

THE EVOLUTION OF RECLAMATION PRACTICE -  
FROM COMPLEX TO SIMPLE

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ABSTRACT

Reclamation practice is a function of public will expressed through either company policy or regulatory requirement and technical capability. Many of the contradictions and conflicts which appear in the reclamation and other environmental fields occur because regulatory requirements and technical capabilities tend to develop along parallel or divergent paths.

The evolution of reclamation practice in Alberta is viewed within the dual contexts of technical and regulatory development. The developmental tendencies within these two areas are evaluated with regard to recurring problems with environmental research programs.

APOLOGY

This is my first experience as Keynote Speaker. I have always felt that the Keynote Speaker's responsibility is to say something meaningful in an engaging way. While this sounds simple enough, it leaves the speaker somewhere between pretension and barnyard jokes. Though these are two areas in which I am reasonably comfortable, the attempted solution fortunately involves sarcasm and hyperbole, perhaps even more hospitable ground. At any rate, no offense is intended.

INTRODUCTION

After working in the field of land reclamation for 12 years as an industry employee and later as a government research and regulatory type, it has become clear that there are three categories of people involved in the process and that their views of the world have a great deal to do with how effectively the process operates. Specifically, I will address complexity and simplicity and how the three groups tend to place different value on these items. This has significant ramifications and has seriously diminished the effectiveness of many environmental regulatory programs.

It is important to understand the actors in this process. Three personality types are involved in reclamation: (1) the regulatory type; (2) the guy in the field; and (3) the research type. Whether they work for the government or the industry is irrelevant. The important point is that these people are motivated by very different impulses.

The Regulatory Type: This person dreams of a simple world, one in which lines of authority are clear, policy directives are unambiguous, guidelines are clear and logical and reports appear on time. Unhappily, at any one time, at least two of the above conditions are not met. He, therefore, manages to the best of his ability, often with the aid of improvisation and luck. His primary consolation is that he no longer has to work in the field and is, therefore, warm much of the winter and dry in the summer. This person is comfortable in meetings and enjoys a good jurisdictional argument. On bad days, he sends conflicting or ambiguous directives to the guy in the field.

The Guy in the Field: This person knows how to do the job, however, at any one time he is likely to be subjected to three or four conflicting versions of what he should be doing. His frustration level is often high and he also dreams of a simple world in which he receives a single set of directives and the technical and physical means to carry them out. He does not like people from the head office. His primary satisfactions are that he gets to drive around in a truck and when required to usher about people from the head office, he gets to choose the muddiest spot on the mine to show off. By the age of 35, he is generally in the head office.

The Research Type: These people are somewhat like dolphins. They are known to breed infrequently and are believed capable of human-like speech. Unlike the regulatory type and the guy in the field, they seek complexity rather than simplicity. This is because they are driven by curiosity and are generally not responsible for implementing the results of their work. It is also a poorly kept secret that when their work results in an identifiable conclusion their funding will cease. As an adolescent, the research type was continuously tormented by the kids who later became regulatory types and guys in the field. He has not forgotten this. When forced to socialize with these people, he is prone to sarcasm and erudition. He avenges earlier insults by delivering long-winded, incomprehensible answers to simple questions. This proves that he is fully cognizant of the complexity of the issue and is capable of listing each potential variable and interaction.

The degree to which a company or agency is understaffed determines how many of these three roles must be assumed by a particular individual. Many lightly-staffed companies require all three functions from one highly talented, if schizophrenic employee.

The preceding descriptions, though somewhat overdrawn, are meant to illustrate the sort of personalities involved in environmental regulation; why communication is miraculous when it occurs and why, left to their own devices, the three forces in this system will not pull in the same direction. The worst case scenario might resemble the following:

1. Research Type does irrelevant research.
2. The Regulatory Type, lacking usable technical advice makes regulations which cannot be implemented.

3. The Guy in the Field required to implement without the technical wherewithall either improvises and succeeds anyway or improvises and fails. Either way, he is criticized for not doing the job the "right way".
4. The Research Type requests continued funding, is refused, and steps 2 and 3 are repeated indefinitely without his help. He conducts many soulful discussions with colleagues about lack of support for "necessary research".

Fortunately, this does not happen in Alberta because on the government's side, the regulatory types, field guys and research types all work under the direction of the Land Conservation and Reclamation Council. The Council is responsible for implementing the Land Surface Conservation and Reclamation Act and thus ensures coordination of the three functions. This has been a remarkably successful concept and it has ensured that the research program has been tailored to the needs of the regulatory and field staffs. Also, it has ensured that regulatory requirements have not outstripped our technical capabilities.

### COMPLEXITY

Regulators are created by regulations which, in turn, are created by the public will. The public generally wants something simple, e.g.: "strip mines should be fixed up so that they can be farmed afterwards". This becomes the objective of the regulator.

Our educational system encourages the inductive approach to problem solving. Namely, reasoning based on the gathering of specific facts to support a conclusion. This has been a powerful tool in the advance of western civilization.

The scientific method is inductive. Done properly it permits the systematic generation of sound conclusions and the solution of problems. In its perverted form, it is the mindless generation of data or the undertaking of unrelated studies in the hope that a solution to the problem will magically appear (it rarely does). Effective scientific research permits the evaluation of complex problems, the systematic identification and resolution of the critical unknowns, the generation of conclusions and, if very good or lucky, the articulation of principles.

These principles are then used by the more deductively-minded (e.g., engineers, physicians, regulators, etc.).

Scientific research is, therefore, a process which should lead from complexity to simplicity. It often does not for three reasons:

1. There was no objective in the first place;

2. There was no strategy in which individual projects were developed to support achievement of the objective;
3. Secondary discoveries. These often occur and in some rare cases these prove more significant than the primary objective. However, before pursuing secondary discoveries, one should reevaluate the original research objective in order to avoid loss of focus, waste of time, money, credibility, etc.
4. The miniaturization of science. No doubt, due to short funding horizons and the pressure to publish at least three papers annually in refereed journals, many researchers have tended to economize effort by introducing and testing increasingly light-weight hypotheses. (While requiring less effort to subdue these more manageable hypotheses, there is some danger that they may become trivial.) It is often necessary, therefore, to assemble a series of independent projects so as to address a more profound hypothesis.

Initiation of environmental research programs without a clear objective and a research strategy is usually a futile exercise. When such research programs do start up, there is an unfortunate tendency to fund a string of unrelated projects which rarely generate a coherent set of conclusions. Why? Because the projects were designed only to be internally consistent rather than to achieve consistency within a program.

The result of this sort of poor planning leaves the research manager to eventually appear before the regulator and explain that: (1) He blew it; (2) "That this whole issue is a lot more complex than we originally thought, but we've come up with some fascinating findings..." or perhaps the least savory; (3) "The researchers blew it." Explanation 2 is often applied in this case in perfect innocence with all parties drifting away with the impression that we are faced with a vast, incomprehensively mysterious universe out there at the mine, cut block, duck pond, hayfield, river, gas plant, etc. While this is sometimes true, the public does not fund environmental research to get one more renditions of the "Complexity of Nature" litany.

### SIMPLICITY

The public funds environmental research to solve environmental problems. Solutions to problems must be workable. This generally means simple.

In seeking technical support, the public, the regulator and the field staff articulate the need for simple answers. They do not particularly care how many complex issues must be dealt with before they receive the simple answer. It is the responsibility of the research type to phrase his questions so that the end of the process a simple answer is generated. It may be good or bad news but it must be correct and it must be simple.



# Proceedings of a Symposium

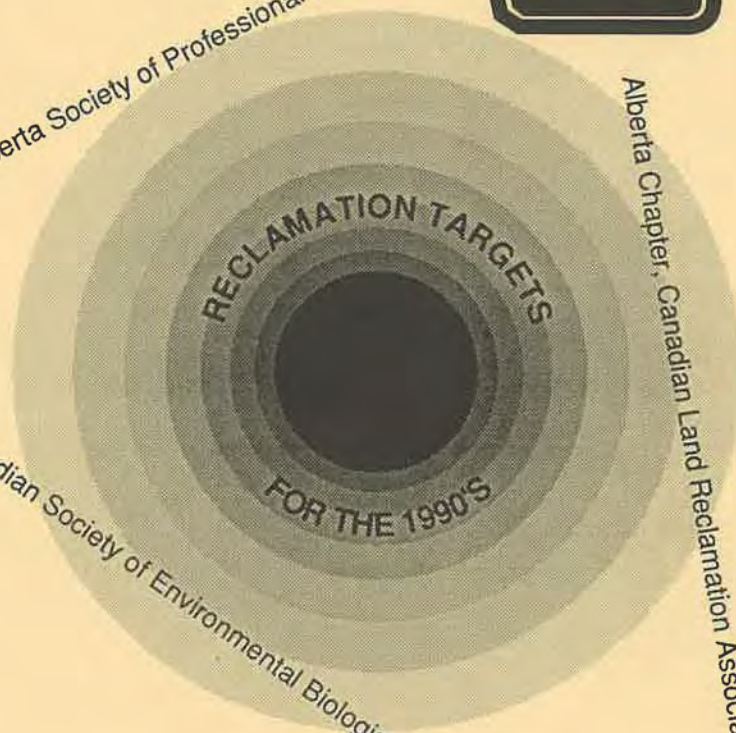


The Alberta Society of Professional Biologists



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Alberta Chapter, Canadian Land Reclamation Association



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RECLAMATION TARGETS FOR THE 1990s

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PROCEEDINGS

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And a special thank you to our two guest speakers:

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Dr. Larry Holbrook, Biotechnica International of Canada, Calgary, Alberta who spoke on Biotechnology and Biologists

- and -

to the Hon. Ken Kowalski, Minister of Environment, for delivering the opening address.



## MESSAGE FROM THE ORGANIZING COMMITTEE

Reclamation practitioners and researchers have gone a long way to solving the problems posed by such disturbances as mining, drilling and pipeline construction. The future challenge for reclamation lies in applying our expertise in other areas such as industrial site decommissioning, habitat creation and restoration, and urban design.

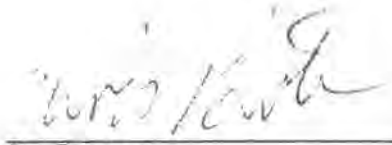
The Symposium was designed to expose participants to a wide variety of "new" areas where reclamation science could be applied. These were the "targets" referred to in the Symposium title. The speakers did an excellent job in meeting this goal. Some of the participants felt the Symposium had not provided enough information on new methods to be employed in reclaiming these new disturbance types. While this was not the goal of the Symposium it remains a valid concern that should be addressed in a future symposium.

Finally, the Hon. Ken Kowalski, Minister of Environment, encouraged all participants to get out and preach the need for, and successes of, reclamation, and indeed all environmental programs. Telling ourselves in conferences how wonderful we are is preaching to the converted. We need to let those who benefit from our labours, that amorphous group known as the public, know what we have done for them. This, too, should be the topic of a future symposium.


The papers in this proceedings have been edited and retyped into a common format. The contents of the papers are essentially unchanged from the submitted manuscripts of the authors.



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