

Farmers Start Savings Account of Water

Haystack Dam And Reservoir To Meet Need

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When you have a savings account in the bank and find yourself needing extra funds to meet an unexpected emergency, you draw out the amount you require.

And when you have a little extra money during ordinary times, you store up savings for the next emergency.

The farmers of irrigated land around Madras will have just such a savings account when Haystack Dam is completed in November. The only difference will be that they will have water in the bank instead of money.

They are the farmers of the North Unit Irrigation project of 50,000 irrigated acres. During the 12 years they have been farming the project, they have had a few emergencies when they needed either more or less water than they were getting. In those brief periods they were out of luck. They had no place to get it.

Farmers Ask For Help
So they lost money when they couldn't give their crops enough water. On other rare occasions of heavy summer rains, they didn't need the irrigation water available to them and it was wasted by spilling it out into the Deschutes or Crooked rivers. It was like pouring gold into a gutter.

They brought the matter to the attention of the U.S. Department of the Interior. The department's Bureau of Reclamation engineers scouted around and found a gently sloping area with hills around it on three sides near Haystack butte. They knew they could throw a 1200 foot long dam across the fourth side of this amphitheater and make a storage basin to hold a lot of water for release when it was needed; or to store excess supplies.

The location was almost perfect — 20 miles north of Redmond, 11 miles south of Madras, in the southern part of the Unit close to the main canal that brings water from the Wickiup reservoir about 80 miles to the south-southwest.

It takes five days for water to come from Wickiup; three from the gates below Bend. In that time, crops can be damaged.

It's Water In The Bank
Work was started on the dam in April of 1956. During the next farming season, the North Unit, or Agency Plains, as part of it is particularly called, will have its savings account of 6,000 acre feet of water ready for use any time it is needed. That's about two billion gallons, enough to meet any emergency conceivable at this time.

It's water in the bank for the farmers, and it will be money, too. Like most other problems, the general question and the way to find the answer to this one were simple. But the steps toward the solution required knowledge, skill, special machinery, and more than 18 months of hard work by 40 or 50 trained men — and \$1,345,000.



VIEW OF BASIN FROM DAM'S TOP — Broken rock in the foreground is at the top of Haystack dam, 80 feet above the low point of the upward sloping reservoir in the center of the picture. It is surrounded on three sides by hills in the background. (Bend Bulletin Photo)



TURNOUT STRUCTURE — Water from the main canal (shown in foreground) will be sent through this turnout structure into the feeder canal beyond which will take it into the two billion gallon capacity reservoir. (Bend Bulletin Photo)

The contract alone to the R. A. Heintz Construction company, of Portland, is for \$721,000.

In charge of this project is a lanky man named John Vertrees, of Redmond. He is the Bureau of Reclamation Engineer. Working engineers rarely get fat. Have you noticed?

Vertrees took the writer of this piece on a quick trip around the dam and reservoir location after explaining the project with maps and statistics. He knows plenty about dams after years of work on the big ones such as Grand Coulee in Washington and Hungry Horse in Montana.

Outside View Unimpressive
We stepped outside the Bureau of Reclamation office on the job site. The 80-foot high dam stretched across the neck of the basin — an unhillied end — only 200 yards

away. The dam was not impressive — looked like a sloping mud wall. It blocked any full view of the reservoir behind it.

A glance across the top of the dam showed the far end of the upward sloping basin and the hills behind it. On a diagonal higher to our right was the small butte called Haystack. Any neat farmer would fire a man who stacked hay in that kind of an untidy lump.

We drove up that way toward the right or northeast end of the dam where a feeder canal is being finished. This will take water

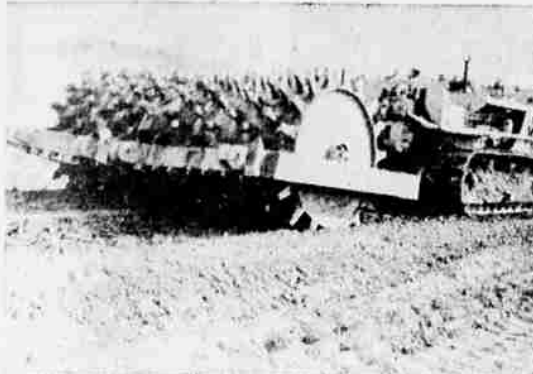
through a "turnout structure" from the main canal which drops 85 feet as it crosses Haystack creek coulee near the butte. The water will rush down from the high end of the feeder canal into the now empty reservoir which averages about a mile long and three-fifths of a mile wide.

The intake flow will be stopped when the water reaches within 6 1/2 feet of the top of the sealed basin. The extra 6 1/2 feet is reserved for any such unexpected addition as cloudburst might bring.

We had angled up to the end of



FRONT VIEW OF HAYSTACK DAM — This photo was taken of the 80 foot high Haystack dam of dirt and broken rock at a distance of 200 yards. The dam will hold water to be stored in a large basin on the other side. (Bend Bulletin Photo)



COMPACTION ROLLER — This especially built roller bristling with metal teeth was used in packing down the center core of dirt, layer by layer, until it is impervious to water. (Bureau of Reclamation Photo)



PROJECT BOSS — Engineer John P. Vertrees, of Redmond, is the U. S. Bureau of Reclamation engineer in charge of construction of the \$1,345,000 reservoir.

the dam. Vertrees picked up a handful of dirt from the center of the top. It was a mixture of silt and clay that forms a center wall 85 feet deep to the bottom of the dam. This mixture has been compressed and compacted by studded rollers, foot by foot, until it is im-

pervious to water. It is the core of the dam, waterproof or as nearly so as it can be made.

Outside this impervious center and against it is another wall of silt, sand and gravel. It is semi-pervious; that is, it will allow a little moisture to seep through.

A third and outside wall is composed of roughly broken rock that water can penetrate easily. Vertrees explained that the outer rock layer is a mechanical protection to the second, semi-pervious one and that both keep the inner impervious wall from eroding.

Grouters Stop Leakage

This part of the work is about 70 per cent finished. From the top of the dam the view is striking. The big basin bottom, now surrounded by hills and the dam, has been cleared of the old Tate ranch house and buildings. It slopes gently from the hills to a lower level along the dam's base. A few popular trees still must be cut down and rocky humps removed. Then the water can flow in.

The only difficulty would be that some of it would leak out through rock crevices at each end of the dam, particularly near the northwest abutment. The crews are in the middle of stopping these myriad leaks by a process called grouting.

The grouters sink holes through

enable workmen to descend by steel ladder to the bottom to make any repairs needed in the outlet gate hoists. The outlet works controls are housed in a small concrete structure at the level of traffic roadways.

At the far end of the top of the dam, which we had crossed, and at the level of its foundation below — we found an outlet conduit for the discharge of the reservoir's water. It was equipped with a structure containing metal grid bars to catch trash in the flow. Downside of this was a "stilling basin" that might be compared in practical use to the brakes of an automobile. Its concrete baffles will slow down the high velocity of the flow from the reservoir so the torrent will not erode the canal bottom or possibly cut back into the outer part of the dam.

Reservoir Will Give Quick Aid

The reservoir will feed out water on demand at the rate of 250 to 400 second feet per minute. This water will reach the farms of the North unit the same day it is needed. Each second foot irrigates about 50 acres, so that if necessary 20,000 acres could be irrigated by Haystack Reservoir water alone. This is more than is ever expected to be needed because the main canal continuously furnishes a regular supply.

The top level of the dam has a roadway 25 feet wide for the use of workers.

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