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AFOEHL REPORT 89-042EQ0133EHB



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**Hazardous Waste Technical Assistance Survey
Moody AFB GA**

NANCY S. HEDGECK, 2Lt, USAF, BSC

MAY 1989

Final Report

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**AF Occupational and Environmental Health Laboratory (AFSC)
Human Systems Division
Brooks Air Force Base, Texas 78235-5501**

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<p>At the request of 347 Medical Group/SG, the AFOEHL conducted a hazardous waste technical assistance survey at Moody AFB (MAFB) from 18 to 28 July 1988. The scope of this survey was to address hazardous waste management practices, establish a waste sampling strategy, and explore opportunities for hazardous waste minimization. The survey team performed a shop-by-shop evaluation of chemical waste management practices as well as met with hazardous waste managers and engineers to discuss the hazardous waste program. The results of our survey showed that MAFB needs to formalize the hazardous waste management program. Recommendations include: (1) The base needs to develop a waste analysis plan. (2) The transportation of wastes from shops to DRMO should be streamlined. (3) The Auto Hobby Shop and 347 CES Paint Shop waste paint storage areas should be classified as satellite accumulation sites. (4) The Auto Hobby Shop should consider using Simple Green Soap and Safety Kleen degreaser rather than aircraft soap and PD-680. (5) The</p>					
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Bioenvironmental Engineering Shop should develop "in-house" training on hazardous waste sampling. (6) Disposable coliwassas should be used for hazardous waste sampling. (7) Civil Engineering should ensure that the oil/water separators are cleaned out according to the maintenance contract. (8) Drums should not be prestenciled with the contents without historical data to substantiate the practice. (9) The rinsewater from 347 EMS Corrosion Control should be analyzed for hazardous waste characteristics. (10) Communication between the BEE Shop and DEEV should be formalized. (11) Spent Citrikleen should be analyzed for hazardous waste characteristics. (12) The education and training program should provide opportunities for input by the BEE Shop and DRMO. (13) Saturated Speedy Dry should be disposed of as hazardous waste. (14) A separate drum should be used at 347 EMS Corrosion Control to store other shop's paint and thinner waste. This drum should be locked and the contents logged. (15) The underground tank at 347 TRANS General Purpose Maintenance Shop should be locked. (16) All shops on base should consider establishing a contract with the local linen contractor for supplying cleaning rags. (17) Accumulation site and waste oil storage area primary and alternate managers should receive hazardous waste training before assuming the position. (18) Accumulation sites should be covered, locked, and located on diked, impermeable surfaces. (19) Used paint filters at 347 EMS Corrosion Control should be analyzed for hazardous waste characteristics.

ACKNOWLEDGMENT

The Hazardous Waste Function, AFOEHL/ECQ, greatly appreciates the technical expertise and hardwork provided by TSgt Michael J. Wantland, NCOIC, Occupational Chemistry Function, AFOEHL/SA, during this survey. We also wish to thank the personnel at Moody AFB who provided information and logistic support during the survey. Mr Knobloch, the Environmental Coordinator, and Mr Brashier, Environmental Specialist, 347 CSG/DEEV; 1Lt Harvey, Chief, Bioenvironmental Engineering, MSgt Diaz, NCOIC, Bioenvironmental Engineering, and the Bioenvironmental Engineering Staff, 347 Medical Group/SGPB were especially supportive of the mission during the survey.



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I. INTRODUCTION

The 347th Medical Group/SG requested the AF Occupational and Environmental Health Laboratory, Consultant Services Division, Environmental Quality Branch (AFOEHL/ECQ) to conduct a Hazardous Waste Technical Assistance Survey at Moody AFB (see Appendix A). The scope of the survey was to address hazardous waste management practices, establish a waste sampling strategy and explore opportunities for hazardous waste minimization.

The survey was conducted by Maj Elliot K. Ng, 2Lt Nancy S. Hedgecock, and TSgt Michael J. Wantland on 18-28 July 88.

II. BACKGROUND

A. Base Description

Moody Air Force Base (MAFB) is located in Lowndes County, Georgia, approximately 10 miles north of Valdosta, Georgia. The base is home of the 347th Tactical Fighter Wing, Tactical Air Command (TAC) and a member of the United States Central Command. As such, it has the mission of deploying overseas during wartime to support United States and/or Allied Forces. The 347th Combat Support Group has the mission of administering and maintaining Moody AFB.

B. Hazardous Waste Program

The hazardous waste program at Moody AFB is managed primarily through the Environmental and Contract Planning Office in Civil Engineering, 347 CSG/DEEV. The program is supported by the Defense Reutilization and Marketing Office (DRMO) who is responsible for contractual removal of wastes, and the Bioenvironmental Engineering (BEE) Shop, 347th Medical Group/SGPB, who monitors the program through industrial shop surveys and waste analyses.

Hazardous wastes generated by a shop are generally taken to the only designated accumulation site on base at 347 Corrosion Control, Bldg 717, at the time of generation. In most cases, the waste is collected in 55-gallon drums and temporarily stored for less than 90 days at the accumulation site. Waste oils and fluids are accumulated in 55-gallon drums located near the shops at sites designated as waste oil storage areas. Each accumulation site and waste oil storage area has a designated primary and alternate manager and is inspected weekly by DEEV. The managers are responsible for assuring that the containers are properly identified and labeled. When waste drums are full, they are normally transferred to DRMO's storage facility (Lot #3). Each shop is responsible for transporting the waste to the storage facility using forklifts and government vehicles. Transportation is accomplished over government-owned roads within the base confines to Lot #3. Lot #3 is open one day a week for accepting wastes.

III. PROCEDURE

The method used to evaluate hazardous waste management practices and opportunities for waste minimization was to contact key personnel responsible for the program and to visit each of the major industrial shops generating chemical waste. With a list of shops generating chemical waste provided by the BEE Shop, the survey team conducted shop visits to observe industrial operations, discuss chemical waste disposal practices with shop personnel, and hand out chemical disposal survey forms (see Appendix B). These forms, which were completed by shop personnel, were reviewed by the survey team and provided additional information for subsequent discussions with shop personnel. Also, the hazardous waste accumulation site and nine waste oil storage areas were visited and an accumulation site survey form (see Appendix C) was filled out for each site.

The following individuals were contacted to discuss their responsibility and involvement in the hazardous waste program:

1Lt Lana Harvey, Chief, Bioenvironmental Engineering, SGPB, AV 460-4747
MSgt Diaz, NCOIC, Bioenvironmental Engineering, SGPB, AV 460-4747
Mr Crenshaw, Environmental and Contract Planning, DEEV, AV 460-4654
Mr Knobloch, Environmental Coordinator, DEEV, AV 460-4654
Mr Brashier, Environmental Specialist, DEEV, AV 460-4654
Mr Boutwell, Defense Reutilization and Marketing Office, DRMO, AV 460-3149

Based on the data from the completed chemical disposal survey forms, the annual forecasted quantities for 8 categories of waste were determined (see Table 1). From Table 1, Column 3 the majority of the wastes, 71.76%, consists of fuels, oils and fluids; however, none of these wastes are disposed of as hazardous wastes. Thirty percent of the total amount of waste generated (paints, thinners, solvents, degreasers, photo and NDI wastes) are drummed and disposed of as hazardous waste through DRMO. Oils and fluids are drummed and sold to a contractor for 50 cents/drum. Fuels are either discharged to an oil/water separator or recycled by POL. Itemized listings of waste categories, shop, amount of waste, and disposal method are found in Appendix D for all wastes and in Appendix E for drummed waste.

in a plastic bag and thrown in the dumpster. Empty thinner, degreaser, and cleaner spray cans are thrown in the dumpster. Used batteries (5/month) are turned in to DRMO wet. Dirty rags are exchanged for clean ones through a local linen service.

All floor drains in the shop are connected to an oil/water separator. Prior to the survey, a heavy rain caused the separator to overflow and contaminate the soil in the area. The contaminated soil has been removed and replaced with uncontaminated soil (see Figure 1). The standpipe has since been elevated to prevent future flooding of the tank. Shop personnel stated that the contractor, who pumps waste from the holding tank, does not completely empty the tank.

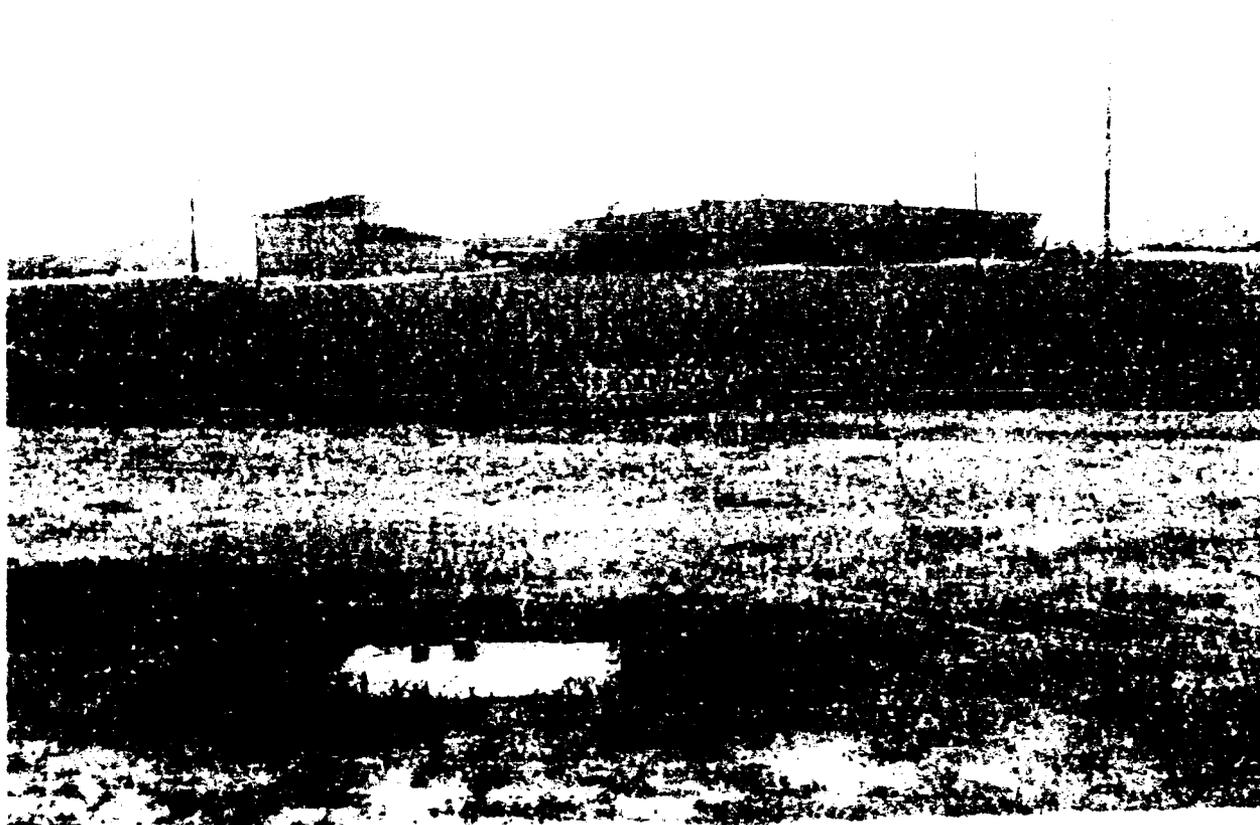


FIGURE 1. Refueling Maintenance Oil/Water Separator Cleanup Project

2. Shop: 347 TRANS Allied Trades
Contact: SSgt D'Agostin

Bldg: 967
AUTOVON: 460-4280

Allied Trades personnel are responsible for repairing vehicle body damage using fiberglass/plastic filler, painting vehicles, and welding vehicles using oxygen/acetylene, arc, and mig welding. The shop generates waste polyurethane paint and thinner (1 gallon/month), enamel paint (1 pint/month), and lacquer paint and thinner (1 quart/month). The paint wastes are placed in a 55-gallon drum and taken to the accumulation site at 347 EMS Corrosion Control (Bldg 717). Dirty rags are exchanged for clean ones through a local linen service.

3. Shop: 347 TRANS Special Purpose
Contact: Mr Cooper

Bldg: 976
AUTOVON: 460-4220

Shop personnel perform routine maintenance on heavy equipment and vehicles (e.g., tow trucks, dump trucks). Brake fluid (2 gallons/month), transmission fluid (25 gallons/month), hydraulic fluid (50 gallons/month), and motor oil (50 gallons/month) are drained from the vehicles into drip pans and poured into a 55-gallon drum which is eventually taken to the waste oil storage area at 347 TRANS General Purpose Maintenance (Bldg 977). The shop has one Safety Kleen degreasing unit (25 gallons) that is changed out every 9 weeks. The shop is in the process of establishing a contract with the Safety Kleen Corporation to lease a paint gun cleaning unit. Used Speedy Dry is thrown in the trash. Dirty rags are exchanged for clean ones through a local linen service. Used batteries (10/month) are disposed of wet through DRMO.

4. Shop: 347 TRANS General Purpose Maintenance
Contact: Mr Thompson

Bldg: 977
AUTOVON: 460-3437

This shop is responsible for oil changes, lubrication, winterization, and maintenance of all military vehicles on Moody AFB. The shop generates waste brake fluid (1/2 gallon/month), transmission fluid (4 gallons/month), hydraulic fluid (1/2 gallon/month), and motor oil (100-150 gallons/month). These wastes are drained from the vehicles into drip pans and poured into 55-gallon drums. The drums are stored at the shop's waste oil storage area. Shop personnel are responsible for transporting all of 347 TRANS's waste oil to Lot #3 on a quarterly basis. Waste oil is not stored at the shop for more than 90 days.

The shop has one Safety Kleen degreasing unit (25 gallons) that is changed out every 9 weeks. Shop personnel stated that leasing the Safety Kleen unit is more cost effective than purchasing other solvent. Used lead-acid batteries (8/month) are disposed of wet through DRMO. Aircraft cleaning soap (1 gallon/month) is used for cleaning the shop interior. All floor drains are connected to an oil/water separator that is cleaned out on a quarterly basis. Used Speedy Dry is thrown in the trash. A local linen contractor supplies 347 TRANS 31,200 rags/year at a cost of \$1274/year.

5. Shop: 347 TRANS Fire Truck Maintenance
Contact: Mr Cooper

Bldg: 621
AUTOVON: 460-4149

Shop personnel are responsible for maintenance of the fire fighting vehicle fleet on Moody AFB. The shop generates waste brake fluid (1 pint/month), transmission fluid (1 gallon/month), antifreeze (1 gallon/month), hydraulic fluid (1 gallon/month), and motor oil (5 gallons/month). These wastes are emptied into pans which are poured into a prestenciled 55-gallon drum (5% antifreeze, 2% brake fluid, 5% transmission fluid, 2% dirt, 2% water, and 84% lube oil). When full, the drum is taken to the waste oil storage area at 347 TRANS General Purpose Maintenance (Bldg 977).

The shop has one Safety Kleen degreasing unit (20 gallons) that is changed out every nine weeks. The vehicles are steam cleaned using aircraft cleaning compound (1 gallon/month). The soap and water run into drains which are connected to an oil/water separator that is cleaned out quarterly. Spray paint is used for touch-up painting; the empty cans are thrown in the trash. Used batteries (2/year) are turned in wet to DRMO.

6. Shop: 347 TRANS Minor Maintenance
Contact: Mr Milani

Bldg: 977
AUTOVON: 460-3350

The Minor Maintenance Shop contains two shops: Battery Shop and Wheel and Tire Shop. The Battery Shop is shared by 347 CES Power Production, 347 EMS AGE, and 347 TRANS. Used lead-acid batteries (300 batteries/6-8 months) are accumulated at this shop and turned in wet to DRMO. The base is in the process of eliminating the use of lead-acid batteries in vehicles; dry cell batteries will be used instead. Batteries are filled in this shop on rare occasions. The Wheel and Tire Shop does not generate any waste.

7. Shop: 347 CES Paint Shop
Contact: Mr Bell

Bldg: 921
AUTOVON: 460-3219

This shop is responsible for painting signs, and building interiors and exteriors. The shop generates waste solvents and mineral spirits (approximately 55 gallons/6 months). The waste drum is stored on concrete blocks behind the Paint Shop. When full, the drum is transported to Lot #3. At the time of the survey, there were two drums behind the shop; one was open and collecting rainwater (see Figure 2). Also, there were several empty latex paint buckets that were accumulating rainwater and mosquito larvae. Prior to the end of the survey, the extra drum and the paint buckets were removed. The shop also has an outdoor sink for cleaning equipment used with latex paint. The sink drains into an oil/water separator.

8. Shop: 347 CES Liquid Fuels Maintenance
Contact: SSgt Trudeau

Bldg: 916
AUTOVON: 460-4658

Liquid Fuels personnel maintain stationary fuel systems and fuel tanks. The base has four aboveground JP-4 tanks (two 10,000-gallon tanks and two 5,000-gallon tanks) that are cleaned every four years by a contractor. The contractor is responsible for removing all waste fuel and sludge from the base. Motor vehicle gasoline tanks are not cleaned.

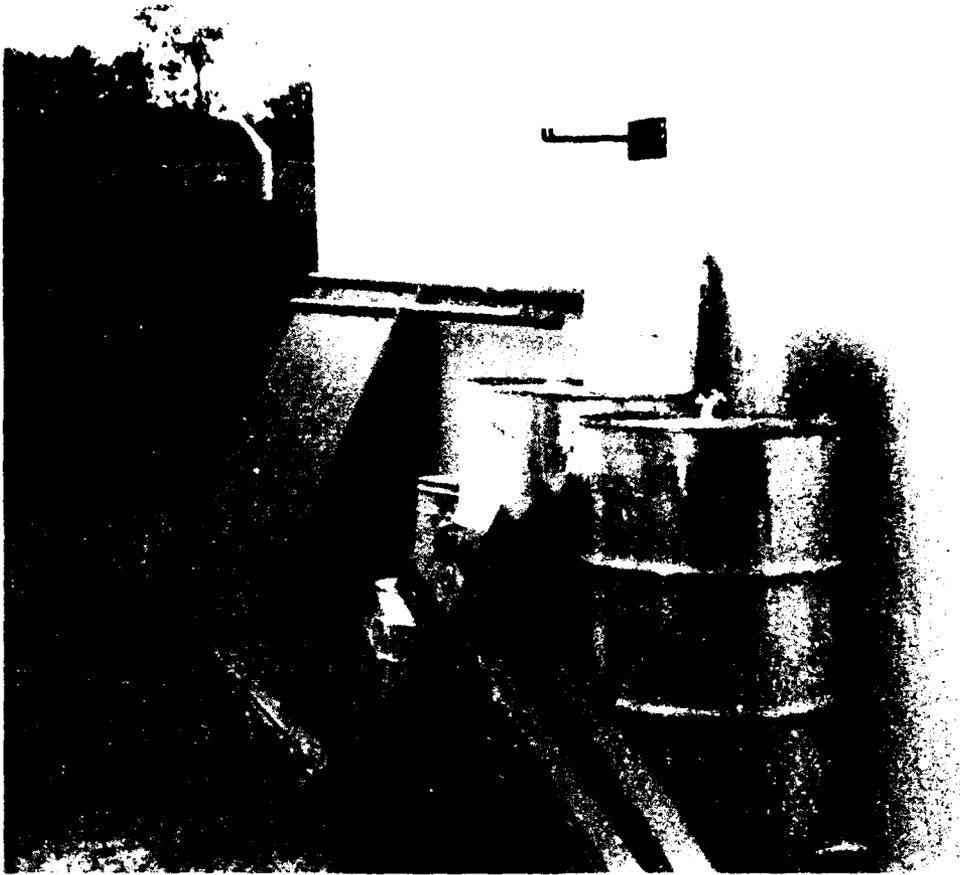


FIGURE 2. Paint Shop Waste Paint Storage Area

9. Shop: 347 CES Power Production
Contact: Mr Kruse

Bldg: 999
AUTOVON: 460-3789

This shop operates and maintains 37 generators. This includes changing the engine oil at least twice per year. The waste oil (110 gallons/ 6-8 weeks) and diesel fuel contaminated with water (55 gallons/6 months) are placed in separate 55-gallon drums that are transported to Lot #3 when full. The drums are prestenciled before any wastes are put into them. Simple Green Soap is used to clean the generators.

10. Shop: 347 CES Entomology
Contact: Mr Parker

Bldg: 965
AUTOVON: 460-4397

This shop is responsible for pest and weed control on Moody AFB. Residual chemicals from triple-rinsing procedures are mixed with other chemicals and used in the field. Empty containers are rendered unusable and thrown in the trash. The shop has one drum of Warfarin that is not going to be used and needs to be disposed.

11. Shop: 347 EMS Corrosion Control
Contact: TSgt Jefferson

Bldg: 717
AUTOVON: 460-3823

This shop is responsible for corrosion treatment and painting of F-16 aircraft, associated aircraft parts, and support equipment. Two F-16 aircraft are painted per week. This shop has the only designated hazardous waste accumulation site on base; all waste paints and thinners generated on base (except for wastes generated at the Auto Hobby Shop and 347 CES Paint Shop) are brought to this accumulation site. The shop generates waste polyurethane paint (55 gallons/month), enamel paint (5 gallons/month), lacquer paint (3 gallons/month), polyurethane thinner (30 gallons/month), MEK (40 gallons/month), aromatic naphtha (10 gallons/month), lacquer thinner (10 gallons/month), and mineral spirits (5 gallons/month). One 55-gallon prestenciled drum is kept inside the shop for waste paint and thinner disposal. When full, the drum is taken to the shop's accumulation site (see Figure 3). The drums are not kept at the site for more than 90 days.

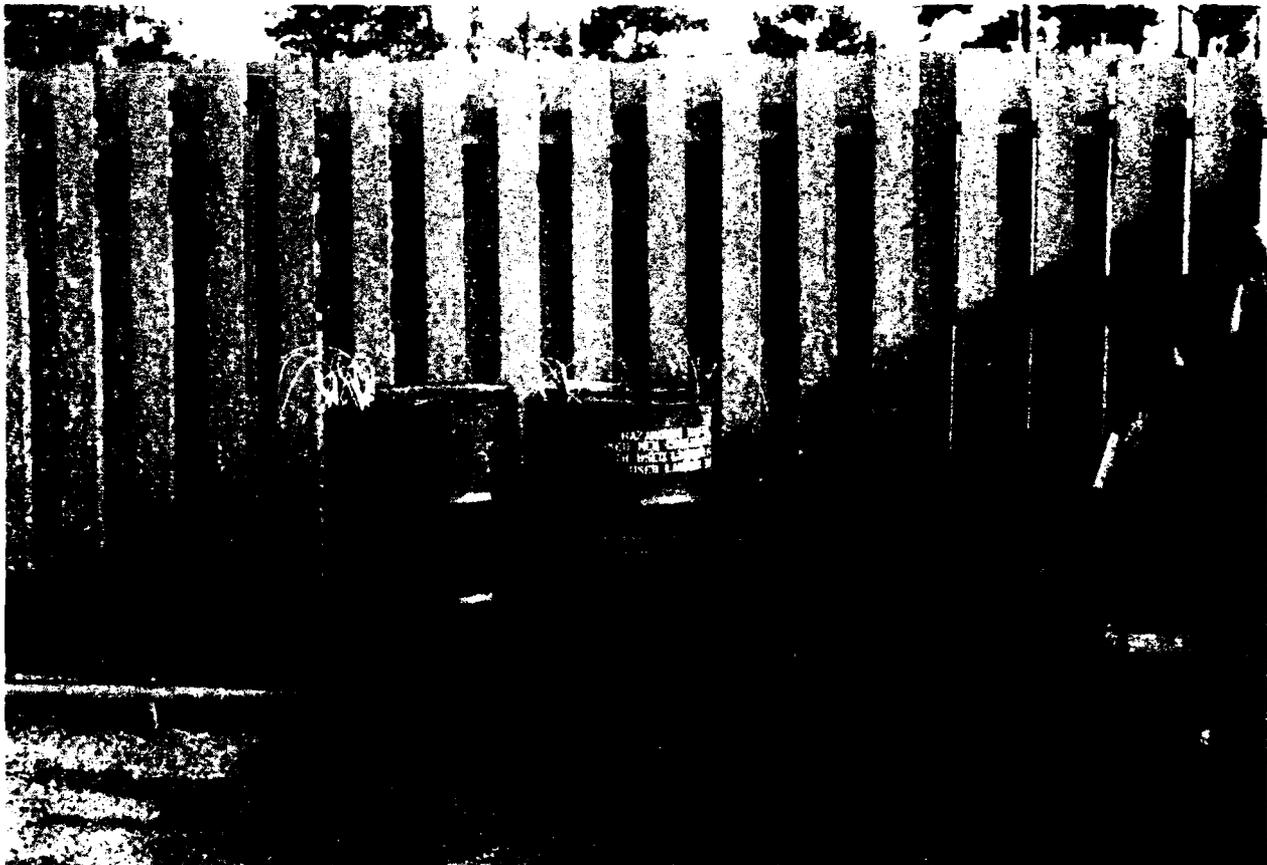


FIGURE 3. Corrosion Control Shop Accumulation Site

The paint area has one dry ventilation system; the filters (266) are changed weekly. The used filters are either added to drums of waste paint and thinners as an absorbent or are thrown in the trash.

The shop has two stripping tanks that contain non-phenolic 4411 stripper (NSN 8010-P4411) and non-phenolic pr-3500 stripper (NSN 8010-00-181-7568) (see Figure 4). The tanks are cleaned once per week; the waste (55 gallons/4 months) is drummed and stored at the shop's accumulation site. Parts are rinsed with water after being removed from the stripping tanks. The rinse-water runs into a drain, and the paint sludge is caught in a bucket that is cleaned daily. The remaining water drains into an oil/water separator.

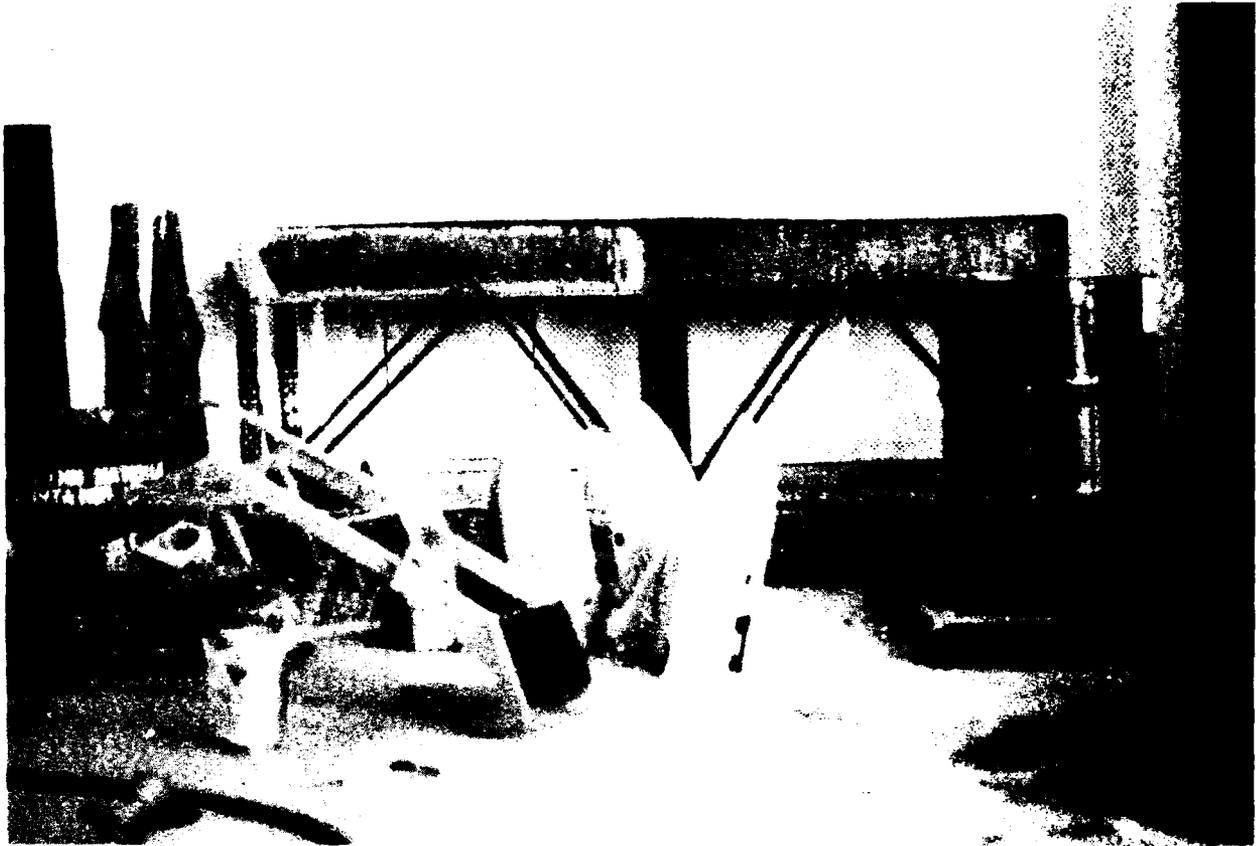


FIGURE 4. Corrosion Control Shop Stripping Tanks

One week prior to the survey, a Safety Kleen paint gun cleaning unit was installed in the shop (see Figure 5). The unit is funded by Civil Engineering. Shop personnel do not like the unit because the Safety Kleen solvent will not remove polyurethane paint from the guns unless they are cleaned immediately after use.

All rags in the shop are drummed and disposed as hazardous waste. A MEK distillation unit is being purchased by TAC for use by the shop.

The accumulation site has been a problem for the base. Several discrepancies have been noted by the Georgia Department of Natural Resources. The area is secured with a locked gate; however, it is located on

grass and gravel and is not curbed. A work order to upgrade the site was submitted three years ago. Grass will not grow in one area of the site (where barrels were previously stored). Prior to the survey, some soil had been removed from the area and soil samples taken to determine the extent of contamination.

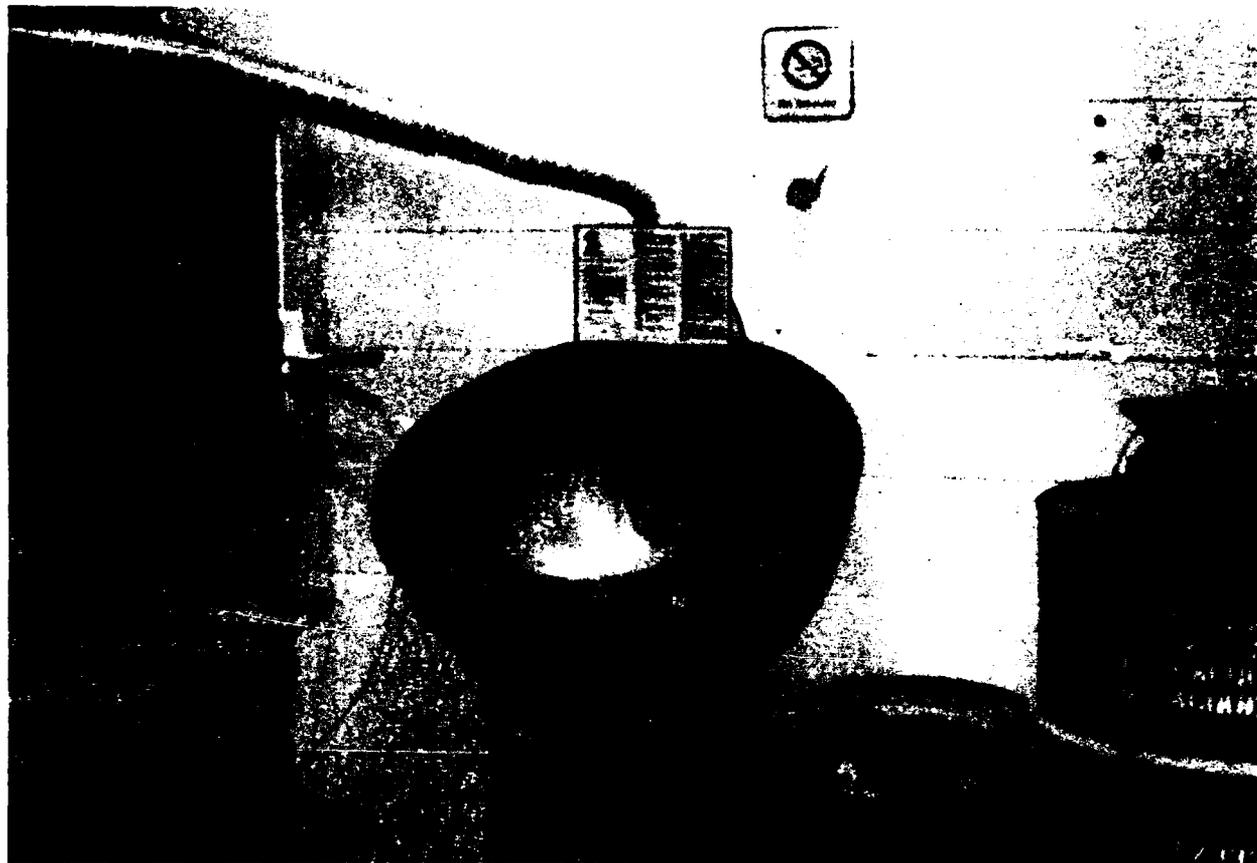


FIGURE 5. Safety Kleen Paint Gun Cleaning Unit

12. Shop: 347 EMS AGE (68th Combat AGE)
Contact: MSgt Roe

Bldg: 755
AUTOVON: 460-3249

The AGE Shop services, maintains, and dispatches flight line support equipment. This shop has one 55-gallon PD-680 tank that is changed out every month. The waste is put in a 55-gallon drum and transferred to Lot #3. The equipment is washed on a washrack using Simple Green Soap (220 gallons/month) and PD-680 (40 gallons/month). The drains on the washrack are connected to an oil/water separator. The shop generates waste hydraulic fluid (55 gallons/3 weeks), synthetic oil (55 gallons/3 weeks), and motor oil (55 gallons/3 weeks). The waste oils and fluids are drained into pans which are then poured into 55-gallon drums. The drums have funnels (with lids) in them and are color-coded by waste (see Figure 6). When full, the drums are transported to Lot #3. Dirty rags are exchanged for clean ones through a local linen service.

The shop is planning to try Citrikleen both on the washrack and in the degreasing tank.

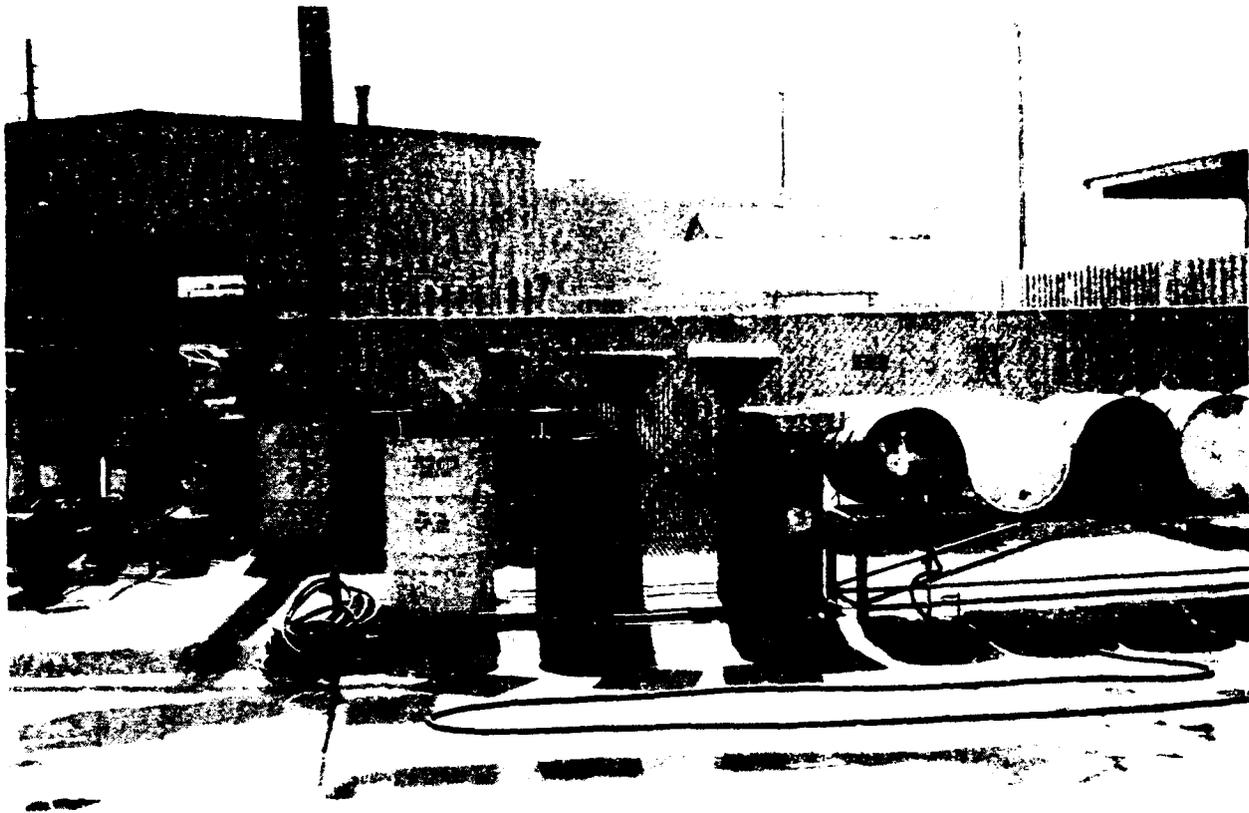


FIGURE 6. AGE Shop Waste Oil Storage Area

13. Shop: 347 EMS Phase Docks
Contact: MSgt Miracle

Bldg: 775
AUTOVON: 460-3953

This shop is responsible for periodic maintenance and inspection of the F-16 aircraft. The shop generates waste hydraulic fluid (10 gallons/month), synthetic oil (6 gallons/month), and JP-4 (36 gallons/month). The hydraulic fluid and synthetic oil are placed in a 55-gallon drum and the JP-4 runs into the floor drain which is connected to an oil/water separator.

14. Shop: 347 EMS Wheel and Tire
Contact: TSgt Spence

Bldg: 718
AUTOVON: 460-3256

This shop is responsible for assembling, disassembling, and cleaning aircraft wheels and tires. Safety Kleen degreaser is used in one of the shop's existing heated tanks (140-gallon). The shop cleans about 250 wheels/month. The tank is changed out monthly at a cost of \$358. Shop personnel are satisfied with the service, but plan to try Citrikleen in the tank as soon as the Safety Kleen contract ends.



FIGURE 7. Jet Engine Shop Waste Oil Storage Area

21. Shop: 347 CRS Pneudraulics
Contact: TSgt Walker

Bldg: 785
AUTOVON: 460-3355

This shop is responsible for the maintenance of pneudraulic components on the F-16 aircraft. The shop has one PD-680 degreasing tank (110-gallon) that is changed out every 6 months. The waste is placed in 55-gallon drums and taken to Lot #3. As soon as a contract is established with the Safety Kleen Corporation, PD-680 will no longer be used. Citrikleen was considered, but shop personnel did not want to use it because of the possibility of water getting into the components and causing corrosion. A local linen company supplies the shop with rags.

In the past the shop had a waste oil storage area. When the area was no longer needed, the concrete pad and contaminated soil were removed and replaced with uncontaminated soil.

22. Shop: 347 MWR Auto Hobby
Contact: Mr Buckholts

Bldg: 840
AUTOVON: 460-3056

The Auto Hobby Shop is housed in a "garage type" building containing equipment for maintenance and repair of privately owned vehicles. The shop has one 25-gallon PD-680 tank that is changed out quarterly. The waste is placed in a 55-gallon drum that is kept in the vehicle storage yard. When full, the drum is transported to Lot #3. Transmission fluid (5 gallons/month) and motor oil (150 gallons/month) are drained into a 500-gallon underground storage tank. A contractor comes to the shop every 6 weeks and pumps out the holding tank. Aircraft cleaning soap (55 gallons/quarter) is used to clean the shop floor. All floor drains in the shop are connected to an oil/water separator. The shop has a dry paint booth; the filters are changed about three times/year and thrown in the trash. Waste polyurethane paint (1 quart/month), enamel paint (2 quarts/month), and lacquer paint (2 quarts/month) are placed in a 10-gallon drum. When full, the drum is taken to Lot #3.

23. Shop: 347 AGS 68th AMU
Contact: MSgt Hinke

Bldg: 772
AUTOVON: 460-3993

This shop is responsible for maintaining and issuing tools and equipment required for flight line maintenance of the 68th Tactical Fighter Squadron's F-16 aircraft. The shop generates waste hydraulic fluid (35 gallons/year) and synthetic oil (35 gallons/year). The wastes are drained from the aircraft into buckets and poured into separate 55-gallon drums. When full, the drums are transported to Lot #3. JP-4 (200 gallons/year) is drained into a bowser which is then taken to the 347 EMS Fuel Barn for recycling. Simple Green Soap (55 gallons/month) is used to spot clean the aircraft. It is sprayed on and wiped off. The dirty rags are thrown in the trash. Used Speedy Dry is also thrown in the trash.

24. Shop: 347 AGS 69th AMU
Contact: TSgt Nelson

Bldg: 786
AUTOVON: 460-3957

This shop is responsible for maintaining and issuing tools and equipment required for flight line maintenance of the 69th Tactical Fighter Squadron's F-16 aircraft. The shop generates waste hydraulic fluid (10 gallons/month) and synthetic oil (10 gallons/month). The wastes are drained from the aircraft into buckets and poured into separate 55-gallon drums located at the shop's waste oil storage area (see Figure 8). When full, the drums are transported to Lot #3. JP-4 (120 gallons/year) is drummed and disposed of through DRMO. Simple Green Soap (55 gallons/month) is used to spot clean the aircraft. Rags are disposed of in 55-gallon drums.

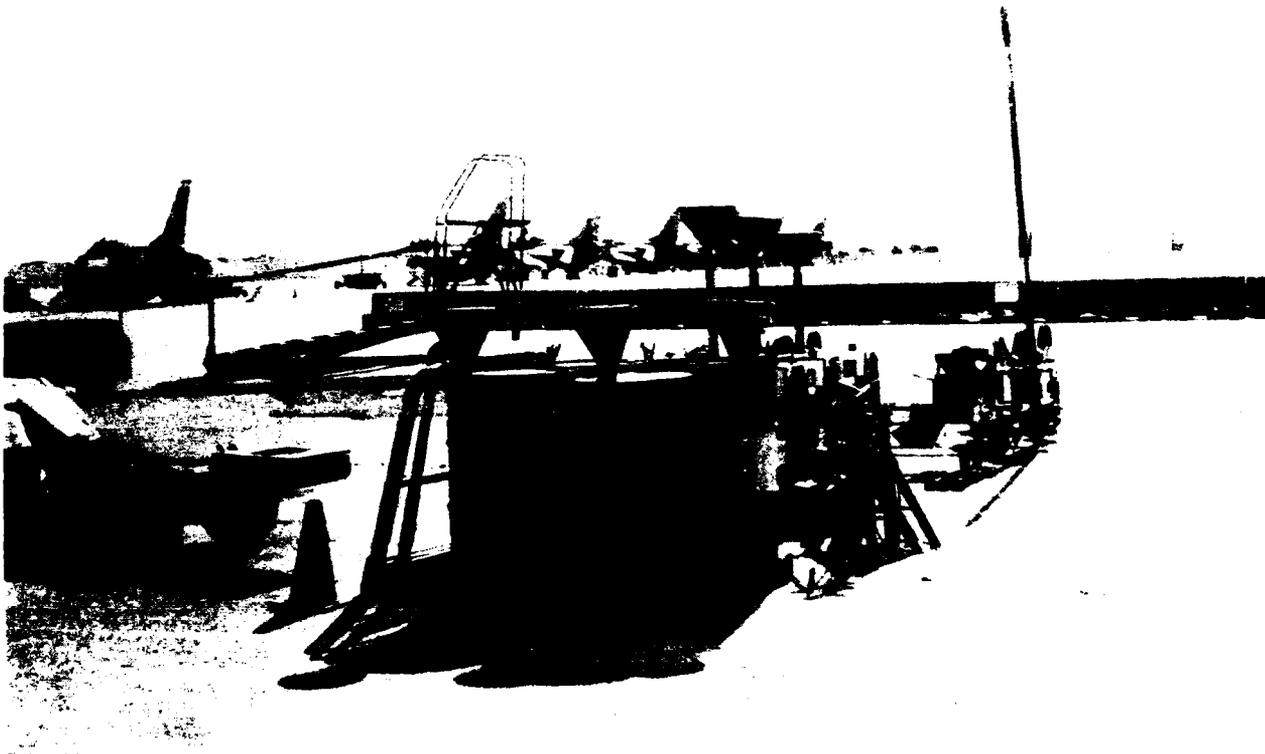


FIGURE 8. 69 AMU Waste Oil Storage Area

25. Shop: 347 AGS 70 AMU
Contact: SSgt Hilmer

Bldg: 770
AUTOVON: 460-4525

This shop is responsible for maintaining and issuing tools and equipment required for the maintenance of the 70th Tactical Fighter Squadron's F-16 aircraft. The shop generates waste hydraulic fluid (15 gallons/month) and synthetic oil (15 gallons/month). The wastes are drained from the aircraft into buckets and poured into separate 55-gallon drums located at the shop's waste oil storage area (see Figure 8). When full, the drums are transported to lot 401 DP-4 (30 gallons/month) is transported to the AGE Shop and disposed of. Dimple Green Soap (10 gallons/month) is used to spot clean the aircraft. All rags (4-5 drums/month) are drummed and disposed of as hazardous waste.

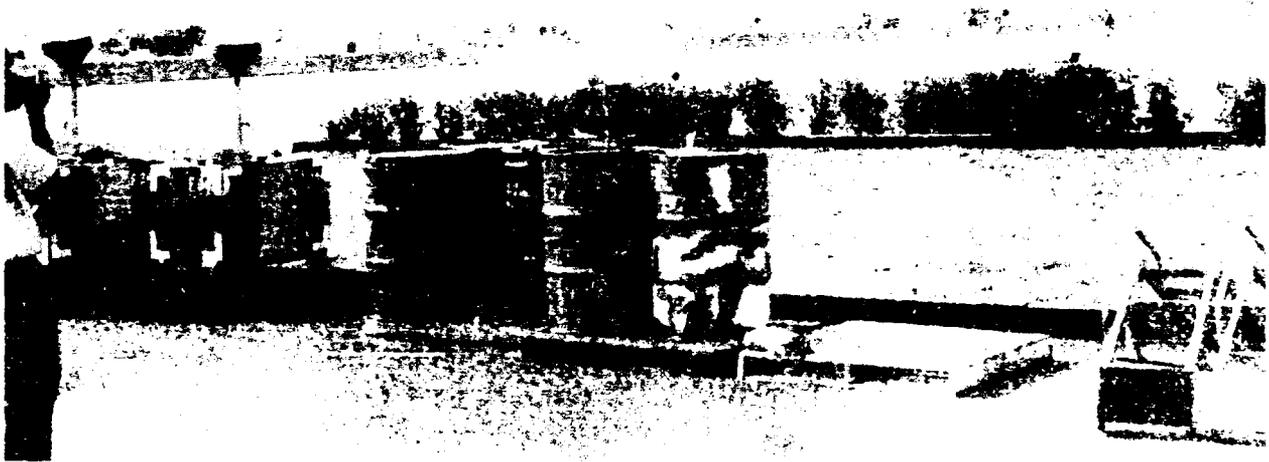


FIGURE 9. 70 AMU Waste Oil Storage Area

V. SUMMARY OF WASTE DISPOSAL PRACTICES

The waste disposal practices for different categories of waste are summarized in this section. A summary of disposal practices for each waste category is contained in Appendix D.

1. Waste paints and thinners are generally placed in 10- or 55-gallon drums, stored at the accumulation site (Bldg 717), and taken to Lot #3 for storage until pickup by a contractor. Waste paints and thinners are also stored at the Auto Hobby Shop and 347 CES Paint Shop.

2. Waste strippers are drummed and disposed of as hazardous waste through DRMO. Stripper enters the sanitary sewer through a floor drain during parts rinsing at 347 EMS Corrosion Control.

3. Waste oils and fluids are drummed or stored in underground waste oil storage tanks. The drums are transported to Lot #3 and stored until the contractor comes and pumps them out. Waste oils and fluids are drummed and sold to a contractor for 50 cents per drum. The contractor pumps the drum contents into a tank truck and also takes the drums. A contractor pumps out the two 500-gallon underground waste oil storage tanks located at the Auto Hobby Shop about every six weeks.

4. Fuel drained from the aircraft is either blended back into the main fuel tanks or drained into an oil/water separator. The oil/water separator is pumped out by a contractor, and the contents are disposed by the contractor.

5. All lead-acid batteries are disposed of wet through DRMO; this eliminates the need for acid neutralization. In the future, 347 TRANS will be using dry cell batteries; this will eliminate the disposal of the majority of the lead-acid batteries used on base.

6. Waste solvents (e.g., PD-680 and carbon remover) are drummed and disposed of through DRMO. Most shops have contracts with the Safety Kleen Corporation to service solvent tanks.

7. Waste fixer from the NDI shop is sent through a silver recovery unit before being discharged to the sanitary sewer. All other photo chemicals used on base are drained to the sanitary sewer.

8. Penetrant and developer (used in the dye penetrant process) from the NDI shop are drummed and disposed of as hazardous waste through DRMO. The emulsifier is discharged to the sanitary sewer.

9. Most shops utilize the service of a local linen contractor for cleaning dirty rags.

10. Paint filters from 347 EMS Corrosion Control are disposed of by either including them in drums of waste paint and thinners as an absorbent, or they are thrown in the trash.

11. Speedy Dry, used to clean small spills, is usually thrown in the trash.

VI. FINDINGS, OBSERVATIONS, AND CONCLUSIONS

1. Moody AFB does not generate a large quantity of hazardous wastes. In the past year, PD-680 usage has been almost eliminated by leasing Safety Kleen degreasing units rather than using PD-680 in tanks and by using Simple Green Soap rather than PD-680 on the washracks. Also, the base is purchasing Citrikleen which will be distributed to 347 CRS Jet Engine, 347 EMS AGE, 347 EMS Wheel and Tire, and 347 CRS Pneudraulics for use on a trial basis. These shops do not plan to use the Citrikleen on bearings or hydraulic components. If the shops are satisfied with the Citrikleen performance, PD-680 usage on base will virtually be eliminated.

2. The base does not have any baseline chemical analysis to characterize wastestreams. Each shop is responsible for identifying the wastes that are put into each drum. Without a baseline chemical wastestream analysis, wastes may be incorrectly identified as either hazardous or nonhazardous.

3. Many drums are prestenciled with the contents (including percentages of each type of waste) before any wastes are put into the drums. There is no historical data to substantiate the prestenciling practice.

4. The majority of the waste oil storage areas are located next to grassy areas (see Figure 10). Generally, the storage areas aren't curbed or covered. In general, waste oil storage area managers feel that it is not necessary to secure or maintain a log of the drum contents because they feel that the shop personnel know the importance of segregating wastes.

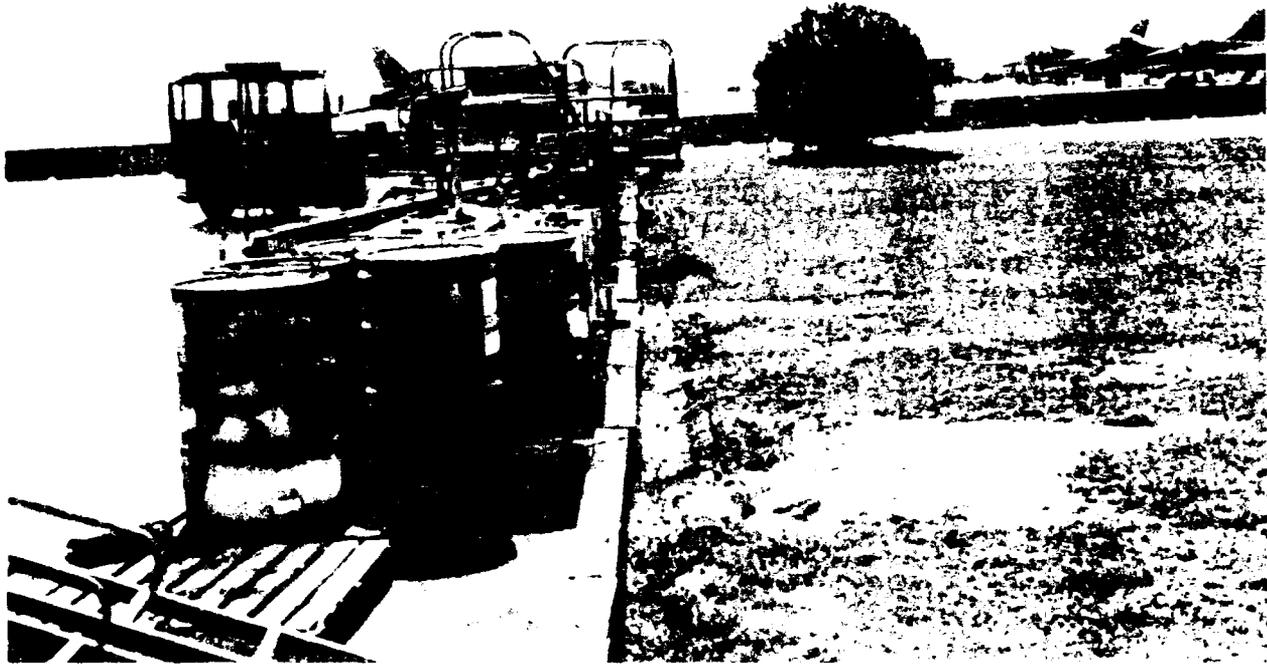


FIGURE 10. Waste Oil Storage Area Located Next to Grassy Area, Bldg 770

5. The Environmental Protection Committee (EPC) has five subcommittees: Used Solvent Elimination, Hazardous Waste, Installation Restoration Program, Natural Resources, and Air Installation Compatible Use Zone. The Bioenvironmental Engineer (BEE) is a member of the Hazardous Waste Subcommittee but not the Used Solvent Elimination Subcommittee.

6. Each accumulation site and waste oil storage area has a designated primary and alternate site manager.

7. The base has one designated hazardous waste accumulation site (Corrosion Control, Bldg 717). All paint and thinner wastes generated on base

(except for wastes generated at the 347 MWR Auto Hobby Shop and 347 CES Paint Shop) are stored at this site. Generally, wastes are not stored at the accumulation site for more than 90 days.

8. The base has 11 oil/water separators and 7 holding tanks that are pumped out on a quarterly basis. According to the contract, the oil/water separators are supposed to be pumped out quarterly and completely emptied of all oil, water, and sludge once a year. However, some shop personnel stated that the contractor pumped only a small amount of waste out of the separators and tanks each quarter.

9. The base is in the process of obtaining a Part B RCRA permit for the Explosive Ordinance Disposal Range.

10. The Safety Kleen paint gun cleaning unit at 347 EMS Corrosion Control (Bldg 717) is funded by Civil Engineering. Shop personnel do not like the unit because if the polyurethane paint is allowed to harden the Safety Kleen solvent will not remove it from the paint gun.

11. The Safety Kleen degreasing units are funded by each shop using funds from their operations and maintenance budget. Shop personnel are very satisfied with the Safety Kleen performance. In fact, if the Safety Kleen Corporation does not have a suitable tank for a particular operation, they will provide their service using the existing cleaning tank.

12. DEEV has explored the possibility of purchasing a large solvent distillation unit for Moody AFB. However, operational problems (such as where to locate the unit and who would be responsible for running the unit) detracted from the desirability of a unit. Nevertheless, Tactical Air Command (TAC) is funding the purchase of two small solvent distillation units. One will be used for MEK (400 gal/yr) recovery at 347 EMS Corrosion Control, and the other will be used for trichloroethane (80 gal/yr) recovery at 347 CRS Jet Engine Shop.

13. In the future, the base is planning to drum and dispose of partially used spray cans (paint and cleaners) as hazardous waste.

14. There is an underground storage tank, which is not in use, located outside the 347 TRANS/General Purpose Maintenance Shop. The tank has two openings, one outside the fence and one inside the fence. The opening outside the fence does not have a lock on it.

15. Waste oils and fluids are drummed and sold to a contractor for 50 cents per drum. The contractor takes the drum and its contents.

VII. RECOMMENDATIONS

A detailed outbriefing on recommendations was given on 27 July 88. Representatives from the Hospital, Bioenvironmental Engineering and Civil Engineering attended. Recommendations given during the outbriefing include:

1. Shops generating wastes are responsible for transporting their wastes (usually in 55-gallon drums) to the DRMO storage facility (Lot #3). Shop

personnel either borrow a forklift from 347 TRANS to transport the wastes or ask 347 TRANS personnel to transport the wastes for them (see Figure 11). Since DRMO accepts wastes only once a week, shop personnel stated that they sometimes have difficulty obtaining a forklift because other shops also need a forklift at the same time.

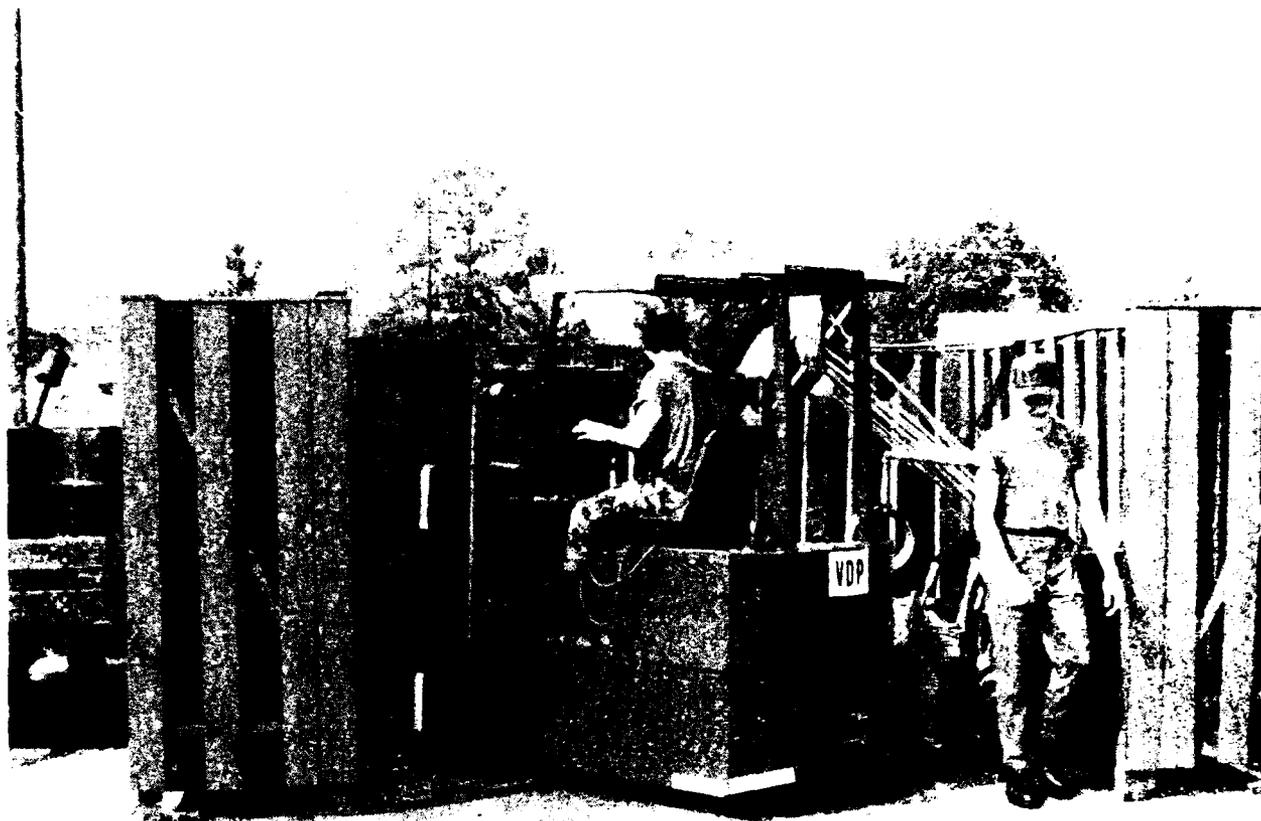


FIGURE 11. Waste Transfer to Lot #3

Some alternatives to having each shop individually transport wastes to DRMO are: (1) Assign a person in Civil Engineering who would be responsible for inspecting and transporting waste drums from all shops to Lot #3. (2) Assign a person from 347 TRANS to go to the accumulation sites and the waste oil storage areas once per month to transport waste drums to Lot #3. (3) Have one or two persons from each organization responsible for transporting waste drums for shops within their organization. These options would streamline the transporting of waste and allow shops to spend less time and manpower on managing wastes.

2. If the Auto Hobby Shop and 347 CES Paint Shop continue to store waste paints and thinners, the storage areas should be classified as satellite accumulation sites in accordance with 40 CFR 262.34.

3. The Auto Hobby Shop should reconsider the possibility of leasing a Safety Kleen degreasing unit rather than using PD-680. Also, Simple Green Soap should be used rather than aircraft soap for cleaning the floor.

4. The validity of a lab analysis is greatly dependent upon the technique used to obtain the sample. Incorrect sampling procedures introduce errors which result in inaccurate lab analysis. The Bioenvironmental Engineering Shop should develop "in-house" training on hazardous waste sampling to ensure that representative samples are collected. A reference on hazardous waste sampling is "Samplers and Sampling Procedures for Hazardous Waste Streams," EPA-600/2-80-018, Jan 1980.

5. The Bioenvironmental Engineering shop uses a glass tube for sampling. Rather than using this tube, disposable coliwassas should be purchased. This would be much more convenient and would eliminate the possibility of cross contamination upon reuse.

6. Civil Engineering should ensure that the oil/water separators are cleaned out according to the maintenance contract.

7. Drums should not be prestenciled with the contents before any wastes are put into them without historical data to substantiate the practice.

8. The rinsewater from rinsing operations at 347 EMS Corrosion Control (where large parts are stripped) should be analyzed to determine the characteristics of the effluent discharged to the sanitary sewer.

9. To eliminate problems between the BEE Shop and DEEV concerning waste analysis requirements, communications between the two should be formalized. The waste stream description, date required, sampling technique, required analysis parameters, and required EPA analysis method should be provided to the BEE shop in written form. The documentation should eliminate confusion about sample requests and will also provide documentation of the requests.

10. Some shops are planning to use Citrikleen in cleaning tanks. The contaminants separate from the Citrikleen and settle to the bottom of the tank. Personnel plan to drum the sludge and drain the remaining Citrikleen into the sanitary sewer. Spent Citrikleen should be analyzed for hazardous waste characteristics to ensure that it is not hazardous waste.

11. The hazardous waste education and training program should provide opportunities for inputs from the BEE shop on the health hazards involved with handling hazardous wastes and materials. Also, DRMO should provide input on the present and future costs to the base of disposing hazardous wastes and the required turn-in procedures.

12. Saturated Speedy Dry should be disposed of as hazardous waste. Shops should reuse the Speedy Dry until it is saturated rather than disposing of it after one use.

13. When most shops on base have paint and thinner wastes to dispose, shop personnel take the wastes to 347 EMS Corrosion Control and pour it into the 55-gallon drum located inside the shop. In order to obtain control over the wastes that are being combined with the wastes generated at 347 EMS Corrosion

Control, a separate 10-gallon drum should be used to store other shop's wastes. This drum should be secured and a waste log should be established (See Table 2 for information). This log should include: (1) organization generating the waste, (2) date, (3) type of waste, (4) amount of waste, (5) name and signature of person putting waste into the drum, and (6) start and stop dates of filling each drum. The log would provide users' knowledge documentation and a basis to compare quality assurance sampling results.

TABLE 2. Example Hazardous Waste Disposal Log

**PAINT SHOP HAZARDOUS WASTE DISPOSAL
LOG FOR DRUM NUMBER: 1**

Date	Time	Type of Waste	Amount of Waste
10 Jun 88	1000	Enamel Paint	1 qt
10 Jun 88	1300	MEK	1 gal
15 Jun 88	1500	MEK	1 gal
20 Jun 88	1100	Polyurethane Paint	1 qt
25 Jun 88	1300	Polyurethane Thinner	1 gal
30 Jun 88	0900	MEK	10 gal
5 Jul 88	1100	Enamel Paint	1 qt
6 Jul 88	1530	MEK	2 gal
6 Jul 88	1130	Enamel Paint	1 qt
7 Jul 88	1130	MEK	2 gal
8 Jul 88	1400	MEK	2 gal
9 Jul 88	1130	MEK	2 gal
11 Jul 88	1400	MEK	2 gal
13 Jul 88	1300	Enamel Paint	1 qt
13 Jul 88	1300	MEK	2 gal
14 Jul 88	1400	MEK	2 gal
16 Jul 88	1130	Enamel Paint	1 qt
16 Jul 88	1130	MEK	5 gal
18 Jul 88	1400	Polyurethane Paint	2 qts
18 Jul 88	1400	Polyurethane Thinner	3 gal
20 Jul 88	1500	MEK	4 gal
21 Jul 88	1600	MEK	1 gal
28 Jul 88	1630	Enamel Paint	1 gal
28 Jul 88	1630	MEK	7 gal

TOTAL: 50 gal

Amounts:

MEK	43.00 gal	86.00%
Polyurethane Thinner	4.00 gal	8.00%
Enamel Paint	2.25 gal	4.50%
Polyurethane Paint	0.75 gal	1.50%

14. The opening to the underground tank located outside the 347 TRANS General Purpose Maintenance Shop area should be locked to prevent the possible dumping of wastes into the tank.

15. All shops on base should consider the possibility of establishing a contract with the local linen contractor for supplying cleaning rags. This option may not be feasible in all situations but may prove to be beneficial in others.

16. DEEV should ensure that all accumulation site and waste oil storage area primary and alternate managers receive hazardous waste training before assuming the position.

17. Although not required by law, it would be advantageous to Moody AFB to upgrade accumulation sites with covers, locking fences, and impermeable, diked surfaces. These measures could help prevent the occurrence of environmental pollution incidents.

18. The used paint filters at 347 EMS Corrosion Control should be analyzed to determine whether or not they are actually hazardous. If they prove to be nonhazardous, the filters can be disposed of in the trash.

19. Moody AFB needs to develop a waste analysis plan. The current plan contained in the base's "Hazardous Waste Management Plan" is inadequate. This plan should include: a complete listing of all known wastestreams with a brief description of the process or operation generating the waste; the results of a baseline chemical analysis (to fully characterize the waste); the sampling technique; the analysis parameters; and the required test method (see Table 3 for example), in addition to the information already provided in the base's "Hazardous Waste Management Plan." Since the base does not have a large number of wastestreams, this type of sampling program will allow the base to establish, within a reasonable time, documented rationale for classifying each wastestream as either hazardous or nonhazardous. A suggested listing of wastestreams specific for Moody AFB is contained in Table 4.

TABLE 3: WASTE ANALYSIS PLAN (EXAMPLE)

GENERATOR LOCATION	DESCRIPTION OF WASTE STREAM	WASTE STREAM CODE	BASELINE ANALYSIS DATE & RESULTS	*SAMPLING METHOD	*SAMPLING FREQUENCY	*PARAMETERS REQUIRED	*TEST METHOD	PROPER SHIPPING NAME & HAZARD CLASS	DISPOSAL METHOD	EPA HAZARDOUS WASTE #
Corrosion Control BLD 150	Paint sludge from paint booth	CC150-001	May 88	1 Grab sample	Every other drum	Flash Point	1010	Waste Paint related material, LIQUID	DRMO	D001
			FP-H (70F)							
			PH-NH RX-NH EP-H Chromium							
Corrosion Control BLD 150	Rinsewater from waterfall paint booth	CC150-002	May 88	Dipper	Every third cleanout of booth	Complete Analysis		N/A	Down Drain	
			FP-NH PH-NH RX-NH TM-NH							
			Cadmium Chromium							
Corrosion Control BLD 150	Spent plastic bead blasting media	CC150-003	Aug 88	1 Composite Sample	From every other drum			Hazardous waste solid (n.o.s.) (Cadmium & Chromium contaminated material)	DRMO	D006 D007
			FP-NH PH-NA RX-NH EP-H Cadmium Chromium							
Vehicle Maint. BLD 100	Waste Motor oil	VM100-001	Jun 88	Coilwasa	Quarterly	Flash Point	1010	N/A	Sold to Contractor for Recycle	D001
			FP-H (100F) PH-NA RX-NH TM-H							
			Arsenic Cadmium Chromium Lead Total Halogens							
Vehicle Maint. BLD 100	Neutralized Battery Acid	VM100-0002	Aug 88	Grab Sample from tank using dipper	Semiannual			N/A	Down Drain	
			FP-NH PH-NH RX-NH TM-NH Lead							

Legend: FP - Flash Point
 EP - EP Toxicity
 TM - Total Metals
 NA - Not Applicable
 RX - Reactivity
 H - Hazardous
 NH - Non-Hazardous

TABLE 4. SUGGESTED LISTING OF WASTESTREAMS

Shop	Wastestream	Sampling Frequency*	Method
Refueling Maint	Oils & Fluids	Annually	Coliwasa
Allied Trades	Paints & Thinners	Each Drum	Coliwasa
Special Purpose Maint	Oils & Fluids	Quarterly	Coliwasa
General Purpose Maint	Oils & Fluids	Quarterly	Coliwasa
Fire Truck Maint	Oils & Fluids	Annually	Coliwasa
CES Paint Shop	Paints	Each Drum	Coliwasa
Power Production	Oils	Quarterly	Coliwasa
	Diesel	Annually	Coliwasa
Corrosion Control**	Paint & Thinners	Monthly	Coliwasa
	Paint Filters	Do 3 analysis to verify if hazardous or non-hazardous	
	Stripping Tanks	Each Change Out	Coliwasa
AGE	PD-680 Tank	Every 3rd Change Out	Coliwasa
	Oils & Fluids	Every 5th Drum of Each Type Waste	Coliwasa
Phase Docks	Oils & Fluids	Semiannual	Coliwasa
Wheel & Tire	Stripping Tank	Each Drum of Waste After Every Other Tank Change Out	Coliwasa
NDI	NDI Chemicals	Each Drum	Coliwasa
	Synthetic Oil	Each Drum	Coliwasa
Jet Engine	Synthetic Oil	Quarterly	Coliwasa

Table 4, continued

Shop	Wastestream	Sampling Frequency*	Method
	TCE	User's Knowledge	
	Carbon Remover	User's Knowledge	
	PD-680	Annually	Coliwasa
Pneudraulics	PD-680	Each Drum of Waste After Every Tank Change Out	Coliwasa
Auto Hobby	PD-680	Annually	Coliwasa
	Dry Paint Filters	Do 3 analysis to verify if hazardous or non-hazardous	
	Paint & Thinners	Each Drum	Coliwasa
68 AMU	Oils & Fluids	Each Drum	Coliwasa
69 AMU	Oils & Fluids	Each Drum	Coliwasa
70 AMU	Oils & Fluids	Each Drum	Coliwasa

* Frequency of sampling is based on waste quantities reported at the time of the survey. Also other factors should be considered, e.g., the shop's waste management practices.

** Paint wastes from other shops should be drummed separately from Corrosion Control's paint waste.

References

1. Hazardous Materials Technical Center, "Hazardous Waste Management Plan, Moody AFB," December 1987.
2. Office of the Federal Register, Protection of the Environment, 40 CFR Part 262.34 (1986).
3. Samplers and Sampling Procedures for Hazardous Waste Streams, EPA-600/2-80-018, Jan 1980.
4. United States Environmental Protection Agency, "Identification and Listing of Hazardous Waste," 40 CFR 261.

APPENDIX A
Request Letter

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DEPARTMENT OF THE AIR FORCE

347th MEDICAL GROUP (TAC)
MOODY AIR FORCE BASE GA 31699-5300

REPLY TO
ATTN OF SG

4 Jan 88

SUBJECT Request for Hazardous Waste Survey by Occupational and Environmental Health
Laboratory Consultants

TO

HQ TAC/SGPB
Langley AFB, VA 23665-5001

1. A U.S. Environmental Protection Agency Notice of Violation requires Moody AFB to revise the Hazardous Waste Analysis Plan according to 40 CFR 268.7 using the Toxicology Characteristics Leaching Procedure or product knowledge. Request that the Occupational and Environmental Health Laboratory Consultant Services, Hazardous Waste Function conduct a Hazardous Waste Survey at Moody AFB to ensure compliance.

2. Direct any questions to 1st Lt Lana Harvey, Bioenvironmental Engineer, AV 460-3506.

A handwritten signature in cursive script, reading "Mark H. Petermann", is written over the typed name.

MARK H. PETERMANN, Col, USAF, MSC
Commander

cc: AFSC/SGP

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APPENDIX B
Chemical Disposal Survey Form

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PLEASE HAVE THIS FORM READY FOR PICKUP BY:

SHOP:

BLDG:

CONTACT:

AUTOVON:

Please fill out this form as accurately and completely as possible. If you have any questions on filling it out, please call Maj Ng or Lt Hedgecock at X4747

Examples:

	Tank Capacity	Change Out Frequency	Method of Disposal
PD-680 used in tank	60 gal	4/year	55-gal drum

Comments: 1/2 gal of MEK per month is used as a wipe on/wipe off process for parts cleaning. None is disposed of.

OILS & FLUIDS

	Amt of Waste	Disposal Method
Brake Fluid	6 gal	placed in
Transmission Fluid	10 gal	same 600-gal
Hydraulic Fluid	3 gal	bowser
Motor Oil	50 gal	500-gal UGT
Synthetic Oil	8 gal	55-gal drum

QUESTIONS: If question does not apply to this shop put "N/A" beside it.

1. Does this shop have any underground storage tanks? _____

If yes: How many? _____

Capacity? _____

What is stored in the tank? _____

How often is it cleaned out? _____

Has it ever been leak-tested? _____

2. Do the floor drains of the shop lead to an oil/water separator? _____

If yes: How often is it cleaned out? _____

3. Does the shop have any Safety Kleen units? _____

If yes: How many? _____

Tank capacity? _____

How often are they serviced? _____

4. What does the shop do with dirty rags? _____

5. What does the shop do with used "Speedy Dry"? _____

6. Describe shop activities and responsibilities below:

Comments

ACIDS

Name of Acid	Manufacturer	Amount of Waste generated/month	Method of Disposal
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----
-----	-----	-----	-----

Comments

BATTERIES

Type of Battery	#/Month	Neutralized in Shop or Turned in Wet
-----	-----	-----
-----	-----	-----
-----	-----	-----

Comments:

SOAPS/CLEANERS

Name of Soap	Dilution Ratio	National Stock#	Amt Used / month	Disposal Method
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

Comments

OILS AND FLUIDS

Amt. of Waste Generated/month	Disposal Method
Brake Fluid	
Transmission Fluid	
Hydraulic Fluid	
Motor Oil	
Synthetic Oil	
Other	
Comments	

SOLVENTS/DEGREASANTS

Name of Chemical	Amt. of Waste OR generated/mo.	Tank Size	Change Out Freq	Disposal Method
Carbon Remover				
PD-680 used in tank				
Pd-680 used on washrack				
Other:				
Comments				

PHOTO CHEMICALS

Name of Chemical	Manufacturer	Amt/mo	OR Tank Size	Change Out freq	Disposal Method

Is the fixer processed through a silver recovery unit before disposal? _____

NDI Chemicals

Name of Chemical	Manufacturer	National Stock #	Tank Size	Change Out Freq	Disposal Method
------------------	--------------	------------------	-----------	-----------------	-----------------

Emulsifier

Dye Penetrant

Developer

Comments

FUELS

Name of Fuel	Amount/Month	Disposal Method
--------------	--------------	-----------------

ANTIFREEZE

Amount/Month	Disposal Method
--------------	-----------------

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APPENDIX C
Accumulation Site Survey Form

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**HAZARDOUS WASTE ACCUMULATION SITE
INSPECTION FORM**

LOCATION: _____
ACCUMULATION SITE MANAGER: _____

DATE: _____
PHONE: _____

ITEM	CONDITIONS	STATUS		COMMENTS
		YES	NO	
STORAGE SITE	Secure			
	Gates Locked			
	Warning Signs			
	No smoking			
	Impermeable Floor			
	Diked/Burmed			
SPILL EQUIPMENT	Valve in Burm to drain water			
	Empty Overpack Container			
FIRE PROTECTION	Materials and Supplies			
	Extinguisher			
STORAGE CONTAINERS	Funnels in Containers			
	Containers Closed			
	Deteriorating			
	Leaking			
	Spills			

Overall Rating of Accumultion Site: _____

LISTING OF WASTES AT ACCUMULTION SITE

EPA WASTE NUMBER	NUMBER OF CONTAINERS	TYPE OF WASTE	ACCUMULATION START DATE	COMMENTS

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APPENDIX D

Summary of Waste Disposal Practices for Each Waste Category

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SUMMARY OF WASTE DISPOSAL PRACTICES FOR EACH WASTE CATEGORY

Type of Waste: Paints and Thinners

SHOP	BLDG	PRODUCT	QTY(GAL/YR)	DISPOSAL
347 EMS Corrosion Control	717	Aromatic Naphtha	120	D
347 EMS Corrosion Control	717	Mineral Spirits	60	D
347 EMS Corrosion Control	717	MEK	480	D
347 EMS Corrosion Control	717	Lacquer Thinner	120	D
347 CES Paint Shop	921	Mineral Spirits	110	D
347 TRANS Allied Trades	967	Lacquer	3	D
347 MWR Auto Hobby Shop	840	Enamel	6	D
347 TRANS Allied Trades	967	Enamel	2	D
347 MWR Auto Hobby Shop	840	Polyurethane	3	D
347 TRANS Allied Trades	967	Polyurethane	12	D
347 AGS 70th AMU	770	Polyurethane	1	UIP
347 EMS Corrosion Control	717	Enamel Paint	60	D
347 EMS Corrosion Control	717	Poly Thinner	360	D
347 EMS Corrosion Control	717	Lacquer Paint	36	D
347 MWR Auto Hobby Shop	840	Lacquer	6	D
347 EMS Corrosion Control	717	Poly Paint	660	D
TOTAL:				2039

Type of Waste: Stripper

SHOP	BLDG	PRODUCT	QTY(GALLONS)	DISPOSAL
347 EMS Corrosion Control	717	Stripper	60	D
347 EMS Corrosion Control	717	Stripper	300	D
347 EMS Wheel and Tire	718	Paint Stripper	220	D
TOTAL:				580

Type of Waste: Batteries and Acids

SHOP	BLDG	PRODUCT	QTY(GAL/YR)	DISPOSAL
347 TRANS Fire Truck Maint	621	Batteries	2*	DRMO
347 TRANS General Purpose	977	Batteries	96*	DRMO
347 EMS Corrosion Control	717	Chromic Acid	2	DD
347 TRANS Special Purpose	976	Batteries	120*	DRMO
347 TRANS Refueling Maint	769	Batteries	60*	DRMO
347 EMS Corrosion Control	717	Phosphoric Acid	1	DD

* Number of batteries/year rather than gallons/year TOTAL: 3

Type of Waste: Oils and Fluids

SHOP	BLDG	PRODUCT	QTY(GAL/YR)	DISPOSAL
347 EMS Phase Docks	775	Hydraulic Fluid	72	D
347 TRANS General Purpose	977	Transmission	48	D
347 TRANS Special Purpose	976	Motor Oil	600	D
347 EMS AGE	755	Hydraulic Fluid	920	D
347 MWR Auto Hobby Shop	840	Transmission	60	PIT
347 AGS 68th AMU	772	Synthetic Oil	35	D
347 TRANS Refueling Maint	769	Motor Oil	108	D
347 TRANS Fire Truck Maint	621	Hydraulic Fluid	12	D
347 TRANS Special Purpose	976	Brake Fluid	24	D
347 EMS AGE	755	Synthetic Oil	920	D
347 EMS Phase Docks	775	Synthetic Oil	72	D
347 TRANS General Purpose	977	Brake Fluid	6	D
347 TRANS Special Purpose	976	Hydraulic Fluid	600	D
347 AGS 69th AMU	786	Hydraulic Fluid	120	D
347 TRANS Fire Truck Maint	621	Motor Oil	60	D
347 EMS AGE	755	Motor Oil	920	D
347 MWR Auto Hobby Shop	840	Motor Oil	1800	PIT
347 TRANS Special Purpose	976	Transmission	300	D
347 TRANS Refueling Maint	769	90W Oil	12	D
347 AGS 70th AMU	770	Hydraulic Fluid	180	D
347 TRANS Fire Truck Maint	621	Brake Fluid	2	D
347 TRANS Refueling Maint	769	Brake Fluid	3	D
347 CRS Jet Engine	758	Synthetic Oil	660	D
347 AGS 69th AMU	786	Synthetic Oil	120	D
347 AGS 68th AMU	772	Hydraulic Fluid	35	D
347 EMS NDI	702	Synthetic Oil	60	D
347 AGS 70th AMU	770	Synthetic Oil	180	D
347 TRANS Fire Truck Maint	621	Transmission	12	D
347 TRANS Refueling Maint	769	Transmission	48	D
347 TRANS General Purpose	977	Motor Oil	1500	D
347 TRANS General Purpose	977	Hydraulic Fluid	6	D
347 CES Power Production	999	Motor Oil	820	D

TOTAL: 10315

Type of Waste: Solvents & Degreasants

SHOP	BLDG	PRODUCT	QTY(GAL/YR)	DISPOSAL
347 CRS Jet Engine	758	Carbon Remover	14	D
347 MWR Auto Hobby Shop	840	PD-680	100	D
347 EMS AGE	755	PD-680	480	OWS
347 CRS Jet Engine	758	Trichloroethane	60	D
347 CRS Jet Engine	758	PD-680	120	D
347 EMS AGE	755	PD-680	660	D
347 CRS Pneudralics	785	PD-680	220	D

TOTAL: 1654

Type of Waste: Photo Chemicals

SHOP	BLDG	PRODUCT	QTY(GAL/YR)	DISPOSAL
347 EMS NDI	702	Fixer	20	SRDD
347 EMS NDI	702	Developer	20	DD

TOTAL: 40

Type of Waste: NDI Chemicals**

SHOP	BLDG	PRODUCT	QTY(GALLONS)	DISPOSAL
347 EMS NDI	702	Penetrant	55	D
347 EMS NDI	702	Emulsifier	55	DD
347 EMS NDI	702	Developer	55	D

** Tanks are changed out on an as needed basis.

TOTAL: 165

Type of Waste: Fuel

SHOP	BLDG	PRODUCT	QTY(GAL/YR)	DISPOSAL
347 AGS 70th AMU	770	JP-4	360	REC
347 EMS Phase Docks	775	JP-4	432	OWS
347 AGS 68th AMU	772	JP-4	200	REC
347 AGS 69th AMU	786	JP-4	120	REC
347 CES Power Production	999	Diesel	110	REC

TOTAL: 1222

Type of Waste: Safety Kleen

SHOP	BLDG	PRODUCT	QTY(GALS/YR)	DISPOSAL
347 TRANS General Purpose	977	Safety Kleen	150	SBC
347 TRANS Special Purpose	976	Safety Kleen	150	SBC
347 EMS Corrosion Control	717	Safety Kleen	180	SBC
347 TRANS Fire Truck Maint	621	Safety Kleen	120	SBC
347 EMS Wheel and Tire	718	Safety Kleen	3120	SBC
347 EMS Armament Systems	700	Safety Kleen	780	SBC

TOTAL: 4500

Type of Waste: Rags

SHOP	BLDG	PRODUCT	DISPOSAL
347 CRS Jet Engine	758	Rags	SBC
347 EMS NDI	702	Rags	BL
347 AGS 69th AMU	786	Rags	D
347 AGS 68th AMU	772	Rags	T
347 TRANS Special Purpose	976	Rags	SBC
347 TRANS Refueling Maint	759	Rags	SBC
347 TRANS Allied Trades	967	Rags	SBC
347 TRANS Fire Truck Maint	621	Rags	SBC
347 TRANS General Purpose	977	Rags	SBC
347 CRS Fuel System Repair	788	Rags	SBC
347 EMS Phase Docks	775	Rags	RU
347 EMS Corrosion Control	717	Rags	D
347 EMS AGE	755	Rags	SBC
347 AGS 70th AMU	770	Rags	D

Type of Waste: Speedy Dry

SHOP	BLDG	PRODUCT	DISPOSAL
347 AGS 68th AMU	772	Speedy Dry	T
347 TRANS General Purpose	977	Speedy Dry	T
347 MWR Auto Hobby Shop	840	Speedy Dry	T
347 EMS AGE	755	Speedy Dry	T
347 TRANS Special Purpose	976	Speedy Dry	T
347 AGS 69th AMU	786	Speedy Dry	D
347 EMS Phase Docks	775	Speedy Dry	RU

Type of Waste: Soaps

SHOP	BLDG	PRODUCT	QTY(GAL/YR)	DISPOSAL
347 TRANS	977	Aircraft	12	OWS
347 AGS 68 AMU	772	Simple Green	660	UIP
347 TRANS Allied Trades	967	Detergent	4	DD
347 CRS Jet Engine	758	Simple Green	360	OWS
347 TRANS Fire Truck Maint	621	Aircraft	12	OWS
347 TRANS Special Purpose	976	Aircraft	60	UIP
347 CRS Jet Engine	758	Aircraft	60	OWS
347 MWR Auto Hobby Shop	840	Aircraft	220	UIP
347 AGS 69 AMU	786	Simple Green	660	UIP
347 AGS 70 AMU	770	Simple Green	120	UIP
347 EMS AGE	755	Simple Green	2640	OWS
347 CES Power Production	999	Simple Green	NA	UIP
347 EMS Corrosion Control	717	815-AF	660	DD
347 EMS Corrosion Control	717	Alkaline	660	DD

TOTAL: 6128

LEGEND:

D - DRUMMED	SBC - SERVICED BY CONTRACTOR
T - THROWN IN TRASH	OWS - OIL/WATER SEPARATOR
DD - DOWN DRAIN	PIT - PLACED IN TANK
BL - BASE LAUNDRY	DRMO - DISPOSED OF THROUGH DRMO
RU - REUSED	SRDD - SILVER RECOVERY THEN DOWN DRAIN
UIP - USED IN PROCESS	NA - NOT AVAILABLE
REC - RECYCLED	

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APPENDIX E

Summary of Drummed Waste Disposal for Each Waste Category

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SUMMARY OF DRUMMED WASTE DISPOSAL FOR EACH WASTE CATEGORY

Type of Waste: Rags

SHOP	BLDG	PRODUCT
347 EMS Corrosion Control	717	Rags
347 AGS 69 AMU	786	Rags
347 AGS 70 AMU	770	Rags

Type of Waste: Speedy Dry

SHOP	BLDG	PRODUCT
347 AGS 69th AMU	786	Speedy Dry

Type of Waste: Paints and Thinners

SHOP	BLDG	PRODUCT	QTY (GAL/YR)
Auto Hobby Shop	740	Polyurethane	3
347 TRANS Allied Trades	967	Enamel	2
347 TRANS Allied Trades	967	Polyurethane	12
347 EMS Corrosion Control	717	Lacquer Paint	36
347 EMS Corrosion Control	717	MEK	480
347 EMS Corrosion Control	717	Poly Thinner	360
347 EMS Corrosion Control	717	Poly Paint	660
347 EMS Corrosion Control	717	Enamel Paint	60
Auto Hobby Shop	840	Enamel	6
Auto Hobby Shop	840	Lacquer	6
347 EMS Corrosion Control	717	Mineral Spirits	60
347 EMS Corrosion Control	717	Aromatic Naphtha	120
347 EMS Corrosion Control	717	Lacquer Thinner	120
347 AGS 70th AMU	770	Polyurethane	1
347 CES Paint Shop	921	Mineral Spirits	110
347 TRANS Allied Trades	967	Lacquer	3

TOTAL: 2039

Type of Waste: Strippers

SHOP	BLDG	PRODUCT	QTY(GAL/YR)
347 EMS Wheel and Tire	718	Paint Remover	220
347 EMS Corrosion Control	717	Stripper	300
347 EMS Corrosion Control	717	Stripper	60

TOTAL: 580

Type of Waste: Oils and Fluids

SHOP	BLDG	PRODUCT	QTY(GAL/YR)
347 EMS AGE	755	Hydraulic Fluid	920
347 TRANS General Purpose	977	Brake Fluid	6
347 EMS NDI	702	Synthetic Oil	60
347 TRANS Fire Truck Maint	621	Motor Oil	60
347 AGS 69th AMU	786	Hydraulic Fluid	120
347 TRANS Refueling Maint	769	90W Oil	12
347 TRANS Fire Truck Maint	621	Hydraulic Fluid	12
347 TRANS General Purpose	977	Transmission Fluid	48
347 AGS 70th AMU	770	Hydraulic Fluid	180
347 EMS AGE	755	Synthetic Oil	920
347 TRANS General Purpose	977	Hydraulic Fluid	6
347 EMS AGE	755	Motor Oil	920
347 TRANS Special Purpose	976	Transmission Fluid	300
347 EMS Phase Docks	775	Synthetic Oil	72
347 TRANS Special Purpose	976	Brake Fluid	24
347 CRS Jet Engine	758	Synthetic Oil	660
347 AGS 70th AMU	770	Synthetic Oil	180
347 TRANS General Purpose	977	Motor Oil	1500
347 EMS Phase Docks	775	Hydraulic Fluid	72
347 TRANS Special Purpose	976	Hydraulic Fluid	600
347 AGS 68th AMU	772	Hydraulic Fluid	35
347 TRANS Refueling Maint	769	Brake Fluid	3
347 TRANS Fire Truck Maint	621	Transmission Fluid	12
347 TRANS Special Purpose	976	Motor Oil	600
347 AGS 68th AMU	772	Synthetic Oil	35
347 TRANS Refueling Maint	769	Transmission Fluid	48
347 TRANS Fire Truck Maint	621	Brake Fluid	2
347 TRANS Refueling Maint	769	Motor Oil	108
347 AGS 69th AMU	786	Synthetic Oil	120
347 CES Power Production	999	Motor Oil	820

TOTAL: 8455

Type of Waste: Solvents

SHOP	BLDG	PRODUCT	QTY(GAL/YR)
347 CRS Jet Engine	758	PD-680	120
347 CRS Jet Engine	758	Carbon Remover	14
347 EMS AGE	755	PD-680	660
347 CRS Pneudralics	785	PD-680	220
347 CRS Jet Engine	758	Trichloroethane	60
347 MWR Auto Hobby Shop	840	PD-680	100

TOTAL: 1174

Type of Waste: NDI Chemicals

SHOP	BLDG	PRODUCT	QTY(GAL/YR)
347 EMS NDI	702	Penetrant	55
347 EMS NDI	702	Developer	55

TOTAL: 110

Type of Waste: Fuels

SHOP	BLDG	PRODUCT	QTY(GAL/YR)
347 AGS 70th AMU	720	JP-4	360
347 AGS 69th AMU	786	JP-4	120
347 AGS 68th AMU	772	JP-4	200
347 CES Power Production	999	Diesel	110

TOTAL: 790

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APPENDIX F
Master List of Shops

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MASTER LIST OF SHOPS

	SHOP	CONTACT	BUILDING	EXTENSION
1.	347 TRANS Refueling Maintenance	Mr Colwell	769	3260
2.	347 TRANS Allied Trades	SSgt D'Agostin	967	4280
3.	347 TRANS Special Purpose	Mr Cooper	976	4220
4.	347 TRANS General Purpose Maintenance	Mr Thompson	977	3437
5.	347 TRANS Fire Truck Maintenance	Mr Cooper	621	4149
6.	347 TRANS Minor Maintenance	Mr Milani	977	3350
7.	347 CES Paint Shop	Mr Bell	921	3219
8.	347 CES Liquid Fuels Maintenance	SSgt Trudeau	916	4658
9.	347 CES Power Production	Mr Kruise	999	3889
10.	347 CES Entomology	Mr Parker	965	4397
11.	347 EMS Corrosion Control	TSgt Jefferson	717	3823
12.	347 EMS AGE	MSgt Roe	755	3249
13.	347 EMS Phase Docks	MSgt Miracle	775	3953
14.	347 EMS Wheel and Tire	TSgt Spence	718	3256
15.	347 EMS Armament Systems	TSgt McLane	700	4239
16.	347 EMS NDI	MSgt Ogren	702	3381
17.	347 CRS Jet Engine Test Cell	MSgt Zakar	4127	3620
18.	347 CRS Fuel System Repair	MSgt Holdin	788	4164
19.	347 CRS Battery/Electric	SSgt Polley	785	3745
20.	347 CRS Jet Engine	SSgt Webie	758	3798
21.	347 CRS Pneudraulics	TSgt Walker	785	3355
22.	347 MWR Auto Hobby	Mr Buckholts	840	3056
23.	347 AGS 68 AMU	MSgt Hinke	772	3993
24.	347 AGS 69 AMU	TSgt Nelson	786	3957
25.	347 AGS 70 AMU	SSgt Hilmer	770	4525

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APPENDIX G

Summary of Waste Disposal Practices by Shop

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WASTE DISPOSAL PRACTICES BY SHOP FOR MOODY AFB

SHOP: 347 AGS 68 AMU

BUILDING NUMBER: 772

WASTE PRODUCT	QTY (GALLONS)	DISPOSAL
Synthetic Oil	35	D
Rags	NA	T
Simple Green Soap	660	UIP
JP-4	200	REC
Speedy Dry	NA	T
Hydraulic Fluid	420	D

SHOP: 347 AGS 69 AMU

BUILDING NUMBER: 771

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Synthetic Oil	120	D
Rags	NA	D
Speedy Dry	NA	D
JP-4	120	REC
Simple Green Soap	660	UIP
Hydraulic Fluid	120	D

SHOP: 347 AGS 70 AMU

BUILDING NUMBER: 770

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Polyurethane Paint	1	UIP
Rags	NA	D
Synthetic Oil	180	D
Aircraft Soap	NA	UIP
JP 4	360	REC
Hydraulic Fluid	180	D
Simple Green Soap	120	UIP

SHOP: 347 CES Paint Shop

BUILDING NUMBER: 921

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Mineral Spirits	110	D

SHOP: 347 CES Power Production

BUILDING NUMBER: 999

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Motor Oil	820	D
Diesel	110	REC
Simple Green Soap	NA	UIP

SHOP: 347 CRS Jet Engine

BUILDING NUMBER: 758

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Synthetic Oil	660	D
Trichloroethane	60	D
Rags	NA	SBC
Simple Green Soap	360	OWS
Aircraft Soap	60	OWS
Carbon Remover	14	D
PD-680	120	D

SHOP: 347 EMS AGE

BUILDING NUMBER: 755

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Synthetic Oil	920	D
Speedy Dry	NA	T
PD-680	660	D
PD-680	480	OWS
Simple Green Soap	2640	OWS
Motor Oil	920	D
Rags	NA	SBC
Hydraulic Fluid	920	D

SHOP: 347 EMS Corrosion Control

BUILDING NUMBER: 717

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Stripper	60	D
Stripper	300	D
Safety Kleen	180	SBC
Aromatic Naphtha	120	D
Enamel Paint	60	D
Lacquer Paint	36	D
Rags	NA	D
Poly Thinner	360	D
Alkaline	660	DD
Poly Paint	660	D
Phosphoric Acid	1	DD
815-AF	660	DD
Mineral Spirits	60	D
Chromic Acid	2	DD
Lacquer Thinner	120	D
MEK	480	D

SHOP: 347 EMS NDI

BUILDING NUMBER: 702

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Fixer	20	SRDD
Developer	20	DD
Rags	NA	BL
Emulsifier	55*	DD
Developer	55*	D
Penetrant	55*	D
Synthetic Oil	60	D

* Tanks are changed out on an as needed basis.

SHOP: 347 EMS Phase Docks

BUILDING NUMBER: 775

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Rags	NA	RU
Speedy Dry	NA	RU
Hydraulic Fluid	72	D
Synthetic Oil	72	D
JP-4	432	OWS

SHOP: 347 EMS Wheel and Tire

BUILDING NUMBER: 718

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Safety Kleen	3120	SBC
Paint Remover	220	D

SHOP: 347 TRANS Allied Trades

BUILDING NUMBER: 967

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Enamel Paint	2	D
Rags	NA	SBC
Polyurethane Paint	12	D
Detergent	4	DD
Lacquer	3	D
Prepsol	NA	UIP

SHOP: 347 TRANS Fire Truck Maint

BUILDING NUMBER: 621

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Batteries	2	DRMC
Brake Fluid	2	D
Motor Oil	60	D
Rags	NA	SBC
Transmission Fluid	12	D
Aircraft Soap	12	OWS
Safety Kleen	120	SBC
Hydraulic Fluid	12	D

SHOP: 347 TRANS General Purpose

BUILDING NUMBER: 977

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Speedy Dry	NA	T
Transmission Fluid	48	D
Brake Fluid	6	D
Aircraft	12	OWS
Rags	NA	SBC
Batteries	96	DRMO
Motor Oil	1500	D
Hydraulic Fluid	6	D
Safety Kleen	120	SBC

SHOP: 347 TRANS Refueling Maint

BUILDING NUMBER: 769

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Engine Cleaner	NA	OWS
Transmission	48	D
Brake Fluid	3	D
Motor Oil	108	D
Batteries	60	DRMO
90W Oil	12	D
Rags	NA	SBC

SHOP: 347 TRANS Special Purpose

BUILDING NUMBER: 976

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Motor Oil	600	D
Aircraft	60	UIP
Transmission Fluid	300	D
Hydraulic Fluid	600	D
Safety Kleen	150	SBC
Speedy Dry	NA	T
Rags	NA	SBC
Batteries	120	DRMO
Brake Fluid	24	D

SHOP: 347 MWR Auto Hobby Shop

BUILDING NUMBER: 840

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Lacquer	6	D
Aircraft Soap	220	UIP
Enamel Paint	6	D
PD-680	100	D
Speedy Dry	NA	T
Transmission Fluid	60	PIT
Polyurethane Paint	3	D
Motor Oil	1800	PIT

SHOP: 347 EMS Armament Systems

BUILDING NUMBER: 700

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Safety Kleen	780	SBC

SHOP: 347 CRS Fuel System Repair

BUILDING NUMBER: 788

WASTE PRODUCT	QTY (GAL/YR)	DISPOSAL
Rags	NA	SBC

SHOP: 347 CRS Pneudralics

BUILDING NUMBER: 788

WASTE PRODUCT	QTY (GALYR)	DISPOSAL
PD-680	220	D

LEGEND:

D - DRUMMED
T - THROWN IN TRASH
DD - DOWN DRAIN
BL - BASE LAUNDRY
UIP - USED IN PROCESS
NA - NOT APPLICABLE
REC - RECYCLED

SBC - SERVICED BY CONTRACTOR
OWS - OIL/WATER SEPARATOR
PIT - PLACED IN TANK
DRMO - DISPOSED OF THROUGH DRMO
SRDD - SILVER RECOVERY THEN DOWN DRAIN

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