

SOME PRELIMINARY RESULTS OF AN ENVIRONMENTAL IMPACT REPORT REVIEW PROCESS (EIRRP)

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ABSTRACT

This paper describes the results of an Environmental Impact Review Process (EIRRP) which was initiated to insure adequate technical review of Environmental Impact Reports necessitated by the Massachusetts Environmental Policy Act (M.G.L. Ch. 30 ss 61 & 62). The process utilized teams of University faculty members to review extremely controversial and/or complex environmental impact reports.

Major results are described from reviews of numerous programmatic and site specific project reviews including a number of controversial projects. Indirect benefits were realized by faculty, graduate students, and the academic community as well as state agencies.

Conclusion and summary includes the major process problems posed by faculty reviews over two years time as well as future recommendations for the improvement of the process and implementation of MEPA.

Introduction

The Environmental Impact Report Review Process (EIRRP) was initiated in December of 1973 as a method of insuring adequate technical review of Environmental Impact Reports necessitated by the Massachusetts Environmental Policy Act.

The Massachusetts Environmental Policy Act [1] is a statewide act enabling environmental review of all state initiated projects or

activities involving state monies and projects or activities needing permits from state agencies.¹ Environmental Impact Reports (EIRs) are needed for only those projects or activities which have the potential for significant impact to the natural environment as reviewed by the Secretary of Environmental Affairs (Executive Office of Environmental Affairs, Commonwealth of Massachusetts) [2].

It was realized from the start of implementation of MEPA that the Executive Office would have limited staff capability to do technical reviews of untold numbers of draft and final environmental impact reports. During the spring of 1973, plans were made to enable the Institute for Man and Environment at the University of Massachusetts, Amherst to coordinate technical reviews by faculty of extremely controversial and/or complex environmental impact reports.

Some of the major reasons for having university faculty review environmental impact reports were that:

1. It was felt that there was the variation and depth of technical expertise existing in the academic community that was often lacking among agency personnel, or if it existed, the agency personnel might not have adequate time to devote to the review.
2. It was felt that the university faculty in most cases would be more objective reviewers of controversial projects or projects and activities involving politically intertwined state agencies.
3. Although the A-95² process would be utilized, past performance by federal and state agencies indicated that there might be uneven quality of review due to the tremendous number of projects and activities already being processed through A-95 under constraints of limited time, staff, and budget.
4. It was realized that the Executive Office and specifically the Secretary, needed the best possible technical counsel in considering and making critical precedent setting policy decisions early in the implementation of MEPA.

It is interesting to note that simultaneous to the development of

¹ Note that activities conducted by local governmental units other than "authorities" are not covered by the act. This is an important distinction in comparison to other statewide Environmental Policy Acts.

² Bureau of Budget Circular A-95 provides for a process of review of projects involving federal monies for comment by appropriate state, regional, and local agencies.

EIRRP, the Institute for Ecology [3] in Washington, D.C. was engaging university and college faculty throughout the country to critique national policy setting federal Environmental Impact Statements that were submitted in compliance with the National Environmental Policy Act [4]. Another project involving faculty review of Environmental Impact Statements is also ongoing at Northwestern University [5].

Developing the Process

A cooperative arrangement already existed between the Executive Office and the Institute prior to EIRRP. Through the efforts of Dr. Hugh C. Davis³ (who at the time served as Assistant Secretary of Environmental Affairs) as well as then Secretary Dr. Charles H. W. Foster and Institute Director, Dr. Ervin H. Zube, the cooperative arrangement was made. This arrangement stipulated that a professional full time staff member from the Executive Office would be attached to the Institute to coordinate and oversee the Environmental Impact Report Review Process (EIRRP).

By September 1973 the professional staff member was stationed at the Institute and by December 1973 a contract was signed by all parties concerned. This contract primarily enabled support of graduate students which would serve as staff for EIRRP. In the interim fall period numerous briefings were held with groups of interested faculty.

These early briefing sessions were utilized to acquaint faculty with the Massachusetts Environmental Policy Act, the basic processes being developed by the Executive Office to implement MEPA, and a very rough sketch of EIRRP as envisioned at that time. Faculty were invited to give their frank reactions and opinions regarding the proposed process.

Early faculty reactions were quite mixed. Many faculty expressed concern about the amount of time that would be involved in reviewing an undetermined number of environmental impact reports. Some faculty expressed concern over the lack of any direct compensation for their efforts. University faculty cannot be reimbursed during the academic year for any of their review efforts. They could be reimbursed 1) during summer months via summer faculty pay compensation or 2) through materials purchased or

³ Dr. Davis is a Professor of Landscape Architecture and Regional Planning at University of Massachusetts and Director of the Center of Environmental Policy Studies, Institute for Man and Environment.

graduate student support provided in lieu of direct compensation. Most faculty members stressed their existing heavy teaching and/or researching loads and lack of open support of public service by the university and departmental administration for tenure considerations. Nevertheless, almost all faculty in the early briefing sessions expressed some interest and concern for EIRRP, especially from the point of view of the opportunity to have a stronger voice affecting environmental policy decisions.

Results

EIRRP was initiated and an interdisciplinary group of graduate students was hired for the winter-spring semester and the first faculty team was assembled for a review. The following section describes the major results of the process for approximately two years activity. On December 31, 1975 the Institute for Man and Environment terminated the contract with the Executive Office of Environmental Affairs for EIRRP reviews. The New England Consortium for Environmental Protection is continuing the Environmental Impact Report Review Process under contract to Environmental Affairs.

In this two year time span EIRRP produced over sixty-five reviews of draft and final impact reports. There were also other long range projects ongoing simultaneously. This was much more than originally envisioned when the contract was first signed. It was mutually recognized however that the reviews in many cases could not have been done elsewhere given the time and monetary constraints.

The first project was a review of a work program for an Environmental Impact Report which was to be done for a large controversial redevelopment project in downtown Boston [6]. The novel aspect of this project was that it allowed an interdisciplinary faculty group to critique a scope of work for an EIR before it was written with the hope of avoiding major conceptual and/or scope problems within the completed EIR. The effort resulted in a twenty-one page critique by a seventeen man review team. Many points within the review have since been incorporated in the revised scope of work for the EIR.

The majority of the twenty-one faculty review projects can be categorized into two major types of reviews. One type of review is for a programmatic or "combined" EIR. The second is a review of extremely large, complex, and/or controversial site specific projects.

PROGRAMMATIC REVIEWS

Environmental Affairs' guideline regulations allow for a combined environmental impact report [2]. This allows an agency to "combine" many very similar minor activities which would not ordinarily have significant impacts as individual activities but could have significant impacts if repeated many times within a given period of time. It is the combined EIR reviews which, in the authors' opinions, yielded the most outstanding faculty reviews.

The four best examples of reviews of combined EIRs include: a review of a four agency EIR on statewide control of snow and ice [7] (use of road salt), a review of a statewide EIR on control of nuisance aquatic vegetation in lakes and ponds by herbicide treatment [8], a review of a statewide EIR on forest management practices [9], and a review of a regional EIR on alternative strategies for the attainment of Primary and Secondary Ambient Air Quality Standards for sulfur dioxide in the Metropolitan Boston Air Pollution Control District [10]. In all four cases the Secretary⁴ called for some major rethinking of policy, procedures, and alternatives partially as a result of the faculty's technical reviews of the EIRs.

In the case of the EIR submitted by the Massachusetts Department of Public Works, the Massachusetts Turnpike Authority, the Metropolitan District Commission, and the Massachusetts Bay Transit Authority there was significant pressure to develop other alternatives to the present volume of road salt usage on roads throughout the state. As a result of the EIRRP faculty technical review, public comments at public hearings throughout the state, and comments submitted by private parties, Governor Michael Dukakis requested that the Secretary of Environmental Affairs and the Secretary of Transportation and Construction meet with the major agencies involved. It was agreed that some experimental stretches of road should be treated with reduced amounts of road salt or mixtures of salt and sand and the results monitored. It was also agreed that special strategies of deicing treatment were needed near sensitive areas, e.g., reservoirs and well fields.

Control of "Nuisance Aquatic Vegetation" by herbicide treatment had long been a "bone of contention" between "recreationally oriented" lakes and ponds users and "ecologically oriented" users. The controversial nature of this issue became evident just as it had in the case of road salt usage. The faculty technical review

⁴ The Secretary at the time of these reviews was Secretary, Dr. Evelyn F. Murphy.

accentuated the need for a much more detailed impact assessment of the use of herbicides as well as an indepth development of other alternatives for controlling "undesirable" aquatic vegetation.

Review of the Forest Management Practices EIR, by a faculty team made up mostly by foresters, found a distinct need to rethink or possibly restate existing forest management objectives in relationship to present management practices, individual forest differences, and local user needs.

The review of sulfur dioxide guidelines was different from the three previous examples in that this EIR was regional in scope and dealt with proposed regulations. The EIR proposed strategies to allow the burning of higher sulfur content fuel oil in the metropolitan Boston area while protecting Primary and Secondary Ambient Air Quality Standards. Previously the state standards were tougher than the federal air quality standards and this action was part of the overall strategy to enforce standards at the same level. Also, the fuel oil crisis and resultant economic impacts influenced the state legislature to pass an act enabling utilities to burn cheaper higher sulfur content fuel oil so that the individual consumer could be charged a lower utility rate.

As part of the review, the faculty team from three different institutions were called upon to critique a sophisticated air pollution diffusion model which was used to predict the impacts of different control strategies on the metropolitan area air quality. The Secretary's statement based on the faculty review and public hearing results brought about some minor shifts in the agencies' proposed strategies for compliance with Primary and Secondary Ambient Air Quality Standards.

Another type of programmatic review conducted by faculty for the Executive Office was the review of select federal agency Environmental Impact Statements of major policy dimensions. Examples include EIS reviews of the *Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf* [11] and the *Energy Independence Act of 1975 and Related Tax Proposals* [12]. Reviews of these two federal environmental impact statements were used to formulate the policy statements of the Secretary of Environmental Affairs and the Governor to the federal agencies concerned.

SITE SPECIFIC PROJECT REVIEWS

The second major type of review done by faculty is that of a standard or more often an extensive EIR for a particular project to

be located at a specific site. Examples include major highways [13-15], airports [16], refuse disposal facilities [17, 18], a high rise building [19], a zoo [20], and a nuclear power plant [21]. The most precedent setting and significant examples will be discussed.

One of the most controversial highway projects reviewed by a faculty team was Interstate I-190 which would create a new north-south connecting link between Fitchburg and Worcester, Massachusetts [13]. The Executive Office had only the Final EIS to review as the draft EIS had already been processed through the federal procedure for the National Environmental Policy Act.⁵

The Final EIS, which was reviewed "in lieu of" an EIR contained many problems which had not been resolved by the federal process. Supplementary material was prepared by the Massachusetts Department of Public Works to satisfy the questions of the Secretary which were derived from the technical faculty review [22].

Questions still remained unresolved pertaining to secondary land use impacts and construction and operational impacts on the Wachusett Reservoir which was part of Boston's water supply system. Under extreme pressure from both environmentalists and project advocates, a memorandum of understanding was signed by the Executive Office of Environmental Affairs, the Executive Office of Transportation and Construction, the Massachusetts Department of Public Works, and the Metropolitan District Commission which pledged all agencies to cooperate in an ongoing environmental review process during final design, construction, and operational phases of the project [23]. A new precedent setting procedure was initiated for continuous environmental review with the input of local agencies and citizen groups, to be overseen by the Secretary of Environmental Affairs.

Another case of comparable controversy which involved faculty review dealt with expansion plans for Logan International Airport in Boston. This particular case evolved into a precedent making court case for the Executive Office [24]. Although it had not been determined whether the Port Authority project in question needed a Federal Environmental Impact Statement under National Environmental Policy Act, the Executive Office maintained that they should also comply with MEPA as well and file for environmental review [25]. The Port Authority maintained, however, that the project had "commenced" before the effective date of MEPA. The

⁵ In retrospect it was realized that it would have been wiser to process any previously done EIS as a "Draft" report for the purposes of MEPA.

Executive Office asked the Attorney General's Office to seek an injunction to stop the project until the Port Authority complied with the provisions of MEPA. An injunction was obtained and construction stopped. The court's favorable decision in summary stated that the project had not effectively commenced before MEPA and hence was indeed subject to the act.

The Port Authority submitted the EIS that they had prepared for the Federal Aeronautics Administration (FAA) under the National Environmental Policy Act to the Executive Office for review in lieu of an EIR. Selection of a faculty review team in this case was extremely critical as there existed the ever present potential of faculty reviewers becoming expert witnesses who, in the advent of further court proceedings, might be put "on the stand." The review of the FAA EIS uncovered many technical problems relating to runoff, fuel spillage, storm sewer design, and flight statistics. These deficiencies were substantially rectified in the Final EIR that the Port Authority prepared explicitly for MEPA.

Two closely related EIRs that were submitted for review dealt with solid waste management problems, the project locations being situated within the same general geographic area. One of these EIRs covered the operational impacts of a refuse burning steam generating plant which was to eventually replace the other project, the expansion and completion of an existing landfill situated on a large saltmarsh. The more critical faculty review, as one could imagine, was that of the proposed expansion and completion of the landfill which would significantly impact a new area of salt-marsh. Due to the combined effect of the faculty review, the Secretary's policy statement, and the Department of Public Health's refusal to grant necessary variances, the private firm opted not to expand horizontally onto the remaining saltmarsh area. Instead the firm is in the process of preparing new engineering specifications for vertical expansion which will continue until the completion and operation of the new refuse-burning plant.

The final project to be discussed, the addition of a second boiling water nuclear reactor unit to the Pilgrim Nuclear Power Plant in Plymouth, Massachusetts, proved to be the most controversial project reviewed via EIRRP. The review was especially relevant given the national concern voiced about siting and safety issues relating to nuclear power plants. This was the first review of a nuclear power plant under MEPA and thus had potential for precedent making policy implications. It should also be noted in this case that even though a federal Final EIS was submitted for

review; that it was in fact accepted as only a draft EIR in the eyes of the Executive Office. Alas the hard learned lessons of accepting inadequate Final (federal) EISs as Final (state) EIRs had their effect.

The faculty review of this "draft EIR/Final EIS" posed serious questions concerning the analysis of the reactor's safety systems, the disposal of spent nuclear fuel, and thermal effects to the coastal ecosystem—all traditional problems of nuclear plants. Nonetheless the review did stir some unexpected reaction in legislative circles. The MEPA budget of the Executive Office of Environmental Affairs suffered a drastic cutback recently. It is the opinion of many informed observers that the cut was primarily politically motivated and that the Secretary's statement regarding the (in)adequacy of the Pilgrim Unit 2 EIR was a central factor [26]. It remains to be seen at this point how the final EIR, that will be prepared for the state, will respond to the technical issues raised by the faculty review and directly reflected in the Secretary's policy review. The way in which this project is handled could well set a precedent in Massachusetts which may have national significance.

SPECIAL PROJECTS

There were several projects involving faculty reviews that were not per se Environmental Impact Reports or Environmental Impact Statements. These special projects involved reviews of broad policy setting documents such as a statewide housing needs and goals study [27], a ten year transit development plan for the Boston Metropolitan Area [28], and a Master Plan for Logan International Airport [29]. Other special projects involved 1) critical reviews of controversial projects at the feasibility or pre-EIS/EIR stage; and 2) special brainstorming projects. The latter two types of projects will be discussed in this section.

The feasibility study review was of a preliminary environmental and economic study of alternative methods of supplying petroleum products to Eastern Massachusetts, essentially a deep water port study with sub-alternatives for delivery and storage systems on the mainland [30]. The effect of this faculty review was to "pop the hoisted trial balloon" because of inadequate baseline information and analysis of both the economic and environmental effects. This review involved the largest faculty review undertaken from the point of view of participants and also proved to be one of those most enthusiastic and concerned review groups assembled.

The other special project to be discussed came about in response

to a bill (M.G.L. Chapter 257) passed by the state legislature which was meant to narrow the scope of the Executive Office's review of private projects. A brainstorming technique was used to derive the maximum results in the minimum time. The project participants consisted of those faculty members who had contributed most generously in time and substance to previous projects during that year. The objective of the exercise was to predict as completely as possible the impacts of different types of privately financed projects and activities which needed state permits. It was hoped that the results would aid the Executive Office in drafting proposed regulations which were necessitated by Chapter 257.

The Chapter 257 modification of MEPA was brought about through pressure by real estate developers, bankers, housing contractors, construction labor, and building industry lobbyists on legislators. These lobbyists maintained that the Executive Office was "stalling" private projects having to comply with MEPA and that the building industry was in great danger of "coming to a grinding halt." In truth the economy in general accounted for the general condition of the building industry. Projects were "stalled" even before they were processed by the Executive Office which has rigid time tables set up for the review of all projects. The Executive Office was the logical target from the point of view of justifiably irate builders who perceived the process of pushing their projects through the state bureaucracy as running a maze with constantly changing paths. MEPA constituted the last hurdle in that maze for many builders who had come to their wits end in dealing with state agency permit systems which in some cases have no set time cutoff for review actions or which have obscure unwritten procedures.

Although Chapter 257 essentially limited the *breadth* of review of any given permit action, it did not limit the *depth* of review [31]. For example, a wetlands permit for a shopping center was previously subject to review of all types of potential environmental impacts, traffic, and other activities not covered by the permit, but under Chapter 257 review is limited to the culverting of the stream which is the only action covered by the permit. The object of the faculty brainstorming exercise was to follow through the impact of the culverting action on the stream to generic secondary and tertiary impacts, e.g., culverting of the stream affects water flow properties which eventually affects stream bottom biota. Thus the faculty exercise yielded lists of potential generic impacts resulting from activities which need to be permitted under state law (e.g., access to state roads; alteration or modification of wetlands, streams, and ponds; and coastal construction) [32].

INDIRECT BENEFITS

In addition to the direct benefits which accrued to the Executive Office under contract, many unanticipated benefits were realized by faculty, graduate students, and the academic community as well as state agencies.

An essential by-product of EIRRP was the production of an *Environmental Faculty Directory* which cross listed many faculty at the University of Massachusetts who had expertise or strong interests in particular environmental concerns [33]. A resultant spin off of this initial reference tool, the *Environmental Directory* [34], will hopefully prove useful to students, fellow faculty, as well as state and federal agencies.

Another inadvertent by-product which was not anticipated at first was the recognition and confidence exhibited by faculty in policy decisions made by the Secretary of Environmental Affairs⁶ concerning the adequacy of draft and final EIRs. It was assumed in the beginning of the conceptualization and organization of EIRRP that the faculty, in preparing their technical reviews of selected EIRs, could conceivably find major deficiencies with certain EIRs which, however, the Secretary might find in compliance with MEPA. Often technical reviews of EIRs by faculty were referred to only in part or were rephrased in the Secretary's policy review. This was overshadowed from the faculty point of view by the fact that their technical comments *were in fact utilized* by the Secretary and that they (the faculty) were appraised of the results of the Secretary's policy review as well as the technical review within a reasonable timespan. In other words we believe that many faculty were grudgingly appreciative or mildly elated to find that they *had affected a policy decision*.

It was found in the course of utilizing the talents of somewhere in the vicinity of 100 University of Massachusetts, Amherst faculty members for technical reviews, that there were often few individuals who could cover key environmental concerns, and occasionally expertise gaps existed. Because of this situation the faculty review network after the first year of operation was broadened to include universities and colleges throughout the Commonwealth, both private and public. Faculty at these various institutions contributed generously of their time and knowledge. Participating faculty came from such institutions as Amherst

⁶ This was true throughout the transition period between two administrations. Dr. Charles H. W. Foster was Secretary when EIRRP started and Dr. Evelyn F. Murphy is the present Secretary of Environmental Affairs.

College, Holyoke Community College, Harvard University, Lowell State College, Lowell Technological Institute, Massachusetts Institute of Technology, Smith College, Tufts University, University of Massachusetts, Boston, Williams College and Worcester Polytechnic Institute. The New England Consortium for Environmental Protection provided indispensable aid⁷ in helping to organize and coordinate these multi-campus faculty review teams.

Reference to Figure 1 shows that only twenty-one reviews were undertaken by faculty dominated interdisciplinary teams, however those reviews were the most controversial, complex, and/or specialized projects and activities. A total of forty-four reviews were essentially done by Institute staff members and graduate students acting as EIRRP staff under faculty supervision. It is interesting to note that there was considerable criticism and grumbling from certain parties within the state legislature and state agencies as to the validity of letting "students" review EIRs!

In fact the "students" were highly qualified environmental impact report reviewers. Graduate students who worked as staff for EIRRP were primarily second and third year masters and doctoral candidates that were carefully selected from the "pick of the crop" of graduate students in environmental majors across the campus.⁸ Many also had previous professional experience which was directly applicable to the review process.

Graduate student research assistants working as an interdisciplinary team utilizing their own individual technical training were able to consistently and thoroughly review EIRs with a high degree of professionalism and objective detachment. In fact, the Executive Office had more complaints from agencies concerning the language, tone, and content of faculty dominated reviews than staff dominated reviews. Many graduate students also volunteered their own time without compensation to work with EIRRP in order to both lend their talents and learn from the other staff members.

As a general result of the above described activity by both graduate students and faculty, academic interest was spurred in the general field of environmental impact assessment. This interest

⁷ Mr. Peter Fairchild is assistant director of the New England Consortium for Environmental Protection and has offices at the Institute for Man and Environment, Blaisdell House, University of Massachusetts, also please see C. Edwin Meadows, Jr., *Directory of Investigators and Environmental Activities*, L. J. Sarasohn, ed., NECEP on EPA Grant T-900258, July 1973.

⁸ A cross sample of graduate students who worked with EIRRP came from the Departments of Botany, Business Administration, Education, Environmental Engineering, Environmental Science, Forestry, Geology, Landscape Architecture and Regional Planning, Political Science, Public Health, and Zoology.

	Total #	Faculty Review	Staff Review	Major Problems ^a	Minor Problems ^b	EIRs Only	EIS/EIR	Prior EIS
TOTALS	65	21	44	44	21	26	11	23
PROJECT TYPES								
Commercial								
Park/CBD	2	0	2	2	0	1	—	1
High Rise	2	1	1	0	2	1	1	—
Energy Facilities								
Nuclear	1	1	0	1	0	—	—	1
Conventional	2	0	2	1	1	1	1	—
Garbage	1	1	0	1	0	1	—	—
Power Lines	2	0	2	0	2	2	—	—
Industrial Park & Renewal	2	0	2	2	0	—	1	1
Landfills	2	1	1	2	0	2	—	—
Medical Facilities	5	0	5	0	5	4	1	—
Reservoirs	2	0	2	2	0	2	—	—
Special Projects	4	4	0	4	0	—	—	—
Residential								
Rural PUD	2	0	2	0	2	2	—	—
Low Income/Elderly	8	0	8	4	4	4	4	—
Urban Redevelopment	3	1	2	1	2	—	3	—
Transportation								
Airport	2	1	1	2	0	—	—	2
Highway Related	15	3	12	14	1	—	—	15
Transit Related	2	1	1	1	1	—	—	1
Program Reviews	6	5	1	5	1	6	—	—
Federal EISs	2	2	0	2	0	—	—	2

^a Includes those projects with major review problems encountered in review of both draft and final EIR.

^b Includes those projects with minor problems with draft, and with final EIRs; includes projects whose problems have been rectified in final EIR.

Figure 1.

often resulted in graduate class projects on environmental impact assessment [35-37]. It also resulted in encouraging graduate thesis topics related to environmental impact assessment [38-40]. Some of these class projects and theses have utility for both agencies and firms working in environmental impact assessment as well as establishing a research foundation for further academic work in the field.

In the context of this activity it must be remembered that the central purpose of EIRRP was to involve faculty in reviews of precedent setting and/or controversial environmental impact reports.

Conclusion and Summary

Analysis of present activity leads us to the following conclusions which may be classified as problems and future directions.

PROBLEMS

Faculty reviews during two years have posed the following process problems:

1. There were occasionally Environmental Impact Reports for which faculty expertise was extremely difficult to obtain. This resulted in the policy of going to a multi-campus review network. Even given the multi-campus review network, there were EIRs which defied expertise, e.g., the EIR on Spraying Malathion to Control Outbreaks of Equine Encephalitis in Eastern Massachusetts.
2. Faculty at times criticized seemingly well done EIRs/EISs which lead to counter accusations from submitting agencies of "picyune" comments. Sometimes faculty comments were edited in order to avoid possibly embarrassing comments but never to change content. In most cases comments were edited so as to keep their integrity. Later reviewers had the benefit of review criteria which were very basic and simple.⁹ This also leads to the inevitable question of: why doesn't the Executive Office of Environmental Affairs develop explicit criteria and standards for preparation and review of EIRs? From previous experience it appears that the regulations themselves, as developed by each of the Executive Offices and patterned after Environmental Affairs' Guideline Regulations, are sufficient if properly used. Explicit standards and criteria for EIRs/EISs can be a disadvantage especially if they lead to "boiler plate" or "cook book formula" EIRs. The EIRs received for review by the Executive Office were, with a few notable exceptions, generally far superior to the average quality of Federal Environmental Impact Statements prepared expressly for the National Environmental Policy Act.
3. Faculty frequently found that their busy teaching and research loads did not allow them to spend as much time as

⁹ Review criteria used by faculty included: 1) Is the scope and breadth of inventory and analysis adequate?; 2) Were there key omissions within any section?; 3) Were alternatives adequately treated?; 4) Were impacts adequately identified?; 5) Were measures to minimize harm adequately identified and developed to the extent that it could be seen how impacts would be minimized?

they would have liked on a particular review. In many instances faculty were unable to participate in the review of an EIR due to these time pressures. As there were certain categories of impacts in which only one or two on-campus faculty members had significant expertise it was crucial to ask for their help on only the most important EIR reviews. This became problematic when dealing with certain impacts categories which occurred frequently such as those relating to groundwater or involving air pollutant dispersion modelling. Careful and equitable selection of faculty for review teams proved to be a very tricky business of judging short and long run tradeoffs.

Adding to the complexity of this problem was the issue of compensation. Many faculty desired more direct rewards for their efforts especially for work which was not given adequate consideration in tenure considerations by university and departmental administrations.

4. No formal mechanism was provided for evaluation of the review of EIRs. Ideally faculty and staff reviewers should have received continual feedback regarding the usefulness of their specific criticisms and comments.

SUMMARY AND FUTURE DIRECTIONS

It is the frank if not unbiased opinion of the authors that the whole EIRRP project is extremely successful in view of 1) the obstacles that had to be overcome and 2) the results gained with the resources available. Most key people in the Executive Office concerned with the implementation and administration of MEPA feel this is also true. We know however that the Executive Office at some point will have to develop its own in-house capabilities for review of Environmental Impact Reports. Faculty review of the rare programmatic and/or controversial EIR should occasionally be utilized to augment the Executive Offices' capabilities.

This review process is critical to the basic concept of implementation shared by the authors, Mr. Bill Hicks, Esq., present program director, Mr. Harley Laing, Esq., past Legal Counsel, past Secretary Charles H. W. Foster, and present Secretary Evelyn F. Murphy. MEPA calls for explicit "measures to minimize harm to the natural environment [1]." Technical reviews pinpoint how well the discussion of impacts is treated and also how well appropriate technical and policy measures to minimize environmental impacts to the natural environment are identified and assessed. In this way

the technical review is essential to proper implementation of MEPA. We feel that this point should be made absolutely clear to legislators, agency personnel, academia, private consultants, and the general public, especially when considering funds, personnel, and resources to implement an act such as MEPA.

Great strides have been made in the implementation and spirit of compliance with the Massachusetts Environmental Policy Act within a very short timespan. EIRRP is just one example and only part of the story. We should not erase our progress to date but work constantly for a more efficient and reasonable evolution of process which 1) accelerates environmental review while 2) insuring adequate substantive technical review.

REFERENCES

1. Massachusetts General Laws, Chapter 30, Sections 61 and 62 as amended by Chapter 257 of 1974.
2. Executive Office of Environmental Affairs, Regulations to Create a Uniform System for the Preparation of Environmental Impact Reports, July 6, 1974.
3. *Environmental Impact Assessment Project*, A project of the Institute of Ecology, Washington, D.C., mimeo, February 24, 1975; and *Science*, 182, p.462.
4. 42 U.S.C., section 4321 *et seq.*
5. H. P. Friesma and P. J. Culhane, Social Impacts, Politics, and the Environmental Impact Statement Process, *Natural Resources Journal*, May, 1976.
6. R. C. Smardon, (ed.), *Review of Park Plaza Urban Renewal Work Program*, Center for Environmental Policy Studies, Institute for Man and Environment, University of Massachusetts, Amherst, IME-EIRRP-11, December, 1973.
7. R. Woodland, (ed.), *Review of Draft Environmental Impact Report, Snow and Ice Control Program 1973-74, 1974-75*, Center for Environmental Policy Studies, Institute for Man and Environment, University of Massachusetts, Amherst, IME-EIRRP-44, January, 1975.
8. M. Soukup, (ed.), *Review of Draft Environmental Impact Report, Control of Nuisance Aquatic Vegetation in Lakes and Ponds by Herbicide Treatment, Commonwealth of Massachusetts*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-61, EOEA-00011, April 1975.
9. J. Difley, (ed.), *Review of Draft Environmental Impact Report, Forest Management Practices, Department of Natural Resources*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-64, EOEA-00193, May, 1975.
10. R. Woodland, (ed.), *Review of Draft Environmental Impact Report, Alternative Strategies for the Attainment of Primary and Secondary Ambient Air Quality Standards for Sulfur Dioxide in the Metropolitan Boston Air Pollution Control District*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-56, EOEA-01341, April, 1975.

11. J. Young and R. Woodland, (eds.), *Review of the Draft Environmental Statement for the Proposed Increase in Acreage to be Offered for Oil and Gas Leasing on the Outer Continental Shelf*, DES 7490, CEPS, IME, University of Massachusetts, January, 1975.
12. R. C. Smardon and R. Woodland, (eds.), *Review of Draft Environmental Statement Energy Independence Act of 1975 and Related Tax Proposals*, DES 75-2, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-68, May, 1975.
13. R. Woodland and J. Young, (eds.), *Review of Final Environmental Impact Statement for Interstate 190 (Mass. Route 52 Expressway) Worcester, Holden, West Boylston, Sterling, Lancaster, Leominster, and Fitchburg, Massachusetts*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-38, EOEA-01158, November, 1974.
14. R. Woodland and J. Young, (eds.), *Review of Draft Environmental Impact Statement I-391 in Chicopee-Holyoke, Massachusetts*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-46, EOEA-00913, February, 1975.
15. J. Difley, (ed.), *Review of Draft Environmental Impact Statement I-495 and State Route 140 in Taunton, Foxborough, Mansfield, Norton, Rayham, and Bridgewater, Massachusetts*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-47, EOEA-00761, February, 1975.
16. R. Woodland, (ed.), *Review of Draft Environmental Impact Statement Extension of Runways 4L & 9, Construction STOL/CA Runway 15-33 Logan International Airport, Boston, Massachusetts*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-32, EOEA-00909, September, 1974.
17. M. Soukup, (ed.), *Review of Draft Environmental Impact Report on Expansion, Operation, and Completion of Saugus Sanitary Landfill*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-48, EOEA-01203, April, 1975.
18. R. Woodland, (ed.), *Review of Draft Environmental Impact Report, Refuse Burning-Steam Generating Power Plant, Saugus, Massachusetts*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-51, March, 1975.
19. J. Norton, (ed.), *Review of Draft Environmental Impact Statement for Sixty State Street*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-21, EOEA-00734, June, 1974.
20. S. Erickson, (ed.), *Review of Draft Environmental Impact Report for Expansion of the Franklin Park Zoo*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-12, June, 1974.
21. R. Woodland, (ed.), *Review of the Draft Environmental Impact Report "Final Environmental Statement, Pilgrim Nuclear Power Station, Unit 2,"* CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-73, EOEA-01950, July, 1975.
22. *Review of Supplemental Information on Interstate I-190, Worcester to Leominster, Massachusetts*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-60, EOEA-01158, April, 1975.
23. Executive Office of Environmental Affairs, Memorandum of Understanding Relating to the Environmental Review Process for I-190 from Worcester to Fitchburg, Massachusetts, April 30, 1975.

24. Commonwealth of Massachusetts, Superior Court, Docket Number 99492, Docket Number 521, *City of Boston, et. al.* (Plaintiffs) v. *Massachusetts Port Authority and Perini Corporation* (Defendants); *Charles H. W. Foster, Secretary of Environmental Affairs, Alan A. Altshuler, Secretary of Transportation and Construction* (Plaintiffs) v. *Massachusetts Port Authority and Perini Corporation* (Defendants).
25. *Boston vs. Brinegar* 6 E.R.C. 1961, D.C. 4. D. Mass., 8/1/74.
26. C. Surkin, Environment: A New Battle, *Boston Globe*, November 13, 1975.
27. R. C. Smardon and E. H. Zube, (eds.), *Review of 1974 on Housing Needs and Programs, Final Review Draft*, CEPS, IME, University of Massachusetts, Amherst, IME-EIRRP-18, May, 1974.
28. R. C. Smardon, (ed.), *Review of Ten Year Transit Development Program, 1974-1983*, CEPS, IME, University of Massachusetts, Amherst, special report, September, 1974.
29. R. C. Smardon, (ed.), *Review of Draft Master Plan; Boston-Logan International Airport*, CEPS, IME, University of Massachusetts, Amherst, special report, September, 1974.
30. J. R. Young, (ed.), *Review of a Preliminary Environmental Economic Study of Alternative Methods of Supplying Petroleum Products to Eastern Massachusetts; Vols. II & III*, CEPS, IME, University of Massachusetts, Amherst, special report, July, 1974.
31. Chapter 257 of Massachusetts Resolves for 1974.
32. Ch. 91 & Wetlands Act Permits for Private Activities, CEPS, Institute for Man and Environment, University of Massachusetts, Amherst, unpublished mimeo.
33. R. C. Smardon, compiler, *Environmental Faculty Directory, Draft*, Center for Environmental Policy Studies, Institute for Man and Environment, University of Massachusetts, Amherst, December 1973, Publication Number R-74-5; revised July 1974 by R. C. Smardon and Dennis Trager, compilers, Pub. No. R-74-8.
34. H. Schwartz, R. C. Smardon, D. Trager and C. Zimmring, *Environmental Directory; Courses, Programs, and Faculty; University of Massachusetts, Amherst*, Institute for Man and Environment, University of Massachusetts, Amherst, Pub. No. R-75-3, June, 1975.
35. B. Barthrop, S. Coleman, S. Erickson, E. Lindelof, M. Schleeweis, and P. Slater, Scope of Work for a Study to Determine the New England Regional Petroleum Requirements and to Recommend Several Alternative Action Plans to Help Meet These Requirements, prepared in partial fulfillment of the requirements for Forestry 792B, Impact Assessment Seminar taught by Dr. Carl A. Carlozzi, University of Massachusetts, Amherst, Spring, 1974.
36. P. J. Cavicchi, E. A. Kidder, W. F. Newbold, Jr., K. A. Richardson, and D. S. Robinson, A Scope of Work for a Generic Environmental Impact Report Assessing the Impacts of Coastal Construction in Massachusetts, prepared in partial fulfillment of the requirements for Forestry 792B, Impact Assessment Seminar taught by Dr. Carl A. Carlozzi, University of Massachusetts, Amherst, Spring, 1975.
37. Warrens New Town Impact Assessment and Site Suitability Models,

- prepared by graduate students in Landscape Architecture 931/Regional Planning 781 Interdisciplinary Studio taught by Dr. Julius Gy. Fabos, Dr. John Foster, Prof. Paul Procopio and Dr. Carl Carlozzi, University of Massachusetts, Amherst, Fall, 1974.
38. J. Twichell, Impact Assessment of Subsurface Sewage Systems in Massachusetts, thesis outline, Department of Landscape Architecture and Regional Planning, Graduate School, University of Massachusetts,, Amherst, April 30, 1975.
 39. J. Difley, Developing Methods of Vegetation Analysis for Environmental Impact Assessment of Upland Vegetation in Massachusetts, thesis outline, Department of Forestry, Graduate School, University of Massachusetts, April 23, 1974.
 40. K. M. Reavis, Criteria of Effectiveness for Environmental Impact Assessment: A Critique of the Federal Council on Environmental Quality Guidelines and the Massachusetts Executive Office of Environmental Affairs Regulations, Masters Thesis submitted to the Graduate School of the University of Massachusetts and the Department of Landscape Architecture and Regional Planning, Amherst, unpublished, May, 1975.

BIBLIOGRAPHY

- Fletcher, K. (ed.), *A Scientific and Policy Review of the Draft Environmental Impact Statement for the Proposed Federal Coal Leasing Program of the Bureau of Land Management, Department of the Interior*, Environmental Impact Assessment Project of the Institute of Ecology, Washington, D.C., 1974.
- Fletcher, K. and Baldwin, M. F., (eds.), *A Scientific and Policy Review of the Final Environmental Impact Statement for the Prototype Oil Shale Leasing Program of the Department of the Interior*, Environmental Impact Assessment Project of the Institute of Ecology, Washington, D.C., October 29, 1973.
- Moore, C. L. and Harris, N., *A Control System for Administering Environmental Assessment and Review for the Massachusetts Environmental Policy Act*, H. M. Swartz and R. C. Smardon, (eds.), prepared by the Center for Environmental Policy Studies, Institute for Man and Environment, University of Massachusetts for the Executive Office of Environmental Affairs, Amherst, MEPA Technical Report No. 2, March, 1975.
- Moore, C. L. and Smardon, R. C., *Designing an Administrative Control System to Implement MEPA: The Massachusetts Environmental Policy Act*, Institute for Man and Environment, University of Massachusetts, Amherst, IME Report No. R-75-4, August, 1975.
- Pearson, G. L., Pomeroy, W. L., Sherwood, G. A. and Winder, J. S., Jr., *A Scientific and Policy Review of the Final Environmental Statement for the Initial Stage, Garrison Diversion Unit (North Dakota) Bureau of Reclamation, U.S. Department of the Interior*, Environmental Impact Assessment Project of the Institute of Ecology, Washington, D.C., January, 1975.

- Smardon, R. C., *MEPA, The Massachusetts Environmental Policy Act—What it Means to You*, prepared by the Center for Environmental Policy Studies, Institute for Man and Environment, University of Massachusetts for the Executive Office of Environmental Affairs, Amherst, pamphlet, April, 1975.
- Smardon, R. C. and Galkiewicz, R., *Environmental Assessment Form Manual*, prepared by the Center for Environmental Policy Studies, Institute for Man and Environment, University of Massachusetts for the Executive Office of Environmental Affairs, Amherst, MEPA Technical Report No. 1, March, 1975.
- Smyth, R. B., (ed.), *A Scientific and Policy Review of Draft Environmental Impact Statement D-EPA-24005-CA Wastewater Treatment and Conveyance System North Lake Tahoe-Truckee River Basin*, Environmental Impact Assessment Project of the Institute of Ecology, Washington, D.C., March 30, 1974.
- Winder, J. S. and Allen, R. H., *The Environmental Impact Assessment Project: A Critical Appraisal*, The Institute of Ecology, Washington, D.C., October, 1975.
- Winder, J. S., Jr. and Lochner, C., *A Scientific and Policy Review of the Draft Environmental Impact Statement on the Development of Coal Reserves in the Eastern Powder River Coal Basin of Wyoming*, Environmental Impact Assessment Project of the Institute of Ecology, Washington, D.C., August 2, 1974.

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