Letter Health Consultation

RAYTHEON HAZARDOUS WASTE SITE
ST. PETERSBURG, FLORIDA

SEPTEMBER 22, 2008

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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LETTER HEALTH CONSULTATION

RAYTHEON HAZARDOUS WASTE SITE
ST. PETERSBURG, FLORIDA

Prepared By:

Florida Department of Health
Under Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

September 30, 2008

Gayle Guidash
Environmental Health Director
Pinellas County Health Department
4175 East Bay Drive
Clearwater, FL 33764

RE: Azalea Neighborhood Irrigation Wells

Dear Ms. Guidash:

As you requested in April 2008, Florida Department of Health (DOH) examined possible health risks associated with contaminated irrigation wells near the Raytheon hazardous waste site in St. Petersburg. Florida DOH evaluates the public health significance of Florida hazardous waste sites through a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR).

To date, 1,4-dioxane, trichloroethene (TCE) and cis-1,2-dichloroethene have been found above drinking water standards in private irrigation wells near the Raytheon site. Trihalomethanes were also found in a few irrigation wells. Trihalomethanes are typically a byproduct of chlorinated water such as swimming pools.

Residents are concerned about the possible health risks associated with exposure to chemicals in their irrigation wells. In this health consultation, Florida DOH examines the following exposure pathways: lawn irrigation and use of private irrigation water to fill swimming pools. In a separate report, Florida DOH will assess consumption of homegrown fruits and vegetables grown with irrigation well water. Florida DOH distributed its preliminary findings on use of private irrigation wells at a July 9, 2008 open house meeting in St. Petersburg (Attachment A).

Background and Statement of Issues

The Raytheon site is at 1501 72nd Street North in St. Petersburg, Florida (Attachment B). The 32 acre site was owned by: Futuronics Toy Company (1955-1958), Air Associates (1958-1976), E-Systems (1976-1995) and Raytheon (1995-present). This property was used to manufacture electronics and communications hardware since

1955. In 1991, E-systems discovered ground water contaminated with 1,4-dioxane, trichloroethene (TCE), and other volatile organic chemicals (VOCs) during construction of the nearby Pinellas Trail. In 1992 E-Systems removed contaminated soil from the site and began a preliminary contamination assessment. In 1995, Raytheon acquired the site and continued the assessment. To date, Raytheon has identified 19 nearby private irrigation wells exceeding a drinking water standard (Attachments C and D) [DEP 2008].

There are no private drinking water wells near the Raytheon site. According to the Pinellas County Department of Public Works, homes near the Raytheon site connected to municipal water following construction. Because of a chronic water shortage, many nearby residents rely on shallow irrigation wells for lawn watering.

On May 5, 2008 Florida DOH, Pinellas CHD, and Florida DEP met with representatives of nearby home owners associations. DOH gathered health concerns associated with use of contaminated irrigation wells. After the meeting Florida DOH established a toll-free hotline to answer health-related questions. On May 30, 2008, DOH attended a public meeting held by Raytheon. On July 9, 2008, in conjunction with a Florida DEP information session, Florida DOH held an open house to answer health related questions, gather community health concerns, and to distribute a community update (Attachment A).

Discussion

Incidental ingestion, inhalation and dermal absorption are three possible completed exposure pathways from the contaminated irrigation water. In order to determine the risk of illness from use of irrigation wells, Florida DOH used an exposure model developed by toxicologists at the University of Florida. This model uses conservative assumptions that are protective of the most sensitive individuals, children and the elderly. This exposure model calculates the risk for non-potable uses of contaminated irrigation well water. The model considers the potential intake of contaminants in ground water through inhalation, dermal contact, and incidental ingestion. Inhalation rates for children and adults were combined with exposure frequency, exposure duration, and air concentration values to estimate inhalation exposures [Roberts 2008]. The irrigation model determines the risk of cancer associated with the levels of chemicals found in the irrigation wells.

DOH used this model for two exposure scenarios: lawn irrigation and swimming pools (Attachment C). The chemicals of concern are 1,4-dioxane, trichloroethene, and cis-1,2-dichloroethene (Attachment D). The model predicts no increased risk of cancer or non-cancer illness associated with the highest levels of contaminants found in the irrigation wells (Attachment E).

Conclusions

- Nineteen private irrigation wells have contaminants above the drinking water standards.
- Lawn watering or filling swimming pools from private irrigation wells near the Raytheon site is no apparent public health hazard.
- Breathing low levels of trichloroethylene (TCE), 1,4-dioxane, and other chemical vapors resulting from lawn irrigation with contaminated ground water is unlikely to cause cancer or other illnesses.
- Skin contact with or accidentally drinking small amounts of water from private irrigation wells are also not likely to cause cancer or other illnesses.

Recommendation

- Private irrigation wells should not be used as a drinking water source.

- Raytheon should continue to monitor private irrigation wells near the Raytheon site.

Public Health Action Plan

- DOH will continue to evaluate private irrigation well data as it becomes available.

- DOH will coordinate indoor air testing in August 2008.

- DOH will assess consumption of homegrown fruit and vegetables grown with irrigation well water.

Please call me if you have any questions about this assessment.

Sincerely,

Randy Merchant
Environmental Administrator
Florida Department of Health
Bureau of Environmental Public Health Medicine

cc: Deborah Getzoff, Southwest District Office
Brian Dougherty, FDEP Tallahassee Office

References

[DEP 2008] Florida Department of Environmental Protection. 2008. Raytheon Groundwater Assessment and Cleanup Plan
http://www.dep.state.fl.us/southwest/Raytheon/default.htm
Last viewed August 14, 2008.

[Roberts 2008] Roberts,S.(University of Florida). Letter to: B. Dougherty (Florida Department of Environmental Protection, Tallahassee, FL). 2008 Aug 1. Title: Risk-based criteria for non-potable use of groundwater, Raytheon Site.

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CERTIFICATION

The Florida Department of Health, Division of Environmental Health prepared this Health Consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. It followed approved methodology and procedures existing at the time it began and completed editorial review.

Jennifer Freed
Technical Project Officer,
CAT, CAPEB, DHAC

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation, and concurs with its findings.

Alan Yarbrough
Team Lead
CAT, CAPEB, DHAC, ATSDR

Attachment A: Community Update

Florida Department of Health/Pinellas County Health Department
Raytheon Area Public Health Update
July 2008

Irrigation Wells OK, Indoor Air Tests Planned

Use of Raytheon area irrigation wells is unlikely to cause illness and is not a public health threat. Area drinking water is from distant wells, routinely tested, and safe to use. The levels of chemicals in outdoor air near Raytheon are also not a public health threat. The Florida Department of Health (DOH) will, however, test air quality inside homes and apartments over the most contaminated ground water.

I. Irrigation Wells - Lawn watering or filling swimming pools from private irrigation wells near the Raytheon site is not a public health threat.

A. Breathing low levels of trichloroethylene (TCE), 1,4-dioxane, and other chemical vapors resulting from lawn irrigation with contaminated ground water is unlikely to cause cancer or other illnesses.
B. Skin contact with or accidentally drinking small amounts of water from private irrigation wells are also not likely to cause cancer or other illnesses.
C. Raytheon is testing homegrown fruits and vegetables for trichloroethylene (TCE), 1,4-dioxane, and other chemicals found in private irrigation wells.
D. Florida DOH will document its findings in a technical report and post on its web site (see below "For More Health Information").

II. Drinking water - Area drinking water is from distant wells, routinely tested, and safe to use. For more information visit http://www.tampabaywater.org/watersupply/currentsupplies.aspx#

III. Outdoor air - The outdoor air levels of chemicals associated with the contaminated ground water are not a public health threat.

A. Between December 2007 and February 2008, outdoor air was tested at 14 places in neighborhoods near the site.
B. Outdoor air levels of trichloroethylene (TCE), 1,4-dioxane, and other chemicals associated with the contaminated ground water were less than health guidelines and are not a public health threat.

IV. Indoor air - In August, Florida DOH and the Pinellas County Health Department will begin sampling air inside selected homes and apartments over areas of highest ground water contamination. They will analyze for trichloroethylene (TCE) and other vapors associated with the contaminated ground water.

About the Raytheon Site

The 32-acre Raytheon site is at 1501 72nd Street North, St. Petersburg. Since October 1957, this site has been used to manufacture electronics and communication hardware.

Releases of degreasing solvents on the Raytheon site resulted in contamination of soil and groundwater with 1,4-dioxane, trichloroethylene (TCE), and its breakdown products including 1,2-dichloroethene and vinyl chloride.

Between 1992 and 1994, the Raytheon site owner removed 100 tons of contaminated soil from on the site. Ground water contamination extends east, south, and southwest of the site under apartments and homes.

Although nearby residents receive municipal drinking water, a number rely on shallow irrigation wells for lawn watering.

About the Florida Department of Health

The Florida DOH reviews the public health threat at hazardous waste sites. It looks at air, soil, and water test results. The Florida DOH works closely with state and federal environmental agencies as well as county health departments. The US Agency for Toxic Substances and Disease Registry (ATSDR) provides financial and technical support to Florida DOH. Florida DOH and ATSDR publish technical reports estimating the health risk and recommending actions to protect public health.

For More Health Information

Florida Department of Health
Randy Merchant, Elizabeth Tull, or Susan Skye: Toll Free (877) 798-2772
Randy_Merchant@doh.state.fl.us; Elizabeth_Tull@doh.state.fl.us; Susan_Skye@doh.state.fl.us
http://hazwastework.doh.state.fl.us/

Pinellas County Health Department
Gayle Guidash (727) 538-7277 ext 1355
Gayle_Guidash@doh.state.fl.us
http://www.pinellashealth.com

US Agency for Toxic Substances and Disease Registry
http://www.atsdr.cdc.gov/

For Ground Water Cleanup Information

Florida Department of Environmental Protection
Pamala Vazquez (813) 632-7600, extension 467
Pamala.Vazquez@dep.state.fl.us
http://www.dep.state.fl.us/southwest/Raytheon/default.htm

For Raytheon Information

Robert Luhrs: 781-768-3995
Robert_C_Luhrs@raytheon.com
http://www.raytheon.com/businesses/ncs/st_petersburg/

Attachment B: Site Location Map

Attachment C: Model Parameters

Irrigation Model Parameters									
	Child	**Adult**	**Agg. Res.**	**Worker**					62-302
Body Weight (kg)	16.8	76.1	51.9	76.1					**Value**
Exposure Duration (y)	6	24	30	25		**Swimming Exposure Frequency (d/y)**			90
Vegetable Ingestion Rate (kg/d)	0.0104	0.0285				**Incidental Water Inges. Rate (L/h)**			0.05
Fruit Ingestion Rate (kg/d)	0.0148	0.0562				**Exposure Time (h/d)**			2
Surface Area (cm^2)	7023	19680	15158			**Aggregate Surface Area (cm^2)**			15158
Inhalation Rate (m^3/h)		1	1.04	1.50					
	Value								
Contaminated Plant Fraction	0.17	(residential)							
Veg. Exposure Frequency (d/y)	350								
Irrig. Exposure Frequency (d/y)	52								
Averaging Time (d)	25550								
Irrigation Rate (L/m^2-d)	3.62								
Irrigation Period	0.25	(3 months/y)							
Soil Leaching Rate (1/d)	2.7E-05								
Long Term Deposition and Buildup (d)	10950								
Area Density for Root Zone (kg/m^2)	240								
Plant Mass Loading Factor	0.26								
Interception Fraction	0.25								
Translocation Factor	1								
Weathering half life (d)	14								
Decay for Removal on Produce (1/d)	0.0495								
Above Ground Exposure Time (d)	60								
Wet Plant Yield (kg/m^2)	2								
Incidental Water Inges. Rate (L/d)	0.01								
Irrigation Time (h/d)	0.483								
Volume of Water Used (L)	1450								
Volume of Air (m^3)	31320								
		DRAFT SPREADSHEET SUBJECT TO CHANGE							

Attachment D: Irrigation Well Data

Sample ID	Sample Date	Contaminant	Concentration	Health Based CTL
			(in ug/L)	(in ug/L)
7520 14th Avenue N	7/11/2008	Trichloroethene	13	3
7335 Lynnwood Avenue N	4/17/2008	Trichloroethene	46	3
1200 Farragut Drive N	4/15/2008	1,4-Dioxane	3.9	3.2
1211 Farragut Drive N	7/15/2008	1,4-Dioxane	10	3.2
7250 13th Avenue	6/23/2008	Trichloroethene	5.9	3
6979 16th Avenue N	4/14/2008	1,4-Dioxane	21	3.2
6901 15th Avenue N	7/22/2008	1,4-Dioxane	4.4	3.2
6901 16th Avenue N	5/9/2008	1,4-Dioxane	16	3.2
6800 16th Avenue N	5/17/2008	1,4-Dioxane	21	3.2
6851 15th Avenue N	5/15/2008	1,4-Dioxane	7.7	3.2
7200 12th Avenue N	4/14/2008	1,4-Dioxane	17	3.2
6940 12th Avenue N	4/29/2008	Trichloroethene	8.9	3
801 74th Street N	5/14/2008	Trichloroethene	65	3
7138 9th Avenue N	5/16/2008	1,4-Dioxane	32	3
7139 8th Avenue N	4/16/2008	1,4-Dioxane	20	3.2
7129 8th Avenue N	4/15/2008	Trichloroethene	21	3
7200 5th Avenue N	7/14/2008	Trichloroethene	20	3

Key:
CTL= Clean-up target level
ug/L= micrograms per liter
Blue = highest level of trichloroethene
Yellow = highest level of 1, 4-dioxane

Attachment E: Cancer Risk

Sample ID	Sample Date	Contaminant	Concentration	Cancer risk from irrigation	Cancer risk from irrigation
			(in ug/L)		
7520 14th Avenue N	7/11/2008	Trichloroethene	13	5.30E-09	8.60E-08
7335 Lynnwood Avenue N	4/17/2008	Trichloroethene	46	1.90E-08	3.00E-07
1200 Farragut Drive N	4/15/2008	1,4-Dioxane	3.9	5.40E-10	9.60E-09
1211 Farragut Drive N	7/15/2008	1,4-Dioxane	10	1.40E-09	2.50E-08
7250 13th Avenue	6/23/2008	Trichloroethene	5.9	2.40E-09	3.90E-08
6979 16th Avenue N	4/14/2008	1,4-Dioxane	21	2.9E-09	5.20E-08
6901 15th Avenue N	7/22/2008	1,4-Dioxane	4.4	6.10E-10	1.10E-07
6901 16th Avenue N	5/9/2008	1,4-Dioxane	16	2.20E-09	3.90E-08
6800 16th Avenue N	5/17/2008	1,4-Dioxane	21	2.9E-09	5.20E-08
6851 15th Avenue N	5/15/2008	1,4-Dioxane	7.7	1.10E-09	1.90E-08
7200 12th Avenue N	4/14/2008	1,4-Dioxane	17	2.40E-09	4.20E-08
6940 12th Avenue N	4/29/2008	Trichloroethene	8.9	3.60E-09	5.90E-08
801 74th Street N	5/14/2008	Trichloroethene	65	2.60E-08	4.30E-07
7138 9th Avenue N	5/16/2008	1,4-Dioxane	32	4.50E-09	7.90E-08
7139 8th Avenue N	4/16/2008	1,4-Dioxane	20	2.80E-09	4.90E-08
7129 8th Avenue N	4/15/2008	Trichloroethene	21	8.50E-09	1.40E-07
7200 5th Avenue N	7/14/2008	Trichloroethene	20	8.10E-09	1.30E-07

Key:
CTL= Clean-up target level
ug/L= micrograms per liter
Blue = highest level of trichloroethene
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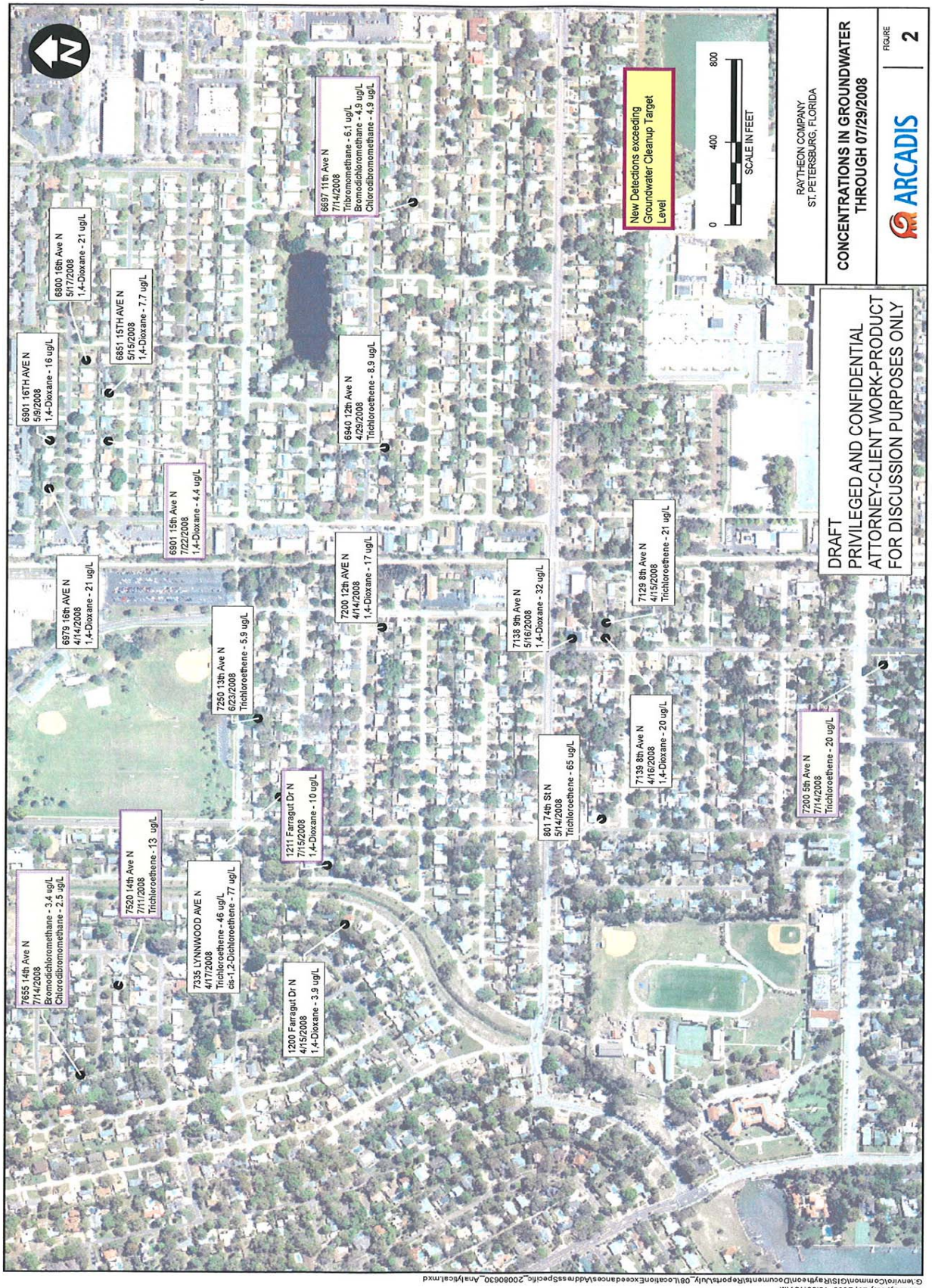
Attachment F: Irrigation Well Locations



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