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## Abstract

Land use planning for reclaimed sites can greatly improve the cost effectiveness of many reclamation programs. Wherever proper planning can be used to identify future uses for reclaimed land to satisfy a local or regional land use need, that land will be of greater value than land that is reclaimed to approximate premining conditions with no consideration of marketability or community needs. Prior to mining, a plan should be developed that includes consideration of extractive processes and reclamation techniques designated to create a specific landscape that will satisfy a land use demand. This planning process will require interaction between the mining company and local and regional planners.

Effective reclamation planning will require input from public sector planners to provide information concerning such factors as land use needs, development potential, and future marketability for various potential uses. This paper examines state and Federal reclamation laws in light of their consideration of planning input and cites examples and background data to highlight the problems and opportunities confronting planners and the mining industry.

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## Introduction

Pre-mine reclamation planning has long been recognized as an essential element in any cost-effective extraction/reclamation program. There is an additional need, however, to carry the planning process a step further to include local and regional land use planning elements in the reclamation planning process. In that way, mined areas could be reclaimed to help satisfy specific local land use needs and comply with land capabilities, rather than merely revegetated to satisfy legal requirements. Such a planning program could be beneficial to both the mining company and the public. The public would benefit by having land use suitability, whereas the company would benefit from making their reclaimed land more marketable. This type of integrated reclamation/land use planning program will generally require input from both industry personnel and public sector planners. A land use needs inventory for the community, and other data necessary for the development of marketing strategies should be provided to the mining company by public planning agencies in whose jurisdiction the mine will be operating. In reciprocation, the mining company could provide to planning agencies information valuable in the generation of future development scenarios. Water and other mineral availability data, analyses of the overburden and the likely effect of disturbance and baseline data relating to archeological, social, historical, biological and other resources could be provided to planning agencies by the mining company and used for their mutual benefit.

An ongoing Argonne National Laboratory program[1], funded jointly by the Energy Research and Development Administration and the U.S. Geological Survey, has examined the potential and effective procedures for achieving integrated reclamation and land use planning in several extractive industries, including the coal industry. As a part of this program, a series of workshops is being conducted to familiarize local planners with the unique problems and opportunities associated with land use planning in surface mine areas. At the time of this writing, a Federal reclamation bill has just been signed into law by President Carter. Since this law contains at least ten distinct references to the implementation of land use planning as related to mined area reclamation, one might expect that a number of RD&D projects would have been conducted to facilitate this process. An examination of the "Inventory of Federal Energy-Related Environment and Safety Research" by the authors disclosed, however, that of the 2536 programs ($453 million in funding) in the Inventory, only the Argonne program is directed specifically at reclamation/land use planning issues.

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[1] The Integrated Reclamation and Land Use Planning Program, Energy and Environmental Systems Division, Argonne National Laboratory, funded by the Resources and Land Investigations (RALI) Office of the U.S. Department of the Interior and the Biological and Environmental Research Division of ERDA.

Such a low priority has clearly resulted in a need for more data concerning the land use impacts of surface mining. Mining company personnel and public sector planners are required by the Federal law to cooperatively confront a number of land use issues which may never have been addressed jointly before.

Land Use Planning Issues of the Federal Reclamation Law

After more than 15 years of debate, a President and Congress have finally agreed upon the substance of federal regulation of surface coal mine reclamation. According to the preamble of the House version, H.R.2 (the compromise bill not being available at the time of this writing), the new federal law establishes a minimum level of performance for the many activities associated with effective conversion of coal-mined land for beneficial use. Forty states have previously enacted mined-area reclamation laws. These laws, whatever their excellence, will likely have to be modified before equivalency will be attained with the new federal legislation, which is both comprehensive and complex.

A comparison of H.R.2 with the 40 state reclamation laws indicates that another critical issue exists in addition to the much-discussed issues of "approximate original contour" and "protection of alluvial valley floors." It will certainly draw much attention when the coal-producing states approach the matter of attaining equivalency with federal legislation. This "sleeper" issue is: governmental land use planning as related to mined-area reclamation. Public land use planning or plan implementation is cited in ten separate places in H.R.2, as shown in Table 1.

A significance of the ten statements in H.R.2 pertaining to land use planning is that mining companies are now required to have their reclamation plans reviewed by whatever local planning agency is available before a permit will be issued. The authors have discerned that in some cases, as in Fulton County, Illinois, there is a history of cooperation between the mining industry and local planning agencies. In Fulton County, for example, coal mining companies routinely submit their reclamation plans to the County Planning Administrator, who frequently suggests constructive changes. For the most part, however, this type of cooperation has been found lacking in many mining areas. During the more than two year tenure of the Argonne program previously mentioned, which examined coal and non-coal mining, examples of reclamation programs which had been designed with active input from local planners were found to be almost non-existant. Numerous examples are available of mined areas that have been converted to residential, commercial, recreational, or other uses. On close examination, however, one finds that in almost every case the land use planning was done after the mining had been completed. One study shows that mined areas can be as much as ten times as attractive for housing sites as adjacent unmined areas (LaFevers, 1974). In every case examined, however, it was found that development was occurring on sites previously reclaimed for other uses (primarily forestry, range, and agriculture).

After-the-fact (of mining) planning and re-reclamation -- generally referred to as development -- are costly in relation to pre-mine planning. A major midwestern city, in dire need of a landfill site, recently acquired a mined area that had been reclaimed for forestry several years previously. About seven hundred dollars per acre had been spent grading, backfilling and revegetating this site. After acquisition, the city then had to spend about two hundred dollars per acre removing the trees and preparing the site for landfill; a process which will completely obliterate all vestiges of the previous reclamation effort, including the grading and backfilling. Not the entire nine hundred dollars per acre was wasted, since some initial expense would have been required to prevent erosion. It is obvious, however, that a significant savings could have been realized with a little foresight and a little interaction between the coal mining company and the local planners. It is most

Table 1
Public Land Use Planning or Plan Implementation Issues
in Federal Bill H.R.2

| Reference | Requirement or Guide (Paraphrased) |
|---|---|
| 201(c)(8) | Technical information on mining and reclamation will be provided to local land use planning agencies. |
| 505(b) | States can enact land use controls more stringent than those required by the Federal law. |
| 508(a)(3) | In reviewing and acting on reclamation plans, the regulatory authority will evaluate the selected land use objective in terms of existing land use policies and plans, including comments of any authorizating local planning bodies. |
| 508(a)(9) | Consideration must be given to making the surface mining and reclamation consistent with applicable state and local land use plans and zoning requirements. |
| 513(a) | Planning agencies shall be notified of applications for mine permits and related opportunities for hearings. |
| 515(b)(2) | The proposed postmining land use shall be consistent with applicable land use policies and plans. |
| 515(c)(3)(A)<br>515(c)(3)(C) | Certain variances from performance standards may be allowed in mountain-top removal, provided there is consultation with the appropriate land use planning agencies (if any) and certification that the proposed land use is consistent with local land use plans and programs. |
| 522(a)(3)(A) | A specific land area may be designated unsuitable for certain types of coal mining operations if such operations are found to be incompatible with existing public land use plans or programs. |
| 522(a)(5) | Determinations of the unsuitability of land for surface mining shall be integrated with present and future land use planning and regulation processes at the Federal, state and local levels. |

likely that city planners were aware at the time of mining that in a few years a new landfill site would have to be acquired. Had they contacted the mining company, a jointly drafted long-term reclamation/land use plan could have been generated that would actually have saved both parties a considerable amount of money.

While inspection of the federal mandates and advisements in Table 1 confirms that the new Federal law is not a national land use law in disguise, it is obvious that local and state land use planning has been afforded a position of potential importance in surface mining and reclamation. The planning community has an opportunity through this law to influence such decisions as where not to mine (Section 522) and to what land use the affected areas should be reclaimed (Sections 508, 513, 515).

State Reclamation Laws and Planning Issues

In most states reclamation laws are not particularly conducive to long-term land use planning. Although they may encourage reclamation, in many cases these laws should be considered deterrents to planning, including reclamation planning. The philosophy of planning inherently is based on the ability to exercise options. It is the nature of most reclamation laws, however, to close a large number of what should be available options. By dictating reclamation practices, the laws limit the planning potential. The development of reclamation laws has gradually affected both reclamation planning and the type of reclamation that is actually achieved. Since they do not generally address the issue of land use planning, however, these laws have had a lesser impact on planners than on mining personnel; a situation that will be considerably equalized by the new Federal law.

The reflection of state mined area reclamation laws in the surface expression of site specific reclamation programs is most apparent in coal mining, as compared with other extractive industries, primarily because it is this industry that has been regulated for the longest period of time. At the end of 1975 four states still had reclamation laws covering only land affected for coal, and five other states had at least two reclamation laws so that coal lands could be regulated separately from other minerals. When the first reclamation laws were enacted in the U.S. in 1939 and 1940, only coal mine lands were covered and little was required of the mine operators other than some attempt at revegetation. Early laws were not really designed to improve the long-term economic use of the land, as non-commercial tree species were often planted because of their rapid growth characteristics. In some instances commercially valuable tree species were planted but because of poor accessibility, were never harvested. Early attempts at creating pasture and range lands were often more successful, with some coal companies reporting successes as early as the 1930s (pre-law). Although these early reclamation laws reflected the state-of-the-art of reclamation technology at the time, they were probably inordinately industry oriented because coal company employees actually drafted the requirements of the first bills. Coal companies have lagged behind the sand and gravel industry in developing the concept of integrated reclamation and land use planning. Because most sand and gravel, and other construction aggregate mining, occurs in close proximity to urbanized areas (because of relatively high transportation costs), these mining operations have a long history of encountering close public scrutiny of mining and reclamation procedures. They also encounter intense competition for land, high land values, and an excellent market potential for land that is reclaimed for public use or commercial or industrial development. Thus, the opportunities and obligation existed for the aggregate industry to develop techniques for planning and initiating cooperative programs with local planners for the development of mined out areas. The first authoritative discussion of public planning imperatives in surface mining is given by Ahern (1964) in a report on the sand and gravel industry.

Investigations by Strauss and Kusler (1976), Doyle (1977), and Imhoff (1976) establish the existance of a variety of state statutory constraints against the interference of local planning with mining. Alabama's Surface Mine Reclamation Act of 1975, for example, prohibits local regulation of surface mining. Judicial review has not yet tested this prohibition in terms of its effect on land use planning and plan implementation. Other states with statutory preclusions against local governmental zoning ordinances that interfere with surface mining activities are listed in Table 2.

Rather than statutory prohibitions, state reclamation laws are generally characterized by omissions with respect to land use planning. Ten states with reclamation laws do not require the declaration of the proposed land use to which reclamation will be directed, and twelve states' (Arkansas, Indiana, Iowa, Kansas, Missouri, Montana, North Dakota, Ohio, Oklahoma, Pennnsylvania,

Table 2
States Exempting Mining from
Specific Land-Use Controls
of Local Government[1]

| State | Control Exempted |
|---|---|
| Arizona | Subdivision regulations and zoning |
| Idaho | Building codes and zoning |
| Missouri | Subdivision regulations and zoning |
| Montana | Zoning |
| West Virginia | Zoning (outside of incorporated areas) |
| Wyoming | Zoning |

[1]Additional exemptions apply in some states in which mining is classified as an agricultural activity under zoning laws.

Tennessee, and West Virginia) reclamation laws are totally silent on the subject of governmental land use planning or plan implementation. In contrast, positive roles for land use planning are set forth in mined-area reclamation laws in those states listed in Table 3.

Constraints to the Attainment of Land Use Planning Goals

A large number of factors can interfere with the ability of the local planner to achieve the land use planning objectives alluded to in H.R.2 and in some state reclamation laws. The most significant of these factors are probably those already discussed (lack of cooperative interaction between local planners and mining industry personnel, and state statutory constraints) and two others: an absence of public planning agencies in the locale of the mining operation; and inadquate information and analytical capability at the planning agency level. A review of the status of county comprehensive planning in coal mine areas, based on information in the files of the National Association of Counties (Washington, D.C.), shows that only half of the coal-mine counties have developed a comprehensive plan, and only part of these counties have developed a land use plan element of such plans. Although there are cases in which planning agencies other than county level may have input to local planning, the absence of county plans, including the absence of even a county planning agency in half the cases, is a severe constraint on the realization of the concept of integration of land use planning and mine reclamation planning.

If there is one condition that seems especially to constrain the ability of a planning agency to fulfill the requirements of H.R.2 it is the fact that local and state planning agencies, with rare exception, don't have the information or analytical capability to perform the complex analyses required. A sampling of ten county level planning/reclamation meetings (Sept. 1976) revealed an amazing paucity of information on and analyses of governmental planning issues, and especially land use planning. In short, it was found that planners were neither generating nor receiving (from the mine operator applicant) answers to the six recurring questions:

1. What is the source, reliability and frequency of collection of the earth sciences information used to support the post-mining land use plan submitted by the mine operator applicant?

Table 3
Briefs of State Assertions of the Role of
Local Public Planning in Regulation of Mine Reclamation
(Adapted from USGS Circular 731, Table 1)

| State | Role Stipulated |
|---|---|
| California | Act on mining permits and reclamation plans and mining policy in general plans (of state). |
| Colorado | Review for conformity with local land-use controls. |
| Florida | Local government may impose stricter standards (silent on local planning). |
| Illinois | County board may recommend land use, and may request hearings. |
| Kentucky | State permits must comply with local zoning laws. |
| Maryland | State, in acting on applications, takes cognizance of county planning, zoning, and grading permits. |
| Minnesota | "Rules . . . shall conform with any state and local land-use planning. |
| New Mexico | Consultation required with soil and water conservation districts. (No word about other types of planning organizations). |
| Oregon | Department may approve local governmental permitting or reviewing in lieu of state (local planning involved). |
| South Carolina | Local soil and water conservation districts review and comment. |
| South Dakota | Incompatibility with local land plans can be basis for state rejection of mining permit application. |
| Texas | Local governments are notified of mining-reclamation and their comments comprise input to the decision-making process. |
| Utah | Local governments are notified and their comments are taken under advisement. |
| Vermont | State action must accord with local plans. |
| Virginia | Local soil and water conservation districts advise. |
| Washington | Applicant must show legality of action with regard to local zoning. |
| Wisconsin | Mining, reclamation and comprehensive plan (for site development) shall conform to local zoning. |
| Wyoming | County involved in administration of act. |

2. What analyses (if any) have been applied to compare the applicant's plan with local governmental plans or policies?

3. As mining proceeds to its completion -- say at intervals of 5 years -- what will be the land cover and land use in the mining affected area, by percent of total and by acreage?

4. What are the estimated impacts on local employment and public income (taxes)?

5. What food and fiber production capability will be lost or gained by the land use conversion?

6. Can the mining and reclamation plan be modified reasonably to reduce impacts adverse to the local government?

It is recognized that some of the above questions are partially addressed in federal environmental impact statements, but EISs apply only to federal lands and do not focus on land use planning considerations. Considering the voluminous amount of data required of state and local planners by the Federal and State reclamation laws, and the sensitive nature of the questions that must be answered if land use planning is to be effective, it appears that the only way an integrated planning/reclamation concept that will be beneficial to the public and private industry can be implemented is through cooperative interaction among all concerned parties. The task is too large and too important to assume that either planners or industry can accomplish the overall goals without the complete cooperation of the other. Although Federal law now mandates that interaction will occur, in the near term the cooperative attitude of industry and planners will determine the success or failure of planning/reclamation programs rather than legal requirements.

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