

~~DECLASSIFIED SECRET//REL TO USA AUS CAN and GBR//MR~~

(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May 2002 - 14 June 2002

Table C-19 (U) (~~C//REL~~). Ambient Air Analytical Results – VOCs – Cont'd.

FIELD ID			2164-EV1	2164-EV2	2164-EV3	2164-EV4
LOCATION DESCRIPTION			Tent City - Tent 216	Tent City - Tent 113	Tent City - Tent 155	Tent City - Tent 261
VOC TUBE NUMBER			C3482	C3488	C3495	C3498
COLLECTION DATE			13 Jun 02 (2164 ³)			
PARAMETERS	UNITS	MDL ¹				
Chlorobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Chloroform	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
cis-1,2-Dichloroethene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
cis-1,3-Dichloropropene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Cyclohexane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	0.6
Cyclopentane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Decane	ug/m ³	0.5	BDL ²	0.9	0.6	1.0
Dibromochloromethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Dibromomethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Ethylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	1.0
Hexachlorobutadiene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Hexane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	0.8
Isooctane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Isopropylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
m/p-Xylene	ug/m ³	0.5	0.6	0.7	0.8	2.6
Methyl Chloroform	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Methylcyclopentane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Methylene Chloride	ug/m ³	0.5	BDL ²	1.7	1.1	0.7
n-Butylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
n-Propylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
o-Xylene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	0.8
sec-Butylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Styrene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	0.6
tert-Butylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Tetrachloroethylene	ug/m ³	0.5	BDL ²	0.8	0.7	6.1
Toluene	ug/m ³	0.5	1.3	1.1	1.6	4.3
trans-1,2-Dichloroethene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
trans-1,3-Dichloropropene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²
Trichloroethene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²

¹ MDL - Minimum Detection Level

² BDL - Below Detection Limit

³ Julian Date

⁴ Invalid Result - Field Blank Result is Greater Than 25% of Sample Result

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Table C-20 (U) (~~C//REL~~). Ambient Air Analytical Results – VOCs

FIELD ID	2164-EV5		2164-EV6		2164-EV7		2165-EV1		2165-EV2	
LOCATION DESCRIPTION	C3499		C3511		C3516		C3484		C3490	
VOC TUBE NUMBER	Bunker on Berm ⁵		Bunker on Berm ⁵		Trip Blank		West Corner of Hospital		North Corner of Hospital	
COLLECTION DATE	13 Jun 02 (2164 ³)		13 Jun 02 (2164 ³)		13 Jun 02 (2164 ³)		14 Jun 02 (2165 ¹)		14 Jun 02 (2165 ¹)	
PARAMETERS	UNITS	MDL ¹								
1,1,1,2-Tetrachloroethane	ug/m ³	0.5	BDL ²	BDL ²						
1,1,2,2-Tetrachloroethane	ug/m ³	0.5	BDL ²	BDL ²						
1,1,2-Trichloroethane	ug/m ³	0.5	BDL ²	BDL ²						
1,1-Dichloroethane	ug/m ³	0.5	BDL ²	BDL ²						
1,1-Dichloroethene	ug/m ³	0.5	BDL ²	BDL ²						
1,1-Dichloropropene	ug/m ³	0.5	BDL ²	BDL ²						
1,2,3-Trichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²						
1,2,3-Trichloropropane	ug/m ³	0.5	BDL ²	BDL ²						
1,2,4-Trichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²						
1,2,4-Trimethylbenzene	ug/m ³	0.5	0.8	1.0	BDL ²	BDL ²	BDL ²	BDL ²	BDL ²	BDL ²
1,2-Dibromo-3-chloropropane	ug/m ³	0.5	BDL ²	BDL ²						
1,2-Dibromoethane	ug/m ³	0.5	BDL ²	BDL ²						
1,2-Dichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²						
1,2-Dichloroethane	ug/m ³	0.5	BDL ²	BDL ²						
1,2-Dichloropropane	ug/m ³	0.5	BDL ²	BDL ²						
1,3,5-Trimethylbenzene	ug/m ³	0.5	0.6	0.7	BDL ²	BDL ²	BDL ²	BDL ²	BDL ²	BDL ²
1,3-Dichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²						
1,3-Dichloropropane	ug/m ³	0.5	BDL ²	BDL ²						
1,4-Dichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²						
2,2-Dichloropropane	ug/m ³	0.5	BDL ²	BDL ²						
2-Chlorotoluene	ug/m ³	0.5	BDL ²	BDL ²						
4-Chlorotoluene	ug/m ³	0.5	BDL ²	BDL ²						
4-Isopropyltoluene	ug/m ³	0.5	BDL ²	BDL ²						
Benzene	ug/m ³	0.5	BDL ²	0.7	BDL ²	BDL ²	BDL ²	BDL ²	0	BDL ²
Bromobenzene	ug/m ³	0.5	BDL ²	BDL ²						
Bromochloromethane	ug/m ³	0.5	BDL ²	BDL ²						
Bromodichloromethane	ug/m ³	0.5	BDL ²	BDL ²						
Bromoform	ug/m ³	0.5	BDL ²	BDL ²						
Carbon Tetrachloride	ug/m ³	0.5	BDL ²	BDL ²						

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Table C-20 (U) (~~C//REL~~). Ambient Air Analytical Results – VOCs – Cont'd.

FIELD ID			2164-EV5	2164-EV6	2164-EV7	2165-EV1	2165-EV2
LOCATION DESCRIPTION			C3499	C3511	C3516	C3484	C3490
VOC TUBE NUMBER			Bunker on Berm ³	Bunker on Berm ³	Trip Blank	West Corner of Hospital	North Corner of Hospital
COLLECTION DATE			13 Jun 02 (2164 ³)	13 Jun 02 (2164 ³)	13 Jun 02 (2164 ³)	14 Jun 02 (2165 ³)	14 Jun 02 (2165 ³)
PARAMETERS	UNITS	MDL ¹					
Chlorobenzene	ug/m ³	0.5	BDL ²				
Chloroform	ug/m ³	0.5	BDL ²				
cis-1,2-Dichloroethene	ug/m ³	0.5	BDL ²				
cis-1,3-Dichloropropene	ug/m ³	0.5	BDL ²				
Cyclohexane	ug/m ³	0.5	BDL ²				
Cyclopentane	ug/m ³	0.5	BDL ²				
Decane	ug/m ³	0.5	1.1	1.6	BDL ²	0	0
Dibromochloromethane	ug/m ³	0.5	BDL ²				
Dibromomethane	ug/m ³	0.5	BDL ²				
Ethylbenzene	ug/m ³	0.5	BDL ²	0.7	BDL ²	BDL ²	BDL ²
Hexachlorobutadiene	ug/m ³	0.5	BDL ²				
Hexane	ug/m ³	0.5	BDL ²	0.6	BDL ²	BDL ²	BDL ²
Isooctane	ug/m ³	0.5	BDL ²				
Isopropylbenzene	ug/m ³	0.5	BDL ²				
m/p-Xylene	ug/m ³	0.5	0.9	1.4	BDL ²	0	0
Methyl Chloroform	ug/m ³	0.5	BDL ²				
Methylcyclopentane	ug/m ³	0.5	BDL ²				
Methylene Chloride	ug/m ³	0.5	BDL ²	0.7	BDL ²	0	0
n-Butylbenzene	ug/m ³	0.5	BDL ²				
n-Propylbenzene	ug/m ³	0.5	BDL ²				
o-Xylene	ug/m ³	0.5	BDL ²	0.7	BDL ²	BDL ²	BDL ²
sec-Butylbenzene	ug/m ³	0.5	BDL ²				
Styrene	ug/m ³	0.5	BDL ²				
tert-Butylbenzene	ug/m ³	0.5	BDL ²				
Tetrachloroethylene	ug/m ³	0.5	2.1	2.3	BDL ²	0	0
Toluene	ug/m ³	0.5	1.6	2.7	BDL ²	0	0
trans-1,2-Dichloroethene	ug/m ³	0.5	BDL ²				
trans-1,3-Dichloropropene	ug/m ³	0.5	BDL ²				
Trichloroethene	ug/m ³	0.5	BDL ²				

¹ MDL - Minimum Detection Level

² BDL - Below Detection Limit

³ Julian Date

⁴ Invalid Result - Field Blank Result is Greater Than 25% of Sample Result

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Table C-21 (U) (~~C//REL~~). Ambient Air Analytical Results – VOCs

FIELD ID			2165-EV3	2165-EV4	2165-EV5	2165-EV6	2165-EV7
LOCATION DESCRIPTION			East Corner of Hospital	South Corner of Hospital	Headquarters	Top of Bunker Next to Headquarters	Trip Blank
VOC TUBE NUMBER			C3491	C3500	C3508	C3513	C3480
COLLECTION DATE			14 Jun 02 (2165 ³)	14 Jun 02 (2165 ³)			
PARAMETERS	UNITS	MDL ¹					
1,1,1,2-Tetrachloroethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,1,2,2-Tetrachloroethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,1,2-Trichloroethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,1-Dichloroethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,1-Dichloroethene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,1-Dichloropropene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2,3-Trichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2,3-Trichloropropane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2,4-Trichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2,4-Trimethylbenzene	ug/m ³	0.5	0	BDL ²	0	BDL ²	0
1,2-Dibromo-3-chloropropane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2-Dibromoethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2-Dichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2-Dichloroethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,2-Dichloropropane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,3,5-Trimethylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,3-Dichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,3-Dichloropropane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
1,4-Dichlorobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
2,2-Dichloropropane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
2-Chlorotoluene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
4-Chlorotoluene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
4-Isopropyltoluene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Benzene	ug/m ³	0.5	0	0	0	BDL ²	0
Bromobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Bromochloromethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Bromodichloromethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Bromoform	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Carbon Tetrachloride	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0

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Table C-21 (U) (~~C//REL~~). Ambient Air Analytical Results – VOCs – Cont'd.

FIELD ID			2165-EV3	2165-EV4	2165-EV5	2165-EV6	2165-EV7
LOCATION DESCRIPTION			East Corner of Hospital	South Corner of Hospital	Headquarters	Top of Bunker Next to Headquarters	Trip Blank
VOC TUBE NUMBER			C3491	C3500	C3508	C3513	C3480
COLLECTION DATE			14 Jun 02 (21653)	14 Jun 02 (21653)	14 Jun 02 (21653)	14 Jun 02 (21653)	14 Jun 02 (21653)
PARAMETERS	UNITS	MDL ¹					
Chlorobenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Chloroform	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
cis-1,2-Dichloroethene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
cis-1,3-Dichloropropene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Cyclohexane	ug/m ³	0.5	BDL	0	BDL ²	BDL ²	0
Cyclopentane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Decane	ug/m ³	0.5	0	0	0	BDL ²	0
Dibromochloromethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Dibromomethane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Ethylbenzene	ug/m ³	0.5	0	BDL ²	BDL ²	BDL ²	0
Hexachlorobutadiene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Hexane	ug/m ³	0.5	0	BDL ²	BDL ²	BDL ²	0
Isooctane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Isopropylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
m/p-Xylene	ug/m ³	0.5	0	0	0	BDL ²	0
Methyl Chloroform	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Methylcyclopentane	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Methylene Chloride	ug/m ³	0.5	BDL ²	BDL ²	0	BDL ²	0
n-Butylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
n-Propylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
o-Xylene	ug/m ³	0.5	0	BDL	0	BDL ²	0
sec-Butylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Styrene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
tert-Butylbenzene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Tetrachloroethylene	ug/m ³	0.5	0	0	0	BDL ²	0
Toluene	ug/m ³	0.5	0	0	0	0	0
trans-1,2-Dichloroethene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
trans-1,3-Dichloropropene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0
Trichloroethene	ug/m ³	0.5	BDL ²	BDL ²	BDL ²	BDL ²	0

¹ MDL - Minimum Detection Level

² BDL - Below Detection Limit

³ Julian Date

⁴ Invalid Result - Field Blank Result is Greater Than 25% of Sample Result

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Figure C-22 (U) (C//REL). Industrial Hygiene Bulk Asbestos Sampling Results

Sample ID	Location	Type of Sample	Collection Date	Method	Results (%)	OSHA Standard 29 CFR 1910.1001	Comparison to Standard
2156-IB1	One Stop Hallway	Bulk Asbestos	5 Jun 02 (2156 ¹)	Bulk	0	1%	Negative
2156-IB2	One Stop -PSS	Bulk Asbestos	5 Jun 02 (2156 ¹)	Bulk	0	1%	Negative
2156-IB3	One Stop -PSS	Bulk Asbestos	5 Jun 02 (2156 ¹)	Bulk	0	1%	Negative
2156-IB4	Red Cross Office	Bulk Asbestos	5 Jun 02 (2156 ¹)	Bulk	0	1%	Negative
2156-IB5	One Stop CDR office	Bulk Asbestos	5 Jun 02 (2156 ¹)	Bulk	0	1%	Negative
2156-IB6	416 AEG	Bulk Asbestos	5 Jun 02 (2156 ¹)	Bulk	5	1%	Positive
2163-IB1	CI/FP/JAG	Bulk Asbestos	12 Jun 02 (2163 ¹)	Bulk	0	1%	Negative
2163-IB2	Jag Office/ Living qtrs	Bulk Asbestos	12 Jun 02 (2163 ¹)	Bulk	0	1%	Negative
2162-IB1	ASP Conex office	Bulk Asbestos	11 Jun 02 (2162 ¹)	Bulk	0	1%	Negative

¹ Julian date

Figure C-23 (U) (C//REL). Industrial Hygiene Air Asbestos Sampling Results

Sample ID	Location	Type of Sample	Collection Date	Method	Results fibers/cc	OSHA Standard 29 CFR 1910.1001	Comparison to Standard
2157-IA1	One Stop	Air	5 Jun 02 (2156 ¹)	Person Samp Pump	0.006	0.1 fiber/cc	Negative
2157-IA2	One Stop	Air	6 Jun 02 (2157 ¹)	Person Samp Pump	0.003	0.1 fiber/cc	Negative
2157-IA3	One Stop	Air	6 Jun 02 (2157 ¹)	Person Samp Pump	0.008	0.1 fiber/cc	Negative
2157-IA4	416 AEG	Air	6 Jun 02 (2157 ¹)	Person Samp Pump	0.003	0.1 fiber/cc	Negative
2157-IA5	416 AEG Office	Air	6 Jun 02 (2157 ¹)	High Volume	0.008	0.1 fiber/cc	Negative
2160-IA1	CI/FP/JAG Gazebo	Air (Outdoor)	9 Jun 02 (2160 ¹)	High Volume	0.002	0.1 fiber/cc	Negative
2162-IA1	ASP Conex office	Air	11 Jun 02 (2162 ¹)	High Volume	0.006	0.1 fiber/cc	Negative

¹ Julian date

Figure C-24 (U) (C//REL). Industrial Hygiene Lead Based Paint Results

Sample ID	Location Description	Sample Type	Collection Date	Method	MDL ²	Results	HUD Title X Section 1017 Standard	Comparison to Standard
2157-IL1	One Stop	Lead Based Paint	5 Jun 02 (2156 ¹)	Paint Scrapings	0.01%	11.000%	0.50%	Positive
2157-IL2	One Stop	Lead Based Paint	6 Jun 02 (2157 ¹)	Paint Scrapings	0.01%	<0.1%	0.50%	Negative
2157-IL3	One Stop	Lead Based Paint	6 Jun 02 (2157 ¹)	Paint Scrapings	0.01%	0.140%	0.50%	Negative
2163-IL1	CI/FP/JAG	Lead Based Paint	12 Jun 02 (2163 ¹)	Paint Scrapings	0.01%	0.024%	0.50%	Negative
2163-IL2	Jag Office	Lead Based Paint	12 Jun 02 (2163 ¹)	Paint Scrapings	0.01%	0.025%	0.50%	Negative

¹ Julian date; ² MDL - Method Detection Limit

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Figure C-25 (U) (~~C//REL~~). Industrial Hygiene Sound Level Measurements

Sample ID	Location Description	Collection Date	Sound Level Meter	Results	Notes
Direct Reading Sound Level					
2160-IN4	Row 140	9 Jun 02 (2160 ¹)	Quest 2800	68 dBA	AC Units Running
2160-IN4	Row 140	9 Jun 02 (2160 ¹)	Larsen Davis	81 dBC	AC Units Running
2160-IN5	Row 120	9 Jun 02 (2160 ¹)	Quest 2800	72 dBA	Porch w/ AC Running
2160-IN5	Row 120	9 Jun 02 (2160 ¹)	Larsen Davis	78 dBC	Porch w/ AC Running
2159-IN1	Prime Power	8 Jun 02 (2159 ¹)	Quest 2800	82.5 dBA	
2159-IN1	Prime Power	8 Jun 02 (2159 ¹)	Larsen Davis	92 dBC	
2159-IN2	Prime Power	8 Jun 02 (2159 ¹)	Quest 2800	81 dBA	
2159-IN2	Prime Power	8 Jun 02 (2159 ¹)	Larsen Davis	89 dBC	
2159-IN3	Prime Power	8 Jun 02 (2159 ¹)	Quest 2800	77 dBA	
2159-IN3	Prime Power	8 Jun 02 (2159 ¹)	Larsen Davis	86 dBC	
2159-IN4	Prime Power	8 Jun 02 (2159 ¹)	Quest 2800	79.4 dBA	
2159-IN4	Prime Power	8 Jun 02 (2159 ¹)	Larsen Davis	88.5 dBC	
2160-IN1	DFAC	10 Jun 02 (2161 ¹)	Quest 2800	79.5 dBA	
2160-IN1	DFAC	10 Jun 02 (2161 ¹)	Larsen Davis	88.5 dBC	
2160-IN2	DFAC	10 Jun 02 (2161 ¹)	Quest 2800	73 dBA	
2160-IN2	DFAC	10 Jun 02 (2161 ¹)	Larsen Davis	82 dBC	
2160-IN3	DFAC-entry	10 Jun 02 (2161 ¹)	Quest 2800	63.5 dBA	
2157-IN1	ROWPU	6 Jun 02 (2157 ¹)	Quest 2800	78 dBA	
2157-IN2	ROWPU	6 Jun 02 (2157 ¹)	Quest 2800	81 dBA	
2157-IN3	ROWPU	6 Jun 02 (2157 ¹)	Quest 2800	78 dBA	
2157-IN4	ROWPU	6 Jun 02 (2157 ¹)	Quest 2800	82 dBA	
2161-IN1	SSA Logistics Yard	10 Jun 02 (2161 ¹)	Quest 2800	78 dBA	
2161-IN2	SSA Logistics Yard	10 Jun 02 (2161 ¹)	Quest 2800	80 dBA	
8-hour Overnight Dosimetry Sound Level					
2162-IN1	Tent 492 -outside	11 Jun 02 (2162 ¹)	Quest Q 300	TWA 73.6 dBA	Peak 138.2(Mig traffic)
2162-IN2	Tent 462-inside	11 Jun 02 (2162 ¹)	Quest Q 300	TWA 68.4 dBA	Peak 128.8(Mig traffic)
2162-IN3	Tent 469-inside	11 Jun 02 (2162 ¹)	Quest Q 300	TWA 49 dBA	Peak 129.1(Mig traffic)
2163-IN1	Tent 384-outside	12 Jun 02 (2163 ¹)	Quest Q 300	TWA 70.6 dBA	Peak 122.3(Mig traffic)
2163-IN2	Tent 205-outside	12 Jun 02 (2163 ¹)	Quest Q 300	TWA 61.2 dBA	Peak 141.7 (Mig traffic)
2163-IN3	SF entry check point	12 Jun 02 (2163 ¹)	Quest Q 300	TWA 58.2 dBA	Peak 136.2 (Mig Traffic)
2163-IN4	Tent 107-outside	12 Jun 02 (2163 ¹)	Quest Q 300	TWA 42.9 dBA	Peak 129.6 (Mig traffic)
48-hour Dosimetry Sound Level					
2161-IN3	PFC N. Caravito-58th Maint.Co.	10-12 Jun 02	Quest Q 300	TWA 89.1 dBA	Peak 147.6 (Mig traffic)

¹ Julian date

(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May 2002 - 14 June 2002

Figure C-26 (U) (~~C//REL~~). Industrial Hygiene Petroleum Hydrocarbon Vapor Monitoring

Sample ID	Location Description	Sample Type	Collection Date	Method	MDL ²	Results
2163-IV1	Fuel Point	Coconut Charcoal Tube	5 Jun 02 (2156 ¹)	TPH ³ Screen	5 mg	BDL ⁴
2163-IV2	Fuel Point	Coconut Charcoal Tube	12 Jun 02 (2163 ¹)	TPH ³ Screen	5 mg	BDL ⁴
No Sample ID	Fuel Point	Field Blank	12 Jun 02 (2163 ¹)	TPH ³ Screen	5 mg	BDL ⁴
No Sample ID	Fuel Point	Field Blank	12 Jun 02 (2163 ¹)	TPH ³ Screen	5 mg	BDL ⁴
No Sample ID	Fuel Point	Trip Blank	12 Jun 02 (2163 ¹)	TPH ³ Screen	5 mg	BDL ⁴
No Sample ID	Fuel Point	Trip Blank	12 Jun 02 (2163 ¹)	TPH ³ Screen	5 mg	BDL ⁴

¹ Julian date

² MDL - Method Detection Limit

³ TPH - Total Petroleum Hydrocarbon

⁴ BDL - Below Detection Limit

Table C-27 (U) (~~C//REL~~). Thermoluminescent Dosimeter (TLD) Results

SAMPLE ID	SHALLOW DOSE	EYE DOSE	DEEP DOSE
Control 1	0.000 REM	0.000 REM	0.000 REM
Control 2	0.000 REM	0.000 REM	0.000 REM
██████	0.000 REM	0.000 REM	0.000 REM
██████	0.000 REM	0.000 REM	0.000 REM
██████	0.000 REM	0.000 REM	0.000 REM
██████	0.000 REM	0.000 REM	0.000 REM
██████	0.000 REM	0.000 REM	0.000 REM
██████	0.000 REM	0.000 REM	0.000 REM

Notes:

1. Wear Period: 4 - 15 June 2002
2. Shallow Dose Equivalent: Depth of 0.007 cm in Tissue
3. Eye Dose Equivalent: Depth of 0.3 cm in Tissue
4. Deep Dose Equivalent: Depth of 1.0 cm in Tissue

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(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May 2002 - 11 June 2002

(U) APPENDIX D
SITE PHOTOGRAPHS

D-1

~~DECLASSIFIED SECRET//REL TO USA AUS CAN and GBR//MR~~

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002

Radiological Monitoring

D-2

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002



Figure D-1(U): Pieces of DU found in Site 1



Figure D-2 (U): Site 1 Radiological Area



Figure D-3 (U): Non-ionizing site survey at Operations Area

D-3

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002



Figure D-4 (U): Gamma Survey



Figure D-5 (U): Air sampling for radioactive material

D-4

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002

Bulk and Airborne Asbestos Sampling

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 Jun 2002



Figure D-6 (U): Gazebo near CI/FP Bldg with Asbestos Tiles



Figure D-7 (U): Apex of Gazebo Roof



Figure D-8 (U): 416th AEG Vehicle Maintenance Personnel Asbestos Monitor

D-6

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002

Noise

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002

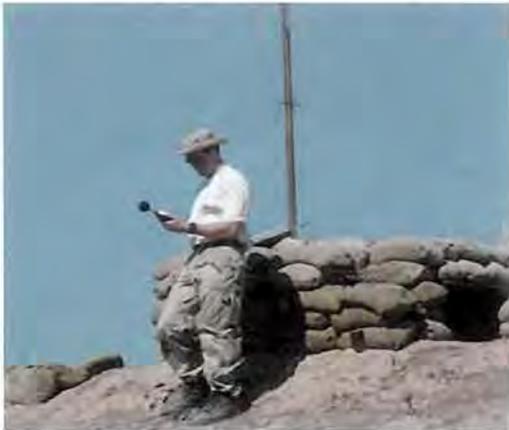


Figure D-9 (U): Noise Survey of Prime Power



Figure D-10 (U): Refrigerated Trucks Near Tent City DFAC



Figure D-11(U): Prime Power Generation - Operations Area



Figure D-12 (U): Porches Next to AC Units in Tent City

D-8

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002

Soil, Water and Ambient Air Sampling

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002



Figure D-13 (U): Subsurface Soil Sampling Using Bosch Hammer in Tent City Area



Figure D-14 (U): Screening Soil Sample With PID

D-10

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002



Figure D-15 (U): ROWPU Operation in Tent City Area



Figure D-16 (U): ROWPU Operation



Figure D-17 (U): ROWPU Water Bladder



Figure D-18 (U): Connection with New Water Line in Operations Area

D-11

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002



Figure D-19 (U): Digging in SSA Area / Exposed Soil Contamination



Figure D-20 (U): VOC Sampling in SSA Area / Exposed Soil Contamination Area



Figure D-21(U): VOC Sampling at Observation Post



Figure D-22 (U): Ambient Air Monitoring with MiniVol in SSA Area
D-12

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002

Risk Communication

(U) (~~S//REL~~) Environmental Site Survey and Occupational Health Risk Assessment Stronghold Freedom; Karshi-Khanabad Airfield, Uzbekistan, 31 May - 14 June 2002



Figure D-23 (U): MAJ [REDACTED] conducting Environmental Health Risk Communication with Troops



Figure D-24 (U): MAJ [REDACTED] conducting Environmental Health Risk Communication with Troops



Figure D-25 (U): LTC (Dr.) [REDACTED] conducting Medical Health Risk Communication with Troops



Figure D-26 (U): LTC (Dr.) [REDACTED] conducting Medical Health Risk Communication with Troops

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DECLASSIFIED (~~S//REL~~) APPENDIX E

SAMPLING COORDINATES

E-1

~~DECLASSIFIED SECRET//REL TO USA AUS CAN and GBR//MR~~

DECLASSIFIED (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May-14 June 2002

Table E-1. Radiological Sample Locations.

Sample Type / Sample	Latitude	Longitude	Sample Type / Sample	Latitude	Longitude
Soil Samples			AIR Samples		
2156-RS1	38° 50' 11.12" N	65° 53' 54.29" E	2157-RA1 (Radon)	38° 50' 08" N	65° 54' 03" E
2156-RS2	38° 50' 12.90" N	65° 54' 5.2" E	2157-RA2	38° 50' 08" N	65° 54' 03" E
2156-RS3	38° 50' 2.94" N	65° 53' 54.05" E	2157-RA3	38° 50' 08" N	65° 54' 03" E
2156-RS4	38° 49' 46.41" N	65° 54' 11.65" E	2157-RA4 (Radon)	38° 50' 12.70" N	65° 54' 4.85" E
2156-RS5	38° 50' 9.07" N	65° 50' 58.41" E	2157-RA5	38° 50' 12.70" N	65° 54' 4.85" E
2156-RS6	38° 50' 03" N	65° 53' 59" E	2157-RA6	38° 50' 12.70" N	65° 54' 4.85" E
2156-RS7	38° 49' 59.44" N	65° 54' 5.62" E	2157-RA7 (Radon)	38° 50' 8.81" N	65° 53' 57.35" E
2156-RS8	38° 49' 58.15" N	65° 54' 14.51" E	2157-RA8	38° 50' 8.81" N	65° 53' 57.35" E
2158-RS1	38° 49' 29" N	65° 54' 24" E	2157-RA9	38° 50' 8.81" N	65° 53' 57.35" E
2158-RS2	38° 49' 25" N	65° 54' 28" E	2157-RA10 (Radon)	38° 49' 54" N	65° 54' 02" E
2160-RS1	38° 50' 11.12" N	65° 53' 54.29" E	2157-RA11	38° 49' 54" N	65° 54' 02" E
			2157-RA12	38° 49' 54" N	65° 54' 02" E
Wipe Samples			2158-RA1 (Radon)	38° 50' 05" N	65° 54' 11" E
2156-RW1	38° 50' 05" N	65° 53' 58" E	2158-RA2	38° 49' 29" N	65° 54' 24" E
2156-RW2	38° 50' 04" N	65° 53' 58" E	2158-RA3	38° 49' 29" N	65° 54' 24" E
2156-RW3	38° 50' 01" N	65° 54' 05" E	2158-RA4	38° 50' 05" N	65° 54' 11" E
2156-RW4	38° 49' 58" N	65° 54' 14" E	2158-RA5	38° 50' 05" N	65° 54' 11" E
2156-RW5	38° 50' 08" N	65° 54' 03" E	2158-RA6	38° 50' 05" N	65° 54' 03" E
2156-RW6	38° 50' 08" N	65° 54' 03" E	2158-RA7	38° 50' 05" N	65° 54' 03" E
2156-RW7	38° 50' 08" N	65° 54' 03" E	2158-RA8 (Radon)	38° 50' 08" N	65° 54' 03" E
2158-RW1	38° 49' 31" N	65° 54' 22" E	2158-RA9	38° 50' 08" N	65° 53' 57" E
2158-RW2	38° 49' 31" N	65° 54' 22" E	2158-RA10	38° 50' 08" N	65° 54' 03" E
2158-RW3	38° 49' 31" N	65° 54' 22" E			
2159-RW1	38° 50' 01" N	65° 54' 03" E	Radon Traps		
2159-RW2	38° 50' 00" N	65° 54' 03" E	2160-RR1	38° 50' 11" N	65° 53' 56" E
2159-RW3	38° 50' 00" N	65° 54' 03" E	2160-RR2	38° 50' 08" N	65° 53' 56" E
2159-RW4	38° 49' 59" N	65° 54' 03" E	2160-RR3	38° 50' 08" N	65° 53' 57" E
2159-RW5	38° 49' 59" N	65° 54' 04" E	2160-RR4	38° 50' 14" N	65° 54' 03" E
			2160-RR5	38° 50' 11" N	65° 54' 02" E
			2160-RR6	38° 50' 06" N	65° 54' 11" E
			2160-RR7	38° 50' 07" N	65° 54' 14" E
			2160-RR8	38° 50' 07" N	65° 54' 13" E
			2160-RR9	38° 50' 04" N	65° 54' 14" E
			2160-RR10	38° 50' 04" N	65° 54' 14" E
			2160-RR11	38° 50' 01" N	65° 54' 18" E
			2160-RR12	38° 49' 56" N	65° 54' 15" E
			2160-RR13	38° 49' 59" N	65° 54' 04" E
			2160-RR14	38° 50' 03" N	65° 53' 59" E
			2160-RR15	38° 50' 03" N	65° 53' 59" E

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Table E-2. Environmental Sample Locations.

Sample Type / Sample	Latitude	Longitude
Drinking Water Samples		
ROWPU - Treated Water (2157-EW1)	38° 50' 09" N	065° 54' 01" E
Soil Samples - Surface Samples		
Southwest Tent City (2157-ES1)	38° 50' 03" N	065° 54' 03" E
Southwest Tent City (2157-ES2)	38° 49' 57" N	065° 54' 02" E
Southwest Tent City (2157-ES3)	38° 50' 00" N	065° 54' 05" E
Southwest Tent City (2157-ES4)	38° 49' 56" N	065° 54' 07" E
Southwest Tent City (2157-ES5)	38° 49' 54" N	065° 54' 03" E
Southwest Tent City (2157-ES5 ¹)	38° 49' 54" N	065° 54' 03" E
Hospital (2159-ES3)	38° 50' 06" N	065° 54' 13" E
Near Headquarters (2159-ES4)	38° 50' 05" N	065° 54' 14" E
Between Headquarters/Hospital (2159-ES5)	38° 50' 08" N	065° 54' 12" E
Soil Samples - Sub-Surface Samples		
Between Headquarters/Hospital (2159-ES1)	38° 50' 07" N	065° 54' 13" E
Between Headquarters/Hospital (2159-ES1)	38° 50' 07" N	065° 54' 13" E
Air Samples - PM10		
Eastern MiniVol - SSA (2157-EP1)	38° 50' 03" N	065° 54' 00" E
Western MiniVol - Power Pole (2157-EP2)	38° 50' 09" N	065° 54' 14" E
Eastern MiniVol - SSA (2158-EP1)	38° 50' 03" N	065° 54' 00" E
Western MiniVol - Power Pole (2158-EP2)	38° 50' 09" N	065° 54' 14" E
Eastern MiniVol - SSA (2159-EP1)	38° 50' 03" N	065° 54' 00" E
Western MiniVol - Power Pole (2159-EP2)	38° 50' 09" N	065° 54' 14" E
Eastern MiniVol - SSA (2160-EP1)	38° 50' 03" N	065° 54' 00" E
Western MiniVol - Power Pole (2160-EP2)	38° 50' 09" N	065° 54' 14" E
Eastern MiniVol - SSA (2161-EP1)	38° 50' 03" N	065° 54' 00" E
Western MiniVol - Power Pole (2161-EP2)	38° 50' 09" N	065° 54' 14" E
Eastern MiniVol - SSA (2162-EP1)	38° 50' 03" N	065° 54' 00" E
Western MiniVol - Power Pole (2162-EP2)	38° 50' 09" N	065° 54' 14" E
Trip Blank (2162-EP3)	Trip Blank	Trip Blank
Air Samples - VOCs		
Center of Excavation in SSA (2163-EV1)	38° 50' 13" N	065° 54' 18" E
Adjacent to Excavation in SSA (2163-EV2)	38° 50' 14" N	065° 54' 20" E
Emptied Area of Tent City (2163-EV3)	38° 50' 10" N	065° 54' 11" E
Emptied Area of Tent City (2163-EV4)	38° 50' 10" N	065° 54' 11" E
Trip Blank (2163-EV5)	Trip Blank	Trip Blank
Tent City - Tent 216 (2164-EV1)	38° 50' 01" N	065° 54' 04" E
Tent City - Tent 113 (2164-EV2)	38° 49' 56" N	065° 54' 05" E
Tent City - Tent 155 (2164-EV3)	38° 49' 55" N	065° 54' 03" E
Tent City - Tent 261 (2164-EV4)	38° 50' 00" N	065° 54' 02" E
Bunker on Berm (2164-EV5)	38° 50' 14" N	065° 54' 12" E
Bunker on Berm (2164-EV6)	38° 50' 14" N	065° 54' 12" E

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Table E-3. Industrial Hygiene Sample Locations.

Sample Type / Sample	Latitude	Longitude
Direct Reading Sound Level Meter		
ROWPU Potable Water Source	38° 50' 08" N	065° 54' 01" E
ROWPU Potable Water Source	38° 50' 09" N	065° 54' 00" E
ROWPU Potable Water Source	38° 50' 10" N	065° 54' 00" E
ROWPU Potable Water Source	38° 50' 10" N	065° 54' 01" E
SSA Logistics Yard	38° 50' 15" N	065° 54' 17" E
SSA Logistics Yard	38° 50' 15" N	065° 54' 19" E
SSA Logistics Yard	38° 50' 13" N	065° 54' 20" E
SSA Logistics Yard	38° 50' 14" N	065° 54' 21" E
Prime Power Generation	38° 50' 01" N	065° 54' 07" E
Prime Power Generation	38° 50' 02" N	065° 54' 08" E
Prime Power Generation	38° 50' 02" N	065° 54' 10" E
Prime Power Generation	38° 50' 02" N	065° 54' 09" E
DFAC	38° 50' 03" N	065° 54' 01" E
DFAC	38° 50' 02" N	065° 54' 01" E
Tent Row 120	38° 49' 56" N	065° 54' 05" E
Tent Row 140	38° 49' 56" N	065° 54' 03" E
8 hour Dosimetry Sound Level		
Tent #462	38° 50' 09" N	065° 54' 04" E
Tent #492	38° 50' 09" N	065° 54' 03" E
Tent #469	38° 50' 07" N	065° 54' 01" E
Tent #205	38° 50' 01" N	065° 54' 06" E
Tent #107	38° 49' 56" N	065° 54' 07" E
Brown and Root Complex	38° 50' 01" N	065° 54' 08" E
SOF Entrance Checkpoint	38° 49' 59" N	065° 54' 13" E
Tent #384	38° 50' 04" N	065° 54' 13" E
Asbestos Bulk Sampling		
One Stop In-processing center	38° 50' 01" N	065° 54' 19" E
CI/Force Protection/ Jag Office	38° 50' 01" N	065° 54' 17" E
416th AEG Vehicle Maintenance Facility	38° 49' 59" N	065° 54' 20" E
Asbestos Air Sampling		
One Stop In-processing center	38° 50' 01" N	065° 54' 19" E
CI/Force Protection/ Jag Office	38° 50' 01" N	065° 54' 17" E
416th AEG Vehicle Maintenance Facility	38° 49' 59" N	065° 54' 20" E
Lead-In-Paint Bulk Sampling		
One Stop In-processing center	38° 50' 01" N	065° 54' 19" E
CI/Force Protection/ Jag Office	38° 50' 01" N	065° 54' 17" E

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~~DECLASSIFIED (C//REL)~~ APPENDIX F
COMMUNICATIONS TO LOCAL COMMAND

F-1

~~DECLASSIFIED SECRET//REL TO USA AUS CAN and GBR//MR~~

Environmental Site Survey and Operational Health Risk Assessment

Stronghold Freedom

13 July 2002

Center for Health Promotion and Preventive Medicine

<http://usachppm1.army.smil.mil>

F-2

Agenda

- Background
 - Authority
 - Previous Survey (Oct-Nov 2001)
- Environmental Survey June 02
 - Findings
 - Recommendations

Authority

- JCS Memo MCM-0006-02 dtd 1 Feb 02
- DoD Directive 6490.2/ DoD Instruction 6490.3

⇒ for all deployments >30 days

⇒ assess hazards

⇒ identify population at risk

⇒ recommend specific countermeasures

⇒ monitor health outcomes

⇒ communicate to population at risk

Environmental Site Characterization and Operational Health Risk Assessment Oct-Nov 2001

- Berm trench- subsurface soils contaminated with jet fuel
- Former AAM/ASM storage facility- DU
- Roofing materials- Asbestos tiles

Environmental Survey June 02

- CHPPM-EUR validated previous assessment
 - No radiation hazard in camp
 - Asbestos tiles present
 - Lead based paint present at One Stop
 - Jet Fuels (primarily kerosene) in soil 1-2 m below ground surface
 - Noise Hazard in specific areas

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REDACTED

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~~DECLASSIFIED SECRET//REL TO USA AUS CAN and GBR//MR~~

Environmental Sampling Radiation

- Survey Methodology
 - Gamma radiation
 - Radon
 - Dosimetry
- Areas surveyed
 - Comprehensive survey of entire installation



Gamma radiation probe

Air sampling for Radiation



F-9

Environmental Sampling Radiation

- No radiation hazards in Stronghold Freedom
- Small pieces of Depleted Uranium were present in the site Northwest of perimeter berm
- No precautions are required for personnel in the camp



Former AAM/ASM Storage site
"Off Limits" since Nov 2001



Pieces of DU found in
this site

Environmental Sampling Air

- Methodology
 - Inhaled particulates
 - fuel vapors
- Areas Sampled
 - Operations area; Logistics and maintenance areas (SSA); Tent city
 - Personal air monitoring



Mini Vol air sampler

Environmental Sampling Air

- Results
 - No heavy metals in respirable particulates
 - Clay surface soils prevent exposure to jet fuel vapors from subsurface soils
- Recommendations
 - Minimize dust
 - Don't Dig in Tent City, SSA, portions of Operations Area

Environmental Sampling Water

- Methodology
 - Chemical, physical and radiological quality
- Samples taken
 - Bottled, untreated, and ROWPU treated water
- Results:
 - Bottled and treated water meets all US drinking water standards

Environmental Sampling Soil

- Methodology
 - Surface and subsurface sampling
 - Analysis: POLs, solvents, heavy metals, pesticides, PCBs, organic compounds
- Areas Sampled:
 - Operations area
 - Tent city



Excavation pit in SSA area

Environmental Sampling Soil

- Results:
 - Detected low levels pesticides, PCBs, heavy metals in surface soil – well below health standards; not a health risk
- Recommendations:
 - minimize digging in Tent City, SSA, portions of Operations Area

Environmental Sampling Noise

- Methodology
 - Direct reading and 8 hour dosimetry
- Areas Sampled:
 - Tent city
 - Prime Power generation facility
- Results:
 - Noise levels in LSA do not exceed the action level of 85dBA
 - Aircraft traffic exceeds action level- short duration impulse noise



Noise Hazard areas

F-20

Environmental Sampling Noise

- Recommendations
 - If you have to raise your voice to be heard you should move away from the area
 - Wear Hearing Protection
 - SSA refrigeration trailers
 - Prime Power
 - Heavy equipment operation

Occupational Sampling Asbestos and Lead Based Paint

- Methodology:
 - Bulk and airborne asbestos fiber sampling
- Areas Sampled:
 - One-Stop office
 - CI/FP/JAG office
 - 416th AEG vehicle maintenance facility
 - ASP Office

F-22

Occupational Sampling Asbestos and Lead Based Paint

- Results:
 - One-Stop = negative for asbestos/ positive for lead based paint
 - 416th AEG = bulk sample positive
 - All Airborne Asbestos fiber sampling = negative
- Recommendations:
 - Minimize dust; leave asbestos tiles in place
 - Paint interior surfaces at the One Stop



Gazebo in CI/FP/Jag area

F-223

Summary

- No radiation hazard in camp
- Jet Fuels (primarily kerosene) in soil 1-2m below ground surface; clay surface soils prevent exposure
- Noise Hazard areas
- Asbestos tiles present on some structures
- Lead based paint present at One Stop

Recomendations

- Countermeasures to minimize risk:
 - ASM/AAM area off limits
 - Minimize digging
 - Minimize dust
 - Paint over asbestos tiles and Lead based paint

Compliance with JCS/DoD Policy

- recognize and assess hazardous exposures
- identify population at risk
- employ specific countermeasures
- monitor health outcomes
- communicate findings, conclusions, and countermeasures to the population at risk

Questions

- POC: COL [REDACTED],
Commander CHPPM-EUR, [REDACTED]
[REDACTED]
- email: [REDACTED]
- A final report available at
<http://usachppm1.army.smil.mil>

**The health of the soldier
should be the Commander's
primary concern.**

Gen George Washington,
(Order and Discipline), 1775

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(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment,
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(U) (~~C//REL~~) APPENDIX G

OPERATIONAL HEALTH RISK ASSESSMENT

G-1

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(U) ~~(S//REL)~~ Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May 2002 - 14 June 2002

1. (U) HEALTH RISK ASSESSMENT

a. (U) ~~(C//REL)~~ Procedures. The sampling data discussed in the body of this report were used to characterize the potential operational occupational and environmental health (OEH) risks for field units deployed at Stronghold Freedom. Exposure to compounds in soil, ambient air, and drinking water were characterized. The risk assessment was performed according to doctrine described in US Army FM 100-14 and US Army Center for Health Promotion and Preventive Medicine Technical Guides 248 and 230 [Appendix A, References 5 and 6].

b. (U) Hazard Identification. An OEH chemical hazard is any chemical or chemical mixture that can cause injury, illness, disease, adverse health conditions, or death for personnel (a health threat). Such conditions may also affect the health status of the field unit or command, in terms of mission effectiveness (a medical threat). OEH hazards are identified through environmental surveillance and sampling.

c. (U) Exposure Profile. An exposure profile is a description of predicted patterns of exposure field personnel will experience while deployed. Exposure patterns describe the frequency and duration of potential personnel exposures to OEH hazards. These patterns also contribute to determining the nature and magnitude of health effects that may be experienced upon exposure to unsafe levels of chemicals. The primary purpose of the exposure profile is to identify one or more exposure periods and exposure media for personnel in the field unit.

(1) (U) ~~(C//REL)~~ Activity Patterns. Stronghold Freedom personnel may consist of units that live in and patrol the area for up to 24 hours a day. The specific deployment duration is not known at this time so a 1-year exposure will be assumed for this evaluation. The type of activities personnel may undertake can affect exposure. Information is not known on specific activity patterns for personnel at Stronghold Freedom so general assumptions were used based on general knowledge of typical activities from past military operations.

(2) (U) ~~(C//REL)~~ Exposure Patterns. Based on the sampling data available, it is impossible to provide a complete assessment of potential exposure over time. However, it is assumed for this assessment that the samples collected represent the overall condition of the Stronghold environment for the deployment duration.

(3) (U) ~~(C//REL)~~ Exposure Periods. This report assesses the potential for health threats based on daily exposures to compounds detected in soil, drinking water, and ambient air during the May - June 2002 sampling event. It was assumed that soldiers would be present at the Stronghold 24 hours per day for the duration of their deployment. This should be a conservative assumption that will add a margin of safety to the evaluation.

d. (U) Preliminary Threat Analysis. The potential soil, water, and air chemical hazards can be classified into health threat categories based on a comparison of conservative estimates of the exposure point concentrations to available standard military guidelines. Table G-1 presents the maximum detected concentrations for each compound that exceeded its respective guideline for each environmental media.

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The exposure guideline is also provided as a point of comparison. The complete list of detected compounds can be found in Annex B. As a preliminary evaluation, all compounds detected were compared to appropriate Military Exposure Guidelines (MEGs) as listed in TG 230 [Appendix A, Reference 6]. If a MEG was not available, USEPA Region 9 Preliminary Remediation Goals (PRGs) were used. Any additional sources consulted are listed individually. The 1-year MEGs are meant to be protective for continuous exposures to soldiers up to a 1-year duration. The EPA Region 9 PRGs are protective of a lifetime of exposure. These general population values are also meant to be protective of small children and the elderly and are generally more protective than the MEGs.

Table G-1. (U) (~~C//REL~~) Data Analysis Summary

Compound	Media	Maximum Detection	Guideline	Source
Tetrachloroethylene	Air	0.0061 mg/m ³	0.0033 mg/m ³	Region 9 PRG
PM ₁₀	Air	0.702 mg/m ³	0.07 mg/m ³	TG 230

(U) (~~C//REL~~) In addition to the chemical analyses, general water quality indicators were measured including pH, total dissolved solids, and turbidity. Each of these was within the acceptable range as listed in TB MED 577. The complete list and their corresponding values are presented in Table G-8. Since the compounds listed above exceed their respective guidelines, the air in the vicinity of Stronghold Freedom may pose a potential medical threat and will be evaluated further in the following sections.

e. (U) Hazard Probability. The hazard probability ranking chart in TG 230 was used to assign a hazard probability to each environmental media.

(1) (U) (~~C//REL~~) Air. The levels of compounds detected in the air samples varied with sample location. Most samples did not indicate the presence of any compounds above the method detection limit. However, a few isolated samples contained elevated levels of tetrachloroethylene as well as particulate matter <10µ (PM₁₀). Due to the highly variable nature of air concentrations, it is estimated that between 50% and 75% of personnel at Stronghold Freedom will be exposed to elevated levels of compounds in air. Therefore, the hazard probability was classified as Likely.

f. (U) Hazard Severity. The hazard severities associated with exposure to the detected levels of compounds in all media were classified using the Chemical Hazard Severity Ranking Chart for Military Deployments provided in TG 230. The assigned hazard severities for each compound are detailed in Table G-2 below. The health threat classification was reevaluated and resulting threat levels are included in Annex A. Potential health outcomes for each compound are also included in Annex A.

(1) (U) (~~C//REL~~) Ambient Air. Air concentrations can vary significantly over time and by location. Maximum concentrations were used for comparison purposes to provide a conservative estimate of risk in the absence of additional surveillance. Concentrations of tetrachloroethylene slightly exceeded the Region 9 PRG, which was the only available guideline in this instance. Exposure to high levels of tetrachloroethylene can produce symptoms such as dizziness, eye and skin irritation, respiratory

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irritation and suffocation. It is estimated that less than 10% of personnel may experience health effects. The resulting hazard severity for tetrachloroethylene is NEGLIGIBLE.

(U) ~~(C//REL)~~ Measured PM₁₀ concentrations also exceeded the long-term guideline in 10 of the 11 samples which produced valid results. Potential affects of PM₁₀ exposure include irritation of the eyes, skin, throat, and respiratory system. These effects are considered temporary irritation and it is estimated that greater than 10% of personnel may experience effects. Therefore, the hazard severity for PM₁₀ exposure is considered MARGINAL.

Table G-2. (U) ~~(C//REL)~~ Hazard Severity Ranking for Ambient Air Compounds

Compound	Concentration	Guideline	Severity Rank
Tetrachloroethylene	0.0061 mg/m ³	0.0033 mg/m ³	Negligible
PM ₁₀	0.702 mg/m ³	0.070 mg/m ³	Marginal

f. (U) ~~(S//REL)~~ Risk Characterization. In order to evaluate the overall operational risk, the hazard probability and severity are compared to the Risk Assessment Matrix provided in TG 248. An evaluation is done for each compound in order to develop an estimate of overall operational risk. In addition, the confidence in the estimate is also provided. Table G-3 provides a summary of the risk estimates for compounds exceeding guidelines at Stronghold Freedom. A more extensive summary is presented in Table G-4.

Table G-3. (U) ~~(C//REL)~~ Operational Risk Levels

Compound	Air			
	Hazard Probability	Hazard Severity	Operational Risk	Confidence
Tetrachloroethylene	Likely	Negligible	Low	Low
PM ₁₀	Likely	Marginal	Moderate	Low

(U) The confidence in the air assessment was considered low due to the highly variable nature of air concentrations and the limited temporal scope of the available sampling data.

g. (U) Develop Controls.

(1) (U) ~~(C//REL)~~ Ambient Air. Most of the air samples collected did not indicate measurable levels of compounds. However some samples detected elevated levels of tetrachloroethylene. Since the operational risk for tetrachloroethylene is LOW, it is not necessary to take action to reduce the air concentrations. However, some simple mitigation action could be undertaken if a source of the compound can be identified. This could consist of removing or isolating the source with soil cover. If this is not feasible, personnel could also simply avoid the area. Elevated PM₁₀ concentrations were also seen during most days of sampling. In order to reduce the operational risk associated with PM₁₀, personnel could utilize dust masks or avoid extensive outdoor activities during periods when dust levels in the air are noticeably elevated. Active dust control measures could also reduce the concentrations to more acceptable levels. Implementation of these measures would reduce the operational risk to LOW.

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2. (U) (~~C//REL~~) UNCERTAINTIES. Overall, this OEH evaluation is meant to be conservative and should be adequately protective of soldiers' health under the conditions evaluated. However, a degree of uncertainty is inherently associated with this type of assessment. The true exposure frequencies of Stronghold Freedom personnel were not known so it was assumed that soldiers would be exposed to the detected hazards continuously for an entire year. However, the samples collected to date are only representative of environmental conditions over a brief time period. It is impossible to account for natural variation in the levels throughout the course of a year. This is particularly true for ambient air quality which can change rapidly and may be highly variable from one day to the next. In addition, the potential cumulative effects of exposure to similar compounds in different media, or different compounds with similar mechanisms of action, cannot be quantified. There were some compounds detected that did not have toxicological data and guidelines available for comparison. These compounds were not evaluated in this assessment. This is a significant source of uncertainty in the evaluation. Future iterations of this evaluation will allow for a more accurate evaluation of potential hazard.

3. (U) (~~C//REL~~) CONCLUSIONS. Of the two compounds detected in air that exceeded guidelines, tetrachloroethylene appears to pose a LOW operational risk while PM₁₀ levels pose a MODERATE operational risk. As a result, tetrachloroethylene is classified as a health threat while PM₁₀ is considered a potential medical threat. Areas with noticeable vapors should be avoided if possible and protective measures should be taken if outdoor activity is necessary during periods when high particulate levels are noticeable in air. In addition, active dust control measures should continue in order to help reduce airborne particulate levels. If these measures are taken, the overall operational occupational and environmental health risk for the Stronghold would be LOW.

4. (U) RECOMMENDATIONS.

a. (U) The following controls should be implemented in order to minimize the operational occupational and environmental health risk.

(1) (U) (~~C//REL~~) Air. Areas of identifiable contamination should be avoided if possible. Potential sources of elevated air concentrations should be mitigated by covering with soil or other appropriate measures if desired. Dust masks should be worn during periods of high wind or other conditions that could produce elevated levels of PM₁₀. Active dust control measures should continue.

b. (U) Continue to monitor all media in order to detect changes from the current baseline conditions, document exposures, and determine the effectiveness of the risk control practices.

c. (U) The operational OEH risk assessment should be updated as additional sampling data become available.

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Table G-4 (U) (~~C//REL~~). OEH Risk Summary and Recommended Controls

OEH Hazard	Hazard Rank		Operational Risk Estimate		Potential Impacts		Courses of Action (COA) and Notes
	Hazard Probability	Hazard Severity	Risk Level	Confidence	Health	Operational	
Tetrachloroethylene	Likely	Negligible	Low	Low	<u>Potential symptoms:</u> Irritation of eyes, nose, throat, and skin; respiratory irritation, dizziness, and suffocation <u>Estimated Incidence:</u> Less than 10 percent	Long-term exposures could lead to an increase in cancer rates	1. Minimize personnel exposures by avoided contaminated areas if possible 2. Identify sources of compounds and perform mitigation.

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<p align="center">PM₁₀ in Air</p>	<p align="center">Frequent</p>	<p align="center">Marginal</p>	<p align="center">Moderate*</p>	<p align="center">Low</p>	<p>Acute effects that may be associated with elevated particulate levels include increased cough, mucous production, respiratory irritation, and exacerbation of any underlying respiratory conditions such as asthma or bronchitis. Given that the high particulate levels did not persist, these effects would be expected to be transient.</p> <p>Asthmatics may notice worsening of their asthma, or more frequent attacks. Blowing sand may also irritate the skin and eyes. Increased sick call rates for upper respiratory conditions may be evident in the DNBI rates a few days following sandstorms and high particulate levels.</p>	<p>High levels are particulates are common in this region of the world with seasonal variation. The particulates measured reflected airborne sand particles rather than industrial or vehicle emissions and soot. Sand storms generate high particulate levels and sampling occasionally coincided with this. Typically, the daily averages were variable, but high levels did not persist for more than a few days. For this reason, it is unlikely that any persistent, measurable health effect would be associated with these levels.</p>	<p>DNBI rates should be monitored. There are no specific diagnostic tests recommended during the deployment, and no specific follow-up tests post-deployment. Outdoor activity should be limited during such storms, and the use of cravats to protect the airways may be helpful.</p>
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 Table G-5 (U) (~~C//REL~~). Soil Analytical Results Summary

Soil Data Summary			
Compound	Max. Conc. (mg/kg)	Guideline (mg/kg)	Source
Arsenic	7.0	1100	TG230
Barium	100	5400	Reg 9 PRG
Beryllium	0.83	16000	TG230
Cadmium	2.2	130	TG230
Chromium	28	5700	TG230
Cobalt	9.4	4700	Reg 9 PRG
Copper	54	2900	Reg 9 PRG
Lead	90	2200	TG230
Manganese	490	1800	Reg 9 PRG
Nickel	25.0	1600	Reg 9 PRG
Selenium	6.4	390	Reg 9 PRG
Zinc	110	69000	TG230
Acenaphthene	0.01	1300	TG230
Acenaphthylene	0.22	NA	-
Anthracene	0.02	6.1	TG230
Benzo(a)anthracene	0.01	2500	TG230
Benzo(a)pyrene	0.01	250	TG230
Benzo(b)fluoranthene	0.02	2500	TG230
Benzo(g,h,i)perylene	0.02	NA	-
Benzo(k)fluoranthene	0.01	3100	TG230
Chrysene	0.02	3100	TG230
Fluoranthene	0.04	42000	TG230
Fluorene	0.12	90	TG230
Indeno(1,2,3-cd)pyrene	0.02	0.62	Reg 9 PRG
Napthalene	16	220	TG230
Phenanthrene	0.05	270	TG230
Pyrene	0.04	31000	TG230
1-Methylnaphthalene	19	NA	-
2-Methylnaphthalene	18	NA	-
2,2',5,5'-Tetrachlorobiphenyl	0.0007	NA	-
2,2',4,5,5'-Pentachlorobiphenyl	0.0022	NA	-
2,2',3,4,4',5'-Hexachlorobiphenyl	0.0059	NA	-
2,2',4,4',5,5'-Hexachlorobiphenyl	0.0033	NA	-
2,2'3,4,4',5,5'-Heptachlorobiphenyl	0.0009	NA	-
Total PCB	0.065	2.1	TG230
Total Petroleum Hydrocarbons	18000	NA	-
1,2,4-Trimethylbenzene	45	5190	TG230
1,3,5-Trimethylbenzene	14	5190	TG230
Ethylbenzene	5.5	230	TG230
Isopropylbenzene	7.1	NA	-
Napthalene	11	220	TG230
Xylene	16.8	210	TG230
n-Butylbenzene	15	140	Reg 9 PRG
n-Propylbenzene	17	140	Reg 9 PRG
p-Isopropyltoluene	6.9	NA	-
sec-Butylbenzene	11	230	TG230
p,p'-DDE	0.17	1.7	Reg 9 PRG
p,p'-DDT	0.09	52	TG230

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Table G-6 (U) (C//REL). Drinking Water Analytical Results Summary

Drinking Water Data Summary	Max. Concentration (mg/L)	TG 230 Guideline (mg/L)	
		5 L/day	15 L/day
Calcium	4	NA	-
Magnesium	0.81	100	30
Zinc	0.012	4	1.3
Toluene	0.0005	3	1
Chloroform	0.0021	1.4	0.5
THM Total	0.0021	NA	-

Table G-7 (U) (C//REL). Ambient Air Analytical Results Summary

Ambient Air Data Summary	Max. Concentration (mg/m ³)	TG 230 Guideline (mg/m ³)
		1-year
1,2,4-Trimethylbenzene	0.0069	3.06
1,3,5-Trimethylbenzene	0.0042	3.06
1,4-Dichlorobenzene	0.0005	1.7
4-Isopropyltoluene	0.0021	NA
Benzene	0.0007	0.039
Cyclohexane	0.0006	NA
Decane	0.0182	NA
Ethylbenzene	0.00065	2.95
Hexane	0.0008	43
Isopropylbenzene	0.0008	NA
Manganese	0.00033	0.00034
m/p-xylene	0.0026	10.6
Methylene Chloride	0.0017	2.1
n-Propylbenzene	0.0014	0.025
o-xylene	0.0009	10.6
sec-Butylbenzene	0.0015	0.025
Styrene	0.0006	2.0
Tetrachloroethylene	0.0061	NA
Toluene	0.00430	4.6
Zinc	0.0024	NA
Particulate Matter (PM ₁₀)	0.702	0.07

NA – Indicates no guideline is available.

Table G-8 (U) (C//REL). General Water Quality Indicators

Parameter	Value	Guideline	Source
Alkalinity	11	NA	-
Calcium	4	NA	-
Conductivity	20	NA	-
Hardness	13	NA	-
Nitrate	0.4	10 mg/L	TBMED 577
Total Nitrate	0.4 mg/L	10 mg/L	TBMED 577
pH	6.1	5 to 9	TBMED 577
Total Dissolved Solids	47 mg/L	1000mg/L	TBMED 577
Turbidity	0.15 NTU	1 NTU	TBMED 577

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(U) ~~(C//REL)~~ APPENDIX H

SUMMARY OF PREVIOUS FINDINGS AND RECOMMENDED COUNTERMEASURES

Page H-1

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APPENDIX H
Summary of Findings/ Recommended Countermeasures
(Reference 1)

(1) (U) ~~(C//REL)~~ Soil Contamination.

(a) (U) ~~(C//REL)~~ Surface Conditions. The surface soil contained trace levels of various contaminants at and below the surface. These contaminants did not pose a health threat at the levels.

(b) (U) ~~(C//REL)~~ Subsurface Conditions. Elevated levels of volatile organic compounds (VOCs) were detected at distinct locations below ground surface (bgs) level. The elevated levels of VOCs and total petroleum hydrocarbons (TPH) appeared to be related to fuel transmission / storage activities that predate US Forces on Stronghold Freedom. These contaminants did not pose a significant health threat at the levels detected based on limited exposure pathways.

(2) (U) ~~(C//REL)~~ Ambient Air Quality. Inhalation of vapors from subsurface fuel contaminated soils could potentially cause adverse health effects in personnel at Stronghold Freedom. Much of the Site 3 future expansion area, the dirt area immediately behind the Uzbek Aircraft Maintenance Hangars, and the areas around the former mess hall and shower facility (near hardened aircraft shelter (HAS) 21) also contained visible petroleum contamination in subsurface soils. The clay soils overlaying subsurface petroleum contamination in these areas greatly mitigated ambient air exposures to either very low or non-detectable levels. For this reason, a "no digging" directive was recommended for these areas to minimize/prevent exposures via the air pathway. Additionally, visual observations and air sampling confirmed that inhalation of respirable particulates could be a viable exposure pathway for personnel stationed at Stronghold Freedom. There were four observations that exceeded the USACHPPM Technical Guide (TG) 230 annual guideline of 70 ug/m³, with several exceeding this standard by a factor of four (e.g., over 300 ug/m³). Surface soil samples did not indicate heavy metal, polycyclic aromatic hydrocarbons (PAHs), polycyclic biphenyls (PCBs), or pesticides that would prompt additional health concerns at this time. Particulate filters did not detect the presence of heavy metals. Monitoring for organic and inorganic air contaminants should continue at Stronghold Freedom in order to provide additional exposure data (IAW requirements of references ? and ?) and evaluate the efficacy of countermeasures. Equipment, environmental media, and sample analysis to perform this monitoring has been provided by USACHPPM. Preventive medicine personnel assigned to Stronghold Freedom will be best suited to perform this mission.

(3) (U) ~~(C//REL)~~ Water Quality. Monitoring for heavy metals should continue on a quarterly basis to ensure that ROWPU operational practices (e.g., recycling brine water) do not concentrate heavy metals in product water.

(4) (U) ~~(C//REL)~~ Radiological.

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(a) (U) ~~(C//REL)~~ Base Camp Assessment. There are no potential ionizing radiological health hazards associated with any areas within the Stronghold Freedom perimeter. Deployed personnel are not subjected to internal or external harmful ionizing radiation exposures within the confines of Stronghold Freedom.

(b) (U) ~~(C//REL)~~ Site 1 contains small pieces of radioactive material later identified to be depleted uranium of non-US origin. The area was declared off-limits as a precautionary measure to minimize the possibility of personnel exposure. There is no health hazard to personnel within the force protection berm.

(c) (U) ~~(C//REL)~~ Bunker and Building Evaluations. There is no potential radiological health hazard to personnel who previously occupied or are presently occupying the bunkers or buildings within the Stronghold Freedom Base Camp. Direct meter measurements do not indicate elevated levels of radioactivity and wipe tests reveal no removable radiological contamination.

(d) (U) ~~(C//REL)~~ Air Sampling. Air samples were determined to be less than or equal to background reference samples. Thus, radiological contamination from Site 1 does not appear to pose a health threat via the air pathway.

(e) (U) ~~(C//REL)~~ Dosimetry. Personnel occupying fighting positions will not receive external exposures from the radiological contamination detected at Site 1. Furthermore, continuous external and internal personnel dosimetry is not warranted.

(5) (U) ~~(C//REL)~~ Asbestos.

(a) (U) ~~(C//REL)~~ Corrugated roof tiles at Stronghold Freedom are asbestos-containing materials. Some of these tiles are broken; there is a possibility that the broken tiles could be releasing asbestos into the air. Since air sampling did not reveal airborne asbestos fibers, the health risk from the asbestos in these roof tiles is negligible.

(b) (U) ~~(C//REL)~~ Broken asbestos tiles on the ground in some areas of the Stronghold pose a possible risk of airborne exposure to asbestos, albeit slight. However, proper handling of broken tiles (see recommendations below) on the ground will pose a negligible risk

(c) (U) ~~(C//REL)~~ The hangars pose no risk of asbestos exposure from the wall coating in the backblast areas.

(d) (U) ~~(C//REL)~~ Missile debris found in the former weapons/munitions storage area contains asbestos. The soil is likely to contain some degree of asbestos fibers. The fibers are harmless unless inhaled. The fighting positions nearest to the former weapons/munitions storage area are highest risk for asbestos inhalation exposure. Results of asbestos air monitoring reveal that no asbestos fibers were detected in the air at the nearest fighting position. Therefore, the

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health risk from asbestos present in the former missile storage site is negligible.

(6) (U) ~~(C//REL)~~ Hantavirus. There is minimal identified health risk for the Tula, Puumala, Hantaan, and Dobrava Hantavirus strains at Stronghold Freedom from the specimens provided by the Preventive Medicine Detachment. Antibody screening results from two specimens indicate that Hantavirus (Hantaan strain) has been in the area and may still be existing in mouse populations not tested.

(7) (U) ~~(C//REL)~~ Operational Risk Management Estimate. When recommended controls are implemented the overall operational risk management estimate of Stronghold Freedom is LOW. Of the 15 compounds detected in environmental media that exceeded guidelines, nine appear to pose a LOW operational risk. Three of these compounds are classified as potential medical threats and the remaining are considered health threats. The risk from all compounds in soil was considered LOW but an attempt should be made to avoid contact with subsurface soils that may have elevated concentrations of fuels and related compounds. Two metals were detected in water at levels that slightly exceeded guidelines. However, the operation OEH risk was considered LOW and the water is suitable for consumption. Air exposure should be handled similarly to soil. Areas with noticeable vapors should be avoided if possible.

b. (U) ~~(S//REL)~~ Recommended Countermeasures.

(1) (U) ~~(C//REL)~~ All Environmental Exposures. Develop and implement a plan for communicating risk to the soldiers and airmen that summarizes our findings and conclusions in a manner consistent with effective environmental risk communication principles. Although the health effects of the radioactivity, chemical uranium, and the asbestos are likely to be nonexistent, the perception of a grave health risk is likely to be present among the stronghold population.

(2) (U) ~~(C//REL)~~ Exposure to Contaminated Soil and Vapors from Contaminated Soil.

(a) (U) ~~(C//REL)~~ Prohibit digging into soil contaminated with jet fuel (tent city, the hangar area, and the eastern expansion area [site 3]). Include this in the risk communication plan, along with recommendations for personal protective equipment when manual digging must be done.

(b) (U) When digging must be done, back fill the resulting hole/trench at the earliest opportunity. If digging is to be done manually, then the following personal protective equipment is recommended:

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1) half- or full-face respirator with organic vapor cartridge and HEPA filter. The M40 mask meets this requirement. If the M40 mask is used, it is recommended that the cartridge/filter be changed when the digging work is complete so that the mask will be fully functional in case of chemical agent attack.

- 2) Tyvek suit with Saranac coating
- 3) Nitrile gloves (or similar impermeable gloves)
- 4) Rubberized overboots

(c) (U) ~~(C//REL)~~ Ambient Air Exposures - Respirable Particulate Inhalation (including inhalation of radiological particulates from Site 1). Implement methods to keep the dust level to a minimum (i.e., dust that could originate from the former missile storage site or other locations). For example, gravel or pave the berm road adjacent to the former missile storage site. Consider capping the area with clean soil. If this is done, the current soil should not be disturbed; clean fill (eg, such as that found west of the westernmost force protection berm) should be compacted over the top of the existing topsoil. Additionally, wet down existing berms and dirt areas to prevent suspension of soil particles and position diesel exhaust sources away from highly trafficked living and working areas.

(d) (U) ~~(C//REL)~~ Radiological Exposures. Declare the former missile storage site (Site 1) to be off-limits. Properly and permanently mark and cordon the area. Follow ambient air exposure recommendations in paragraph 11c above to minimize exposure to inhaled radiological particulate matter from Site 1.

(e) Asbestos Exposures.

(1) (U) Wet, double-bag, label, and properly dispose of asbestos tiles on the ground. Once the tiles are wet, workers should wear nitrile or similar nonpermeable gloves to handle the tiles. Workers should wash their hands after the work is completed.

(2) (U) Do not disturb roof tiles currently in place on existing structures. If work needs to be done in which the roof tiles would be disturbed or replaced, contact USACHPPM-EUR for recommendations on protective measures.

(f) (U) Hantavirus/ Rodent Borne Disease Exposures. Implement rodent control programs/ measures as necessary to prevent potential rodent-borne health threats.

(g) Future Environmental Monitoring.

(1) (U) ~~(C//REL)~~ Conduct radiological air monitoring for uranium (soluble and insoluble) in or near the fighting positions nearest to the former missile storage site. Instructions and equipment/supplies were provided to the Preventive Medicine Detachment for conducting this monitoring. (Completed 5-10 June 02; awaiting analysis results.)

(U) ~~(S//REL)~~ Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi Khanabad Airfield, Uzbekistan, 31 May – 14 June 2002

(2) (U) ~~(C//REL)~~ Perform radon air sampling in the fighting positions nearest to the former missile storage site. Radon detectors were provided by USACHPPM-EUR for this purpose. The Preventive Medicine Detachment at Stronghold Freedom has been briefed regarding the conduct of this monitoring. (Completed 5-10 June 02. No hazardous concentrations of radon exist. Long-term monitoring for radon will continue.)

(3) (U) ~~(C//REL)~~ Continue monitoring for organic and inorganic air contaminants at Stronghold Freedom in accordance with requirements in references 1 and 2. Forward samples to USACHPPM for sample analysis and technical support.

(4) (U) ~~(C//REL)~~ Continue to monitor water quality at Stronghold Freedom IAW references 1 and 2 on a quarterly basis to ensure water meets health standards. Monitor new water sources as necessary using deployment test kits or other approved methods.

~~DECLASSIFIED SECRET//REL TO USA AUS CAN AND GBR//MR~~

(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May-14 June 2002

(U) APPENDIX I

HEALTH RISK COMMUNICATIONS

~~DECLASSIFIED SECRET//REL TO USA AUS CAN AND GBR//MR~~

(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May 2002 - 14 June 2002

STRONGHOLD FREEDOM BULLETIN

JUNE 2002

K2 Environmental Snapshot

CHPPM-Europe Team returns to update environmental assessment of Stronghold Freedom

For all deployments over thirty days, an environmental assessment to monitor environmental, occupational and epidemiological threats is required in accordance with JCS Memorandum MCM-0006-02 dated 1 Feb 2002, and DoD Directive 6490.2. An environmental assessment of Stronghold Freedom was conducted in November of 2001, by the Center for Health Promotion and Preventive Medicine-Europe (CHPPM-Eur). Their findings indicated that there are no harmful substances to which Stronghold Freedom personnel are exposed to during the course of their normal duties. A CHPPM-Eur team from Landstuhl, Germany will return in the coming week to collect additional environmental samples and validate that service members are protected from environmental threats.

The environmental assessment completed in November of 2001 identified several environmental hazards and advised on-site Commanders and troops on methods to prevent or minimize the risk of exposure. The primary environmental hazards included subsurface jet fuels and a small amount of processed uranium products located outside the perimeter berm. The only area where the uranium was found has been "off limits" since

November 2001. The jet fuel is underground and as long as no digging takes place there is no threat to service members at Stronghold Freedom. Asbestos-containing tiles were identified on some of the older structures throughout the compound. Intact tiles pose no health threat. Loose tiles on the ground were removed and disposed of properly. These protective measures are sufficient to prevent exposure to the substances identified.

The CHPPM-Europe team will be sampling various environmental media (soil, water, air) throughout parts of Stronghold Freedom for the next several weeks. The results of this sampling will be reported to Stronghold Freedom personnel as soon as the analysis is completed. The team members come with a variety of specialties to include environmental engineering, environmental toxicology, preventive, occupational and environmental medicine, epidemiology, and health physics. They are supported by their own internationally accredited environmental laboratory at Landstuhl and a larger laboratory at CHPPM-Main, Aberdeen Proving Ground, Maryland.

To date, CHPPM-Europe has not identified any harmful substances to which service members are exposed during the course of their normal duties. Any questions/concerns that soldiers and airmen have regarding health and the environment at Stronghold Freedom can be referred to the on-site CHPPM-Europe team directly or through your chain of command. Keeping our forces healthy at Stronghold Freedom is the primary concern of all members of the team and your chain of command.

"Mission First...Soldiers Always!!"

(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May 2002 - 14 June 2002

STRONGHOLD FREEDOM BULLETIN

JUNE 2002

K2 Guidelines

- 1) Any hand digging, driving of pickets, or excavation of any kind requires a Dig Permit. If your job requires digging, you must call 647-6304 or see the Base Engineers to complete the permit process and for instructions on site-specific personal protective measures.
- 2) Do not disturb roof tiles currently in place on Uzbekistan constructed structures, as material could contain asbestos.
- 3) Park the exhaust pipes of all vehicles away from high traffic areas.
- 4) Keep out of marked restricted areas and 'off-limits' areas shown on the attached map at all times.
- 5) Avoid working in very dusty areas. Notify your unit leader to discuss options to minimize your exposure (e.g., putting on a dust mask, wetting soil, use of dust control agent, etc.).

Ongoing Preventive Measures for Your Health at K2

- 1) Use of a dust control agent to minimize dust.
- 2) Placement of bait and traps for rodents in strategic areas. Notify the Preventive Medicine Detachment if you experience a problem at 640-2111.
- 3) Placement of "Do not Enter" signs have been posted around 'off-limit' areas.

Each of you plays a role in the environmental decisions at K2. We encourage you and your leadership to stay involved and participate in the EQCC and Safety meetings. Visit and talk with representatives of our medical staff to discuss any concerns you might have about the conditions in which you are living and working. If you believe that your health has been impacted in any way, please contact the K2 medical staff.

Feel free to visit our website (<http://k2.swa.arcent.army.smil.mil/engineer>) to review additional K2 environmental information.

"Mission First...Soldiers Always!!"

(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May-14 June 2002

K2 Environmental Snapshot

July 2002

CHPPM-Europe Team returns to validate environmental assessment of Stronghold Freedom

An environmental assessment of Stronghold Freedom was conducted in November of 2001, by the US Army Center for Health Promotion and Preventive Medicine-Europe (CHPPM-Eur). For all deployments over thirty days, this type of assessment to monitor environmental, occupational and epidemiological threats is required in accordance with JCS Memorandum MCM-0006-02 dated 1 Feb 2002, and DoD Directive 6490.2. The team's findings indicated that there are no harmful substances to which Stronghold Freedom personnel are exposed to during the course of their normal duties. In early June, a team returned to validate that service members continue to be protected from environmental threats and to communicate their findings to personnel on the base.

The environmental assessment completed in November of 2001 identified several hazards and advised the on-site Commanders and troops on methods to prevent or minimize the risk of exposure. The primary environmental hazards included subsurface jet fuels and a small number of depleted uranium pieces located outside the perimeter berm. The only area where the uranium was found has been "off limits" since November 2001. The jet fuel is approximately 2 meters underground and as long as no digging takes place there is no threat to service members at Stronghold Freedom. Asbestos-containing tiles were identified on some of the older structures throughout the compound. Intact tiles pose no health threat. Loose tiles on the ground should be removed and disposed of properly. Another hazard identified at Stronghold Freedom is noise. The Prime Power facility is a continuous noise hazard area. Additionally, flight operations occasionally exceed peak standards for impulse noise. The use of hearing protection is recommended for these areas and circumstances.

The CHPPM-Europe team has sampled various environmental media (soil, water, air) throughout parts of Stronghold Freedom. The results of this sampling will be reported to Stronghold Freedom personnel as soon as laboratory analysis is completed. Another town hall meeting will be held to update everyone on the team's findings.

Any questions/concerns that soldiers and airmen have regarding health and the environment at Stronghold Freedom can be referred to the on-site CHPPM-Europe team directly or through your chain of command. Keeping our forces healthy at Stronghold Freedom is the primary concern of all members of the team and your chain of command.

(U) (~~S//REL~~) Field Final Report, Environmental Site Survey and Operational Health Risk Assessment, Stronghold Freedom, Karshi-Khanabad Airfield, Uzbekistan, 31 May-14 June 2002

K2 Environmental Snapshot

July / August 2002

Environmental Assessment of Stronghold Freedom

An environmental assessment of Stronghold Freedom conducted by the US Army Center for Health Promotion and Preventive Medicine-Europe (CHPPM-EUR) has identified a number of potential hazards. Preventive measures are in place to minimize these hazards, but there are several precautions you can take to ensure protection from these hazards.

During the first environmental survey in the fall of 2001, a small number of depleted uranium pieces (smaller than a quarter) were found in the area outside the perimeter berm. This area has been placed "off limits" to all personnel since November 2001. Repeated soil and air sampling have shown no radiation present inside the perimeter berm. There is no radiation hazard to personnel at Stronghold Freedom.

The primary environmental hazards present on Stronghold Freedom are subsurface jet fuels, the presence of asbestos tiles, and noise. The jet fuel has contaminated the soil approximately 2 meters underground. As long as no digging takes place, there is no threat to health. Asbestos tiles are present on the roof of several structures. Intact asbestos-containing tiles pose no health threat. Notify your safety officer for clean up procedures if these tiles are deteriorating or crumbling. Another hazard identified at Stronghold Freedom is noise. The Prime Power facility is a continuous noise hazard area. Additionally, flight operations occasionally exceed peak standards for impulse noise. The use of hearing protection is recommended for these areas and circumstances. If personnel follow these simple preventive measures, they help to protect themselves from these hazards.

Any questions or concerns from military or civilian personnel regarding health and the environment at Stronghold Freedom can be referred to the on-site safety officer or through your chain of command. Keeping our forces healthy is the number one priority for all personnel deployed to Stronghold Freedom.