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Scott R. Spoerl  
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April 16, 2008

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**Via Federal Express**

K-4

Mr. Steven Courtemanche  
Health Physicist  
Division of Nuclear Materials Safety  
Commercial Research and Development Branch  
US Nuclear Regulatory Commission-Region I  
475 Allendale Road  
King of Prussia, PA 19406-1415

03036785

RECEIVED  
REGION I  
2008 APR 17 AM 10: 29

**Re: License Amendment: Radiological Survey of Previous Waste Storage Area - Conopco, Inc.; License #29-30984-01**

Dear Mr. Courtemanche:

As promised in our letter dated March 28, 2008, we are now providing the attached survey report from DAQ Inc. This survey report should provide the information necessary to clear the previous waste storage area for unrestricted use. If this information satisfies your requirements, please update the maps supporting our license to reflect these changes. Revised versions of the site maps were provided with our March 28, 2008 letter.

If you have any questions or require additional information, please don't hesitate to contact me.

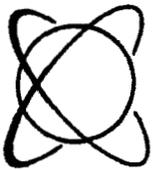
Regards,

Scott R. Spoerl

Enclosure

142266

NMSS/RCN1 MATERIALS-002



# DAQ Inc.

Health and Safety Consultants

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RADIOLOGICAL • ENVIRONMENTAL • OCCUPATIONAL

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April 4, 2008

Scott R. Spoerl  
Senior Attorney - Environmental & Safety  
Unilever United States, Inc.  
700 Sylvan Avenue, B3002  
Englewood Cliffs, NJ 07632

Subject: Radiological Survey of Hazardous Waste Storage Trailer at Trumbull

Dear Mr. Spoerl:

On April 1, 2008, I conducted a radiological survey of the Hazardous Waste Storage Trailer at the Conopco Facility in Trumbull, Connecticut. This survey was performed because in the original submission to the NRC for radioactive materials license (No. 29-30984-01), the subject trailer was listed as a radioactive materials storage area.

The survey report is attached, and indicates that for radiation and radioactive contamination considerations, the Hazardous Waste Storage Trailer can be considered cleared for unrestricted use.

Regards,

Dennis Quinn, CHP  
Radiation Safety Officer for License No. 29-30984-01

## Hazardous Waste Trailer Radiological Survey Report – April 1, 2008

### 1.0 Introduction

Conopco, Inc. maintains an NRC radioactive materials license (No. 29-30984-01) with a radioisotope lab at 40 Merritt Blvd., Trumbull, CT. In the original submission for the license, the location of radioactive waste storage was listed as a Hazardous Waste Trailer located just outside the south end of the 40 Merritt Blvd. near the shipping receiving area. In our letter dated March 28, 2008, Conopco notified the NRC of the movement of this radioactive waste storage area to a location much closer to the actual radioisotope use area.

The Hazardous Waste Trailer is believed never to have been contaminated with any licensed material. In order to document that there is no radioactive contamination in the trailer, a radiological survey was performed on April 1, 2008.

### 2.0 Radionuclides of Concern

License No. 29-30984 permits use of the following radionuclides. Nickel-63 had been on the license, but had not been used at Conopco in Trumbull.

<b>Radionuclide</b>	<b>License Limit (mCi)</b>	<b>Radionuclide</b>	<b>License Limit (mCi)</b>
Hydrogen-3	1000	Sulfur-35	50
Carbon-14	500	Chlorine-36	20
Phosphorus-32	40	Calcium-45	20
Phosphorus-33	40	Iodine-125	40

The only nuclides used since obtaining of the license in 2005 were H-3, C-14, and I-125. Note that I-125 use has only started in 2008, and all I-125 is in the radioisotope lab; that is, none has yet been sent for radioactive waste storage.

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### **3.0 Survey Design**

The survey was designed primarily to detect low energy beta emitters by performing the following:

1. Direct surface radioactivity measurements - scan with a Ludlum 44-9 pancake Geiger Mueller probe (50% of surface area scanned)
2. Removable activity concentration measurements (liquid scintillation counter results) (15 smears)
3. Gamma radiation survey – readings with a Ludlum 44-3 low energy gamma scintillator (15 fixed locations)

Note that Iodine-125 had never been present in the Hazardous Waste Trailer; however, gamma readings were obtained to determine if there was any appreciable gamma radiation above background.

### **4.0 Release Limits**

For this survey, the release limits were based on the requirements of the Code of Federal Regulations, Title 10, Part 20 (10CFR20). Paragraph 20.1402 states, “A site will be considered acceptable for unrestricted use if the residual radioactivity that is distinguishable from background radiation results in a TEDE to an average member of the critical group that does not exceed 25 mrem (0.25 mSv) per year, including that from groundwater sources of drinking water, and the residual radioactivity has been reduced to levels that are as low as reasonably achievable (ALARA). Determination of the levels which are ALARA must take into account consideration of any detriments, such as deaths from transportation accidents, expected to potentially result from decontamination and waste disposal.”

For residual radioactivity, screening levels have been determined in NUREG-1757, Rev. 1, “Consolidated NMSS Decommissioning Guidance, U.S. Nuclear Regulatory Commission”, August 2002. Use of these screening levels will help to ensure that calculated doses to individuals do not exceed 25 millirem per year. Table B.1 of the NUREG lists acceptable screening levels for unrestricted release for four out of the eight radionuclides on the radioactive materials license, H-3, C-14, S-35, and Cl-36. The most restrictive screening level is for Cl-36, with a value of 500,000 dpm/100 cm<sup>2</sup>. Since H-3 and C-14 were the only two nuclides used that were transferred to any waste storage area at the Trumbull facility, use of a value of 500,000 dpm/100 cm<sup>2</sup> or lower would be acceptable. Significantly lower values were chosen for this survey, in keeping with the ALARA philosophy.

The gamma radiation limit was set based on a worker present in the Hazardous Waste Storage Trailer for 2000 hours per year, and being exposed to a level of gamma radiation

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that would deliver 25 millirem over a one year period. Note that this is a very conservative value, because it would be unlikely for an individual to spend more than one hour per week, or 50 hours per year in the trailer.

The release limits for this survey are as follows:

1. Total (fixed plus removable) contamination: 5000 dpm/100 cm<sup>2</sup>
2. Removable contamination: 1000 dpm/100 cm<sup>2</sup>
3. Gamma radiation: 12.5 micro-R/hr (based on 25 mrem per 2000 working hours/year). In effect, this limit was set at "background", where any reading above background would be investigated.

## 5.0 Survey Instruments

The survey was performed on April 1, 2008 by Dennis Quinn, CHP. The instruments used were as follows:

Meter Model No.	Serial No.	Probe Model	Probe No.	Calibration Date
Ludlum 3	169906	Ludlum 44-9	PR-173734	2/10/2008
Ludlum 3	169906	Ludlum 44-3	PR-260280	2/10/2008
Beckman LS-6500	R00991	N/A	N/A	Eff. determined at time of use

## 6.0 Minimum Detectable Activities:

1. Total (fixed plus removable) contamination: the scan sensitivity is about 1200 dpm per probe area.
  2. Removable contamination: MDA is about 47 dpm or less
    - Using a H-3 background of about 50 cpm, the 2 minute count = 100 counts
    - $MDA = 4.66 (C_B)^{1/2} = 4.66 (10) = 46.6 \text{ counts}/2 \text{ minutes} = 23.3 \text{ cpm}$
    - With consideration for H-3 efficiency (~0.5), then  $MDA = 47 \text{ dpm}$
    - For C-14, it has a higher efficiency with a lower background, so MDA will be < 47 dpm.
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3. Gamma radiation: MDA is about 170 cpm above background. Since background is about 120 cpm for the 44-3 probe, this is slightly more than twice background. There is not a direct correlation between cpm and micro-R/hr because of the energy dependence of the scintillator. However, the MDA would be in the range of background (approximately 10 micro-R/hr).

## **7.0 Survey Results:**

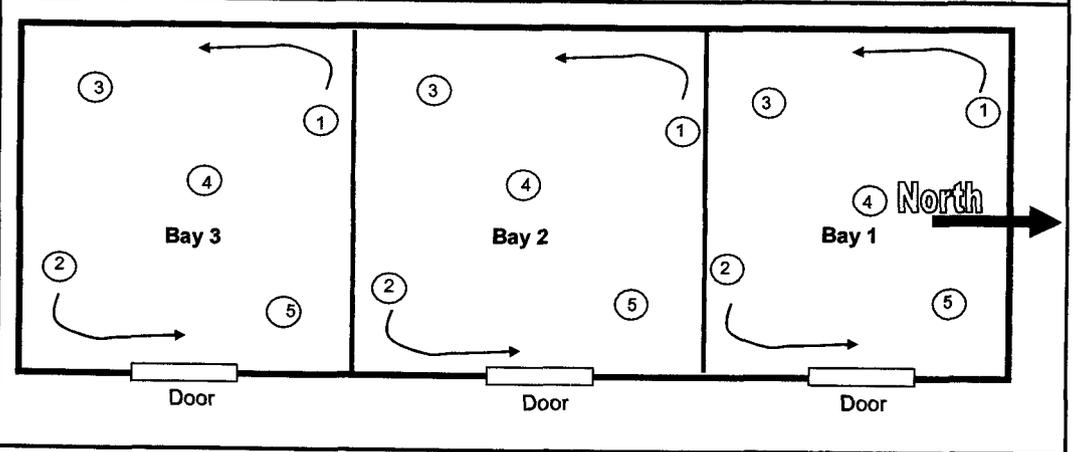
Survey results are shown on the attached survey form. Surveys taken in the Hazardous Waste Storage Trailer indicated near background levels of radioactivity, and results are less than the release limits shown in Section 4.0 above.

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<b>Surveyor:</b>	Dennis Quinn, CHP		
<b>Date:</b>	4/1/2008	<b>Facility:</b> Conopco Facility - Trumbull, CT	
<b>Building:</b>	Hazardous Waste Storage Trailer	<b>Room:</b> Hazardous Waste Storage Trailer	
<b>Survey Type:</b>	Clearance Verification		

Removable Contamination				
Smear #	Gross Beta (dpm/wipe)	Tritium (DPM/wipe)	Carbon-14 (DPM/wipe)	Location
1		86	16	Bay 1, N&W walls
2		221	21	Bay 1, S&E walls
3		73	17	Bay 1, Floor
4		111	23	Bay 1, Floor
5		102	27	Bay 1, Floor
6		102	30	Bay 2, N&W walls
7		106	24	Bay 2, S&E walls
8		108	23	Bay 2, Floor
9		96	19	Bay 2, Floor
10		93	18	Bay 2, Floor
11		99	18	Bay 3, N&W walls
12		87	17	Bay 3, S&E walls
13		102	19	Bay 3, Floor
14		87	20	Bay 3, Floor
15		100	19	Bay 3, Floor

**Fixed Contamination**  
Instrument: Lud-3, #169906      Calibration Date: 2/10/2008      Efficiency: 0.0685 for C-14 on 44-9  
Probes: Lud 44-9 (#173734) and Lud 44-3 (#260280)      Bkg = 60 cpm (44-9)  
Sketch of Laboratory or Area: (indicate radiation readings and smear locations)      Bkg = 120 cpm (44-3)



**Remarks**  
Ludlum 44-9 scans all indicated near background, from 40 - 80 cpm on walls, shelves, and floors.  
Ludlum 44-3 scintillator gamma readings were taken on each wall and at the middle of each bay at about 3 ft from the floor; all readings were near background, 80 - 120 cpm.  
Smears were taken at the numbered locations shown in the sketch.  
All smears indicated near background levels, and well below 1000 dpm per 100 cm<sup>2</sup>.

## Liquid Scintillation Count Results for Smears

ID: DUAL LABEL

1 APR 2008 15:24

USER: S COMMENT:2

ANALYSIS TIME : 8.00  
 DATA FILE : DL.DPM LW :YES SAMPLE REPEATS: 1 PRINTER : L10  
 COUNT BLANK : NO IC# : NO REPLICATES : 1 AS222 : 194  
 TWO PHASE : NO ACC :YES LVTILE REPEATS : 1  
 SCINTILLATOR: LIQUID LUMEX: NO LOW SAMPLE NO: 0  
 LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

ISOTOPE 1: 3H XERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0  
 ISOTOPE 2: 14C XERROR: 0.00 FACTOR: 1.000000 BKG. SUB: 0

BACKGROUND QUENCH CURVE: Off COLOR QUENCH CORRECTION: Off

Quench Limits Low: 7.613 High:305.60

SM NO	POS	TIME MIN	HM	3H		14C		3H DPM	14C DPM	3H		14C		RATIO	LUMEX %	ELAPSED TIME
				CPM	XERROR	CPM	XERROR			EFF-1	EFF-2	EFF-1	EFF-2			
1	16-1	2.00	95.3	42.00	21.82	13.00	39.82	86.07	16.43	45.32	0.66	18.20	75.60	5.240	10.01	2.52
2	16-2	2.00	96.7	103.50	13.90	17.50	33.81	221.55	21.20	44.98	0.66	18.20	75.63	10.449	35.58	5.18
3	16-3	2.00	109.2	33.50	24.43	13.50	38.49	72.60	17.33	41.80	0.66	18.20	75.12	4.189	5.39	7.75
4	16-4	2.00	99.1	53.50	19.33	18.00	23.33	111.24	22.86	44.35	0.66	18.20	75.53	4.867	4.11	10.32
5	16-5	2.00	101.8	49.50	20.10	21.00	30.66	102.87	25.95	43.69	0.66	18.21	75.42	3.788	3.71	12.90
6	16-6	2.00	97.6	51.00	19.80	23.50	29.17	101.72	30.20	44.74	0.66	18.20	75.59	3.358	3.65	15.50
7	16-7	2.00	98.0	51.50	19.71	18.50	32.60	105.70	23.55	44.63	0.66	18.20	75.57	4.491	3.88	18.00
8	16-8	2.00	94.6	53.50	19.33	18.00	33.33	100.40	22.83	45.49	0.66	18.20	75.71	4.752	4.81	20.65
9	16-9	2.00	93.4	47.50	20.52	15.00	36.51	96.16	18.96	45.81	0.66	18.19	75.76	5.072	4.90	23.26
10	16-10	2.00	93.1	46.00	20.85	14.00	37.80	93.27	17.66	45.88	0.66	18.19	75.77	5.188	5.05	25.85
11	16-11	2.00	95.7	48.00	20.41	14.50	37.14	90.77	18.30	45.82	0.66	18.20	75.67	5.397	5.18	28.47
12	16-12	2.00	96.4	42.50	21.69	13.50	38.49	87.43	17.80	45.85	0.66	18.20	75.64	5.118	6.08	31.05
13	17-1	2.00	96.3	49.50	20.10	15.00	36.51	102.81	18.94	45.86	0.66	18.20	75.64	5.397	4.64	33.77
14	17-2	2.00	94.9	43.00	21.57	14.00	35.36	86.51	20.38	45.42	0.66	18.20	75.70	4.245	4.98	36.30
15	17-3	2.00	94.4	49.00	20.20	15.00	36.51	100.00	18.94	45.55	0.66	18.20	75.72	5.281	5.32	38.97

Brand	Description of project			
Project	Date received	Investment	Legal Fees	
<b>Agreements</b>				
	# of agreements			
<b>TOTAL</b>			<b>\$</b>	<b>- \$</b>