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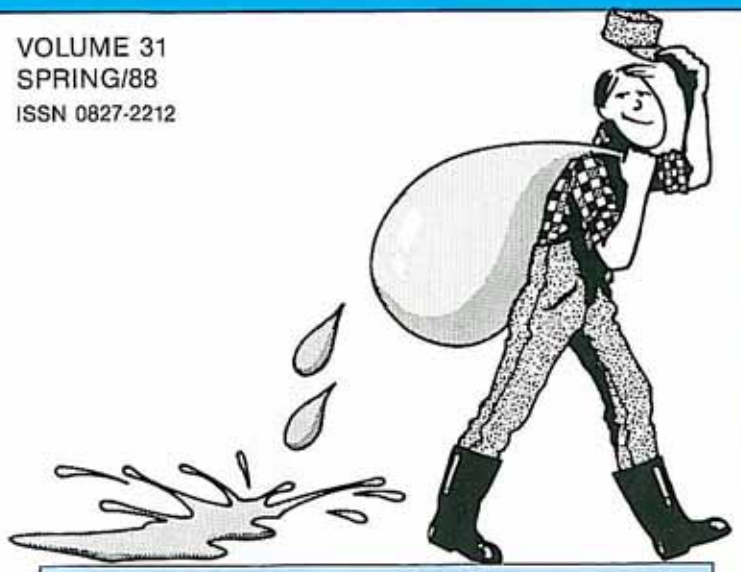


IN THIS ISSUE:

CORRUGATED METAL PIPE DURABILITY STUDY

25 Year Expectancy Confirmed.

Corrugated Metal Pipe (CMP) is one of the most widely used construction materials in southern Alberta's irrigation districts. Many durability studies have been done in various parts of North America by transportation agencies, but no one has ever studied the durability of CMP in an irrigation environment. This task has recently been completed by the Research, Planning & Monitoring Section of the Irrigation Branch of Alberta Agriculture in Lethbridge.

In the course of the study, over 200 different CMP structures with verifiable installation dates were examined in eight irrigation districts. Tests done at each site included: soil and water resistivity, soil and water pH, and soil to pipe electropotential. The soil to pipe potential measurement is a valuable tool in estimating the condition of the culvert exterior. The potential between the culvert and soil (measured in millivolts), drops as the zinc coating on the culvert is corroded away and only bare steel remains. Therefore, the potential coupled with the internal appearance of the culvert helped the inspector give the pipe a rating based on its estimated functional life remaining. With the functional life remaining, expressed as a percentile, and the actual age of the culvert, an estimated life expectancy was derived.

On site tests included soil and water resistivity, soil and water pH, and soil to pipe electropotential.

Previous studies by several transportation agencies had suggested that soil resistivity and pH influenced culvert life. To test this hypothesis and its applicability in southern Alberta, soil and water resistivity and pH values for each structure site were plotted against the life expectancy for each structure. Our findings show little or no reliable relationship can be found between expected life and resistivity or pH.

By inspecting culverts before they were to be removed during rehabilitation work, and then examining them once again after they had been removed, a great deal of confidence was built into the rating scale. Using the percent of remaining life estimates and the actual age of the culverts, it was found that 99.5% of the structures investigated had an expected life of 25 years or more and 82.7% of the structures had an expected life of 50 years or more.

Several recommendations have been proposed as a result of the study.

1. Use soil resistivity values of 1000 ohm-cm or less only as a warning of possibly corrosive conditions. Soil resistivity has been found to be more influential in determining corrosion than water resistivity.

2. Use the performance of other culverts already installed in the construction area as a guide to the possible performance of a new installation.

3. If a possibly corrosive environment is detected, use preventative measures such as a coating, or heavier gauge, as a low cost corrosion fighter. Cathodic protection should only be used in extreme cases, as it is generally too expensive and requires too much maintenance for widespread use.

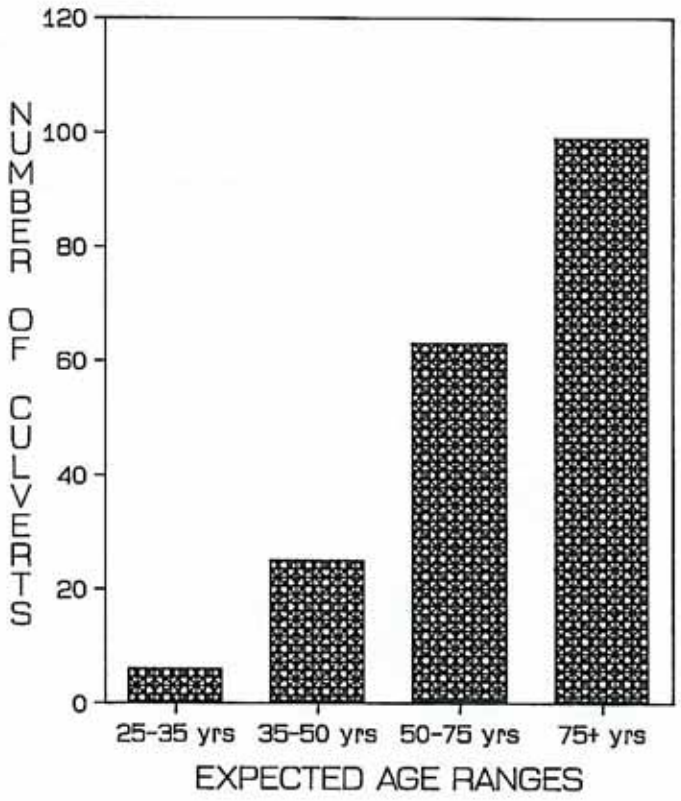
4. Take care to ensure that coatings are not scratched or chipped during transport or installation.

5. Avoid adding new sections of pipe to older pipe.

6. Use homogeneous and uniformly compacted backfill.

7. Do not use CMP for steep gradients, as the combined action of corrosion and abrasion severely reduces culvert life.

CMP LIFE EXPECTANCY



This study has shown that corrugated metal pipe has provided good service in irrigation applications such as turnouts and road crossings. In these applications, a design life of 25 years can be very confidently used.

The fact that almost 83% of the CMP structures had an expected life of 50 years or more, suggests that a design life of much more than 25 years can be used. However, CMP has shown poor performance characteristics when used in tailouts. This problem is emphasized by the fact that the only CMP structure out of 201 studied which had failed before 25 years of age was a tailout. Therefore, if some of the simple safeguards outlined above are used when planning and installing a structure, CMP can continue to be used on a wide basis. Southern Alberta's Irrigation Districts should be able to use CMP with confidence for many years to come. For a copy of the complete report, or further information, please contact Svat Jonas, P. Eng., Irrigation Branch, Alberta Agriculture, Agriculture Centre, Lethbridge, Alberta, T1J 4C7. Telephone (403) 381-5164. ■

IRRIGATION CENSUS UNDERWAY IN ALBERTA

1st Comprehensive Irrigation Farming Census.

The first-ever comprehensive irrigation farming census conducted in Alberta is currently underway. The uniquely Alberta survey, which will collect information for the 1987 calendar production year, will supplement and update general Statistics Canada information provided through its 1986 Census of Agriculture.

John CALPAS, long-time employee of Alberta Agriculture and avid irrigation promoter, is spearheading the census with the Statistics Branch of Alberta Agriculture. The irrigation census has the full support and cooperation of the Alberta Irrigation Projects Association, Alberta Environment, and all of the irrigation districts. "Without their significant help and support, this census would not be possible", says Calpas.

The census will extend through to the end of April and CALPAS urges all irrigation farmers and agricultural water users throughout Alberta to complete and return the irrigation questionnaire. All irrigation districts have the necessary documents and have pledged their ditch-rider staff assistance, where required, to assist their water users with the census. The compilation and analysis will be on a summary level basis, since individual responses will remain strictly confidential.

CALPAS believes the irrigation census will point to trends and opportunities in the agricultural industry which will be useful for future planning and will benefit both the irrigation and dryland sectors. The 1986 Statistics in the National Census indicated that in aggregate, irrigation farmers in Alberta farmed almost an equivalent acreage of dryland — some 1.3 million acres.

"In recent years we've done a meticulous job documenting information of irrigation costs and public investment in capital works and rehabilitation. The public and environmentalists keep throwing those numbers back at us and some cry fowl, subsidies and so forth", says CALPAS. "The industry and the irrigation community need to step up their efforts in documenting and promoting the benefits side of the irrigation equation. I believe this census is one giant step in that direction, since it will provide each irrigation district with a detailed overview of the character, scope and impact of their agricultural production."

"I'm convinced there's lots of 'slippage' in adequately quantifying all the primary production components let alone the secondary and tertiary impacts, even before we go on to the municipal, industrial, recreational and positive environmental habitat considerations.

Anti-irrigationists are doing their lobbying, getting a lot of media support and, in the process, are spreading a lot of misinformation.

We know and understand what irrigation means to the Alberta economy, but we can't afford to sit on our hands and take things for granted. The support of each and every irrigation farmer is essential to help tell the irrigation story and get the facts to all Albertans. They can contribute significantly by taking the time to accurately complete the census questionnaire and return it in the stamped, self-addressed envelope to our Statistics Branch", says CALPAS.

The five-part irrigation census focuses on irrigation systems, crop and livestock production, capital investments, management practices, irrigation-dryland productivity comparisons, and covers a wide range of irrigation demographics. "It is not intended in any way to replace the district's regular agricultural production information gathering and publication, but if they get a few new ideas from the process, that's great. I'm sure they'll have some excellent supplementary data to provide for their water users. Preliminary census results should be available in the fall of 1988."

"We also have an excellent opportunity to get a detailed window, especially on southern Alberta's complex livestock industry. The impacts, multipliers and irrigation-dryland interdependences are especially significant in the range beef and feedlot sectors. They support a tremendous agri-business service and processing industry, but we've never really been able to put a good handle on it", says CALPAS.

REMEMBER, the census continues through April. Irrigation District support and involvement will ensure its success.■

LANDOWNER HABITAT PROJECT

Landowners to be Paid to Keep Critical Wildlife Habitat.

No question, rehabilitation of a canal stops seepage and in doing so often eliminates critical wildlife habitat. Now, however, there is a project in place that can reduce this habitat loss by actively encouraging the landowner, through economic incentives, to retain and manage some of those seepage areas.

In the early 1900's, irrigation became a permanent fixture of the land with remarkable results. High production of a variety of agricultural crops became a reality, along with oases of trees, shrubs and grass wherever there was seepage from the canals. Several species of wildlife adapted so well to these seepage areas and to adjacent irrigable and non-irrigable land that their survival in any given year was dependent on these areas. These areas are critical wildlife habitats, particularly for pheasant, waterfowl and deer.

Unfortunately, over the years, many of the critical habitats have been lost as a result of a number of things, including irrigation rehabilitation projects. Recent studies by the Alberta Fish and Wildlife Division showed losses of critical habitats, after an 8 year period (1975-1983), of 20 to 76 percent depending on the irrigation district involved. Forty-four to 96% of these habitats were on private land. To reverse this loss on private land, the Fish and Wildlife Division and Wildlife Habitat Canada developed a 3 year pilot project, called the Landowner Habitat Project, to determine effective means of reducing the loss of critical habitat. The Bow River Irrigation District (BRID) and the Eastern Irrigation District (EID) were chosen as the study areas because 80% of the remaining pheasant and waterfowl habitat are within these two districts; they have cooperated in the past; and they have an active canal rehabilitation program.

A prime objective of the project is to develop acceptable economic incentives through direct payment, or payment in kind to the landowner in return for maintaining and enhancing critical habitat on his or her land. Those critical habitats in danger of removal through irrigation rehabilitation programs help in prioritizing which landowners are approached first.

The process of acquiring landowner's cooperation involves: discussions of the farm operations in so far as they affect existing or potential critical habitat and discussion of ways to maintain and improve the critical habitat. Such practices as rotational and deferred grazing, limited tilling, fencing and delayed haying help in improving vegetative cover for pheasant, deer and a host of other wildlife species. Also, farms suffering from erosion and overgrazing can often benefit from such practices. A delay in haying by just one week can result in increasing pheasant production by 30 to 40 percent. Although some hay quality is sacrificed for quantity, many farmers feel they can cut later providing they are paid a dollar value for the delay and the acreage involved is not too large.

Valuable areas of trees, willow, cattail and adjacent farmland provide the critical habitat for wildlife survival.

Length of agreements vary from 5 to 20 years and more. There are also possibilities of agreements more permanent in nature such as restrictive covenants and easements.

The agreement, once signed by the landowner, should then be endorsed by the irrigation district in which the critical habitat exists. This endorsement assures that canal access and a water source is available to the Alberta Fish and Wildlife Division for maintenance and improvement of the critical habitat. Water for the critical habitat is used only when not required by the landowner for crop production. At no time is water provided to the critical habitats when it is needed by the water users for their farm operations.

With the endorsement completed, the Fish and Wildlife Division and the landowner agree to a location for the erection of an attractive sign that acknowledges the landowner and irrigation district "cooperation and participation in the enhancement and management of habitat for Alberta's Fish and Wildlife Resources". The landowner still has sole right to control access and may find that the sign helps in reducing trespass violations.

The response of landowners to the program has been excellent in that most farmers approached are willing to cooperate to maintain some of their wildlife habitat. The key ingredients for success of this project are: (1) an interest in maintaining wildlife; (2) economic incentives to complement the changes asked for in the farm operation; (3) cooperation of the irrigation districts in allowing access and water, when available; and (4) support from various branches of Alberta Agriculture and the private sector in the form of advice for formulating incentive payments and classifying land upon which the critical habitat exists.

Agreements are sought from landowners only where the maintenance and improvement of the critical habitat will not seriously conflict with the objectives of an irrigation rehabilitation project. There is a misunderstanding among some landowners who feel a conflict of interest exists, namely, one department removing seepage areas and subsequently another one to reestablish them. On the contrary, the program is a cooperative venture, whereby the loss of water through seepage is now utilized to maintain critical wildlife habitat. Measured amounts of water are now supplied by the district, only when not required by the water users, to maintain this critical wildlife habitat. Maintenance of critical habitat through water application must not contribute to salinity problems on land adjacent to the habitat.

The Landowner Habitat Project is just a beginning towards assuring that wildlife is a part of the private landscape. As long as the landowner appreciates wildlife and receives reasonable compensation for changes in his or her operation to accommodate wildlife, there will be a future for the wildlife resource on private property. The public must, however, be willing to pay the landowner a fair price to retain critical wildlife habitat.

For further information please contact Lorne Fitch, Habitat Management, Fish & Wildlife Division, Alberta Forestry, Lands & Wildlife, 530 - 8 Street South, Lethbridge, Alberta, T1J 4C7. Telephone (403) 381-8681.■

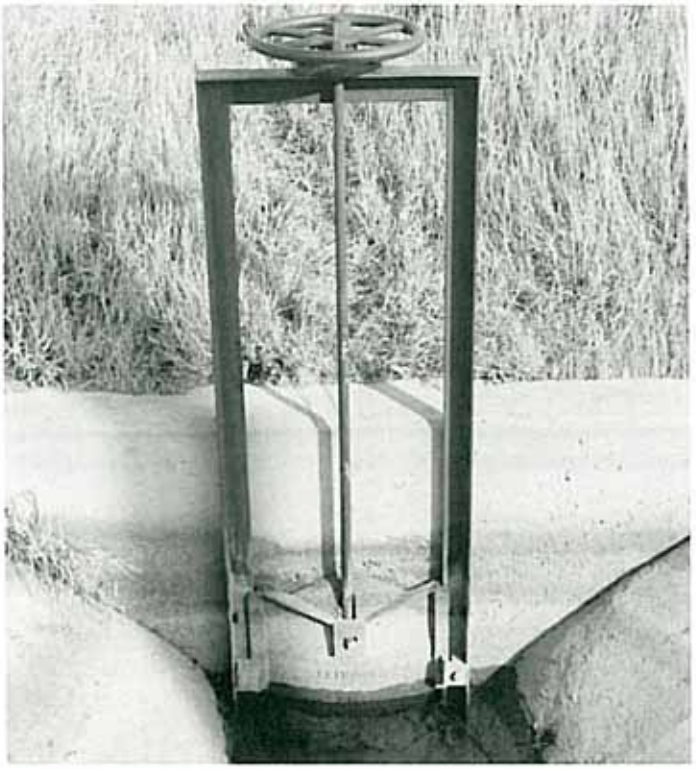
LEAKY GATES

Two Year Research Study Underway.

Leaking turnout gates can be a nagging headache for farmers and ditchriders. Seepage through poorly sealed gates causes problems with trafficability in nearby fields, increased weed growth, soil degradation, reduced crop yields, and a needless loss of valuable water. A recent report by Associated Engineering Alberta Ltd. for the Irrigation Branch of Alberta Agriculture, has attempted to assess the severity of the problem of leaky turnout gates and proposes some viable solutions to minimize leakage.

To determine the severity of the problem, 16 gates (including Lethiron, Armco, and Whipps brands) ranging from 450 to 1200 mm in diameter and 1 to 34 years in age, were investigated. All of the gates were situated along main laterals in the Raymond Irrigation District. To determine the rate of leakage, the gates were closed and the downstream side was drained. The water level upstream of the gate was raised to its maximum level and the leakage through the gate was measured using a small pump and a measuring vessel.

Leakage rates were found to vary from a high of 1.035 L/s to a low of 0.009 L/s, with an average rate of 0.3 L/s. Reasons for the leakage included debris buildup, weed growth, silt, improper adjustment, and corrosion or gouging of the seating faces. Leakage rates were not wholly dependent on age, since a 34 year old Lethiron gate produced the least leakage of all the gates studied.



Associated Engineering recommended several means of reducing the leakage.

One proposal calls for the installation of scrapers to clean the seats when the gate is opened or closed. One wiper would be mounted on the gate frame to scrape the slide face, and another wiper mounted on the bottom of the slide would scrape the thimble seat face. Another solution could be the addition of a lever arm on the gate frame. The lever would be attached to the slide and pass through a fulcrum point above the slide, allowing this operation to exert additional pressure on the gate face and thereby produce better seat contact. However, reducing leakage can be as simple as properly adjusting the wedges so that the slide settles evenly on them, or thoroughly cleaning debris from the inlet so that it will not be caught between the seat faces.

Although it is easy to disregard a small trickle of water leaking through a gate, consider these numbers: a 0.3 L/s flow over a 163 day irrigation season translates into 4225 m^3 of water. If the estimated 9000 turnout gates in use in southern Alberta are shut and leaking for 30% of the irrigation season, 11,407,500 m^3 - approximately 9250 acre feet - of valuable water is trickling away each year.

Funding for the continuance of this research study in 1988-89 has been provided by Farming For the Future. Associated Engineering will return to the original study area in 1988 to further monitor the gates and implement some gate improvements. Hopefully some viable solutions can be found for this often ignored waste of water.

For more information please contact Svat Jonas, P. Eng., Irrigation Branch, Alberta Agriculture, Agriculture Centre, Lethbridge, Alberta, T1J 4C7. Telephone (403) 381-5164.■

EDITOR'S NOTE

"From the Farm Perspective" will be a new feature article that will highlight on-farm irrigation topics. Many of the articles will be written by the irrigation specialists, however, anyone with an idea for an article is welcome to contribute it.

FROM THE FARM PERSPECTIVE

Drip Irrigation Used to Irrigate Dry Corners.

A demonstration project was initiated through Farming for the Future to show how subsurface drip irrigation could be used to irrigate "dry corners" on fields irrigated with centre pivots.

In May 1987, 8,910 metres of typhoon dripper line was installed on three acres of a field in the Vauxhall area of the Bow River Irrigation District. The dripper line was installed at two depths, 30 cm and 37.5 cm and at two spacings, 1.25 m and 1.5 m. This gave a total of four fields to demonstrate the best depth and spacing. Soil moisture readings were read weekly with a neutron probe. The area was seeded to soft white spring wheat near the end of May 1987.

The installation process greatly dried out the soil to a dry powder, resulting in a very poor germination. Because of this condition, gophers became a problem and chewed holes in the line in three or four places. These were easy to spot because the ground became saturated. The line had to be dug up and repaired. Because

The typhoon dripper line is installed into the soil by the plough method.

the soil became saturated quickly, the crop appeared to do better in these locations. After moisture levels were raised, gophers were no longer a problem.

The other major problem was filter plugging. A 200 mesh filter was installed on the system which was fed from the centre pivot supply. The problem was eventually solved by continuous bleeding off of a small amount of water from the filter. This caused a continuous flushing action and prevented a buildup of algae on the filter.

Approximately 6 million litres of water was applied through the subsurface irrigation system. This represents approximately 450 mm of water being applied to the project area. Because the soil was dried out beyond the wilting point at installation, a lot of the water applied was unavailable to the crop in the first year.

1st Year Yields bu/ac

Spacing Depth	Average
1.5 m x 37.5 cm	54.7
1.2 m x 37.5 cm	78.7
1.5 m x 30.0 cm	72.6
1.2 m x 30.0 cm	74.7

bu/acre based on 14% moisture.
Dry Basis vs. Spacing and Depth of Dripper Line.

The dryland adjacent to the project site had a yield of approximately 15 bu/ac. The soft white wheat under the pivot ran about 70 bu/ac. The yields for the demonstration area are very impressive when one considers the very poor germination and resulting poor stand. Next year the yields should be higher due to improved germination. The first year data indicates that the narrow spacing is better than the wide spacing. We suspect that this may not hold true for 1988 because the soil moisture is much more uniform now for germination.

Now that the system has been installed and some of the problems worked out, we expect better results from the demonstration project this year, says Lloyd Healy, Irrigation Specialist. Again in 1988 it will be monitored for soil moisture and yield samples will be taken. A field day is planned in 1988 to demonstrate how it works.

For further information please contact Lloyd Healy, Irrigation Specialist, Alberta Agriculture, Provincial Building, Vauxhall, Alberta, T0K 2K0. Telephone (403) 654-2161.■

GRASS CARP RESEARCH STUDY TO BEGIN IN '88

Proposed Five Year Study.

Triploid grass carp, the sterile genetic derivatives of the common grass carp are being imported under quarantine into Alberta for a trial research project. The fish, as many of our readers remember, is herbivorous and is stocked in irrigation canals in the United States to control aquatic vegetation.

The Irrigation Council of Alberta approved funding year one of the proposed five year study. A Committee on Biological Control of Aquatic Vegetation was formed to oversee and manage the research. This committee is made up of researchers and members from: Alberta Departments of Forestry, Lands & Wildlife, Environment, Agriculture, Alberta Irrigation Projects Association, and Canada Agriculture.

In the first year of the study, the fish will be raised under quarantine in the Vegreville Research Centre. There, the fish will be subjected to a multitude of pathological tests for disease and parasites, as well as, sterility. Year two, will see the first field stocking in a closed system (dugout) in the Raymond Irrigation District. The Raymond Irrigation District is the logical choice recommended by the committee, because if any accidental release of the sterile fish should occur, the fish would likely end up in land-locked Pakowki Lake and winterkill. Actual stocking of fish in a flowing canal won't take place until the third year, and then only after careful examination and analysis of past years' results.

The research study will provide meaningful answers as to the fish's effectiveness here in Alberta as an alternative to aquatic herbicides, mechanical harvesting and other current techniques for managing aquatic plants in irrigation canals. It is expected that this sterile fish will occupy an unfilled niche in the ecosystem.

For more information please contact Duncan Lloyd, Irrigation Branch, Alberta Agriculture, Agriculture Centre, Lethbridge, Alberta, T1J 4C7. Telephone (403) 381-5164.■

ALBERTA AGRICULTURE RETIREMENTS

Jay Purnell

Mr. Jay Purnell retires June 6, 1988 after 21 years of service to the Departments of Agriculture and Environment. Jay began his engineering career as a junior sewer design engineer for the City of Calgary away back in 1959. In 1961, Jay left the engineering field to teach school. This was short lived however, for he was back "engineering" the next year. After four years in B.C. Water Resources, Jay came back to Alberta as a River Basin Planning Engineer. In 1972 he became the 1st Director of the newly formed Irrigation Division.

Jay in retiring reiterates that "I'm just happy to have played an active role in seeing our irrigation development grow from 700,000 to 1.2 million acres today. In those years, ICW funding increased from 1 to 30 million dollars, we developed the ditchrider course, the irrigation manager/board member annual seminar, saw the debut of the television program "Agri Vision" and the publication of the Water Hauler's Bulletin. To say the least they were fast paced productive years."

Jay won't stray too far away from irrigation as he and wife Gail plan to continue to live in Lethbridge. Happy retirement Jay!■

Kaljo Pohjakas

Mr. Kaljo Pohjakas, after more than 20 years of being involved with the utilization and management of soil and water resources, is retiring. As Branch Head of the Land Classification since 1981, Kaljo has been responsible for land classification in Alberta for water rights, rehabilitation and irrigation project improvement. However, he did not start with Agriculture in this capacity, but worked from 1976 to 1981 as a soil and water specialist conducting applied irrigation research.

Before coming to Alberta Agriculture, Kaljo spent 12 years working with the Canada Department of Agriculture. He has also spent 8 years overseas with U.N.F.A.O. & C.I.D.A. in Iran, Malaysia and East Indonesia.

Kaljo will be long remembered for spearheading the first Land Classification Standards Manual for use here in Alberta. Even after retirement Kaljo says he won't be too far away from his life's work - irrigation and soil management.

On the occasion of his official retirement, may we extend our congratulations and best wishes for a long happy future.

NOTE:

Alberta Agriculture is organizing a retirement party for Jay and Kaljo on May 6, 1988 at the El Rancho Motor Hotel. Anyone wishing to attend or like to contribute to a gift please contact Mrs. Rita Alexander at telephone (403) 381-5158.■

THE WATER HAULER'S BULLETIN

Designed to provide the operation and management personnel of Irrigation Districts with items of interest in their line of work. Comments are welcome. Please contact Duncan Lloyd, editor, at Area Code (403) 381-5164, Lethbridge.

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