DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE FOR OPERATIONAL HEALTH (AFMC)
BROOKS CITY-BASE TEXAS

21 July 2006

MEMORANDUM FOR MR. PAUL REKOWSKI, AFRPA/COO
AFRPA/DB – WURTSMITH
3950 ARROW
OSCODA MI 48750

FROM: AFIOH/SDR
2350 Gillingham Drive
Brooks City-Base TX 78235-5103

SUBJECT: Consultative Letter, IOH-SD-BR-CL-2006-0065, Findings of Investigational Radiological Survey at the Former Wurtsmith AFB, Oscoda, MI

1. The Air Force Institute for Operational Health (AFIOH), Radiation Surveillance Division (SDR), Health Physics Consulting Branch (SDRH) performed an investigative radiological survey of a capped landfill at the former Wurtsmith Air Force Base (AFB) at the request of the Air Force Real Property Agency (AFRPA) representative and the State of Michigan. All results were in the range of background. No further action is recommended.

2. Historical Information:

a. Wurtsmith AFB is located in the northeastern portion of Michigan's Lower Peninsula, about 2 miles west of Lake Huron in Iosco County. The facility is bordered to the north and north east by Van Etten Lake, on the northwest by Au Sable State Forest, on the west and south by forested wetlands, on the southwest by Allen Lake, and on the southeast and east by the Village of Oscoda. Wurtsmith covers 5,223 acres, 1,943 acres of which are owned by the U.S. Air Force.

b. The facility was established in 1923 as a subsidiary of Selfridge Field and was named Camp Skeel. Until World War II, Camp Skeel was used for gunnery practice, winter maneuvers, and aircraft landings. The base was renamed Oscoda Army Air Field and was operated by the Continental Air Command as a transient aircraft stopover. In 1953, the base was renamed Wurtsmith Air Force Base when it came under the command of the U.S. Air Force Strategic Air Command. The primary mission of the base was to maintain full readiness to conduct strategic bombing missions. Support activities included training of bombing crews, aircraft refueling, and vehicle and aircraft maintenance activities.

c. The facility was slated for closure under the 1991 Base Realignment and Closure program with a closure date of June 30, 1993. The facility was placed on the National Priorities List (NPL) in January 1994 due to industrial solvents being detected in the groundwater. Clean-up operations are still on-going.

3. Reviewed documents and information:

a. Consultative Letter, AL/OE-CL-1993-0119, Radiological Decommissioning Survey of Weapons Storage Area (WSA), Wurtsmith AFB, MI dated 21 September, 1993. This CL reported that there were no indications any residual radioactive materials were present in the WSA and that it could be release for public use.

b. NPL Site Narrative for Wurtsmith Air Force Base, USEPA website. The narrative was first published in the Federal Register on 18 January 1994. Radioactive materials were not listed as a pollutant by the EPA or the State of Michigan.

4. Findings:

a. The September 1993 CL reported that the WSA could be released for public use. All of the swipes and static measurements were less than the applicable release limits of the United States Nuclear Regulatory Commission. The CL also states that the base only used sealed radioactive materials that would present only a slight risk for radioactive contamination and that there were no indications of any releases of radioactive materials.

b. In preparation for investigative trenching in the Northern Landfill Area (Area of Interest, Attachment 1), the Michigan Department of Environmental Quality (MDEQ) performed a radiation survey. They reported that a few areas within landfill LF 3031 showed radiation readings that were two to three times the background reading. The background readings were reported as 4 – 6 micro-roentgens (μR). The elevated areas were reported to be 15 – 18 μR.

c. AFIOH/SDRH was asked to assist AFRPA/COO(CR) with a radiological survey to ensure there were no personnel safety issues due to radioactive materials in the landfill. The survey methodology consisted of a walkover survey with a Thermo-Electron MicroRem ratemeter to establish the general area background rate and a two-inch by two-inch sodium-iodide (2"x2" NaI) for quantification of any detected gamma radiation. The 2"x2" NaI was first used to scan the entire landfill area and any areas with elevated readings were marked for further investigation. Further investigation consisted of a one minute static count with the 2"x2" NaI and if the scan reading was confirmed, soil samples were taken. Elevated readings were defined as any area that exceeded an investigation level of 1.5 times the average background reading, measured in counts per minute (cpm) with the 2"x2" NaI.

d. Soil samples were collected from any areas that exhibited confirmed elevated readings and from the areas that the MDEQ identified as elevated. The samples were taken at a depth of 0 – 6" below ground surface (bgs) and 24" to 30" bgs. Each sample was drawn from a hole that was approximately 3" in diameter. The samples were double bagged in plastic bags and transported to the AFIOH Radioanalytical Laboratory in San Antonio, Texas. The samples were analyzed for gross alpha and beta radiations and for gamma emitters, primarily radium-226 (^{226}Ra) since it is the principle contaminant on bases that performed aircraft maintenance. The ^{226}Ra was from dial face painting on aircraft instruments for illumination.

e. The background area was established in the Huron National Forest to the west of the base with no known risk from radioactive materials (Attachment #2). The area was similar to the landfill in that each area was a planted pine forest with a pine needle covering on the ground. Each area had been planted at least 20 years previously. The soil in both areas was mostly sand mixed with some organic material. The background area was surveyed in the same manner as the landfill. No soil samples were taken from the background area because there was no significant difference between the background area and the landfill as indicated by the walkover and static measurements.

f. No areas of the landfill exhibited elevated readings (Attachment #3). A total of six samples were taken from the landfill area. Four of the samples were taken in two areas denoted by the MDEQ; one shallow and one deep at each location. The other two samples, one shallow and one deep, were taken at a location between the road to the north of the landfill and the landfill. The sample results may be found in Attachment #4.

g. Area of Interest #10 (AI #10) was an area that the MDEQ placed two flags. The 2"x2" NaI survey indicated slightly higher counts per minute in a roughly circular area with an approximate diameter of 36 feet. The MicroRem meter survey had two spikes in activity up to 16 μrem/hour in this area. These indications, while less than the 1.5 times the background investigation point, were sufficient to perform seven additional static measurements in this area. The average rate was approximately 537 cpm with the 2"x2" NaI; which is less than the investigation level.

5. Recommendations and Conclusions:

a. No areas of elevated activity were found in Landfill LF-3031 during a walkover survey or during subsequent soil sampling. There are no indications that a radiological hazard exists in Landfill LF-3031.

b. Based on the survey and sample results, and a review of the historical record, we recommend that no additional precautions are required.

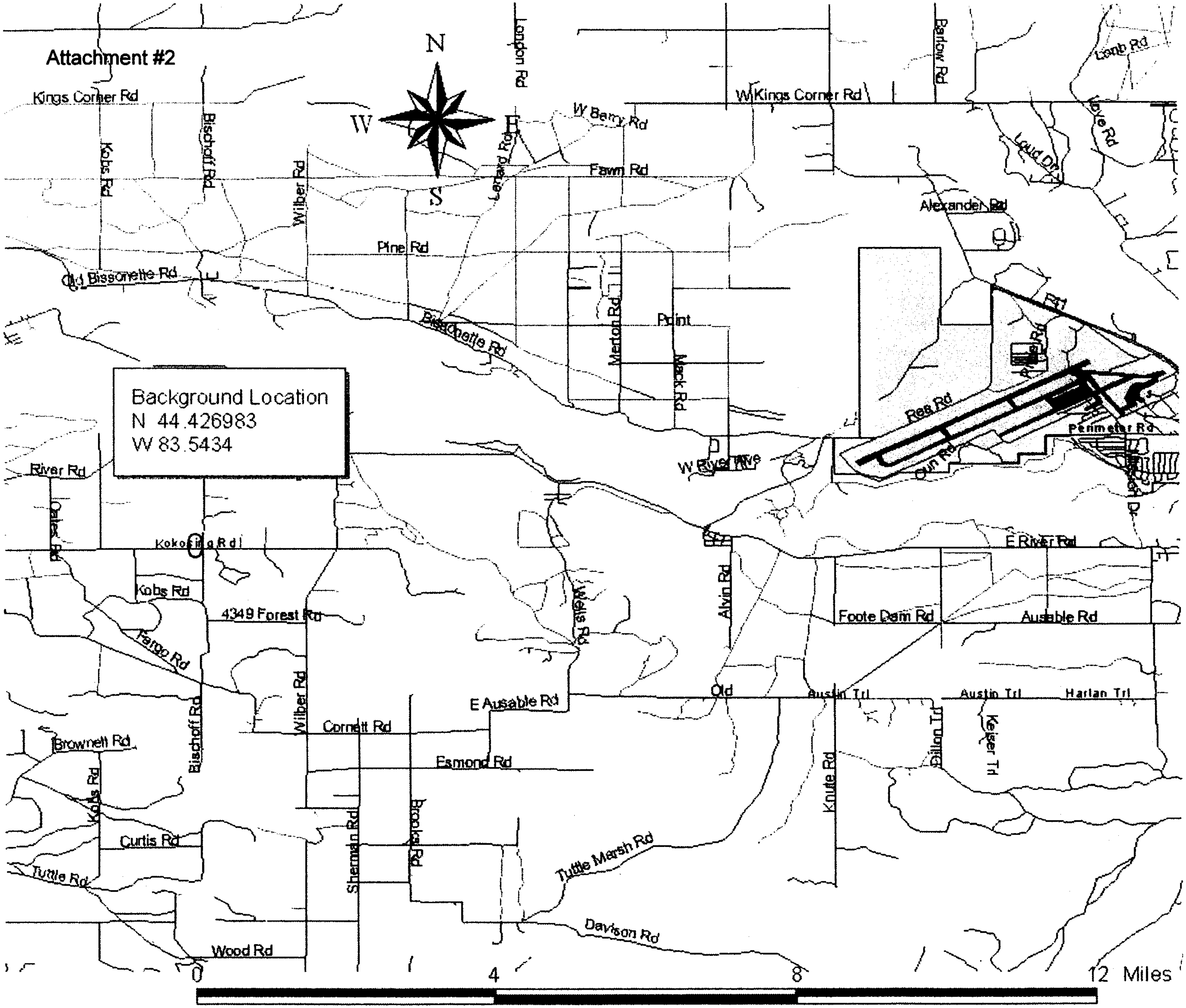
6. If you have any questions or need additional information, please contact Mr. Brian Harcek DSN 240-4263, commercial (210) 536-4263, or e-mail brian.harcek@brooks.af.mil.

//signed//

SCOTT M. NICHELSON, Lt Col, USAF, BSC, CHP, CIH
Chief, Radiation Surveillance Division

Attachments:
1. Aerial Photo Depicting Base Location
2. Map Depicting Background Location
3. Field Results
4. Laboratory Results

Attachment #1


Attachment #2
N
W
E
S
Kings Corner Rd
London Rd
Barlow Rd
W Kings Corner Rd
Lamb Rd
Love Rd
W Berry Rd
Loud Dr
Fawn Rd
Kobs Rd
Bischoff Rd
Wilber Rd
Alexander Rd
Pine Rd
Old Bissonette Rd
Bissonette Rd
Merton Rd
Point
Mack Rd
Background Location
N 44.426983
W 83.5434
Ren Rd
Perimeter Rd
Oun Rd
River Rd
W River Ave
Oates Rd
E River Rd
Alvin Rd
Wells Rd
Foote Dam Rd
Ausable Rd
4349 Forest Rd
Fargo Rd
Old
Austin Trl
Harlan Trl
E Ausable Rd
Cornett Rd
Dillon Trl
Keiser Trl
Brownell Rd
Esmond Rd
Knute Rd
Curtis Rd
Sherman Rd
Brooks Rd
Tuttle Marsh Rd
Tuttle Rd
Davison Rd
Wood Rd
0
4
8
12 Miles

Attachment #3

Wurtsmith Field Results

Background Area (N44°25.619' W83°32.604')
1 minute static count

1	391
2	391
3	345
4	459
5	417
6	411
7	400
8	376
9	401
10	404
Average	399.5
St. Dev.	29.2
1.5x	599.3

	Time	Counts	Rate (μrem/hr)
Al #1	1011	443	7.5
Sunken area 6'x18'x150'			
Al #2	1018	433	8
First step into depressed area			
Al #3	1024	429	5 (spike to 15)
Stake E1400			
Al #4	1029	399	5
Gentle slope			
Al #5	1036	413	5
Steeper slope			
Al#6	1050	371	10
Near green State placed flag; During scan with 2"x2" 1294 cpm; unable to locate a second time.			
Al#7	1114	430	5
Stake E1500			
Al #8	1126	350	7 (spike to 16)
Beween road and tree line by power pole			
Al #9	1140	419	6 (spike to 16)
One 'burrow'; barrel size depression; ~7" dia tree leaning into depression; Spike near the green State placed flag			
Al #10	Multiple	Multiple	10 (2 spikes to 16)

Two green State placed flags; Scan readings in area of ~36' diameter were in the range 400-900 cpm with 2"x2"; Greater than ~36' diameter, rate dropped to ~420 (bkgd); 2 rate reading spikes to 16 μrem/hr. Seven (7) 1 minute static counts were taken in a roughly circular pattern centered on the two State placed flags with one point (#8) taken about center.

1	504
2	505
3	545
4	554
5	536
6	538
7	572
8	539
Average	536.6
St. Dev.	23.0

Attachment #4

Wurtsmith
Laboratory Results

CUSTOMER SAMPLE NUMBER	SDRR SAMPLE NUMBER	ANALYSIS	ISOTOPE	VALUE		UNCERTAINTY	UNITS	MDA
GS060016	10600160	GAMMA SPEC	Bi-214	0.47	+/-	0.03	pCi/g	
Shallow		(Marinelli)	Cs-137	0.12	+/-	0.01	pCi/g	
AI #8			K-40	9.84	+/-	0.57	pCi/g	
			Pb-214	0.45	+/-	0.04	pCi/g	
			Ra-226	1.29	+/-	0.23	pCi/g	
			Th-232	0.36	+/-	0.02	pCi/g	
			Th-234	<0.2			pCi/g	0.2
			U-235	<0.02			pCi/g	0.02
		Gross Alpha	Alpha	6.86	+/-	2.12	pCi/g	
		Gross Beta	Beta	27.97	+/-	1.54	pCi/g	
		GAMMA SPEC	Ra-226	0.68	+/-	0.05	pCi/g	
		(Can Geometry)						
		21 Day in-growth						
GS060017	10600161	GAMMA SPEC	Bi-214	0.15	+/-	0.01	pCi/g	
Deep		(Marinelli)	Cs-137	<0.01			pCi/g	0.01
AI #8			K-40	10.31	+/-	0.57	pCi/g	
			Pb-214	0.15	+/-	0.02	pCi/g	
			Ra-226	0.5	+/-	0.13	pCi/g	
			Th-232	0.19	+/-	0.02	pCi/g	
			Th-234	0.09	+/-	0.09	pCi/g	
			U-235	<0.06			pCi/g	0.06
		Gross Alpha	Alpha	<1.73			pCi/g	1.73
		Gross Beta	Beta	24.44	+/-	1.5	pCi/g	
		GAMMA SPEC	Ra-226	0.16	+/-	0.03	pCi/g	
		(Can Geometry)						
		21 Day in-growth						
					+/-			
GS060018	10600162	GAMMA SPEC	Bi-214	0.25	+/-	0.02	pCi/g	
Shallow		(Marinelli)	Cs-137	0.06	+/-	0.009	pCi/g	
AI #9			K-40	9.65	+/-	0.55	pCi/g	
			Pb-214	0.27	+/-	0.03	pCi/g	
			Ra-226	0.69	+/-	0.17	pCi/g	
			Th-232	0.26	+/-	0.02	pCi/g	
			Th-234	<0.18			pCi/g	0.18
			U-235	<0.07			pCi/g	0.07
		Gross Alpha	Alpha	6.57	+/-	2.06	pCi/g	
		Gross Beta	Beta	25.78	+/-	1.52	pCi/g	
		GAMMA SPEC	Ra-226	0.36	+/-	0.04	pCi/g	
		(Can Geometry)						
		21 Day in-growth						
GS060019	10600163	GAMMA SPEC	Bi-214	0.22	+/-	0.02	pCi/g	
Deep		(Marinelli)	Cs-137	0.006	+/-	0.005	pCi/g	
AI #9			K-40	10.4	+/-	0.6	pCi/g	
			Pb-214	0.24	+/-	0.02	pCi/g	
			Ra-226	0.62	+/-	0.18	pCi/g	
			Th-232	0.23	+/-	0.02	pCi/g	
			Th-234	0.18	+/-	0.09	pCi/g	
			U-235	<0.02			pCi/g	0.02
		Gross Alpha	Alpha	2.22	+/-	1.54	pCi/g	
		Gross Beta	Beta	22.18	+/-	1.45	pCi/g	
		GAMMA SPEC	Ra-226	0.24	+/-	0.04	pCi/g	
		(Can Geometry)						
		21 Day in-growth						
GS060020	10600164	GAMMA SPEC	Bi-214	0.35	+/-	0.03	pCi/g	
Shallow		(Marinelli)	Cs-137	0.08	+/-	0.01	pCi/g	
AI #10			K-40	11.21	+/-	0.65	pCi/g	
			Pb-214	0.33	+/-	0.03	pCi/g	
			Ra-226	0.94	+/-	0.22	pCi/g	
			Th-232	0.33	+/-	0.02	pCi/g	
			Th-234	0.18	+/-	0.1	pCi/g	
			U-235	<0.02			pCi/g	0.02
		Gross Alpha	Alpha	3.04	+/-	1.7	pCi/g	
		Gross Beta	Beta	26.02	+/-	1.54	pCi/g	
		GAMMA SPEC	Ra-226	0.37	+/-	0.04	pCi/g	
		(Can Geometry)						
		21 Day in-growth						
GS060021	10600165	GAMMA SPEC	Bi-214	1.59	+/-	0.07	pCi/g	
Deep		(Marinelli)	Cs-137	0.02	+/-	0.007	pCi/g	
AI #10			K-40	7	+/-	0.47	pCi/g	
			Pb-214	1.74	+/-	0.12	pCi/g	
			Ra-226	3.55	+/-	0.5	pCi/g	
			Th-232	1.14	+/-	0.05	pCi/g	
			Th-234	1.17	+/-	0.2	pCi/g	
			U-235	0.12	+/-	0.09	pCi/g	
		Gross Alpha	Alpha	10.04	+/-	2.14	pCi/g	
		Gross Beta	Beta	27.2	+/-	1.41	pCi/g	
		GAMMA SPEC	Ra-226	2.71	+/-	0.12	pCi/g	
		(Can Geometry)						
		21 Day in-growth						