0.3	0.0	1.2	0.0	0.0	0.2	0.7	0.0	0.0	0.1	0.2	0.0	0.0	
2009	0.0	0.4	0.0	0.6	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.3	0.5	0.3	0.0	0.7	0.0	1.0	0.0	0.0	0.8	2.1	0.0	0.0	0.2	0.5	0.2	0.2	
2010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	
2011	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	
2012	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.2	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	
2013	0.0	0.0	0.2	0.0	0.3	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	1.1	0.0	0.0	0.0	0.9	0.0	0.0	0.2	0.2	0.2	0.2	
2014	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
2015	0.0	0.0	0.9	0.0	1.3	0.0	0.0	0.0	0.8	0.0	0.0	0.2	0.3	0.4	0.0	0.6	0.8	1.2	0.0	0.0	0.0	2.1	0.0	0.0	0.5	1.0	0.0	0.4	