N00158.AR.000377
NASJRB WILLOW GROVE
5090.3a

LETTER AND U S NAVY RESPONSE TO U S EPA REGION III COMMENTS REGARDING REMEDIAL INVESTIGATION REPORT FOR SITE 3 NINTH STREET LANDFILL NAS JRB WILLOW GROVE PA
08/24/2011
TETRA TECH NUS

TETRA TECH

PHIL-24457

August 24, 2011

Project Number 02014

Ms. Lisa Cunningham (3HS11)
United States Environmental Protection Agency (EPA)
1650 Arch Street
Philadelphia, Pennsylvania 19103

Reference: Contract No. N62470-08-D-1001
Contract Task Order (CTO) No. WE05

Subject: Response to EPA Comments
Remedial Investigation (RI) Report
Site 3 - Ninth Street Landfill
Naval Air Station Joint Reserve Base (NAS JRB) – Willow Grove
Philadelphia, Pennsylvania

Dear Ms. Cunningham:

Tetra Tech is pleased to submit the following response to EPA's comment received by email on August 15, 2011 regarding the human health risk assessment for the draft RI report for Site 3 - Ninth Street Landfill at NAS JRB Willow Grove. These responses are provided on behalf of the Navy Base Realignment and Closure (BRAC) Program Management Office (PMO).

The EPA comment on the calculations for the RAGS D tables has been included with the response below the comment.

EPA COMMENT

EPA attempted to confirm Table 7.27 RME, Soil Ingestion. EPA was not able to confirm the exact cancer risk values but came very close. Here is an example of the results compared to the recorded risk results:

Benzo(a)pyrene - risk results indicate - 1.23E-04, EPA calculated 1.4E-04

Benzo(k)fluoranthene - risk results indicate - 9.13E-07, EPA calculated - 1.1E-06

Chrysene - risk results indicate - 1.53E-07, EPA calculated - 1.75E-07

Dibenz(a,h)anthracene - risk results indicate - 1.19E-05, EPA calculated 1.38E-05

These are the only results EPA attempted to confirm. As you can see, the numbers are very close but EPA results are slightly higher. Please confirm the proper use of the ADAF's.

Tetra Tech NUS, Inc.
234 Mall Boulevard, Suite 260, King of Prussia, PA 19406-2954
Tel 610.491.9688 Fax 610.491.9645 www.ttnus.com

RESPONSE

The risks shown in Table 7.27 are child risk only. The EPA calculation included in the comment is for Lifetime Risk which are included in Table 7.29. Table 7.29 was reviewed and is consistent with the risks calculated by EPA. A copy of Table 7.29 is attached.

I hope this response adequately addresses EPA's comment. Please do not hesitate to contact me if you have any questions.

Sincerely,

Andrew Flebowitz
Project Manager

AF/nfs

Enclosure

c: Jeffrey Dale (Navy BRAC PMO)
Robert Lewandowski (Navy BRAC PMO)
Linda Watson (EPA Region 3)
Tim Sheehan (PADEP)
Jessica Kasmari (PADEP)
Glenn Wagner (Tetra Tech)
File

ATTACHMENT

TABLE 7.29.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - LIFETIME RESIDENT EXPOSURE TO SITE 3 LANDFILL AREA SOIL

REASONABLE MAXIMUM EXPOSURES

NAS JRB WILLOW GROVE

Scenario Timeframe: Future
Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
Soil	Soil	Site 3 Landfill Area Contact with Soi	Ingestion	Total 2,3,7,8-TCDD Equiv	2.43E-01	ug/kg	3.80E-10	mg/kg-day	1.30E+05	mg/kg-day	4.95E-05					N/A
				Aluminum	1.98E+04	mg/kg	9.30E-03	mg/kg-day	--	mg/kg-day	--					N/A
				Antimony	2.50E+01	mg/kg	1.17E-05	mg/kg-day	--	mg/kg-day	--					N/A
				Arsenic	6.21E+00	mg/kg	9.72E-06	mg/kg-day	1.50E+00	mg/kg-day	1.46E-05					N/A
				Cadmium	4.71E+01	mg/kg	2.21E-05	mg/kg-day	--	mg/kg-day	--					N/A
				Chromium	3.94E+01	mg/kg	6.17E-05	mg/kg-day	5.00E-01	mg/kg-day	1.32E-04					N/A
				Cobalt	1.23E+01	mg/kg	5.78E-06	mg/kg-day	--	mg/kg-day	--					N/A
				Copper	9.67E+02	mg/kg	4.54E-04	mg/kg-day	--	mg/kg-day	--					N/A
				Iron	3.36E+04	mg/kg	1.58E-02	mg/kg-day	--	mg/kg-day	--					N/A
				Lead	3.22E+02	mg/kg	1.51E-04	mg/kg-day	--	mg/kg-day	--					N/A
				Manganese	1.32E+03	mg/kg	6.20E-04	mg/kg-day	--	mg/kg-day	--					N/A
				Mercury	1.15E+00	mg/kg	5.40E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Nickel	3.74E+01	mg/kg	1.76E-05	mg/kg-day	--	mg/kg-day	--					N/A
				Silver	1.60E+01	mg/kg	7.51E-06	mg/kg-day	--	mg/kg-day	--					N/A
				Vanadium	4.45E+01	mg/kg	2.09E-05	mg/kg-day	--	mg/kg-day	--					N/A
				Zinc	1.38E+03	mg/kg	6.48E-04	mg/kg-day	--	mg/kg-day	--					N/A
				4,4'-DDD	4.63E+03	ug/kg	7.25E-06	mg/kg-day	2.40E-01	mg/kg-day	1.74E-06					N/A
				4,4'-DDE	6.03E+02	ug/kg	9.44E-07	mg/kg-day	3.40E-01	mg/kg-day	3.21E-07					N/A
				4,4'-DDT	1.73E+04	ug/kg	2.71E-05	mg/kg-day	3.40E-01	mg/kg-day	9.21E-06					N/A
				Aroclor-1248	5.60E+02	ug/kg	8.77E-07	mg/kg-day	2.00E+00	mg/kg-day	1.75E-06					N/A
				Aroclor-1254	1.34E+02	ug/kg	2.10E-07	mg/kg-day	2.00E+00	mg/kg-day	4.20E-07					N/A
				Aroclor-1260	4.51E+01	ug/kg	7.06E-08	mg/kg-day	2.00E+00	mg/kg-day	1.41E-07					N/A
				Dieldrin	7.01E+02	ug/kg	1.10E-06	mg/kg-day	1.60E+01	mg/kg-day	1.76E-05					N/A
				Heptachlor Epoxide	1.28E+01	ug/kg	2.00E-08	mg/kg-day	9.10E+00	mg/kg-day	1.82E-07					N/A
				Benz(a)anthracene	3.92E+03	ug/kg	6.14E-06	mg/kg-day	7.30E-01	mg/kg-day	1.92E-05					N/A
				Benzo(a)pyrene	2.89E+03	ug/kg	4.52E-06	mg/kg-day	7.30E+00	mg/kg-day	1.41E-04					N/A
				Benzo(b)fluoranthene	3.21E+03	ug/kg	5.03E-06	mg/kg-day	7.30E-01	mg/kg-day	1.57E-05					N/A
				Benzo(k)fluoranthene	2.14E+03	ug/kg	3.35E-06	mg/kg-day	7.30E-02	mg/kg-day	1.05E-06					N/A
				Chrysene	3.58E+03	ug/kg	5.60E-06	mg/kg-day	7.30E-03	mg/kg-day	1.75E-07					N/A
				Dibenz(a,h)anthracene	2.80E+02	ug/kg	4.38E-07	mg/kg-day	7.30E+00	mg/kg-day	1.37E-05					N/A
				Indeno(1,2,3-cd)pyrene	1.30E+03	ug/kg	2.04E-06	mg/kg-day	7.30E-01	mg/kg-day	6.36E-06					N/A
				Naphthalene	7.76E+02	ug/kg	3.64E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Phenanthrene	1.25E+04	ug/kg	5.87E-06	mg/kg-day	--	mg/kg-day	--					N/A
				Ethylbenzene	6.55E+02	ug/kg	1.03E-06	mg/kg-day	1.10E-02	mg/kg-day	1.13E-08					N/A
			Exp. Route Total								4.25E-04					--

TABLE 7.29.RME

CALCULATION OF CHEMICAL CANCER RISKS AND NON-CANCER HAZARDS - LIFETIME RESIDENT EXPOSURE TO SITE 3 LANDFILL AREA SOIL

REASONABLE MAXIMUM EXPOSURES

NAS JRB WILLOW GROVE

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Receptor Population: Resident
Receptor Age: Child/Adult

Medium	Exposure Medium	Exposure Point	Exposure Route	Chemical of Potential Concern	EPC		Cancer Risk Calculations					Non-Cancer Hazard Calculations				
					Value	Units	Intake/Exposure Concentration		CSF/Unit Risk		Cancer Risk	Intake/Exposure Concentration		RfD/RfC		Hazard Quotient
							Value	Units	Value	Units		Value	Units	Value	Units	
			Dermal	Total 2,3,7,8-TCDD Equiv	2.43E-01	ug/kg	3.60E-11	mg/kg-day	1.30E+05	mg/kg-day	4.68E-06					N/A
				Aluminum	1.98E+04	mg/kg	3.71E-04	mg/kg-day	--	mg/kg-day	--					N/A
				Antimony	2.50E+01	mg/kg	4.68E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Arsenic	6.21E+00	mg/kg	9.21E-07	mg/kg-day	1.50E+00	mg/kg-day	1.38E-06					N/A
				Cadmium	4.71E+01	mg/kg	8.83E-08	mg/kg-day	--	mg/kg-day	--					N/A
				Chromium	3.94E+01	mg/kg	1.95E-06	mg/kg-day	2.00E+01	mg/kg-day	1.56E-04					N/A
				Cobalt	1.23E+01	mg/kg	2.30E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Copper	9.67E+02	mg/kg	1.81E-05	mg/kg-day	--	mg/kg-day	--					N/A
				Iron	3.36E+04	mg/kg	6.30E-04	mg/kg-day	--	mg/kg-day	--					N/A
				Lead	3.22E+02	mg/kg	6.03E-06	mg/kg-day	--	mg/kg-day	--					N/A
				Manganese	1.32E+03	mg/kg	2.47E-05	mg/kg-day	--	mg/kg-day	--					N/A
				Mercury	1.15E+00	mg/kg	2.16E-08	mg/kg-day	--	mg/kg-day	--					N/A
				Nickel	3.74E+01	mg/kg	7.01E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Silver	1.60E+01	mg/kg	3.00E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Vanadium	4.45E+01	mg/kg	8.34E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Zinc	1.38E+03	mg/kg	2.59E-05	mg/kg-day	--	mg/kg-day	--					N/A
				4,4'-DDD	4.63E+03	ug/kg	6.87E-07	mg/kg-day	2.40E-01	mg/kg-day	1.65E-07					N/A
				4,4'-DDE	6.03E+02	ug/kg	8.94E-08	mg/kg-day	3.40E-01	mg/kg-day	3.04E-08					N/A
				4,4'-DDT	1.73E+04	ug/kg	2.57E-06	mg/kg-day	3.40E-01	mg/kg-day	8.72E-07					N/A
				Aroclor-1248	5.60E+02	ug/kg	3.87E-07	mg/kg-day	2.00E+00	mg/kg-day	7.75E-07					N/A
				Aroclor-1254	1.34E+02	ug/kg	9.27E-08	mg/kg-day	2.00E+00	mg/kg-day	1.85E-07					N/A
				Aroclor-1260	4.51E+01	ug/kg	3.12E-08	mg/kg-day	2.00E+00	mg/kg-day	6.24E-08					N/A
				Dieldrin	7.01E+02	ug/kg	3.46E-07	mg/kg-day	1.60E+01	mg/kg-day	5.54E-06					N/A
				Heptachlor Epoxide	1.28E+01	ug/kg	6.33E-09	mg/kg-day	9.10E+00	mg/kg-day	5.76E-08					N/A
				Benz(a)anthracene	3.92E+03	ug/kg	2.52E-06	mg/kg-day	7.30E-01	mg/kg-day	7.37E-06					N/A
				Benzo(a)pyrene	2.89E+03	ug/kg	1.86E-06	mg/kg-day	7.30E+00	mg/kg-day	5.43E-05					N/A
				Benzo(b)fluoranthene	3.21E+03	ug/kg	2.06E-06	mg/kg-day	7.30E-01	mg/kg-day	6.03E-06					N/A
				Benzo(k)fluoranthene	2.14E+03	ug/kg	1.37E-06	mg/kg-day	7.30E-02	mg/kg-day	4.02E-07					N/A
				Chrysene	3.58E+03	ug/kg	2.30E-06	mg/kg-day	7.30E-03	mg/kg-day	6.73E-08					N/A
				Dibenz(a,h)anthracene	2.80E+02	ug/kg	1.80E-07	mg/kg-day	7.30E+00	mg/kg-day	5.26E-06					N/A
				Indeno(1,2,3-cd)pyrene	1.30E+03	ug/kg	8.35E-07	mg/kg-day	7.30E-01	mg/kg-day	2.44E-06					N/A
				Naphthalene	7.76E+02	ug/kg	1.89E-07	mg/kg-day	--	mg/kg-day	--					N/A
				Phenanthrene	1.25E+04	ug/kg	3.05E-06	mg/kg-day	--	mg/kg-day	--					N/A
				Ethylbenzene	6.55E+02	ug/kg	9.71E-08	mg/kg-day	1.10E-02	mg/kg-day	1.07E-09					N/A
			Exp. Route Total								2.46E-04					--
		Exposure Point Total									6.71E-04					--
	Exposure Medium Total										6.71E-04					--
	Air	Site 3 Landfill Area Outdoor Air, Volatilization from Soil	Inhalation	Naphthalene	7.76E+02	ug/kg	3.37E-05	mg/m3	3.40E-02	1/(mg/m3)	1.15E-06					N/A
				Ethylbenzene	7.00E+03	ug/kg	1.19E-03	mg/m3	2.50E-03	1/(mg/m3)	2.97E-06					N/A
			Exp. Route Total								4.12E-06					--
		Exposure Point Total									4.12E-06					--
	Exposure Medium Total										4.12E-06					--
	Particulates	Site 3 Landfill Area Airborne Particulates, Emitted from Soil	Inhalation	Chromium	3.94E+01	mg/kg	2.50E-09	mg/m3	1.20E+01	1/(mg/m3)	7.61E-08					N/A
				Manganese	1.32E+03	mg/kg	6.71E-06	mg/m3	--	1/(mg/m3)	--					N/A
			Exp. Route Total								7.61E-08					--
		Exposure Point Total									7.61E-08					--
	Exposure Medium Total										7.61E-08					--
Medium Total											6.75E-04					--
										Total of Receptor Risks Across All Media	6.75E-04				Total of Receptor Hazards Across All Media	--