



Hill Air Force Base, Utah

Proposed Final

**Environmental Assessment:
Proposed Thermal Spray Addition,
Building 505,
Hill Air Force Base, Utah**

September 18, 2003

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Proposed Thermal Spray Addition,
Building 505,
Hill Air Force Base, Utah**

Contract GS-35F0065J, Order #0740

**General Services Administration, and Department of the Air Force
Air Force Materiel Command
Hill Air Force Base, Utah 84056**

September 18, 2003

Prepared in accordance with the Department of the Air Force Environmental Impact Analysis Process (EIAP) 32 CFR Part 989, Effective July 6, 1999, which implements the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality (CEQ) regulations.

EXECUTIVE SUMMARY

Purpose and Need

The purpose of the proposed action is to accommodate current United States Air Force (USAF) missions by constructing a thermal spray addition to Building 505 at Hill Air Force Base (AFB). The thermal spray addition would house a quantity of 8 spray booths, in which a tungsten carbide and cobalt based coating would be applied to landing gear and pneudraulic components using a thermal spray coating process.

The proposed action is needed to meet operational requirements and to eliminate the potential for hexavalent chromium in Hill AFB wastewater sludge. As the average age of the USAF aircraft fleet increases, the requirement for repair of landing gear and pneudraulic components is also increasing, such that the required sortie rates can be met. Additional mission benefits would be gained because the proposed tungsten carbide cobalt coating is more wear resistant and corrosion resistant than chromium-based coatings, thereby reducing the frequency of parts being returned for subsequent repairs.

Scope of Review

No cultural and/or historical resources were identified within the area of the proposed action on Hill AFB property. No species of plants or animals listed as endangered, threatened, or sensitive by state or federal agencies were observed in or around the proposed excavation area, and no suitable habitat for any such species is likely to be disturbed by the project. No solid hazardous waste is expected to be generated by the project, but accidental spills of fuel, lubricants, or other chemicals during construction could occur. There is a potential for liquid and airborne hazardous waste streams to be generated by material coating processes.

The issues that were identified and analyzed in the document are: air quality (both indoor and outdoor air), solid and hazardous wastes, and physical environment (surface soils and groundwater). Environmental effects of the no action alternative were also considered.

Selection Criteria

The future facility and repair technology for surfaces of hydraulic and pneudraulic equipment and landing gear at Hill AFB should:

- be adjacent to the related activities of: parts storage; preparation of parts for coating; and final grinding after the coating process is completed;
- have sufficient space to house all of the required equipment;
- provide sufficient capacity to meet USAF mission objectives;
- be a technology that is approved by USAF technical orders;
- reduce rework due to inconsistencies in the coating process;
- reduce or eliminate the use of chromic acid in compliance with *Executive Order 13148 Section 502*; and

- be protective of facilities, human health, and the environment.

Proposed Action

Proposed Action - The proposed action includes all work necessary to construct a thermal spray addition to Building 505 at Hill AFB. The proposed addition would house a quantity of 8 spray booths, in which a tungsten carbide and cobalt based coating would be applied to landing gear and pneudraulic components using a thermal spray coating process. The proposed structure would consist of approximately 7,000 square feet situated on the north side of Building 505. The type of construction would be concrete panels and concrete floor to match the existing structure. Cargo doors would be located on the west and east sides of the addition. A monorail overhead crane system would be attached to the structure, and a dust collection system would be provided on the roof. Utilities and the thermal spray coating systems would be installed. During the construction process, an existing overhead power line and an existing buried water line would be protected and/or relocated.

No Action Alternative – Under the no action alternative, it is predicted that Hill AFB may be unable to provide sufficient capacity for repair of landing gear and pneudraulic components of USAF aircraft. It is therefore possible that aircraft would be grounded, and mission requirements for sorties would not be met.

Additional Alternatives - Hill AFB planners and engineers evaluated several alternative locations and technologies for coating of landing gear and pneudraulic components. These alternatives were not retained for detailed consideration due to logistical issues such as proximity to related processes, and lack of USAF approval for alternative technologies.

Results of the Environmental Assessment

The proposed action and the no action alternative were both considered in detail. The proposed action could be implemented with minor environmental impacts. Following the construction phase, backfill and paving operations would prevent erosion of the site. The proposed action could be implemented with minor air emissions of both short term and long term duration. The proposed action would be expected to reduce indoor air exposures to workers who are responsible for overhaul and repair of landing gear and pneudraulic components in accordance with USAF technical order specifications. The small amounts of solid residue generated by the proposed action would not be expected to be classified as hazardous waste. The proposed action would reduce hexavalent chromium and total chromium loading to the Hill AFB industrial wastewater treatment plant (IWTP). No cumulative environmental impacts are expected from either the proposed action or the no action alternative.

COMPARISON OF ALTERNATIVES

Issue	<u>Proposed Action</u> Construct the Thermal Spray Addition to Building 505	<u>No Action</u> Do Not Construct the Addition
Air Quality	Temporary construction-related emissions. Worker exposures may be reduced. Emissions of less than 0.017 pounds per year of HAPs would be expected.	Current conditions would continue.
Solid and Hazardous Wastes	Would not be generated as solids. Chromium and hexavalent chromium loading to the IWTP would be reduced.	Current conditions would continue.
Surface Soils	Construction-related erosion control measures may be required.	No impact.
Groundwater	No impact (contaminated groundwater is below the maximum depth of excavation).	No impact.

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LIST OF ACRONYMS AND CHEMICAL TERMS

AFB	Air Force Base
bgs	Below Ground Surface
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CWA	Clean Water Act
DAQ	Utah Division of Air Quality
EA	Environmental Assessment
EPA	United States Environmental Protection Agency
FONSI	Finding of No Significant Impact
HAP	Hazardous Air Pollutant
HEPA	High Efficiency Particulate Air
HVAF	High Velocity Air Fuel
HVOF	High Velocity Oxygen Fuel
IRP	Installation Restoration Program
IWTP	Industrial Wastewater Treatment Plant
MAN	Hill AFB Maintenance Directorate
NAAQS	National Ambient Air Quality Standards
NDCSD	North Davis County Sewer District
NEPA	National Environmental Policy Act
NO _x	Oxides of Nitrogen
O ₃	Ozone
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PM-10	Particulates Smaller Than 10 Microns in Diameter
ppm	Parts Per Million
RCRA	Resource Conservation and Recovery Act
SO ₂	Sulfur Dioxide
TCLP	Toxicity Characteristic Leaching Procedure
UAC	Utah Administrative Code
µg/m ³	Micrograms Per Cubic Meter
UPDES	Utah Pollutant Discharge Elimination System
USAF	United States Air Force
VOC	Volatile Organic Compound

1.0 PURPOSE AND NEED FOR THE PROPOSED ACTION

1.1 Introduction

Hill Air Force Base (AFB) is an air logistics center that maintains aircraft, missiles, and munitions for the United States Air Force (USAF). In support of that mission, Hill AFB: provides worldwide engineering and logistics management for the F-16 Fighting Falcon and A-10 Thunderbolt; accomplishes depot repair, modification, and maintenance of the F-16, A-10 Thunderbolt, and C-130 Hercules aircraft; and overhauls and repairs landing gear, wheels and brakes for military aircraft, rocket motors, air munitions, guided bombs, photonics equipment, training devices, avionics, instruments, hydraulics, software, and other aerospace related components.

This document addresses proposed construction activities related to the overhaul and repair of landing gear and pneudraulic components in accordance with USAF technical order specifications. The Commodities and Landing Gear Division of the Hill AFB Maintenance Directorate (the division's organizational designation is MAN) repairs hydraulic and pneudraulic equipment and landing gear for all USAF aircraft. During this process, damage and wear to exterior surfaces is repaired, and the surfaces are restored to their original dimensions. The traditional method to accomplish this repair employs aqueous chromium plating. This plating process uses chemical baths containing chromic acid (hexavalent chromium).

1.2 Purpose and Need

The purpose of the proposed action is to accommodate current USAF missions by constructing a thermal spray addition to Building 505 at Hill AFB. The thermal spray addition would house a total of 8 spray booths, in which a tungsten carbide and cobalt based coating would be applied to landing gear and pneudraulic components using a thermal spray coating process.

The proposed action is needed to meet operational requirements and to eliminate the potential for hexavalent chromium in Hill AFB wastewater sludge, as discussed in the paragraphs that follow.

As the average age of the USAF aircraft fleet increases, the requirement for repair of landing gear and pneudraulic components also increases. Currently, landing gear and pneudraulic components that require rebuilding to technical order specifications are chromium plated and then ground back to desired dimensions. There is a large volume of rework due to inconsistencies in the plating process. This rework decreases the throughput of parts compared to rates achievable using the new thermal spray technology. Additional mission benefits would be gained because the proposed tungsten carbide cobalt coating is more wear resistant and corrosion resistant than chromium-based coatings, thereby reducing the frequency of parts being returned for subsequent repairs.

Executive Order 13148 Section 502 requires USAF to reduce discharge of toxic chemicals by 40 percent by December 31, 2006. Hexavalent chromium falls within this group of toxic chemicals. With the current chromium plating process, hexavalent chromium flows to the Hill AFB industrial wastewater treatment plant (IWTP), and has the potential to be discharged from the base as a component of the wastewater sludge. The proposed action is needed to support the intent and requirements of *Executive Order 13148*.

1.3 Location of the Proposed Action

Hill AFB is located approximately twenty five miles north of downtown Salt Lake City and 7 miles south of downtown Ogden, Utah (Figure 1). Hill AFB is surrounded by several communities: Roy and Riverdale to the north; South Weber to the northeast; Layton to the south; and Clearfield, Sunset, and Clinton to the west. The base lies primarily in northern Davis County with a small portion located in southern Weber County.

The proposed thermal spray addition would be located in the southeastern portion of the base, just north of the south entrance gate (Figure 2). The thermal spray addition would be constructed on the north end of existing Building 505 (Figure 3).

1.4 Scope of the Environmental Review and Anticipated Environmental Issues

The scope of this environmental review is to analyze environmental concerns related to constructing a thermal spray addition to Building 505. During the construction process, an existing overhead power line and an existing buried water line would need to be protected and/or relocated. Current chromium plating operations generate hazardous wastewater, which in turn has the potential to contribute hexavalent chromium to the resulting sludge. Depending on coating formulations, either greatly reduced amounts of hazardous waste, or no hazardous waste is expected to be generated by operating the proposed thermal spray booths. During construction activities, solid wastes may be generated, and hazardous wastes could be generated if a spill of fuel, lubricants, or construction-related chemicals occurs.

Building 505 is not an historic structure, and has been determined ineligible for inclusion in the *National Register of Historic Places*. No species of plants or animals listed as threatened or endangered are known to occur on Hill AFB. The proposed project area consists of less than ¼ acre of previously disturbed land in an existing industrial area of Hill AFB. No surface water resources exist within the area of the proposed action. Hill AFB conducts groundwater monitoring of the shallow, unconfined aquifer within the area of the proposed action. Contamination has been detected in wells in the vicinity of the proposed thermal spray addition. Shallow soil contamination has been detected to the south of the proposed thermal spray addition.

The issues that have been identified for detailed consideration and are therefore presented in Sections 3 and 4 are: air quality (both indoor and outdoor air), solid and hazardous wastes, and physical environment (surface soils and groundwater). Environmental effects of the proposed action and the no action alternative were both considered.

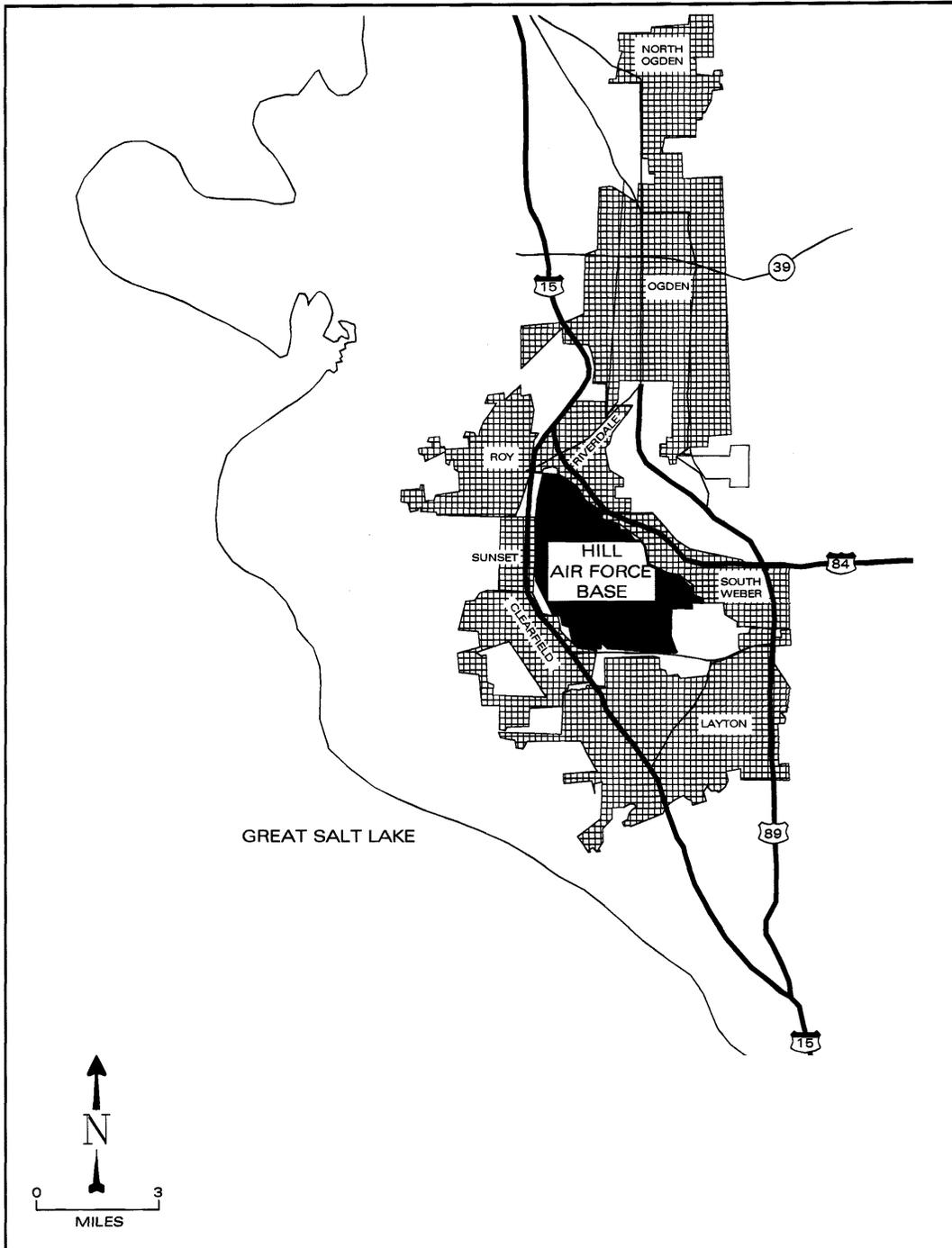


Figure 1: Hill AFB Location Map

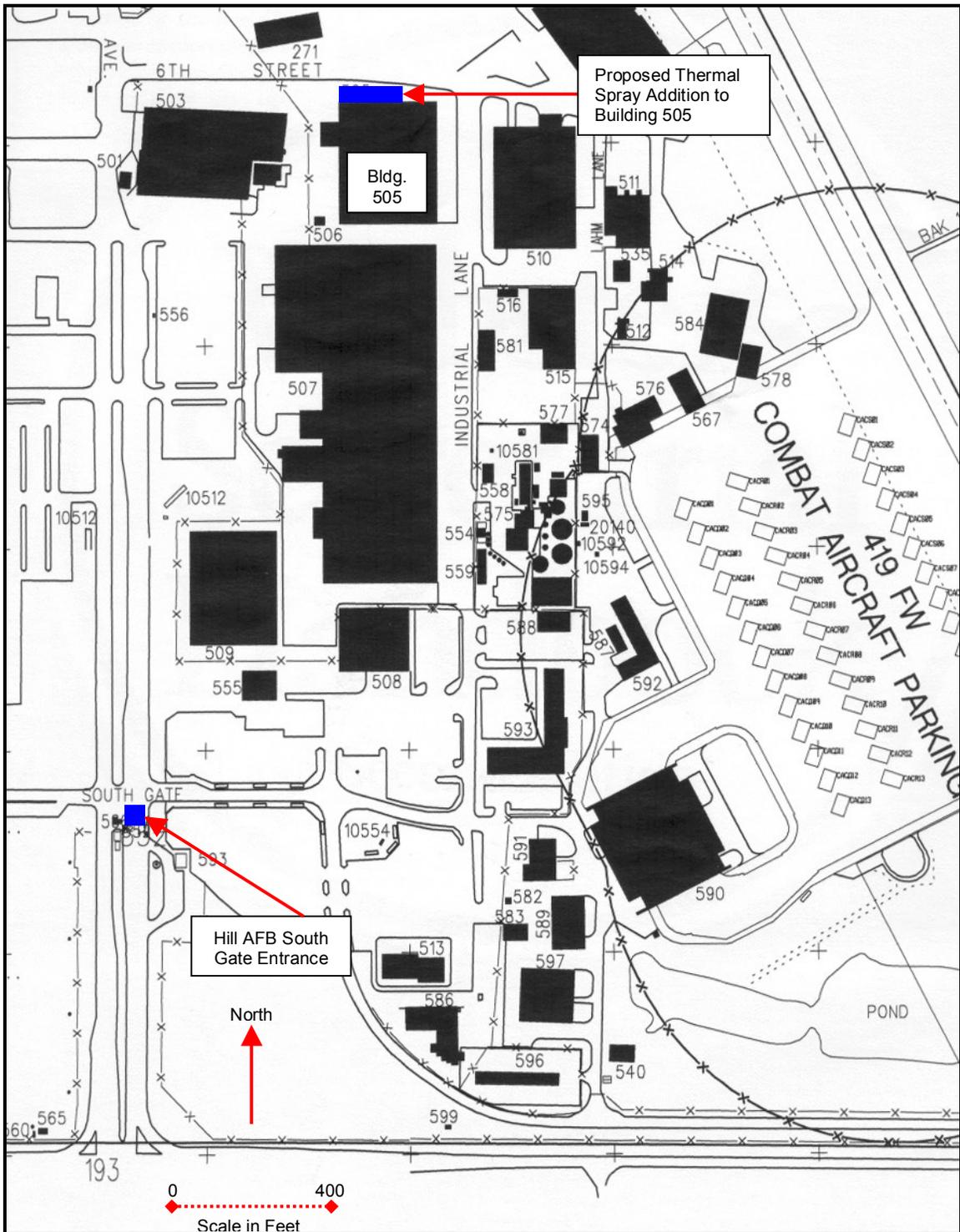


Figure 2: Location of the Proposed Thermal Spray Addition

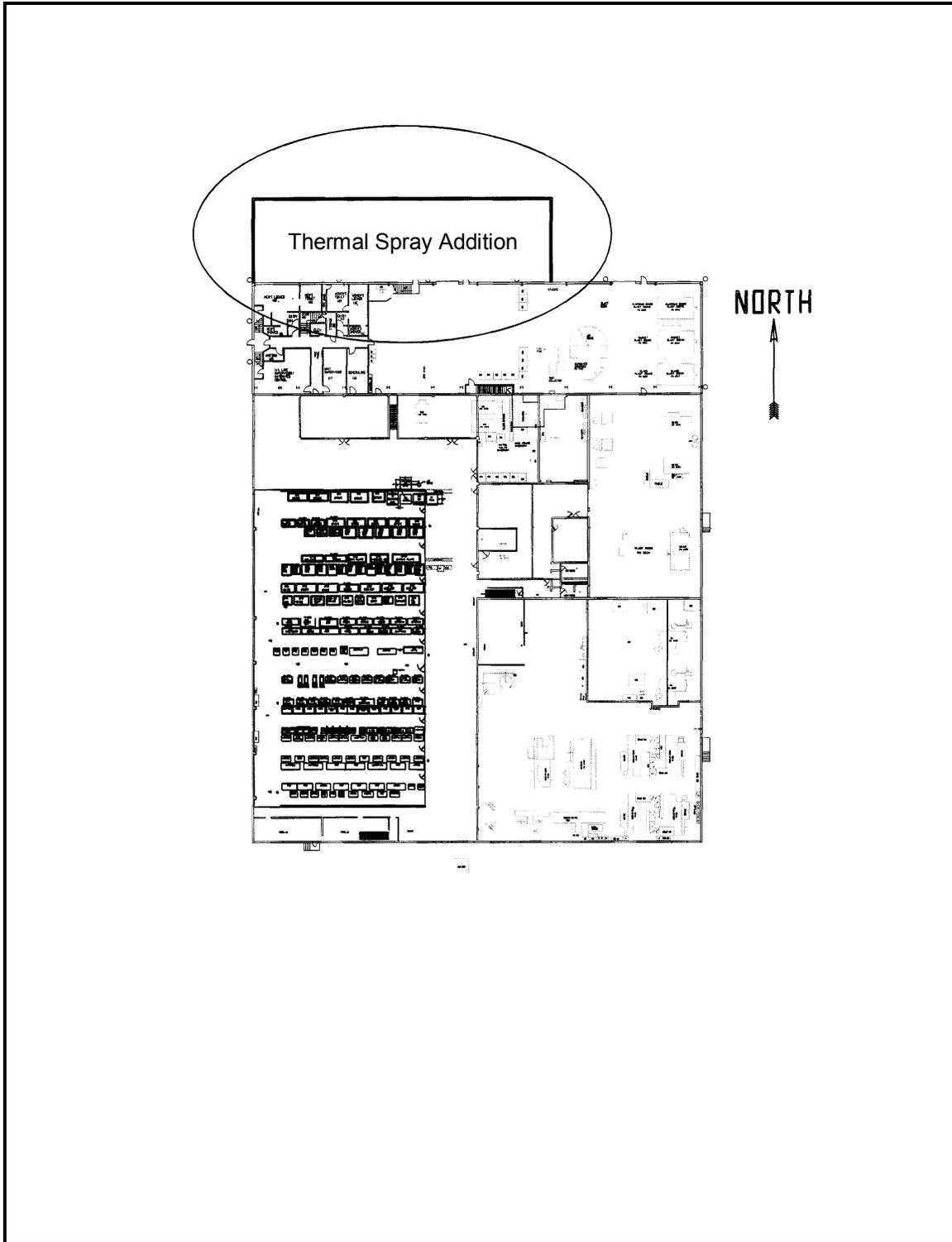


Figure 3: Proposed Addition to Building 505

(credit Linda MacCauley, facility engineer)

1.5 Applicable Regulations and Permits

Throughout the construction phase of the project, Hill AFB personnel and their contractors would follow safety guidelines of the Occupational Safety and Health Administration (OSHA) as presented in the *Code of Federal Regulations* (CFR) for trenching, Title 29 Part 1926 Subpart P, and power distribution, 29 CFR 1926 Subpart V.

The proposed action would disturb less than $\frac{1}{4}$ acre. Since the project would disturb less than 1 acre, a stormwater construction permit would not be required.

The proposed construction is not expected to contact any cultural resources (defined as archaeological, architectural, or traditional cultural properties). If suspected cultural resources are observed during any Hill AFB construction project, work in the immediate vicinity stops, and the Hill AFB cultural resources manager implements inadvertent discovery procedures in accordance with the Hill AFB *Draft Integrated Cultural Resources Management Plan*.

Hill AFB has completed remedial investigations in the vicinity of the proposed action according to the conditions of a federal facility agreement and the Comprehensive Environmental Response Compensation and Liability Act (CERCLA). Specific discussions for ongoing CERCLA activities and requirements related to the proposed action are presented in Sections 3 and 4 of this document.

The contractor would be required to have a water truck on site as needed during especially dry and windy weather for the purpose of dust suppression. Air emissions from the current chromium plating operations are regulated by the Utah Division of Air Quality and the *Hill AFB Title V Operating Permit*. New operations, such as the proposed action, must be incorporated into the Title V permit. Specific discussions for current air emissions and potential impacts related to the proposed action are presented in Sections 3 and 4 of this document. Air emissions generated by the proposed action must be addressed in accordance with Utah's State Implementation Plan, which complies with the Clean Air Act's General Conformity Rule, Section 176 (c). A conformity analysis was conducted for this proposed action as specified by "*Determining Conformity of Federal Actions to State or Federal Implementation Plans*," 40 CFR 93, revised July 1, 1998 (see Sections 3.1 and 4.1 of this document).

The proposed construction is not expected to generate any wastes that are regulated by the Resource Conservation and Recovery Act (RCRA), Toxic Substances Control Act, or similar law. Hazardous wastes at Hill AFB are routinely and properly handled in accordance with RCRA regulations, Utah hazardous waste management regulations contained in the Utah Administrative Code (UAC) Section R315-1, and the *Hill AFB Hazardous Waste Management Plan*. These regulations control hazardous waste from its origin and storage to ultimate treatment, and/or disposal. In Utah, the above regulations are enforced by the Utah Division of Solid and Hazardous Waste. The potential for generation of hazardous waste during operation of the proposed thermal spray booths is discussed in Section 4.

Hill AFB industrial wastewater discharges must comply with an industrial pretreatment permit issued by the North Davis County Sewer District (NDCSD). The pretreatment permit regulates the quality of water entering the county sewer system and ensures compliance with requirements of the Clean Water Act (CWA) and the Utah Pollutant Discharge Elimination System (UPDES).

2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This section describes selection criteria, the proposed action, the no action alternative, and other alternatives that were considered.

2.1 Selection Criteria

As discussed in Sections 1.1 and 1.2, the Hill AFB Maintenance Directorate (MAN) repairs hydraulic and pneumatic equipment and landing gear for all USAF aircraft, including repairing damage and wear to exterior surfaces by the current process of aqueous chromium plating. The rate of repairs is currently increasing, and USAF is simultaneously striving to decrease the use of chromic acid (hexavalent chromium). Hill AFB proposes to accommodate USAF missions as well as the pollution prevention goals in *Executive Order 13148 Section 502*, by constructing a facility to provide additional coating capacity using an improved surface coating technology (a thermal spray coating process).

Due to these considerations, the following selection criteria were established. The future facility and repair technology for surfaces of hydraulic and pneumatic equipment and landing gear at Hill AFB should:

- be adjacent to the related activities of: parts storage; preparation of parts for coating; and final grinding after the coating process is completed;
- have sufficient space to house all of the required equipment;
- provide sufficient capacity to meet USAF mission objectives;
- be a technology that is approved by USAF technical orders;
- reduce rework due to inconsistencies in the coating process;
- reduce or eliminate the use of chromic acid in compliance with *Executive Order 13148 Section 502*; and
- be protective of facilities, human health, and the environment.

2.2 Proposed Action: Construct the Thermal Spray Addition

The proposed action includes all work necessary to construct a thermal spray addition to Building 505 at Hill AFB. The proposed addition would house a quantity of 8 spray booths, in which a tungsten carbide and cobalt based coating would be applied to landing gear and pneumatic components using a thermal spray coating process. Thermal spray coating processes currently approved by USAF are the high velocity oxygen fuel (HVOF); high velocity air fuel (HVOF); electric arc wire; combustion wire; and plasma spray processes.

The proposed structure would consist of approximately 7,000 square feet situated on the north side of Building 505 (Figure 3). The type of construction would be concrete panels and concrete floor to match the existing structure. Cargo doors would be located on the

west and east sides of the addition. A monorail overhead crane system would be attached to the structure, and a dust collection system would be provided on the roof. Utilities and the thermal spray coating systems would be installed. During the construction process, an existing overhead power line and an existing buried water line would be protected and/or relocated.

The deepest point of excavation would be 10-15 feet below ground surface (bgs). While open, the sides of any excavations would be sloped at 1.5 horizontal to 1.0 vertical or other such angle as approved by the design and geotechnical engineering contractors. The construction contractor would restore nearby surfaces to their original condition.

The environmental impacts of the proposed action are summarized in Section 4.5 of this document, and are discussed at greater length throughout Section 4 of this document.

2.3 No Action Alternative: Do Not Construct the Facilities

The no action alternative does not meet the selection criteria to supply sufficient capacity to meet USAF mission objectives; to reduce rework due to inconsistencies in the coating process; or to reduce or eliminate the use of chromic acid. However, the framework of an environmental assessment requires that the no action alternative must be considered even if it does not meet all of the selection criteria.

Under the no action alternative, it is predicted that Hill AFB may be unable to provide sufficient capacity for repair of landing gear and pneudraulic components of USAF aircraft. It is therefore possible that aircraft would be grounded, and mission requirements for sorties would not be met.

The environmental impacts of the no action alternative are summarized in Section 4.5 of this document, and are discussed at greater length throughout Section 4 of this document.

2.4 Identification Of Alternatives Eliminated From Further Consideration

Hill AFB project managers eliminated other potential locations for housing the proposed coating process for the following reasons. The parts are located in Building 505; the parts are prepared to be coated using the facilities in Building 505; and final grinding after coating is performed in Building 505. No other existing location is known that could support the proposed activity without new construction, and other locations (either on base or off base) would either cause mission delays due to transporting parts before and after the coating process, or require the construction of a much larger facility to house the storage, preparation, coating, and grinding activities.

Hill AFB engineers identified 5 developing technologies for repair of landing gear and pneudraulic components that have the potential to achieve mission requirements. The 5 potential technologies are:

- electroless nickel phosphorus;
- electroless nickel boron;

- PVD magnetron;
- cold spray; and
- nanocomposite plating.

None of these technologies has been approved by USAF, nor are they expected to be approved within the next few years.

3.0 EXISTING ENVIRONMENT

3.1 Air Quality

Hill AFB is located in Davis and Weber Counties, Utah. Neither county is in complete attainment status with federal clean air standards (Figure 4). Nonattainment areas fail to meet national ambient air quality standards (NAAQS) for one or more of the criteria pollutants: oxides of nitrogen (NO_x), sulfur dioxide (SO_2), ozone (O_3), particulates less than 10 microns in diameter (PM-10), carbon monoxide (CO), and lead. Davis County was upgraded from an ozone non-attainment area to a maintenance area, effective 1997. Current status according to the Utah Division of Air Quality (DAQ 2003) for the City of Ogden in Weber County (approximately 7 miles north of the proposed action) is designation as a non-attainment area for PM-10 and a maintenance area for CO.

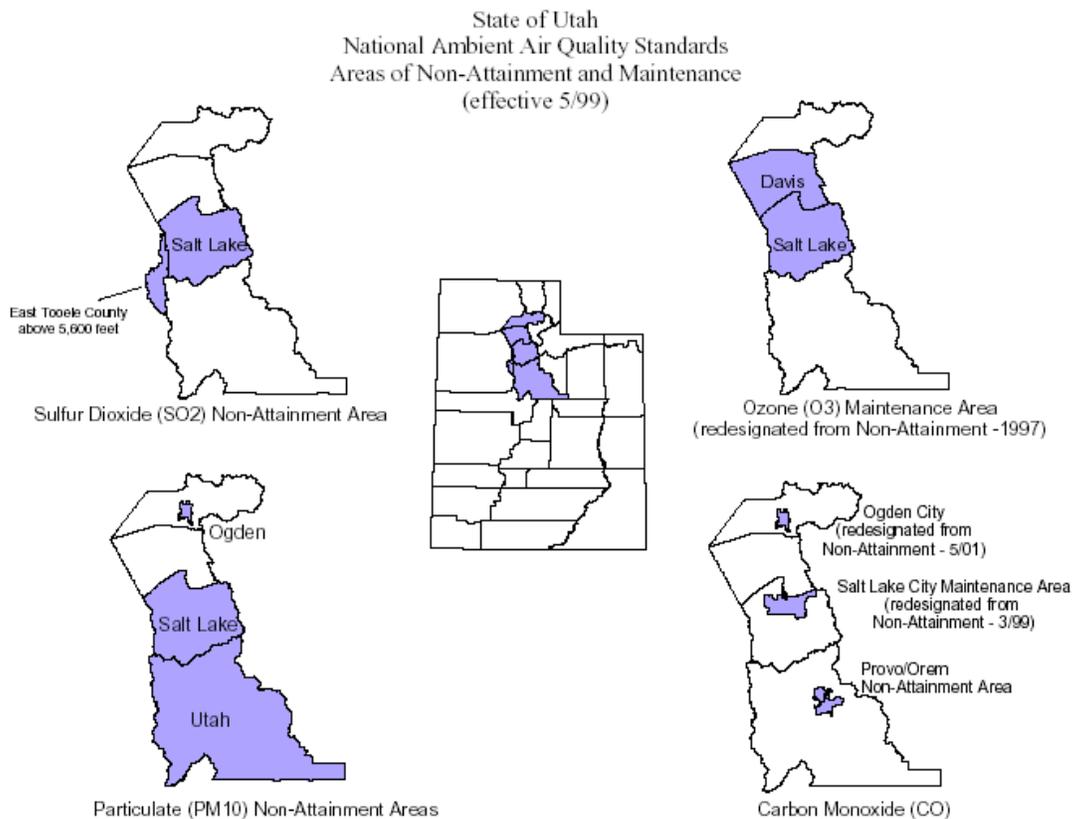


Figure 4: State of Utah National Ambient Air Quality Standards, Areas of Non-Attainment and Maintenance (Effective 5/99)

The current air quality trend at Hill AFB is one of controlling emissions as Hill AFB managers implement programs to eliminate ozone-depleting substances, limit use of volatile organic compounds (VOCs), install VOC emission control equipment for painting operations, switch to lower vapor pressure solvents and aircraft fuel, convert internal combustion engines from gasoline and diesel to natural gas, and improve the capture of particulates during painting and abrasive blasting operations (in compliance with the base's Title V air quality permit).

The aqueous chromium plating solutions contain chromic acid (hexavalent chromium). Potential worker exposures exist due to mists near the plating tanks (personal communication, Mr. Bruce Sartwell). However, indoor air quality in Building 505 is currently in compliance with OSHA and USAF regulations (personal communication, Ms. Cary Fisher).

For calendar year 2002, Hill AFB did not segregate airborne chromium emissions by location. However, the base wide total reported for 2002 was a negligible weight of 1.17 pounds (Bird 2003).

3.2 Solid and Hazardous Wastes

In general, hazardous wastes include substances that, because of their concentration, physical, chemical, or other characteristics, may present substantial danger to public health or welfare or to the environment when released into the environment or otherwise improperly managed. Hazardous wastes generated at Hill AFB are managed as specified in the *Hill AFB Hazardous Waste Management Plan* with oversight by personnel from the Environmental Management Directorate and the Defense Reutilization and Marketing Office. Hazardous wastes at Hill AFB are properly stored during characterization, and then manifested and transported off site for treatment and/or disposal.

The IWTP generates approximately 250 tons per year of hazardous wastewater sludge. The hazardous classification is due largely to the potential presence of hexavalent chromium and results of toxicity characteristic leaching procedure (TCLP) analyses for total chromium in the sludge.

Hill AFB hazardous waste management records indicate that under current practices, approximately 22,000 pounds per year of aqueous chromium (mostly in the hexavalent form) enter the IWTP from the plating operations in Building 505. IWTP has a process in place to treat hexavalent chromium, converting it to trivalent chromium. However, subsequent oxidizing environments, such as natural gas fired sludge dryers that were used in the past, can convert some of the trivalent chromium back to hexavalent chromium. There is also a potential for failure of the hexavalent chromium treatment process, which would cause hexavalent chromium to be present in IWTP sludge.

Recent results of TCLP analyses for total chromium in IWTP sludge are in the range of 4 part per million (ppm) to 12 ppm, compared to a hazardous threshold of 5 ppm.

3.3 Physical Environment

3.3.1 Surface Soils

The surface soils in the vicinity of proposed excavations are flat and covered with pavement. There is no known shallow soil contamination on the north side of Building 505 (personal communication, Ms. Shannon Smith).

3.3.2 Groundwater

Trichloroethene contamination has been detected in wells in the immediate vicinity of the proposed action (Hill 2001). However, in this area of Hill AFB, depth to groundwater is approximately 150 feet bgs (personal communication, Ms. Shannon Smith).

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Air Quality

4.1.1 Impacts of the Proposed Action

Emissions of PM-10 would be produced as soil is disturbed during proposed construction activities. The US Environmental Protection Agency (EPA) has estimated that fugitive dust emissions from construction activities produce 0.11 tons of PM-10 per acre per month (EPA 1996). The proposed action would involve approximately 1 week of excavation and backfill activities for approximately 0.25 acres being disturbed during construction of buried power lines, foundations, and pavement. Fugitive dust emissions of 0.007 tons of PM-10 were therefore calculated for the proposed action. To mitigate emissions of fugitive dust, the construction contractor would be required to have a water truck on site as needed during dry and windy weather for the purpose of dust suppression and reducing the emissions of PM-10.

The internal combustion engines of heavy equipment would also generate emissions of PM-10, VOCs, NO_x, and CO. Fugitive emissions from construction activities should be mitigated according to *Utah Administrative Code, Rule R307-205, Emission Standards: Fugitive Emissions and Fugitive Dust*. Good housekeeping practices should be used to maintain construction opacity at less than 20 percent. Haul roads should be kept wet, and any soil that is deposited on nearby paved roads by construction vehicles should be removed from the roads and returned to the site or appropriate disposal area.

Assumptions and estimated emissions for the construction period are listed in Table 1.

Table 1: Calculated Heavy Equipment Emissions

Data Assumptions							
Equipment Type	Diesel Emission Factor (lbs/hr)						
	VOC (HC)	CO	NO_x	PM10	HAPs	SO_x	
Asphalt Paver	0.28	1.24	2.96	0.24	0.05	0.25	
Concrete Truck	0.80	3.55	8.50	0.69	0.15	0.72	
Crane	2.14	6.96	17.08	2.39	0.33	1.54	
Dump Truck	0.63	2.04	6.98	0.58	0.16	0.65	
Flat Bed Truck	0.48	1.54	5.29	0.44	0.12	0.49	
Fork Lift	0.42	2.47	1.98	0.40	0.05	0.23	
Front End Loader	0.87	4.12	6.12	0.64	0.06	0.52	
Motored Grader	0.83	2.01	5.08	0.53	0.06	0.46	
Scraper	0.33	2.31	4.03	0.58	0.13	0.42	
Track Hoe	0.91	6.65	13.75	1.84	0.26	1.19	
Vibratory Compactor	0.38	1.44	4.31	0.36	0.09	0.46	
Water Truck	1.10	3.58	12.28	1.02	0.28	1.14	
Wheeled Dozer	0.46	1.48	5.08	0.35	0.08	0.49	
Note: VOCs = Hydrocarbons and HAPs = Aldehydes							
Source: Industry Horsepower Ratings and EPA 460/3-91-02							
Construct Thermal Spray Addition to Building 505							
EQUIPMENT TYPE	HOURS OF OPERATION	Diesel Emissions (lbs)					
		VOC	CO	NO_x	PM10	HAPs	SO_x
Asphalt Paver	10	2.8	12.4	29.6	2.4	0.5	2.5
Concrete Truck	24	19.2	85.2	204.0	16.6	3.6	17.3
Crane	16	34.2	111.4	273.3	38.2	5.3	24.6
Dump Truck	36	22.7	73.4	251.3	20.9	5.8	23.4
Flat Bed Truck	8	3.8	12.3	42.3	3.5	1.0	3.9
Fork Lift	4	1.7	9.9	7.9	1.6	0.2	0.9
Front End Loader	24	20.9	98.9	146.9	15.4	1.4	12.5
Motored Grader	4	3.3	8.0	20.3	2.1	0.2	1.8
Scraper	2	0.7	4.6	8.1	1.2	0.3	0.8
Track Hoe	24	21.8	159.6	330.0	44.2	6.2	28.6
Vibratory Compactor	16	6.1	23.0	69.0	5.8	1.4	7.4
Water Truck	20	22.0	71.6	245.6	20.4	5.6	22.8
Wheeled Dozer	8	3.7	11.8	40.6	2.8	0.6	3.9
TOTAL ESTIMATED EMISSIONS (lbs)		162.9	682.2	1668.9	175.0	32.2	150.5
TOTAL ESTIMATED EMISSIONS (tons)		0.08	0.34	0.83	0.09	0.02	0.08

Source of Hours: Discussions With 2Lt Jim Keller, Hill AFB CE Project Manager

No personnel would be present inside the thermal spray coating booths while the booths operate. Employees view the process from an external observation point. There would be no indoor air impacts resulting from ongoing operations of the proposed action. If the thermal spray coating process is implemented, it is estimated that 2 of the existing 5 aqueous chromium plating lines will no longer be required. Indoor air exposures to some workers could be reduced by removing 2 of the aqueous chromium plating lines from service (see Section 4.1.2).

As stated in Section 2.2, 8 spray booths are proposed, in which a tungsten carbide and cobalt based coating would be applied to landing gear and pneumatic components using a thermal spray coating process. The material most likely to be used for Air Force applications is 83% tungsten carbide and 17% cobalt. The Navy as a customer may at times request a formulation containing 86% tungsten carbide, 10% cobalt, and 4% chromium (not hexavalent). Both cobalt and chromium are listed by EPA as hazardous air pollutants (HAPs).

The thermal spray coating booths would exhaust air through high efficiency particulate air (HEPA) filters. Hill AFB environmental engineers have previously estimated airborne emissions from HEPA-filtered coating facilities very similar to the proposed thermal spray equipment. The estimated controlled particulate emission rate was 0.01 pounds per year per spray booth (Bird 2003). Using a worst case calculation for both cobalt (at 17%) and chromium (at 4%) in all 8 spray booths, the following results were calculated:

- $0.01 \times 8 \times 0.17 = 0.014$ pounds per year cobalt; and
- $0.01 \times 8 \times 0.04 = 0.003$ pounds per year chromium.

Related to conformity with Utah's State Implementation Plan, and therefore the Clean Air Act's General Conformity Rule and 40 CFR 93, the proposed action is expected to emit less than 500 pounds per year of a single HAP and less than 2,000 pounds per year of a combined HAPs. Therefore, it does not require a new source review. Conformity was determined to exist.

4.1.2 Impacts of the No Action Alternative

There would be no construction-related air quality impacts associated with the no action alternative.

The existing aqueous chromium plating tanks produce vapor and mist of hexavalent chromium compounds. OSHA defines permissible exposure limits (PELs) for contaminants found in plating shops. In the near future, OSHA is expected to issue new regulations lowering the PELs for chromium (as chromates) from the current PEL of 100 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to an 8-hr time-weighted average between 0.5 and $5.0 \mu\text{g}/\text{m}^3$, with an action level at one-half the PEL.

The ventilation control measures currently recommended by industrial hygienists and required by 29 CFR 1910.94 may not reduce employee exposure below a PEL of 0.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). It is therefore likely that additional respiratory protection would be required in addition to local exhaust ventilation to achieve the PEL of 0.5 $\mu\text{g}/\text{m}^3$. It is also possible that additional respiratory protection would be required even if OSHA sets the new PEL at a higher value of 5 $\mu\text{g}/\text{m}^3$.

Under the no action alternative, air emissions from Building 505 would stay the same as currently exist. For calendar year 2002, Hill AFB did not segregate airborne chromium emissions by location. However, the base wide total reported for 2002 was a negligible weight of 1.17 pounds.

4.1.3 Cumulative Impacts

Construction-related air emissions would be temporary. There are no cumulative impacts to air quality associated with operation of the proposed action. There are no cumulative air quality impacts associated with operation of the no action alternative.

4.2 Solid and Hazardous Wastes

4.2.1 Impacts of the Proposed Action

During the proposed construction activities, no solid wastes would be generated except for minor amounts of construction debris that would be treated as uncontaminated trash. It is possible that equipment failure or a spill of fuel, lubricants, or construction-related chemicals could generate solid or hazardous wastes. In such a case, or if excavated soils exhibit suspicious odors or appearance, the following procedures would apply on Hill AFB.

Hill AFB personnel have specified procedures for handling construction-related solid and hazardous wastes in their engineering construction specifications. The procedures are stated in *Section 01000, General Requirements, Part 1, General, Section 1.24, Environmental Protection*. All solid non-hazardous waste is collected and disposed on a daily basis. Samples from suspect wastes are analyzed for hazardous vs. non-hazardous determination. The suspect waste is safely stored while analytical results are pending. Hazardous wastes are stored at sites operated in accordance with the requirements of 40 CFR 265. The regulations require the generator to characterize hazardous wastes with analyses or process knowledge. Hazardous wastes are eventually labeled, transported, treated, and disposed in accordance with federal and state regulations.

The proposed thermal spray booths in Building 505 would use dust collection drums and HEPA filters. Based on current experience with similar processes in Building 511, it might take 5-10 years to fill a 55 gallon drum with dust for disposal. The dust would be tested for hazardous constituents prior to disposal, but it is believed the dust will be confirmed to be non hazardous (personal communication, Mr. Blake Peterson). The

HEPA filters would also be anticipated to be non hazardous, and on a 5-10 year changeout schedule. The report by Concurrent Technologies Corporation (CTC 2003) stated *“the material can be sold to a third party for reprocessing, with the proceeds offsetting any internal handling costs.”* A representative for the manufacturer of the coating powders (Praxair Surface Technologies) stated their waste powder has been tested, and passed the TCLP, to be classified as non hazardous (personal communication, Mr. John Barry).

The proposed action would not generate any wastewater. If the proposed action is implemented, and 2 of the existing 5 aqueous chromium plating lines are removed from service, hexavalent chromium loading to the IWTP would be reduced by approximately 8,800 pounds per year. This would in turn reduce the likelihood that hexavalent chromium would appear in IWTP sludge. TCLP results for total chromium in IWTP sludge would be reduced, supporting the goal of eventually reducing chromium concentrations below the hazardous threshold of 5 ppm.

Due to the remaining hexavalent chromium loading to the IWTP, the proposed action would not have a significant effect on operations at the IWTP or its ability to remain in compliance with the conditions of its industrial pretreatment permit.

4.2.2 Impacts of the No Action Alternative

With respect to solid and hazardous wastes, current conditions would continue under the no action alternative (see Section 3.2).

4.2.3 Cumulative Impacts

Proper handling of solid and hazardous wastes eliminates releases of contaminants to the environment. There are no cumulative solid or hazardous waste impacts associated with the proposed action. There are no cumulative solid or hazardous waste impacts associated with the no action alternative.

4.3 Physical Environment

4.3.1 Surface Soils

4.3.1.1 Impacts of the Proposed Action

The surface soils in the vicinity of the proposed excavation are flat and covered with pavement. The area disturbed by excavation would be backfilled and pavement would be replaced. The proposed action would not impact surface soils.

4.3.1.2 Impacts of the No Action Alternative

With respect to surface soils, the no action alternative has no impacts.

4.3.1.3 Cumulative Impacts

There are no cumulative impacts to surface soils associated with the proposed action or with the no action alternative.

4.3.2 Groundwater

4.3.2.1 Impacts of the Proposed Action

Contaminated groundwater exists beneath the proposed action, at a depth of approximately 150 feet bgs (personal communication, Ms. Shannon Smith). The anticipated depth of excavation would not exceed 15 feet bgs, and no contact with groundwater would exist.

4.3.2.2 Impacts of the No Action Alternative

With respect to groundwater, the no action alternative has no impacts.

4.3.2.3 Cumulative Impacts

There are no cumulative impacts to groundwater resources associated with the proposed action or the no action alternative.

4.4 Summary of Impacts

The proposed action and the no action alternative were both considered in detail. Following the construction phase, backfill and paving operations would prevent erosion of the site. The proposed action could be implemented with minor air emissions of both short term and long term duration. The proposed action would be expected to reduce indoor air exposures to workers who are responsible for overhaul and repair of landing gear and pneudraulic components in accordance with USAF technical order specifications. The small amounts of solid residue generated by the proposed action would not be expected to be classified as hazardous waste. The proposed action would reduce hexavalent chromium and total chromium loading to the IWTP. No long-term environmental impacts are expected from either the proposed action or the no action alternative.

Table 2: Summary Comparison of Alternatives

Issue	<u>Proposed Action</u> Construct the Thermal Spray Addition to Building 505	<u>No Action</u> Do Not Construct the Addition
Air Quality	Temporary construction-related emissions. Worker exposures may be reduced. Emissions of less than 0.017 pounds per year of HAPs would be expected.	Current conditions would continue.
Solid and Hazardous Wastes	Would not be generated as solids. Chromium and hexavalent chromium loading to the IWTP would be reduced.	Current conditions would continue.
Surface Soils	Construction-related erosion control measures may be required.	No impact.
Groundwater	No impact (contaminated groundwater is below the maximum depth of excavation).	No impact.

5.0 LIST OF PREPARERS

ML Technologies
1713 N. Sweetwater Lane, Farmington UT 84025
(801) 451-7872
Randal B. Klein, P.E., Project Manager

Environmental Management, OO-ALC/EMR
7274 Wardleigh Road, Hill AFB UT 84056
(801) 777-0383
Kay Winn, NEPA Manager

6.0 LIST OF PERSONS AND AGENCIES CONSULTED

Environmental Management, OO-ALC/EM
7274 Wardleigh Road, Hill AFB UT 84056
Kay Winn, NEPA Manager, (801) 777-0383
Dana McIntyre, Stormwater Program, (801) 775-3651
Shannon Smith, IRP Project Manager, (801) 775-6913

Maintenance Directorate, Commodities Division, OO-ALC/MAN
Building 507, Hill AFB UT 84056
Linda MacCauley, Facility Engineer, (801) 775-6298
Brian Kemp, Facility Engineer, (801) 777-9269
Grant Cheever, Mechanical Engineer, (801) 777-4171
Nate Hughes, Process Engineer, (801) 777-4181
Blake Peterson, Thermal Spray Specialist, (801) 777-3485

Maintenance Directorate, Environmental and Safety Branch, OO-ALC/MAPE
Building 507, Hill AFB UT 84056
Brad Christensen, Branch Chief, (801) 777-1475

Civil Engineering, 75CEG
7302 Wardleigh Road, Hill AFB UT 84056
2Lt Jim Keller (Project Manager), (801) 777-1214

Bioenvironmental Engineering, 75 MDG/SGPB
Building 249, Hill AFB UT 84056
Cary Fisher (Supervisor, Industrial Hygienist), (801) 777-1053

Naval Research Laboratory
4555 Overlook Ave. S.W.
Washington, DC 20375
Bruce Sartwell, Env. Technology Program Manager, (202) 767-0722

EMAssist
7274 Wardleigh Road, Hill AFB UT 84056
Dwight V. Bird, P.E., Mechanical/Environmental Engineer, (801) 777-3932

Concurrent Technologies Corporation
Louisville KY
Anne Kaltenhauser, (502) 897-7815

Praxair Surface Technologies
Indianapolis IN
John Barry, Safety and Env. Services Mgr., (317) 240-2484

7.0 REFERENCES

Bird 2003: e-mail from Dwight Bird, P.E., mechanical/environmental engineer (contractor).

CFR: *Code of Federal Regulations*, US Government Printing Office, Office of the Federal Register (various sections and dates).

CTC 2003: *Draft Cost Benefit Analysis of Hard Chromium Vs. High-Velocity Oxygen-Fuel Thermal Spray Coatings for Landing Gears and Actuators*, Concurrent Technologies Corporation, 2003.

DAQ 2003: *State of Utah National Ambient Air Quality Standards, Areas of Non-Attainment and Maintenance (Effective May, 1999)*, Utah Division of Air Quality Website, July, 2003.

EPA 1991: *Nonroad Engine and Vehicle Emission Study - Report*, Table 2-07a, US Environmental Protection Agency, 1991.

EPA 1996: *National Air Pollutant Emission Trends, Procedures Document for 1900-1996*, US Environmental Protection Agency, Page 4-285, 1996.

Hill AFB: *Construction Specifications, Section 01000, General Requirements, Part 1, General, Section 1.24, Environmental Protection*, Hill AFB, UT, current version.

Hill AFB 2001: *Hill AFB 2001 Environmental Restoration Management Action Plan (Web Pages)*, <http://www.em.hill.af.mil/restoration/Map02/hill.html> and <http://www.em.hill.af.mil/restoration/Map02/ou8.html>.

FINDING OF NO SIGNIFICANT IMPACT

1. NAME OF ACTION: Construct a thermal spray addition to Building 505 at Hill Air Force Base (AFB), Utah.

2. DESCRIPTION OF THE PROPOSED ACTION: Hill AFB proposes to accommodate current United States Air Force (USAF) missions by constructing a thermal spray addition to Building 505 on Hill AFB.

The proposed action includes all work necessary to construct a thermal spray addition to Building 505 at Hill AFB. The proposed addition would house a quantity of 8 spray booths, in which a tungsten carbide and cobalt based coating would be applied to landing gear and pneudraulic components using a thermal spray coating process. The proposed structure would consist of approximately 7,000 square feet situated on the north side of Building 505. The type of construction would be concrete panels and concrete floor to match the existing structure. Cargo doors would be located on the west and east sides of the addition. A monorail overhead crane system would be attached to the structure, and a dust collection system would be provided on the roof. Utilities and the thermal spray coating systems would be installed. During the construction process, an existing overhead power line and an existing buried water line would be protected and/or relocated.

3. SELECTION CRITERIA: The following criteria were used to assemble alternatives. The future facility and repair technology for surfaces of hydraulic and pneudraulic equipment and landing gear at Hill AFB should:

- be adjacent to the related activities of: parts storage; preparation of parts for coating; and final grinding after the coating process is completed;
- have sufficient space to house all of the required equipment;
- provide sufficient capacity to meet USAF mission objectives;
- be a technology that is approved by USAF technical orders;
- reduce rework due to inconsistencies in the coating process;
- reduce or eliminate the use of chromic acid in compliance with *Executive Order 13148 Section 502*; and
- be protective of facilities, human health, and the environment

4. ALTERNATIVES CONSIDERED OTHER THAN THE PROPOSED ACTION:

Under the no action alternative, it is predicted that Hill AFB may be unable to provide sufficient capacity for repair of landing gear and pneudraulic components of USAF aircraft. It is therefore possible that aircraft would be grounded, and mission requirements for sorties would not be met.

Hill AFB planners and engineers evaluated several alternative locations and technologies for coating of landing gear and pneudraulic components. These alternatives were not

retained for detailed consideration due to logistical issues such as proximity to related processes, and lack of USAF approval for alternative technologies.

5. SUMMARY OF ANTICIPATED ENVIRONMENTAL EFFECTS:

a. Proposed Action: This alternative fully satisfies all applicable regulations and provides for accomplishment of mission objectives without significant impacts to human health or the environment. The proposed action could be implemented with minor environmental impacts. Following the construction phase, backfill and paving operations would prevent erosion of the site. The proposed action could be implemented with minor air emissions of both short term and long term duration. The proposed action would be expected to reduce indoor air exposures to workers who are responsible for overhaul and repair of landing gear and pneudraulic components in accordance with USAF technical order specifications. The small amounts of solid residue generated by the proposed action would not be expected to be classified as hazardous waste. The proposed action would significantly reduce hexavalent chromium and total chromium loading to the Hill AFB industrial wastewater treatment plant (IWTP). No adverse cumulative environmental impacts are expected.

b. No Action Alternative: Under the no action alternative, current conditions would continue. Opportunities to reduce potential worker exposures to chromium and loading to the IWTP would not be realized. Under the no action alternative, it is predicted that Hill AFB may be unable to provide sufficient capacity for repair of landing gear and pneudraulic components of USAF aircraft.

6. FINDING OF NO SIGNIFICANT IMPACT: Based on the above considerations, a Finding of No Significant Impact (FONSI) is appropriate for this assessment.

Approved by:

Environmental Protection
Committee Chairman

Date: _____