

**APPENDIX B**

**Unilateral Administrative Order for Removal Action  
CERCLA Docket No. 10-27-0051**

**Action Memo for Time Critical Removal Action  
FMC Pond 16S, Pocatello, Idaho  
December 13, 2006**



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10  
IDAHO OPERATIONS OFFICE  
1435 N. Orchard St.  
Boise, Idaho 83706

Reply To  
Attn Of: ECL-116

**ACTION MEMORANDUM**

SUBJECT: Request for Approval of Time-Critical Removal Action – FMC Pond 16S,  
Pocatello, Idaho

FROM: Greg Weigel  
On-Scene Coordinator  
Idaho Operations Office

THRU: Chris D. Field, Unit Manager   
Emergency Response Unit  
Office of Environmental Cleanup

TO: Daniel D. Opalski, Director  
Office of Environmental Cleanup

SSID: 10EY

**I. PURPOSE**

The purpose of this Action Memorandum is to request and document approval of a proposed time-critical removal action described herein for FMC Pond 16S (Site), in Power County, Idaho. This proposed removal action is to extract and treat phosphine gas and other gases that exist at concentrations within the cap of Pond 16S that present a threat of release to the environment and endangerment to public health or welfare, or the environment.

**II. SITE CONDITIONS AND BACKGROUND**

The CERCLIS ID # for the Eastern Michaud Flats NPL site, of which the FMC Pond 16S is a part, is IDD984666610. This Action Memorandum is for a proposed time-critical removal action.

## **A. Site Description**

### **1. Site location**

The FMC site is located in Southeastern Idaho on Highway 30, approximately 2.5 miles northwest of Pocatello, Idaho, in Township 6 South, Range 33 East (see Figure 1). Pond 16S is entirely within the exterior boundaries of the Fort Hall Indian Reservation. Pond 16S access is via a private gated and locked access road approximately ½ mile to the west from the main FMC entrance, off of E. County Road.

### **2. Site characteristics**

The FMC Site contains hazardous waste management units regulated under RCRA, including Pond 16S. Pond 16S covers an area of approximately 10.2 acres and contains approximately 140 square feet of waste from the elemental phosphorus manufacturing process. Pond 16S received waste until September 1999, including phosphorus containing water and precipitator slurry from the furnace building, phosphorus decontamination residues, water from other ponds and waste to which lime had been added. Pond 16S solids consist of fine-grained furnace solids (ore, coke and silica), elemental phosphorus from the precipitators, and residual sludge and dirt contained in phossey water after processing at the phosphorus loading dock. The Pond 16S cap consists of a seven foot thick evapo-transpiration layer composed of soil, crushed and screened slag and sand which overlays a geo-synthetic composite barrier and drainage system which overlays the waste. A dual purpose pressure monitoring and gas collection system was installed under the cap around the perimeter of the Pond. Eight temperature monitoring sensors were also installed in well casings extending through the cap to locations above the waste to monitor temperature.

### **3. Site history**

From 1947 to April 2000, FMC Corporation owned the FMC Site. In April 2000, FMC sold the FMC Site to Astaris Idaho LLC, a subsidiary of Astaris LLC. Astaris LLC was owned 50% by FMC Corporation and 50% by Solutia Inc. In February 2002, FMC acquired 100% of Astaris Idaho LLC and changed its name to FMC Idaho LLC. FMC Idaho LLC, a wholly owned subsidiary of FMC Corporation, has owned and operated the FMC Site since February 2002.

The Site was used to manufacture elemental phosphorus from phosphate ore from the late 1940s until December 2001. Since 2001, FMC has been in the process of decommissioning and dismantling the manufacturing plant.

On October 16, 1998, the United States filed a Complaint against FMC in U.S. District Court for the District of Idaho alleging a number of RCRA violations at the FMC elemental phosphorus manufacturing facility, including the allegation that FMC placed

reactive and ignitable phosphy wastes in Pond 16S since it became operational in 1993. A Consent Decree entered on July 13, 1999, required FMC Corporation, among other things, to close and cap Pond 16S waste in accordance with all applicable RCRA requirements and an EPA approved closure plan. EPA approved the final closure plan for Pond 16S on February 6, 2004. The Consent Decree and the approved closure plan required removal of water, construction of a center dike to allow placement of fill material, and placement of a cap over the waste. It also required temperature and pressure monitoring and gas collection systems to be installed. FMC reported that it had completed closure in 2004, and certified that it had completed closure in accordance with the approved closure plan in January 2005.

On March 13, 2001, FMC discovered that phosphine had apparently built up, auto-ignited, and melted small holes in the temporary liner that FMC installed on Pond 16S over the fill material in advance of installing the final cap. Subsequent gas monitoring detected phosphine at the perimeter of the temporary cover in concentrations greater than 20 parts per million (ppm). FMC attributed the presence of phosphine to the sludge-intrusive activities of the center dike construction, which caused mixing of limed and non-limed materials. Prior to the placement of the interim cover and final cap, hydrogen cyanide gas was also detected at Pond 16S at a maximum concentration of 1.11 ppm.

In February 2006, elevated levels of phosphine gas were detected in the metal enclosure housing the top of the well casing for a temperature sensor. Subsequently, in June 2006, intermittent emissions of smoke from two temperature monitoring point (TMP) vents (T03 and T04) were observed. FMC has reported that its assessment is that phosphine gas was continuing to collect in TMP well casings and likely accumulating to the phosphine auto-ignition concentration (20,000 ppm) inside the temperature well casings, forming phosphorus pentoxide. Visible air emissions from Pond 16S have been observed on a several occasions since June 2006, including by Shoshone-Bannock Tribal staff on September 6, 2006 and September 18, 2006.

#### **4. Removal site evaluation**

On November 20 and 21, 2006, the EPA On-Scene Coordinator and START contractor conducted removal site evaluation activities at the Site. Air samples were collected of ambient air at Pond 16S, upwind of Pond 16S and downwind of Pond 16S. Additionally, air samples were collected from the top of a temperature monitoring well casing (TMP #1) that extends to beneath the cap, as well as from the discharge end of FMC's existing gas extraction and treatment system (see Figure 2). Samples were analyzed for phosphine, hydrogen cyanide, and hydrogen sulfide. Analytical data show elevated concentrations of phosphine gas (360 ppm) hydrogen cyanide gas (0.12 ppm), and hydrogen sulfide gas (507 ppm) being generated within the cap at Pond 16S. Ambient air samples showed concentrations as high as 0.13 ppm for hydrogen sulfide downwind of the pond; phosphine and hydrogen cyanide were not detected in ambient air at levels at or above the detection limits.

## **5. Release or threatened release into the environment of a hazardous substance, or pollutant or contaminant**

Phosphine, hydrogen sulfide and hydrogen cyanide are hazardous substances as defined by sections 101(14) and 101(33) of the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. section 9601(14) and (33). Phosphine concentrations have been measured in gasses under the cap at Pond 16S at concentrations of 360 ppm. FMC has reported that their monitoring has shown concentrations in excess of 1,000 ppm coming from TMP well casings on Pond 16S. Releases of phosphorous pentoxide to the atmosphere, from the oxidation of phosphine, have been observed as white plumes of smoke coming from one or more of the TMPs at Pond 16S, at various times and as recently as September, 2006. Additionally, elevated concentrations of hydrogen cyanide and hydrogen sulfide have been measured in TMP well casings and hydrogen sulfide has been measured in ambient air at and in the vicinity of Pond 16S.

## **6. NPL status**

The FMC Site, including Pond 16S, is part of the Eastern Michaud Flats (EMF) Superfund site that was listed on the CERCLA National Priority List (NPL) on August 30, 1990 (Federal Register, Volume 55, Number 169, page 35502). Within the EMF Superfund site boundaries are the FMC Site and the J.R. Simplot Company "Don" Plant. EPA issued a CERCLA Record of Decision (ROD) selecting a remedy for the EMF site in 1998. EPA is reevaluating the Record of Decision as it pertains to the FMC Site. FMC is conducting a Supplemental Remedial Investigation and Feasibility Study pursuant to a CERCLA Administrative Order on Consent, which will include an investigation of former FMC plant operating areas that were in operation and not evaluated at the time of EPA's original site investigation.

## **B. Other Actions to Date**

After observing high concentrations of phosphine gas in TMP metal enclosure housings in February, 2006, FMC personnel began operation of two small gas extraction systems, which draw gas from a 2 inch perforated pipe that goes around the perimeter of the cap, which is then run through carbon units before being exhausted. Subsequently, in June 2006, intermittent emissions of smoke from two TMP vents were observed. FMC's assessment was that phosphine gas was continuing to collect in TMP well casings and accumulating to the auto-ignition concentration of 20,000 ppm. When the phosphine in well casings reached its auto-ignition concentration, a combustion reaction occurred, forming phosphorous pentoxide, resulting in a heavy white smoke venting from the TMP well casings. To reduce the phosphine gas buildup in the TMP well casings, FMC installed passive vent systems with activated carbon columns on all TMPs. However, phosphorous pentoxide releases continued to be observed at the outlet of these un-

powered venting systems. FMC concluded that the passive vent system was not drawing enough volume to maintain phosphine levels below the auto-ignition concentration. Subsequently, the passive vent systems and carbon columns were removed, and FMC began utilizing the perimeter gas extraction system to actively extract gas out of two TMPs during regular work shift hours. During off-work hours the gas extraction system is switched back to the perimeter piping system. FMC has also made efforts to seal the well casings to minimize the continued release of phosphine gas and phosphorous pentoxide to the environment.

**C. State and Local Authorities' Roles**

The Site is within the outer boundaries of the Fort Hall Reservation. EPA is consulting and coordinating with the Shoshone-Bannock Tribes regarding this action. Neither the Tribes, nor state or local governments have authorities and/or resources to conduct this proposed action.

**III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

Conditions at this site meet the criteria for a time-critical removal action as stated in the National Contingency Plan (NCP), 40 CFR Section 300.415, as follows:

**A. Threats to Public Health or Welfare**

1. Actual or potential exposure to hazardous substances or pollutants or contaminants by nearby populations or the food chain (300.415(b)(2)(i)). Phosphine has been released from TMP well casings to the atmosphere at Pond 16S at concentrations estimated by FMC to be greater than 1,000 parts per million (ppm). Auto-ignition of phosphine gas has been observed inside well casings. The auto-ignition concentration of phosphine is 20,000 ppm. The National Institute of Occupational Safety and Health has determined that phosphine gas is immediately dangerous to life and health at 50 ppm (based on a 30 minute exposure). The Occupational Safety and Health Administration (OSHA) time weighted average permissible exposure limit is 0.3 ppm. High concentrations of phosphine gas and other toxic gases accumulating within the Pond 16S cap may be released through the TMP well casings as has already occurred, or otherwise from the cap as a result of continued gas build-up. Such potential releases, if not addressed by the proposed removal action, may present an imminent and substantial endangerment to site workers, visitors and others at or nearby the Site.

While access to Pond 16S is controlled by FMC via a series of two chain link fences with locked gates, employees of FMC and their contractor personnel access Pond 16S and nearby areas on a regular basis for maintenance and monitoring activities. Also,

a major northwest Union Pacific rail line runs adjacent the Site to the North, approximately 200 feet from the Pond 16S, and old Bannock Highway 30 is approximately 100 feet North of the rail line.

2. High levels of hazardous substances or pollutants in soils largely at or near the surface that may migrate(300.415(b)(2)(iv)). FMC has reported that phosphine gas was continuing to collect in TMP well casings and accumulating to the phosphine auto-ignition concentration (20,000 parts per million) inside the temperature well casings or vents, at or near the surface. Analytical data from samples collected by an EPA contractor November 20 and 21, 2006, show high levels of phosphine gas (360 ppm) hydrogen cyanide gas (0.12 ppm), and hydrogen sulfide gas (507 ppm) being generated within the cap at Pond 16S and measured near the surface in TMP well casings. These gases may migrate to the atmosphere through the TMP well casings, as has already occurred, or otherwise as a result of continued gas build-up in the cap.

3. Threat of fire or explosion (300.415(b)(2)(vi)). Based on observations from EPA's recent removal site evaluation, FMC's current gas treatment equipment may be inadequate for keeping up with gas generation rate at Pond 16S. Consequently, the potential exists for high concentrations of phosphine and other explosive gasses to continue to build up within the cell. Concentrations of phosphine gas that exceed it's auto-ignition concentration pose a risk of fire and explosion. Phosphorus pentoxide, from the auto-ignition of phosphine, has been observed at Pond 16S on several occasions, and as recently as September, 2006. The occurrence of a fire and/or explosion would pose a serious risk for on-site workers and potentially the public and would likely result in significant damage to the engineered cover.

4. The availability of other appropriate Federal or State response mechanisms to respond to the release (300.415(b)(2)(vii)). There are no other appropriate Federal, Tribal or State response mechanisms that have the authorities and/or resources to respond to this release.

#### **IV. ENDANGERMENT DETERMINATION**

Actual or threatened releases of hazardous substances from this Site may present an imminent and substantial endangerment to public health or welfare, or the environment.

#### **V. PROPOSED ACTIONS AND ESTIMATED COSTS**

##### **A. Proposed Actions**

##### **1. Proposed action description**

The proposed action requires the design and implementation of a system for the removal of phosphine and other gases that may endanger public health from beneath the cap at Pond 16S, such that concentrations of these gases beneath the cap are reduced to levels that are sustainable using the current perimeter gas extraction system or some other EPA approved long-term gas extraction/treatment system. In order to adequately design a system there will need to be additional characterization of gasses present under the cap at Pond 16S.

At a minimum, gas concentrations must be reduced to below 10% of the lower explosive limit (LEL). The system design and operation must include measures to ensure that additional air is not drawn in beneath the cap as gas is extracted. The design and operation must address the balancing of gas extracted and any inert gas injected to ensure that introduction of gas does not cause releases, if gas injection is included as part of the design. The gas extraction and treatment system must be designed and operated such that gas concentration from any discharge point does not exceed levels that are protective of human health and the environment, including workers and site visitors.

Also, the system design and work plan must provide for a monitoring and sampling/analysis plan that will include periodic monitoring and sample collection and analysis sufficient to demonstrate compliance with the performance objectives, as well periodic ambient air monitoring and/or sampling and analysis to determine the nature and extent of any releases of gas at and around Pond 16S at levels that may endanger public health or the environment, and to ensure that gas is not leaking out of the system or through the cap. Monitoring must continue for one full year after gas concentrations have been reduced to 10% of the LEL.

## **2. Contribution to remedial performance**

The purpose of the proposed time-critical removal action is to reduce high concentrations of phosphine and any other gases that have built up beneath the cap that present a threat of release to the environment, such that any remaining concentrations of phosphine and other gases are at levels that are sustainable and do not present an imminent and substantial endangerment to public health. This short-term action is consistent with the approved RCRA closure plan, and any other likely long-term action, either under RCRA or CERCLA authority, that may be needed to address any continued generation of phosphine and other gases within the cap at Pond 16S.

## **3. Description of alternative technologies**

There are no viable alternative technologies, in addition to the proposed removal action that, at this time, have been identified for the Site.

## **4. Engineering Evaluation/Cost Analysis (EE/CA)**

This proposed action is for time-critical removal action, and an EE/CA therefore is not required.

## 5. Applicable or relevant and appropriate requirements (ARARs)

The NCP requires that removal actions attain ARARs under federal or state environmental or facility siting laws to the extent practicable, considering the exigencies of the situation. The proposed removal action will attain or exceed ARARs to the extent practicable. Below is a summary of potential ARARs that have been identified or otherwise considered for this project:

- Resource Conservation and Recovery Act, as amended (RCRA), 42 U.S.C. §§ 6901 *et seq.*, and its implementing regulations codified in Parts 260 through 265, and 268 of the Code of Federal Regulations (CFR), including but not limited to the following specific requirements identified at this time:
  - 1) 40 CFR §§ 261.10 and 261.24, relating to characteristics of hazardous wastes including the toxicity characteristic;
  - 2) 40 CFR § 262.11, relating to hazardous waste determinations;
  - 3) 40 CFR § 265.17, relating to management of ignitable, reactive, or incompatible wastes;
  - 4) 40 CFR §§ 262.20, 262.21, 262.22, 262.23, 262.30, 262.31, 262.32 and 262.34, relating to hazardous waste accumulation, manifesting and labeling requirements prior to transportation of hazardous waste off-site;
  - 5) 40 CFR §§ 263.20 and 263.21, relating to off-site transport of hazardous waste (handling and manifesting requirements);
  - 6) 40 CFR Part 268, relating to off-site and on-site land disposal restrictions for hazardous wastes;
  - 7) 40 CFR § 300.440, relating to the CERCLA "Off-Site Rule."
- Clean Air Act as amended (CAA), 42 U.S.C. 7401, §§ *et seq.*, and its implementing regulations codified in Title 40, Part 49 of the Code of Federal Regulations (CFR) including but not limited to the following specific requirements identified at this time:
  - 1) 49.124 – relating to visible air emissions;
  - 2) 49.125 – relating to particulate matter emissions;
  - 3) 49.126 – relating to fugitive particulate matter emissions.

## 6. Project Schedule

It is expected that project implementation will begin in January, 2007, and will take a year or more to complete, depending on the volume and concentration of phosphine and other gasses under the cap, and the rate at which they can be safely extracted and treated and monitoring completed to confirm that performance objectives have been met.

**B. Estimated Costs**

It is anticipated that work described in this proposed removal action will be implemented by FMC and their contractor personnel, under a CERCLA Section 106(a) Administrative Order that EPA is expected to issue. EPA estimated costs per this Action Memorandum, therefore, are anticipated only for costs associated with implementation of the Order by FMC, including but not limited to review and development of comments on required deliverables, oversight of work plan implementation, on-site monitoring and sample collection and analysis with respect to evaluating compliance with the Order and protection of public health and welfare, and other EPA responsibilities with respect to Order implementation. If EPA were to undertake implementation of the work described in this Action Memorandum with its own resources, an Action Memorandum Amendment and Cost Ceiling Increase would be required.

<u>Extramural Contractor Costs:</u>		
START Contractor Costs		\$ 80,000
Extramural Costs Contingency	(20% Contractor Costs)	\$ 16,000
Total, Extramural Costs		\$ 96,000
<u>Requested Removal Project Ceiling</u>		\$ 96,000

**VI. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

If the proposed removal action is not implemented, high concentrations of phosphine and other toxic gasses will likely continue to build up within the cell, which may be released, either through the TMP well casings as has already occurred, or otherwise through the cap. Such potential releases, if not addressed by the proposed removal action, may present an imminent and substantial endangerment to site workers, visitors and others at or nearby the Site. The continued build-up of phosphine and other flammable gasses also presents a fire and/or explosion hazard which poses a serious risk for on-site workers and potentially the public and would likely result in significant damage to the engineered cover.

**VII. OUTSTANDING POLICY ISSUES**

The recommended removal requires actions to be taken at Pond 16S, which was closed under RCRA and is subject to a RCRA post closure plan. The removal is not expected to conflict with post closure requirements.

**VIII. ENFORCEMENT**

FMC Idaho LLC, a wholly owned subsidiary of FMC Corporation, is a viable potentially responsible party. EPA plans to require FMC Idaho LLC to implement the selected removal action under a Unilateral Administrative Order issued under Section 106(a) of CERCLA.

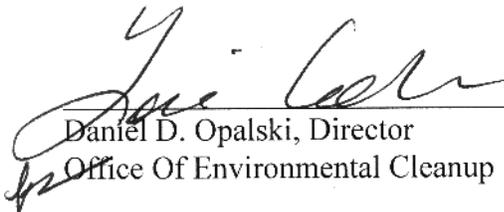
**IX. RECOMMENDATION**

This decision document represents the selected removal action for the FMC Pond 16S Site, in Power County, Idaho, developed in accordance with CERCLA as amended, and not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at this site meet the NCP section 300.415(b)(2) criteria for a removal and I recommend your approval of the proposed removal action. The total EPA extramural project ceiling, if approved, will be \$96,000.

**X. APPROVAL / DISAPPROVAL**

APPROVAL:

  
\_\_\_\_\_  
Daniel D. Opalski, Director  
Office Of Environmental Cleanup

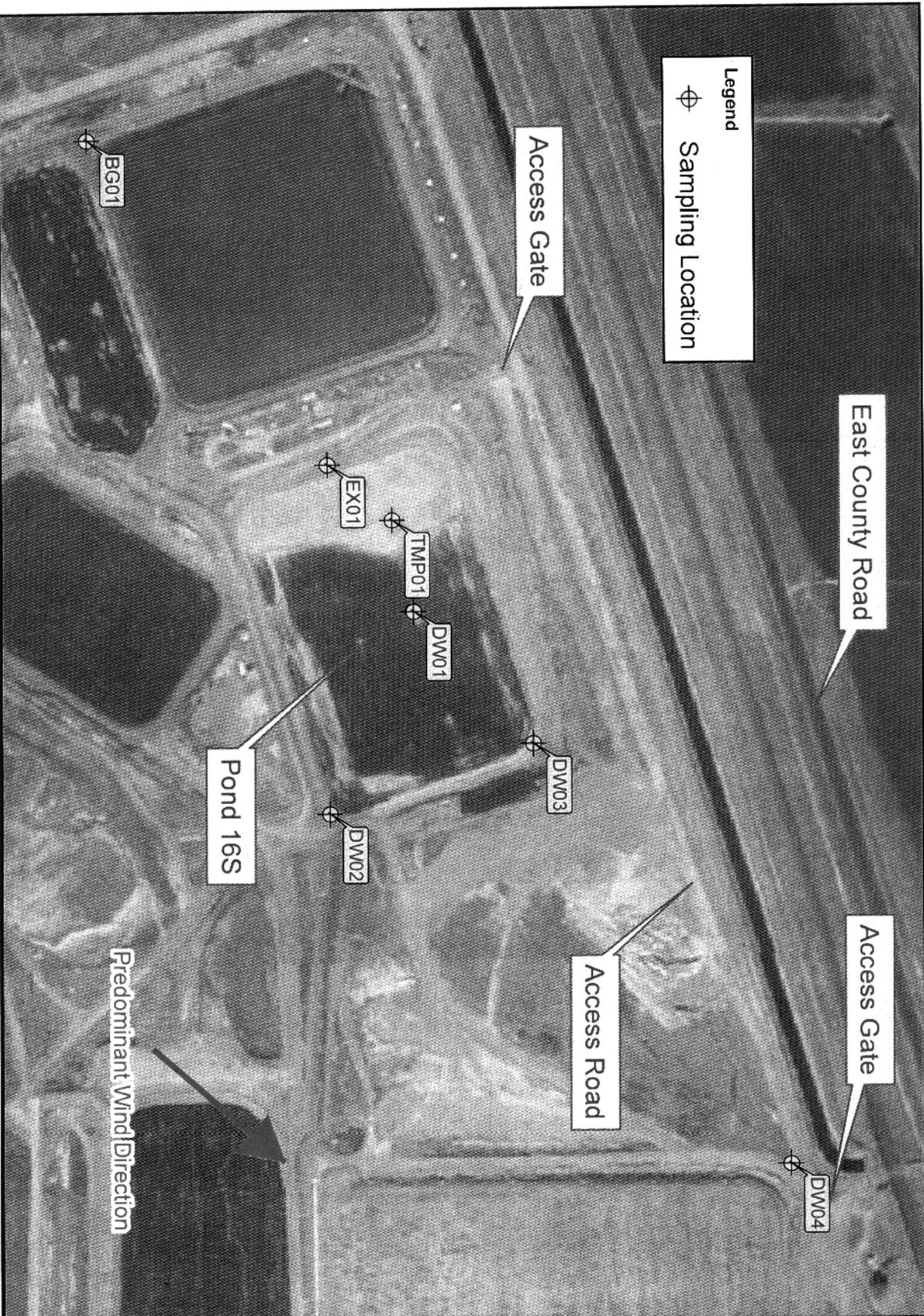
12/13/06  
\_\_\_\_\_  
Date

DISAPPROVAL:

\_\_\_\_\_  
Daniel D. Opalski, Director  
Office Of Environmental Cleanup

\_\_\_\_\_  
Date





**Legend**  
 ⊕ Sampling Location

East County Road

Access Gate

Access Gate

Access Road

Pond 16S

Predominant Wind Direction

BG01

EX01

TMP01

DW01

DW03

DW02

DW04



**Ecology and environment, inc.**  
 International Specialists in the Environment  
 Seattle, Washington

Map Reference: Globe Xplorer 2003

FMC Pond 16S  
 Pocatello, ID

**SAMPLING AND LAYOUT MAP**

Figure 2

Date:	Drawn by:	Job Number:
12/06/2006	ammi	002233.0139.01SF