

RECLAMATION BY TRANSALTA UTILITIES THROUGH PLANNED RESEARCH AND EXPERIENCE

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This presentation will deal with four topics. The first two will be brief and will describe what TransAlta Utilities Corporation is and the business which TransAlta Utilities is engaged in. I will then present a description of our reclamation activities, what the research programs are and details of the experience we have gained in reclamation since mining started in the Lake Wabamun area.

TransAlta Utilities is an investor owned electric generating company employing approximately 2,500 people. The company head office is located in Calgary, Alberta. In 1909, Calgary Power Company Limited was incorporated as an Alberta business. In 1981, the name was changed to TransAlta Utilities Corporation. The company originally served the Calgary area from hydro electric dams located to the west of Calgary in the mountainous regions. The company has, of course, expanded and is now a diverse organization responsible for the mining of coal, the generation of electricity and the delivery of power to customers throughout the south and central portions of Alberta. The roots of the company were in hydro electric generation. In 1962, the first coal-fired generating plant was opened. The Wabamun plant, located 65 kilometers east of Edmonton, is fed with coal from the Whitewood mine immediately adjacent to the plant. In 1970, the Sundance generating plant was opened and is supplied with coal from the Highvale mine to the south of Lake Wabamun. A third plant, Keephills, is to be commissioned in 1983, and is to receive coal from the Highvale mine.

Since 1962, coal mining at the Whitewood mine has recovered approximately 34 million tonnes of coal with delivery at the present of approximately 1.5 million tonnes per year. The Highvale mine has yielded approximately 40 million tonnes of coal from 1970 to 1981 and recovery of coal is now at 8 million tonnes per year. The permit area of the Whitewood mine contains approximately 75 million tonnes of coal and the Highvale mine approximately 1,000 million tonnes of coal. With these tonnages available, there are obviously many years of active mining ahead of us and that, of course, means years of active reclamation.

I will now describe very briefly the activities that we go through prior to mining coal. Following exploration to evaluate the size of reserves and the heat value of the coal available, mine plans are developed. When mine plans are suitably mature, the surface rights to the land are acquired by the company and negotiation with the owners of the coal rights are started. Applications to the Energy Resources Conservation Board and also Alberta Environment and related agencies are started in order to provide adequate time before the mine must be opened. To meet the requirements of the Government agencies, numerous reports, environmental impact statements, soil surveys, water resource surveys and, of course, coal resource and mine planning designs must be submitted. The keystone to the reclamation and development approvals for the mine come in the

form of the Development and Reclamation plans which are reviewed by a multi-disciplinary committee under the chairmanship of a member of Alberta Environment. When mining has recovered the coal, the mine spoil is levelled, subsoil and topsoil is replaced, vegetation is re-established and the land is put back to useful purposes. The land must, of course, be given a reclamation certificate prior to returning to private or other ownerships other than TransAlta Utilities.

A nutshell history of the Whitewood mine shows us that in 1962, the mine was opened at the east end of the permit area. REclamation activities started in 1963 by simply knocking the tops off spoil piles and seeding the area with alfalfa and mixtures of alfalfa and grass. The steep slopes were not suitable for agricultural equipment and the area has slowly re-established itself with natural vegetation. Most recently, slopes on levelled spoil have been reduced to 10 degrees or less and this makes the area suitable for seeding and management with farm equipment. The vegetation planted and managed in these areas has been chosen to create an erosion free cover, to rebuild an active soil and to allow for the multiple use of the areas in the future.

A similar nutshell history of the Highvale mine shows us that in 1970, mining began. In 1973, the reclamation of Pit 01 to the west of the generating station was undertaken although seeding was not successful. After spreading 45 centimeters of suitable soil, reseeding the area in 1979 was very successful and reclamation has now moved from Pit 01 to Pit 02. Soil depths of 45 centimeters have now been increased to 1.2 meters of replacement wherever the suitable soil existed to that depth before mining. In 1982, Pit 03 two miles to the west of Sundance generating station will be opened.

TransAlta Utilities has always believed that finding solutions to reclamation problems must identify the most economical and technically feasible methods. A range of research related programs have been in effect since the early 1970's at both the Whitewood and Highvale mines. I will briefly describe the scope of these projects and a few notes on the results obtained to date. Trials with alfalfa, barley and various rates of fertilizers have been set up to determine if fertilizer is really essential for the successful growth and production of cereal crops at Whitewood. The results have shown that, although fertilizer can give extremely high yields, the self-sustaining nature of the soil is far greater if alfalfa is rotated with the barley crop, preferably on a seven year basis with five years of alfalfa and two of barley.

Wildlife at the Whitewood mine has always been a high priority and grass and trees have been established on the older mine areas. In 1976, the Stony Plain Fish and Game Association established 2,900 trees and shrubs on an old spoil area. Their findings are summarized in a 1981 report and conclude that 25 to 50 centimeter trees are the best to plant in grassed areas; that white spruce must be planted in early spring to be successful; and wildlife in the area has made increasing use of the land since 1977.

The growth of grass on the ash lagoons at the Whitewood mine has been looked at since 1977. Ash is particularly poor in nitrogen and does not hold nutrients well. We have found that some grasses and alfalfa can successfully grow on the ash. There are still questions remaining on how long these plants will keep growing without regular fertilizer applications.

At the Highvale mine, there have been some modest investigations of trees and shrubs growing in mine spoil and suitable soil on spoil. The greatest problem has been controlling weed vegetation around the trees and shrubs which tended to die out after being smothered by the weeds. This program will be modified to make use of the trees and shrubs in regular plantings along fence rows and at the same time, testing certain selected species.

A most interesting and, I believe, challenging project at both Highvale and Whitewood is the measurement of productivity on pasture land, hay land and land cropped to cereals before mining. We call these productivity or target yield plots. The results we have obtained so far indicate that on the better soils in the Highvale area, 1.4 to 1.7 tonnes of hay are produced per acre and on the poorer solonchic soils, 0.9 to 1.5 tonnes of hay are produced for each acre.

Reclamation is not a new activity to TransAlta Utilities and has in fact been a part of our operations for the past 18 years. By December 31, 1981, we had mined 1,869 acres at the Whitewood mine and successfully reclaimed 1,210 of these acres. At the same time, we have mined 1,037 acres at Highvale and reclaimed 217 acres. Reclamation has involved a diverse number of activities and our experience has shown that extremely successful crops can be grown at Whitewood with a minimum of soil salvage and manipulation prior to seeding and farming. The soils at the Highvale mine are very different from those at Whitewood and contain high levels of sodium in some instances and are also slightly more acidic. The result of this is that there has to be careful selection of suitable topsoils and subsoils before mining at Highvale and these soils have to be carefully respread on the mine spoil. There have been no indications on the reclaimed sites at Highvale that our past approach of replacing 45 centimeters of suitable soil will lead to poorer returns from the land than previously existed. Our most recent decision to replace as much as 1.2 meters of suitable soil gives us further assurance that our long term reclamation will match our recent experiences of success and a positive return on our efforts. As evidence of this, our land is producing between 1 and 2 tons per acre of very valuable hay and at Whitewood, we have raised one extremely good crop of barley yielding 35 bushels per acre. This particular crop has received numerous very favourable comments from members of the Canada Department of Agriculture and others concerned with the growth of pedigreed seed. Experience takes time. At both Whitewood and Highvale, we do not consider that the investigation of our success has to stop just because the plants keep coming up green. We have in place, a number of assessment or monitoring programs that provide us with insights on how the soils are maturing on our reclaimed land, how the crops are responding to our management approaches and what corrective actions, if any, we have to take in the future. We look forward to adding to the long history of this company with valuable planned research programs and beneficial reclamation that will enable many people to appreciate and enjoy the lands returned to a variety of uses following mining.

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INTRODUCTION

Last Spring the Provincial Government's Reclamation Research Technical Advisory Committee presented a two day Reclamation Research Seminar at the Chateau Lacombe. We were surprised by the large turnout and an overwhelming majority of those in attendance indicated the desirability of an Annual Reclamation Conference for Alberta which would focus on Policy and Practice as well as Research and which would include industry, academic and government participation.

These were very sensible suggestions though their implementation would exceed the mandate and manpower of the Reclamation Research Technical Advisory Committee. So various groups were contacted to sponsor and help organize the Conference. Positive responses were received from the Canada Land Reclamation Association (CLRA) The Alberta Government's Land Conservation and Reclamation Council, The Coal Association of Canada and The Oil Sands Environmental Study Group (OSESg).

The CLRA authorized formation of an Alberta Chapter to serve as the umbrella organization with a Program Committee consisting of representatives of the Government and the two Industry groups. Through this Conference and perhaps other functions the Alberta Chapter of the CLRA can fulfill two important roles:

1. To provide an opportunity for members of the Reclamation community to meet, exchange experiences or argue and otherwise improve communications among its industry, government and academic factions.
2. To provide a public forum for reclamation activities, capabilities, issues and challenges.

This was the first function of its kind in Alberta. Special thanks are due the Sponsors, Speakers and the other Members of the organizing Committee: Jennifer Hansen, Malcolm Ross and Al Fedkenheuer. Their talents and efforts made the Conference a success.

One final word on the Speakers: they were given very short notice of the Conference and not only responded enthusiastically but prepared presentations which were of remarkable quality and consistency. We are fortunate to have individuals of this caliber working in the Field of Reclamation in Alberta.

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