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**UNITED STATES ARMY  
ENVIRONMENTAL HYGIENE  
AGENCY**

ABERDEEN PROVING GROUND, MD 21010-5422

GROUND-WATER QUALITY SURVEY NO. 38-26-K986-91  
EVALUATION OF SOLID WASTE MANAGEMENT UNITS  
FORT RICHARDSON, ALASKA  
24 JUNE - 2 JULY 1991

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DEPARTMENT OF THE ARMY  
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY  
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO  
ATTENTION OF

EXECUTIVE SUMMARY  
GROUND-WATER QUALITY SURVEY NO. 38-26-K986-91  
EVALUATION OF SOLID WASTE MANAGEMENT UNITS  
FORT RICHARDSON, ALASKA  
24 JUNE - 2 JULY 1991

1. PURPOSE. This survey was performed to evaluate and update the Solid Waste Management Unit (SWMU) information contained in Fort Richardson's RCRA Facility Assessment (RFA); to determine which SWMU's require further sampling, investigation, or corrective action; and to identify and evaluate any SWMU's not previously documented.
2. CONCLUSIONS. Four of the 120 previously-identified SWMU's require sampling and analysis to verify environmental release, and 14 sites are being investigated under separate programs. Thirty-one SWMU's are Waste Accumulation Areas (WAA's), some of which require improvements to identify, prevent, or control environmental releases. Eighteen underground storage tanks (UST's) require no actions other than continued documentation of efforts. The two SWMU's located at Camp Carroll should not be addressed under Fort Richardson's corrective action requirements. Based on a low potential for release and/or a lack of a susceptible migration pathway, 51 SWMU's require no further action. Six new SWMU's were identified, five of which have ongoing or planned investigations. The remaining new SWMU requires no further action.
3. RECOMMENDATIONS. Provide the information contained in this report, along with supporting documentation for all SWMU's, to the permitting agency when issuance of the Part B RCRA permit becomes imminent. Initiate investigative actions recommended at SWMU's 15/120, 37, and 41 to determine whether environmental releases have occurred. Implement the improvements recommended for specific WAA's to identify, prevent, or control environmental releases. Maintain complete documentation of all sampling and analysis, remedial action, construction/removal, or investigation work associated with every SWMU. Continue with ongoing or planned investigations at 14 original SWMU's and five new SWMU's.



DEPARTMENT OF THE ARMY  
 U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY  
 ABERDEEN PROVING GROUND, MARYLAND 21010-6422

REPLY TO  
 ATTENTION OF

HSHB-ME-SG

GROUND-WATER QUALITY SURVEY NO. 38-26-K986-91  
 EVALUATION OF SOLID WASTE MANAGEMENT UNITS  
 FORT RICHARDSON, ALASKA  
 24 JUNE - 2 JULY 1991

1. REFERENCES. Appendix A contains a list of references used in this report.

2. AUTHORITY.

a. AEHA Form 250-R, Fort Richardson, 22 August 1990.

b. Memorandum, USAEHA, HSHB-ME, 18 March 1991, subject: USAEHA Schedule of Field Services, FY 91.

3. PURPOSE. This survey was performed to evaluate and update the Solid Waste Management Unit (SWMU) information contained in Fort Richardson's Resource Conservation and Recovery Act (RCRA) Facility Assessment (RFA); to determine which SWMU's require further sampling, investigation, or corrective action; and to identify and evaluate any SWMU's not previously documented.

4. GENERAL.

a. Personnel Contacted. A list of the personnel contacted during the survey is provided in Appendix B.

b. Location and Mission. Fort Richardson is located in the city of Anchorage in south-central Alaska. Its borders are formed by the Chugach mountain range and State Park (to the south and east), the city of Anchorage and Elmendorf Air Force Base (to the west), and the Eagle Bay and Knik Arm waterways to the north. Fort Richardson, home to the 6th Infantry Division (Light), fulfills the missions of preparedness for rapid worldwide deployment and defense of the State of Alaska and Aleutian Islands.

c. Background.

(1) Part B permits issued after 8 November 1984 (under the RCRA Hazardous and Solid Waste Amendments of 1984), must contain provisions for the identification of all SWMU's, and remediation of those releasing hazardous constituents to the environment. Referred to as the corrective action provision, this requirement

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includes all past and present SWMU locations, regardless of whether the site was intended for the management of solid or hazardous wastes (HW's).

(2) The definition of a SWMU is contained in the RCRA Facility Assessment Guidance document prepared by the U.S. Environmental Protection Agency (EPA) (reference 1). A SWMU is considered any unit intended for waste management or receiving routine, systematic, and deliberate discharge of wastes. Typical SWMU's include landfills, waste impoundments, waste tanks, waste storage areas, wastewater and sewage treatment plants (STP's), and incinerators. Units at which routine monitoring of emissions or discharges is conducted under permit requirements are also considered SWMU's, though their function may not be directly related to waste management. Examples of this are heating plants for which air monitoring is conducted or storm sewer outfalls regulated under National or State Pollutant Discharge Elimination System. The SWMU definition excludes product tanks or material storage areas, ranges or training areas with no wastes associated with them, individual parts of a flow-through process, or one-time spills. These excluded sites are often addressed as "areas of concern" (AOC's).

(3) Fort Richardson notified the EPA as an HW generator and operator of an HW storage facility in 1980. The Part A application was also submitted in 1980, and later resubmitted in 1983. A Part B permit application, including an HW storage facility (SWMU 88) and a deactivation furnace (SWMU 101), was submitted in November 1988. Although the Alaska Department of Environmental Conservation (ADEC) has not been granted full authority for implementation of RCRA, the agency has maintained involvement and worked closely with EPA Region X on RCRA issues.

(4) In 1989, the Visual Site Inspection of the RCRA RFA was performed at Fort Richardson by members of an EPA contract firm and an ADEC representative. The RFA report, dated January 1990 (reference 2), contained descriptions of 116 SWMU's and four AOC's. Recommendations for further actions were not included in the copy provided to the Fort Richardson Environmental Office.

(5) The EPA indicates (based on verbal communication between the installation and the regulator) that Fort Richardson's Part B permit will not be issued for 4 to 5 years, due to the lengthy review process and current backlog. It is our purpose to provide an update to the RFA document, as well as to offer recommendations for categorizing the SWMU's into groupings such as "no further action" or "requiring further investigation." The organization of the RFA SWMU list is redundant and

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cumbersome, since many SWMU's of similar nature may be dealt with concurrently or in a similar manner. We have consolidated and categorized the original SWMU list into reasonable, workable groupings. We have also provided an interim update which identifies work already planned or accomplished. This eliminates those SWMU's from further consideration under corrective action requirements. Finally, we have added several new SWMU's that were not previously identified.

5. **PHYSICAL AND ENVIRONMENTAL CONDITIONS.** The following information briefly describes the environmental setting of the installation and sets the stage for assessing the potential for contaminant migration via subsurface pathways.

a. Physiography/Topography. Fort Richardson is situated within the Cook Inlet-Susitna Lowland Section of the Coastal Trough physiographic province. Most elevations on the installation lie below 490 feet above sea level (reference 2), with the exception of the Chugach Mountains. The topography in the cantonment area is mostly flat to gently rolling (reference 3).

b. Surface Drainage. Streams, creeks, and ponds are numerous on Fort Richardson, due to the flows of glacial meltwaters and mountain runoff. The primary direction of flow is to the west/northwest towards Knik Arm. Eagle River, which cuts across the northern third of the installation, and Ship Creek, which traverses the southern third, are the major drainage features. A reservoir along Ship Creek (located in the Chugach Mountains within the reservation boundary) provides potable water to Fort Richardson and Anchorage. A small water body, Otter Lake, is used for recreation.

c. Soils. The two main soil types found at Fort Richardson include Rockland soil and loams. The Rockland soil consists of rocky, cobbly to gravelly material which may be poorly to well-drained (reference 3). The loams are generally well-drained silt and peat layers over more coarse-grained gravels and sands. The loams occur in depressions and drainage basins, whereas the Rockland unit occupies mountainous regions, ice fields, and unvegetated areas (reference 3).

d. Geology. The geology of Fort Richardson is the result of metamorphism and recurrent periods of glaciation. The Kenai Formation underlies Fort Richardson and outcrops in the southeastern part of the installation. This is overlain by Wisconsin Age till, outwash, and silt. In addition, Pleistocene/Recent alluvial materials have been deposited along the drainageways of Eagle River, Ship Creek, and various tributaries.

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e. Ground Water. Ground water occurs in the alluvial and glacial deposits throughout the region, and is regulated by the snow melt and glacial melt waters which recharge it. Ground water beneath Fort Richardson is fed primarily by streams, and generally flows from east to west, toward Knik Arm. Depth to ground water varies across the installation, but averages about 23 feet below ground surface. The rate of flow varies seasonally, dependent on precipitation and snow/ice melt. Although ground water is not currently used on Fort Richardson, several wells exist which are used for standby purposes.

f. Meteorology. Fort Richardson falls within a transitional zone between the coastal maritime climate and the continental climate dominating the interior. The prevailing wind direction is from the south (reference 3). Average annual precipitation is 15.5 inches, most of it occurring between July and September. Average annual snowfall is 61 inches, occurring between November and March (reference 4).

g. Potential For Contaminant Migration.

(1) The potential for contaminant migration is greatest for the ground water pathway. Well-drained soils, coarse-grained glacial till, and a seasonal abundance of water from precipitation, snow melt, and ice melt all contribute to the potential for contaminant movement. The relatively shallow water table and low clay content in the subsurface promote migration via the ground-water pathway, which may also receive contaminants from surface water recharge. As both ground water and surface water discharge to Knik Arm, this body is the ultimate receiver of any contaminants.

(2) Direct exposure potentials are minimal although contaminant migration may occur from releases on Fort Richardson. The drinking water reservoir, a surface water basin located along Ship Creek, is not downgradient from any likely sources of contamination within Fort Richardson. Ground water is not currently used on the installation or in the general vicinity. Potentials for indirect exposures are being investigated in the Eagle River Flats area, due to the discovery of contaminated waterfowl, which may result in human exposure when hunted for game.

## 6. FINDINGS AND DISCUSSION.

a. SWMU's Identified. One hundred sixteen SWMU's and four AOC's were identified in the RFA report (reference 2). A copy of the original SWMU list is provided as Table 1. Six new SWMU's were identified during this survey, and are discussed below in paragraph 6b. The following paragraphs discuss the SWMU's in logical categories which are grouped according to the need for further actions or by site type [for example, underground storage tanks (UST's), Waste Accumulation Areas (WAA's), oil water separators].

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TABLE 1. SWMU'S IDENTIFIED IN THE RFA

<u>SWMU #</u>	<u>DESCRIPTION</u>
1	Waste Accumulation Area Near Bldg. 700
2	Paint Spray Booth in Bldg. 700
3	Waste Accumulation Area Near Bldg. 704
4	DEH Drum Storage Yard Near Bldg. 704
5	Wash Rack Sump in Bldg. 704
6	Oil/Water Separator Near Bldg. 704
7	Waste Accumulation Area Near Bldg. 710
8	Pesticide Mixing Area Sump in Bldg. 721
9	Waste Accumulation Area Near Bldg. 726
10	Distillation Unit #1 in Bldg. 726
11	Distillation Unit #2 in Bldg. 726
12	Distillation Unit #3 in Bldg. 726
13	Aeration Box in Bldg. 726
14	Vapor Reclamation Unit in Bldg. 726
15	Former Soil Aeration Area Near Bldg. 726
16	Underground Waste Oil Storage Tank Near Bldg. 732
17	Waste Accumulation Area Near Bldg. 740
18	Oil/Water Separator Near Bldg. 740
19	Underground Waste Oil Tank Near Bldg. 740
20	Waste Accumulation Area Near Bldg. 750
21	Oil/Water Separator #1 Near Bldg. 750
22	Oil/Water Separator #2 Near Bldg. 750
23	Underground Waste Oil Tank #1 Near Bldg. 750
24	Underground Waste Oil Tank #2 Near Bldg. 750
25	Oil/Water Separator Near Bldg. 754
26	Underground Waste Oil Tank Near Bldg. 755
27	Paint Spray Booth in Bldg. 755
28	Oil/Water Separator Near Bldg. 756
29	Underground Waste Oil Tank Near Bldg. 756
30	Underground Used Oil Tank Near Bldg. 770
31	Oil/Water Separator Near Bldg. 778
32	Oil/Water Separator Near Bldg. 784
33	Waste Accumulation Area Near Bldg. 796
34	Sumps and Wash Rack in Bldg. 796
35	Underground Used Oil Tank Near Bldg. 796
36	Paint Spray Booth in Bldg. 796
37	Former Underground Neutralization Tank Near Bldg. 796
38	Underground Used Oil Tank #1 Near Bldg. 798
39	Underground Used Oil Tank #2 Near Bldg. 798
40	Oil/Water Separator Near Bldg. 812



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TABLE 1. SWMU'S IDENTIFIED IN THE RFA (Continued)

<u>SWMU #</u>	<u>DESCRIPTION</u>
41	Used Oil Transfer Area at Bldg. 955
42	Underground Waste Oil Tank Near Bldg. 955
43	Underground Slop Fuel Tank Near Bldg. 955
44	Waste Accumulation Areas Near Bldg. 974
45	Waste Solvent Accumulation Area Near Bldg. 974
46	Fuel Blivet Cleaning Area Near Bldg. 974
47	Oil/Water Separator at Fuel Blivet Cleaning Area
48	Underground Waste Oil Tank Near Bldg. 974
49	Oil/Water Separator Near Bldg. 974
50	Wash Rack Sump in Bldg. 975
51	Oil/Water Separator #1 Near Bldg. 975
52	Oil/Water Separator #2 Near Bldg. 975
53	Underground Waste Oil Storage Tank Near Bldg. 975
54	Waste Accumulation Area Near Bldg. 976
55	Paint Spray Booth in Bldg. 976
56	Former Acid Bath/Neutralization Tank in Bldg. 976
57	Fiberglass Filter in Bldg. 976
58	Silver Recovery Unit in Bldg. 978
59	Paint Spray Booth in Bldg. 978
60	Waste Accumulation Area Near Bldg. 986
61	Underground Waste Fuel Tank Near Bldg. 986
62	Waste Accumulation Area Near Bldg. 36012
63	Underground Waste Oil Storage Tank Near Bldg. 45590
64	Waste Accumulation Area Near Bldg. 45726
65	Oil/Water Separator Near Bldg. 45726
66	Underground Waste Oil Tank Near Bldg. 45726
67	Waste Accumulation Area Near Bldg. 47431
68	Underground Waste Oil Storage Tank Near Bldg. 47641
69	Underground Waste Oil Storage Tank Near Bldg. 57112
70	Waste Oil Storage Tank - Camp Carroll
71	Waste Accumulation Area Near Bldg. 732
72	Waste Accumulation Area Near Bldg. 755
73	Waste Accumulation Area Near Bldg. 756
74	Waste Accumulation Area Near Bldg. 760
75	Waste Accumulation Area Near Bldg. 770
76	Waste Accumulation Area Near Bldg. 778
77	Waste Accumulation Area Near Bldg. 784
78	Waste Accumulation Area Near Bldg. 789
79	Waste Accumulation Area Near Bldg. 798
80	Waste Accumulation Area Near Bldg. 812

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TABLE 1. SWMU'S IDENTIFIED IN THE RFA (Continued)

<u>SWMU #</u>	<u>DESCRIPTION</u>
81	Waste Accumulation Area Near Bldg. 27006
82	Waste Accumulation Area Near Bldg. 45040
83	Waste Accumulation Area Near Bldg. 45590
84	Waste Accumulation Area Near Bldg. 47641
85	Waste Accumulation Area Near Bldg. 47432
86	Waste Accumulation Area Near Bldg. 47727
87	Waste Accumulation Area at Camp Carroll
88	Hazardous Waste Storage Area at Bldg. 45125
89	Hazardous Waste Storage Area at Bldg. 45133
90	Emergency Hazardous Waste Storage Area at Bldg. 35752
91	Transformer/Capacitor Storage Area Near Bldg. 700
92	Grease Pit #1
93	Grease Pit #2
94	Former Landfill Area
95	"Current" Landfill
96	Transfer Station
97	Former Fire Training Area #1
98	Former Fire Training Area #2
99	Former OB/OD Area
100	Open Burning Sites at Firing Points
101	Popping Furnace
102	Pathological Incinerator
103	Classified Waste Incinerator
104	Multiclone Precipitator #1
105	Multiclone Precipitator #2
106	Multiclone Precipitator #3
107	Multiclone Precipitator #4
108	Ash Hoppers
109	Air Wash Unit #1
110	Air Wash Unit #2
111	Sludge Tank #1
112	Sludge Tank #2
113	Cyclone Separator #1
114	Cyclone Separator #2
115	Storm Drainage System
116	Sanitary Sewer System

POTENTIAL SOLID WASTE MANAGEMENT UNITS

117	Eagle River Flats Artillery Range
118	Roosevelt Road Transmitter Site
119	Leaking Underground Storage Tanks
120	Former Underground Storage Tank Near Building 726

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b. SWMU's Not Previously Identified in the RFA. The following SWMU's were not in existence or were not discovered during the RFA. These sites should be formally added to the SWMU list, and supporting documentation regarding ongoing work or justification for no further action should be provided to the regulator prior to issuance of the permit. New SWMU's are listed in Table 2.

TABLE 2. SWMU'S NOT PREVIOUSLY IDENTIFIED IN THE RFA

<u>SWMU NO.</u>	<u>SWMU NAME</u>
121	Contaminated Soil Piles
122	Oil Water Separators
123	Poleline Road Site
124	DEH Sludge Bin
125	Antennae Site
126	Circle Drive Drum Site

(1) Contaminated Soil Piles (SWMU 121). This site consists of numerous piles of soil from various sources on the installation, including soil excavated during UST removal. The piles are maintained in accordance with ADEC current guidance; they are covered with impervious sheeting and weighted with tires pending proper disposal. Disposal of the soil will be accomplished after completion of sampling and analysis as required by ADEC (reference 5). The Fort Richardson Quality Assurance Program Plan (QAPP) for Site Assessment of Underground Storage Tank Sites (reference 6) details the procedures of sample collection, field screening, and transport of "contaminated" soil to the landfill area. Soil considered contaminated is that for which a photoionization detector indicates elevated levels of the suspected contaminants. A contractor to the U.S. Army Corps of Engineers, Alaska District, has developed a Workplan for the Remediation of Contaminated Soil Stockpiles (reference 7), which addresses sites at Forts Wainwright and Greely as well. This SWMU should be considered as under investigation.

(2) Oil Water Separators (SWMU 122). The RFA report listed 13 oil water separators as SWMU's; there are an additional 17 separators and oil traps which were not listed. These were identified in a 1990 USAEHA consultation (reference 8), and are located in or near Buildings 770 (2 separators), 756, 750, 760, 784, 980, 778, 798, 796 (3 traps), and 755 (5 traps). The separators and traps are all connected to the sanitary sewer so there is little potential for environmental release from these units. The separators and traps at Fort Richardson are

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periodically cleaned out by Directorate of Engineering and Housing (DEH) personnel. The 13 listed SWMU's and additional 17 (grouped as one SWMU for simplification) should be considered as requiring no further action. Several separators are scheduled for replacement or removal; documentation of such actions should be kept in the SWMU information files.

(3) Poleline Road Site (SWMU 123). A contractor under the U.S. Army Toxic and Hazardous Materials Agency (THAMA) has just completed an investigation at this former disposal site (reference 9). The investigation has identified soil and ground-water contamination, and proposed additional work includes a soil gas survey, additional monitoring wells and aquifer tests, and trenching/soil sampling.

(4) DEH Sludge Bin (SWMU 124). The DEH sludge bin was an open storage bin used for sludge generated from oil water separators. It was located near Building 955, and during the site visit exhibited signs of poor maintenance and releases to soil. This site was listed as requiring action in a Federal Facility Compliance Agreement (FFCA) issued Fort Richardson by EPA (reference 10); it was not in existence at the time of the RFA. Fort Richardson is required to sample and analyze the contents/surrounding soils to determine whether HW's were stored or released in accordance with the FFCA. The practice of storing oily sludge in this open container should be discontinued regardless of these results. The sludges should be stored in a container within a bermed, paved area, and should be protected overhead. This site should be added to the SWMU list under the category of undergoing investigation.

(5) Antennae Site (SWMU 125). This site consists of several UST's formerly containing oil and slop fuels. Investigations in 1990 included sampling/analysis of ground water and soils, and additional work will be accomplished if necessary.

(6) Circle Drive Drum Site (SWMU 126). This site was also listed on the FFCA, with a requirement to determine if the wastes stored there were HW's, and if so, to prepare a formal closure plan for the site. This site should be considered as a WAA with planned investigation.

c. SWMU's Requiring No Further Action. We recommended no further action for S1 sites from the 120 SWMU's/AOC's listed in the RFA. These sites are listed in Table 3.

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TABLE 3. SWMU'S REQUIRING NO FURTHER ACTION

<u>SWMU NO.</u>	<u>SWMU NAME</u>
2,27,36,55,59	Paint Spray Booths
5,34,50	Wash Rack Sumps
6,18,21,22,25	Oil Water Separators
28,31,32,40	
47,49,51,52	
8	Pesticide Mixing Area Sump
10,11,12,13,14	Drycleaning Units
46	Fuel Blivet Cleaning Area
56	Former Acid Bath/Neutralization Tank
57	Fiberglass Filter
58	Silver Recovery Unit
88,89	HW Storage Areas
91	Transformer/Capacitor Storage Area
96	Transfer Station
100	Open Burning Sites at Firing Points
101	Popping Furnace
102	Pathological Incinerator
104,105,106,107	Power Plant Units
108,109,110,111	
112,113,114	
115	Storm Drainage System
116	Sanitary Sewer System

(1) There is a minimal or virtually nonexistent potential for environmental release which jeopardizes human health or the environment for most of these SWMU's. Examples are units within buildings or with sufficient release controls present, such as paint spray booths, components of the Drycleaning facility, wash rack sumps and separators (which are connected to the sanitary sewer), and the silver recovery unit. Units within the Fort Richardson Power Plant (SWMU's 104-114) are located in Building 36012, and have a low release potential. Air emissions are regulated by the operating permit and are not likely to release hazardous constituents during operation of the coal-fired units, which is on a standby basis.

(2) The wastes managed at many other sites are not likely to have released hazardous constituents, such as the solid waste Transfer Station (SWMU 96). During the site visit, this SWMU appeared to be handling only brush, limbs and other inert material. Also, the site was well-maintained, had adequate

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release controls, and appeared fairly inactive. Another example is the classified waste incinerator (SWMU 103), which handled waste paper and is no longer used.

(3) Some SWMU's are no longer operational or could not be located during the site visit. The Pathological Incinerator (SWMU 102) was apparently demolished. The Former Acid Bath Neutralization Tank (SWMU 56) was removed. The Open Burning Sites at Firing Points (SWMU 100) could not be definitively located, even though the survey team conducted a thorough search of the area described in the RFA. For this site, it would be futile to attempt to locate and sample areas where powder burning was conducted. Most likely, the burning was conducted sporadically in numerous areas rather than concentrated. The expected residues would be slight and scattered. In addition, these are not true waste management areas. Army policy considers powder burning at firing ranges as incidental to the training mission and not a disposal procedure.

(4) The HW Storage Areas (SWMU's 88 and 89) and the Popping Furnace (SWMU 101) are listed as no further action because they will be the permitted facilities on the RCRA Part B permit. Permitted facilities have strict release controls, operating requirements, and other restrictions which will minimize or eliminate releases.

(5) The Storm Drainage System (SWMU 115). The storm drainage system should not be addressed as a corrective action issue. The EPA recently set forth regulations requiring permitting of storm water discharges associated with industrial activities under the NPDES program (reference 11). These rules require all storm water conveyances emanating from industrial areas (which include SWMU's) to be covered under the permit. The requirements may include sampling and analysis from discharge points, for parameters to be specified in the permit. Furthermore, the storm drainage system is not likely to contain significant concentrations of hazardous constituents as compared to the source areas themselves. The source areas are much more likely to contribute directly to surface water and ground-water contamination, and are being addressed directly either as SWMU's or under ongoing investigations.

(6) Sanitary Sewer System. The RFA report cites the conditions of the system to be in disrepair and evaluates the potential for releases to soil/ground water as moderate. A recent USAEHA consultation (reference 8) performed a more in-depth evaluation of the system in response to grease and oil exceedences at the receiving municipal system. Several

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recommendations were made to improve the system, including repairing/replacing oil traps and separators, performing frequent inspections, and educating personnel on system maintenance. The accomplishment of these actions should significantly reduce the problems associated with the sewer system. In addition, Fort Richardson's sewage discharge is currently regulated by their Industrial Wastewater Discharge Permit, which specifies standards applicable to the sewage quality prior to entering the tie-in with the municipal system. Finally, a waste management program which ensures that HW's and other unacceptable wastes are properly managed should reduce the potential for hazardous constituents to enter this waste stream.

d. SWMU's Requiring Additional Investigation. The following SWMU's require investigative work not already being accomplished or planned. Limited sampling and analysis are needed at these sites to determine whether a release to the environment has occurred. Table 4 lists these SWMU's and the recommended level of sampling.

TABLE 4. SWMU'S REQUIRING ADDITIONAL INVESTIGATION

<u>SWMU NO.</u>	<u>SWMU NAME</u>	<u>ACTIONS</u>
15,120	Former Soil Aeration Area/ UST at Bldg 726	Soil/ground-water sampling
37	Former Neutralization Tank (Bldg 796)	Records and soil/ ground-water sampling
41	Used Oil Transfer Area (Bldg 955)	Records and ground- water sampling

(1) Former Soil Aeration Area/UST at Building 726. Building 726 is the post laundry/drycleaning facility, which has operated since the 1950's. The UST containing petroleum solvents was removed in the mid-1980's (the plant uses perchloroethylene solvent; this is assumed to be the tank contents). Soils from the excavation, apparently contaminated with solvent, were placed on the ground at the UST site for aeration. An HNu detector did not indicate the presence of organic vapors at the time of tank excavation. The soil pile was present for several months until the soil was disposed of. The quantity of soil, condition of the ground (soil or paved), and extent of contamination are unknown. Due to the relative mobility of solvents in ground water and the unknown length of time that the UST was leaking, this site requires investigation into potential soil and ground-water

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contamination. It is recommended that Fort Richardson proactively pursue this site investigation rather than delaying action until the corrective action negotiations.

(2) Former Neutralization Tank, Building 796. Building 796 is used for equipment and vehicle maintenance, and formerly contained a battery neutralization system. An underground tank storing neutralized battery acid deteriorated over time, until its remains and surrounding soils were reportedly removed in the late 1980's. The tank was most likely leaking for several years before its removal, and therefore there is a potential for ground-water contamination. There could be continuing releases to ground water if soils were not sufficiently cleaned up during excavation (there was no documentation available for the RFA). Fort Richardson should first attempt to locate any documentation of the tank removal and cleanup actions, to verify whether appropriate actions were taken. The installation should initiate an investigation of soil and ground water to determine whether a release has occurred if such documentation is not available. In addition to the release of acids/caustics, heavy metals would be of concern in this study work.

(3) Used Oil Transfer Area, Building 955. This is a DEH facility where used oils and fuels are collected and transferred to underground tanks for temporary storage. This site has historically been in poor condition and there have been numerous reports of spillage and oil-stained soil. The fact that solvents were believed to have been mixed with waste oil in the past indicates that this site deserves some attention. However, much of the area where staining was noted is now paved over. It was not known whether samples were taken or contaminated soil was removed prior to the paving. It is not necessary to remove the blacktop to obtain samples underneath, but installation records should be thoroughly searched for any indication of sampling, soil removal, or verification that the site appeared clean. It is recommended that a few monitoring wells be installed to determine if releases to ground water have occurred from this site if data do not already exist.

e. SWMU's With Ongoing or Planned Investigations. Several SWMU's are undergoing investigations or are in the planning stages of future project work. Documentation of all investigative and remedial efforts at these sites will be crucial to the corrective action process. All information should be maintained in SWMU files to be provided to the regulator prior to negotiations in order to avoid redundant work. The following SWMU's are being or will be investigated under separate



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environmental programs (Table 5). Most have been targeted in the FFCA issued in April 1991 (reference 10), and will almost certainly be addressed before corrective action for SWMU's is required.

TABLE 5. SWMU'S WITH ONGOING OR PLANNED INVESTIGATIONS

<u>SWMU NO.</u>	<u>SWMU NAME</u>
3,4	WAA's at Bldg 704
60	WAA at Bldg 986
72	WAA at Bldg 755
90	Emergency HW Storage Area (35752)
92,93	Grease Pits
94	Former Landfill Area
95	Current Landfill
97	Fire Training Area #1
98	Fire Training Area #2
99	Former OB/OD Area
117(AOC1)	Eagle River Flats Artillery Range
118(AOC2)	Roosevelt Road Transmitter Site

f. Special Categories of SWMU's. The remaining SWMU's have been grouped together based on site type. These similar sites should be handled as a group, since an environmental program (such as for UST's or WAA's) would address all sites within that category, and the practices applied to one site should apply to others.

(1) Waste Accumulation Areas.

(a) General.

(i) Since the time of the RFA site visit, many changes had occurred in the installation's WAA's. Changes in locations, improved facilities, operational changes, education of personnel, and variations in the wastes generated all contribute to the inconstant nature of these sites. A few general statements can be made about the condition of most of the WAA's visited. They are generally located on a gravel or soil surface, and often contain sandbag berms around the drum storage area. Most container labelling was adequate, and almost all sites had posted signs around the area. Drums were most often stored on pallets. With few exceptions, no noticeable signs of release to the soil were noted by the survey team. Releases that were noted were

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relatively minor, and appeared surficial. Fort Richardson has displayed considerable efforts toward complying with good storage practices.

(ii) There is a low potential for release from these units which would cause harm to human health or the environment. The sites are small, as are the volumes of wastes stored. The majority of waste stored is used oil, and should not contain significant amounts of hazardous constituents. The sites are used constantly, preventing releases from going undetected for any length of time. Therefore, sampling and analysis are generally not required at the WAA's. Exceptions are the WAA's listed on the FFCA (SWMU's 3, 4, 60, and 72).

(b) Identification and Evaluation of WAA's. It would require substantial effort to maintain accurate, current information on every WAA due to the variable nature of these sites. Several steps should be taken to update and maintain these records so that this information is available for the corrective action process. Certain records should be part of the overall installation waste management program, and are listed as follows.

(i) Locations of former WAA's (those identified in the RFA which no longer exist) should be investigated, particularly those noting storage problems. During this site visit, original SWMU's 7, 67, 74, 75, and 83 no longer existed at the documented locations. Using RFA original photographs (not available during our site visit), inspection reports, and interviews with current and past facility personnel, these locations and their current condition may be documented. Those with indications of releases should be so noted and cleanup initiated.

(ii) The current list of waste locations and generating activities should be used by the Environmental Office to perform routine, unannounced inspections.

(c) Cleanup and Documentation. All releases from WAA's should be cleaned up on a day-to-day basis, with soil sampling and analysis performed when the waste type is questionable. All inspections, removals, and sampling results must be carefully documented and filed with other SWMU information.

(d) Specific WAA's. Specific WAA's visited during this survey merit the following comments.

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(i) Releases to soil were not evident at most of the WAA's. Exceptions were SWMU's 17, 72, 76, and 79, where soil staining was noted around the drum storage areas. A drum labelled an HW was actively leaking at SWMU 76, the WAA at Building 778. The waste appeared to be oil and there was a stained area around the drum which was placed on a pallet on the soil. Near this site were 5-gallon containers that appeared to contain fuel stored along a fence on a paved area. The drainage channel next to the containers sloped out of the lot into Fifth Street (eventually to the storm sewer). Containment should be provided to prevent spilled fuels from entering the storm drainage system.

(ii) A WAA had been constructed at SWMU 64 (Building 45726) which consisted of a concrete pad with surrounding concrete berm. One corner of the berm was open, and sloped into a grated opening to the oil water separator used by the facility. This was to prevent rainwater from accumulating in the bermed area. Containers of hazardous materials as well as waste oils were stored within the bermed area. The material would be discharged to the sanitary sewer via the oil water separator in the event of a spill. Additional containment is required at this site if materials other than waste oils are to be stored in the WAA.

(iii) The WAA at Building 974 (SWMU 45) is used to store waste trichloroethane solvent prior to transfer and disposal. During the site visit, as has been noted in the past, the drums were stored on a concrete platform several feet high which was filled in with gravel and soil. There were no noticeable releases to soil around the solvent drums. The site was well-organized and well-labelled. The only potential problem is that the integrity of the concrete platform is unknown. It could not be determined whether the platform did in fact have a bottom to it. Spillage has been noted in the past (reference 2); it should be determined whether this setup is conducive to ground-water contamination through the bottom of the platform. Facility drawings or interviews with past employees may help make this determination.

(2) Underground Storage Tanks. Although UST's containing wastes generally have the potential to cause ground-water contamination, Fort Richardson actively addresses this concern through its UST management program. This program includes annual leak-testing, good record-keeping, removal/replacement of old or leaking tanks, and site assessments which include sampling and analysis of soils around excavated tanks. No further actions should be required as part of corrective

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action. Of high importance is the documentation of all UST activities, including test failures, removals, soil excavations, and sampling results. This information must be provided to the permitting authority to justify no further action recommendations.

(3) Camp Carroll SWMU's. At the time of the survey, it was not clear whether the Camp Carroll SWMU's would in fact be covered under Fort Richardson's corrective action requirements. Two sites were included in the RFA; a WAA and an UST. There are several reasons why Camp Carroll sites should not be considered Fort Richardson SWMU's. Camp Carroll operates under a unique EPA generator ID number and receives separate inspections, violation notices, and correspondence from the regulators. In short, Camp Carroll is considered a separate entity by EPA and State environmental regulatory authorities. Furthermore, Camp Carroll is not under the command jurisdiction of Fort Richardson, and is not subject to the programs, operational plans, and standard procedures maintained by Fort Richardson. It is our recommendation that the Camp Carroll sites be removed from the SWMU list or be considered as requiring no further action under Fort Richardson's corrective action requirements.

## 7. CONCLUSIONS.

a. The EPA conducted an RFA at Fort Richardson which identified 116 SWMU's and four AOC's, as required by the RCRA Hazardous and Solid Waste Amendments of 1984.

b. An additional six SWMU's were identified at Fort Richardson. Five are already undergoing investigations; the remaining SWMU requires no further action.

c. No further action is required for 51 of the original 120 sites, based on a low potential for environmental release and/or a lack of a susceptible migration pathway.

d. Four SWMU's have sufficient potential for release to require investigations to determine whether releases have occurred. These are the Former Soil Aeration Area/UST (SWMU's 15/120), Former Neutralization Tank (SWMU 37), and Used Oil Transfer Area (SWMU 41).

e. Fourteen original SWMU's have ongoing or planned investigations associated with them, and should not require investigations in the corrective action process.

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f. The 31 WAA's generally do not require sampling and analysis, due to a low potential for harmful release to the environment. However, certain measures should be taken to justify a determination of no further action in the corrective action process.

g. Improvements at specific WAA's are needed to minimize the potential for environmental release.

h. Eighteen UST's listed in the RFA require no further action other than continued documentation of efforts. The UST management program at Fort Richardson appeared to adequately address the potential for release from these units.

i. The two SWMU's located at Camp Carroll should not be addressed under Fort Richardson's corrective action requirement.

## 8. RECOMMENDATIONS.

a. Provide the information contained in this report to the permitting agency when issuance of the Part B RCRA permit becomes imminent. Use this document as an updated, consolidated version of the RFA, and as a starting point for corrective action negotiations.

b. Maintain complete documentation of all sampling and analysis, remedial action, construction/removal, or investigative work associated with every SWMU.

c. Initiate investigative actions recommended at SWMU's 15, 37, and 41 to determine whether environmental releases have occurred.

d. Continue with ongoing or planned investigations at 14 original SWMU's and five new SWMU's, documenting all progress and study results for future corrective action negotiations.

e. Assemble and maintain basic documentation for the additional six SWMU's identified during this survey. Continue to amend the SWMU list as new sites are discovered or created.

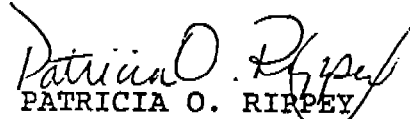
f. Identify and evaluate past and current WAA's, and maintain supporting documentation of releases, cleanup actions, sampling and analysis, and inspections performed.

g. Implement the improvements recommended for specific WAA's to identify, prevent, or control environmental releases.

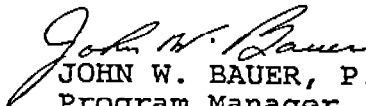
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h. Continue the current management of UST's, to include periodic leak-testing, removal of confirmed leakers, and UST site assessments to identify and control releases from these units.

i. Prior to permit issuance, negotiate with the regulators to remove Camp Carroll sites from the Fort Richardson SWMU list.

  
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## APPENDIX A

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APPENDIX B

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