

Appendix E: Interagency Fill Impact Study Group, Proposed Statement of Mutual Intent and Scopes of Work for Each Study Element.

STATEMENT OF MUTUAL INTENT
between the
U. S. ENVIRONMENTAL PROTECTION AGENCY
the
U. S. DEPARTMENT OF THE ARMY
Corps of Engineers
and the
U. S. DEPARTMENT OF THE INTERIOR
Office of Surface Mining
Fish and Wildlife Service

A. Purpose

Surface coal mining and reclamation in steep slope areas requires the disposal of excess material. This material is often permanently placed in what is referred to as "valley fills", which completely cover headwater streams, and may reach over two miles in length. During the past ten years, there has been an increase in both the size and frequency of valley fills in the Appalachian region, where the practice of mountaintop removal has caused significant changes in topography. In addition, waste generated during coal processing from both surface and underground mines is deposited in adjacent valleys. Accordingly, the U.S. Environmental Protection Agency (EPA), U.S. Army Corps of Engineers (CE), and U.S. Department of the Interior - Office of Surface Mining (OSM) and Fish and Wildlife Service (FWS) intend to document the environmental consequences of this regional trend in surface mining practices, and make these data available to Federal and State regulatory agencies and offices to facilitate informed, environmentally sound, and consistent regulatory decisions.

B. Statement of Mutual Intent

The undersigned agencies will work together to conduct a joint Federal evaluation of the environmental impacts and regulation of valley fill activities in the Appalachian coalfields region (Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Kentucky, and Tennessee). The evaluation will focus on the topics and related study plans outlined in the attached scope of work, including effects on water quantity and quality, changes in aquatic and terrestrial habitats, downstream flooding potential, reclamation and other mitigation practices, fill stability and safety, and current Federal and State regulatory approaches to these problems.

The evaluation will be developed and implemented by the four Federal agencies, and guided by a steering committee consisting of one senior official from each agency. The agencies will share information, personnel, and funds as necessary and appropriate to accomplish this evaluation in an efficient and cost-effective manner.

The evaluation will be completed within 18 months of the date of this Statement, with interim measures implemented as available information warrants. Upon completion of the evaluation, the

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steering committee will provide the results and conclusions to respective agency leadership, along with recommendations for appropriate action.

Throughout the evaluation process, the participating Federal agencies will coordinate their activities with State agencies, and will solicit their technical and policy expertise. The Federal agencies will also provide opportunities for public and industry involvement, and all available sources of information on valley fills will be given full consideration.

C. Agency Authorities

Nothing in this Statement is intended to diminish, modify, or otherwise affect the statutory or regulatory authorities of the undersigned agencies. This Statement is intended to assist the agencies in fulfilling their authorities by increasing understanding of the valley fill issue, strengthening coordination, and sharing agency resources and information to address mutual environmental concerns.

U.S. Environmental Protection Agency

U.S. Army Corps of Engineers

USDOJ Office of Surface Mining

USDOJ Fish and Wildlife Service

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Evaluation of Fills Related to Coal Mining

BACKGROUND: Surface coal mining and reclamation in steep slope areas requires the disposal of excess spoil. This spoil is often permanently placed in what is referred to as "valley fills" which completely cover headwater stream sections. During the past ten years, there has been an increase in both size and frequency of valley fills in the Appalachians, particularly where the practice of mountain top removal has generated significant changes in the topography. Some of these fills have reached more than two miles in length. In addition, the waste generated during coal processing has been deposited in adjacent valleys. With the regional trend in surface mining practices, there is a growing need to document the environmental effects of the placement of fill material in headwater streams. Furthermore, states responsible for administering mining and water programs pursuant to the Surface Mining Control and Reclamation Act and the Clean Water Act may have different program requirements regarding decisions to mitigate (mitigation may include efforts to avoid, minimize, rectify, or compensate) aquatic and other natural resource losses. The increased scale of fill activity, the need to document environmental consequences, and the potential for inconsistent regulatory approaches necessitate an evaluation by federal agencies responsible for environmental protection.

GOALS: The Environmental Protection Agency, the Office of Surface Mining, the U.S. Army Corps of Engineers, and the U.S. Fish and Wildlife Service will conduct a joint federal evaluation of the impacts and regulation of fill activities in the Appalachian region. This will include the States of Pennsylvania, Maryland, Ohio, West Virginia, Virginia, Kentucky, and Tennessee. Goals of this joint effort will be to:

1. Assess the past and reasonably foreseeable future environmental impacts and regulation of fills on aquatic and terrestrial environments;
2. Develop data to assist various regulatory authorities in making decisions on the permitting of fills, and the circumstances under which fills may be prohibited or otherwise mitigated; and
3. Provide information to assist agencies in making policy or regulatory decisions that minimize duplication of efforts and achieve greater consistency among federal and state agencies in the review and permitting of fills.

IMPLEMENTATION: This evaluation will be developed and administered by the participating federal agencies and guided by a steering committee consisting of one senior official from each of these agencies. As envisioned in the framework of the Clean Water Action Plan, the federal agencies will conduct the evaluation in a way that focuses agency resources and meets agency information needs, while balancing individual agency missions. States will be invited to participate in the evaluation and will be encouraged to provide technical and policy input. The public and industry will be provided opportunities for input and will be kept informed.

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Agency teams will be assembled to transform each of the specific topics described below into a final work plan. Following steering committee concurrence with the work plan, the agency teams will complete the tasks by evaluating the relevant technical and policy information obtained from agency files, additional field investigations and discussions with stakeholders (industry, environmental groups, and other public and private sector interests). It is anticipated that all review activities will be completed in 18 months after development of the final work plan, with interim measures implemented as available information warrants. The fact that these evaluations are ongoing will not be used as reasons to delay any necessary decisions on proposed fill activities.

EVALUATION TOPICS: This evaluation will cover several key issues which may be modified as data are gathered and public input is obtained. The effort will:

1. Assess and document the cumulative environmental impacts of fills since the permanent regulatory program under the Surface Mining Control and Reclamation Act was implemented in each State, and estimate the extent of future impacts. This assessment will consider effects on water quantity and quality, and aquatic and terrestrial habitats both under the footprint of the fill and downstream. The assessment will also consider final reclamation results and the success of any mitigation requirements, both on and off site.
2. Assess the individual and cumulative effects of valley fills and the associated mining disturbance on downstream flooding potential;
3. Review mitigation practices utilized in various States;
4. Assess long term stability of fills with emphasis on safety issues; and
5. Document existing federal and state laws and regulations, and current regulatory practices. This will include relevant provisions of the Clean Water Act, as well as consideration of the utilization of the provisions in the Surface Mining Reclamation and Control Act requiring operators to complete a probable hydrologic consequence determination, and the state regulatory agency to complete a cumulative hydrologic impact assessment.

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EVALUATION TOPIC 1A: INVENTORY OF FILLS

DATE: October 1, 1998

OSM Contact: Thomas Koppe, Lexington Field Office

606-233-2896

Status of workplan: On July 15, 1998, the Steering Committee requested the team proceed with developing a GIS valleyfill inventory for Kentucky, West Virginia, and Virginia. The committee asked to look at sedimentation ponds being added to the inventory. OSM offered to use the agency's grant process as the funding mechanism. The following has been accomplished.

- In a letter dated July 27, 1998, Kentucky DSMRE offered to assist in a GIS-fill inventory for their State.
- West Virginia/OSM met on July 10, 1998. On September 16, 1998, WV DEP scoped out the GIS project for West Virginia.
- In a letter dated August 7, 1998, Virginia Department of Mines, Minerals, and Energy offered to assist in developing a GIS-based fill inventory for their State. They have requested \$25,000.

Participation by other agencies: In September 1998, the U.S. Fish and Wildlife Service published their independent inventory for Kentucky, Pennsylvania, Virginia and West Virginia. The inventory contains only summary figures for the coal field watersheds. The team will try to obtain any detailed work sheets and maps to assist on the Four Agency Inventory.

EPA, Region 4, provided funding assistance of \$17,000.00 to the Commonwealth of Kentucky to help create a GIS-based fill inventory.

Progress Report: As stated in status of workplan, Kentucky, West Virginia and Virginia have officially offered to assist. OSM has awarded a cooperative agreement of \$57,000.00 to Kentucky, \$75,000.00 to West Virginia and \$25,000.00 to Virginia to transfer funds to accomplish GIS-based fill inventories. OSM's Tennessee Office agreed to provide a GIS fill inventory for their federal program by December 1998.

Contracts: Cooperative agreements awarded to the States obligated \$140,000 from FY 98 funds.

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SCOPE OF WORK

EVALUATION TOPIC 1A: Assess and document the cumulative environmental impacts of fills since the permanent regulatory program under the Surface Mining Control and Reclamation Act was implemented in each State, and estimate the extent of future impacts.

OSM CONTACT: Thomas Koppe, Lexington Field Office

PARTICIPANTS: Jack Felbinger, ARCC; Jack Nelson, Charleston Field Office; Dave Beam, Lexington Field Office; Jeff Coker, Knoxville Field Office; Gale Heffinger, USFWS, Abingdon, VA.; Al Rogalla, COE, Pittsburgh, PA.; David Pelren, USFWS, Cookeville, TN; and Peter Stokely, EPA, Reston, VA.

METHOD OF REVIEW/OPTIONS:

Population/Sample

For each ARCC State, the total population of permanent program permits issued is as follows:

KY - 6,987 from 1982 through 1997
OH - 1,158 from 1981 through present
MD - Estimated 150 from 1980 through 1997
WV - 5,741 from 1981 through present
PA - 2,292 from 1982 through 1997
VA - 1,639 from 1982 through present
TN - 560 from 1982 through present

Population of Permits with Fills

KY - There are approximately 2,500 surface permits issued for Eastern Kentucky since primacy that would need to be screened for a fill inventory. In addition, there are 250 refuse disposal sites. Kentucky has permit boundary information for all permitted sites from 1982 through 1996. Permitted site location including fill locations is available on Mylar that overlay quad sheets. The State is behind in mapping approximately 12 months worth of permits. This task should take approximately 12 weeks to update in which the State is taking on this project. The USFWS's has measured 130 quads of the Mylars for stream information. The USFWS found that the breakdown of quads per major watershed is as follows: Big Sandy Watershed - 42 quads, Licking River Watershed - 5 quads, Kentucky River Watershed - 40 quads, and The Upper Cumberland River Watershed - 43 quads.

WV - There are several inventories occurring in West Virginia. The OSM Charleston Field Office maintained a database of inspectable units from 1981 through 1995. This database shows that as of September 5, 1995, the State approved 545 permits with excess spoil fills and 494 permits with coal refuse fills. As of 1995, a total of 2,232 fills have been permitted in the State. This includes 1,638 excess spoil fills and 494 coal refuse fills in WV. DEP is developing their own inventory of

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fills. The location of all fills by permit back to 1972 is to be completed by June 1, 1998. EPA is conducting a 32 quad aerial evaluation of fills in West Virginia by comparing 1977, 1990 and 1996 aerial photos. Hobet Mining, Inc. digitized USGS data and fill information for Mud River's watershed. The USFWS's developed an inventory for five watersheds.

PA - PA has not approved any excess spoil fills. Since 1982, PA has 159 coal refuse fills.

OH - OH reports 18 excess spoil fills and 45 waste disposal sites.

VA - VA has established a digitized permit boundary map and will make information available on fills. Actual constructed fill certification is also readily available.

MD - MD estimates that there are 8 permits with 7 excess spoil fills and 3 coal refuse disposal fills.

TN - TN could conduct a fill review of approximately 50-60 permits that contain small fills and obtain any necessary information.

Stream Impact by Fills

KY - LFO is reporting for the period January 1, 1994 through July 1, 1997. DSMRE issued 375 original permits and 498 amendments to existing permits. Of those, 59 permits filled in 30.3 miles of perennial streams.

WV - An estimated 100 acres of stream have been impacted since OMR assumed control of the program in 1992. Impacts include stream relocations and crossings in addition to fills. State inspectors are currently trying to estimate miles of stream affected. Streams are defined as waters of the State and must contain aquatic life. Includes wet weather and intermittent streams. Length includes the uppermost point of impact to the furthest downstream point of impact. Width includes the high water mark.

No readily available stream information for the remaining Appalachia States could be obtained for this planning document.

REVIEW METHODOLOGY: By August 1, 1998, a detailed scoping effort will be completed that will identify all existing fill data collection techniques. The goal will be to complete a inventory by December 30, 1998. This first step will help eliminate the present practice of multiple reporting by several of our agencies. Presently, the group knows of at least three separate collection tasks in West Virginia including the USFWS's review and interal collection of fill information, EPA's 32 quad watershed aerial interpretation, and a State DEP inventory of fills. An initial review of the Appalachia states found that the inventory would be designed around West Virginia and Kentucky study due to the number of fills. The remaining Appalachia States

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would have the entire inventory collected through internal sources based on the design of the West Virginia and Kentucky fill inventory. The team agreed on collecting the fill footprint as permitted. The team also agreed to measure the stream under the fill by three techniques first, using USGS defined streams; second, the total watershed the fill encompasses; and third, the total drainage way length from toe of fill to top of ridge. The following approaches can be done to obtain an inventory of fills in the Appalachian Region and the mileage of streams impacted.

Task 1: Creating Inventory

Complete inventory of fills based on a GIS system using USGS digital 7 1/2 minute maps as base.

- 1) Define the study area, determine the number and name of the USGS 7 1/2 minute quads in the study area. This will form the base map for the study area.
- 2) Determine through permit records which USGS quads have mountaintop removal and valley fills.
- 3) Determine which of these USGS quads exist digitally or are under contract to be digitized.
- 4) Obtain the digital quads currently available to begin map base assembly.
- 5) Identify those USGS maps that need to be digitized and contract with the USGS to get them digitized.
- 6) Begin converting the permit data bases from the various states into digital files that can be overlaid on the USGS 7 1/2 minute digital maps.
- 7) Complete the process of digital base map creation and assembly.
- 8) Complete the process of overlaying the permit files on the digital USGS maps.
- 9) Using ARCVIEW or similar technology determine the stream length under the permitted valley fills. Use the USGS digital stream files obtained from 4 and 5 above. Also determine the length of drainage way from toe of slope to ridge top.
- 10) Assemble the digital maps with the valley fill locations into a large file for output and presentation at small scale (1:100,000 to 1:500,000).

A recommendation is for OSM to start developing agreements with the States of Kentucky and West Virginia to create a GIS inventory of all existing fill information that have been permitted by the State. The digitize (or convert) data will be an overlay containing the fill footprint map. This map will be overlaid with the USGS stream data for analysis. The USGS would supply the base maps for USGS defined streams under fills, the fill watershed size in acreage, and length of

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drainage way from toe of fill to ridge line. OSM is in a good position to develop contracts with the States to accomplish this task. At the same time, contact with the other Appalachia States will be done to determine the contract needs.

Task 2 : Future

To make a judgement on the likelihood of future mountaintop removal mining a combination of factors will be evaluated through a reporting process; 1) The existing permitting and application information will show trends by analyzing coal production, type of mining and acreage permitted, 2) Number of landowners that have large blocks of land that are conducive to large scale mining, 3) The availability of equipment especially draglines.

Timeline

Complete inventory.

1. Define all existing inventories in West Virginia and Kentucky and develop detail contract for work - 30 days.
2. Obtain permits and bond release files. - estimated 2-3 months.
3. Develop digital base maps and inventory. - estimate 4-6 months
4. Prepare findings - 30 days.

Staff Time: Staff time to be developed.

Cost Estimate: Mapping cost to be developed. Kentucky already has a digitized base map of all streams in Kentucky. This project was completed through a joint USGS, KYGIS and NRCS effort. To digitize all mylar footprints of the fills for Kentucky, the cost would be approximately \$40,000.

West Virginia is going to request the information from all Permittees. The remainder of the permits will be digitized by a contractor. The estimated cost will be \$100.00 a map. This will cost \$320,000 for digitizing all permit maps in West Virginia. A priority system must be developed based on existing information.

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Final Report

The report would tally all permit fill data and stream mileage based on analysis by ARCVIEW. A digitized overlay would be completed and made available on OSM's web page.

STATE CONTACTS:

Kentucky - Allen Lutrell DSMRE and John Dovak, DOW

West Virginia - Lewis Halstead and Ken Politan, WVDEP

Pennsylvania - Harold Miller, PADEP

Maryland - Al Hooker, MDBOM

Virginia - Ron Robinson

Tennessee - Beverly Brock, OSM

OTHER ASSISTANCE NEEDED: Responsible State and Federal agencies, as requested.

TASK COMPLETION DATE: four months.

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U.S. DEPARTMENT OF THE INTERIOR
Office of Surface Mining
COOPERATIVE AGREEMENT

Grantee: Commonwealth of Kentucky	Grant Number: GR803215
Agency: Natural Resources and Environmental Protection Cabinet	Project Name: Geographic Information System (GIS)-Based Hollowfill Inventory
	Grant Period: 9/1/98 to 4/1/99

This agreement is made between the Department for Surface Mining and Reclamation Enforcement (DSMRE), Commonwealth of Kentucky, and the Office of Surface Mining (OSM), United States Department of the Interior (DOI), pursuant to their respective duties and activities under the Kentucky Revised Statutes Chapter 350 and the Surface Mining Control and Reclamation Act of 1977 (Act), U.S.C. Section 1201 *et seq.* The timeframe for completing the specific performance requirements outlined in this agreement shall be from September 1, 1998, until April 1, 1999. The Director of OSM, or her delegate, agrees to provide to DSMRE funds in the amount of \$40,000, which represents 100 percent Federal funding, in accordance with approved terms and conditions set out in this agreement. By acceptance of funds, DSMRE agrees to abide by the terms and conditions of the agreement as set forth in this document.

The specific terms and conditions of this agreement are as follows:

1. OSM is conducting a Federal evaluation of the environmental impacts and regulation of surface and underground coal mining in the Appalachian region (Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Kentucky, and Tennessee). One of the primary components of this evaluation is to assess and document the environmental impacts of fills since the permanent regulatory program under the Act was implemented in each State.

It is mutually agreed and understood by OSM and the State of Kentucky that a GIS-based inventory of fills will be created. The State will take the lead role in developing a GIS-based inventory. DSMRE is in the early stages of developing a GIS-based system. A server has been acquired and a base map is in place. DSMRE has five series of mylar overlays containing historical mining data on them. DSMRE will create digitized data files compatible with several spatial systems of maps currently on mylar film at the DSMRE offices.

DSMRE agrees to digitize the fills as described below:

PHASE 1: During this phase, it is proposed to scan and Geo-reference all Series IV and Series V mylars (about 250).

PHASE II: Hollowfills on each permit would be digitized and placed in one of four layers. A fifth layer would identify all perennial and intermittent streams, possibly utilizing United States Geological Survey data. This digitized information would then be linked to a data base that would be able to provide all permanent program hollowfills permitted (not necessarily disturbed). After all layers for the GIS have been developed, random measurements using sub-meter accurate Global Positioning System units will be taken to relate disturbed acres to permitted acres. Components of this second phase are as follows:

- 1st hollowfill layer - All hollowfills with watersheds greater than 250 acres (pre-1994).
- 2nd hollowfill layer - All hollowfills with watersheds greater than 480 acres (post-1994).
- 3rd hollowfill layer - All hollowfills with watersheds less than 480 acres (post-1994).
- 4th refuse fill layer - All identified permanent refuse disposal areas.
- 5th stream layer - All known perennial and intermittent streams.
- Each layer would identify hollowfill number, permit number, county location, and acres permitted.
- The Department of Information Systems will bid out source, developing specifications from this document.

After these two phases are completed, we could then use the workstation to add features that are not on the mylars at this time. It should also be determined what will be attempted in the next phases.

2. The funds from this cooperative agreement shall only be used to cover allowable costs which are incurred during the performance period. In addition, valid obligations incurred before the end of the performance period for purchased services, equipment, and supplies specifically identified in the approved application shall be considered allowable expenditures. If obligations are included in the claimed cooperative agreement costs, adequate records shall be maintained to fully disclose the date and amount incurred and the date and amount of subsequent payment. Obligations claimed in one cooperative

agreement period shall be excluded from expenditures claimed in prior or subsequent cooperative agreement periods.

3. The State shall submit financial status reports, performance reports, and other such reports according to the timing, content, and format as required by OSM. The State shall report program outlays and program income on a cash basis.
4. Transfer of funds between total direct cost categories in the approved budget shall receive the prior approval of OSM when such transfers exceed ten percent of the total budget.
5. The State shall transfer to OSM the appropriate share based on the Federal support percentage of any refund, rebate, credit, or other amounts arising out of the performance of this agreement, along with accrued interest, if any. The State shall take necessary action to affect prompt collection of all monies due or which may become due and to cooperate with OSM in any claim or suit in connection with amounts due.
6. The State shall comply with the requirements, as applicable, of the Grants Management Common Rule adopted by DOI at 43 CFR 12 regarding administrative procedures; Treasury Circular No. 1075 and 31 CFR 205.6 on financial procedures; OMB Circulars No. A-87, A-21, and A-122 on cost principles; and OMB Circular No. A-128 on audit requirements.
7. No employee of the State, Indian Tribal Government, or Federal Government performing any function or duty under this cooperative agreement shall have a direct or indirect financial interest in any coal mining operation. The State shall comply with all requirements and regulations established by OSM to carry out this requirement, including 30CFR Part 705 and those requirements which it has adopted in its regulatory program or reclamation plan.
8. This agreement can be amended only by compliance with the requirements of 30 CFR 735.20. The cooperative agreement shall be subject to reduction or termination pursuant to 30 CFR 735.21.
9. Cooperative agreement funds shall not be used to attempt to influence the public on legislation pending before Congress.
10. For purposes of this cooperative agreement, program income includes, but is not limited to, income from the sale of publications, the sale of real or personal property purchased with cooperative agreement funds, the sale of services under a cooperative agreement (such as the sale of computer time), permit fees, income earned from investment of permit fees or other program income, and/or income earned from royalties received as a result of copyrights and/or patents produced under the cooperative agreement. Program income does not include income from fines, penalties, taxes, or forfeitures. This cooperative agreement shall use the deductive option for handling program income. Proceeds from the sale, transfer, or distribution of real or personal property must be

handled in accordance with the provisions in the Grants Management Common Rule and implementing DOI guidelines.

11. It is a National policy to place a fair share of purchases with minority business firms. Minority Business Enterprises/Women's Business Enterprises (MBE/WBE) utilization is based on Executive Orders 11625, 12138, 12432 and the Grants Management Common Rule. DOI is strongly committed to the objectives of this policy and encourages all recipients of its grants and cooperative agreements to take affirmative steps to ensure such fairness. In particular, recipients should:

- a. Place minority business firms on bidder's mailing lists.
- b. Solicit these firms whenever they are potential sources of supplies, equipment, construction, or services.
- c. Where feasible, divide total requirements into smaller needs and set delivery schedules that will encourage participation by these firms.
- d. Use the assistance of the Minority Business Development Agency of the Department of Commerce, the Small Business Administration, DOI's Office of Small and Disadvantaged Business Utilization, the Business Utilization and Development Specialists who reside in each DOI bureau and office, and similar State and local offices where they exist.

If the Federal amount of this cooperative agreement is \$500,000 or more and involves the procurement of supplies, equipment, construction, or services in excess of \$10,000, the State shall complete a Standard Form 334 (MBE/WBE Utilization under Federal Grants, Cooperative Agreements, and other Federal Financial Assistance). The form shall be submitted to the appropriate OSM Field Office Director within ten calendar days after the end of the each Federal fiscal quarter, up to and including the Federal fiscal quarter in which the end of the cooperative agreement performance period occurs.

12. The State is free to copyright any original work developed in the course of or under the agreement. OSM reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for Government purposes. Any publication resulting from work performed under this agreement shall include an acknowledgment of OSM financial support and a statement that the publication does not necessarily reflect OSM's views.

13. No subsequent regulatory grants, monetary increase amendments, or time extension amendments will be approved unless all overdue final financial performance reports have been submitted by the recipient to the appropriate Field Office. Exceptions to this policy can be approved only by the Deputy Director, Administration and Finance, OSM, or his designate.

14. No transfer of funds to agencies other than those identified in the approved cooperative agreement application shall be made without prior approval of OSM.
15. This cooperative agreement takes effect at the time of signing by the Director of OSM or his/her authorized delegate. However, the State shall have a period of 20 calendar days from the date of signing to execute this cooperative agreement in order to indicate its agreement with the terms and conditions. Unless an extension of time is formally approved by OSM, failure to execute the agreement within the stated period shall result in a deobligation of the total Federal award amount.

We, the undersigned authorized representatives, hereby agree to the terms and conditions set forth in this agreement between the United States of America and the Commonwealth of Kentucky.

OFFICE OF SURFACE MINING

COMMONWEALTH OF KENTUCKY

William J. Kovacic
William J. Kovacic, Field Office Director
Lexington Field Office
Office of Surface Mining

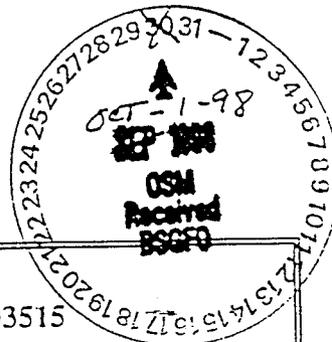
James E. Bickford, Secretary
Natural Resources and Environmental
Protection Cabinet

9/3/98

Date

Date

U.S. DEPARTMENT OF THE INTERIOR
Office of Surface Mining
COOPERATIVE AGREEMENT



Grantee: Commonwealth of Virginia	Grant Number: GR803515
Agency: Department of Mines, Minerals and Energy; Division of Mined Land Reclamation	Project Name: Geographic Information System (GIS)-Based Hollowfill Inventory
	Grant Period: 10/1/98 to 4/1/99

This agreement is made between the Department of Mines, Minerals and Energy, Division of Mined Land Reclamation (DMME), Commonwealth of Virginia, and the Office of Surface Mining (OSM), United States Department of the Interior (DOI), pursuant to their respective duties and activities under the Chapter 19 of the Code of Virginia and the Surface Mining Control and Reclamation Act of 1977 (Act), U.S.C. Section 1201 *et seq.* The time frame for completing the specific performance requirements outlined in this agreement shall be from October 1, 1998, until April 1, 1999.

Grant Financial Data The following are hereby incorporated into this agreement by reference:

- | | |
|--------------------------------|---|
| Total Funds \$ <u>25,000</u> | 1. 30 CFR Chapter VII, Parts 735 and 946; |
| Federal Support <u>100%</u> | 2. Approved Budget Information Report, OSM-47; |
| Federal Grant \$ <u>25,000</u> | 3. Grant Application and Assurances contained therein received by OSM on 9/28/98. |

The Director of OSM, or her delegate, agrees to provide to DMME funds in the amount of \$25,000, which represents 100 percent Federal funding, in accordance with approved terms and conditions set out in this agreement. By acceptance of funds, DMME agrees to abide by the terms and conditions of the agreement as set forth in this document.

The specific terms and conditions of this agreement are as follows:

OSM is conducting a Federal evaluation of the environmental impacts and regulation of surface and underground coal mining in the Appalachian region (Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Kentucky, and Tennessee). One of the primary components of this evaluation is to assess and document the environmental impacts of fills since the permanent regulatory program under the Act was implemented in each State.

1. It is mutually agreed and understood by OSM and the Commonwealth of Virginia that an electronic or digital inventory of fills will be created. The digital inventory will be incorporated as a feature layer into the DMME Automated Mapping System. The DMME will take the lead role in developing an electronic or digital inventory. Base digital topographic maps have been acquired for all the Geologic Quadrangles in Virginia where active mining is taking place. DMME has developed numerous data layers such as permit boundaries, AML features, etc. and is currently entering additional permitting features like water monitoring points, complaint locations, etc. DMME has servers and computers necessary to continue to develop the DMME Automated Mapping System.

2. DMME agrees to digitize the fills as described below:

a. PHASE I:

- i. During this phase, DMME field inspectors will field verify whether or not permitted hollow fills have been constructed.
- ii. DMME will obtain digital satellite imagery with coverage of the active coal mining field in Virginia.

b. PHASE II:

In this phase, DMME will scan existing maps to capture hollow fills and valley fills geographic locations. DMME will attempt to use the digital satellite imagery overlain by the Automated Mapping System to identify fills. To facilitate the capturing of the fill structures or features on the digital mapping, DMME will scan existing permit maps to capture hollow fills and valley fills geographic locations. DMME will scan the existing permit mapping as well as future mapping to capture these types of fill features. This digitized information will be linked to a data base that will show all permanent program hollow fills permitted (not necessarily disturbed). After all layers for the GIS have been developed, random measurements using sub-meter accurate GPS units will be taken to relate disturbed acres to permitted acres. The DMME digital topographic maps are based upon the USGS/TVA Topographic mapping and include a data layer for blue line and intermittent streams as mapped by USGS and TVA. The DMME will determine in this phase:

- i. If the fill was constructed to design capacity or a lesser one; and
- ii. The length of blue line stream (according to USGS/TVA maps) affected, if any, for each fill.

3. OSM will review the progress of the activity monthly or at the end of Phase I activities, whichever comes first. OSM approval must be granted prior to beginning activities associated with Phase II of this agreement. Anytime OSM finds that the work is not progressing as planned, OSM will redirect the work or immediately halt the activity.

4. The funds from this cooperative agreement shall only be used to cover allowable costs which are incurred during the performance period. In addition, valid obligations incurred before the end of the performance period for purchased services, equipment, and supplies specifically identified in the approved application shall be considered allowable expenditures. If obligations are included in the claimed cooperative agreement costs, adequate records shall be maintained to fully disclose the date and amount incurred and the date and amount of subsequent payment. Obligations claimed in one cooperative agreement period shall be excluded from expenditures claimed in prior or subsequent cooperative agreement periods.
5. The funds for the grant shall only be used to cover allowable costs which are incurred during the grant period. In addition, valid obligations incurred before the end of the grant period for purchased services, equipment and supplies specifically identified in the approved application shall be considered allowable grant period costs to the extent of actual subsequent expenditures. If obligations are included in the claimed grant costs, adequate records shall be maintained to disclose fully the date and amount incurred and the date and amount of subsequent payment. Obligations claimed in one grant period shall be excluded from expenditures claimed in prior or subsequent periods.
6. No transfer of funds to agencies other than those identified in the approved grant application shall be made without prior approval of OSM.
7. The Grantee shall submit financial status reports, performance reports, and other such reports on a quarterly basis and according to the content and format as required by OSM. The Grantee shall report program outlays and program income on a cash basis. Grantees are exempt from submitting the form SF272, Federal Cash Transactions Report.
8. Transfers of funds between total direct cost categories in the approved budget require the prior approval of OSM when such transfers exceed ten percent of the total budget. For grants that fund both construction and nonconstruction activities, budget transfers between nonconstruction and construction subaccounts require prior written approval of OSM.
9. The Grantee shall transfer to OSM the appropriate share, based on the Federal support percentage, of any refund, rebate, credit of other amounts arising from the performance of this agreement, along with accrued interest, if any. The Grantee shall take necessary action to effect prompt collection of all monies due or which may become due and to cooperate with OSM in any claim or suit in connection with amounts due.
10. The Grantee shall comply with the requirements, as applicable, of the Grants Management Common Rule, adopted by the Department of the Interior at 43 CFR Part 12, regarding administrative procedures; Cash Management Improvement Act and 31 CFR 205.6 on financial procedures; OMB Circulars A-87, A-21 and A-122 on cost principles; and OMB Circular A-133, as implemented by 43 CFR 12, on audit requirements.

11. No employee of the State, Indian Tribal Government or Federal Government performing any function or duty under the State regulatory or reclamation program plan shall have a direct or indirect financial interest in any coal mining operation. The Grantee shall comply with all requirements and regulations established by OSM to carry out this requirement, including 30 CFR Part 705, and those requirements which it has adopted in its regulatory program or reclamation plan.
12. Prior to the start of any construction activity, the Grantee shall ensure that all applicable Federal, State and local permits and clearances are obtained.
13. Recipients shall not use any part of the appropriated funds for any activity or the publication or distribution of literature that in any way tends to promote public support or opposition to any legislative proposal on which Congressional action is not complete.
14. The Grantee shall comply with the following Federal procurement requirements:
 - a. Requirements of Executive Orders 11625, 12138 and 12432, and the Grants Management Common Rule as they relate to Minority Business Enterprises utilization;
 - b. Requirements of 43 CFR Part 12, Subpart E, relating to implementation of the Buy American Act; and
 - c. For any procurement action having an aggregate value of \$500,000 or more:
 1. Specify, in any announcement of the awarding of a contract for the procurement of goods or services (including construction services), the amount of Federal funds that will be used to finance the acquisition; and
 2. Express the amount announced pursuant to subparagraph 1, as a percentage of the total costs of the planning acquisition.
 - d. Recipients shall give preference to the purchase of recycled products pursuant to guidelines outlined by the Environmental Protection Agency.
 - e. For announcement of contract awards with an aggregate value of \$500,000 or more, recipients shall specify the amount of Federal funds that will be used to finance the acquisitions.
15. The Grantee is free to copyright any original work developed in the course of or under the agreement. OSM reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish or otherwise use, and to authorize others to use, the work for Government purposes. Any publication resulting from work performed under the agreement shall include an acknowledgment of OSM financial support and a statement that the publication does not necessarily reflect OSM's views.
16. No subsequent cooperative agreements, monetary increase amendments or time extension amendments shall be approved unless all overdue final performance reports have been submitted by the recipient to the appropriate Field Office. Exceptions to this policy can be approved only by the Deputy Director, OSM, or his designate.

17. OSM reserves the right to transfer equipment acquired with grant funds to the Federal Government or a third party.
18. This grant takes effect at the time of signing by the Director of OSM or his authorized delegate. However, the Grantee shall have a period of 20 calendar days from the date of signing to execute this grant in order to indicate its agreement of the terms and conditions. Unless an extension of time is formally approved by OSM, failure to execute the agreement within the stated period shall result in a deobligation of the total Federal Grant Amount.

We, the undersigned authorized representatives, hereby agree to the terms and conditions set forth in this agreement between the United States of America and the Commonwealth of Virginia.

OFFICE OF SURFACE MINING

COMMONWEALTH OF VIRGINIA



Robert A. Penn, Field Office Director
Big Stone Gap Field Office
Office of Surface Mining

9/30/98
Date



Benny R. Wampler, Deputy Director
Department of Mines, Minerals and Energy

10-1-98
Date

U.S. DEPARTMENT OF THE INTERIOR
Office of Surface Mining
COOPERATIVE AGREEMENT

Grantee: State of West Virginia	Grant Number: GR803546
Agency: Division of Environmental Protection	Project Name: Geographic Information System (GIS)-Based Hollowfill Inventory
	Grant Period: 9/1/98 to 4/1/99

This agreement is made between the West Virginia Division of Environmental Protection (DEP) and the Office of Surface Mining (OSM), United States Department of the Interior (DOI), pursuant to their respective duties and activities under the Code of West Virginia and the Surface Mining Control and Reclamation Act of 1977 (Act), U.S.C. Section 1201 *et seq.* The timeframe for completing the specific performance requirements outlined in this agreement shall be from September 1, 1998, until April 1, 1999. The Director of OSM, or her delegate, agrees to provide to DEP funds in the amount of \$75,000 which represents 100 percent Federal funding, in accordance with approved terms and conditions set out in this agreement. By acceptance of funds, DEP agrees to abide by the terms and conditions of the agreement as set forth in this document.

The specific terms and conditions of this agreement are as follows:

1. OSM is conducting a Federal evaluation of the environmental impacts and regulation of surface and underground coal mining in the Appalachian region (Pennsylvania, Maryland, Virginia, West Virginia, Ohio, Kentucky, and Tennessee). One of the primary components of this evaluation is to assess and document the environmental impacts of fills since the permanent regulatory program under the Act was implemented in each State.

It is mutually agreed and understood by OSM and the State of West Virginia that a GIS-based inventory of fills will be created. The State will take the lead role in developing a GIS-based inventory. DEP is in the early stages of developing a GIS-based system. A server has been acquired and a base map is in place. DEP will create digitized data files compatible with several spatial systems of approved permit maps currently at the DEP offices.

DEP agrees to digitize the fills as described below:

DEPT. OF INTERIOR
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OSM--R&E CHARLESTON

Information for each permit to be digitized would be placed in one of a minimum of seven main layers or coverages. This information would be geo referenced and then linked to the applicable database. The layers or coverages proposed are as follows:

- Permit Boundary
- Disposal Area Boundaries
 - Excess Spoil- Type of excess spoil will be identified
 - Refuse
- Drainage Structures
 - Ponds/Impoundments
- Drainage Area Above
 - Toe of disposal area
 - Exit Channel of last drainage structure below disposal area
- Mineral Removal Area
 - Surface
 - Augering
 - Deep Mined
- Coal Seam(s)
- Watershed Boundaries (related to the permit)

The approximate number of SMCRA related sites since permanent program approval is 6,000 (prospects are excluded). The cost to digitize the specified information for all SMCRA related sites is estimated to be \$600,000.00. This is based upon an average of \$100.00 per site. DEP will develop a GIS-fill inventory based on the availability of funding. The first priority will be to establish a GIS-fill inventory of all permits on West Virginia's inspectable units list. DEP estimates that currently 885 sites contain fills. Phase I will cost \$88,500.00 to digitize sites that have fills and/or refuse structures associated with them. After this is completed, DEP and OSM will establish a priority of additional fill sites to be digitize going back through the permanent program permits. This will be phase II of the inventory.

2. The funds from this cooperative agreement shall only be used to cover allowable costs which are incurred during the performance period. In addition, valid obligations incurred before the end of the performance period for purchased services, equipment, and supplies specifically identified in the approved application shall be considered allowable expenditures. If obligations are included in the claimed cooperative agreement costs, adequate records shall be maintained to fully disclose the date and amount incurred and the date and amount of subsequent payment. Obligations claimed in one cooperative agreement period shall be excluded from expenditures claimed in prior or subsequent cooperative agreement periods.
3. The State shall submit financial status reports, performance reports, and other such reports according to the timing, content, and format as required by OSM. The State shall report program outlays and program income on a cash basis.

4. Transfer of funds between total direct cost categories in the approved budget shall receive the prior approval of OSM when such transfers exceed ten percent of the total budget.
5. The State shall transfer to OSM the appropriate share based on the Federal support percentage of any refund, rebate, credit, or other amounts arising out of the performance of this agreement, along with accrued interest, if any. The State shall take necessary action to affect prompt collection of all monies due or which may become due and to cooperate with OSM in any claim or suit in connection with amounts due.
6. The State shall comply with the requirements, as applicable, of the Grants Management Common Rule adopted by DOI at 43 CFR 12 regarding administrative procedures; Treasury Circular No. 1075 and 31 CFR 205.6 on financial procedures; OMB Circulars No. A-87, A-21, and A-122 on cost principles; and OMB Circular No. A-128 on audit requirements.
7. No employee of the State, Indian Tribal Government, or Federal Government performing any function or duty under this cooperative agreement shall have a direct or indirect financial interest in any coal mining operation. The State shall comply with all requirements and regulations established by OSM to carry out this requirement, including 30CFR Part 705 and those requirements which it has adopted in its regulatory program or reclamation plan.
8. This agreement can be amended only by compliance with the requirements of 30 CFR 735.20. The cooperative agreement shall be subject to reduction or termination pursuant to 30 CFR 735.21.
9. Cooperative agreement funds shall not be used to attempt to influence the public on legislation pending before Congress.
10. For purposes of this cooperative agreement, program income includes, but is not limited to, income from the sale of publications, the sale of real or personal property purchased with cooperative agreement funds, the sale of services under a cooperative agreement (such as the sale of computer time), permit fees, income earned from investment of permit fees or other program income, and/or income earned from royalties received as a result of copyrights and/or patents produced under the cooperative agreement. Program income does not include income from fines, penalties, taxes, or forfeitures. This cooperative agreement shall use the deductive option for handling program income. Proceeds from the sale, transfer, or distribution of real or personal property must be handled in accordance with the provisions in the Grants Management Common Rule and implementing DOI guidelines.
11. It is a National policy to place a fair share of purchases with minority business firms. Minority Business Enterprises/Women's Business Enterprises (MBE/WBE) utilization is based on Executive Orders 11625, 12138, 12432 and the Grants Management Common Rule. DOI is strongly committed to the objectives of this policy and encourages all recipients of its grants and cooperative agreements to take affirmative steps to ensure such fairness. In particular, recipients should:

- a. Place minority business firms on bidder's mailing lists.
- b. Solicit these firms whenever they are potential sources of supplies, equipment, construction, or services.
- c. Where feasible, divide total requirements into smaller needs and set delivery schedules that will encourage participation by these firms.
- d. Use the assistance of the Minority Business Development Agency of the Department of Commerce, the Small Business Administration, DOI's Office of Small and Disadvantaged Business Utilization, the Business Utilization and Development Specialists who reside in each DOI bureau and office, and similar State and local offices where they exist.

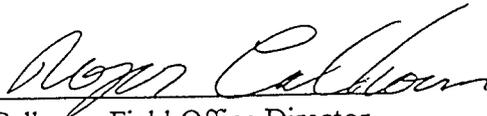
If the Federal amount of this cooperative agreement is \$500,000 or more and involves the procurement of supplies, equipment, construction, or services in excess of \$10,000, the State shall complete a Standard Form 334 (MBE/WBE Utilization under Federal Grants, Cooperative Agreements, and other Federal Financial Assistance). The form shall be submitted to the appropriate OSM Field Office Director within ten calendar days after the end of the each Federal fiscal quarter, up to and including the Federal fiscal quarter in which the end of the cooperative agreement performance period occurs.

12. The State is free to copyright any original work developed in the course of or under the agreement. OSM reserves a royalty-free, nonexclusive and irrevocable right to reproduce, publish, or otherwise use, and to authorize others to use the work for Government purposes. Any publication resulting from work performed under this agreement shall include an acknowledgment of OSM financial support and a statement that the publication does not necessarily reflect OSM's views.
13. No subsequent regulatory grants, monetary increase amendments, or time extension amendments will be approved unless all overdue final financial performance reports have been submitted by the recipient to the appropriate Field Office. Exceptions to this policy can be approved only by the Deputy Director, Administration and Finance, OSM, or his designate.
14. No transfer of funds to agencies other than those identified in the approved cooperative agreement application shall be made without prior approval of OSM.
15. This cooperative agreement takes effect at the time of signing by the Director of OSM or his/her authorized delegate. However, the State shall have a period of 20 calendar days from the date of signing to execute this cooperative agreement in order to indicate its agreement with the terms and conditions. Unless an extension of time is formally approved by OSM, failure to execute the agreement within the stated period shall result in a deobligation of the total Federal award amount.

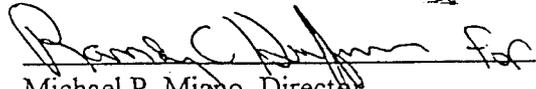
We, the undersigned authorized representatives, hereby agree to the terms and conditions set forth in this agreement between the United States of America and the State of West Virginia.

OFFICE OF SURFACE MINING

STATE OF WEST VIRGINIA



Roger W. Calhoun, Field Office Director
Charleston Field Office
Office of Surface Mining



Michael P. Miano, Director
Division of Environmental Protection

9/23/98

Date

9/23/98

Date

EVALUATION TOPIC 1B: ASSESSING IMPACTS

DATE: September 29, 1998

OSM Contact: Max Luehrs, Columbus Office

614-866-0578 ext. 110

Status of Workplan: The Scope of Work (SOW) was deemed unacceptable by the Steering Committee at its July 15, 1998 meeting. It was revised on July 21, 1998 and e-mailed to Roger Calhoun but has not been yet approved by the steering committee. The Steering committee did vote to have EPA be the focal point for this project since it may coincide with studies they already have underway and or a future decision on EIS requirements.

Participation by Other Agencies: The working group was formed at the interagency meeting held in Washington Pa. on May 19, 1998. There has been several changes of players but all agencies appear to want to have active participation in this effort.

Progress Report: Even though the SOW has not been approved by the Steering Committee, the group proceeded with some of the first tasks:

A literature search was conducted through OSM's WRCC librarian in addition to individual Internet searches. Although some useful information was found, it is apparent that there is not a great deal of published information on this topic.

A letter of inquiry was sent to the state regulatory authority, the state NPDES authority, and the state coal associations, for each state in the Appalachian Region. Letters were also sent to West Virginia University. This was an effort to locate data or "institutional" knowledge about valley fills that would not be found in a literature search. We sent 24 letters in total and received six responses. The results by state were as follows:

KY - None

MD- The RA and the coal association responded that there were no valley fills of any kind.

OH - The RA responded that there were no valley fills other than coal refuse fills.

PA - The RA responded that there were no valley fills other than coal refuse fills.

TN - None

VA - The RA responded that the majority of their fills were the head-of-hollow type.

WV- The RA provided a list of valley fills that had mitigation plans due to exceeding the 250-acre threshold. The West Virginia Mining and Reclamation Association responded that there were previous studies done on some fills. However, none of these were about the large durable rock fills that are at issue with this group.

The group is attempting to locate potential sites for study in the states of Kentucky, Virginia, and West Virginia. The group is also to define both the minimum and optimum data needs for the studies.

Reactions to SOW: The SOW has only been distributed internally amongst the group, and the Steering Committee. The Steering Committee has requested a "more detailed" plan, but has never provided any detailed comments.

Contracts: No contracts were issued in FY 98.

November 3, 1998

SCOPE OF WORK

(Revised 7-21-98)

EVALUATION TOPIC 1B: Assess the impacts of post-SMCRA (after 1977) valley fills on aquatic and terrestrial habitats, including water quality and quantity, on and below the fill areas. This assessment of impacts will also evaluate the effectiveness of any off-site mitigation measures.

OSM CONTACT: Max Luehrs

OSM PARTICIPANTS: Jeff Coker, Knoxville Field Office; Jack Felbinger, ARCC; Dan Ross, Lexington Field Office; Vann Weaver, ARCC

USEPA PARTICIPANTS: Jim Green, Wheeling W. Va. Office; Eva Long, Atlanta Office; Dan Sweeney, Philadelphia Office

US FISH and WILDLIFE (FWS) PARTICIPANTS: Dan Ramsey, Elkins W. Va., Cindy Tibbott, State College Pa.

US ARMY CORPS of ENGINEERS (COE) PARTICIPANT: Ginger Mullens, Huntington W. Va. District

METHOD OF REVIEW/OPTIONS:

Population/Sample

For the purpose of this evaluation, valley fills within the seven-state Appalachia Region that encroach upon perennial or intermittent streams will be considered for study. This will be determined as those streams that show as perennial or intermittent on USGS topographic maps. One watershed with several head-of-hollow fills will also be selected for study to determine the cumulative impact of several smaller fills versus one larger fill. The population of fills from which to select, may be determined by the team evaluating the inventory of sites if possible. However, the group will also make inquiries to various entities to identify potential study sites as early as possible.

REVIEW METHODOLOGY:

1. Conduct a literature search for any existing studies concerning the environmental impacts of valley fills.
2. Conduct inquiries to various government agencies, educational institutions, and industry about what on-going studies may exist, and what kinds of data are available concerning valley fills.

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3. Analyze the information gathered to determine: 1) Is there sufficient information in existence to reach a conclusion about the impacts from valley fills ? and 2) Is there data available that could be used for new studies.
4. Assuming no existing research, studies, or other information is available that would be adequate to reach a conclusion about the biological impacts of valley fills, new studies will need to be conducted. The team will then analyze any existing data identified that could serve as a baseline for new studies.
5. The data needed for assessing the impacts must include the following:
 - a. Flow data
 - b. Water chemistry
 - c. Biotic diversity
 - d. Habitat evaluation
6. The team will then select sites to be studied using the following criteria:
 - a. The fill should encroach upon a significant portion of a perennial or intermittent stream.
 - b. One site will be a watershed containing several head-of-hollow fills
 - c. One site will be for coal refuse disposal.
 - c. Two sites will involve durable rock fills
 - d. One site should involve a compacted embankment fill with a rock core chimney drain
 - e. The fills must be reclaimed, with older fills being more preferable to more recent fills
 - d. The area upstream of the fill drainage should have some biological diversity that includes fish (In order evaluate biological impacts, some biological diversity must be present, and fish are a significant indicator of stream health). If the stream receiving the fill drainage is long enough before it empties into another stream, the upstream sampling point may be omitted.
 - e. At least one of the selected sites should involve off-site mitigation (not on the fill itself) if possible
 - f. Sites with premining data are preferred
7. For sites without premining data, a similar watershed that has not been impacted by valley fills, will be selected for comparison to the watershed containing the fill (paired approach). The unimpacted watershed should be similar in size, gradient, vegetative cover, and any other influences, to the watershed which was filled. The watershed should also be located as close to the filled watershed as possible.
8. Select sampling points for biological, water quality, and flow monitoring on and below the selected sites and in the similar unmined control watershed for each site.
9. Select sampling points for any off-site mitigation areas related to the fill.

10. Sampling shall be conducted in the following manner:
 - a. Flow measurements will be done in accordance with USEPA approved methods at all sampling points.
 - b. Water chemistry sampling and analysis shall also be done according to USEPA approved methods for all group I mine drainage parameters including temperature and total suspended solids.
 - c. Biological diversity will be measured using qualitative methods as called for by USEPA's Rapid Bioassessment Protocols.
 - d. Habitat evaluation will be done both qualitatively and quantitatively in accordance with USEPA Rapid Bioassessment Protocols.
 - e. Flow measurements and water chemistry testing shall be done in both low flow and high flow periods, or on a monthly basis from March through October.
 - f. All sampling of the fill area shall be done as nearly as possible to the same time of the sampling on any paired watershed.
 - g. For sampling points with premine data, post mine sampling as close to the premine schedule as possible.

11. For each fill site and paired watershed the following information will be recorded:
 - a. Fill sites
 1. Acreage of watershed above the toe of the fill
 2. Acreage of the fill itself
 3. An estimate of the cubic yards in the fill
 4. The design method used
 5. The type of material disposed of
 6. Length of stream channel restored by reclamation
 7. Habitat evaluation for the length of channel restored, the upstream sampling point, and the downstream sampling point
 8. Biodiversity evaluation for the sampling point on or around the fill itself, an upstream sampling point (if applicable), and a sampling point downstream of the sediment pond
 9. Stream length from the toe of the fill to the sediment pond discharge
 10. Water chemistry and flow for all sampling points
 11. A description of the vegetative cover on the fill, and in the rest of the fill watershed
 - b. Paired watershed
 1. Acreage of the watershed
 2. Length of stream channel
 3. Habitat evaluation for length of channel
 4. Biodiversity evaluation for sampling point at location equivalent to fill sampling point
 5. Flow and water chemistry for the biodiversity sampling point, and a sampling point at the bottom of the watershed
 6. A description of the vegetative cover in the watershed

- c. Off-site mitigation area
 1. The size of the mitigation area in channel length, surface acreage, and acre feet of water, or average flow
 2. Habitat evaluation for the entire mitigation area
 3. Biodiversity evaluation for mitigation area
 4. Water chemistry, and flow data for mitigation area
 5. A description of the vegetative cover in the watershed of the mitigation area
12. For each fill site, its paired watershed, and any off-site mitigation area, summarize the following:
 - a. The length of stream gained or lost as a result of the fill activity
 - b. The change in biological diversity as a result of the fill activity
 - c. The change in habitat as a result of the fill activity
 - d. Changes in water quality and quantity as a result of the fill activity, and their influence on biological diversity and habitat
 - e. Changes in terrestrial habitat as a result of the fill activity
13. Analyze the results and draft a report with findings and recommendations.

Tasks

- Task 1: Conduct literature search and inquiries. Cost/Time Required - This can be done by agency staff within 200 hours (0.09 FTE).
- Task 2: Review the information and determine which sites will be studied. Cost/Time Required - This can be accomplished by agency staff within 400 hours (0.19 FTE)
- Task 3: Conduct initial site visits, habitat evaluations, and location of sampling stations. This will be done by agency staff in three-man teams. Allowing two days for the site visits and a day for travel plus preparation, equals 72 man hours per fill (including the paired watershed). The total for the five areas would be 360 man hours. Depending on how many mitigation areas might exist, this might go as high as 480 man hours, or 0.23 FTE.
- Task 4: Begin sampling for flow and water chemistry by March, 1998. Cost/Time Required - This will require contracting with a consulting firm or firms for sampling approximately 20 stations once a month for eight months. At approximately \$100 per analysis, plus \$400 for sample collection, flow measurement, and overhead, the cost would be \$10,000 per month for a total cost of \$80,000.
- Task 5: Begin biological diversity sampling by April 1, 1999, and end by September 1, 1999. If premining data is available the sampling will attempt to replicate as closely as possible the premine sampling dates. Cost/Time Required - Biological sampling will take place on a one-time basis at the 20 stations. At an estimated \$1000 per station for collection and analysis the cost will be about \$20,000.

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Task 6: The team will meet at a central location to discuss the data collected and develop findings and recommendations. Subgroups will be assigned to complete sections of the final report. Cost/Time Required - Two man days X 11 team members = 176 hours (0.85 FTE). Per diem for two days at \$105/day/person comes to \$2310. Any air travel required could increase this by as much as 100 per cent.

Task 7: Draft report and finalize recommendations. Cost/Time Required - Approximately three man days for each team member or 264 hours (0.13 FTE).

NOTE: All data collection should be completed by November 1, 1999, and the final report published by January 1, 2000.

DRAFT

EVALUATION TOPIC 2: EFFECTS ON DOWNSTREAM FLOODING

DATE: September 29, 1998

OSM Contact: Don Stump, ARCC

412-937-2848

Status of Workplan: A scope of work was drafted and accepted at the four agency working meeting in Pittsburgh, on July 15, 1998.

Participation by Other Agencies: The Corps of Engineers is an active participant in the study. An interagency agreement has been signed with the Pittsburgh District, Corps of Engineers. As planned the work effort would be primarily by the Federal agencies with State cooperation.

Progress Report: COE indicated that they had the capabilities to do the modeling proposed in the SOW. Participation by the Waterways Experiment Station and the Sacramento District units would occur as needed. OSM and COE staff have visited valley fill sites in developing the scope of work.

On August 20, 1998, Jim Spotts and Don Stump discussed the study SOW with members of the VADMLR. After explaining the aspects in which the state could participate, the VADMLR indicated that they would participate. Draft special study workplan are being prepared for the purpose of oversight negotiations in VA, KY, and WV.

Reaction to SOW: The SOW was favorably received by the four-agency steering committee and VADMLR.

Contracts: OSM obligated \$150,000 of FY 98 funds to the COE for a portion of the project.

November 3, 1998

SCOPE OF WORK

(7/14/98 Draft)

EVALUATION TOPIC 2. Effects of large-scale mountaintop mining and valley fills in steep slopes on downstream flooding potential.

OSM CONTACT: Jim Spotts, ARCC

OSM PARTICIPANTS: Steffan Koratich (Pittsburgh Field Branch, Columbus, OH); Danny Rahnema (Knoxville Field Office); Don Stump, (ARCC); Mike Superfesky (Morgantown Area Office); Sheila Walton (Knoxville Field Office); Mike Robinson, (ARCC-OSM Management Sponsor)

OTHER AGENCY PARTICIPANTS: Bob Neill, COE (Pittsburgh, PA)

OBJECTIVE: This study will evaluate the individual and cumulative effects of mining and post-mining changes in the terrain on downstream flooding potential.

INTRODUCTION: Surface coal mining operations excavate overburden and the resultant "bulking" of the overburden due to the incorporation of air, creates an excess of spoil material that is not needed for reclaiming the mine pit. Disposal of excess spoil and reclamation of the mine site not only reshapes the land, but also can result in different slopes, vegetative cover, and drainage patterns than existed prior to mining.

In steep-slope Appalachia, large, ridge-top mining operations methods can include, separately or in combination, mountaintop removal, return of the mine site to approximate original contour (AOC), or steep slope mining AOC variances. These large-scale mining operations, with their excess spoil fills, diversion channels, roads, sediment ponds, backfills, and other mining features have a dynamic effect on the runoff characteristics of the mined land during operation and following reclamation. The runoff from these operations ultimately winds up in a receiving stream and the peak flows during rainfall events at any particular receiving stream are directly affected by the land forms upslope during and after mining. To the extent that the rainfall/runoff characteristics (peak and duration) may be significantly changed, large scale mountaintop area mining could potentially result in greater flows or a flooding condition downstream. However, the peak flows could also be attenuated because of the "sponge-like" effect of voids spaces due to increased infiltration in reclaimed spoil, the retention of runoff volume in a mining pit or sediment control structure, diversion of part of drainage area to another receiving stream, etc..

The environmental community has suggested that valley fills might contribute to flooding downstream. However, valley fills comprise only a portion of the disturbance in the watershed. It is necessary therefore to consider all upslope disturbed elements in the watershed to assess potential flooding impacts. Mountaintop mining affects several tributaries, due to the mining location occurring at the uppermost reaches of the watershed. Evaluation of flooding can be

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focused on each watershed, which respond independently from other adjacent, mining-affected drainage courses. But, several of the tributaries may ultimately merge downstream, and the impacts after confluence, the peak runoff characteristics could be cumulative, to the extent that flooding potential is equal to the sum of the watershed components.

Data reported for the impact of forest logging operations (often equated to the impact of mining) indicates that stream flow characteristics increased in some studies, but also decreased in others. Data reported by Curtis for mined surfaces produced the same contradictory results. Findings in a study by Collier, et. al., 1970 indicated that flow from a mined watershed was more variable than on an unmined watershed. The variation increased with the size of the storm and those having lower base flow. However, most of the observations reported had some "qualifying conditions" that prevented a direct correlation.

To study the impacts of a mining operation on peak runoff, the study must evaluate the peak runoff which would occur for a given storm intensities--prior to any disturbance. This pre-mining condition becomes the control. The peak runoff then must be determined for some point in time during mining, when mining pits, sediment ponds, diversions, and other runoff-controlling structures are in place. The final condition to be modeled would be following backfilling, grading, establishment of vegetation, and removal of ponds, etc. The study would then compare the peaks for the different conditions. The result could be that peaks remain the same, increase, or decrease, depending on each disturbed watershed.

Assumptions: Field investigation of changes in watershed hydrologic characteristics requires a commitment of finances and human resources over a sufficient period of time to allow data collection during varying storm events and correlation of the data with variable mine site conditions (prior to mining, during mining, and after reclamation). Data taken for years, may not be adequate or representative, and application of a site-specific event may not realistically portray the impacts on other watersheds due to site-specific watershed and mining disturbance conditions.

Based on years of collected hydrologic data, computer models have been developed to explain the complex nature of watershed runoff characteristics. These models have also proven effective in predicting the potential impacts of future storms. The use of computer models also allows the user to selected specific rainfall events for analysis. Due to the limited time frame and resources for this study, modeling is the only practical way to evaluate hydrologic changes attributable to a mine site.

This evaluation topic proposes to accomplish the stated objective using the services of the US Army Corps of Engineers (COE) as the principal contractor for modeling analysis. The COE has many years of experience in modeling flood potential conditions and is recognized as an objective, expert organization in this field. In addition to developing models for its own programs, the COE is cognizant of and adept with models developed by other sources. The COE has provided professional similar services for complex studies to OSM.

November 3, 1998

Scope of Review: Possible review tasks relevant to evaluating the flooding potential from large-scale mountaintop mining operations include:

1. Identify, assemble and evaluate existing literature based on the effects of steep slope mining on downstream runoff.
2. Determine the population of documented flooding events due to mining in steep slope areas of Appalachia since the permanent regulatory program, and review the causative factor(s).
3. Develop an interagency agreement (IAG) with the U.S. Army Corps of Engineers to conduct the modeling effort.
4. Determine the appropriate computer model(s) for performing the evaluation.
5. Evaluate the inventory of large-scale mining operations in Kentucky, Virginia, and West Virginia to determine candidate sites for modeling analysis.
6. Review the permitting documentation for each modeling site and collect all relevant topographic and mine site development data.
7. Conduct mine site visits and/or aerial reconnaissance to verify that any critical permitting information is accurate, e.g. the post-mining configuration does not vary substantially from the final reclaimed plans in the permit.
8. Conduct modeling evaluations of selected sites.
9. Compare modeling results to existing PHC and CHIA and document variances, recommend revisions in PHC/CHIA processes to more accurately reflect the impacts of large-scale mining hydrologic impacts and assure maintenance of the hydrologic balance.
10. Prepare a final report for inclusion as a chapter in the overall study findings.

REVIEW TASK DETAILS: This study is comprised of ten tasks, described below. Some tasks will be completed by in-house OSM personnel, and others will require outside consultation services. The study will be completed in 18 months.

Task 1. *Identify, assemble, and evaluate existing literature base on the effects of steep slope mining on downstream runoff.*

This task entails assembly and review of government reports, contract studies, and other technical reviews pertaining to the impacts of steep slope mining on peak runoff downstream. This includes National Academy of Science reports, computer word searches, contract research studies, oversight special studies, reports of investigation on specific flooding

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problems, professional articles, memoranda, etc. An accounting of program-related problems and issues affecting flooding will be developed. From these reviews, a historical perspective of the technical issues at hand will be developed. Issues and recommendations delineated in the reports will be compared to current day issues and practices for relevance. This data will be used to formulate surveys and data collection efforts for the other tasks encompassed by Evaluation Topic 2.

Cost/Time Required: Can be accomplished by staff from ARCC and Field Offices, 400 hours compilation and review throughout the project (.200 FTE); \$1,000 purchase and/or reproduction costs; \$2,000 travel for meetings/analyses

Task 2. *Determine the population of documented flooding events due to mining in steep slope areas of Appalachia since the permanent regulatory program, and review the causative factor(s).*

Any documented flooding from reports gathered in Task 1 and failures known by state regulatory authorities (SRAs) will be assessed to quantify the failure rate of permanent program fills. The review might include interviews with permit reviewers, inspectors, scientists, engineers, supervisors and other professionals involved with the enforcement programs. Additional sources may include citizen complaint files, state violations, and contacts with state agencies responsible for monitoring flooding problems. A list of flooding causes will be compiled to see if commonality exists. Flooding causes may dictate survey and data collection efforts for other tasks encompassed by Evaluation Topic 2.

Cost/Time Required: Can be accomplished by staff from ARCC and Field Offices through visits to SRA offices, 200 hours (.072 FTE-150 hrs. data collection; 50 hrs. report writing). 2 weeks travel costs: \$50 X 10 days + \$500 airfare possible= \$1,000

Task 3: *Develop an interagency agreement (IAG) with the U.S. Army Corps of Engineers to conduct the modeling effort.*

ARCC and Field Office staff will prepare a statement of work (SOW) detailing the computer modeling analysis needed to perform this evaluation. Necessary I.G. documents, financial transfer mechanisms, and other administrative processes will be used to enact the study effort.

Cost/Time Required: ARCC and Field Office staff will require approximately 320 hours of technical and administrative time to enact this I.G., (.153 FTE);

[3 days travel for three staff to Vicksburg, MS to get COE concurrence on SOW, \$3,000 travel.]

Task 4: *Determine the appropriate computer model(s) for performing the evaluation.*

Staff will identify computer programs capable of modeling flooding conditions. Consultation with expertise and guidance available from the COE will be necessary to complete this task. The team will select a computer program best suited for modeling

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watershed characteristics for mining conditions. Next the team will identify the needed input variables for the modeling program to be obtained from data collected in previous tasks.

Cost/Time Required: This task will be completed by OSM ARCC and Field Office staff and interaction with the USACE, Pittsburgh District Office with possible site reconnaissance. One week staff time for two individuals, 80 hours (.038 FTE), \$2,000 per diem + \$1,500 airfare.

Task 5. Evaluate the inventory of large-scale mining operations in Kentucky, Virginia, and West Virginia to determine candidate sites for modeling analysis.

Based on data collected in Evaluation Topic 1, large-scale mine sites in Kentucky, West Virginia, and Virginia will be chosen for the review. Three permits will be selected in West Virginia and two each in Virginia and Kentucky. Particular weight will be given to sites where previous allegations of flooding were made. Staff will review state GIS or other maps showing mine site location and plot the data on topographic maps to determine the appropriateness of the candidate sites. The sites should, individually, have disturbances in more than one headwater stream, but two or more headwater streams should be common tributaries of a downstream watercourse. In addition, the selected mine sites in each state should share disturbance in the same watershed. That is, two or more mine sites analyzed in a particular state will not only be analyzed separately for their impacts on peak runoff, but also cumulatively as to their cumulative impacts on a common receiving stream.

Cost/Time Required: Can be accomplished by staff from ARCC and Field Offices with visits to the state regulatory authority offices. Three weeks staff time by two individuals (one week per state office), 240 hours (.115 FTE); six weeks per diem (\$1,500 + \$1,000 airfare); \$500 reproduction costs.

Task 6: Review the permitting documentation for each modeling site and collect all relevant topographic and mine site development data.

Selected permits would be evaluated and appropriate data extracted, including hydrologic baseline data; watershed analyses containing runoff hydrographs, watershed characteristics, etc., sediment control, diversion, road or other runoff-controlling structure designs; mapping, cross-sections, or other pre- and post-mining contour information; probable hydrologic consequences (PHC) and cumulative hydrologic impact analyses (CHIA); and, any other data useful in establishing the models.

Cost/Time Required: This work would be performed by OSM staff from ARCC and Field Offices, coupled with Task 3, above. Additional week of SRA office visits (two persons) added to Task 3, 240 hours (.115 FTE); \$1,500 per diem, \$500 document copying.

Task 7: *Conduct mine site visits and/or aerial reconnaissance to verify that any critical permitting information is accurate, e.g, the post-mining configuration does not vary substantially from the final reclaimed plans in the permit.*

Selected sites would be evaluated based on aerial photography, helicopter overflights, previous aerial video footage, or site visits to affirm site conditions comport with permit data collected in Task 4. This task does not envision any detailed surveying to assure reclamation contours are identical to permit projections—just a visual verification that the site was reclaimed as-planned. Significant changes will be documented for input into modeling assumptions. Video tape and audio notes will be utilized for future reference during the study.

Cost/Time Required: This work would be performed by OSM staff from ARCC and Field Offices, and could possibly be combined with the fill stability inspection (in part) effort of Evaluation Topic 4, assume two persons, two days field evaluation per site, two days travel time per state (WV-16 days total [128 hours]; KY/VA 24 days total [192 hours]; .153 FTE); \$2,000 per diem, \$1,500 airfare.

Task 8: *Conduct modeling evaluations of selected sites.*

At each site, pre-mining plans will be used to characterize the undisturbed hydrology characteristics. Data will be gathered from mining plans and field visits during earlier tasks will be used to represent pre-, during, and post-mining surface topography. The COE will calibrate the computer model for field conditions and perform various runs under pre-, during, and post-mining conditions under several rainfall events of different frequency/duration. Modeling will be performed on: a) individual watersheds serving as receiving streams for each mine site; b) cumulative adjacent watersheds which share a confluence downstream of an individual large-scale mine site; c) cumulative impacts of two or more large-scale mining operations (i.e., analyzed in a and c, above) which are in the headwaters of tributaries joining downstream into a common stream. The study report will provide peak runoff values for the various scenarios and rainfall events in a final report.

Cost/Time Required: OSM staff from ARCC and a Field Office will monitor the contractor's work. The contract will occur over an eight-month period. Estimate 60 hours per month, average monitoring time, 480 hours (.230 FTE), three visits to Vicksburg, MS, \$6,000 travel. Contract costs estimated at 3 GS-14 senior scientists x eight months (\$80K X 3 X .75 year + 25% benefits + 40% overhead = \$315K), Miscellaneous computer and report preparation costs, \$5,000. Total contract costs \$320,000.

Task 9. *Compare modeling results to existing PHC and CHIA and document variances, recommend revisions in PHC/CHIA processes to more accurately reflect the impacts of large-scale mining hydrologic impacts and assure maintenance of the hydrologic balance.*

Using the information provided in Tasks 4 and 8, OSM staff will evaluate the COE report compared with the PHC and CHIA's developed for the mine(s). An oversight study report

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will be prepared with recommendations to be implemented by each state,

Cost/Time Required: ARCC and Field Office staff will be used to complete this task. Two staff, 160 hours evaluation, 160 oversight report and recommendation preparation, peer review, 80 hours (.197 FTE), meeting in Pittsburgh with 4 staff traveling, \$1,200 per diem, \$1,500 airfare; reproduction costs \$500.

Task 10: *Prepare a final report for inclusion as a chapter in the overall study findings.*

The results of the COE's modeling study and the PHC/CHIA oversight evaluation will be summarized and incorporated in a report to be incorporated into the overall Interagency Evaluation Final Report.

Cost/Time Required: ARCC and Field Office staff will perform this task. Two staff, two weeks, 160 hours (.077 FTE), \$500 reproduction costs.

STATE CONTACTS: West Virginia-Tom Galya; Kentucky-John-Mark Clements; Virginia-Les Vincent

OTHER ASSISTANCE NEEDED: Interagency Agreement with U.S. Army Corps of Engineers to perform the modeling aspects.

TASKS' COMPLETION DATE: 18 months

Summary of Resource Requirements:

TASK	TIME	DOLLARS	
1	.200	\$ 3,000	(travel, purchase/reproduction of documents)
2	.072	1,000	(travel)
3	.153	3,000	(travel)
4	.038	3,500	(travel)
5	.115	3,000	(travel, reproduction)
6	.115	2,000	(travel, reproduction)
7	.153	3,500	(travel)
8	.230	326,000	(contract, travel)
9	.197	3,200	(travel, reproduction)
10	.077	500	(reproduction)
TOTAL	1.350	348,700	

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EVALUATION TOPIC TWO: EFFECTS OF LARGE-SCALE MOUNTAINTOP MINING
AND VALLEY FILLS IN STEEP SLOPES ON DOWNSTREAM FLOODING POTENTIAL.

PROPOSED TIME LINE

TASK	1999																	
	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	
1. Literature search																		
2. Flooding events																		
3. IAG with COE																		
4. Determine model																		
5. Review inventory/ select sites																		
6. Review permits/ extract data																		
7. Site reconnaissance																		
8. Perform Modeling																		
9. PHC/CHIA review																		
10. Final report																		

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Agreement No. 143868-IA98-12244

EFFECTIVE DATE: September 24, 1998

INTERAGENCY AGREEMENT

Between

THE OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT
U.S. DEPARTMENT OF THE INTERIOR

And

U.S. ARMY, CORPS OF ENGINEERS
PITTSBURGH DISTRICT

MODEL ANALYSIS OF POTENTIAL DOWNSTREAM FLOODING AS A RESULT OF
VALLEY FILLS AND LARGE-SCALE SURFACE COAL MINING OPERATIONS
IN APPALACHIA

Agency Location Code: 14-18-0001
Account No.: 1T4200420
Obligated Amount: \$150,000
CQ#802028

INTERAGENCY AGREEMENT

Between

UNITED STATES, DEPARTMENT OF THE INTERIOR
THE OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT

And

U.S. ARMY, CORPS OF ENGINEERS
PITTSBURGH DISTRICT

I. PURPOSE

The purpose of this Interagency Agreement is to evaluate the potential for flooding as a result of the construction of valley fills and associated large-scale mountaintop surface coal mining.

II. BACKGROUND

Surface coal mining and reclamation in steep slope areas generates excess spoil. This spoil is often permanently placed in what is referred to as "valley fills." The construction of these fills and the associated reclamation of large mountaintop surface mining operations upstream of the fills causes permanent changes in the topography. During the past ten years, there has been an increase in both size and number of valley fills and large-scale surface coal mining operations in the Appalachian coal fields. Consequently, there is a growing need to evaluate the potential for downstream flooding caused by valley fill construction and large-scale surface coal mining operations.

The Environmental Protection Agency (EPA), the Office of Surface Mining Reclamation and Enforcement (OSM), the U.S. Army Corps of Engineers (COE), and the U.S. Fish and Wildlife Service (FWS) support the need for this evaluation.

III. SCOPE OF WORK

The work done under this agreement will include literature research, computer modeling, field data collection, and reports. The initial work will include researching available surface water modeling programs and selecting the most appropriate software to use to model the hydrologic impacts from the land-use and topographic changes caused by valley fill construction and upstream mining operations.

For each site, selected data will be collected in the field, at the site, and from the mining permit files. The data will then be entered as input for the surface water runoff model. The modeling of each site will be summarized and an individual site report will be prepared. The reports will include an analysis of 10-year and 100-year design storms and the potential flooding associated with the valley fills and mine sites investigated.

After completion of all funded site reports, a final report will be prepared that includes the analyses of all the sites investigated.

The following tasks will be performed by a team which includes various COE personnel and a representative from OSM.

Task A: *Determine the appropriate numerical computer model(s), such as HEC-1, HEC-HMS, HEC-2, HEC-RAS for performing the evaluation.*

Staff will identify computer programs capable of modeling flooding conditions. Consultation with expertise and guidance available from the COE will be necessary to complete this task. The team will select a computer program best suited for modeling watershed characteristics for mining conditions. Next, the team will identify the needed input variables for the modeling program to be obtained from data collected in previous tasks.

Task B: *Conduct mine site visits and/or aerial reconnaissance to verify that any critical permitting information is accurate, e.g, the post-mining configuration does not vary substantially from the final reclamation plans in the permit.*

Selected sites will be evaluated based on aerial photography, helicopter overflights, previous aerial video footage, or site visits by the COE, Pittsburgh District to confirm that site conditions are consistent with permit data collected in Task A. This should not involve any detailed surveying to assure reclamation contours are identical to permit projections. The mine site engineer's construction certification reports will be used to document alterations from the original plans. Significant changes will be documented for input into modeling assumptions. Video tape and audio notes may be used for future reference during the study. The District will also obtain all data required for the hydraulic analysis of water surface changes (if any) at the critical point (denoted by

OSM and COE) for each of the funded study sites.

OSM staff will concurrently conduct reviews and evaluations of the Probable Hydrologic Consequences (PHC) and Cumulative Hydrologic Impact Assessments (CHIA) for these permits.

Task C: *Conduct modeling evaluations of selected sites to determine the impact of selected rainfall events on the selected sites.*

At each site, pre-mining plans will be used to characterize the undisturbed hydrology characteristics. Data will be collected from mining plans and field visits. Information collected during earlier tasks will be used to represent pre-mining, active mining, and post-mining surface topography. The COE will perform various modeling runs under pre-mining, active mining, and post-mining conditions under several rainfall events of different intensity/frequency/duration modes. The study report will provide peak runoff values for the various scenarios and rainfall events (10-year and 100-year) in a final report. The study shall predict the potential for flooding at selected points, in the immediate vicinity, downstream of the valley fill.

Task D: *Prepare reports.*

Reports will be prepared to document progress, identify resources used, analyze the computer modeling results at each site. A final report, either for the funded base period or for the base period and the option work (if the option work is executed), will be prepared that summarizes all the work performed under this agreement.

IV. PARTICIPATION and EVALUATION

An OSM representative will participate with the COE team during the entire performance period for consultation, discussion and evaluation.

OSM reserves the right to make programmatic evaluations of the work carried out by the District under this Agreement, (including site visits). The District Project Officer will be notified of any site visits. Appropriate and mutually-agreeable overview procedures will be established by the District and OSM project officers to adjudicate review results in case of a District-OSM disagreement.

V. KEY OFFICIALS

The technical project officers are:

Don Stump
Office of Surface Mining
Appalachian Regional Coordinating Center
Three Parkway Center
Pittsburgh, PA 15220
Tel: (412) 937-2164

Walt Leput
U.S. Corps of Engineers
Pittsburgh District Office
Wm. Morehead Federal Building, Room 1910
Pittsburgh, PA 15222
Tel: (412) 395-7352

This Agreement will be administered by Ray Navarro, OSM Contract Specialist, : (412) 937-2839.

VI. AGENCY RESPONSIBILITIES

The District agrees to:

1. Provide personnel and equipment necessary to complete the tasks listed in the Scope of Work.
2. Make appropriate contacts with other COE Districts if work is within their area of responsibility.
3. Attend meetings with OSM to present preliminary findings, recommend project modifications where appropriate and identify support/coordination requirements for remaining activities. The exact time and place of the meetings shall be agreed upon by project participants.
4. Provide the reports listed in Section VII, Deliverables.

VII. DELIVERABLES

The following items are deliverables under this Agreement:

1. Monthly narrative reports describing the progress to date and a separate report prepared through the Corps of Engineers Financial Management System (CEFMS) documenting costs and labor will be submitted to the OSM Technical Project Officer within seven days following the end of each calendar month. Each submittal will include three copies of the report with supporting documentation. The supporting documentation for costs and labor will include a breakdown of manpower levels, hours, overhead, materials used, and travel costs, as well as a breakdown of the

portions paid by OSM and COE.

2. Technical reports will be prepared for each site. The reports will describe the field work and computer modeling results. Two hard copies of the report will be submitted to OSM.
3. A final report will be prepared. Three hard copies of the final report and a set of 3/1/2-inch disks or a CD-ROM disk that contains all databases of field data and analyses will be submitted to OSM. The CD-ROM will be in a WordPerfect format compatible to both OSM and COE.

VIII. TERMS OF AGREEMENT

Authority to enter into this Interagency Agreement is contained in the Surface Mining Control and Reclamation Act of 1977 (P.L. 95-87) and the Economy Act (P.L. 97-258). This Agreement may be modified by mutual consent of both parties in writing. It shall continue in force, unless modified by mutual consent or terminated by either party by written notice to the other party at least 30 days prior to the termination date.

IX. SCHEDULE

A. Funded Base Period Schedule

Start - up (Computer model selection, site selection, literature search)	: 1.0	month
Site #1 (Site visits, Hydrology and Hydraulic Analysis, and Report)	: 5.0	months
Site #2 (Site visits, Hydrology and Hydraulic Analysis, and Report)	: 3.5	months
Site #3 (Site visits)	: 2.0	months
Final Report (if Option Schedule not funded)	: 0.5	month
Total	: 12.0	months

B. Unfunded Option Schedule:

Site #3 (Hydrology and Hydraulic Analysis, and Report)	: 1.5	months
Site #4 (Site visits, Hydrology and Hydraulic Analysis, and Report)	: 2.5	months
Site #5 (Site visits, Hydrology and Hydraulic Analysis, and Report)	: 2.5	months
Final Report (Includes Sites 1 thru 5)	: 1.0	month
Total	: 7.5	months

X. COSTS

A. Funded Base Period Costs (OSM \$150,000 + COE \$56,000)

	Labor	Travel	Running Total
Start - up	\$19,200	0	\$ 19,200
Site #1	\$77,000	\$5,500	\$101,700
Site #2	\$69,000	\$1,500	\$172,200
Site #3	\$32,300	\$1,500	\$206,000
		Funded Total	\$206,000

B. Unfunded Option Schedule (\$182,700)

Site #3	\$36,700	0	\$242,700
Site #4	\$69,000	\$1,500	\$313,200
Site #5	\$69,000	\$1,500	\$383,700
Final Report	\$ 5,000	0	\$388,700
		Grand Total	\$388,700

XI. PERIOD OF PERFORMANCE

The period of performance for this agreement (the funded base period) will be 12 months. Subject to the availability of appropriated funds, OSM may require continued performance of services at the rates described under Section X of this agreement. This option can be exercised by OSM in writing to the COE at any time during the initial twelve (12) month period based on technological results achieved and appropriated funds available during the base year. The period of performance for the unfunded option will be set by agreement between OSM and COE.

XII. FUNDING

The base period will include funding from OSM and the COE. The OSM portion of the funding is \$150,000 from Regulation and Technology. The Corps of Engineers is expected to cost-share an estimated \$56,000. The total amount (\$206,000) will fund the estimated costs associated with this work as set forth in Section X.

If available, additional funding will be used to fund the option work. The option work will require funding in the amount of \$182,700 and will be provided between both parties in Fiscal Year 1999.

OSM will fund its portion of this Agreement by obligations under its Regulatory and Technology Activity using a combination of FY 1998 and FY 1999 funds (if appropriated).

XIII. PAYMENT

OSM will make monthly payments when it receives a COE invoice supported by the labor and cost information submitted in the monthly reports identified in Section VII "Deliverables." The three copies of the invoice and monthly report should be sent to:

Office of Surface Mining Reclamation and Enforcement
Appalachian Regional Coordinating Center
Three Parkway Center
Pittsburgh, PA 15220
Attn: Ray Navarro

XIV. PUBLIC INFORMATION

All information obtained under the terms of this Agreement is public property.

Prior to public release or presentation the OSM will review all scientific publications of the results of research and any press releases prepared by the District regarding this Agreement. In such cases, credit for joint support to the District and OSM shall be acknowledged in all printable material. If there is no agreement on the interpretation of results, either party may publish data after due notice and submission of the proposed manuscript to the other. In such instances, the party publishing the data will duly credit the cooperation of the other party, but will assume responsibility for any statements on which there is a difference of opinion. To prevent disclosure of information requested to be kept confidential by third parties and prohibited from disclosure by Federal law, Project Officers will seek advice of their respective legal counsel as appropriate. Provisions of this Agreement cannot supersede public disclosure requirements of the Freedom of Information Act.

XV. MISCELLANEOUS

During the performance of this Agreement, the participants agree to abide by the terms of Executive Order 11246 on non-discrimination and will not discriminate against any person because of race, color, religion, sex or national origin. The participants will take affirmative action to ensure that applicants are employed without regard to their race, color, religion, sex or national origin.

Signed this 24th day of September, 1998.

UNITED STATES DEPARTMENT OF THE INTERIOR
OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT

By: Allen D. Klein
Allen D. Klein

Title: Regional Director, ARCC

Accepted this 25th day of SEP, 1998.

U.S. ARMY, CORPS OF ENGINEERS
PITTSBURGH DISTRICT

By: Frank Likar P.E.
Frank Likar

Title: Acting Chief, Engineering Division

EVALUATION TOPIC 3: MITIGATION PRACTICES

DATE: September 29, 1998

OSM Contact: Thomas Koppe, Lexington Field Office 606-233-2896

Status of Workplan: On July 15, 1998, the steering committee agreed to proceeding with this task in so far as to collecting regulations on stream mitigation practices as applied in State programs. The steering committee thought this would be useful information in developing the plans for assessing overall impact.

Participation by Other Agencies: OSM agreed to complete this task.

Progress Report: OSM plans to canvas each SRA through meetings/conferences calls to discuss and collect all data. Initiation of this effort has been delayed by other priorities.

Reactions to SOW: No reaction identified.

Contracts: No contracts anticipated.

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SCOPE OF WORK

EVALUATION TOPIC 3: Review mitigation practices utilized in various States.

OSM CONTACT: Tom Koppe, Lexington Field Office

OSM PARTICIPANTS: Jack Nelson, Charleston Field Office; Fred Sherfy, Harrisburg Field Office

METHOD OF REVIEW/OPTIONS:

Population/Sample

The population is all surface mining permits, including coal refuse disposal permits, issued under approved State permanent regulatory programs in Pennsylvania, Maryland, West Virginia, Virginia, Kentucky, Ohio, and the Federal Tennessee Program. After data is collected on the number of permanent program permits issued with excess spoil/coal refuse fills, sample selection may be limited to specific watersheds and certain types of fills to assess environmental effects.

REVIEW METHODOLOGY: OSM, in cooperation with the U.S. Army Corps of Engineers (COE), the U.S. Environmental Protection Agency (EPA) and the U.S. Fish and Wildlife Service (FWS), will perform the following tasks:

- 1) Identify for each State the laws, regulations, and/or policies that require mitigation of impacts to wetland and stream resources;
- 2) Identify the number of permanent program permits requiring mitigation;
- 3) Identify the miles of stream and/or acres of wetland affected since primacy;
- 4) Identify the type, extent and basis of mitigation; and
- 5) Identify similarities and differences in mitigation approaches used by each State.

Timeline

June 1, 1998 through August 1, 1998 - Interview State regulatory authorities (RA) to determine existing regulatory requirements that protect wetland/stream resources during the permitting of excess spoil and coal refuse disposal activities.

August 1, 1998 through September 15, 1998 - Collect permit specific information from each RA to identify the degree to which regulatory requirements have been implemented.

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September 15, 1998 through November 15, 1998 - Analyze information to assess the similarities and differences in approaches used by each RA to protect wetland and stream resources. Prepare draft report and obtain/resolve comments.

November 15, 1998 - Submit Final Report.

Staff Time: 2 FTEs

Cost Estimate: In-house. Assistance from COE, EPA, and FWS in collecting and analyzing the data will reduce the amount of time and staff needed to complete this project.

Final Report

The team will prepare a final report that will identify the regulatory requirements under each State program and in the Tennessee Federal Program that address impacts to streams/wetlands due to excess spoil and coal refuse disposal. The final report will outline the degree to which the mitigation practices have been implemented and will characterize the status of such efforts among the different State permanent regulatory programs.

STATE CONTACTS: State SMCRA and NPDES authorities, including representatives responsible for stream mitigation. This task will be coordinated with Tasks 1 and 5 to avoid duplication of efforts and to ensure consistency in completing the final report.

PUBLIC OUTREACH: OSM will not conduct a public outreach effort as part of completing this task. This task will receive public input as part of the final report associated with the completion of the final workplan for all tasks under this review.

OTHER ASSISTANCE NEEDED: EPA, COE, and FWS, as requested.

TASK COMPLETION DATE: November 15, 1998

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EVALUATION TOPIC 4: ASSESS LONG TERM STABILITY OF FILLS

DATE: September 29, 1998

OSM Contact: Peter R. Michael, ARCC

412-937-2867 →

Status of Workplan: The workplan was approved by the four-agency steering committee at a meeting in OSM's Pittsburgh office, on July 15, 1998.

Participation by Other Agencies: Task 2 is the only part of the SOW that requires consultation with Federal agencies involved in geotechnical engineering. The remainder of the SOW is planned as a special oversight study and will be conducted jointly with the States of WV, KY, and VA--largely during EY99.

Progress Report: The details of the work are being further refined through discussions with the individual states. Discussions have occurred with three states as follows:

- Meetings or conference calls were held with WVDEP, KYDNREP, and VADSMRE to explain/discuss the SOW.
- A draft performance agreement special study plan was developed and is under review by KYDNREP to begin negotiations for the EY99 oversight workplan. Similar documents are planned for negotiations with VADMLR and WVDEP in the near future.
- The project team is developing draft questionnaires, procedures, and checklists to utilize in performance of tasks 3-13.

Reactions to SOW: WVDEP, VADMLR, and KYDNREP all received the proposal very favorably.

Contracts: No contracts were issued in FY 98.

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SCOPE OF WORK

7/22/98

EVALUATION TOPIC 4: Assess long-term stability of fills.

OSM CONTACT: Peter Michael, ARCC

OSM PARTICIPANTS: Mike Superfesky (Morgantown Field Office); Joe Blackburn (Lexington Field Office); David Lane (Knoxville Field Office); Ann Stewart-Murphy (ARCC); Mike Gheen (COE-Huntington, WV); Mike Robinson (ARCC-OSM Management Sponsor).

OTHER AGENCY PARTICIPANTS: Mike Gheen, COE (Huntington, WV).

OBJECTIVE: Assess long-term stability of fills with emphasis on public safety.

INTRODUCTION:

Assumptions: Although the mitigation and fill impact portions of the overall study will include coal waste disposal, because of the more rigorous multi-agency review of coal waste (embankment and impoundment) disposal fill/dam stability, this evaluation topic will be limited to excess spoil disposal fills.

The Surface Mining Control and Reclamation Act (SMCRA) led to regulations containing permitting, design, and construction monitoring requirements intended to implement state-of-the-art engineering standards for excess spoil disposal. The regulations and engineering standards were tailored to ensure meeting the SMCRA goals of long-term stability and, hence, public safety and environmental protection. To perform a retrospective study definitively evaluating the mass stability of large earth and rock structures requires intimate knowledge of representative shear strength parameters of the fill and foundation material, as well as definition of the phreatic surface within the fill. With reliable excess spoil geotechnical strength parameters and internal pore water pressure information (along with the dimensions of the fill, foundation, and bedrock) a stability analysis can provide accurate engineering estimates for the factor of safety of the fill.

It is impractical for this evaluation (i.e., cost-prohibitive and an inadequate term of study) to definitively establish the geotechnical condition of thousands of fills throughout Appalachian mine sites. In fact, the various state regulatory programs routinely evaluate the company submission of this type of information in permits, evaluate the adherence to approved plans in monthly inspections, and assess the fills for signs of incipient or actual failure prior to making bond release decisions after construction. Company engineers and consultants perform extensive tests, stake their professional reputation and licenses on fill designs, document/certify critical construction phases, and certify quarterly. It is therefore recommended that this evaluation focus on issues which are indirect or direct indicators of regulatory program effectiveness in assuring long-term stability of fills. The evaluation would entail a combination of literature, permitting, inspection

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and enforcement process, and field reviews.

Scope of Review: Possible review tasks relevant to establishing the effectiveness of regulatory programs with respect to fill stability include:

4. Assemble all available literature on excess spoil disposal practice evaluations and compare the conclusions and recommendations with known current practices.
5. Examine the feasibility of documenting that 80% durable rock (by unit volume) is attained during construction and in final fill configurations.
6. Evaluate the effectiveness of current sampling and testing protocols for establishing representative rock durability of excess spoil.
7. Establish the effectiveness of current methods utilized in inspection and enforcement of excess spoil disposal.
8. Determine the population of documented fill failures since the permanent regulatory program, and the causative factor(s).
9. Evaluate state surface mining information systems (SMIS) data and compile violation data relative to excess spoil disposal.
10. Assess the appropriateness of strength parameters, phreatic surfaces, and failure analysis methods used in stability analyses in the approved permit.
11. Evaluate adherence to the requirements for documentation, certification of critical construction phases, and quarterly certification.
12. Establish if foundation conditions for fill placement are as defined in the approved permit.
13. Aerial reconnaissance of a sampling of completed and fills under construction in WV, KY, and VA to visually assess stability, drainage control, and related features.
14. On-the-ground visits to selected sites identified in 12, above to further assess stability, drainage control, and related features.
15. Investigate whether or not final fill configurations conform with the approved design.
16. Assess if proper surface and subsurface drainage controls are installed.

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17. Field verification of foundation conditions and phreatic surface projections in the permit.

REVIEW TASK DETAILS:

The following descriptions of the approach for each task assumes the completion of the inventory of fill types, sizes, and location proposed under Evaluation Topic 1; or, the existence of other inventories. Based on these inventories, candidate fills for the study will be selected. Other tasks encompass interviews of I & E and/or permit review staff or permit file review.

Task 1: Assemble all available literature on excess spoil disposal practice evaluations and compare the conclusions and recommendations with known current practices.

This task entails assembly and review of government reports, contract studies, and other technical reviews pertaining to the construction of excess spoil fills. This includes National Academy of Science reports, contract research studies, oversight special studies, reports of investigation on specific fill problems, professional articles, regulation preambles, public hearing transcripts, court decisions, letters, memoranda, etc. The review will also assess current Federal and State regulations and past and current regulatory program policy and practice. This will include directives and other policy-related documentation and interviews with permit reviewers, inspectors, scientists, engineers, supervisors and other professionals involved with the enforcement programs. An accounting of program-related problems and issues affecting fill construction will be developed. From these reviews, a historical perspective of the technical issues at hand will be developed. Issues and recommendations delineated in the reports will be compared to current day issues and practices for relevance. This data will be used to formulate surveys and data collection efforts for the other tasks encompassed by Evaluation Topic 4.

Cost/Time Required: Can be accomplished by staff from ARCC and Field Offices, 200 hours compilation and review throughout the project (.100 FTE); \$1,000 purchase and/or reproduction costs

Task 2: Examine the feasibility of documenting that 80% durable rock (by unit volume) is attained during construction and in final fill configurations.

The concept of 80% durable rock by unit volume is a valid one, theoretically--with respect to attaining long-term excess spoil fill stability. However, there is no known feasible representative sampling technique to evaluate a fill during or following construction to assess if the material placed meets the regulatory standard. The study team will evaluate the "enforceability" of the regulatory standard and consult with geotechnical experts throughout the Federal government for advice on the standard or an alternative measurable standard(s). Experts will also be asked their opinion on the possible use of a more rigorous durability

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classification system on overburden cores used in permit design; greater controls on spoil selected for fill placement (e.g., selective handling controls to assure higher volumes of durable rock); and/or, in-pit sampling and testing of overburden to show that permit conditions are or are not field validated.

Cost/Time Required: Assume interviews can occur by telephone conference call. Staff time 80 hours (.038 FTE, 40 hours establishing contacts and conducting interviews, 40 hours report writing).

Task 3: Evaluate the effectiveness of current sampling and testing protocols for establishing representative rock durability of excess spoil.

Many inspectors and engineers have complained that the rock being end dumped into some durable rock fills seems to contain a disproportionate amount of fine material—even though the permit showed predominantly durable overburden. The study team will conduct a survey to document the rock durability observations of SRA permitting and inspection staff in WV, VA, and KY. OSM completed a comprehensive research study in 1990 that concluded the slake durability test is not particularly effective at discriminating rock durability. The study recommended a different testing protocol and rock durability classification system that more closely evaluates rock durability under the excess spoil disposal conditions of slaking in water and under compression in a fill. Based upon impressions gained in the survey the study team will consider whether or not the rock durability classification system proposed in the OSM study should be recommended for proposed rule making.

Cost/Time Required: Can be accomplished by staff from ARCC and Field Offices through visits to SRA offices, 2.5 days interviews per state (available inspectors and permit reviewers on days of visit—not all staff) 100 hours to compile (.048 FTE, 60 hrs. data collection, 40 hrs. report writing). Travel costs: 1.5 weeks per diem (\$400 + \$500 airfare).

Task 4: Establish the effectiveness of current methods utilized in inspection and enforcement of excess spoil disposal.

SRA I&E supervisors and inspection staff will be interviewed to answer a standard set of questions about the way they evaluate excess spoil disposal fills for compliance with the approved permit. The desired outcome would be: a) determine if a fairly standard protocol for fill inspection is in effect in each state; b) document those areas related to fill inspection that inspectors feel uncomfortable about or ill-equipped to evaluate; and, c) any issues or practices encountered about excess spoil disposal that concern the SRA staff. This task would be performed in conjunction with Task 3, and would also conceivably influence other data collection/evaluation tasks in this evaluation topic.

Cost/Time Required: Assume this task can be accomplished in conjunction with tasks 3, 5, 7.

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Task 5: Determine the population of documented fill failures since the permanent regulatory program, and the causative factor(s).

Any documented failures from reports gathered in Task 1 and failures known by state regulatory authorities (SRAs) will be assessed to quantify the failure rate of permanent program fills. A list of failure causes will be compiled to see if commonality exists. Failure causes may dictate survey and data collection efforts for other tasks encompassed by Evaluation Topic 4.

Cost/Time Required: Can be accomplished by staff from ARCC and Field Offices through visits to SRA offices, 200 hours (.072 FTE-150 hrs. data collection, 50 hrs. report writing) 2 weeks travel costs: \$50 X 10 days + \$500 airfare possible= \$1,000

Task 6: Evaluate state surface mining information systems (SMIS) data and compile violation data relative to excess spoil disposal.

This task would document the types of violations written over the past five years on excess spoil disposal sites through entry into a database. The types of violations would be categorized and the frequency of violation for each state calculated. The potential impact of the violation on the stability of the fill will be considered. A report of findings will be prepared for incorporation into the Evaluation Topic 4 final report.

Cost/Time Required: Assume FO staff can perform at SRA offices or with access to SRA SMIS, without travel costs. Staff time, 160 hours planning, data collection, database construction, report writing (.077 FTE).

Task 7: Assess the appropriateness of strength parameters, phreatic surfaces, and failure analysis methods used in stability analyses in the approved permit.

Based upon existing SRA fill inventory data or results from Evaluation Topic 1, a sample of permits (possibly the same sample of permits used in tasks 4 and 12) with varying size (small, <3 MCY; medium, 4 to 20 MCY, large, >20 MCY) excess spoil fills in VA, TN, KY, and WV will be reviewed to determine the spoil types, shear strength parameters, phreatic surface, and failure method type used to assess fill stability. The data will be compiled into a database and compared with accepted ranges for shear strength (based on rock type); expected phreatic surface (based on drainage control and fill rock type); and, appropriate failure type (based on foundation condition). Conclusions will be drawn as to the employed frequency of inappropriate parameters, phreatic surfaces, or failure modes relative to the size of the sample.

Cost/Time Required: Assume office review of permitting data at SRA permit office, 2 fills per permit average, 12 permits in VA, 25 permits each, WV and KY. Assume 6 permits reviewed per day, staff time 225 hours (.108 FTE, 168 hrs. data collection, 32 hrs. data base development, 25 hours report writing). Travel costs 4 weeks per diem (\$1,000 + \$1,000

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airfare).

Task 8: Review Evaluate adherence to the requirements for documentation and certification of critical construction phases and quarterly certification.

Based upon existing SRA fill inventory data or results from Evaluation Topic 1, a sample of permits selected for task 7, will be reviewed to determine if the required photos and certifications of critical fill construction phases will be reviewed to obtain an understanding of on-site fill construction methods are on file. Findings will be presented in a report, explaining if trends were observed or not.

Cost/Time Required: Assume this task can be completed as part of tasks 7, 9

Task 9: Establish if foundation conditions for fill placement are as defined in the approved permit.

Based upon existing SRA fill inventory data, results from Evaluation Topic 1, or Using same permits as in task 7 and 10, a sample of permits will be reviewed to compare fill foundation preparation and underdrain placement documentation (color photos and RPE certifications submitted by the company as required by regulatory programs) with foundation test holes. This review will give an indication whether or not foundation conditions encountered in the field comport with fill design considerations.

Cost/Time Required: Assume office permit review similar to task 7, requiring similar costs: 6 permits reviewed per day, staff time 225 hours (.108 FTE, 168 hrs. data collection, 32 hrs. data base development, 25 hours report writing). Travel costs 4 weeks per diem (\$1,000 + \$1,000 airfare).

Task 10: Aerial reconnaissance of a sampling of completed and fills under construction in WV, KY, and VA to visually assess stability, drainage control, and related features.

Based upon existing SRA fill inventory data or results from Evaluation Topic 1, a Using the samples selected for task 7, of permits with 125 completed fills of varying sizes will be selected in a several county area in the states of WV, VA, and KY for Aerial observations of the fills will be made. An inspection checklist will be developed to document the condition of each fill observed with respect to signs of instability, seepage, drainage control failure, etc. Video and audio tapes would be used by the inspection team to document findings for transcription onto the checklist at a later time. The results of the aerial inspection would determine the sites selected for Task 11. A summary report will be prepared.

Cost/Time Required: This task would require helicopter contracts to accomplish. Based on an estimate of 25 fills viewed in VA; and 50 each in KY and WV, assuming approximately 30

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minutes per fill (including travel time between fills) to complete the inspection, and around four hours of flying per day, the aerial reconnaissance would require 14 flight-days for WV and KY, and 4 flight-days in VA. At an estimated cost of \$500/flight hour x 72 hours (4 hours x 18 flight days), not including ferry time from helicopter base location, the flights would cost \$36. Staff time would include planning and checklist/protocol development 80 hours and reconnaissance 45 person days (360 hours, assuming 2 staff and some down time due to weather delays), for a total of 440 hours (.211 FTE). Travel costs for two staff over 9 weeks = \$2,250 per diem + \$2,500 airfare).

Task 11: On-the-ground visits to selected sites identified in 7210, above to further assess stability, drainage control, and related features.

Sites selected from Task 10 would be evaluated on-the-ground to confirm conditions observed in the air and obtained more detailed information on the condition of slopes, seepage, drainage control systems, etc. An inspection checklist will be developed to document the condition of each fill observed with respect to signs of instability, seepage, drainage control failure, etc. Video and audio tapes would be used by the inspection team to document findings for transcription onto the checklist at a later time. A summary report will be prepared from the findings.

Cost/Time Required: Assume 30 fills surveyed as part of task 10, and 25 fills surveyed as a result of task 12. Assume four fills evaluated per day of field work, with travel time, 20 days of field work, total. Staff time 80 hours planning, 320 hours field work (.192 FTE). Travel costs include 8 weeks per diem (\$2,000 + \$2,000 airfare).

Task 12: Investigate whether or not final fill configurations conform with the approved design.

Regulatory staff say it is a common occurrence that as-built fills are often very different configurations than proposed and approved in the permit. Situations have been described when fills are much smaller than planned, or the fill site is not used at all. Whether a fill is constructed smaller or larger than planned can have definite impacts on the stability analyses. Smaller fills tend to be higher in the watershed—sometimes where the foundation is steeper and instability could be more probable due to less friction counteracting sliding/driving forces.

Based upon existing SRA fill inventory data or results from Evaluation Topic 1, a Using the sample of permits from task 7, the permits will be reviewed to compare fill designs with as-built configurations. The potential effect of the variance from design on fill stability will be estimated. Overburden characterization and coal exploration thoroughness will be evaluated in the permit to see if the reason(s) for variance can be determined. The absence of permit revisions for the change in plans will be noted. The frequency of as-built fill variance from as-designed in the sample population will be calculated. Recommendations for improving the rate of as-built = as-designed will be developed if the review finds this is a common problem,

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Cost/Time Required: Assume field visits of 25 randomly selected completed fills in VA (5), WV (10), and KY (10). Can be scheduled in conjunction with field work for task 13. Assume permit selection can be accomplished during SRA visits for tasks 2, 3, 4, or 6-7-9, with no additional time. Thus, see time and cost estimate for task 13.

Task 13: Assess if proper surface and subsurface drainage controls are installed.

Based upon existing SRA fill inventory data or results from Evaluation Topic 1, a sample of permits will be selected for permit and field evaluation in Task 12 and/or 13. The sample will include fill/natural ground interface diversions, natural ground diversions, rock-core chimney drain systems, center drain systems, or other types of surface runoff control. The fills selected will be evaluated in an aerial overflight and/or site visit to evaluate the presence of seepage in areas contrary to the expected subdrain performance (as shown in the stability analysis assumptions). The designed surface drainage control system will be documented in the permit review phase and evaluated in the aerial/field phase for discrepancies from the design or as-constructed flaws. Findings will be presented in a report, explaining if trends were observed or not.

Cost/Time Required: See estimates for tasks 10, 11-11.

Task 14: Field verification of foundation conditions and phreatic surface projections in the permit.

Drilling of spoil material is difficult due to the large rocks and potential collapse of the hole. However, a self-advancing, cased hole will allow completion of well points or piezometers. Foundation soils can also be sampled upon completion of spoil drilling. This task would envision selection of several sites evaluated in task 10 or 11.

Cost/Time Required: The development of 3 piezometer and foundation sampling test holes in each of 4 fills could exceed \$120,000 (assume \$7.5K mobilization/demobilization per site = \$22.5K; 900 feet of drilling per site @ \$20/ft. = \$18K/site x 4 sites = \$72K; soil split spoon sampling of 120'/site x \$85/ft. = \$41K; laboratory testing of foundation soils \$500/sample x 40 samples = \$20K). Assume 120 hours for specification and contract development/award, 1.5 weeks per site to establish monitoring holes (360 hours (.172 FTE)); travel expenses for OSM staff to manage the contract and record the data (\$1,500 per diem + \$2,000 airfare). Upon recording the drilling results, monitoring of water levels should occur over at least a period from March through October. Phreatic surface and foundation soil parameter measurements would be compared to those utilized in long-term stability analyses. Results would be documented in a report.

Final Report: A chapter will be generated that can be incorporated into the report of investigation for the entire project. This chapter will provide a comprehensive analysis of the

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phase will be conducted from January through June 1999. The third phase will be conducted in coordination with the other teams from June through December 1999. A final report will be completed by December 1999.

Staff Time: Staff time will be dependent on which review option is selected. Option 1 will involve significantly less staff time than Option 2. All team members will be involved in both options. Option 1 will require staff time to review and coordinate information gathering while under Option 2 staff will have to perform these functions and actively gather the information. Additional legal assistance from OSM, EPA, COE, FWS, and MSHA will be required for Option 2.

Cost Estimate: No costs external to Federal or State Governments are anticipated. At a minimum, this study will be conducted in-house by OSM with assistance from the other Federal agencies listed previously. Internal costs will include staff time and expenses related to travel for meetings.

Final Report

The final report will contain a plain English interpretation of the various State and Federal requirements for regulation of fills. As necessary, flow charts and comparison tables will be employed to explain the processes of permitting fills and regulating their impacts within each State. There will be a lengthy appendix to the report detailing all regulatory and administrative documents compiled in Phase I of the study. A checklist will be developed at the conclusion of Phase I to assist other team members in identifying regulatory requirements for their portions of the overall study. The team will use this information in completing Phase III of the study. In addition, the results from that review will assist this team in determining the overall effectiveness of the existing procedures and requirements.

STATE CONTACTS: As designated by the participating agencies.

OTHER ASSISTANCE NEEDED: Legal and programmatic personnel assistance from COE (Rodney Woods, Terry Clark), EPA (Stephanie Shamet, Dan Sweeney), FWS (Laurie Zicrai, Cindy Tibbott), OSM, MSHA, and all states in ARCC.

TASK COMPLETION DATE: December 1999.

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SCOPE OF WORK

EVALUATION TOPIC 5: Review existing Federal and State laws, regulations and current practices relating to regulation of fills and their impacts. This will include relevant provisions of the Clean Water Act (CWA) and the Surface Mining Control and Reclamation Act (SMCRA).

OSM CONTACT: Mike Bower, ARCC

OSM PARTICIPANTS: Dave Beam, Lexington Field Office; Dennis Boyles, Charleston Field Office; Vermell Davis, Headquarters; Dave Hartos, ARCC; Jeff Smith, Pittsburgh Oversight and Inspection Office; Doug Stone, Big Stone Gap Field Office.

METHOD OF REVIEW/OPTIONS:

Population/Sample

Not applicable.

REVIEW METHODOLOGY: The evaluation will be conducted in the following three phases.

Phase I: In the first phase, the team will establish contacts in applicable Federal or State agencies with jurisdiction involving the review subject matter. The team will conduct a review of all existing laws, regulations, policies, and memoranda of understanding issued under SMCRA governing underground and large-scale surface mining operations relating to fills (both excess spoil and refuse) and their impacts. The review will consist of compiling all these applicable documents and condensing the regulatory requirements into laymen's terms. As a first priority, the team will focus on compiling and reviewing the SMCRA-related documents from any State agencies in West Virginia and Kentucky with regulatory responsibility for fills. After completion of the review for these two states, the team will review the SMCRA regulatory requirements for fills and their impacts from the remaining states within ARCC; Tennessee, Pennsylvania, Ohio, Maryland, and Virginia. Finally, all regulatory requirements, including laws, regulations, policies, and memoranda of understanding written by the U.S. Army Corps of Engineers (COE), the U.S. Environmental Protection Agency (EPA), the U.S. Fish and Wildlife Service (FWS), and the U.S. Department of Labor's Mine Safety and Health Administration (MSHA) regarding fills and their associated impacts will be collected. A guide containing all fill-related programmatic and legal requirements of SMCRA and the CWA (including documents from COE, EPA, FWS, MSHA, and State complements) will be compiled.

Phase II: The second phase of the review will involve identification of overlaps, duplication, or gaps in jurisdiction of the various State and Federal agencies responsible for authorizing, monitoring and/or permitting excess spoil and coal refuse disposal fills. This portion of the study will involve defining all aspects of fill permitting, construction and mitigation. The team will use the various regulatory documents obtained in Phase I to determine which agencies exercise what

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type of jurisdiction over fills and which requirements take precedent. Any gaps or duplication in jurisdiction or confusion over an agency's role in regulating such fills will be identified. The aim of this portion of the review is to determine whether additional guidance documents or memoranda of understanding are necessary to eliminate duplication or clear up jurisdictional confusion between agencies or whether existing guidance needs to be revised. Modifications to the guide created as part of Phase I will be made as necessary by the review in this phase.

Phase III: The last phase of the review is to examine how the laws are administered in the field. West Virginia and Kentucky will be the primary focus of this portion of the study. The other states within ARCC will be reviewed at the conclusion of the West Virginia and Kentucky study. During this portion of the review, the team will present the guide compiled in the phase I of the review to the other teams involved in field reviews for use in their evaluations. The team will further refine the guide established in phase I based on an analysis of feedback from field reviews conducted by the other teams. The team will aim to define both permitting and regulatory responsibilities relating to field implementation of regulatory requirements during this portion of the review. Options and recommendations for new or revised policy documents or memoranda of understanding are an expected outcome of this part of the review.

There are two options for conducting this review.

Option 1: The first option will require substantial involvement from the State and Federal agencies involved in permitting and regulating fills. In this option, these agencies will be asked to provide all the documentation listed in the first phase of the review. These agencies will be asked to provide both legal and programmatic contact persons available to the team for compilation of the necessary information. On the plus side, this option will ensure the most comprehensive and current information is made available to the team. On the negative side, there may be reluctance on the part of other agencies to make a long term commitment of personnel to this project and the team cannot be assured of receiving all pertinent information in a timely manner. The team favors this option believing it to be the most efficient and effective approach.

Option 2: The second option would be for OSM to compile all necessary information. Under this approach all resource gathering would be conducted by OSM. The plus side of this option is there would be no dependence on anyone else to provide the information. The negative side would be an intensive impact on OSM resources and we would not be assured of receiving all relevant or current information, particularly the program knowledge.

Either option will require a contact within each Federal and State agency to verify information gathered and conclusions reached.

Timeline

The first phase of the review will be conducted from June through December of 1998. The team will present the guide envisioned in this phase to the other teams in January 1999. The second

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person and name of SRA person are responsible for coordinating any assistance requested by the OSM study team.

The OSM study team will coordinate the aerial and on-the-ground field inspections with the appropriate entity withing the SRA.

The OSM study team will coordinate data gathering, and permit reviews at the SRA regional offices with the appropriate SRA entity. The team will coordinate this work at the SRA main office with the appropriate SRA entity.

OSM and the SRA agree that the primary emphasis of the study is to assess the effectiveness of the regulatory program in ensuring long-term stability of excess spoils. OSM does not intend to utilize the Ten-Day Notice (TDN) process for problems identified during the assessment. The SRA will be responsible for taking appropriate enforcement action on any violation discovered during the study. For permit deficiencies identified, the SRA will be responsible for taking appropriate action under their program. However, performance standard violations or permit deficiencies not addressed by the SRA will be handled through the TDN process.

VI. SIGNATURES

Representing OSM and the SRA, the following officials agree to the objectives and steps outlined in this plan:

____ Field Office

The SRA

FOD's name
Field Office Director

Ranking official's name
Title

Date: _____

Date: _____

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PERFORMANCE AGREEMENT

DRAFT--9/17/98

I. INTRODUCTION

The _____ Field Office of the Office of Surface Mining Reclamation and Enforcement (OSM) and the State regulatory authority (SRA or "State") agree to work together to assess the effectiveness of the regulatory program in ensuring the long-term stability of surface-coal-mine-related excess-spoil fills constructed and under construction within the state of _____. This assessment (or "study") will contribute to a multi-Federal-agency investigation into the effects on the environment and public safety of surface-mine fills. The assessment is also part of Evaluation Topic 4 under this investigation, designed to assess regulatory-program-effectiveness with respect to the long-term stability of excess-spoil fills in the steep-topographic regions of West Virginia, Kentucky, Virginia, and Tennessee.

The study will focus on issues which are indirect or direct indicators of regulatory-program effectiveness in assuring long-term stability of fills. This will entail a combination of literature, permitting, inspection and enforcement process, and field reviews. Most of the work will be performed by a team of OSM employees, the exceptions being helicopter-flight and test drilling services under contract and State assistance in the form of furnishing information, responding to survey and interview requests, and providing field assistance.

Scope of Assessment: The tasks relevant to establishing the effectiveness of regulatory programs with respect to fill stability include:

1. Assemble all available literature on excess spoil disposal practice evaluations and compare the conclusions and recommendations with known current practices.
2. Examine the feasibility of documenting that 80% durable rock (by unit volume) is attained during construction and in final fill configurations.
3. Evaluate the effectiveness of current sampling and testing protocols for establishing representative rock durability of excess spoil.
4. Establish the effectiveness of current methods utilized in inspection and enforcement of excess spoil disposal.
5. Determine the population of documented fill failures since the permanent regulatory program, and the causative factor(s).
6. Evaluate state surface mining information systems (SMIS) data and compile violation data relative to excess spoil disposal.

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7. Review strength parameters, phreatic surfaces, and failure analysis methods used in stability analyses in the approved permit.
8. Review documentation, certification of critical construction phases, and quarterly certification.
9. Establish if foundation conditions for fill placement are as defined in the approved permit.
10. Aerial reconnaissance of a sampling of completed and fills under construction in WV, KY, and VA to visually assess stability, drainage control, and related features.
11. On-the-ground visits to selected sites identified in 12, above to further assess stability, drainage control, and related features.
12. Compare as-built fill configurations with as-designed.
13. Assess if proper surface and subsurface drainage controls are installed.
14. Field verification of foundation conditions and phreatic surface projections in the permit.

II. IMPLEMENTATION

Upon completion of each task, OSM will brief the SRA on the preliminary findings. A report will then be drafted and reviewed by the SRA for comment. At the completion of all the tasks, a combined draft report will also be submitted to the SRA for review and comment.

The following task descriptions assumes the completion of the inventory of fill types, sizes, and location under Evaluation Topic 1 of the umbrella investigation; or, the existence of other inventories. Based on these inventories, candidate fills for the study will be selected. The tasks encompass: surveys of State I & E and permit-review staff; document and permit-file review; data analysis; and field observation.

Task 1: Assemble all available literature on excess spoil disposal practice evaluations and compare the conclusions and recommendations with known current practices.

OSM will assemble and review government reports, contract studies, and other technical reviews pertaining to the construction of excess spoil fills. This includes National Academy of Science reports, contract research studies, oversight special studies, reports of investigation on specific fill problems, professional articles, regulation preambles, public hearing transcripts, court decisions, letters, memoranda, etc. The review will also assess

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current Federal and State regulations and past and current regulatory program policy and practice. This will include directives and other policy-related documentation and interviews with permit reviewers, inspectors, scientists, engineers, supervisors and other professionals involved with the enforcement programs. From these reviews, OSM will develop an accounting of program-related problems and issues affecting fill construction; and a historical perspective of the technical issues at hand. Issues and recommendations delineated in the reports will be compared to current day issues and practices for relevance. This data will be used to help formulate surveys and data collection efforts for some of the other tasks.

State assistance: The SRA will help the OSM team identify relevant documents, especially those generated by or on behalf of the State, and provide copies of said documents in response to specific requests from the team.

Task 2: Examine the feasibility of documenting that 80% durable rock (by unit volume) is attained during construction and in final fill configurations.

The concept of 80% durable rock by unit volume is a valid one, theoretically--with respect to attaining long-term excess spoil fill stability. However, there is no known feasible representative sampling technique to evaluate a fill during or following construction to assess if the material placed meets the regulatory standard. The OSM study team will evaluate the "enforceability" of the regulatory standard and consult with geotechnical experts throughout the Federal government for advice on the standard or an alternative measurable standard(s). Experts will also be asked their opinion on the possible use of a more rigorous durability classification system on overburden cores used in permit design; greater controls on spoil selected for fill placement (e.g., selective handling controls to assure higher volumes of durable rock); and/or, in-pit sampling and testing of overburden to show that permit conditions are or are not field validated.

State assistance: None required

Task 3: Evaluate the effectiveness of current sampling and testing protocols for establishing representative rock durability of excess spoil.

Many inspectors and engineers have complained that the rock being end dumped into some durable rock fills seems to contain a disproportionate amount of fine material--even though the permit showed predominantly durable overburden. The OSM study team will conduct a survey to document the rock durability observations of SRA permitting and inspection staff. OSM completed a comprehensive research study in 1990 that concluded the slake durability test is not particularly effective at discriminating rock durability. The study recommended a different testing protocol and rock durability classification system that more closely evaluates rock durability under the excess spoil disposal conditions of slaking in water and under compression in a fill. Based upon impressions gained in the

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survey the study team will consider whether or not the rock durability classification system proposed in the OSM study should be recommended for proposed rule making.

State assistance: State inspectors, permit reviewers, technical staff, and inspection and permit-review supervisors will individually fill out questionnaires querying their experiences and opinions related to rock-durability sampling and testing protocols. The SRA management will review and approve two questionnaire forms (one tailored to I&E personnel the other to permit-review personnel) in advance of its distribution. OSM will consider requests for changes to the forms while maintaining consistency with forms applied to other States in the study. Following receipt of responses, the same SRA personnel will participate in one of two group interviews moderated by the OSM investigators, one interview focusing on I&E-related perspectives and the other on permit-review aspects. The interviews will take place in a conference room in a State facility. Assume approximately one hour for each SRA employee in responding to the questionnaire. (Assume approximately four hours for each group interview).

Task 4: Establish the effectiveness of current methods utilized in inspection and enforcement of excess spoil disposal.

The OSM study team will interview SRA I&E supervisors and inspection staff with a standard set of questions about the way the SRA evaluates excess spoil disposal fills for compliance with the approved permit. The desired outcome would be: a) determine if a fairly standard protocol for fill inspection is in effect in each state; b) document those areas related to fill inspection that inspectors feel uncomfortable about or ill-equipped to evaluate; and, c) any issues or practices encountered about excess spoil disposal that concern the SRA staff. This task would be performed in conjunction with Task 3, and would also conceivably influence other data collection/evaluation tasks in this evaluation topic.

State assistance: State inspectors, technical staff, and inspection supervisors will individually fill out questionnaires querying their experiences and opinions related to the inspection and enforcement of excess spoil disposal. The SRA management will review and approve the questionnaire form in advance of its distribution. OSM will consider requests for changes to the form while maintaining consistency with forms applied to other States in the study. Following receipt of responses, the same SRA personnel will participate in a group interview moderated by the OSM investigators. The interviews will take place in a conference room in a State facility. Assume approximately one hour for each SRA employee in responding to the questionnaire (two hours for one questionnaire combining questions for both task 3 and 4). {Assume approximately four hours for each group interview (six hours for one interview combining issues of tasks 3 and 4)}.

Task 5: Determine the population of documented fill failures since the permanent regulatory program, and the causative factor(s).

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The OSM study team will assess any documented failures from reports gathered in Task 1 and failures known by state regulatory authorities (SRAs) to quantify the failure rate of permanent program fills. A list of failure causes will be compiled to see if commonality exists. Failure causes may dictate survey and data collection efforts for other tasks.

State assistance: SRA inspectors, technical staff, and inspection supervisors will be asked to identify failures they are aware of on the questionnaire and/or during the group interview. SRA will also provide OSM investigators with the pertinent permit applications and other documentation held by the State that describes the nature and the investigative analysis of the failure events.

Task 6: Evaluate state surface mining information systems (SMIS), environmental resource information networks (ERIN) or other similar databases and compile violation data relative to excess spoil disposal.

The OSM study team will document the types of violations written over the past five years on excess spoil disposal sites through entry into a database. The types of violations would be categorized and the frequency of violation for each state calculated. The potential impact of the violation on the stability of the fill will be considered. A report of findings will be prepared for incorporation into the Evaluation Topic 4 final report.

State assistance: The appropriate State personnel will assist the OSM team in downloading violation data into specified software. The team will identify the specific database fields of interest. Otherwise, the team will be permitted to query the databases directly or the SRA will query the databases upon the investigators' request. (The amount of time required for this assistance should depend on what is the most efficient method of providing the investigators with the required data).

Task 7: Review strength parameters, phreatic surfaces, and failure analysis methods used in stability analyses in the approved permit.

Based upon existing SRA fill inventory data or results from Evaluation Topic 1, a sample of permits (possibly the same sample of permits used in tasks 4 and 12) with varying type (pre-SMCRA, post-SMCRA durable-rock, and post-SMCRA non-durable-rock) and size (small, <3 MCY, medium, 4 to 20 MCY, large, >20 MCY), the OSM study team will review excess spoil fills to determine shear strength parameters, phreatic surface, and failure method type used to assess fill stability. The data will be compiled into a database and compared with accepted ranges for shear strength (based on rock type); expected phreatic surface (based on drainage control and fill rock type); and, appropriate failure type (based on foundation condition).

State assistance: The SRA will provide the OSM team information/data from which the investigators will select sample fills to be evaluated under tasks 7 through 13. It is anticipated that the sample distribution of fill type will be approximately 20%, 60%, and 20% for pre-SMCRA, post-SMCRA durable-rock, and post-SMCRA non-durable-rock fills respectively. The same approximate distribution applies to small-, medium-, and large-sized fills respectively. State personnel will supply pertinent permits to the investigators upon request.

Task 8: Review documentation and certification of critical construction phases and quarterly certification.

Using the sample of permits selected for task 7, the OSM study team will review photos and certifications of critical fill construction phases ensure they are on file and to obtain an understanding of the on-site fill construction methods.

State assistance: State personnel will supply pertinent permits to the investigators upon request.

Task 9: Establish if foundation conditions for fill placement are as defined in the approved permit.

Using same sample as in task 7, the OSM study team will review permits to compare fill foundation preparation and underdrain placement documentation (color photos and RPE certifications submitted by the company as required by regulatory programs) with foundation test holes. This review will give an indication whether or not foundation conditions encountered in the field comport with fill design considerations.

State assistance: State personnel will supply pertinent permits to the investigators upon request.

Task 10: Aerial reconnaissance of a sampling of completed and fills under construction in WV, KY, and VA to visually assess stability, drainage control, and related features.

Using the samples selected for task 7, the OSM study team will make aerial observations of the fills. An inspection checklist will be developed to document the condition of each fill observed with respect to signs of instability, seepage, drainage control failure, etc. Video and audio tapes would be used by the inspection team to document findings for transcription onto the checklist at a later time. The results of the aerial inspection would determine the sites selected for Task 11.

State assistance: The SRA will provide the services of a mine inspector during each flight to assist the OSM investigators in locating sample fills to be observed and documented. (Assume approximately 7 flight days [would be 4 for VA]).

Task 11: On-the-ground visits to selected sites identified in 10, above to further assess stability, drainage control, and related features.

The OSM study team will make on-the-ground inspections of fills selected from Task 10 to confirm conditions observed in the air and obtain more detailed information on the condition of slopes, seepage, drainage control systems, etc. An inspection checklist will be developed to document the condition of each fill observed with respect to signs of instability, seepage, drainage control failure, etc. Video and audio tapes would be used by the inspection team to document findings for transcription onto the checklist at a later time. A summary report will be prepared from the findings.

State assistance: The SRA will provide the services of a mine inspector during the on-the-ground field visits to assist the OSM inspectors in locating the sample fills to be observed and documented and act as liaison between the mine operators and the investigators. (Assume 10 fills [5 for VA] visited and 1-2 fills per day).

Task 12: Compare as-built fill configurations with as-designed.

Regulatory staff say it is a common occurrence that as-built fills are often very different configurations than proposed and approved in the permit. Situations have been described when fills are much smaller than planned, or the fill site is not used at all. Whether a fill is constructed smaller or larger than planned can have definite impacts on the stability analyses. Smaller fills tend to be higher in the watershed—sometimes where the foundation is steeper and instability could be more probable due to less friction counteracting sliding/driving forces.

Using the sample from task 7, the OSM study team will review the permits--and observe the fills observed during the aerial reconnaissance--to compare fill designs with as-built configurations. The potential effect of the variance from design on fill stability will be estimated. Overburden characterization and coal exploration thoroughness will be evaluated in the permit to see if the reason(s) for variance can be determined. The absence of permit revisions for the change in plans will be noted. The frequency of as-built fill variance from as-designed in the sample population will be calculated. Recommendations for improving the rate of as-built = as-designed will be developed if the review finds this is a common problem.

State assistance: See "state assistance" for tasks 9 and 10.

Task 13: Assess if proper surface and subsurface drainage controls are installed.

This task will use the same sample of permits as Task 7. The OSM study team will inspect the fills during the aerial overflight and/or site visit to evaluate the presence of seepage in areas contrary to the expected subdrain performance (as shown in the stability analysis assumptions). The designed surface drainage control system will be documented in the permit review phase and evaluated in the aerial/field phase for discrepancies from the design or as-constructed flaws. Findings will be presented in a report, explaining if trends were observed or not.

State assistance: See "state assistance" for tasks 9, 10, and 11.

Task 14: Field verification of foundation conditions and phreatic surface projections in the permit.

Drilling of spoil material is difficult due to the large rocks and potential collapse of the hole. However, a self-advancing, cased hole will allow completion of well points or piezometers. Foundation soils can also be sampled upon completion of spoil drilling. This task would envision selection of several sites evaluated in task 10 or 11.

State assistance: None required.

III. STUDY PERIOD

It is anticipated that all of the tasks will be completed within approximately 18 months from the official signing of this performance agreement.

IV. REPORT AND RECOMMENDATION

The SRA will be briefed on the reviews as they progress. A draft report will be submitted to the OSM FOD, ranking SRA official, and OSM's chief coordinator of the multi-agency fill-impact investigation. The final report will address comments submitted on the draft and will be completed within three months after distribution of the draft. This will be available for public distribution as a section within a comprehensive report documenting the results of the multi-agency investigation.

V. COORDINATION AND ADMINISTRATIVE MATTERS

OSM and/or the SRA may determine that additional technical assistance is necessary on a case-by-case basis. The assistance may be provided by OSM staff and/or the SRA staff. Name of OSM

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technical and programmatic issues identified and the results of the field inspections and testing. General conclusions, where they can be reached, on the long-term stability of the fills will also be included.

STATE CONTACTS: West Virginia-Dalip Sarin, Bob Grafton; Kentucky-Mahfouz Bishara; Virginia-Bob Stimpson

OTHER ASSISTANCE NEEDED: Consultation with geotechnical experts in the U.S. Army Corps of Engineers, Federal Highways Administration, Bureau of Reclamation. It is assumed for now, that this assistance will be offered without cost.

TASKS' COMPLETION DATE: 18 months

Summary of Resource Requirements:

TASK		TIME	DOLLARS
1	.100	\$ 1,000	(purchase/reproduction of documents)
2	.038		
3	.048	900	(travel)
4			
5	.072	1,000	(travel)
6	.077		
7	.108	2,000	(travel)
8			
9	.108	2,000	(travel)
10	.211	40,750	(36K flying, 4.75K travel)
11	.192	4,000	(travel)
12			
13			
14	.172	136,500	(113K drilling and sampling, 20K lab testing, 3.5K travel)
TOTAL	1.126	188,150	

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EVALUATION TOPIC FOUR: ASSESS THE LONG-TERM STABILITY OF FILLS

PROPOSED TIMELINE

TASK	1998					1999												
	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	
1. Literature search	XXXXXX																	
2. 80/20 rule				XXXX														
3. Durability test				XXXXXXX														
4. I & E procedures				XXXXXXX														
5. Fill failures				XXXXXXX														
6. Violations				XXXXXXX														
7. Stability analysis				XXXXXXX														
8. Critical phase records				XXXXXXX														
9. Foundation conditions				XXXXXXX														
10. Aerial reconnaissance																		XXXXXXXXXX
11. Field visits																		XXXXXXXXXXXXXXXXXX
12. Design vs. as-built				XXXXXX														XXXXXXXXXXXXXXXXXX
13. Drainage control				XXXXXX														XXXXXXXXXXXXXXXXXX
14. Drilling program																		XXXXXXXXXXXXXXXXXX

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