Permit Application Information

Each permit approved under a permanent program for surface coal mining and reclamation is issued based upon the review of information submitted by the applicant in the Permit Application Package. The Permit Application Package contains a comprehensive review of groundwater and surface water resources, including extensive baseline data, for the proposed mining site and adjacent areas. This information is used by the applicant to estimate the probable hydrologic consequences (PHC) of the proposed mining. If the probable hydrologic consequences are adverse, the applicant sets forth a plan to prevent or minimize disturbance to the hydrologic balance. That plan includes a proposed monitoring scheme to verify its effects.

The regulatory authority uses the applicant's PHCs and other information to make a cumulative hydrologic impact assessment (CHIA) which is used as a "yardstick" in the permit approval process to determine whether the proposed operation has been designed to prevent material damage to the hydrologic balance beyond the permit area. It may be necessary to update CHIAs as additional data are gathered or when permit applications undergo extensive revision.

Before making an initial inspection, the reclamation inspector should review the Permit Application Package; the permit, which may contain specific stipulations, and the CHIA to become familiar with:

- the general topography of the mine plan area and its relationship to the proposed method of operation and any previous mining;
- the location of surface waters within and adjacent to the permit site and potential users of surface water and groundwater resources;
- the location of identifiable mining-related hydrologic contact points such as sediment ponds, stream buffer zones, diversions, monitoring wells, and point-source discharges from the permit area;
- the geologic description of lands within and adjacent to the permit area and the expected relationship of that geology to surface and subsurface flow patterns before and after disturbance;
- the analysis of coal and overburden, especially the identification of acid- or toxic-forming materials that may be disturbed or activated during mining;
- the character and population of aquatic biota,—fish, plant, or other biological resources—that may be affected by disruptions in flow or changes in water quality caused by mining;
- the water parameters on the permit site before mining, as well as the baseline information for adjacent groundwater or surface water resources;
- the areas or locations authorized for point source discharge and any conditions upon such discharges which are delineated in the approved Permit Application Package;
- the monitoring and reporting requirements specified;
- the identity of special hydrologic features, functions, or requirements stated in or conditioned by the Permit Application Package and the permit; and
- the soil types within the Permit Application Package area and their susceptibility to erosion and transport.

For an initial inspection where mining will be underground, the inspector should consider:

- type of mining;
- possibilities of surface water and groundwater depletion; and
- long-term problems such as subsidence.

During review of the Permit Application Package, the inspector should pay close attention to any baseline data that indicate abnormal conditions or fluctuations and note any such abnormalities that might need verification under field conditions. Where modeling techniques or adjacent area studies are referenced, the inspector may need to compare actual site conditions to the hypothetical projections presented in the application.

During review of the PHC, frequent cross-checking within the Permit Application Package may be necessary. Review the proposed mining procedures, such as handling of overburden and burial of acid or toxic waste for their likely impact upon the hydrology. The CHIA, if available, can be a useful reference because it may help identify possible errors in the PHC or discrepancies in the impact area described in the Permit Application Package.

While conducting the Permit Application Package review, the inspector should make brief notes for later field reference and report writing. Such notes might include:

- typical effluent quality of the receiving streams and the identity of parameters measurable in the field;
- average seasonal rainfall and dimensions of commonly referenced events, such as 10 year, 24 hour, or probable maximum precipitation event;
- discharge parameters at key monitoring points if different from routine performance standards;
- characteristics of major affected soil types such as erodibility, particle suspension, and coloration;
- typical habitat and organisms in receiving streams;
- types of streams in and near the mining area;
- the identity of any users of those groundwaters and surface waters that might be affected by operations;
- the names, dimensions, and general quality of the coal seam(s) to be mined, including any potentially adverse characteristics such as acidity, iron, or manganese;
- general direction of identifiable subsurface flow and the names of important aquifers;
- location and depth of any monitoring wells and the identity of parameters to be measured as shown or listed in the Permit Application Package;
- types of vegetation and soil-stabilizing practices required; and
- for underground mining, the nature, extent, and projected mining impacts.

Whenever possible, some field inspections should be conducted during or immediately after adverse weather conditions. Inspection during periods of system stress allows better evaluation of both Permit Application Package proposals and the likely effectiveness of their application. Hydrologic protection measures should be designed to accommodate problems that arise under extreme conditions and should be judged accordingly.

Field evaluation of mining operations often requires travel in areas not easily accessible by vehicle. The necessary

documentation and sampling equipment should have minimum encumbrance and weight.

Except where the inspector is extremely familiar with a permit, drainage or hydrology maps and notes accumulated during the Permit Application Package study should always be on hand during a field review. To avoid overlooking areas or items which may have problems, make a brief list of specific areas or facilities to be checked. A more detailed version might include a point-to-point itinerary and a list of items to be inspected at each location along the route.

Use facts and insight gained through review of the Permit Application Package and prior inspections to identify specific areas, items, facilities, etc. to be inspected and to choose the equipment needed to make the necessary measurements and take the necessary samples. Some nearly indispensable items are:

- a camera with extra film;
- "quick check" water quality indicators, such as a Hach Kit;
- several clean, prenumbered sample bottles;
- nitric acid;
- 0.45 micron filters;
- a device for measuring water level in wells;
- a 6- to 12-foot retractable tape measure; and
- a note pad.

These items may be managed easily in a knapsack. By using them correctly an inspector can adequately identify and document most water violations common to mining.

Hydrologic Aspects of the Permit Application Package

Nearly every step of the mining/reclamation process, and every structure designed and built to serve the permit site, may be viewed as a technique for the control of drainage and erosion. Preparing mining and reclamation plans and maps, designating the sequence of operations, designing structures, and selecting methods and processes by which the overburden and spoils are to be removed, handled, and placed are all aimed toward controlling water.

Specific inspection duties of the reclamation inspector may vary with circumstances and time of involvement. Some inspectors become involved during permit application review, and may be required to verify in the field the various statements, conditions, and site situations described in the Permit Application Package. For others, duties begin only after the Permit Application Package has been approved. Still others exercise what is primarily an oversight role; their duties involve periodic inspection of mining and reclamation operations.

Regardless of an inspector's specific duties, their scope, or when during the permitting and inspection process they begin, it is important that inspectors understand and be able to interpret the various permit documents in light of the requirements, and understand the assumptions and principles upon which the spoil handling methods, construction techniques, and reclamation practices have been selected.

Equally important in the day-to-day performance of an inspector's duties is the ability to recognize in the field any conditions that support or contradict these assumptions and any clues to inappropriate mining, construction, and reclamation practices.

Field-checking the Permit Application Package

The Permit Application Package identifies measures that are approved for use on a given site. The major questions are: (1) Are the proposed control measures appropriate for the site conditions and mining practices described in the Permit Application Package? (2) Are the site conditions, as they are presented in these documents, verifiable in the field? (3) Are they supported by the inspector's independent observations made on the site? and (4) Do the measures and practices set forth in the Permit Application Package, with any requested variances, meet requirements?

Answers to these questions can be found from evaluations such as the three given here. This is not intended to be a complete list. Any specific case may involve any or all of the listed items—plus others.

Evaluation of the Completeness and Applicability of the Mining and Reclamation Plan with Respect to Hydrology

I. Investigation pertinent to the particular permit area.
   A. Study maps of geology, hydrology, and topography along with other permit documents to see if the plan is complete and meets regulatory requirements. Pertinent items may include:
      1. general strike and dip of strata;
      2. variations in strike and dip in and near the permit area;
      3. slope of land surface;
      4. location of natural surface drainage courses;
      5. location of previous man-made alterations to the natural surface and drainage patterns as caused by roads, such as logging roads, skid trails; previous mining, as evidenced by spoil piles, deep mine adits, auger holes, subsidence; irrigation facilities, such as ditches and pipes;
      6. surface water and groundwater monitoring programs should address sampling site locations, sampling methods, sampling schedules, sample preservation and chain of possession, testing methods, and names and qualifications of testing lab personnel; and
      7. determine whether an aquifer exists and if so, verify:
         a. description of physical characteristics of matrix materials
         b. description of hydrologic characteristics of the aquifer(s). Some items of interest are:
            (1) Is the potential yield to wells of consequence?
            (2) Is it of a pressurized (artesian) or unpressurized (free water table) type?
            (3) Seasonal flow and stage characteristics
            (4) Chemistry of the water.
         c. What are the geographic limits of the aquifer? For example: Is the aquifer entirely within the permit area or does part of it extend beyond that area?