DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

3 MAR 2009

FROM: AFCESA/CEO
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SUBJECT: **Engineering Technical Letter (ETL) 09-3: Chemical Dust Control for Contingency Roads, Base Camps, Helipads, and Airfields**

1. Purpose. This ETL provides guidance for the mitigation of dust for contingency roads, base camps, helipads, and airfields. This ETL includes detailed guidance for selecting and applying chemical dust palliatives in contingency environments. The implementation of dust mitigation technology is necessary to reduce foreign object debris (FOD) potential, improve the safety of military operations, and reduce operational hazards to military personnel.

Note: The use of the name or mark of any specific manufacturer, commercial product, commodity, or service in this ETL does not imply endorsement by the Air Force.

2. Application. This ETL applies to all Department of Defense (DOD) organizations responsible for airfield maintenance and repair.

2.1. Authority: Air Force policy directive (AFPD) 32-10, *Installations and Facilities.*

2.2. Coordination: Major command (MAJCOM) pavement engineers; Air Force Center for Engineering and the Environment (HQ AFCEE).

2.3. Effective Date: Immediately. This ETL will remain in effect until these findings are incorporated into joint Service criteria.

2.4. Intended Users**:**

- Air Force Prime BEEF and RED HORSE units
- Army Corps of Engineers
- Navy and Marine Corps
- Construction contractors performing DOD airfield repairs
- Other organizations responsible for airfield maintenance

3. References.

3.1. Air Force:

- AFPD 32-10, *Installations and Facilities*, available at http://www.e-publishing.af.mil/

3.2. American Society for Testing and Materials (ASTM):

- ASTM D 2487, *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*, available at http://www.astm.org
- ASTM D 2834, *Standard Test Method for Nonvolatile Matter (Total Solids) in Water-Emulsion Floor Polishes, Solvent-Based Floor Polishes, and Polymer-Emulsion Floor Polishes*, available at http://www.astm.org

4. Acronyms and Terms.

AFCESA – Air Force Civil Engineer Support Agency
ASTM – American Society for Testing and Materials
DOD – Department of Defense
ERDC – U.S. Army Engineer Research and Development Center
ETL – Engineering Technical Letter
FAARP – forward area arming and refueling point
FOD – foreign object debris
ft – foot
gal – gallon
gsy – gallons per square yard (gal/yd^2)
HMMWV – high-mobility multipurpose wheeled vehicle (Humvee)
hr – hours
in – inch
lb – pound
MAJCOM – major command
Prime BEEF – Prime Base Engineer Emergency Force
psi – pounds per square inch
RED HORSE – Rapid Engineers Deployable - Heavy Operations Repair Squadron
sq yd – square yard
yd – yard

5. Preface.

5.1. The U.S. military was plagued by fugitive dust during Operations Enduring Freedom and Iraqi Freedom. Airborne dust generated during air and ground operations had a significant impact on missions: ground vehicles experienced safety hazards during convoy activities and personnel were exposed to potential health hazards from fine particulate matter. In addition, the widespread accumulation of dust during ground vehicle operations and in base camps adversely impacted the ability of military personnel to effectively conduct combat operations. Rotary-wing aircraft often experienced “brown out” conditions, in which the density of airborne dust was such that the pilots lost sight of the ground, resulting in hazardous operating conditions. Aircraft and personnel were lost due to accidents resulting from “brown out” conditions. Fixed-wing aircraft operations in contingency environments generated significant dust from operating on semi-prepared surfaces and unusually narrow taxiways and runways. The generated dust resulted in increased aircraft

maintenance, airfield maintenance (particularly sweeping operations), and reduced operations tempo while waiting for the dissipation of dust clouds generated during aircraft landings and departures.

5.2. The U.S. Army Engineer Research and Development Center (ERDC) was tasked by the U.S. Air Force Civil Engineer Support Agency (AFCESA) to develop dust-control guidance to address these concerns. ERDC recently concluded research and development of chemical dust palliatives for the U.S. Marine Corps Systems Command for mitigating dust for two distinct applications: one for expeditionary use on forward area arming and refueling points (FAARP) and one for sustainment use on roads and other large area applications. The technology developed under the Marine Corps program was leveraged and applied to fixed-wing aircraft operations, including field tests at two semi-prepared runway test sites sustaining C-17 aircraft operations. The results of these experiments were used to develop this ETL.

6. Relevant Standard Test Methods. American Society for Testing and Materials (ASTM) Annual Book of ASTM Standards:

- ASTM D 2487, *Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)*
- ASTM D 2834, *Standard Test Method for Nonvolatile Matter (Total Solids) in Water-Emulsion Floor Polishes, Solvent-Based Floor Polishes, and Polymer-Emulsion Floor Polishes*

7. Summary of Recommended Product Applications.

7.1. General Application Guidance. This ETL is a quick reference tool for rapidly selecting a type of dust palliative, the target palliative application rate, and method of applying the product for a variety of dust-abatement missions. The recommended use of this ETL is summarized in the following steps:

1. Use Table 1 to select the recommended type of product.
2. Review paragraph 7.2. “Detailed Dust Palliative Descriptions.”
3. Select a product from a recommended product category (Tables 2 through 4).
4. Review paragraph 7.3, “General Application Information.”
5. Review paragraph 7.4, “Detailed Application Guidance.”

Table 1 provides a summary table for selecting a type or category of dust palliative recommended for a particular application. The table provides general guidance concerning the recommended application rate or quantity of each product, as well as information on whether the product should be diluted with water before use. Table 1 also indicates whether the material should be applied topically or admixed into the soil to achieve the desired dust control results. If site conditions or the mission scenario preclude the use of the primary solution, Table 1 also includes secondary solution recommendations.

Table 1. Recommended Product Applications

Application	Primary Solution				Secondary Solution(s)			
	Product Category	Application Rate	Dilution Ratio	Application Type	Product Category	Application Rate	Dilution Ratio	Application Type
Fixed-Wing Airfields	Synthetic Fluid	0.4 gsy	N/A	Topical	Polymer Emulsion	1.2 gsy	3:1	Admix*
Roads	Polymer Emulsion	0.8 gsy	3:1	Admix**	Synthetic Fluid	0.6 gsy	N/A	Topical
Helipads	Synthetic Fluid	0.4 gsy	N/A	Topical	Polymer Emulsion	1.2 gsy	3:1	Topical
Base Camps	Synthetic Fluid	0.4 gsy	N/A	Topical	Polymer Emulsion	0.6 gsy	3:1	Topical
					Polysaccharide	0.6 gsy	3:1	Topical

* Depth of mixing should be a minimum of 4 inches (102 millimeters).
** Depth of mixing should be a minimum of 3 inches (76 millimeters).

7.2. Detailed Dust Palliative Description . This section desc ribes the different categories of recommended chem ical dust palliatives. Sele cting t he correct type of dust palliative is critic al to ens ure the method of dust abatement is compatible wit h the mission.

7.2.1. Polymer Emulsions. Polymer emulsions used for dust control are generally vinyl acetate or acrylic-based copolymer s suspended in water by surfactants. They typic ally consist of 40 percent to 50 percent solid particl es by weight of emulsion. Once they are appl ied, the polymer particles begin to coalesce as the water evaporates from the system, leavin g a soil-polymer matrix that prevents small dust particles from escaping t he surface. The polymers used for dust control typically have exc ellent tensile and flexural strength, adhesion to soil particles, and resistance to water. Thes e materials are often limited by a short shelf life (less than 2 years). Some vendor s dilute poly mer emulsion products, so it is recom mended that random samples of the bulk product be taken to ensure that the bulk product inclu des at least 40 percent solids according to AST M D 2834. Poly mer emulsions should not be mix ed with gray water or salt water for dilution. If applied topically to helipads, take care to ensure sufficient applica tion rates and penetration depths to avoid the fo rmation of thin crusts (less than 1 inch), creating the potential for FOD.

Table 2. Polymer Emulsions

Product Description	Effective Uses	Limitations	Shipping
Vinyl acetate or acrylic polymers suspended in water by surfactants. Water evaporates when placed on soil and leaves a bonded soil-polymer matrix. Prevents dust by binding soil grains.	Helipads Roads Base Camps Airfields	May require mixing with soil for roads and airfields. Potential for FOD damage on helipads, especially when light topical applications are used or thin crusts (< 1 in.) are produced.	275-gal containers (2,500 lb)

Product	Vendor	Web Site Address	Telephone Number
Soiltac	Soilworks, LLC	www.soilworks.com	1-800-545-5420

7.2.2. Polysaccharides. Polysaccharides are solutions or suspensions of sugars, starches, and surfactants in water. They have excellent shelf life, but the solids may settle from the solution when the product is not stored per the manufacturer's recommendations. Polysaccharides may be diluted with water, depending on the intended use. Polysaccharides provide dust abatement by encapsulating soil grains and providing a binding network in the ground. They are biodegradable and may leach from the soil with exposure to precipitation.

Table 3. Polysaccharides

Product Description	Vendor Information	Effective Uses	Limitations	Shipping
Surtac: Mixture of sugar and starches designed to bind soil grains. Product is water soluble, biodegradable, and capable of dilution with water.	Soilworks, LLC www.soilworks.com 1-800-545-5420	Helipads Base Camps	Limited effective lifespan. Lower strength than polymer emulsions. May settle from solution during storage.	275-gal containers (2,500 lb)

7.2.3. Synthetic Fluids. Synthetic organic fluids have an indefinite shelf life and are applied to a soil "as received." These fluids are not miscible with water and are therefore unable to be diluted. They consist of isoalkanes that do not dry or cure with time. The reworkable binder is ready for immediate use upon application and maintains effectiveness over extended periods of time. Follow-on applications have a cumulative effect. Despite lower application rates for a given usage (i.e., airfields, roads, helipads, or base camps), since synthetic organic fluids are not diluted for application they can be two to three times as costly to use as polymer emulsions and polysaccharides.

Table 4. Synthetic Fluids

Product Description	Vendor Information	Effective Uses	Limitations	Shipping
Durasoil: Blend of isoalkanes that form a reworkable binder in soil. Will not mix with water. Effective for long-term use.	Durasoil Soilworks, LLC www.soilworks.com 1-800-545-5420	Helipads Roads Base camps Airfields	More expensive than most other products.	275-gal containers (2,000 lb)

7.3. General Application Information. This section briefly describes the primary considerations and methods for applying the recommended dust palliatives.

7.3.1. Soil Type. The soil type has an effect on the performance of dust palliatives. Finer grained soils (silts and clays) present a larger problem with dust generation and are more difficult to control. The higher specific surface of the soil will require greater quantities of the product for treatment. Penetration may also be hindered by the small pore sizes between soil grains. Multiple light application rates may be required to effectively treat fine-grained soils and to prevent ponding or surface runoff. Coarse-grained soils (sands and gravels) typically have higher infiltration rates that minimize ponding or runoff. The soil should be classified according to ASTM D 2487.

7.3.2. Intended Use. Choosing a dust palliative will ultimately be governed by the existing need for dust control. Some products work better for helipads, while others are more effective on roads or airfields. Each chemical has benefits and limitations which should be considered before selecting a product. Table 1 lists some of the recommended product categories for different dust-control needs.

7.3.3. Application Rates. Application rates should be chosen according to the soil type, the intended use of the treated area, and the necessary duration of use. Dust palliatives should be applied at the rates given in Table 1. Synthetic fluids may be applied at lower rates for most projects because they contain 100 percent active ingredients. Polymeric materials may require application rates greater than 1.0 gsy in areas of heavy traffic. For example, using polymer emulsions on helipads will require an application rate of approximately 1.2 gsy to produce thicker surface crusts to reduce FOD potential. Refer to Table 1 for guidance on selecting application rates. Note that higher application rates may be required if the polymer emulsions/polysaccharides are pre-diluted by the vendor as evidenced by less than 40 percent solids according to ASTM D 2834.

7.3.4. Dilution Ratios. Some products may require dilution with water. These are typically emulsified products (polymers and polysaccharides). Diluting an emulsion will reduce the viscosity and improve penetration. In general, 3 parts water should be added for each part product. Note that the recommended

dilution ratio may need to be reduced if th e palliatives have been pre-diluted by the vendor to less than 40 percent solid s according to ASTM D 2834. Synt hetic fluids are intended for use “as rece ived” and s hould be applied in their concentrated form.

7.3.5. Topical Method. Topical applicatio ns are the most commonly used technique f or dust control. Spraying the su rface of the soil with a dust palliative will solve most dust problem s. Alternative methods should be used when the area to be treated is structurally defici ent for the anticipated t raffic or when greater durability is needed. Topical applic ations are accomplished by spraying the dust palliative onto the natural or prepared soil s urface. It i s imperative to maintain the greatest level of uniformity while dispersing the liquid. Applicat ion quantities are determined by estimating the area of ground surfac e to be treated and multiplying that area by the sugges ted application rate. Manufacturers ’ literature indicate that t opical applications are typica lly effective for 6 to 24 months, dependent on soil type, compac tion, penet ration dept h, climate, and traffic type and volum e. Reapplication is ge nerally performed at 20 percent t o 30 percent of the initial application rate.

7.3.6. Admixture Method. Admix methods are designed to incorporate dust palliatives deeper into the soil and prov ide longer lasting dust abatement. Thes e methods are usually necessary when heavy, repetitive loading will be applied to the soil. Roads and airfields (r unways, taxiways, or parking aprons) generally require admix applic ations to achieve t he desired results. Admix depths should be at least 3 inches (76 millimeters) for roads and at least 4 inches (102 millim eters) for airfield s. The followin g procedure (Figures 1 through 4) is recommended for incorporating the dust palliative into the soil:

1. Grade the soil, if necessary, using a motor grader (Figure 1).
2. Spray half of total palliative application rate onto the soil surface (Figure 2).
3. Blend into the top 3 inches to 4 inches (76 millimeters to 102 millimeters) of soil using a rotary mixer (Figure 2).
4. Compact using steel-wheeled vibratory roller (Figure 3).
5. Spray remaining product onto the compacted surface (Figure 4).

This method will provide optimal perform ance of m ost palliatives. Alternative construction methods may not provide sufficient durability.

Figure 1. Grading Soil Surface before Treatment

Figure 2. Applying Product with HydroSeeder and Mixing into Soil with Rotary Mixer

Figure 3. Compacting Soil after Mixing

Figure 4. Applying Final Spray to Soil Surface after Compaction

7.3.7. Distribution Equipment. A variety of distribution equipment can be used to apply the palliatives. Table 5 includes some equipment used by the ERDC.

Table 5. Distribution Equipment and Vendor Information

Equipment Type	Model*	Vendor	Web Site Address	Telephone
HydroSeeder	T-90 T-120	Finn Corporation	www.finncorp.com	1-800-543-7166
Water Distributor	613CWD	Caterpillar	www.cat.com	1-309-675-1000
* Listed models were evaluated by ERDC researchers. Other models which may meet project needs are also available. It is recommended to consult ERDC researchers (1-601-634-2467) before renting or purchasing any equipment.				

7.4. Detailed Application Guidance. This section provides detailed guidance for treating helipads; roads; large, open areas; base camps; and fixed-wing airfield facilities. Undiluted chemicals used in these processes pose a potential skin, eye and respiratory irritation hazard. Therefore, during mixing, personnel should avoid skin contact with these products by using—at a minimum—nitrile gloves (or other gloves approved by the site bioenvironmental engineer) and chemical goggles. Aprons and/or face shields may be necessary if a significant splash hazard exists. Mixing operations should be reviewed by the bioenvironmental engineer to determine if adequate ventilation exists. If the products are mixed outside in a well-ventilated area, respiratory protection should not be required. The primary environmental concern with organic nonpetroleum dust and solvent-based suppressants is how they impact the groundwater quality, freshwater aquatic environment, and plant community. Do not apply these products in excess or directly to any water bodies, wetlands, or where excess product runoff could discharge to a water body (e.g., stream, lake, pond, wetlands). Take all necessary precautions to keep dust palliative materials out of water drainages and roadway ditches leading to streams.

7.4.1. Dust Abatement on Unsurfaced Helipads. Equipment requirements may be modified depending upon availability and mission requirements; however, the general types of equipment and process should be similar.

7.4.1.1. Supplies. Necessary supplies include the following:

1. Truck to haul the chemical totes, pumps, etc., and to tow the distribution equipment, if necessary.
2. HydroSeeder or other spray distribution system compatible with the selected chemical.
3. Two to four 275-gallon totes for dust palliative (synthetic fluid – primary solution).
4. One trash pump and sufficient hoses with quick-connect ends to transfer the material from the totes to the distributor if the distributor does not include a pump.

7.4.1.2. General Procedures. General application procedures are as follows:

1. Survey and establish the area to be treated.
2. Place the synthetic fluid into a HydroSeeder/distributor (Figure 5).
   a. Approximately 450 gallons will be required for a 100-foot by 100-foot (30-meter by 30-meter) helipad for smaller rotary-wing aircraft.
   b. Approximately 900 gallons will be required for a 150-foot by 150-foot (46-meter by 46-meter) helipad for larger rotary-wing aircraft.
   c. Greater quantities will be required for treating with a polymer emulsion (secondary solution). Follow dilution/application guidance in Table 1.
   d. If a polymer emulsion is used as the secondary solution, the material must be diluted 3:1 with water and agitated for a minimum of five minutes before application.
3. Position the HydroSeeder/distributor on the edge of the helipad.
4. Use the tower gun and a long-distance nozzle to spray half of the product on half of the helipad (Figure 6).
5. Move to the opposite side of the helipad and spray the remaining product.
6. If the distributor does not have standoff spray capability, it may be necessary to traverse the helipad to ensure spray overlap. (Note: If the helipad ruts significantly under the distributor, an attempt to smooth the ruts should be made and the ruts retreated by a hand wand to keep the ruts from acting as erosion focal points during aircraft operations.)

Helicopters may land immediately on areas treated with synthetic fluids; however, for best results wait one day before trafficking (Figure 7). If a polymer emulsion is used as the alternative solution, the material must be allowed to cure for 24 hours before allowing traffic on the helipad.

Figure 5. Filling HydroSeeder from Material Tote

Figure 6. Topical Material Application from HydroSeeder Tower Gun

Figure 7. UH-1 Helicopter Operating on Treated Helipad

7.4.2. Dust Abatement on Unsurfaced Roads. Equipment requirements may be modified depending upon av ailability and mission r equirements; however , the general types of equipment and the process should be similar.

7.4.2.1. Supplies. Necessary supplies include the following:

1. Motor grader for initial grading, if necessary.
2. Truck and/or HMMWV to haul c hemical totes, pumps, etc., and t o tow the distribution equipment, if necessary.
3. HydroSeeder or other chemic al d istributor compatible with the product(s).
4. Polymer emulsion and water (primary solution)*.
5. Rotary mixer for admixing.
6. Steel-wheeled vibratory compactor.

* Quantities must be calculated based upon the recommended product application rate and the length and width of the road.

7.4.2.2. General Procedures. The general application procedures are as follows:

1. Grade the road to establis h gener al grade requirements and correct distresses.

2. Determine the length of road that can be treated per tank of product (HydroSeeder/distributor tank capacity) as follows:

Length (yd) = [Tank Capacity (gal)] / [Application Rate (gsy)] x [Road Width (yd)]

3. Place 675 gallons of water into HydroSeeder/distributor (minimum 900-gallon capacity). For smaller distribution equipment, recalculate quantities to match the recommended dilution ratio.
4. Add 225 gallons of polymer emulsion.
5. Mix for five minutes using mechanical agitation.
6. Apply product to the road surface using a distribution bar or wide fan nozzle on the tower gun.
7. Immediately till the road surface with a rotary mixer to a depth of 3 inches (76 millimeters).
8. Compact the soil until the desired density is achieved.
9. Spray a light application (~0.2 gsy) of the product over the compacted road surface.
10. Repeat steps 1 through 9 for all subsequent road lengths to be treated.

7.4.2.3. If a synthetic fluid (secondary solution) is used, it is applied in a topical application following the general approach described for dust abatement on unsurfaced helipads.

7.4.3. Dust Abatement in Base Camps and other Non-Traffic Areas. The application guidance for these areas is less robust and more cost effective since the surface is subjected to reduced loading requirements. Thus, this guidance should not be used for areas directly exposed to vehicle traffic. Equipment requirements may be modified depending upon availability and mission requirements; however, the general types of equipment and process should be similar.

7.4.3.1. Supplies. Necessary supplies include the following:

1. Truck and/or HMMWV to haul the chemical totes, pumps, etc., and to tow the distribution equipment, if necessary.
2. HydroSeeder or other chemical distributor compatible with the product(s).
3. Synthetic fluid*.

* Quantities must be calculated based upon the recommended product application rate and the length and width of the area to be treated.

7.4.3.2. General Procedures. The general application procedures are as follows:

1. Determine the area that can be treated per tank of product (HydroSeeder/distributor tank capacity) as follows:

   Area (sq yd) = [Tank Capacity (gal)] / [Application Rate (gsy)]

2. Fill the distribution equipment with the synthetic fluid. Do not dilute.
3. Apply product to the soil surface using a distribution bar, wide fan nozzle on the tower gun, or a hand wand/hose.
4. Repeat steps 1 through 3 as required to treat the desired area.

7.4.4. Dust Abatement around Fixed-Wing Airfields. For paved airfields, chemical dust palliatives may be used on any unpaved area around the perimeter of the pavement, including unpaved shoulders and graded areas. Due to safety concerns associated with surface friction requirements, dust palliatives are not recommended on any primary operating surface of unsurfaced airfields. The exception is when a polymer emulsion is used as a soil stabilization agent and effectively admixed into the soil at depths greater than 4 inches (102 millimeters) and at higher application rates, typical of soil stabilization. Additionally, since the shoulders of unsurfaced airfields are designed to support occasional aircraft loading, it is also recommended that the products not be used on shoulders of unsurfaced airfields. Thus, for unsurfaced airfields, the use of chemical dust palliatives is limited to the graded areas. Due to potential FOD concerns, it is highly recommended that synthetic fluids be used for this application. If the alternative polymer emulsion solution is used, the material MUST be admixed into the soil to minimize FOD potential. Polymer emulsions or other stabilization additives cannot be topically applied around fixed- wing airfields due to the potential to form thin crusts capable of generating FOD. Equipment requirements may be modified depending upon availability and mission requirements; however, the general types of equipment and the process should be similar.

7.4.4.1. Supplies. Necessary supplies include the following:

1. Truck and/or HMMWV to haul the chemical totes, pumps, etc., and to tow the distribution equipment, if necessary.
2. HydroSeeder or other chemical distributor compatible with the products.
3. Synthetic fluid*.

* Quantities must be calculated based upon the recommended application rate and the length and width of the area to be treated.

7.4.4.2. General Procedures. The general application procedures are as follows:

1. Determine the area of airfield that can be treated per tank of product (HydroSeeder/distributor tank capacity) as follows:

Area (sq yd) = [Tank Capacity (gal)] / [Application Rate (gsy)]

2. Fill the distribution equipment with synthetic fluid. Do not dilute.
3. Apply to soil surface using a distribution bar or wide fan nozzle on the tower gun.
4. Repeat steps 1 through 3 as required to treat the desired area.

7.4.4.3. Application Areas for Fixed-Wing Facilities. A major consideration in the treatment of areas around fixed facilities is the size of the area requiring treatment. The width of treatment along the perimeter is generally reasonable; however, the length of treatment for airfields can range from 1 to 3 miles per side of the runway—the resulting treatment area can accumulate quickly. Analyses of the propeller/jet wakes for the C-130 and C-17 aircraft were performed to develop recommendations for the width of the area to be treated. The minimum treatment width for effective treatment is based upon the wingspan of the aircraft and the highest intensity exhaust plume, while the optimum treatment width is based upon the distance required to reduce the exhaust plume to a maximum velocity of 50 feet per second (35 miles per hour). As general guidance, the treatment width along each side of the runway and around any turnarounds or aprons should be:

- C-130 minimum treatment width: 27 feet (8 meters)
- C-130 optimum treatment width: 50 feet (15 meters)
- C-17 minimum treatment width: 50 feet (15 meters)
- C-17 optimum treatment width: 100 feet (30 meters)

For unsurfaced fixed-wing facilities, the treatment should begin at the edge of the shoulder and be applied outward into the graded area and transition area. For paved fixed-wing facilities, the treatment should begin at the edge of the paved surface and extend outward for the recommended width.

8. Point of Contact. Recommendations for improvements to this ETL are encouraged and should be furnished to the Pavements Engineer, HQ AFCESA/CEOA, 139 Barnes Drive, Suite 1, Tyndall AFB, FL 32408-5319, DSN 523-6439, commercial (850) 283-6439, E-mail AFCESAReachbackCenter@tyndall.af.mil

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