

STATE OF MISSOURI  
**DEPARTMENT OF NATURAL RESOURCES**



**MISSOURI HAZARDOUS WASTE MANAGEMENT FACILITY  
PART I PERMIT**

**PERMIT NUMBER: MOD000818963**

**PERMITTEE**

Owner and Operator: The Boeing Company  
P.O. Box 516  
St. Louis, MO 63166

**FACILITY LOCATION**

The Boeing Company – Hazelwood, Tract 1  
James S. McDonnell Boulevard and Lindbergh Boulevard  
Hazelwood, MO 63145  
St. Louis County  
North Latitude – 38°45'25"  
West Longitude – 90°21'55"

**FACILITY DESCRIPTION**

The Boeing Company operated an aerospace manufacturing facility located at McDonnell Douglas Boulevard and Lindbergh Boulevard, called Tract 1, in Hazelwood, St. Louis County. The total acreage for Tract 1 is approximately 210 acres. Facility activities primarily consisted of the manufacturing of fighter aircraft and aircraft components. Processes included the fabrication of aluminum, titanium, composite structures, and other air frame material. The manufacturing processes also included metal cutting, metal forming and grinding, degreasing, painting, aircraft assembly, aircraft fueling, and aircraft flight testing.

The Tract 1 facility is divided into two sections: Tract 1 North is located north of Banshee Road and Tract 1 South is located south of Banshee Road. In 2001, Boeing sold a portion of Tract 1 North, 87.88 acres, to GKN Aerospace, who manufactures aircraft components. In 2001, most of Tract 1 South, 75.99 acres, was sold to the St. Louis Lambert International Airport (“Airport”). A portion of the permitted property owned by the Airport is used as a runway protection zone and does not contain any buildings. The remaining portion of the permitted property owned by the Airport is being leased to tenants for commercial and light industrial use. The remaining portion of Tract 1 South consists of approximately 23 acres and is owned by the Airport, and was leased by the Airport to Boeing for use in Boeing’s flight ramp operations supporting Tract 1 until 2004, at which time the lease terminated. Boeing retained ownership of 40.43 acres of Tract 1 North and 5.11 acres of Tract 1 South. Property maintained by Boeing includes the former Power Plant and Industrial Water Treatment Plant, as well as office and warehouse facilities. The property is primarily surrounded by commercial and light industrial businesses to the north, east, and west and the St. Louis Lambert International Airport to the south.

The Permittee has completed a Resource Conservation and Recovery Act Facility Investigation and a Corrective Measures Study Report for Solid Waste Management Units and Areas of Concern at the facility. The Permittee also completed several interim measures/stabilization activities at the facility. All interim status and permitted regulated hazardous waste management units have been closed or deferred to the corrective action process governed by this Permit. All closure certifications submitted by the Permittee have been accepted by the Department. The general facility location is shown in Figure 1. The facility property boundaries are shown in Figure 2.

Subarea 6A (GKN Facility) and Area 7 (Engineering Campus) which were previously part of the permitted facility property have been removed from the jurisdiction of this Permit, due to absence of contamination related to releases at the facility. Subarea 6A consists of 27.307 acres owned by GKN. Area 7 consists of 24.088 acres owned by Boeing. Area 8 (Office Complex North) will be removed from the jurisdiction of the permit once the Environmental Covenant is executed, recorded, and proof of recording is provided to the Department. Area 8 consists of 14.44 acres owned by Boeing. Figure 3 represents the areas that are included in this permit.

### **PERMITTED ACTIVITIES**

This Permit requires implementation of a facility-wide corrective action program to address known releases to the environment from Solid Waste Management Units and Areas of Concern. This Permit also contains contingent corrective action conditions to

address any newly-identified releases to the environment from previously- or newly-identified Solid Waste Management Units and Areas of Concern, as necessary and appropriate.

EFFECTIVE DATES OF PERMIT: November 15, 2017 to November 14, 2027

November 15, 2017  
Date

[Original signed by John D. Jurgensmeyer]

John D. Jurgensmeyer, Director  
HAZARDOUS WASTE PROGRAM

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## INTRODUCTION

After public notice, according to Code of State Regulations 10 CSR 25-8.124, and review of The Boeing Company's Missouri Hazardous Waste Management Facility Permit Application (hereafter referred to as the application), the Missouri Department of Natural Resources (hereafter referred to as the Department) has determined the application conforms to the provisions of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976 (RCRA) and regulations promulgated thereunder by the U.S. Environmental Protection Agency (hereafter referred to as EPA) (codified and to be codified in Title 40 of the Code of Federal Regulations) and the Missouri Hazardous Waste Management Law (and all standards, rules, and regulations adopted under this act), Section 260.350, et seq., of the Missouri Revised Statutes (RSMo). Pursuant to Section 260.375.13, RSMo. and the Solid Waste Disposal Act, the Department hereby approves the application and issues Permit Number MOD000818963 to The Boeing Company, as the facility owner and operator, (hereafter referred to as the Permittee) for "active" corrective action activities, including implementation of a final remedy. This Permit also includes "contingent" corrective action requirements that may be triggered, if necessary, for Solid Waste Management Units and Areas of Concern, pursuant to the state equivalent requirements of the federal Hazardous and Solid Waste Amendments of 1984 (HSWA) of RCRA, as administered and enforced by the Department. Applicable regulations are found in 40 CFR Parts 260 through 264, 266, 268, and 270, and 10 CSR 25-7, as specified in this Permit. The Department is issuing this Missouri Hazardous Waste Management Facility (MHWMF) Part I Permit (hereafter referred to as the Permit) under state authority.

All citations to federal regulations throughout this Permit are for the sake of convenient reference. The federal regulations are adopted by reference in 10 CSR 25. In instances where state regulations are more stringent, the appropriate state reference is given and shall apply.

The provisions of this Permit are severable. If any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

All permit application information shall be available to the public unless the Permittee requests nondisclosure in writing, as described in Section 260.430, RSMo and 10 CSR 25-7.270(2)(B)2. This Permit and accompanying materials shall be available for review by the public at the Department's office in Jefferson City, Missouri.

Any appeals of this Permit, or specific permit conditions based on state authority, shall be filed according to 10 CSR 25-8.124(2). Any parties adversely affected or aggrieved by this decision may be entitled to pursue an appeal before the Administrative Hearing Commission (AHC). To appeal, the party shall file a petition with the AHC within 30 calendar days after the date this Permit was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, then it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC can be found online at <http://ahc.mo.gov>, or by calling (573) 751-2422. The Department also requests that a copy of any appeal request be provided to the Director of the Department's Hazardous Waste Program, P.O. Box 176, Jefferson City, MO 65102-0176.

The following shall collectively be referred to as the "approved permit application":

- Missouri Hazardous Waste Management Facility Permit Application, dated February 28, 2007, with revisions dated August 19, 2009.
- Additional technical information, dated December 9, 2010.
- RCRA Facility Investigation (RFI) Report, dated June 18, 1998, and approved December 22, 2004.
- Risk-Based Corrective Action (RBCA) Report, Boeing Tract 1, dated September 2004, and associated Addenda approved August 24, 2009.
- Focused Corrective Measures Study (CMS) Report, dated July 22, 2014, and approved July 24, 2014.
- Boeing Permitted Facility, Excavated Soil Management Plan, dated January 2011, with revisions dated July 2013.

The "consolidated permit application" is defined as the approved permit application, any changes resulting from the public comment period, and all additional documents required to be submitted under the Schedule of Compliance contained in this Permit. The Permittee shall maintain a copy of all documents outlined above with the original consolidated permit application at the facility.

Any inaccuracies found in information submitted by the Permittee may be grounds for the termination, revocation and reissuance, or modification of this Permit, according to

40 CFR Part 270 Subpart D, incorporated by reference in 10 CSR 25-7.270(1), and for potential enforcement action. The Permittee shall inform the Department of any deviation from, or changes in, the information in the application, which would affect the Permittee's ability to comply with the applicable regulations or permit conditions.

When the Department receives any information, such as inspection results, information from the Permittee, or requests from the Permittee, it may decide whether cause exists to modify, revoke and reissue, or terminate this Permit. All such changes to this Permit shall be handled according to the requirements of 10 CSR 25-8.124 and 40 CFR Part 270 Subpart D, as incorporated by reference in 10 CSR 25-7.270(1).

Corrective action program activities shall be according to the provisions of this Permit, the Missouri Hazardous Waste Management Law (Sections 260.350 to 260.434, RSMo), the rules and regulations promulgated thereunder [Code of State Regulations, Title 10, Division 25 (10 CSR 25)] as effective on the date of this Permit, all final engineering plans, petitions, specifications, and operating procedures that were submitted to the Department during the permit application review process, which are included in the final version of the permit application, and any other conditions, changes, or additions to the engineering plans, specifications, and operating procedures as specified in this Permit. The consolidated permit application, which includes the final engineering plans, specifications, and operating procedures, is therefore incorporated by this reference into the conditions of this Permit. All conditions specified in this Permit supersede any conflicting information in the consolidated permit application. Where conflicts arise between documents, the latest revision shall be effective.

This Permit for corrective action activities and is issued only to the Permittee named above. This Permit is issued for a period of ten years and expires at midnight on November 14, 2027. This Permit is subject to review and modification by the Department, according to Section 260.395.12, RSMo and 40 CFR 270.41, as incorporated by reference in 10 CSR 25-7.270(1). According to 40 CFR 270.51, as incorporated by reference in 10 CSR 25-7.270(1), if a timely and complete application is submitted, the conditions of this Permit will continue in force until the effective date or denial of a new permit.

On July 6, 1999, Missouri received final authorization for revisions to its hazardous waste management program, including the corrective action portion of the HSWA Codification Rule (July 15, 1985, 50 FR 28702), which had been previously adopted by the state. Thus, the corrective action requirements implemented by the state in lieu of EPA are incorporated into this Permit and are under state authority.

40 CFR 264.101(a), as incorporated by reference in 10 CSR 25-7.264(1), requires all owners or operators of facilities seeking a Permit for treating, storing, or disposing hazardous waste, to institute corrective action as necessary to protect human health and the environment from all releases of hazardous wastes or hazardous constituents from any Solid Waste Management Unit, regardless of the time at which waste was placed in such unit.

40 CFR 264.101(b), as incorporated by reference in 10 CSR 25-7.264(1), requires that permits issued under the Hazardous Waste Management Law contain a schedule of compliance for corrective action (where corrective action cannot be completed before permit issuance) and assurances of financial responsibility for completing such corrective action.

40 CFR 264.101(c), as incorporated by reference in 10 CSR 25-7.264(1), requires corrective action to be taken by the facility owner or operator beyond the facility property boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action. 40 CFR 264.101(c) further stipulates that the owner or operator is not relieved of any responsibility to cleanup a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases shall be determined on a case-by-case basis. In addition, assurances of financial responsibility for completing such corrective action shall be provided, according to 40 CFR 264.101.

40 CFR 270.32(b)(2), as incorporated by reference in 10 CSR 25-7.270(1), and Section 260.395.12, RSMo, require that each permit issued under that section contain terms and conditions as the Department determines necessary to protect human health and the environment.

The Permittee is required to comply with all applicable environmental laws and regulations enforced by the Department. These environmental laws and regulations are administered by the Air Pollution Control Program, Hazardous Waste Program, Land Reclamation Program, Solid Waste Management Program, and Water Protection Program. Failure to comply with these environmental laws and regulations may, in certain circumstances, result in the suspension or revocation of this Permit and may subject the permit holder to civil and criminal liability.

## DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in RCRA and 40 CFR Parts 260, 261, 264, 266, 268, and 270, and 10 CSR 25, unless this Permit specifically provides otherwise. Where terms are not defined in RCRA, the regulations, this Permit, or EPA guidance or publications, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

“Alternate Concentration Limit (ACL)” means a Department-approved groundwater maximum concentration for a hazardous constituent, facility-related contaminant, or combination thereof, in the groundwater that will not pose a substantial present or potential hazard to human health or the environment, as long as that concentration limit is not exceeded.

“Approved Permit Application” means the original permit application and all subsequent revisions or addenda to the permit application, and any completeness and technical information submitted as referenced in the Introduction of this Permit.

“Area of Concern (AOC)” means any area where an actual or potential release of hazardous wastes or hazardous constituents that is not from a Solid Waste Management Unit has occurred or is occurring and is determined by the Department to pose a current or potential threat to human health or the environment. Investigation and/or remediation of AOCs may be required pursuant to Section 260.395, RSMo, and 40 CFR 270.32(b)(2), as incorporated by reference in 10 CSR 25-7.270(1).

“Consolidated Permit Application” means the approved permit application, any changes resulting from the public comment period, and all additional documents required to be submitted under the Schedule of Compliance contained in this Permit.

“Director” means the Director of the Missouri Department of Natural Resources or authorized delegate.

“Facility” means:

- (1) All contiguous land and structures, other appurtenances, and improvements on the land used for treating, storing, or disposing hazardous waste; and
- (2) All contiguous property under the control of the owner or operator, for the purpose of implementing corrective action under 40 CFR 264.101, as

incorporated by reference in 10 CSR 25-7.264(1) and as specified in this Permit.

“Hazardous constituent” means any chemical compound listed in 40 CFR Part 261 Appendix VIII, as incorporated in 10 CSR 25-4.261.

“Hazardous waste” means any waste, or combination of wastes, as defined by or listed in 10 CSR 25-4, which, because of its quantity, concentration, physical, chemical, or infectious characteristics, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness or which may pose a threat to the health of humans or other living organisms.

“Interim/Stabilization Measures (ISMs)” means actions to control or abate threats to human health and/or the environment from releases at RCRA facilities and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued.

“Point of Exposure (POE)” means the point at which a potential receptor could come in contact, either now or in the future, with the contaminated groundwater. The contaminant concentrations identified in Table I must meet the Groundwater Protection Standard (GPS) at and beyond the POE, which in this case corresponds to the boundaries of the permitted facility property.

“Points of Compliance” means the locations at which groundwater concentrations are measured to demonstrate the concentrations at and beyond the POE will not exceed the GPS contained in Table I.

“Release” means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes or hazardous constituents into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

“Solid Waste Management Unit (SWMU)” means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

**SCHEDULE OF COMPLIANCE**

- I. Within 60 calendar days after the effective date of this Permit, the Permittee shall:
  - A. Submit to the Department two paper copies and one searchable electronic copy of the consolidated permit application, incorporating any changes resulting from public participation comments on the draft Permit, as required by 10 CSR 25-7.270(2)(B)7. and defined in the Introduction of this Permit.
  - B. Submit to the Department a certification by the Permittee that the Permittee has read this Permit in its entirety and understands all permit conditions contained in this Permit.
  - C. Submit to the Department, to the attention of the Hazardous Waste Program, Permits Section, a check or money order payable to “State of Missouri” for any outstanding engineering review costs.
  - D. Submit to the Department, to the attention of the Hazardous Waste Program, Permits Section, a check or money order payable to “State of Missouri” for \$1000 for each year this Permit is to be in effect beyond the first year. This Permit is effective for ten years. Since the Permittee submitted a \$1000 deposit with the permit application and paid a \$1000 permit continuation fee for the current year, the remaining balance to be submitted by the Permittee is calculated as:

$$\text{Remaining balance} = \$9000.00 - \frac{\$1000.00}{365 \times \text{days}} \times N_d$$

where  $N_d$  equals the number of calendar days from the expiration date of the continued permit (which coincides with the anniversary date of the original permit issuance) to the date of permit reissuance. An invoice is included with this Permit based on the foregoing formula.

- II. Within 90 calendar days after the effective date of this Permit, the Permittee shall submit to the Department for evaluation, an updated, detailed corrective action cost estimate, in current dollars, of the cost of hiring a third party to perform the corrective action activities required by this Permit. This cost estimate shall be developed using appropriate cost estimating software or other methods, and

shall be certified by a registered professional engineer or registered geologist licensed in Missouri.

- III. Within 30 calendar days after receipt of the Department's final written response of the review of the corrective action cost estimate, the Permittee shall submit to the Department, all documentation necessary to demonstrate the Permittee satisfies the financial assurance criteria, in accordance with 40 CFR 264.145, as incorporated by reference in 10 CSR 25-7.264(1).
- IV. Within ten calendar days after receiving the Department's final written response regarding the draft updates to the financial assurance instrument(s), the Permittee shall execute or otherwise finalize all instruments or other documents required in order to make the selected financial assurance legally binding. The update shall be in a form identical to the draft financial assurance documents reviewed by the Department.
- V. Within 30 calendar days after receiving the Department's final written response regarding the draft updates to the financial assurance instrument(s), the Permittee shall ensure the issuing institution submits all original executed and/or otherwise finalized instruments or other documents to the Department. Facsimiles or photocopies are not acceptable.
- VI. Within 90 calendar days after the effective date of this Permit, the Permittee shall submit to the Department for approval, a Corrective Measures Implementation (CMI) Work Plan. The CMI Work Plan shall be based on the final remedy decision and shall comply with the requirements of this Permit. The Permittee shall submit as part of the CMI Work Plan:
  - A. An Operation, Maintenance, and Monitoring Plan (OM&M Plan). The OM&M Plan shall comply with the requirements of this Permit.
  - B. A Site Security Program specifying access controls, including fencing, controlled access to wells, posting warning signs, and designated operating areas for workers and visitors.
  - C. A revised Sampling and Analysis Plan (SAP), consistent with approved CMS, to reflect any additional requirements contained in this Permit, as required in Corrective Action Condition I.C.1. of this Permit. The SAP shall include a Health and Safety Plan (HASP), specifying health and safety procedures at the facility and provisions for activities performed during

long-term groundwater, surface water, and groundwater containment performance monitoring.

- VII. Within 60 calendar days after the effective date of this Permit, the Permittee shall:
- A. Execute the Environmental Covenants and submit the Environmental Covenants for signature by all other relevant parties needed to file the Environmental Covenants in the property chains-of-title, consistent with the approved CMS. Such covenants are needed to mitigate potentially unacceptable future exposures to residual contamination at the facility.
  - B. Within 15 calendar days after all relevant parties have executed the Environmental Covenants, the Permittee shall record with the county recorder of deeds, the local zoning authority, or the authority with jurisdiction over local land use, according to state law, the executed Environmental Covenants in the chains of title for the facility property or on some other instrument that is normally examined during title search that will, in perpetuity, notify any potential purchaser of the environmental conditions of the property.
  - C. Within 30 calendar days after recording the executed Environmental Covenants in the chains of title for the facility property or other instrument normally examined during a title search, the Permittee shall submit to the Department a notarized statement certifying the Environmental Covenants have been recorded. Copies of the recorded pages that show the Environmental Covenants have been recorded and become part of the property records shall be included with the notarized statement.
- VIII. The Permittee shall comply, as necessary, with all planned and contingent corrective action requirements of this Permit, as specified in the Corrective Action Conditions of this Permit and as summarized in Tables 5 and 6.

## **SUBMITTAL OF REQUIRED INFORMATION**

- I. Unless otherwise requested by the Department, the Permittee shall submit two paper copies and one searchable electronic copy of all reports, documents, and plans/specifications required under the terms of this Permit to:

Chief, Permits Section  
Missouri Department of Natural Resources  
Hazardous Waste Program  
P.O. Box 176  
Jefferson City, MO 65102-0176

- II. The Permittee shall submit one paper copy and one searchable electronic copy of all reports, documents, and plans/specifications required under the terms of this Permit to:

Chief, Waste Remediation and Permitting Branch  
U.S. Environmental Protection Agency Region 7  
Air and Waste Management Division  
11201 Renner Boulevard  
Lenexa, KS 66219

- III. If the Permittee requires additional time to submit a scheduled document or perform other activities required by this Permit, the Permittee shall submit a written extension request to the Department in accordance with Corrective Action Condition XXII. of this Permit.

### **STANDARD PERMIT CONDITION**

- I. The Permittee shall comply with the requirements set forth in the Missouri Hazardous Waste Management Law and all corresponding standards, rules, and regulations adopted under this Law, Section 260.350, et seq., RSMo, 40 CFR Part 264 Subpart H, 40 CFR 264.101, 40 CFR 270.10, 40 CFR 270.30, 40 CFR 270.40, 40 CFR 270.42, and 40 CFR 270.51, as incorporated in 10 CSR 25-7 and 10 CSR 25-8.

### **GENERAL PERMIT CONDITIONS**

- I. The Permittee shall comply with the applicable requirements described in 40 CFR Part 264 Subparts B, C, D, E, G, and H, 40 CFR Part 268, and 40 CFR Part 270, as incorporated in 10 CSR 25-7 and 10 CSR 25-8.

- II. Notification of an Emergency Situation [Chapter 260.505.4, RSMo]

The Permittee shall, at the earliest practical moment upon discovery of an emergency involving the hazardous waste under the Permittee's control, implement the facility contingency plan, including notifying the Department's emergency response hotline at (573) 634-2436 and the National Response Center at 1-800-424-8802.

Within 15 calendar days of the incident occurrence, the Permittee shall submit a written report to the Department providing details. The content of the written report shall conform to 40 CFR 264.56(j), as incorporated by reference in 10 CSR 25-7.264(1), and be provided to the addressees listed in "Submittal of Required Information" provision.

- III. This Permit does not authorize the management of any non-hazardous solid waste outside of the hazardous waste management processes and units described herein. Handling of non-hazardous solid waste outside of the requirements of this Permit is subject to regulation under the state of Missouri's Solid Waste Management Law and regulations and is not authorized by this Permit.

## **SPECIAL PERMIT CONDITIONS**

In accordance with 40 CFR 270.32, as incorporated by reference in 10 CSR 25-7.270(1), the Department has established the following permit conditions for the Permittee and the hazardous waste facility at the location specified in this Permit.

I. Seismic Evaluation Requirements [40 CFR 270.32]

The Permittee has demonstrated compliance with the seismic requirements, as certified by a professional engineer registered in Missouri. The Permittee shall maintain the seismic evaluation in the facility operating record.

II. 100-Year Floodplain Requirements [40 CFR 264.18(b)]

The Permittee submitted information, as required in 40 CFR 270.14(b)(11)(iii) and 40 CFR 270.28, that identifies the active portion of the facility as not being located in a 100-year floodplain. The active portion in this case refers to SWMUs, AOCs, wells, and/or other waste management structures. The Permittee shall maintain this information in the facility operating record.

## **CORRECTIVE ACTION CONDITIONS**

The Permittee shall comply with all applicable groundwater monitoring and corrective action requirements contained in 40 CFR Part 264 Subparts F, as incorporated by reference in 10 CSR 25-7.264(1), and all provisions of this Permit, for all previously- and any newly-identified SWMUs, AOCs, and releases identified pursuant to the provisions of this Permit.

### **I. Groundwater Monitoring and Corrective Action Program [40 CFR 264 Subpart F]**

#### **A. Groundwater Protection Standards (GPS), Hazardous Constituents, and Concentration Limits [40 CFR 264.90(f) and 264.101]**

The GPS establishes the maximum concentrations for hazardous constituents (40 CFR 261, Appendix VIII) in groundwater related to releases originating on the permitted facility property that must not be exceeded where groundwater use is possible (i.e., beyond the permitted facility property boundaries) since no enforceable groundwater use restrictions currently exist on properties adjacent to the permitted facility. The hazardous constituents and related contaminants, currently published health- and/or environmental-based concentration limits, and maximum analytical detection limits specified in Table 1 of this Permit constitute the GPS for the Permittee's groundwater monitoring and corrective action program. The listed GPS hazardous constituents and related contaminants either have been detected in the groundwater beneath the permitted facility property and are reasonably expected to be in or derived from wastes managed at the SWMUs and AOCs at the facility.

1. The GPS for the hazardous constituents listed in Table 1 are based on protection of human health and the environment and were derived from several different sources as explained by the footnotes to Table 1.
2. The GPS for some hazardous constituents are below the lowest, reasonably achievable analytical method detection limit due to limitations in current analytical technology. In these cases, the GPS shall be equal to the constituent's lowest reasonably achievable analytical detection limit.
3. The allowable maximum detection limit shall never be greater than the GPS. If the GPS for specific hazardous constituents cannot be

achieved due to matrix interferences or other analytical limitations (provided that appropriate supporting documentation is provided), the affected sample(s) and associated chemical analysis shall be exempted from this requirement. However, such an exemption does not in any way relieve the Permittee from complying with the GPS.

4. The Department reserves the right, based on future advances in analytical technology, to modify this Permit to require the Permittee to achieve analytical detection limits for the hazardous constituents and related contaminants covered by Corrective Action Condition I.A.2. of this Permit, which allow for adequate comparison with appropriate health- or environmental protection-based GPS concentration limit(s) indicated in the footnotes to Table 1.
5. The Permittee shall demonstrate, by the ongoing collection of groundwater samples and evaluation of groundwater monitoring data, that the on- and off-property concentrations of contaminants in groundwater related to releases originating on the permitted facility property are protective of human health and the environment throughout the facility and are consistent with the approved CMS and risk assessment. Additionally, the Permittee may make a demonstration to the Department, at any time during the term of this Permit, for establishing Alternate Concentration Limits (ACLs) in lieu of the GPS contained in this Permit. Any such demonstration shall ensure any and all ACLs proposed in lieu of the GPS are protective of human health and the environment, according to the requirements of 40 CFR 264.94(B)(1) and (2), and are consistent with the approved CMS and risk assessment. In proposing an ACL(s), the Permittee shall consider and formally address those factors listed in 40 CFR.94(B)(1) and (2) and EPA's Interim Final Alternate Concentration Limit Guidance, Part 1, OSWER Directive 9481.00-6C, EPA 530/SW-87-017, July 1987. Any ACL(s) proposed by the Permittee shall be processed as a Class 3 Permit Modification in accordance with 40 CFR 270.42. Any final decision/approval by the Department regarding the Permittee's proposed ACLs shall be processed following completion of the public review and comment period for the proposed Class 3 Permit Modification.

6. The Permittee shall propose modification of the GPS to include any additional hazardous constituent(s) (40 CFR Part 261, Appendix VIII.) in the groundwater that is identified, and their presence confirmed, during future sampling and analysis, if such constituents may be attributed to past releases at the facility and/or the degradation of hazardous constituents known to be present in the groundwater. The Appendix IX. (40 CFR Part 264) groundwater sampling and analysis requirements contained in Corrective Action Condition I.E.6. of this Permit shall be used as the basis for determining if the addition of hazardous constituents to the GPS is necessary. The Permittee can demonstrate that a source other than facility related releases caused the presence of such hazardous constituent(s) or that the apparent presence was a result of an error in sampling, analysis, or evaluation. For the demonstration under this paragraph to be considered, the Permittee shall:
  - a. Within seven calendar days of determining that an additional hazardous constituent has been discovered, notify the Department in writing that the Permittee intends to make a demonstration under this paragraph.
  - b. Within 90 calendar days, submit a report to the Department that demonstrates a source other than the facility related releases caused the hazardous constituent presence or that the presence resulted from an error in sampling, analysis, or evaluation.

Any addition of hazardous constituents to the GPS as a result of the above determination shall require a Class 1 Permit Modification with prior Director's approval. Any other changes to the GPS list of hazardous constituents shall require a permit modification, in accordance with 40 CFR 270.42.

**Table 1 – Groundwater Protection Standards**

<b>Hazardous Constituent</b>	<b>Chemical Abstract Number</b>	<b>Maximum Concentration Limit (µg/l)</b>	<b>Maximum Detection Limit (µg/l)*</b>
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	10,000(c)	20
1,1-Dichloroethane	75-34-3	2.8(c)	1
1,1-Dichloroethylene	75-35-4	7(a)	5
1,2-Dichloroethylene (cis-)	156-59-2	70 (a)	5
1,2-Dichloroethylene (trans-)	156-60-5	100 (a)	5
1,2,3-trimethylbenzene	526-73-8	10 (c)	5
1,2,4-trimethylbenzene	95-63-6	15 (c)	5
2-butanone (MEK)	78-93-3	5600(c)	25
Acetone	67-64-1	14,000(c)	25
Benzene	71-43-2	5 (a)	2
Butylbenzene (n-)	104-51-8	1,000(c)	5
Butylbenzene (sec-)	135-98-8	2,000(c)	5
Chlorobenzene	108-90-7	100(a)	5
Dichlorodifluoromethane	75-71-8	200(c)	5
Isopropylbenzene	98-82-8	450(c)	5
Ethylbenzene	100-41-4	700(a)	5
Methylene Chloride	75-09-2	5(a)	5
Methyl tert-butyl ether	1634-04-4	14(c)	2
Naphthalene	91-20-3	20(b)	10
Propylbenzene (n-)	103-65-1	660(c)	5
Tetrachloroethylene	127-18-4	5 (a)	5
Trichloroethylene	79-01-6	5 (a)	5
Toluene	108-88-3	1,000(a)	5
Vinyl Chloride	75-01-4	2 (a)	2

\* Detection limit based on the lowest achievable practical quantitation limit available from the Permittee's contract laboratory.

- (a) Denotes limits derived from Missouri Public Drinking Water Standards (10 CSR 60-4, dated February 29, 2016) and National Primary Drinking Water Regulations (EPA 816-f-09-0004, May 2009).
- (b) Denotes limits derived from Missouri Water Quality Standards (10 CSR 20-7.031, dated January 29, 2014) for protection of groundwater.
- (c) Denotes limits derived from risk-based concentration values for tap water as contained in EPA Regional Screening Level Tables, dated June 2017 (TR=1E-6, HQ=1.0).

B. Points of Compliance [40 CFR 264.90(f)]

The points of compliance are represented by the various groundwater monitoring wells located throughout the groundwater contaminant plume, due to the current inability to distinguish releases from SWMUs and AOCs subject to 40 CFR 264.101 that are known to have contributed to groundwater contamination at the facility. Such points of compliance and the modified groundwater monitoring and corrective action requirements are established pursuant to 40 CFR 264.90(f).

The Permittee's groundwater corrective action program shall continue until the Permittee demonstrates that the GPSs contained in Table I have not been exceeded, and are not likely to be exceeded, at the POE and the on-property groundwater plume(s) are stable or declining for a period of three consecutive years. This demonstration shall include an assessment of the potential for significant "contaminant rebound" beyond the three consecutive year time period due to matrix and/or secondary porosity feature back diffusion or other relevant subsurface contaminant release mechanisms that could result in future plume expansion or exceedance of the GPS at the POE.

C. General Groundwater Monitoring Requirements [40 CFR 264.97].

The Permittee has previously submitted to the Department, a facility-related plan for groundwater monitoring. The SAP contains all sampling and analysis protocols and procedures to ensure accurate data is being obtained to determine the effectiveness of the groundwater monitoring and corrective action activities at the facility. The SAP also outlines the specific monitoring wells, constituents, and frequency for data collection for the corrective action, monitoring programs at the facility.

1. Within 90 calendar days of the effective date of this Permit, the Permittee shall revise and resubmit to the Department for review and approval, a revised SAP as a part of the OM&M Plan, to reflect any revised and additional requirements contained in this Permit. All SAP procedures and techniques used in groundwater sampling, sampling frequency, analysis, and measurement of groundwater-related parameters shall be designed to meet the requirements of 40 CFR Part 264 Subpart F, as incorporated by reference in 10 CSR 25-7.264(1), and this Permit. The Permittee's sampling,

analysis, and measurement protocols shall ensure the representative nature of all analysis and measurement results. The Department shall review and approve the SAP as part of the OM&M Plan, according to the procedures described in Corrective Action Condition XIX. of this Permit.

2. The Permittee shall retain a copy of the approved groundwater SAP with the local facility representative and/or at the facility and comply with the approved sampling and analysis procedures. The groundwater SAP shall describe sample collection, preservation, and shipment methodology; chain-of-custody procedures; and analytical methodology for field samples, trip blanks, and other quality control samples.
3. The Permittee's groundwater monitoring system shall be designed, installed, operated, and maintained in a manner that ensures:
  - a. Detection and/or delineation of the horizontal and vertical extent of groundwater contamination throughout the groundwater contaminant plume(s), including beyond the facility property boundary;
  - b. Determination of representative concentrations of hazardous constituents and contaminant plume indicator parameters in the groundwater, and
  - c. Determination of the effectiveness of any groundwater corrective action activities in terms of contaminant removal, destruction, and/or containment (plume stability).
4. The number, location, and depth of the Permittee's monitoring wells shall be sufficient to define the horizontal and vertical extent of groundwater contamination beneath the Permittee's property and beyond the facility property boundaries. If, at any time during the compliance period, including any necessary extensions, the Permittee or the Department determines the existing monitoring system fails to define the horizontal and vertical extent of groundwater contamination, the Permittee shall submit, within 30 calendar days of such determination by the Permittee or written

notification by the Department, a proposal for the installation of additional monitoring wells to define such extent.

At such time as the Department determines the Permittee has adequately redefined the horizontal and/or vertical extent of groundwater contamination, the wells defining such extent shall be incorporated into the groundwater monitoring system and be designated for continued monitoring in the Permittee's SAP. The Department shall notify the Permittee in writing regarding this determination. Within 30 calendar days of receipt of this notification, the Permittee shall submit appropriate SAP revisions to the Department for review and approval, according to the procedures described in Corrective Action Condition XIX. of this Permit.

5. Any new groundwater monitoring well(s) installed by the Permittee to meet the requirements of this Permit shall be designed and constructed according to the requirements of 40 CFR 264.97, applicable portions of the Missouri Well Construction Rules 10 CSR 23-1 through 10 CSR 23-4 (Monitoring Well Construction Code) and/or well-specific plans and specifications approved by the Department.

The Permittee shall submit to the Department, a copy of the well certification report form and the resulting certification acceptance required by 10 CSR 23-4.020 for any new monitoring wells installed pursuant to this Permit. This information shall be reported as part of the Semi-Annual Groundwater and Corrective Action Progress Report, described in Corrective Action Condition XV. of this Permit.

6. Plugging and abandonment of any groundwater monitoring well(s) operated by the Permittee pursuant to the requirements of this Permit shall meet the requirements of 10 CSR 23-4.080.
  - a. The Permittee shall submit to the Department's Hazardous Waste Program, a copy of the well registration report form and resulting registration acceptance required by 10 CSR 23-4.080, for any monitoring wells abandoned and plugged pursuant to this Permit. This information shall be reported as part of the Semi-Annual Groundwater and Corrective Action

Progress Report, described in Corrective Action Condition XV. of this Permit.

- b. At such time as the Permittee's well registration has been accepted by the Department's Missouri Geology Survey (MGS), the plugged wells shall be removed from the Permittee's SAP. Within 30 calendar days of MGS' registration acceptance, the Permittee shall submit appropriate SAP revisions to the Department for review and approval, according to the procedures described in Corrective Action Condition XIX of this Permit.
7. The Permittee shall contact the Department at least seven calendar days before conducting any field work associated with the construction or modification of the groundwater monitoring system or installation of any additional groundwater monitoring wells required by this Permit or approval hereunder. The Department shall then have the option of observing any part of this field work. This notification requirement applies to major work such as new wells, retrofitting of existing wells, or abandonment of wells. It does not apply to minor repairs, minor maintenance, or other minor changes.
8. A monitoring well inspection and maintenance program shall be implemented for the duration of groundwater monitoring conducted pursuant to this Permit. This program shall be designed to ensure the ongoing structural integrity of all monitoring well installations. The Permittee's revised SAP shall specify the details of this program relative to the following requirements.
  - a. Surface well integrity inspections shall be performed at the time of each sampling event and shall be documented on a well inspection log sheet. Surface integrity evaluations for each monitoring well shall include a visual inspection of the outer protective casing, inner casing riser, surface well seal, well cap, and locking mechanism, to document any damage or deterioration. The ground surface in the immediate vicinity of each monitoring well and the annular space between the outer protective casing and casing riser shall be inspected

for visible anomalies (e.g., collection or ponding of water, ground subsidence, etc.).

- b. Subsurface well integrity inspections shall be performed periodically on all wells, according to the provisions contained in the Permittee's SAP, and shall be documented on a well inspection log sheet. Subsurface well integrity inspections may consist of a combination of one or more elements, including total well depth measurements, groundwater turbidity measurements, in-situ hydraulic conductivity tests, casing caliper logs, down-hole television camera surveys, and/or other methods capable of verifying the subsurface integrity of the well casing and screen.
- c. Wellbore siltation evaluations shall be conducted periodically on all monitoring wells. The Permittee's SAP shall specify the frequency and performance standards for this evaluation to assess down-well siltation and well screen occlusion in all monitoring wells. This evaluation shall be designed to ensure the representative nature of the Permittee's groundwater sample analysis and field measurement results through minimization of sampling and measurement interferences (e.g., turbidity, excessive well screen occlusion, etc.).

The Permittee's SAP shall specify a well redevelopment trigger criterion based on a percentage of well screen occlusion and the potential of such occlusion to compromise the representative nature of the Permittee's groundwater sample analysis and field measurement results. Wells demonstrating well screen occlusion equal to or in excess of the selected criterion (e.g., ten percent occlusion) shall be redeveloped before the next regularly scheduled sampling event.

- d. The Permittee shall perform well-specific surface and subsurface integrity inspections within 14 calendar days following any naturally-occurring event (contact of wells by flood waters, tornado, etc.) or man-made event (vehicular contact, vandalism, etc.) that has the potential to compromise the structural integrity of the well.

- e. Monitoring well repairs shall be completed within 60 calendar days of identifying any surface or subsurface well integrity problem(s). If adverse weather or site conditions preclude the Permittee from gaining access to and/or repairing flood-impacted monitoring wells within 60 calendar days, then the Permittee shall take appropriate action as soon as possible. A written justification for any delay, completed well inspection log sheets, a narrative description of any well repairs, and before and after repair photographic documentation (in the case of visible surface well repairs) shall be provided to the Department as part of the Semi-Annual Groundwater and Corrective Action Progress Report, as described in Corrective Action Condition XV. of this Permit.

D. Corrective Action Program [40 CFR 264.101].

All SWMUs and AOCs are subject to the corrective action program requirements of 40 CFR 264.101, as incorporated by reference in 10 CSR 25-7.264(1), and this Permit, until such time as these regulatory and permit requirements have been satisfied.

1. The Permittee's corrective action program shall consist of groundwater monitoring according to Corrective Action Condition I. of this Permit. Any further investigation, evaluation, and/or implementation of remedial alternatives necessary to address facility-wide groundwater contamination shall be in accordance with Corrective Action Conditions VI. through X. of this Permit. The corrective action program shall also address any groundwater contamination that has migrated beyond the facility property boundaries. The corrective action program is based on:
  - a. The inability to differentiate groundwater contamination related to releases from the various SWMUs and AOCs, which are subject to corrective action according to 40 CFR 264.101.
  - b. The exceedance or the potential exceedance of the GPS contained in Table I at the property boundary (POE) and/or evidence of groundwater plume expansion may act as a

“trigger” for additional investigation, evaluation, and/or implementation of additional groundwater remedial or interim/stabilization measures.

- c. The desirability of implementing a holistic, facility-wide approach to groundwater investigation, monitoring, and remediation given the foregoing circumstances.
2. The Permittee shall perform groundwater sampling and analysis and field measurement of groundwater-related parameters to monitor releases from the SWMUs and AOCs according to the schedule presented in Table 2.
  - a. Sampling and analysis in accordance with this schedule shall begin during the next regularly scheduled sampling event following approval of the revised SAP required by Corrective Action Condition I.C.1. of this Permit. Given the potential lag time between the effective date of this Permit and approval of the revised SAP, the Permittee shall continue sampling and analysis according to the latest version of the approved SAP, until such time as the revised SAP is approved.
  - b. Sampling and analysis of groundwater from any newly-installed wells required by 40 CFR Part 264 Subpart F or this Permit shall be performed no later than the next regularly scheduled sampling event following their installation and according to the latest version of the approved SAP.
3. Only single sample analyses (as opposed to replicates) are required for the parameters listed in Table 2, with the exception of duplicate samples taken for Quality Assurance (QA)/Quality Control (QC) purposes.
4. Field parameter values measured and reported by the Permittee shall be representative of stabilized well conditions.
  - a. Downwell measurement of non-aqueous phase liquid thickness, static water level, and total well depth shall be taken before well purging.

- b. Specific conductance, pH, and temperature measurements reported to the Department shall be those taken upon stabilization of these parameters during well purging. Any additional field parameter measurements shall be recorded in the field logbook.
5. Within one year before the fifth and tenth years of this Permit, the Permittee shall sample and analyze groundwater from two historically contaminated wells for parameters contained in Appendix IX of 40 CFR Part 264, as specified in Table 2. Pesticides, herbicides, and dioxins may be excluded from the Appendix IX sampling.
  - a. The wells sampled to meet this requirement are left to the discretion of the Permittee; however, the choice of wells shall include one historically contaminated well in Subarea 2B and one historically contaminated well in Subarea 6B.
  - b. This sampling and analysis is required to determine if additional hazardous constituents (40 CFR Part 261, Appendix VIII.) or contamination indicator parameters are present in the groundwater that may be attributable to a release(s) from the SWMUs and AOCs or degradation of currently known hazardous constituents.
  - c. If hazardous constituents and/or contamination indicator parameters are identified in the groundwater, which are not currently specified in the Table 1 constituent list, the Permittee may resample the groundwater, according to 40 CFR 264.99(g). If the Permittee's subsequent groundwater analyses confirm the presence of additional hazardous constituents or contamination indicator parameters, then the Permittee shall propose a Class 1 Permit Modification with prior Director's approval, in accordance with 40 CFR 270.42, to add the confirmed hazardous constituent(s) or contamination indicator parameter(s) Table 1 constituent list and the monitoring program schedule specified in Table 2, if the

constituent/indicator is not already covered by the analysis methods specified in the footnotes to Table 2.

**Table 2 – Groundwater Monitoring, Sampling, Analysis, and Parameter Measurement Schedule**

Parameters	Type*	Maximum Detection Limit (µg/l)(a)	Frequency**
Appendix IX (1)	HC	PQLs per SW-846(b)	Every five years
Volatiles (2)	HC	Per Table 1	Annually
LNAPL thickness	FM/NAPL	Not Applicable	Annually
pH	FM/IN	Not Applicable	Annually
Specific Conductance	FM/IN	Not Applicable	Annually
Static Groundwater Elevation (3)	FM	Not Applicable	Annually
Temperature	FM	Not Applicable	Annually
Total Well Depth	FM	Not Applicable	Annually

\* FM = Field Measurement, HC = Hazardous Constituent, IN = Indicator, NAPL = Non-Aqueous Phase Liquid.

\*\* MW6 will be sampled semi-annually. Any newly-installed monitoring wells will be sampled semi-annually for a minimum of four sampling events. All other wells will continue to be sampled annually. Changes to the monitoring frequency will require a Class 1 Permit Modification with prior Director's Approval in accordance with 40 CFR 270.42.

- (1) Appendix IX. (40 CFR 264), excluding herbicides, pesticides, and dioxins. Scan on two wells only.
- (2) EPA SW-846 Method 8260B or equivalent.
- (3) Potentiometric measurements shall be obtained at the time of each regularly scheduled sampling event from each sampled well. Elevation shall be to the nearest 0.01 foot.
  - (a) Detection Limit based upon the lowest achievable practical quantitation limit available from the Permittee's contract laboratory.
  - (b) Current SW-846 version at time of sampling.

Note: The full suite of constituents for each EPA SW-846 method used shall be tested for and reported in the Annual Groundwater Corrective Action Reports, Corrective Action Condition XX. of this Permit.

II. Previously Identified SWMUs and AOCs [40 CFR 264.101]

- A. EPA completed a RCRA Facility Assessment (RFA) to identify and gather information on releases from any SWMUs and AOCs at the facility, which would require further investigation. The RFA Report, dated August 14, 1995, identified 32 SWMUs. The RFA Report concluded that seven individual SWMUs required further investigation and/or remediation.

The RCRA Facility Investigation (RFI) Report, dated December 2004, identified several AOCs, including five that required further investigation and/or remediation. An additional AOC (AOC 4, Building 5) was identified by the Permittee and reported in a letter dated August 17, 2006. Table 3 provides a summary of the current status of the 32 SWMUs and six AOCs. Figure 4 shows the approximate locations of the SWMUs and AOCs located at the facility. The SWMUs and AOCs identified in the RFA Report, RFI Report, and August 17, 2006 letter are as follows:

1. SWMU 1 - Waste Sodium Hydroxide ASTs, H19 and H20, Building 52

SWMU 1 consisted of four 10,000-gallon above ground storage tanks (ASTs) used to store waste sodium hydroxide solution that was generated from chemical milling of aluminum at Building 52. Two different sets of ASTs were used to store the waste. The first two were steel 10,000-gallon ASTs that operated from 1966 to May 1988, when they were removed.

The second two 10,000-gallon ASTs operated from May 1988 to 2000. The second set of ASTs and associated piping were constructed of carbon steel. The tanks were 16 feet tall and rested on a 6-inch thick concrete pad, surrounded by a 6-inch thick asphalt spill pad. The spill pad was underlain by 6 to 10 inches of crushed limestone base rock over clayey backfill. The asphalt pad was surrounded by a 9-inch high asphalt curb. The area inside the asphalt curb drained to the Industrial Wastewater Treatment Plant (IWTP). Soil sampling was conducted at this unit in 1993, as part of RCRA closure activities. The Department accepted the clean closure certification for this unit on August 5, 2003.

2. SWMU 2 - Waste Nitric and Hydrofluoric Acid Solution Storage, Tanks H12, H13, H14, H15, and H16, Building 52

SWMU 2 originally consisted of five 500-gallon polyethylene tanks that were used to store nitric and hydrofluoric waste. These tanks were designated in the 1984 Permit as H12, H13, H14, H15, and H16, and operated from 1968 to 1986. In 1993, a closure investigation of the former tanks was conducted.

The tanks were replaced in 1986 by three 850-gallon ASTs. These tanks were used for less-than-90-day storage of waste nitric acid and hydrofluoric acid solution from chemical milling of titanium. The tanks were supported on a wooden platform constructed of 6-inch by 6-inch wooden beams, which was raised about 4 feet above the ground and supported on concrete piers. The area beneath the tanks was surrounded on three sides by a 6-inch high asphalt curb that abutted the foundation wall of Building 52. The spill containment area with the asphalt curb was underlain by 6 to 12 inches of crushed limestone base rock over a bentonite lining. The spill containment area sloped from the perimeter to a polyvinylchloride (PVC) drain located in the center of the curbed area. The drain is connected to the IWTP. The tanks were removed in 2001. The Department accepted the clean closure certification for this unit on August 5, 2003.

3. SWMU 3 - Wastewater Sludge Collection and Holding Tank, Tank B40, Building 14

SWMU 3 is a 120,000-gallon tank located outside the IWTP in Building 14. The tank is used for holding sludge prior to dewatering. It is constructed of 12-inch steel reinforced concrete with straight sides and a conical bottom. There is a drain at the apex of the cone from which the sludge is pumped into a filter press for dewatering. The tank is 25 feet high from the drain. The diameter of the tank above the conical bottom is approximately 14 feet. The top of the tank extends 12 feet above natural grade, but an earthen mound encapsulates all but the upper 3 feet of the tank.

The tank has been in operation since 1941. In 1988, the tank was drained for inspection, and cracks were observed in the wall of the

tank. In November 1989, a 60 mil high density poly-ethylene (HDPE) liner was installed on the inside of the tank. SWMU 3 stored wastewater treatment sludge that was listed hazardous waste (F006 and F019 electroplating wastes). The Department accepted the clean closure certification for this unit on November 21, 2001.

4. SWMU 4 - Leaked or Spilled Jet Aircraft Fuel Storage Tank, Building 28

SWMU 4 consisted of a 5,000-gallon, double-walled, below grade tank that stored waste jet fuel. This tank provided less-than-90-day storage of waste jet aircraft fuels collected from leaks or spills that occurred during the testing of aircraft fuel systems. Tank B65 was installed in 1989 and replaced Tank B62, a steel underground storage tank (UST) that was installed in 1953. Tank B65 was 8 feet in diameter, and approximately 14 feet long. The top of the tank was approximately 4 feet below ground surface (bgs). The tank was covered and surrounded with river gravel and capped by 3 inches of asphalt and 8 inches of concrete. A leak detection system was installed in the gravel, and the tank had a leak detection system between the double walls. Tank B65 was removed in 2000 and not replaced. The Department accepted the clean closure certification for this unit on November 6, 1995.

5. SWMU 5 - Reactive Cyanide and Sulfide-Bearing Waste Storage, Container Storage Area 2 (1989 to 2001), Building 22

SWMU 5 was a fully enclosed, prefabricated steel storage building. The storage building was used from 1989 to 2001, for less-than-90-day storage of cyanide and sulfide-bearing waste. It replaced the former storage area (SWMU 6) for this waste. The building had a capacity of twenty-eight 55-gallon drums. The drums rested on a wire mesh floor in a spill containment system, with a capacity of 380 gallons. The Department accepted the clean closure certification for this unit on November 16, 2001.

6. SWMU 6 - Reactive Cyanide and Sulfide-Bearing Waste Storage, Container Storage Area 2 (1979 to 1989), Building 22

SWMU 6 was placed into service in 1977 and replaced in 1989 by SWMU 5. The building consisted of a 22-foot by 10-foot structure with a concrete floor. This unit was used to store cyanide and sulfide-bearing waste and had a storage capacity of thirty-one 55-gallon drums. It contained a 6-inch high curb surrounding the waste storage area and a 3-foot deep sump in the northeast corner of the building. The surrounding area was covered with asphalt and concrete.

In 1989, storage of waste in this area was discontinued because water seepage into the shelter after heavy rains or snowmelt became a regular problem. The facility wanted to eliminate the potential hazard of water combining with reactive cyanide waste. The Department accepted the clean closure certification for this unit on November 9, 1993.

7. SWMU 7 - Explosive Waste Storage, Container Storage Area 3, Building 10

SWMU 7 contained explosive waste used in military aircraft (e.g., gas generators, rocket motors, ammunition, etc.), as well as a small amount of raw explosive material (black powder, smokeless powder) used for research purposes. SWMU 7 was 10 to 20 feet wide by 40 feet long with a sealed concrete floor. Storage of explosive waste was discontinued in December 1981. The Department accepted the clean closure certification for this unit on November 6, 1995.

8. SWMU 8 - Scrap Dock Shelter, Area 1, Building 39

SWMU 8 was Boeing's permitted hazardous waste storage facility. The unit was used to store container (drums/carboys) of various hazardous waste for more than 90 days. A 6-inch high curb divided the scrap dock shelter into two sections. Each section had a 3-foot by 3-foot by 2-foot deep sump to accumulate any leakage. Containers of acids, alkalis, and unwashed empty drums previously used for hazardous waste storage were in one section of this

shelter. Paint sludges, oils, solvents, and unwashed empty drums that previously held oils or solvents were stored in the other section of this shelter.

Results from soil samples collected during closure of SWMU 8 were below cleanup levels. Groundwater sample results exceeded cleanup levels; however, it was determined the contaminated groundwater was from the nearby Scrap Metal Recycling Dock/ Fabrication Operations Facility and not from SWMU 8. The Department accepted the closure certification for this unit on November 16, 2001, with the provision that institutional controls prohibiting groundwater use be put into place as part of the final remedy under facility -wide corrective action.

9. SWMU 9 - Waste Nitric and Hydrofluoric Acid Solution Storage, Tanks H1, H2, H3, H4, H5, H6, Building 52

SWMU 9 consisted of six 750-gallon ASTs located adjacent to the south wall of Building 52. All six tanks were open top, cylindrical, one piece molded, high density, black polyethylene plastic. The tanks were structurally supported on a wooden platform. The area under the tanks and platform was sealed with a 3-inch thick asphalt pad, surrounded by a 6-inch high asphalt curb. Inside the curb was a 4-inch thick layer of crushed limestone and a drain to the IWTP. Waste nitric acid and hydrofluoric acid solution from chemical milling of titanium were managed in this unit. The Department accepted the closure certification for this SWMU on May 27, 1993.

10. SWMU 10 - Waste Oil Tank, Building 5

SWMU 10 operated from 1988 to 1997, and consisted of a steel, double-walled 375-gallon AST located outside the southeast side of Building 5. The tank was 60 inches long, 48 inches wide and 34 inches high. The tank rested on asphalt underlain with concrete and surrounded by a four-inch asphalt berm. The tank was used to store waste oil separated from condensate of an oil-lubricated, steam-operated air compressor located inside Building 5.

In March 1990, approximately 100 gallons of oil were spilled during a tank overflow. The tank was removed in 1997 and replaced by a

375-gallon AST located inside Building 5. Building 5 was vacated and demolished in 2006. The RFA recommended further investigation at this SWMU. Interim measures were conducted, pursuant to the Permittee's 1997 MHWMF Part I Permit, and are discussed further in Corrective Action Condition V. of this Permit.

11. SWMU 11 - Former Waste Oil Tank, Building 6

SWMU 11 was located at Building 6 and consisted of a 1,000-gallon, horizontal, below grade carbon steel tank that rested on a subsurface pad. SWMU 11 began operating in 1970 and was used to store oil separated from condensate of an oil-lubricated, steam-operated air compressor. The tank and associated hydrocarbon sensing system were removed on December 23, 1988. The Department accepted the clean closure certification for this unit on November 9, 1993.

12. SWMU 12 - Waste Jet Aircraft and Hydraulic System Spillage Storage Tank, F-18 Silencer, Building 45E

SWMU 12 was a 2,130-gallon, horizontal UST (Tank B28) located west of the Hush House. A concrete slab covered the tank, as well as the central area where the tank was located. This tank received waste fuel and hydraulic system spillage from the F-18 Silencer building. If a fuel system failed on an engine undergoing testing, any leaked fuel flowed through a drain to an oil-water separator and then into this tank. The tank was used from 1978 until December 30, 1992, when it was removed. The Department accepted the clean closure certification for this unit on November 9, 1993.

13. SWMU 13 - Waste Jet Aircraft and Hydraulic System Spillage Storage Tank, Hush House, Building 45C/45D

SWMU 13 was a 3,380-gallon UST (Tank B26) located adjacent to the Hush Houses. Between 1963 and 1983, SWMU 13 was used between Hush Houses 45C and 45D to store waste fuel (JP-4 and/or JP-5). The UST was excavated in June 1989 after releases were documented. The tank was not replaced. Closure of this unit

was deferred to corrective action and investigated as part of the RFI.

Results from soil sampling conducted as part of the RFI were below detection limits for all constituents. Groundwater concentrations exceeded applicable screening levels; however, the extent of groundwater contamination has been defined at SWMU 13. From 1990 through 2002, product recovery and groundwater remedial action was conducted on a monthly basis, consisting of vacuum removal of water from select wells in the area of SWMU 13 with a vacuum truck. Sampling results can be found in the RFI Report. SWMU 13 is paved and all buildings have been demolished. SWMU 13 is in the Runway Protection Zone and use of this property is restricted by Federal Aviation Administration regulations.

14. SWMU 14 - Waste Jet Aircraft Fuel Storage Tanks, Fuel Pits 3 and 4, Building 45

SWMU 14 consisted of two 2,000-gallon, vertical USTs (Tanks B29 and B30) in fuel pits located approximately 40 feet south of Building 45. Each tank had a nominal capacity of about 3,000 gallons, but the bottom third of each was filled with concrete. Fuel Pit 3 Tank was installed in 1977. Fuel Pit 4 Tank was installed in 1983.

The fuel pits are concrete-lined, subgrade structures that housed the pumps and filters used for fueling and defueling aircraft. While the tanks were in place, whenever the pumps in the fuel pits were turned on, a valve opened so that any jet fuel that spilled during fueling or defueling operations would automatically go into the tank. A concrete slab covered the tanks and the entire area where the tanks were located.

Both tanks were removed in August 1992. Closure of this unit was deferred to corrective action and investigated as part of the RFI. From 1990 through 1998, product recovery and groundwater remedial action was conducted on a monthly basis, consisting of vacuum removal of water from select wells in the area of SWMU 14 with a vacuum truck. Free product has not been observed in these wells since 1992.

15. SWMU 15 - Waste Jet Fuel Storage Tank, Ramp Station 1 and 2, Building 45K

SWMU 15 was a 4,380-gallon fiberglass UST, located at Building 45K. The tank was used from 1983 to June 1993 to store jet aircraft fuel that had leaked or been spilled during the repair of aircraft fuel systems. The tank was removed in August 1993 and not replaced. Closure of this unit was deferred to corrective action and was investigated as part of the RFI. Soil and groundwater results at SWMU 15 were below applicable screening levels, indicating no further investigation is necessary at this SWMU. Further information can be found in the RFI Report.

16. SWMU 16 - MEK/MIBK Recovery Unit, Building 48

SWMU 16 was a recovery unit located in Building 48 and used to recycle spent Methyl Ethyl Ketone (MEK) and Methyl Iso-Butyl Ketone (MIBK). These solvents were used to clean spray painting guns, lines, and equipment. The system was enclosed in an inner room with concrete floors and stainless steel walls. Waste still bottoms were collected in drums for subsequent disposal as hazardous waste. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

17. SMWU 17 - Tetrachloroethylene (PCE) Recovery Unit, Building 51

SWMU 17 was a continuously paved area outside of Building 51, used from 1983 to 1998 for tank transfer activities involving recovered PCE. The unit contained a series of tanks which were used to store the separated PCE stream while being transferred from a 55-gallon tank to a 750-gallon holding tank, and finally into various 350-gallon portable tanks for off-site shipment. All tanks were removed in 1998 and the building was demolished in 2004.

The RFA recommended further investigation at this SWMU. As part of the RFI, extensive soil and groundwater sampling was conducted at SWMU 17. As described in the 2004 RBCA Report, the carcinogenic risk of PCE exceeded the target risk for a potential future construction worker through dermal contact with

contaminated groundwater. Interim measures were conducted and are discussed further in Corrective Action Condition V. of this Permit.

18. SWMU 18 - MEK/MIBK Recovery Unit, Building 27

SWMU 18 was a recovery unit located within Building 27 and used to recycle MEK and MIBK. These solvents were used to clean spray painting guns, lines, and equipment. The system was enclosed in an inner room with concrete floors and stainless steel walls. Waste still bottoms were generated. The unit was removed in 1995. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

19. SWMU 19 - Drum Storage Area and Related Satellite Accumulation Areas, Numerous Locations

SWMU 19 consisted of drum storage areas located at numerous satellite locations within several buildings throughout Tract 1. Spent solvents, waste paints, and oils from cleaning spray painting guns, lines, and equipment were collected in drums. When full, the drums were transferred to one of the less-than-90-day storage areas. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

20. SWMU 20 - Paint Solids Satellite Accumulation Areas, Numerous Locations

SWMU 20 consisted of 55-gallon drums and 2-cubic yard red dumpsters, located within several buildings throughout Tract 1, and two roll-bins/trash compactors located at the north side of Building 27 and the north side of Building 48, respectively. The dumpsters and drums received waste paint solids. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

21. SWMU 21 - Industrial Wastewater Treatment Plant (IWTP) Tanks, Building 14

The IWTP began operating in 1970 and consists of several in-ground open-top sludge settling and equalization tanks. The tanks have a 4-inch reinforced concrete floor and 6-inch thick concrete walls. The capacity of tanks S-1 and S-2 is 51,897 gallons, tanks S-3 and S-4 is 124,936 gallons, tank E-1 is 82,931 gallons, tank E-2 is 131,200 gallons, and tank E-3 is 323,100 gallons. The tanks are connected in series from S-1 to E-3.

The IWTP currently receives rinse water from chemical process operations in Tract 1 and GKN Aerospace (former McDonnell Douglas Tract 1 North). Waste managed at SWMU 21 consists of rinse water and overflow from chemical process operations. The primary constituent of concern is chromium. The sludge accumulated in the settling tanks is pumped to a 120,000-gallon holding tank (SWMU 3) and then pumped to a filter press for dewatering. The filter cake generated from this process is listed as hazardous waste (F006 and F019). The filter cake is accumulated (less than 90 days) in an open top, roll-off container and transported to a permitted hazardous waste treatment, storage, and disposal facility for disposal.

The RFA recommended further investigation of this SWMU. Soil and groundwater sampling was conducted as part of the RFA and RFI. As described in the 2004 RBCA Report, calculated risks for all constituents of concern and all potentially complete routes of exposure for this unit were below the acceptable target risk level.

22. SWMU 22 - Paint Booth Satellite Accumulation Drum Storage Area, Building 2

SWMU 22 was an asphalt covered area, approximately 25 feet by 25 feet, used from 1990 through 2000. This area was located outside the northwest side of the former McDonnell Douglas Building 2, outside the Building 2 paint mix room. A 55-gallon drum was used for satellite accumulation of paint waste and 2-cubic yard dumpsters were used for collecting solid waste from painting operations. Solid wastes consisted of wipes, overspray paper,

personal protective equipment, empty paint cans, and applicator tubes. The area also contained a 4-foot by 4-foot sump covered by wood timbers.

The RFA recommended further investigation at this SWMU. Interim measures were conducted, pursuant to the Permittee's 1997 MHWMF Part I Permit, and are discussed further in Corrective Action Condition V. of this Permit.

23. SWMU 23 - Less-Than-90-Day Storage Area, Building 45C/45D

SWMU 23 was a prefabricated steel storage building, located south of Buildings 45C and 45D in the Ramp Area. The building had inside dimensions of about 14-feet by 8-feet and a capacity of twenty-eight 55-gallon drums. The area around this building is paved. A sunken floor in this storage building provided a spill containment capacity of 380 gallons. Waste solvents, paints, and oils generated in Building 40 and at other satellite areas were placed in 55-gallon drums. When full, the drums were transferred to this storage area. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

24. SWMU 24 - Less-Than-90-Day Storage Area, Building 2

SWMU 24 was a prefabricated steel storage building, located outside the east side of Building 2. The building has inside dimensions of about 14-feet by 8-feet and a capacity of twenty-eight 55-gallon drums. The storage unit was open in front and enclosed on the other three sides. The area around this building is paved. A sunken floor provided a spill containment capacity of 380 gallons. Waste solvent, paints, and oils generated in Building 2 were placed in 55-gallon drums throughout the building. When full, the drums were transferred to this storage area, as well as drums from the satellite accumulation areas. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

25. SWMU 25 - Less-Than-90-Day Storage Area, Building 51

SWMU 25 operated between June 1989 and December 2000, and consisted of a prefabricated steel storage building, located outside the east side of Building 51. The storage unit was open on all sides and had a corrugated steel roof. The building had the capacity to store twenty-eight 55-gallon drums. A sunken floor provided a spill containment capacity of 380 gallons. Waste solvents, paints, and oils generated in Building 51 were placed in 55-gallon drums throughout the building. When full, the drums were transferred to this storage area, as well as drums from satellite accumulation areas. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

26. SWMU 26 - Former Less-Than-90-Day Storage Area, Building 40

SWMU 26 operated from 1990 to 1993, and consisted of a prefabricated steel building, measuring 14-feet by-8 feet by 7-feet and a capacity of twenty-eight 55-gallon drums. The storage unit was open in front and closed on the other three sides and equipped with spill containment. Waste solvent, paint, and oil were stored in 55-gallon drums for less than 90 days. The RFA recommended further investigation of this SWMU. Interim measures were conducted, pursuant to the Permittee's 1997 MHWMF Part I Permit, and are discussed further in Corrective Action Condition V. of this Permit.

27. SWMU 27 - Waste Nitric and Hydrofluoric Acid Scrubber Saddles Drum Storage, Building 52

SWMU 27 operated from 1990 to November 1993, and consisted of ten 55-gallon drums located outside the southeast corner of Building 52. The area where the drums were placed was paved with asphalt and concrete. There was no spill containment system for this storage area. The drums contained waste plastic packing saddles used in the nitric and hydrochloric acid fume scrubber within the building. The plastic packing saddles were rinsed prior to being drummed. The packing saddles were sent to a sanitary landfill with other facility trash for disposal. The drums were crushed and also sent to the landfill.

Four soil samples were collected at this unit during the RFA sampling visit, from depths of 0 to 12 and 12 to 24 inches bgs at locations outside a wooden fence and between the parking posts. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

28. SWMU 28 - Leaking Transformer, Building 6

SWMU 28 consisted of an electrical transformer located outside the northeast corner of Building 6. The transformer contained PCB Aroclor 1260 oil. The transformer was removed in 1997. The RFA recommended further investigation of this SWMU. Interim measures were conducted, pursuant to the Permittee's 1997 MHWMF Part I Permit, and are discussed further in Corrective Action Condition V. of this Permit. As described in the 2004 RBCA Report, calculated risks for all constituents of concern and all potentially complete routes of exposure for this unit were below the acceptable target risk level.

29. SWMU 29 - Waste Ferracoat, MEK, and TCE Drum Storage, Building 29A

SWMU 29 consisted of a small room in the northwest corner of Building 29A, used for satellite accumulation storage of several 55-gallon drums. The drums contained waste Ferracoat and spent MEK and trichloroethylene (TCE) generated from manufacturing processes in Building 29A. The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary.

30. SWMU 30 - Chemical Etching Spill Containment Area, Building 27

SWMU 30 is the spill containment system for the area within Building 27, where metal parts were chemically etched. The metal parts were dipped into several open-top tanks that contained a variety of chemicals. One process tank held potassium dichromate solution, which was filtered to extend its life. Any chemicals that spilled out of the chemical etching tanks were managed in this unit. A new tank line and containment system was installed in 2000. Results from soil sampling conducted as part of the RFI were below

applicable screening levels, indicating no further investigation was necessary at this SWMU. Further information can be found in the RFI Report.

31. SWMU 31 - Maintenance Shop Waste Oil Tank, Building 22

SWMU 31 operated from 1986 to 1996, and consisted of a 740-gallon steel AST, located outside the west side of Building 22. The tank rested on an asphalt pad, surrounded by a 6-inch asphalt berm. The tank was used to collect and store waste oil from vehicle maintenance activities conducted in Building 22. Boeing leased Building 22 from GKN Aerospace until March of 2009, when the building was vacated.

The RFA recommended further investigation at this SWMU. The analytical results for soil samples collected on August 6, 2009, as part of the building closure, were below investigation threshold (risk-based screening) levels. Soil and groundwater sample analyses conducted as part of the RFI were below investigation threshold (risk-based screening) levels, indicating no further investigation is necessary at this SWMU. Investigation threshold levels can be found in the RFI Report.

32. SWMU 32 - PCB Storage (1987 to 2000), Building 39

SWMU 32 was a fully-enclosed, prefabricated steel storage building. The storage building was used from December 1987 to December 2000, for less-than-90-day storage of PCB oil from transformers at McDonnell Douglas. The building had a capacity of twenty-eight 55-gallon drums. The drums rested on a wire mesh floor in a spill containment system, with a capacity of 380 gallons.

The RFA concluded there was no potential for a release from this SWMU and additional investigation was not necessary. However, groundwater at this SWMU was investigated as part of the RFI, due to its proximity to AOC 6B (Scrap Metal Recycling Dock Area/Fabrication Operations Facility). It was determined that the contaminated groundwater was from AOC 6B, not SWMU 32. No further investigation is necessary at this SWMU.

33. AOC 3A - Building 41 Tank Farm

The Building 41 Tank Farm consisted of jet fuel USTs, located to the immediate west of Building 41, and underground jet fuel distribution lines that ran from the Building 41 Tank Farm to the aircraft fueling area south of Building 42. Interim measures conducted in this area are discussed further in Corrective Action Condition V. of this Permit.

34. AOC 3E - 1,000-Gallon Diesel UST (B24)

Tank B24 was a 1,000-gallon diesel fuel UST, located on the east side of Building 2. The tank was removed in 1989. Interim measures conducted in this area are discussed further in Corrective Action Condition V. of this Permit.

35. AOC 4 - Building 5

This AOC was identified June 19, 2006, during demolition of Building 5. This AOC operated from 1945 to 2006, and consisted of three concrete pits. The largest pit was approximately 50 feet long by 20 feet wide by 12 feet deep. The other two pits were approximately 15 feet long by 10 feet wide by 5 feet deep. An incinerator unit for destroying classified documents was located in one of the pits. The other pits were used to collect the incinerator ash.

While preparing the building for demolition, groundwater containing TCE was encountered during cleaning of the incinerator pits. The water was sampled and the results indicated the presence of TCE above investigative threshold levels (risk-based screening) previously established for the RFI. In February 2007, following demolition of Building 5, the Airport conducted subsurface sampling. Sampling results showed that soil and groundwater samples were below EPA's regional screening levels, indicating no further investigation was necessary at this AOC. Sampling results can be found in the Limited Subsurface Investigation Building 6 and former Building 5 Area, Tract 1 South Report, prepared by Golder Associates, Incorporated, for the Airport, and dated April 16, 2007.

36. AOC 6B - Scrap Metal Recycling Dock Area/Fabrication Operations Facility, Building 27

The recycling dock area was used for recycling and accumulating scrap since the Building 27 expansion in 1954. The dock is comprised of an elevated ramp and a concrete lined and curbed chip drainage area. Roll-offs containing scrap aluminum, titanium, and other metal shavings and scrap from the manufacturing process were taken to the top of the elevated ramp and loaded into open-top semi-trailers located on the drainage area below. The trailers were inclined to allow the water based coolant (cutting oil before 1990) to drain out of the trailers and into a collection drain. The collection drain was plumbed into an oil/water sump located beneath the elevated area of the dock. The water from the oil/water sump flowed into the industrial waste sewer which was connected to the IWTP.

Soil and groundwater in this area was investigated as part of the RFI. Interim measures in this area included removing contaminated soil that was acting as a source of groundwater contamination and injecting Hydrogen Release Compound (HRC<sup>®</sup>) to encourage reductive dechlorination of chlorinated solvents in the groundwater. Interim measures are discussed further in Corrective Action Condition V. of this Permit.

37. AOC 6C - Industrial Sewer

Two industrial wastewater sewer lines run underneath the parking lot east of Building 17. These sewers provided drainage from the plating and aluminum lines in Building 27 to the IWTP. In October 2000, during an inspection using a video camera, a separation in a joint was observed. The sewer lines from Building 27 to the first manhole junction were replaced and approximately 75 cubic yards of soil was excavated and disposed of off-site as a special waste.

38. AOC 8B - Building 220 Trash Compactor

The Building 220 Trash Compactor was located at the northwest corner of Building 220 and used for miscellaneous office waste.

The trash compactor had a hydraulic oil system that contained less than 30 gallons of hydraulic oil. Total Petroleum Hydrocarbon (TPH) was detected in groundwater above risk-based screening levels at boring B220N1, adjacent to the trash compactor. Interim measures in this area discussed further in Corrective Action Condition V. of this Permit.

**Table 3 – Summary of Solid Waste Management Units and Areas of Concern**

<b>SWMU/AOC Number</b>	<b>Date and Source Identified</b>	<b>Description</b>	<b>Current Status</b>
SWMU 1	RFA August 14, 1995	Waste Sodium Hydroxide Above Ground Storage Tanks, Building 52, Tank Storage H19-H20	Closure certification accepted August 5, 2003.
SWMU 2	RFA August 14, 1995	Waste Nitric and Hydrofluoric Acid Solution Storage, Building 52, Tank Storage H12-H16	Closure certification accepted August 5, 2003.
SWMU 3	RFA August 14, 1995	Wastewater Sludge Collection and Holding Tank, Building 14, Tank B40	Closure certification accepted November 21, 2001.
SWMU 4	RFA August 14, 1995	Leaked or Spilled Jet Aircraft Fuel Storage Tank, Building 28	Closure certification accepted November 6, 1995.
SWMU 5	RFA August 14, 1995	CSA 2 - Reactive Cyanide and Sulfide-Bearing Waste Storage, Building 22 (1989 to 2001)	Closure certification accepted November 16, 2001.
SWMU 6	RFA August 14, 1995	CSA 2 - Reactive Cyanide and Sulfide-Bearing Waste Storage, Building 22 (1979 to 1989)	Closure certification accepted November 9, 1993.
SWMU 7	RFA August 14, 1995	CSA 3 - Explosive Waste Storage, Building 10	Closure certification accepted November 6, 1995.
SWMU 8	RFA August 14, 1995	CSA 1 - Scrap Dock Shelter, Building 39	Closure certification accepted November 16, 2001. Institutional Controls required as part of the final remedy under facility-wide corrective action.

SWMU/AOC Number	Date and Source Identified	Description	Current Status
SWMU 9	RFA August 14, 1995	Waste Nitric and Hydrofluoric Acid Solution Storage, Building 52, Tank Storage H1-H6	Closure certification accepted May 27, 1993.
SWMU 10	RFA August 14, 1995	Waste Oil Tank, Building 5	RFA recommended further investigation. Interim measures conducted.
SWMU 11	RFA August 14, 1995	Waste Oil Tank, Building 6	Closure certification accepted November 9, 1993.
SWMU 12	RFA August 14, 1995	Waste Jet Aircraft and Hydraulic System Spillage, F-18 Silencer, Building 45E	Closure certification accepted November 9, 1993.
SWMU 13	RFA August 14, 1995	Waste Jet Aircraft and Hydraulic System Spillage Storage Tank, Hush, House, Building 45C/45D	Deferred to corrective action August 31, 1995, and investigated as part of RFI. Addressed under facility-wide corrective action.
SWMU 14	RFA August 14, 1995	Waste Jet Aircraft Fuel Storage Tanks, Fuel Pits 3 and 4, Building 45	Deferred to corrective action August 31, 1995, and investigated as part of RFI. Addressed under facility-wide corrective action.
SWMU 15	RFA August 14, 1995	Waste Jet Fuel Storage Tank, Ramp Station 1 and 2, Building 45K	Deferred to corrective action August 31, 1995, and investigated as part of RFI. RFI indicates no further investigation necessary.
SWMU 16	RFA August 14, 1995	MEK/MIBK Recovery Unit, Building 48	RFA concluded there were no significant potential releases from this unit.

SWMU/AOC Number	Date and Source Identified	Description	Current Status
SWMU 17	RFA August 14, 1995	Tetrachloroethylene (PCE) Recovery Unit, Building 51	RFA recommended further investigation. Investigated as part of RFI. Interim measures conducted. Corrective measures evaluated in CMS.
SWMU 18	RFA August 14, 1995	MEK/MIBK Recovery Unit, Building 27	RFA concluded there were no significant potential releases from this unit.
SWMU 19	RFA August 14, 1995	Drum Storage Area and Related Satellite Accumulation Areas, Numerous Locations	RFA concluded there were no significant potential releases from this unit.
SWMU 20	RFA August 14, 1995	Paint Solids Satellite Accumulation Areas, Numerous Locations	RFA concluded there were no significant potential releases from this unit.
SWMU 21	RFA August 14, 1995	Industrial Wastewater Treatment Plant Tanks, Building 14	RFA recommended further investigation. Investigated as part of RFI.
SWMU 22	RFA August 14, 1995	Paint Boot Satellite Accumulation Drum Storage Area, Building 2	RFA recommended further investigation. Investigated as part of RFI. Interim measures conducted.
SWMU 23	RFA August 14, 1995	Less-Than-90-Day Storage Area, Building 45C/45D	RFA concluded there were no significant potential releases from this unit.
SWMU 24	RFA August 14, 1995	Less-Than-90-Day Storage Area, Building 2	RFA concluded there were no significant potential releases from this unit.

SWMU/AOC Number	Date and Source Identified	Description	Current Status
SWMU 25	RFA August 14, 1995	Less-Than-90-Day Storage Area, Building 51	RFA concluded there were no significant potential releases from this unit.
SWMU 26	RFA August 14, 1995	Former Less-Than-90-Day Storage Area, Building 40	RFA recommended further investigation. Investigated as part of RFI. Interim measures conducted.
SWMU 27	RFA August 14, 1995	Waste Nitric and Hydrofluoric Acid Scrubber Saddles Drums Storage, Building 52	RFA concluded there were no significant potential releases from this unit.
SWMU 28	RFA August 14, 1995	Leaking Transformer, Building 6	RFA recommended further investigation. Investigated as part of RFI. Interim measures conducted.
SWMU 29	RFA August 14, 1995	Waste Ferracoat, MEK, and Trichloroethylene Drum Storage, Building 29A	RFA concluded there were no significant potential releases from this unit.
SWMU 30	RFA August 14, 1995	Chemical Etching Spill Containment, Building 27	RFA recommended further investigation. Investigated as part of RFI. RFI indicates no further investigation necessary
SWMU 31	RFA August 14, 1995	Maintenance Shop Waste Oil Tank, Building 22	RFA recommended further investigation. Investigated as part of RFI. RFI indicates no further investigation necessary.
SWMU 32	RFA August 14, 1995	Polychlorinated Biphenyl Storage, Building 39 (1987 to 2000)	RFA concluded there were no significant potential releases from this unit.

<b>SWMU/AOC Number</b>	<b>Date and Source Identified</b>	<b>Description</b>	<b>Current Status</b>
AOC 3A	RFI December 2004	Building 41 Tank Farm	Investigated as part of RFI. Interim measures conducted.
AOC 3E	RFI December 2004	1000-Gallon Diesel Underground Storage Tank (B24)	Investigated as part of RFI. Interim measures conducted.
AOC 4	Facility Letter August 17, 2006	Building 5	Investigated as part of building demolition.
AOC 6B	RFI December 2004	Scrap Metal Recycling Dock Area/Fabrication Operations Facility, Building 27	Investigated as part of RFI. Interim measures conducted. Corrective measures evaluated in CMS.
AOC 6C	RFI December 2004	Industrial Sewer	Investigated as part of RFI. Interim measures conducted.
AOC 8B	RFI December 2004	Trash Compactor, Building 220	Investigated as part of RFI. Interim measures conducted.

- B. The status of the known SWMUs and AOCs is based on available information at the time of issuance of this Permit. In the event new information becomes available indicating human health or the environment may be adversely impacted, the Permittee may be required to conduct additional investigations and evaluations, as necessary, to determine the need for additional corrective action for the previously-identified SWMUs and AOCs, or any newly-identified SWMUs and AOCs, including off-site release(s), as specified in Corrective Action Conditions III. and IV. of this Permit.
- C. The Permittee shall conduct additional investigation(s) and/or take corrective action as deemed appropriate by the Department for previously-identified SWMUs and AOCs or any newly-identified SWMUs and AOCs, including off-property release(s), demonstrating releases of hazardous waste or hazardous constituents to soil, surface water, sediment, groundwater, and/or air in excess of applicable regulatory thresholds, as specified in Corrective Action Conditions III. and IV. of this Permit. Any off-property impacts to surface water, soil/sediment, or groundwater shall be

addressed to the extent that these media are impacted by releases to surface water, soil/sediment, or groundwater originating from SWMUs, AOCs, or other releases on the facility property.

III. Notification Requirements for, and Assessment of, Newly-Identified SWMUs and AOCs

- A. The Permittee shall notify the Department and EPA, in writing, no later than 15 calendar days after discovery (e.g., visual observations, laboratory test results, or information not previously available) or after discovery should have been made, of any new SWMU(s) or AOC(s) identified after the issuance of this Permit.
- B. The Department may require the Permittee to conduct an investigation of any newly-identified SWMU(s) or AOC(s). The Department shall notify the Permittee, in writing, of this decision. Within 30 calendar days after receipt of the Department's request to conduct an investigation, the Permittee shall prepare and submit a SWMU/AOC Assessment Work Plan to the Department and EPA for review and approval. The SWMU/AOC Assessment Work Plan shall include, but not be limited to, the following:
  - 1. A discussion of past hazardous wastes management practices related to the unit(s);
  - 2. A detailed investigation approach for surface and subsurface soils, surface water, groundwater, and air as necessary to:
    - a. Determine if a release of hazardous wastes or hazardous constituents has occurred or is occurring at the unit(s);
    - b. Yield reliable, representative samples and results;
    - c. Determine impacts or potential impacts to human health and the environment; and
    - d. Sufficiently assess all hazardous wastes and hazardous constituents related to the unit(s).

3. A proposed schedule for implementing the SWMU/AOC Assessment Work Plan, which is predicated on the date of Departmental approval of the plan; and
  4. Identification of all data to be collected necessary to provide for a complete SWMU/AOC Assessment Report, as specified below.
- C. The Department shall review and approve the SWMU/AOC Assessment Work Plan according to the procedures described in Corrective Action Condition XIX. of this Permit. The Permittee shall complete all activities described in the SWMU/AOC Assessment Work Plan according to the schedule contained in the approved plan.
- D. The Permittee shall submit a SWMU/AOC Assessment Report to the Department and EPA according to the schedule specified in the approved SWMU/AOC Assessment Work Plan. The SWMU/AOC Assessment Report shall present and discuss the information obtained under the approved SWMU/AOC Assessment Work Plan. At a minimum, the SWMU/AOC Assessment Report shall provide the following information for each newly-identified SWMU or AOC:
1. The location of the newly-identified SWMU or AOC in relation to other SWMU(s) and AOC(s);
  2. The type and function of the SWMU or AOC;
  3. The general dimensions, capacities, and structural description of the SWMU or AOC;
  4. The period during which the SWMU or AOC was operated;
  5. The physical and chemical properties of all wastes that have been or are being managed at the SWMU or AOC, to the extent possible;
  6. The results of any sampling and analysis conducted;
  7. Past and present operating practices;
  8. Previous uses of the area occupied by the SWMU or AOC;

9. Amounts of waste handled;
  10. Drainage areas and/or drainage patterns near the SWMU or AOC;  
and
  11. A recommendation as to whether further action is necessary and justification for the recommendation, such as updating the site conceptual model and/or assessing SWMU/AOC-specific risk. If further action is recommended, the SWMU/AOC Assessment Report shall include a proposal for additional investigation or corrective action, as appropriate.
- E. The Department shall review and approve the SWMU/AOC Assessment Report according to the procedures described in Corrective Action Condition XXII. of this Permit. Based on the findings of this report and any other available information, the Department shall determine the need for additional investigation, including interim/stabilization measures or a RCRA Facility Investigation (RFI), at specific unit(s) identified in the SWMU/AOC Assessment Report.
- F. If the Department determines that additional investigations are needed, the Department may require the Permittee to prepare and submit for approval a work plan for such investigations according to the applicable Corrective Action Conditions of this Permit. The Department shall review and approve any such work plan according to the procedures described in Corrective Action Condition XIX. of this Permit. The Permittee shall complete all activities described in the work plan according to the schedule contained in the approved plan.
- IV. Notification Requirements for, and Assessment of, Newly-Identified Releases from Previously-Identified SWMUs and AOCs
- A. The Permittee shall notify the Department and EPA, in writing, no later than 15 calendar days after discovery (e.g., visual observations, laboratory test results, or information not previously available) or after discovery should have been made, of any newly-identified release(s) of hazardous wastes or hazardous constituents from any previously-identified SWMU(s) or AOC(s) at the facility, including those being investigated and reported as part of the corrective action process that are discovered during the course of groundwater monitoring, field investigation, environmental

auditing, or other activities undertaken after issuance of this Permit. The Department may examine the Facility's inspection records to determine if the Permittee should have known that a release occurred.

- B. The Department may require the Permittee to conduct an investigation of the newly-identified release(s). The Department shall notify the Permittee, in writing, of this decision. Within 30 calendar days after receipt of the Department's request to conduct an investigation, the Permittee shall prepare and submit a Newly-Identified Release Work Plan to the Department and EPA for review and approval. The Newly-Identified Release Work Plan shall include, but not be limited to, the following:
1. A discussion of the hazardous waste/chemical management practices related to the release(s);
  2. A detailed investigation approach for groundwater, land surface and subsurface soils, surface water, and air as necessary to:
    - a. Define the extent of the release area(s);
    - b. Yield reliable, representative samples and results;
    - c. Determine impacts or potential impacts to human health and the environment; and
    - d. Sufficiently assess all hazardous wastes and hazardous constituents related to the release(s).
  3. A proposed schedule for implementing the Newly-Identified Release Work Plan, which is predicated on the date of Departmental approval of the plan; and
  4. Identification of all data to be collected necessary to provide for a complete Newly-Identified Release Report, as specified below.
- C. The Department shall review and approve the Newly-Identified Release Work Plan according to the procedures described in Corrective Action Condition XIX. of this Permit. The Permittee shall complete all activities described in the Newly-Identified Release Work Plan according to the schedule contained in the approved plan.

- D. The Permittee shall submit a Newly-Identified Release Report to the Department and EPA according to the schedule specified in the approved Newly-Identified Release Work Plan. The Newly-Identified Release Report shall present and discuss the information obtained under the approved Newly-Identified Release Work Plan. At a minimum, the report shall provide the following information for each newly-identified release:
1. The location of the newly-identified release in relation to the SWMU(s) or AOC(s) under investigation and to any other SWMU(s) and AOC(s);
  2. The general dimensions of the release;
  3. The period during which the release is suspected to have occurred;
  4. The physical and chemical properties of all wastes that have been determined to comprise the release;
  5. The results of any sampling and analysis conducted;
  6. Past and present operating practices near and at the location of the release;
  7. Previous uses of the area(s) occupied near and at the location of the release;
  8. Amounts of waste handled near and at the location of the release;
  9. Drainage areas and/or drainage patterns near and at the location of the release; and
  10. A recommendation as to whether further action is necessary and justification for the recommendation, such as updating the site conceptual model and/or assessing SWMU/AOC-specific risk. If further action is recommended, the Newly-Identified Release Report shall include a proposal for additional investigation or corrective action, as appropriate.
- E. The Department shall review and approve the Newly-Identified Release Report according to the procedures described in Corrective Action

Condition XIX. of this Permit. Based on the findings of the report and any other available information, the Department shall determine the need for additional investigation, including interim/stabilization measures or an RFI, at specific releases(s) identified in the Newly-Identified Release Report.

- F. If the Department determines that additional investigation is needed, the Department may require that the Permittee prepare and submit for approval a work plan for such investigations in accordance with the applicable Corrective Action Conditions of this Permit. The Department shall review and approve any such work plan according to the procedures described in Corrective Action Condition XIX. of this Permit. The Permittee shall complete all activities described in the work plan according to the schedule contained in the approved plan.

V. Previously Implemented Interim/Stabilization Measures

- A. Between October 10, 1997, and November 11, 1997, the Permittee conducted interim/stabilization measures (ISMs) at four SWMUs/AOCs, under the requirements of Corrective Action Condition V. of the Permittee's 1997 MHWMF Part I Permit. The Permittee submitted an Interim Measures Report, dated December 18, 1997. The SWMUs and AOCs identified in the Interim Measures Report and a summary of the ISMs conducted at each SWMU/AOC are as follows:

1. SWMU 10 - Current Waste Oil Tank, Building 5

ISMs consisted of cleaning and removing the AST and secondary containment berm and washing the concrete pad beneath the AST with a high pressure detergent (Citra-clean) and water wash. Soil samples were collected and analyzed at SWMU 10 during the RFI. As described in the 2004 RBCA Report, calculated risks for all constituents of concern and all potentially complete routes of exposure for this area were below the acceptable risk-based target levels.

2. SWMU 22 - Building 2 Paint Booth Satellite Accumulation Drum Areas

ISMs included placing a 1-inch lift of asphalt over the areas and cleaning the sump. Soil and groundwater samples were collected

and analyzed as part of the RFI. As described in the 2004 RBCA Report, calculated risks for constituents of concern and all potentially complete routes of exposure for the area were below the acceptable risk-based target levels.

3. SWMU 26 - Former Less-Than-90-Day Storage Area, Building 40

ISMs included cleaning and sealing the existing cracks in the concrete. Soil and groundwater samples were collected and analyzed as part of the RFI. No constituents were detected above the investigation threshold (risk-based) levels in soil or groundwater samples. As described in the 2004 RBCA Report, calculated risks for all constituents of concern and all potentially complete routes of exposure for this risk area were below the acceptable risk-based target levels.

4. SWMU 28 - Leaking Transformer Building 6

ISMs included decommissioning and removing the power transformer, cleaning the concrete pad, and removing impacted gravel and underlying soil. Soil samples were collected at the completion of the interim measure activities. Based on the analytical results, additional soil was excavated to a depth of 18 inches below grade. Following this removal, and as described in the 2004 RBCA Report, calculated risks for all constituents of concern and all potentially complete routes of exposure for this risk area were below the acceptable risk-based target levels.

B. SWMU 17 - PCE Transfer Area, Building 51

Between November 8 and 11, 2005, the Permittee conducted extensive ISMs at SWMU 17 - PCE Transfer Area, Building 51, according to the interim measures work plan dated May 20, 2005, approved by the Department October 25, 2005. The Permittee submitted an Interim Measures Completion Report Solid Waste Management Unit 17, dated June 24, 2006. The objective of this interim measure was to remove PCE contaminated soil that could be a source of VOCs to groundwater.

SWMU 17 was a PCE transfer area that contained a series of tanks which were used to store and transfer separated PCE from 55-gallon tanks to a

750-gallon holding tank, and finally into various 350-gallon portable tanks for off-property shipment. A total of 2,178 tons of PCE impacted soil was excavated from an area approximately 100 feet long by 40 feet wide to a depth of approximately 10 feet below ground surface. Approximately 2,073 tons were disposed off-property as special waste. Approximately 105 tons were disposed off-property as hazardous waste by virtue of exhibiting the toxicity characteristic via TCLP testing.

Following removal of the PCE contaminated soil, approximately 8,000 pounds of HRC<sup>®</sup> was added to the bottom of the excavation to facilitate degradation of residual PCE concentrations remaining in the subsurface. The excavation was lined with a geotextile non-woven filter fabric and backfilled with 1-inch clean (no fines) limestone gravel from the base of the excavation to two feet bgs. Additional filter fabric was placed over the gravel, backfilled with a one-foot layer of clay soil, and topped with a one foot layer of 3/8-inch minus limestone gravel. Confirmatory sampling of the excavation sidewalls prior to backfilling indicated that PCE in soil remaining in place was below acceptable risk-based target levels.

C. Previously Submitted Interim Action Remedial Excavation Work Plan

The Permittee submitted an Interim Action Remedial Excavation Work Plan on January 24, 2005, which the Department approved on May 20, 2005. Activities were conducted on September 7 and 8, 2005, and October 27, 2005, and are summarized in the Interim Action Remedial Excavation Completion Report, dated May 17, 2006. Soil excavation was conducted at four risk areas: Building 41 Tank Farm (AOC 3A), 1,000-gallon diesel UST (AOC 3E), Scrap Metal Recycling Dock Area (AOC 6B), and Building 220 Trash Compactor (AOC 8B). Groundwater in these four areas posed a potential future risk via volatilization of contaminants from groundwater to indoor air. As an ISM, impacted soil that could pose a source to groundwater was excavated and transported off-property at a permitted hazardous waste landfill for disposal. The excavation floors and sidewalls in each risk area were sampled to confirm that soil left in place was below risk-based screening levels.

1. AOC 3A - Building 41 Tank Farm

The Building 41 Tank Farm consisted of jet fuel USTs, located to the immediate west of Building 41, and underground jet fuel

distribution lines that ran from the Building 41 Tank Farm to the aircraft fueling area south of Building 42. TPH was detected in groundwater above screening levels at boring B42N5. On October 27, 2005, a total of 88.23 tons of soil was excavated and disposed off-property as special waste. The excavation was 11.5 feet long by 9.5 feet wide by 6 feet deep. The excavation was backfilled with gravel and capped with concrete. Confirmatory soil samples from the excavation floor and sidewalls confirmed that soil left in place was below risk-based screening levels.

2. AOC 3E - 1,000-Gallon Diesel UST (B24)

Tank B24 was a 1,000-gallon diesel fuel UST, located on the east side of Building 2. The tank was removed in 1989. TPH was detected in groundwater above screening levels at boring B2E2, located at the former UST. On October 27, 2005, a total of 8.12 tons of soil was excavated and disposed off-property as special waste. The excavation was 8 feet long by 7 feet wide by 4 feet deep. The excavation was backfilled and brought to grade with gravel. Confirmatory soil samples from the excavation floor and sidewalls confirmed that soil left in place was below risk-based screening levels.

3. AOC 6B - Scrap Metal Recycling Dock Area/Fabrication Operations Facility, Building 27

The recycling dock area was used for recycling and accumulating scrap aluminum, titanium, and other metal shavings and scrap from manufacturing processes. TPH and benzo(a)anthracene were detected in groundwater above screening levels at boring RC2, located at the northern end of the recycling dock. On September 8, 2005, a total of 56.35 tons of contaminated soil was excavated and disposed off-property as special waste. The excavation was 15 feet wide by 15 feet long by 6 feet deep. The excavation was backfilled with gravel and capped with concrete. Confirmatory soils samples from the excavation floor and sidewalls confirmed that soil left in place was below risk-based screening levels.

4. AOC 8B - Building 220 Trash Compactor

The Building 220 Trash Compactor was located at the northwest corner of Building 220. TPH was detected in groundwater above screening levels at boring B220N1, adjacent to the trash compactor. On September 7, 2005, a total of 23.02 tons of soil was excavated and disposed off-property as special waste. The excavation was 10 feet wide by 10 feet long by 5 feet deep. The excavation was backfilled with gravel and capped with asphalt. Confirmatory soils samples from the excavation floor and sidewalls confirmed that soil left in place was below risk-based screening levels.

D. RFI Pilot Study Work Plan for the Former Boeing Fabrication Operations Facility (AOC 6B - Scrap Metal Recycling Dock Area/Fabrication Operations Facility)

In August 2001, the Permittee submitted an RFI Pilot Study Work Plan for the Former Boeing Fabrication Operations Facility (AOC 6B - Scrap Metal Recycling Dock Area/Fabrication Operations Facility), which the Department approved. The details of the pilot study are provided in the Enhanced Bioremediation Pilot Test Report, dated April 2, 2004. The Pilot study consisted of injecting HRC<sup>®</sup> in nine borings around MW3. A total of 810 pounds of HRC<sup>®</sup> was injected into the subsurface. Monthly groundwater monitoring was conducted at monitoring wells MW3, MW3A, and MW3B for one year. The monitoring results provided definitive evidence of accelerated reductive dechlorination through the use of HRC<sup>®</sup>. The dechlorination process was observed to go to completion with the reduction of trichloroethylene to cis-dichloroethylene to vinyl chloride to ethene to ethane.

E. Interim Measures Work Plan Subareas 2B (SWMU 17 - PCE Transfer Area) and 6B (AOC 6B - Scrap Metal Recycling dock Area/Fabrication Operations Facility)

On December 15, 2011, the Permittee submitted an Interim Measure Work Plan Subareas 2B and 6B, which the Department approved on April 24, 2012. On October 3, 2013, the Permittee submitted an Interim Measures Subarea 2B and 6B Report. The purpose of the ISM at these two subareas was to evaluate whether groundwater concentrations and

mass of chlorinated solvents could be further reduced with in-situ chemical oxidation (ISCO).

1. SWMU 17 - PCE Transfer Area

The primary contaminants of concern at SWMU-17 are PCE, trichloroethylene (TCE), cis-1,2-dichloroethylene, and vinyl chloride. Thirteen direct push borings and a total of 11 groundwater monitoring wells were installed in the area, in the shallow, intermediate and deep zones. Observations during monitoring well installation indicated the presence of increasingly tight clays in the intermediate and deep zones. The deep groundwater concentrations were relatively lower compared to the shallow and intermediate zone concentrations. Sodium permanganate was injected using a total of six injection points.

2. AOC 6B - Scrap Metal Recycling Dock Area/Fabrication Operations Facility

The primary chemicals of concern at AOC 6B are TCE, cis-1,2-dichloroethylene, and vinyl chloride. Eight direct push borings, one shallow zone well and one intermediate zone well were installed in the area. The shallow soil consisted of silty-clays with low permeability. Soil and groundwater analytical data confirmed chlorinated solvent impacts in the area west and northwest of MW3 and west of the higher elevation bermed area. The impacts in the intermediate zone were relatively low compared to the shallow zone. Sodium permanganate was injected at four injection points in the vicinity of MW3.

Short-term results at SWMU 17 and AOC 6B indicated some positive effect on contaminant concentrations, but fluctuations in concentrations over time did not support further injection of either an oxidizing or reducing agent to promote in-situ reduction in mass. The less than optimal results can be attributed to reduced delivery of sodium permanganate to target areas caused by the silty clay sediments of very low permeability, low hydraulic gradient resulting in a very low groundwater velocity, and the on-going natural attenuation of the solvents. While the low groundwater velocity limited the effectiveness of in-situ treatment, it is beneficial in that it

limits the further migration of chlorinated solvents. The additional data collected during this investigation supports the existing site conceptual model and the conclusion that groundwater movement is generally slow and residual subsurface contamination is naturally contained and should not migrate off-property. Based on this pilot test, additional in-situ treatment at SWMU 17 and AOC 6B was not pursued, as it would not provide meaningful benefits in terms of either contaminant mass or risk reduction. Further, the on-going monitoring program will confirm the conceptual model that indicated very slow groundwater movement and containment of the impacts.

- F. Should the Permittee become aware of a situation that may require any additional ISMs that may be necessary to protect human health or the environment, the following conditions shall apply:
1. The Permittee shall notify the Department and EPA within 24 hours after becoming aware or should have become aware of a situation that may require ISMs to protect human health or the environment. The Department may examine the Facility's inspection records to determine if the Permittee should have known that ISMs might be required and notification should have occurred.
  2. If, during the course of any activities initiated under this Permit, the Permittee or the Department determines that a release or potential release of hazardous wastes or hazardous constituents poses a threat to human health or the environment, the Department may require ISMs in coordination with the Permittee, to slow or stop the further spread of contamination until final corrective action measures are implemented. The Department shall determine the specific action(s) that shall be taken to implement ISMs, including potential permit modifications, and the schedule for implementing the ISMs. The Department shall notify the Permittee, in writing, of decisions regarding the action(s). This requirement shall not preclude the Permittee from responding to an emergency situation without direction from the Department.
  3. The Permittee shall notify the Department and EPA, in writing, no later than ten calendar days after determining or after a determination should have been made, that the ISMs are not effectively limiting or stopping the further spread of contamination.

The Department may require the ISMs be revised to make them effective in limiting or stopping the spread of contamination, or that additional corrective measures are required to address the contaminated media.

4. In cases where releases or potential releases present minimal exposure concerns and/or the remedial solution is relatively uncomplicated, the Permittee may propose ISMs to the Department for review and approval. These ISMs shall be consistent with and may supplement or satisfy the requirements for a final remedy(s) in specific areas. Proposed ISMs determined by the Department to be significant (e.g., those which are anticipated to make up a substantial part of the final remedy) may be subject to public review and comment before final approval by the Department. Proposed ISMs determined by the Department not to be significant will be reviewed and approved according to the procedures described in Corrective Action Condition XIX. of this Permit.

VI. RCRA Facility Investigation (RFI) Work Plan

- A. The RFI Work Plan and RFI Work Plan addenda were submitted on November 24, 1997, March 16, 2000, and July 19, 2001. The scope of work described in the Work Plan and its addenda was based on a phased approach to the field investigations. The RFI Work Plan and addenda were approved on January 13, 1998, June 16, 2000, and August 20, 2001, respectively.
- B. If the Department determines that additional investigations are needed, the Department may require the Permittee to conduct a supplemental RFI. The Department shall notify the Permittee, in writing, of this decision. Within 60 calendar days after receipt of the Department's request to conduct a supplemental RFI, and after meeting with the Department to discuss the content of the Work Plan, the Permittee shall prepare and submit a supplemental RFI Work Plan to the Department and EPA for review and approval.
- C. The supplemental RFI Work Plan shall be designed to investigate releases of hazardous wastes and hazardous constituents to all appropriate media of concern including surface and subsurface soils, surface water, sediment, groundwater, and air, as necessary. In order to

substantiate future corrective action decisions, the supplemental RFI Work Plan shall contain provisions that are sufficient to meet the following objectives and a proposed schedule for implementing the supplemental RFI Work Plan, which is predicated on the date of Departmental approval of the plan:

1. Full characterization of the nature, vertical and horizontal extent, and rate of migration of releases of hazardous wastes and hazardous constituents from SWMUs and AOCs, or groups of SWMUs and AOCs, or newly-identified release(s) at the facility and the actual or potential receptors of such releases; and
  2. Collection of any other pertinent data that may be utilized to substantiate future corrective action decisions.
- D. The supplemental RFI Work Plan shall be appropriate for facility-specific conditions and shall be consistent with and address all applicable investigation elements described in the EPA document entitled, RCRA Facility Investigation (RFI) Guidance, EPA 530/SW-89-031, May 1989, or the most recent version. At a minimum, the supplemental RFI Work Plan shall detail all proposed activities and procedures to be conducted at the facility, including, but not limited to, the following:
1. A description of current conditions;
  2. The schedule for implementing and completing such investigations and for submission of reports (including the supplemental RFI Report);
  3. The qualifications of personnel performing or directing the investigations, including contractor personnel; and
  4. The overall management of the RFI activities.
- E. The supplemental RFI Work Plan shall include a Quality Assurance Project Plan (QAPP). The QAPP shall present the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities designed to achieve the data quality goals of the supplemental RFI. It shall include, at a minimum, the supplemental RFI objectives, sampling procedures, analytical methods, field and laboratory

quality control samples, chain-of-custody procedures, and data review, validation, and reporting procedures. The Permittee shall follow the EPA document entitled, EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, March 2001, (reissued May 2006) or the most recent version.

- F. The Permittee shall prepare and maintain a Health and Safety Plan during the project that assures the supplemental RFI activities are conducted in a manner that is protective of human health and the environment.
- G. Due to the complexity of defining the extent of contamination, the Permittee may be required to use a phased approach that requires the submittal of additional supplemental RFI Work Plans.
- H. The Department shall review and approve the supplemental RFI Work Plan(s) according to the procedures described in Corrective Action Condition XIX. of this Permit. The Permittee shall complete all activities described in the supplemental RFI Work Plan(s) according to the schedules contained in the approved plan(s).

VII. RCRA Facility Investigation (RFI) Report

- A. On June 18, 1998, the Permittee submitted the RFI Report to the Department and EPA. The Department and EPA approved the RFI Report on December 22, 2004. The nature and extent of groundwater and soil contamination at the facility was defined during the RFI field investigation activities. The Permittee submitted a RBCA Report in September 2004, and 13 addenda. The Department approved the Risk-Based Corrective Action report and associated addenda on August 24, 2009. EPA conducted a supplemental risk assessment, dated March 2008, to confirm the findings of the RBCA Risk Assessment and provide the basis for evaluation of corrective measures alternatives in specific areas at the facility. The findings and conclusions of the approved final RFI Report, approved RBCA Report, and EPA supplemental risk assessment are incorporated herein by reference.
- B. Should additional investigations become necessary, the Permittee shall submit a supplemental RFI Report to the Department and EPA, according to the schedule specified in the approved supplemental RFI Work Plan described in Corrective Action Condition VI. of this Permit. The

supplemental RFI Report shall present all information obtained under the approved supplemental RFI Work Plan, along with a brief facility description and map showing the property boundary and all SWMUs and AOCs. The supplemental RFI Report shall contain adequate information to support additional corrective action decisions at the facility. Information contained in the supplemental RFI Report shall be presented in a format consistent with Section 5 of the EPA document entitled, RCRA Facility Investigation (RFI) Guidance, EPA 530/SW-89-031, May 1989, or the most recent version.

- C. The supplemental RFI Report shall provide an interpretation of the RFI information gathered, supported with adequate documentation, to enable the Department to determine whether additional ISMs or a Corrective Measures Study (CMS) may be necessary. The supplemental RFI Report shall describe the procedures, methods, and results of all investigations of SWMUs and AOCs and associated releases, including, but not limited to, the following, as appropriate:
1. Characterization of the nature, concentration(s), horizontal and vertical extent, and direction/rate of migration of releases from SWMUs and AOCs at the facility;
  2. Characterization of the environmental setting of the facility, including:
    - a. Hydrogeological conditions;
    - b. Climatological conditions;
    - c. Soil and bedrock characteristics;
    - d. Surface water and sediment quality; and
    - e. Air quality and meteorological conditions.
  3. Characterization of SWMUs and AOCs from which releases have been or may be occurring, including unit and waste characteristics;
  4. Descriptions of human and environmental receptors and associated risks to the receptors which are, may have been, or, based on site-

specific circumstances, could be exposed to release(s) from SWMUs and AOCs;

5. Assessment of potential risks to the human and environmental receptors exposed to release(s) from SWMUs and AOCs;
  6. Extrapolations of future contaminant migration including description of contaminant fate and transport mechanisms, and pathways for human and environmental exposure;
  7. Laboratory, bench-scale, pilot-scale and/or appropriate tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be appropriate in implementing remedies at the facility;
  8. Statistical analyses to aid in the interpretation of data;
  9. Results of any ISMs previously implemented; and
  10. Evaluation of data quality that may affect the nature and scope of a CMS, as well as the evaluation of corrective measures alternatives thereunder (e.g., identification of any potential bias in the supplemental RFI data and documentation of its precision, accuracy, representativeness, completeness, comparability, validation, etc.)
- D. The Department shall review and approve the supplemental RFI Report according to the procedures described in Corrective Action Condition XIX. of this Permit. If the Department determines the objectives of the supplemental RFI have not been met, the Department may require additional investigation. Upon approval of the supplemental RFI Report, the Department shall notify the Permittee of the next step in the corrective action process, which may include submission of a CMS Work Plan, as described in Corrective Action Condition VIII. of this Permit.

VIII. Corrective Measures Study (CMS) Work Plan

- A. The Permittee submitted a CMS Work Plan, dated December 17, 2009, which the Department approved in a letter dated July 2, 2010.

- B. If the Department determines that there has been a release of hazardous waste or hazardous constituents from newly- or previously-identified SWMUs or AOCs that may pose a threat to human health or the environment, the Department may require the Permittee to conduct a supplemental CMS or remedy evaluation. The Department shall notify the Permittee, in writing, of this decision. The notice shall identify the hazardous constituent(s) of concern and may specify remedial alternatives to be evaluated by the Permittee.
- C. As part of the supplemental CMS or remedy evaluation, the Department may require the Permittee to evaluate one or more specific remedial alternatives for removal, containment, and treatment of hazardous wastes and hazardous constituents in contaminated media based on the objectives established for the corrective action. These remedial alternatives may include a specific technology or combination of technologies that, in the Department's judgment, may be capable of achieving standards for protection of human health and the environment.
- D. Within 45 calendar days after receipt of the Department's request to conduct a supplemental CMS or remedy evaluation, and after meeting with the Department to discuss the nature and scope of the supplemental CMS or remedy evaluation, the Permittee may be required to submit a supplemental CMS Work Plan or Remedy Evaluation Plan to the Department and EPA for review and approval. If required, the supplemental CMS Work Plan or Remedy Evaluation Plan shall be consistent with the EPA document entitled, RCRA Corrective Action Plan (Final), OSWER Directive 9902.3-2A, May 1994, or the most recent version. At a minimum, the supplemental CMS Work Plan or Remedy Evaluation Plan shall provide the following information, as appropriate, and a proposed schedule for implementing the elements of the plan:
  - 1. A description of the general approach to investigating and evaluating potential remedial alternatives or combinations of alternatives.
  - 2. A definition of the specific objectives of the study/evaluation.
  - 3. A description of the remedial alternative or combination of alternatives that will be studied/evaluated.

4. A description of those potentially viable remedial alternatives that were initially considered, but were dropped from further consideration, including the rationale for elimination.
  5. The specific plans for evaluating remedial alternatives or combinations of alternatives to ensure compliance with applicable remedy selection threshold/balancing criteria and cleanup standards.
  6. A schedule, predicated on the date of Departmental approval of the supplemental CMS Work Plan or Remedy Evaluation Plan, for conducting the study/evaluation and submitting a CMS Report and/or a preferred remedy proposal.
  7. The proposed format for ranking remedial alternatives or a combination of alternatives in support of a preferred remedial alternative or combination of alternatives.
  8. Identification of laboratory, bench-scale, pilot-scale and/or other appropriate tests or studies that will be used to determine the feasibility or effectiveness of treatment technologies, or other technologies that may be appropriate in implementing remedial alternatives at the facility.
- E. The Department shall review and approve the supplemental CMS Work Plan or Remedy Evaluation Plan according to the procedures described in Corrective Action Condition XIX. of this Permit. The Permittee shall complete all activities described in the supplemental CMS Work Plan or Remedy Evaluation Plan according to the schedule contained in the approved plan.
- IX. Corrective Measures Study (CMS) Report
- A. On April 7, 2011, a draft Focused CMS Report was submitted to the Department and EPA. A revised Focused CMS Report was submitted to the Department and EPA on February 16, 2012, November 7, 2012, July 16, 2013, and July 22, 2014. The Department approved the CMS Report in a letter dated July 24, 2014.

- B. If the Department determines that an additional CMS or Remedy Evaluation Report is necessary to address a release(s) of hazardous waste or hazardous constituents from newly- and/or previously-identified SWMUs/AOCs, the Permittee shall submit a supplemental CMS or Remedy Evaluation Report to the Department and EPA according to the schedule specified in the approved supplemental CMS Work Plan or Remedy Evaluation Plan described in Corrective Action Condition VIII. of this Permit. The supplemental CMS or Remedy Evaluation Report shall present all information obtained under the approved supplemental CMS Work Plan or Remedy Evaluation Plan and shall be consistent with guidance contained in the EPA document entitled, RCRA Corrective Action Plan (Final), OSWER Directive 9902.3-2A, May 1994, or the most recent version.
- C. The supplemental CMS or Remedy Evaluation Report shall describe and discuss each remedial alternative or combination of alternatives that was evaluated, including any bench-scale or pilot tests conducted. The supplemental CMS or Remedy Evaluation Report shall include, but not be limited to, the following information:
1. Evaluation of the performance, reliability, ease of implementation, and potential impacts of each remedial alternative or combination of alternatives, including safety impacts, cross media impacts, overall carbon footprint, and control of exposure to any residual contamination;
  2. Assessment of the effectiveness of each remedial alternative or combination of alternatives in terms of achieving adequate control of contaminant sources and cleanup of hazardous waste and/or hazardous constituents released from the SWMU(s) and AOC(s);
  3. Estimation of the time required to begin and complete implementation of each remedial alternative or combination of alternatives, and an estimate of the time required to meet the proposed remediation objectives contained in the supplemental CMS or Remedy Evaluation Report;
  4. Estimation of the costs to implement, operate, monitor, and maintain each remedial alternative or combination of alternatives;

5. Recommendation of a preferred remedial alternative or combination of alternatives, and rationale for the proposed selection; and
  6. Assessment of institutional requirements that may be needed (e.g., state or local permits), discussion of other environmental or public health requirements or institutional controls that may substantially affect implementation of the preferred remedial alternative or combination of alternatives (e.g., local ordinances), and a draft of any site-specific institutional controls proposed as part of the preferred remedial alternative or combination of alternatives (e.g., a draft environmental covenant containing specific activity and use limitations prepared pursuant to the Missouri Environmental Covenants Act).
- D. The supplemental CMS or Remedy Evaluation Report shall contain information that is sufficient to facilitate the Department's development of a Statement of Basis in support of the final remedy decision-making process.
- E. The Department shall review and approve the supplemental CMS or Remedy Evaluation Report according to the procedures described in Corrective Action Condition XIX. of this Permit. Upon approval of the supplemental CMS or Remedy Evaluation Report, the Department will approve a final remedy as specified in Corrective Action Condition X. of this Permit.
- X. Final Remedy Selection and Approval
- A. The proposed final remedy is being issued concurrently with this Permit. The proposed approach is presented in more detail in the Statement of Basis accompanying this Permit. The proposed final remedy is also discussed in more detail in the approved CMS Report and includes the following:
1. Remedial Actions to Address Risk to Construction Workers
    - a. Use of area-specific health and safety plans (HASPs) to protect the future construction worker from unacceptable exposures, particularly to groundwater. The HASP should include the appropriate personal protective equipment and

monitoring based on specific chemicals of concern causing the exceedance, specific locations within the construction area with exceedances, and depth to groundwater in specific locations where unacceptable risk have been identified.

- b. The specific details of each HASP will be determined on a project-by-project basis and will contain procedures and equipment to address potential exposures related to specific project requirements. The soil management plan includes requirements for HASPs. These requirements will be used to develop project and area specific HASPs.

2. Remedial Actions to Address LNAPL

- a. Wells that have historically contained measurable LNAPL will be gauged for LNAPL on an annual schedule. Measurable LNAPL will be removed as necessary. During periodic reviews of the gauging data, the need to continue or modify gauging will be re-evaluated. Should data indicate the presence of persistent measurable LNAPL, then a contingency plan to remove the LNAPL will be developed and implemented.

3. Remedial Actions to Address Exceedance of Groundwater Protection Standards

- a. To prevent future use of contaminated groundwater for drinking water purposes on the permitted facility property, AULs will be established in an enforceable Environmental Covenant in accordance with Corrective Action Condition XV.D. of this Permit.
- b. Monitored Natural Attenuation (MNA) will be implemented to supplement the numerous interim measures conducted to date that are described in Corrective Action Condition V. of this Permit. The MNA remedy includes annual groundwater sampling and analysis that will be implemented according to Tables 1 and 2 and the Revised SAP, as required by Corrective Action Condition I.D.2. of this Permit.

- c. The use of MNA will include contingency planning provisions. Contingency planning includes specific measures to be taken if changed conditions are observed that are inconsistent with the ongoing MNA program (e.g., a sustained increase in contaminant concentrations in groundwater). Therefore, the response actions will be specific to the location, sources, and triggering criteria. Examples of contingency actions that may be considered include:
    - (1) Increase in monitoring frequency for specific monitoring wells.
    - (2) Increase in the number of monitoring wells included in the monitoring plan.
    - (3) Evaluation of the additional data collected to determine the cause of the increase(s).
  - d. If a sustained increase in groundwater contamination is verified, actions may be selected to address the increases as appropriate. Contingency mitigation measures may include one or more of the following:
    - (1) Investigation of suspected contaminant releases and/or source areas.
    - (2) Removal, treatment, and/or control of previously unknown releases/sources that are identified.
    - (3) Implementation of other active or passive remedial technologies as warranted by a detailed evaluation of the data.
4. Since October 2014, TCE has been detected in groundwater monitoring well MW6, at levels exceeding the GPS. MW6 is a shallow zone groundwater monitoring well, located at the edge of known groundwater contamination in Subarea 6D. Prior to the issuance of the Permit, a contingency plan was initiated to investigate the increasing concentration of TCE in MW6. Based on

the investigation the TCE source was not identified. Groundwater monitoring of MW6 will continue. One or more of the contingency actions outlined above may be implemented, if needed, if concentrations in MW6 continue to increase.

5. Remedial Actions to Address Future Risk and Groundwater Plume Stability
    - a. Groundwater monitoring will be conducted to monitor, verify, and document groundwater plume stability. The data will be evaluated to determine if the groundwater concentrations are stable, decreasing, or increasing.
- B. This Corrective Action Condition may apply to additional activities undertaken in response to newly-identified SWMUs and AOCs, additional activities undertaken in response to newly-identified release(s) from previously-identified SWMUs and AOCs, and additional activities undertaken in response to any increasing trends in levels of contamination identified through long-term monitoring under Corrective Action Condition(s) III. and/or IV. of this Permit.
1. If a supplement to the final remedy is determined to be necessary, following the approval of the supplemental CMS or Remedy Evaluation Report, as described in Corrective Action Condition IX. of this Permit, the Department shall prepare a Statement of Basis summarizing the remedial alternatives evaluated by the Permittee and the Department's basis of support for the proposed supplement to the final remedy.
  2. Following the Department's preparation of the Statement of Basis, a permit modification shall be initiated in accordance with 40 CFR 270.41 or 270.42(c), as applicable, to facilitate public review and comment on the Statement of Basis, proposed supplemental final remedy, and supporting documents. When, and if, required, the Permittee shall provide assurances of financial responsibility for any approved revised or supplemental corrective action final remedy pursuant to 40 CFR 264.101(b), and as specified in Corrective Action Condition XVIII. of this Permit.

3. Upon completion of the public participation activities associated with the permit modification to implement the proposed supplemental final remedy, the Department shall approve a final remedy that shall:
  - a. Be protective of human health and the environment;
  - b. Control and/or eliminate the source(s) of contaminants so as to reduce or eliminate, to the maximum extent practicable, further contaminant releases, exposures or migration that may pose a threat to human health and the environment; and
  - c. Meet all applicable federal, state, and local laws and regulations.

XI. Corrective Measures Implementation (CMI) Work Plan

- A. The approved final remedy at the facility includes HASPs, gauging of LNAPL, contingency plan implementation (if warranted), AULs established in enforceable Environmental Covenants, MNA, and long-term groundwater monitoring, as described in the approved CMS Report and Statement of Basis issued concurrently with this Permit. The Permittee shall submit a CMI Work Plan to the Department and EPA within 90 calendar days of the effective date of this Permit. The CMI Work Plan shall provide detailed design specifications, construction plans, and a schedule for implementation of the final remedy. The CMI Work Plan shall provide detailed plans for remedy implementation consistent with all applicable CMI components as specified in the EPA document entitled, RCRA Corrective Action Plan (Final), OSWER Directive 9902.3-2A, May 1994, or the most recent version, and shall be consistent with the objectives specified in the approved CMS Report. The CMI Work Plan shall also contain the following:
  1. Detailed technical descriptions of the monitoring, maintenance, and quality assurance requirements;
  2. A detailed schedule for monitoring;

3. Timeframes for submission of the relevant work plans described in the OSWER Directive referenced above; and
  4. Management procedures for hazardous wastes and hazardous constituents recovered as a result of implementing the corrective measures.
  5. Environmental Covenant requirements as described under Corrective Action Condition XV.D. of this Permit;
  6. Site OM&M Plan;
  7. A Site Security Program;
  8. A revised SAP; in accordance with Corrective Action Condition I.C.1. of this Permit;
  9. Project-specific HASPs as required under the Soil Management Plans, and
  10. Other information, as necessary, pertaining to the design and implementation of the corrective measure(s) in the approved final remedy.
- B. The Permittee shall submit, as part of the CMI Work Plan, an OM&M Plan. The OM&M Plan shall specify operation, maintenance, and monitoring procedures for the approved final remedy, including the relevant information described in Chapter V, Section II, of the EPA document entitled, RCRA Corrective Action Plan (Final), OSWER Directive 9902.3-2A, May 1994, or the most recent version.
- C. The Permittee shall prepare project-specific HASPs to protect future construction workers from potentially unacceptable exposures, particularly to contaminated groundwater, as required under the soil management plans. The specific details of each HASP will be determined on a project-by-project basis and will contain procedures and equipment to address potential exposures related to the specific project requirements. The soil management plans include requirements for HASPs. These requirements will be used to develop project-and area-specific HASPs.

- D. The Permittee shall include, as part of the OM&M plan, a site security program. The site security program shall describe access controls for preventing unplanned and accidental exposures to soil and groundwater contamination. The site security program shall also identify access controls that are intended to provide long-term protection against unplanned and accidental exposures and integrate these with access controls that are available at the facility as of the effective date of this Permit.
- E. The Permittee shall revise and submit a SAP as a part of the OM&M Plan in accordance with Corrective Action Condition I.C.1. of this Permit. The revised SAP shall reflect any revised and additional requirements contained in this Permit.
- F. Those elements of the approved final remedy that have received prior approval and are operational prior to submittal of the CMI Work Plan should be incorporated in the CMI Work Plan by reference, along with any additional information requested by the Department.
- G. The Department shall review and approve the CMI Work Plan according to the procedures described in Corrective Action Condition XIX. of this Permit. The Permittee shall implement the CMI Work Plan in accordance with the schedule contained in the approved plan.
- H. In the event that new SWMU(s), AOC(s), or release(s) are identified on the permitted facility property, the Permittee shall comply with Corrective Action Conditions III. and IV., as appropriate. New SWMU(s), AOC(s), or release(s) that are identified shall be reported to the Department and EPA.

XII. Certification of Completion of Construction of Final Remedy

- A. This Permit and the Corrective Action Conditions contained herein are based on the approved CMS Report and the final remedy specified in this Permit. If the Department or Permittee determines a new remedy or revised final remedy is necessary, all current Corrective Action Conditions shall continue to be in force, unless and until appropriate permit modifications are reviewed and approved.
- B. Within 60 calendar days of completion of all construction activities associated with implementation of any approved final remedy, the

Permittee shall submit a written certification to the Department and EPA, by certified mail, stating the final remedy has been constructed according to this Permit, the approved CMS or Remedy Evaluation Report, final remedy decision, and CMI Work Plan. The certification shall be signed by the Permittee and a professional engineer registered in Missouri.

This certification shall be part of a Construction Completion (CC) Report. The CC Report shall contain a summary of all final remedy construction activities implemented at the facility (including any previously-implemented ISMs), the exact location(s) and design of any new wells, and discussion of any deviations from the approved CMI Work Plan. The CC Report shall also address the information described in Chapter V, Section VI of the EPA document entitled, RCRA Corrective Action Plan (Final), OSWER Directive 9902.3-2A, May 1994, or the most recent version.

- C. For SWMUs and/or AOCs requiring extended time periods for operation of the final remedy, the Permittee shall summarize the progress of the final remedy and continue to provide data obtained during final remedy operation, maintenance, and monitoring in the Semi-Annual Groundwater and Corrective Action Progress Report, required in Corrective Action Condition XV. of this Permit.

### XIII. Certification of Completion of Corrective Measures

- A. When the Permittee decides to verify completion of corrective measures at a SWMU, group of SWMUs, or facility-wide, the Permittee shall submit documentation to demonstrate that groundwater contaminant levels are protective of human health and the environment. Factors to be addressed in the demonstration include the continued presence (or lack thereof) of legally enforceable groundwater use restrictions, the groundwater contaminant plume(s) has been stable or decreasing for at least three consecutive years, the GPSs included in Table 1 of this Permit are not likely to be exceeded in the future beyond the permitted facility property boundaries, and future expansion of the groundwater contaminant plume(s) is unlikely beyond the three consecutive year period due to “contaminant rebound” related to back diffusion of contaminants from matrix or secondary porosity features. The Permittee’s groundwater corrective action program shall continue until the Permittee makes a successful demonstration that addresses the foregoing factors. Groundwater corrective action may stop at any individual SWMU or group

of SWMUs, once the Department reviews and approves the Permittee's demonstration and a successful modification of this Permit recognizing this demonstration has been completed pursuant to 40 CFR 270.42 or 270.41, as appropriate. Documentation related to the certification of completion of corrective measures can be included in the Semi-Annual Groundwater and Corrective Action Progress Reports submitted according to Corrective Action Condition XV. of this Permit, or may be submitted as a stand-alone document under separate cover.

- B. The Department shall review and approve the documentation verifying completion of all corrective action at each SWMU, group of SWMUs, or facility-wide, according to the procedures described in Corrective Action Condition XIX. of this Permit.
- C. Within 60 calendar days of receipt of the Department's approval of the documentation verifying completion of all corrective action under Corrective Action Condition XIII.B. of this Permit, the Permittee shall submit a written certification to the Department and EPA, by certified mail, stating the final remedy has been completed according to the approved CMS or Remedy Evaluation Report, approved final remedy decision, and CMI Work Plan. The certification shall be signed by the Permittee and a professional engineer registered in Missouri.
- D. Facility-wide cessation of the groundwater corrective action program shall require the submittal of a Groundwater Remediation Completion Report that addresses all factors identified in Corrective Action Condition XIII.A. above, in support of a Class 3 Permit Modification or permit termination, following the requirements of 40 CFR 270.42, as incorporated in 10 CSR 25-7.270(1), and the public notice and opportunity for comment requirements of 10 CSR 25-8.124.

XIV. Activity and Use Limitations (AULs)

AULs are legal or physical restrictions or obligations with respect to the facility property. AULs place a legal responsibility and physical restrictions or limitations on the use of, or access to, the permitted facility property. The following AULs, consistent with the approved CMS, apply to the Permittee and the facility property subject to the jurisdiction of this Permit:

A. Soil or Other Environmental Media Disturbance at the Facility

1. Any planned construction, excavation, or maintenance and repair activities must be performed according to the approved Boeing Permitted Facility Excavated Soil Management Plan dated February 7, 2011, or most recent version. The Department shall review and approve any revisions to the Excavated Soil Management Plan according to the procedures described in Corrective Action Condition XIX. of this Permit.

B. Transfer of Interest of Permitted Property

1. The Permittee shall notify the Department at least 90 calendar days before the transfer of any interest in any portion of the permitted facility property. The Permittee shall comply with all requirements of 40 CFR 270.40, as related to any transfer of ownership or operational control of any portion of the permitted facility property.
2. Any proposal by the Permittee to remove any parcel of the permitted facility property from the jurisdiction of this Permit shall require a submission of a demonstration that all residual contamination on the portion of the property proposed for removal is protective of human health and the environment. Such demonstrations can be made by demonstrating the residual concentrations are below applicable regulatory standards consistent with any enforceable institutional and/or engineering controls contained in an environmental covenant for that portion of the property.
3. Any parcel of the permitted facility property proposed to be removed from the jurisdiction of this Permit shall require a legal survey for that portion of the property, execution of an environmental covenant, if needed and such a covenant is not already in place at the time of the proposal, and successful completion of a Class 3 Permit Modification to remove the proposed portion of the property from the jurisdiction of this Permit following the requirements of 40 CFR 270.42, as incorporated by reference in 10 CSR 25-7.270(1), and the public notice and opportunity for comment requirements of 10 CSR 25-8.124.

C. Change in Use of Property

The Permittee shall notify the Department, in accordance with 10 CSR 25-7.270(1), which incorporates by reference 40 CFR 270.30(h), at least 30 calendar days before any proposed change in the use of the facility property, including any applications for building permits for work on the facility property or proposals for work that could potentially be affected by contamination from a SWMU or AOC and/or compliance with the requirements of this Permit.

D. Missouri Environmental Covenants Act

The Permittee and other non-permitted owners of the permitted facility property (i.e., GKN Aerospace and St. Louis Lambert International Airport) prepared three draft Environmental Covenants that comply with the Missouri Environmental Covenants Act, Sections 260.1000 through 260.1039, RSMo. The draft Environmental Covenants are being provided for public review and comment as part of the proposed final remedy along with this Permit.

1. Within 60 calendar days after the effective date of this Permit, the Permittee shall execute the Environmental Covenants, incorporating any changes necessitated in response to public comments, and shall submit the Environmental covenants to all other relevant parties for signature.
2. Within 15 calendar days after execution (signature by all parties) of any Environmental Covenant for the permitted facility property, or for any off-property areas impacted by soil and/or groundwater contamination originating from SWMUs and AOCs on the facility property, the Permittee shall record, according to state law, the executed Environmental Covenants in the chain-of-title for all affected properties, or on some other instrument which is normally examined during title search, that will in perpetuity notify any potential purchaser of the environmental conditions of the property(ies).
3. Within 30 calendar days after recording the executed Environmental Covenants, the Permittee shall provide a notarized statement to the Department, certifying that the executed

Environmental Covenants have been recorded, including a copy of the Environmental Covenant showing the book/page/instrument number of recordation.

4. In the event that one or more parties (other than the Permittee) fails to timely execute the final Environmental Covenants for their portions of the permitted property after submittal to that party, the Department, with assistance from the Permittee, shall pursue all reasonable and necessary measures to obtain that party's signature. If any party does not timely execute the final Environmental Covenant for their portion of the permitted property following further discussion with the Department, the Department reserves the right pursuant to 10 CSR 25-7.270(1), which incorporates by reference 40 CFR 270.41, to modify this Permit to name that party as an owner/operator (Permittee) and establish additional permit conditions for that portion of the permitted Facility owned or operated by that party that are equivalent to the enforceable AULs provided for in the final Environmental Covenants.
5. The Environmental Covenants shall run with the land (permitted facility property) and shall be binding upon any future owners, operators, heirs, successors, lessees, or assigns and their authorized agents, employees, or persons acting under their direction or control. In the event of permit termination, the Permittee and/or facility owners shall cause any lease, grant, or other transfer of any interest in the facility property to include a provision expressly requiring the lessee or transferee to comply with the Environmental Covenant conditions filed in the chain-of-title for the facility property.
6. In the event that future additional remediation on the permitted facility property, before or after permit termination, reduces contaminants to levels below applicable risk-based threshold/standards based on use of the property, the AULs, or portions thereof, contained in the Environmental Covenants may be rescinded and/or modified according to the provisions specified in the Environmental Covenants. This may include placement of an additional document in the property chain-of-title indicating the

Environmental Covenants, or portions thereof, have been rescinded and/or modified.

- E. Environmental Covenant Provision Requirements Before Permit Termination
1. If the Permittee or facility owners desire to rescind or modify all or part of a previously-executed Environmental Covenant, the Permittee shall submit a proposal to the Department at least 180 calendar days before the effective date of any proposed permit transfer or termination. This proposal shall contain a demonstration signed by the Permittee that evaluates the residual levels of contamination in comparison with then-current risk-based thresholds/standards. The Permittee shall demonstrate that residual contaminant levels have decreased to less than the applicable risk-based thresholds/standards in support of rescinding and/or modifying established AULs. The demonstration shall include, at a minimum, a summary of analytical data collected during any monitoring and/or confirmation sampling of contaminated media, a summary of all relevant historical data, accompanying narrative discussion, and any other relevant information that will ensure that residual contaminant levels will be protective of human health and the environment if specific AULs are rescinded and/or modified.
  2. If the Department determines, based on the demonstration required in Corrective Action Condition XIV.E.1. of this Permit, that the residual levels of contamination present may still pose a threat to human health or the environment based on use of the property, the Department shall notify the Permittee, in writing, that the terms of the existing Environmental Covenant are still appropriate or that the Permittee shall prepare and submit for approval, a revised draft Environmental Covenant to address the changed conditions at the facility. Within 60 calendar days after receipt of the Department's notification, the Permittee shall prepare and submit a revised draft Environmental Covenant to the Department for review and approval. The revised Environmental Covenant shall include the following:

- a. A record of the type, location, and concentrations of hazardous wastes and hazardous constituents expected to remain in the subsurface soils and/or groundwater that will exceed the currently applicable regulatory risk-based thresholds/standards at the time of proposed revision of the Environmental Covenant and/or termination of this Permit;
- b. Two figures illustrating the boundary of each SWMU/AOC for which the levels of contamination in the subsurface soils and/or groundwater exceed the applicable regulatory risk-based thresholds/standards at that time. One figure shall illustrate soil contamination in relation to individual SWMUs or groups of SWMUs at the time of proposed revision of the Environmental Covenant and/or termination of this Permit. The second figure shall illustrate groundwater contamination in relation to individual SWMUs or groups of SWMUs at the time of proposed revision of the Environmental Covenant and/or termination of this Permit. The figures shall be to scale and indicate the location and dimensions of each SWMU with respect to key landmarks, such as major buildings, the permitted facility property boundaries, etc. These figures shall also illustrate the location of any engineered controls implemented as part of the final remedy, which are to be restricted from disturbance;
- c. Groundwater use restrictions applicable at the time of proposed revision of the Environmental Covenant and/or termination of this Permit; and
- d. A provision to provide for continued proper operation and maintenance of any engineering controls implemented as part of the final remedy to prevent unacceptable human and/or environmental exposures to disposed wastes, contaminated soils and/or groundwater contaminated with hazardous wastes or hazardous constituents in concentrations exceeding applicable regulatory risk-based thresholds/standards at the time of proposed revision of the Environmental Covenant and/or termination of this Permit. Any engineering controls shall not be disturbed, remain in place, and be effective until the Department provides written

approval to alter, modify, eliminate, or otherwise cease operation and maintenance of such controls.

3. If the Department determines that the demonstration required in Corrective Action Condition XIV.E.1. of this Permit is sufficient to support elimination and/or modification of established AULs, the Department shall direct the Permittee to prepare and submit a revised draft Environmental Covenant to the Department for review and approval, to address the changed conditions at the facility.
4. The Department shall review and approve the revised draft Environmental Covenant according to the procedures described in Corrective Action Condition XIX. of this Permit.
5. The Permittee shall record the approved revised Environmental Covenant as outlined in Corrective Action Condition XIV.D.2. of this Permit and submit any related documentation to the Department according to the schedule outlined in Corrective Action Conditions XIV.D.3. of this Permit. The Permittee shall also comply with any additional Environmental Covenant conditions as outlined in Corrective Action Conditions XIV.D.4. through D.5. of this Permit, as appropriate.

XV. Semi-Annual Groundwater and Corrective Action Progress Reports

- A. The Permittee shall prepare and submit Semi-Annual Groundwater and Corrective Action Progress Reports to the Department and EPA, summarizing all permitted corrective action activities undertaken during the previous calendar half-year (i.e., January through June and July through December). Semi-Annual Groundwater and Corrective Action Progress Reports are due by March 1 and September 1 of each calendar year for the previous calendar half-year. The first Semi-Annual Groundwater and Corrective Action Progress Report shall be due within 60 calendar days after the end of the six-month period in which this Permit becomes effective. The Semi-Annual Groundwater and Corrective Action Progress Reports shall continue to be submitted until the Permittee's corrective action activities (including any long-term operation, maintenance, and monitoring activities) are complete.

- B. The Semi-Annual Groundwater and Corrective Action Progress Reports shall include the following information for the time period being reported:
1. A description of the work completed;
  2. Summaries of all findings, including summaries of analytical laboratory data;
  3. Copies of the field parameter measurement results, field sampling/well inspection log sheets, and quality assurance/quality control (QA/QC) data;
  4. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;
  5. Projected work for the next reporting period; and
  6. Any instances of noncompliance with the corrective action requirements of this Permit not otherwise required to be reported elsewhere in this Permit.
- C. Any detailed technical information that is part of any additional corrective action activities undertaken pursuant to this Permit and required to be submitted as part of the ISMs, RFI and/or CMS work plans and reports, need not be reproduced as part of the Permittee's Semi-Annual Groundwater and Corrective Action Progress Reports.
- D. Each September 1 Semi-Annual Groundwater and Corrective Action Progress Report shall include the following information for the time period being reported:
1. All original, uninterpreted laboratory analytical data from the Permittee's semi-annual groundwater sampling events, groundwater analysis results, field parameter measurement results, copies of field sampling and well inspection log sheets, well repair documentation, QA/QC data, statistical analysis of groundwater data, field investigation results, and other relevant groundwater-related information, as appropriate.
  2. Presentation and discussion of any exceedances of the GPS.

- E. Each March 1 Semi-Annual Groundwater and Corrective Action Progress Report shall, in addition to the information listed for the September 1 Semi-Annual Groundwater Corrective Action Report, provide a comprehensive evaluation of the facility-wide groundwater monitoring program for the previous calendar year (i.e., January through December). The March 1 Semi-Annual Groundwater and Corrective Action Progress Report shall include the following information for the time period being reported:
1. A narrative discussion of the nature and evolution of the Permittee's groundwater monitoring program, as well as conclusions concerning the overall adequacy of the program as related to its intended purpose, including any interim measures/stabilization actions/remedial action plans. Any conclusions concerning inadequacies in the groundwater monitoring program shall be accompanied by a discussion of proposed remedies. Specific details concerning any proposed remedies shall be further developed outside of the scope of this report or as otherwise specified in this Permit.
  2. Comprehensively address all technical requirements of 40 CFR Part 264 Subpart F and this Permit. The Permittee shall summarize relevant groundwater monitoring information and present this information in the form of narrative discussions, groundwater flow calculations, and/or diagrammatic illustrations (e.g., tabular groundwater and statistical data summaries, hydrogeologic and potentiometric contour maps/cross-sections, chemical parameter trend graphs, calculated rate(s) of contaminant migration, contaminant isoconcentration maps/cross-sections, fence/isometric diagrams, groundwater flow nets, etc.), as appropriate.
  3. Evaluate the effectiveness of the groundwater corrective action program, including, but not limited to, the following:
    - a. The rate and direction of groundwater movement in underlying aquifers and potential effects on any corrective action measures being designed or implemented at the facility for removal, containment or control of the groundwater contaminant plume(s);

- b. The horizontal and vertical extent and concentrations of hazardous constituents (Table 1) in groundwater throughout the contaminant plume(s) as evaluated from the data obtained through the Permittee’s groundwater monitoring program;
  - c. Any surface and/or subsurface well integrity problems and their potential or actual influence on the groundwater data or effectiveness of the groundwater corrective action program;
  - d. An annual plume stability analysis, which shall demonstrate whether the plume is growing, shrinking or stable for the past ten years. The analysis shall demonstrate increasing, decreasing, or stable contaminant trends for the past ten years;
  - e. The amount of Non-Aqueous Phase Liquids, if present, and groundwater extracted from the subsurface as part of the groundwater corrective action program. This information shall be reported both as a total amount and per well or extraction location, and shall be used in conjunction with dissolved phase contaminant concentration information to estimate quantities of contaminants removed;
  - f. Contaminant trend analyses in groundwater from year to year using analytical results of the groundwater samples to help evaluate the overall progress/trends of the corrective action program, and to provide the basis for future decisions regarding the need for additional corrective action/ stabilization measures and/or optimization of existing measures; and
  - g. The conclusions and summary, including statistical evaluation, of analytical results from groundwater monitoring conducted during the reporting period.
4. Contain detailed boring logs for any new exploratory borings, monitoring wells, and/or detailed “as-built” monitoring well diagrams for any new monitoring wells installed during the corresponding reporting period and the monitoring well-related information

specified in Corrective Action Conditions I.D.4 through 6. of this Permit.

XVI. Planned and Contingent Activities

- A. The Permittee shall comply with the schedule for planned corrective action activities as specified in this Permit and summarized in Table 5.
- B. The Permittee shall comply, as necessary, with the schedule(s) for contingent corrective action activities as specified in this Permit and summarized in Table 6.

XVII. Supplemental Data

All uninterpreted data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Permit shall be maintained by the Permittee during the term of this Permit, including the term of any continued or reissued permits.

XVIII. Corrective Action Cost Estimates and Financial Assurance

The Permittee shall comply with the requirements described in the Missouri Hazardous Waste Management Law (and all standards, rules, and regulations adopted under this act), Section 260.350, et seq., RSMo, 40 CFR Part 264 Subpart H, 40 CFR 270.30, 40 CFR 270.40, 40 CFR 270.42, and 40 CFR 270.51, as incorporated in 10 CSR 25-7 and 10 CSR 25-8.

A. Cost Estimates

1. Corrective Action Cost Estimate

Within 90 calendar days of the effective date of this Permit, the Permittee shall submit, in compliance with 40 CFR 264.101, an updated, detailed, written cost estimate, in current dollars, of the cost of hiring a third party to implement each remedial alternative or combination of alternatives identified in the approved CMS that are part of the approved final remedy required by this Permit

- a. The corrective action cost estimate shall account for the total cost of all work activities and related costs that are expected to continue until such time as final clean-up objectives are met and confirmed. This includes, but is not limited to, any long-term costs such as:
  - (1) Final remedy operation, maintenance, monitoring;
  - (2) Utility costs including electricity, water and sewer;
  - (3) Decommissioning of remediation equipment and proper plugging/abandonment of monitoring wells;
  - (4) Payment of real estate taxes on the property; and
  - (5) Departmental oversight cost reimbursement.
- b. The cost estimate shall be certified by a registered professional engineer licensed in Missouri and developed using appropriate cost estimating software.
- c. The Permittee may, at any time during final remedy implementation, submit a demonstration to the Department for review and approval, to adjust the corrective action cost estimate in recognition of the estimated time remaining to achieve applicable remediation objectives/standards.
- d. A contingency cost allowance of ten percent of the total cost of all corrective action activities shall be included in the cost estimate.
- e. A third party, as defined in 40 CFR 264.144(a)(1), is a party who:
  - (1) Is neither a parent nor a subsidiary of the Permittee; and
  - (2) Does not share a common parent or subsidiary with the Permittee.

- f. The cost estimates shall not include any salvage value that may be realized from the sale of wastes, facility structures or equipment, land, or other assets associated with the facility.
- g. The Permittee shall submit each revised corrective action cost estimate to the Department for review and evaluation. If the cost estimate requires modification, the Department shall notify the Permittee, in writing, of the estimate's deficiencies and specify a due date for submission of a revised cost estimate for further evaluation and final written response.

The Permittee shall maintain, in the operating record, the most recent corrective action cost estimate that has received a final written response from the Department.

## 2. Revisions to the Corrective Action Cost Estimate

### a. Annual Adjustment for Inflation

The Permittee shall annually adjust the corrective action cost estimate for inflation until all corrective action activities required by this Permit are complete. The inflation adjustment shall be determined by using the procedures described in 40 CFR 264.142(b) except that the inflation factor should be derived from the most recent annual Implicit Price Deflator for the Gross Domestic Product, instead of the Gross National Product. The cost estimate is due within 60 calendar days before the anniversary date of the establishment of the financial assurance instrument used to comply with this section. If the Permittee uses a financial test or corporate guarantee to demonstrate financial assurance, the cost estimate is due within 30 calendar days of the end of the provider's fiscal year.

b. Additional Corrective Action Activities

The Permittee shall adjust the corrective action cost estimate if:

- (1) The Permittee or the Department determines that any additional corrective action activities are required; or
- (2) Any other conditions increase or decrease the estimated cost of the corrective action activities to be performed under this Permit.

If the Department determines a new cost estimate is required, the Department shall notify the Permittee, in writing, of this requirement.

The Permittee shall submit each revised corrective action cost estimate to the Department for review and evaluation, within 60 calendar days of the Permittee's determination that a revised cost estimate is necessary or written notification by the Department that a new cost estimate is required. If the new cost estimate requires further revision, the Department shall notify the Permittee, in writing, of the estimate's deficiencies and specify a due date for submission of a new revised cost estimate.

B. Financial Assurance

In order to provide for the full and final completion of the corrective action activities required by this Permit, the Permittee shall establish and maintain financial assurance for the benefit of the Department in the amount at least equal to the most recent corrective action cost estimate that received a final written response from the Department. The Permittee may use one or more of the financial assurance forms generally described in Corrective Action Condition XVIII.B.11. of this Permit. All financial assurance instruments provided pursuant to this Permit shall be satisfactory in form and substance as determined by the Department. The Department reserves the right to limit the choices of the Permittee to one or more of the instruments described in Corrective Action Condition XVIII.B.11. of this Permit, on a case-by-case basis, in order to

ensure the full and final completion of the corrective action activities required by this Permit.

1. Timeframes for Financial Assurance Instruments (other than Financial Test or Corporate Guarantee)
  - a. Within 30 calendar days after receipt of the Department's final written response to the Permittee's corrective action cost estimates pursuant to this Permit, the Permittee shall submit draft financial assurance instruments and related documents to the Department for review and evaluation. This applies to all financial assurance instruments except the financial test or corporate guarantee. See Corrective Action Condition XVIII.B.2. of this Permit for timeframes for financial tests and corporate guarantees.
  - b. Within ten calendar days after receiving the Department's final written response regarding the draft financial assurance instrument(s), the Permittee shall execute or otherwise finalize all instruments or other documents required in order to make the selected financial assurance legally binding. The instruments or other documents shall be in a form identical to the financial assurance documents reviewed and responded to by the Department.
  - c. Within 30 calendar days after receiving the Department's final written response regarding the draft financial assurance instrument(s), the Permittee shall ensure that the issuing institution submits all original executed and/or otherwise finalized instruments or other documents to the Department. Facsimiles or photocopies are not acceptable.
2. Timeframes for Financial Tests and Corporate Guarantees
  - a. Within 30 calendar days after the Department's final written response regarding the Permittee's corrective action cost estimate(s) pursuant to this Permit, the Permittee shall submit to the Department all documentation necessary to demonstrate that the Permittee satisfies the financial test

criteria pursuant to Corrective Action Condition XVIII.B.11.e. of this Permit.

- b. The Permittee's financial assurance shall be effective immediately upon the Permittee's receipt of the Department's final written response regarding the Permittee's corrective action cost estimates or the Permittee's demonstration that the Permittee satisfies the financial test criteria under Corrective Action Condition XVIII.B.11.e. of this Permit, whichever date is later.
- c. The Permittee agrees that if the Permittee provides financial assurance by means of a corporate guarantee or financial test, the Department may request additional information (including financial statements and accountant's reports) from the Permittee or corporate guarantor at any time. Any request by the Department for this information shall be in writing and shall specify a due date for submission of this information. The Permittee shall promptly provide the requested information to the Department.

3. Certified Mail

The Permittee shall submit all required financial assurance instruments and related documents to the Department by certified mail.

4. Multiple Instruments

The Permittee may combine more than one mechanism to demonstrate financial assurance for the corrective action activities required by this Permit. As specified in 40 CFR 264.145(g), these mechanisms are limited to trust funds, surety bonds guaranteeing payment into a trust fund, letters of credit and insurance (i.e., use of the foregoing instruments in combination with the financial test and/or corporate guarantee is not allowed).

5. Inadequate Financial Assurance Instrument

- a. If at any time the Department determines that a financial assurance instrument provided pursuant to this Permit is inadequate, or no longer satisfies the requirements, the Department shall notify the Permittee in writing. This applies whether there is an adjustment in the estimated cost of the corrective action activities required by this Permit as independently determined by the Department or due to a determination by the Permittee pursuant to Corrective Action Condition XVIII.B.5.b.
  - (1) Within 30 calendar days of receipt of such notice, the Permittee shall submit draft revised financial assurance instruments and related documents to the Department for review and evaluation. The draft revised financial assurance instruments and related documents shall address the inadequacies outlined in the Department's notice.
  - (2) Within ten calendar days of receiving the Department's final written response regarding the draft revised financial assurance instrument(s), the Permittee shall execute or otherwise finalize all instruments or other documents required in order to make the selected financial assurance instruments/ documents legally binding. The instruments or other documents shall be in a form identical to the revised financial assurance documents reviewed and responded to by the Department.
  - (3) Within 30 calendar days after receiving the Department's final written response regarding the draft revised financial assurance instrument(s), the Permittee shall ensure that the issuing institution submits all original executed and/or otherwise finalized instruments or other documents to the Department. Facsimiles or photocopies are not acceptable.

- b. If at any time the Permittee determines that any financial assurance instrument provided pursuant to this Permit is inadequate or no longer satisfies the requirements described or incorporated by reference herein, the Permittee shall notify the Department in writing within ten calendar days of this determination. This applies whether due to an adjustment in the estimated cost of the corrective action activities required by this Permit or for any other reason. The Permittee shall follow the procedures in Corrective Action Condition XVIII.B.5.a. of this Permit to update/replace the financial assurance instrument.

6. Obligation to Complete Corrective Action Activities

The Permittee's inability or failure to establish or maintain financial assurance for completion of the corrective action activities required by this Permit in no way excuse performance of any other requirements of this Permit, including, without limitation, the obligation of the Permittee to complete all necessary corrective action activities in strict accordance with the terms of this Permit.

7. Automatic Renewal

All financial assurance instruments shall automatically renew by March 31st of each calendar year unless the financial assurance provider notifies both the Permittee and the Department by certified mail of a decision to cancel, terminate, or not renew a financial assurance instrument. The Permittee and the Department shall receive such notification at least 120 calendar days before expiration, cancellation, or termination of the instrument. Under the terms of the financial assurance instrument, the 120 calendar days shall begin on the date of receipt of the notice by certified mail by both the Permittee and the Department.

Within 90 calendar days following receipt of such notice by both the Permittee and the Department, the Permittee shall provide alternate financial assurance and obtain a written final response from the Department regarding such alternate financial assurance.

If the Permittee fails to provide alternate financial assurance within 90 calendar days, the Department shall notify the financial assurance provider, in writing, before the expiration of the instrument. The notification to the financial assurance provider shall instruct the financial assurance provider to immediately deposit the remaining funds obligated under the financial assurance into the standby trust fund or a newly created trust fund acceptable to the Department.

8. Modification of Amount and/or Form of Financial Assurance

a. Reduction of Amount of Financial Assurance

If the Permittee believes that the estimated cost to complete the corrective action activities required by this Permit has diminished below the amount covered by the existing financial assurance provided under this Permit, the Permittee may submit a written proposal to the Department to reduce the amount of the financial assurance provided under this Permit. The amount of the financial assurance proposed shall be at least equal to the estimated cost of the remaining corrective action activities required by this Permit. The written proposal shall specify, at a minimum, the cost of the remaining corrective action activities to be performed and the basis upon which such cost was calculated (e.g. years remaining until established clean-up standards are expected to be met). In seeking approval of a revised financial assurance amount, the Permittee shall follow the procedures described in Corrective Action Condition XVIII.B.8.b.(2) of this Permit. The Department shall notify the Permittee in writing regarding its evaluation of the revised financial assurance amount. The Permittee may reduce the amount of the financial assurance after receiving the Department's written response to the proposed revisions, but only according to and to the extent permitted by the Department's response. No change to the form or terms of any financial assurance provided under this Section, other than a reduction in amount, is authorized except as provided in Corrective Action Condition XVIII.B.8.b. of this Permit.

b. Change of Form of Financial Assurance

- (1) If the Permittee wishes to change the form or terms of financial assurance, the Permittee may submit a written proposal to the Department to change the form of financial assurance. The submission of such a proposal shall be as provided in Corrective Action Condition XVIII.B.8.b.(2) of this Permit.
- (2) A written proposal for a revised or alternative form of financial assurance shall specify, at a minimum:
  - (a) The cost of the remaining corrective action activities to be performed;
  - (b) The basis upon which such cost was calculated; and
  - (c) The proposed revised form of financial assurance, including all proposed instruments or other documents required in order to make the proposed financial assurance legally binding.

The proposed revised or alternative form of financial assurance shall satisfy all requirements described or incorporated by reference in this Permit. The Department shall notify the Permittee, in writing, of its decision regarding the revised or alternative form of financial assurance submitted pursuant to this paragraph.

Within ten calendar days after receiving a final written response regarding the proposed revised or alternative financial assurance, the Permittee shall execute and/or otherwise finalize all instruments or other documents required in order to make the selected financial assurance legally binding and effective in a form identical to the documents submitted to the Department.

Within 30 calendar days of receiving a final written response regarding the proposed revised or alternative financial assurance, the Permittee shall ensure that the issuing institution submits all original executed and/or otherwise finalized instruments or other documents to the Department. Facsimiles or photocopies are not acceptable.

The Department shall release, cancel, or terminate the prior existing financial assurance instruments only after the Permittee has submitted all executed and/or otherwise finalized new financial assurance instruments or other required documents to the Department.

9. Performance Failure

a. In the event that the Department determines the Permittee:

- (1) Has ceased implementation of any of the corrective action activities required by this Permit; or
- (2) Is significantly or repeatedly deficient or late in its performance of the corrective action activities required by this Permit; or
- (3) Is implementing the corrective action activities required by this Permit in a manner that may cause an endangerment to human health or the environment;

the Department may issue a written notice (“Performance Failure Notice”) of the Permittee’s failure to perform to both the Permittee and the financial assurance provider. The notice shall specify the grounds upon which the notice was issued and shall provide the Permittee a period of ten calendar days to remedy the circumstances.

b. If the Permittee fails to remedy the Performance Failure to the Department’s satisfaction before the expiration of the

ten calendar-day notice period specified in Corrective Action Condition XVIII.B.9.a. of this Permit, the Department shall have immediate access to and benefit of the financial assurance provided. The Department may, at any time thereafter, direct the financial assurance provider to immediately:

- (1) Deposit into the standby trust fund, or a newly created trust fund acceptable to the Department, the remaining funds obligated under the financial assurance instrument; or
- (2) Arrange for performance of the corrective action activities required by this Permit.

c. The Department shall give the Permittee written notice if:

- (1) The Department determines that any of the circumstances described in Corrective Action Condition XVIII.B.9.a.(1), (2), or (3) of this Permit have occurred; and
- (2) The Department is nevertheless unable, after reasonable efforts, to secure the payment of funds or performance of the corrective action activities required by this Permit from the financial assurance provider.

d. Within ten calendar days of receiving such written notice, the Permittee shall provide cash to fund the standby trust fund, or a newly-created trust fund acceptable to the Department. The funds shall at least equal the cost of the remaining corrective action activities required by this Permit. The deposit shall be made in immediately available funds and without setoff, counterclaim, or condition of any kind.

10. Release of Financial Assurance.

The Permittee may submit a written request to the Department to release the Permittee from the requirement to maintain financial

assurance after the Department and the Permittee have mutually agreed that all corrective action activities required by this Permit are complete. The Department shall notify both the Permittee and the provider(s) of the financial assurance if and when the Permittee is released from all financial assurance obligations under this Permit. The Permittee shall not release, cancel, or terminate any financial assurance provided pursuant to this Permit, except as provided in this paragraph or Corrective Action Condition XVIII.B.8.b. of this Permit.

11. Financial Assurance Instruments

The wording of the financial assurance documents shall meet the requirements of 40 CFR 264.143 and 40 CFR 264.151, as incorporated in 10 CSR 25-7.264(1), except that deviation in wording of a financial assurance instrument to incorporate coverage for corrective action activities is allowed. All financial assurance instruments provided pursuant to this Permit shall be satisfactory in form and substance as determined by the Department.

a. Trust Fund

The trust fund shall be:

- (1) Established for the benefit of the Department;
- (2) Administered by a trustee who has the authority to act as a trustee under federal or state law and whose trust operations are regulated and examined by a federal or state agency; and
- (3) Acceptable in all respects to the Department.

The trust agreement shall provide that the trustee shall make payments from the fund as the Department shall direct in writing:

- (4) To reimburse the Permittee for expenditures made by the Permittee for corrective action activities performed according to this Permit; or
- (5) To pay any other person whom the Department determines has performed or will perform the corrective action activities required by this Permit.

The trust agreement shall further state that the trustee shall not refund to the grantor any amounts from the fund until the Department has advised the trustee, in writing, that the corrective action activities performed according to this Permit have been completed to the satisfaction of the Department.

b. Surety Bond

A surety bond shall unconditionally guarantee either:

- (1) Payment at the direction of the Department into a standby trust fund that meets the requirements of the trust fund in Corrective Action Condition XVIII.B.11.a. of this Permit; or
- (2) Performance of the corrective action activities required by this Permit. The Surety Company issuing the bond shall, at a minimum, be among those listed as acceptable sureties on Federal Bonds as described in Circular 570 of U.S. Department of the Treasury.

If the Permittee seeks to establish financial assurance by using a surety bond, the Permittee shall, at the same time, establish and maintain a standby trust fund. The standby trust fund shall meet the requirements of Corrective Action Condition XVIII.B.11.a. of this Permit. Funds from the surety bond shall be deposited into the standby trust fund if the Department directs the financial assurance provider to do so, pursuant to Corrective Action Condition XVIII.B.9. of this Permit.

c. Irrevocable Letter of Credit

An irrevocable letter of credit shall be payable at the direction of the Department into a standby trust fund that meets the requirements of Corrective Action Condition XVIII.B.11.a. of this Permit. The letter of credit shall be issued by a financial institution:

- (1) That has the authority to issue letters of credit; and
- (2) Whose letter-of-credit operations are regulated and examined by a federal or state agency.

If the Permittee seeks to establish financial assurance by using a letter of credit, the Permittee shall, at the same time, establish and maintain a standby trust fund. The standby trust fund shall meet the requirements of Corrective Action Condition XVIII.B.11.a. of this Permit. Funds from the letter of credit shall be deposited into the standby trust fund if the Department directs the financial assurance provider to do so, pursuant to Corrective Action Condition XVIII.B.9. of this Permit.

d. Policy of Insurance

A policy of insurance shall:

- (1) Provide the Department with rights as a beneficiary which are acceptable to the Department; and
- (2) Be issued by an insurance carrier that:
  - (a) Has the authority to issue insurance policies in Missouri; and
  - (b) Whose insurance operations are regulated and examined by a federal or state agency.
- (3) The insurance policy shall be issued for a face amount at least equal to the current corrective action

cost estimate for which the facility has received a written final review response from the Department except that the face amount may exclude costs that are covered by another financial assurance instrument, as permitted in Corrective Action Condition XVIII.B.4. of this Permit.

- (4) The insurance policy shall state that the insurer shall make payments up to an amount equal to the face amount of the policy as directed by the Department in writing:
  - (a) To reimburse the Permittee for expenditures made by the Permittee for corrective action activities performed according to this Permit; or
  - (b) To pay any other person whom the Department determines has performed or will perform the corrective action activities required by this Permit.
  
- (5) The insurance policy shall also state that it may not be canceled, terminated, or non-renewed and the policy shall remain in full force and effect in the event that:
  - (a) The Permittee is named as a debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or
  - (b) The Department notifies the insurer of the Permittee's failure to perform, under Corrective Action Condition XVIII.B.9. of this Permit.

e. Financial Test

A Permittee may provide financial assurance through a demonstration by the Permittee that the Permittee meets the financial test criteria of 40 CFR.264.143(f), provided that all other requirements of 40 CFR 264.143(f), as incorporated in

10 CSR 25-7.264(1), are satisfied. See Corrective Action Condition XVIII.B.11.g. of this Permit for further requirements.

f. Corporate Guarantee

A direct or indirect parent company of a Permittee may provide a corporate guarantee executed in favor of the Department. Such guarantee shall state that the company providing the guarantee shall perform the corrective action activities required by this Permit or that the company shall establish a trust fund as permitted by Corrective Action Condition XVIII.B.11.a. of this Permit. Any company providing such a guarantee shall demonstrate, to the satisfaction of the Department, that it meets the financial test requirements of 40 CFR 264.143(f), as incorporated by reference in 10 CSR 25-7.264(1). See Corrective Action Condition XVIII.B.11.g. of this Permit for further requirements.

g. Additional Requirements for Financial Test/Corporate Guarantee

If at any time during the term of this Permit the Permittee demonstrates financial assurance for the corrective action activities required by this Permit by providing a financial test or corporate guarantee pursuant to Corrective Action Conditions XVIII.B.11.e. or XVIII.B.11.f. of this Permit, the Permittee shall also comply with the applicable requirements of 40 CFR 264.143(f), 40 CFR 264.151(f), and 40 CFR 264.151(h)(1), as incorporated by reference in 10 CSR 25-7.264(1), relating to these methods, unless otherwise provided in this Permit. This includes, but is not limited to:

- (1) Initial submission of required financial reports and statements from the guarantors' chief financial officer and independent certified public accountant;

- (2) Annual re-submission of such reports and statements within 90 calendar days after the close of each of the guarantor's fiscal year; and
- (3) Notification to the Department by certified mail within 90 calendar days after the close of any of the guarantor's fiscal year in which any such guarantor no longer satisfies the financial test requirements described at 40 CFR Part 264.143(f)(1), as incorporated in 10 CSR 25-7.264(1).

If the Permittee provides financial assurance by means of a financial test or corporate guarantee, the Department may request additional information (including financial statements and accountant's reports) from the Permittee or corporate guarantor at any time. Any request by the Department for this information shall be in writing and shall specify a due date for submission of this information. The Permittee shall promptly provide the requested information to the Department.

For purposes of the financial test or corporate guarantee described in Corrective Action Conditions XVIII.B.11.e. and XVIII.B.11.f. of this Permit, references in 40 CFR 264.143(f), as incorporated in 10 CSR 25-7.264(1), to "the sum of current closure and post closure costs" and "the current plugging and abandonment cost estimates" and references in 40 CFR 264.101(c), as incorporated in 10 CSR 25-7.264(1), to "Assurances of financial responsibility for such corrective action shall be provided" shall mean "the sum of all environmental remediation obligations" guaranteed by such company or for which such company is otherwise financially obligated, in addition to the cost of the corrective action activities required by this Permit. This includes obligations under the Comprehensive Environmental Response, Compensation, and Liability Act, RCRA, Underground Injection Control Program, Toxic Substances Control Act, and any other state or tribal environmental obligation.

XIX. Review and Approval Procedures

- A. Financial assurance cost estimates and draft financial assurance mechanisms for corrective action shall be reviewed and responded to by the Department according to the procedures described in Corrective Action Condition XVIII. of this Permit.
- B. Following submission of any plan, report, or extension request pertaining to corrective action activities (excluding the Semi-Annual Groundwater and Corrective Action Progress Reports, unless proposed actions to address corrective action program inadequacies are contained therein; and Corrective Measures Implementation Report) and any Certification of Completion of Construction of Final Remedy, the Department shall review and either approve or provide written comments on the plan, report, or request. If the Department does not approve the plan, report, or request, the Department shall notify the Permittee, in writing, of the deficiencies in the plan, report, or request and specify a due date for submittal of a revised plan, report, or activity.
- C. If the Department does not approve the revised plan, report, or associated activity schedule, the Department may modify the plan, report, or schedule and notify the Permittee of the modifications. The plan, report, or schedule, as modified by the Department, shall be the approved plan, report, or schedule.
- D. If the Permittee disagrees with any Department-initiated plan, report, or schedule modifications, and a mutually acceptable resolution of such modifications cannot be informally reached, the Permittee may file an appeal of the Department-initiated modifications according to 10 CSR 25-2.020, and Sections 260.395.11 and 621.250, RSMo.

XX. Document and Activity Extension Requests

If the Permittee requires additional time to submit a scheduled document or perform other activities required by this Permit, the Permittee shall submit a written extension request to the Department. The Department shall receive the extension request at least seven calendar days before the scheduled due date of the document or activity. The Permittee's extension request shall specify the amount of additional time needed and shall be accompanied by the Permittee's justification for the extension. The Department shall review and approve the

extension request according to the procedures described in Corrective Action Condition XIX. of this Permit.

**FACILITY SUBMISSION SUMMARY**

**Table 4 – Planned Submittal Requirements  
Pursuant to this Permit and Schedule of Compliance**

<b>Submittal Requirements</b>	<b>Due Date*</b>	<b>Permit Condition</b>
Two paper copies and one searchable electronic copy of the consolidated permit application.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance Item I.A.
Certification that Permittee has read and understands all permit conditions in this Permit.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance Item I.B.
Check or money order for any outstanding engineering review costs.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance Item I.C.
Check or money order for each year this Permit is to be in effect beyond the first year.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance Item I.D.
Updated corrective action cost estimate.	Within 90 calendar days after effective date of this Permit.	Schedule of Compliance Item II.
Updated draft financial assurance instrument.	Within 30 calendar days after the Department's final written response on the corrective action cost estimate.	Schedule of Compliance Item III.
Execute/finalize updated financial assurance instrument reflecting the updated cost estimate.	Within 10 calendar days of Department's final written response on draft financial assurance instrument.	Schedule of Compliance Item IV.
Submit all original executed/ finalized financial assurance instruments and related documents.	Within 30 calendar days after receiving the Department's final written response regarding the draft financial assurance instrument.	Schedule of Compliance Item V.

Submittal Requirements	Due Date*	Permit Condition
Corrective Measures Implementation Work Plan	Within 90 calendar days after the effective date of this Permit.	Schedule of Compliance Item VI.
Operation, Maintenance and Monitoring Plan incorporating: <ul style="list-style-type: none"> <li>- Revised Sampling and Analysis Plan</li> <li>- Health and Safety Plan</li> <li>- Site Security Program</li> </ul>	Within 90 calendar days after the effective date of this Permit.	Schedule of Compliance Item VI.A.
Recordation of Environmental Covenants	Within 15 calendar days after execution of Environmental Covenants	Schedule of Compliance Item VII.B.
Notarized statements certifying the executed Environmental Covenants were recorded.	Within 30 calendar days after recording executed Environmental Covenants	Schedule of Compliance Item VII.C.
Biennial Report with information required by 40 CFR 264.75	March 1 of each even numbered calendar year.	General Permit Condition I.
Permit Renewal Application	Within 180 calendar days of expiration date of this Permit.	Standard Permit Condition I.

\*Extensions may be requested and approved by the Department for cause without modifying this Permit.

**Table 5 – Planned Corrective Action Submittal Requirements Pursuant to the Corrective Action Conditions of this Permit**

<b>Planned Submittal Requirements</b>	<b>Due Date</b>	<b>Corrective Action Condition</b>
Corrective Measures Implementation (CMI) Work Plan	According to the schedule in the implementation permit modification.	XI.
Certification of final remedy construction	Within 60 calendar days after completion of all construction activities.	XII.B.
Certification of Completion of Corrective Measures	Within 60 calendar days after receipt of Department approval of document verifying completion.	XIII.C.
Semi-Annual Groundwater and Corrective Action Progress Reports	By March 1 and September 1 of each calendar year.	XV.
Updated corrective action cost estimate	Annually, within 60 calendar days before anniversary date of establishment of the financial assurance instrument.	XVIII.A.2.
Draft financial assurance instrument(s)	Within 30 calendar days after the Department's final written response on the updated corrective action cost estimate.	XVIII.B.1.a.
Execute/finalize updated financial assurance instrument reflecting the updated cost estimate.	Within 10 calendar days of Department's final written response on draft financial assurance instrument.	XVIII.B.1.b.
Submit all original executed/finalized financial assurance instruments and related documents.	Within 30 calendar days after receiving the Department's final written response regarding the draft financial assurance instrument.	XVIII.B.1.c.

**Table 6 – Contingent Corrective Action Submittal Requirements Pursuant to the Corrective Action Conditions of this Permit**

<b>Contingent Submittal Requirements</b>	<b>Due Date</b>	<b>Corrective Action Condition</b>
Written notification of newly-identified SWMU(s) and AOC(s)	No later than 15 calendar days after discovery.	III.A.
SWMU/AOC Assessment Work Plan	Within 30 calendar days after notice by the Department that a work plan is required.	III.B.
SWMU/AOC Assessment Report	According to the schedule in the approved SWMU/AOC Assessment Work Plan.	III.D.
Written notification of newly-identified releases from previously-identified SWMU(s) and AOC(s)	No later than 15 calendar days after discovery.	IV.A.
Newly-Identified Release Work Plan	Within 30 calendar days after notice by the Department that a work plan is required.	IV.B.
Newly-Identified Release Report	According to the schedule in the approved Newly-Identified Release Work Plan.	IV.D.
Notification of interim/stabilization measures	Within 24 hours after discovery of need for stabilization.	V.F.1.
Notification of interim/stabilization measures not effective	Within ten calendar days after determination.	V.F. 3.
RCRA Facility Investigation (RFI) Work Plan	Within 60 calendar days of notice by the Department that a work plan is required.	VI.B.
RCRA Facility Investigation (RFI) Report	According to the schedule in the approved RFI Work Plan.	VII.B.
Corrective Measures Study (CMS) or Remedy Evaluation Work Plan	Within 45 calendar days of notice by the Department that a work plan is required.	VIII.D.

<b>Contingent Submittal Requirements</b>	<b>Due Date</b>	<b>Corrective Action Condition</b>
Corrective Measures Study (CMS) or Remedy Evaluation Report	According to the schedule in the approved CMS Work Plan.	IV.B.
Soil or Other Media Disturbance at the Facility	As specified in referenced permit condition.	XIV.A.
Transfer of Interest in Permitted Property	As specified in referenced permit condition.	XIV.B.
Change in Use of Property	As specified in referenced permit condition.	XIV.C.

## **FIGURES**

### **Figure 1 – Facility Location**

**Figure not available due to size.**

**Please see hard copy or separate electronic file online at**

**<http://dnr.mo.gov/env/hwp/permits/mod000818963/20041207-figure1.pdf>**

**Figure 2 – Facility Property Boundaries**

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**Please see hard copy or separate electronic file online at**

**<http://dnr.mo.gov/env/hwp/permits/mod000818963/20170601-figure2c.pdf>**

**Figure 3 – Permitted Area**

**Figure not available due to size.**  
Please see hard copy or separate electronic file online at  
<http://dnr.mo.gov/env/hwp/permits/mod000818963/20170601-figure3.pdf>

**Figure 4 – Location of SWMUs and AOCs at the Facility**

**Figure not available due to size.**  
Please see hard copy or separate electronic file online at  
<http://dnr.mo.gov/env/hwp/permits/mod000818963/20041207-figure4.pdf>