

GEOHERMAL PIPELINE
Progress and Development Update
from the Geothermal Progress Monitor

MEETING ANNOUNCEMENTS

Eighteenth New Zealand Geothermal Workshop, 6-8 November 1996

The Geothermal Institute and the New Zealand Geothermal Association will host the 18th New Zealand Geothermal Workshop at the University of Auckland on 6-8 November 1996. The meeting will provide a forum to exchange information on all aspects of the exploration, development and use of geothermal resources worldwide. Topics will include:

- Exploration: Geophysics, Geology, Geochemistry, Site Investigation, Epithermal Mineralization
- Field Development: Drilling, Reservoir Engineering, Reinjection, Mineral Deposition
- Utilization: Electric, Direct-Use, Optimization, Environmental Consequences, Preventive Maintenance
- Applications: Materials, Standards, Environmental, Economic, Legal
- Case Studies: Geothermal Field or Plant--for example, Make-up Drilling and Reinjection Strategies

For more information contact:

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22nd Stanford Workshop on Geothermal Reservoir Engineering, 27-29 January 1997

The Stanford Geothermal Program will organize the workshop, whose aims are: to bring together engineers, scientists and managers involved in geothermal reservoir studies and developments, to provide a forum for the exchange of ideas on the exploration, development and use of geothermal resources, and to enable, promote and open reporting of progress. Topics to be covered will include:

- Case Studies: Reservoir Response to Production, Effects of Injection, Scaling Characteristics
- Engineering Techniques: Reservoir Stimulation, Empirical Methods, Well Tests, Tracers
- Field Management: Strategies for Exploitation, Injection, Scale Inhibition

- Exploration: Geophysics, Geochemistry, Geology, Heat Flow Studies, Outflows
- Drilling and Well Bore Flows: Well Stimulation, Bare Flow Modeling, Hydro-Fracturing, Scaling
- Low-Enthalpy Systems: Applications of Heat Pumps, Hot-Dry Rock Technology
- Geosciences: Application of Geophysics, Geochemistry, Thermodynamics and Fluid Mechanics

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COLORADO

New San Luis Valley Aquaculture Training Program

The commemorative "signing of the lease" between the State Board of Community Colleges and Occupational Education and Mrs. Ilene O. Kerr occurred on Thursday, August 1, at Kerr's Aquafarm location in Colorado's beautiful San Luis Valley.

In addition to the lease signing, the unveiling of a new sign dedicated Kerr's aquafarm as the James G. Kerr Educational Center for the Advancement of Aquaculture, Agriculture, Wildlife, and Water Conservation in honor of Ilene's late husband.

The aquafarm will be used entirely for instructional and production purposes in the new Aquaculture Technician Program being offered for the first time this 1996 Fall Semester by the San Luis Valley Educational Center, Alamosa Campus, Trinidad State Junior College.

The new program will strive to address the growing demand for properly trained farm and hatchery technicians: both the private and public sectors.

Students currently enrolled in the new program may choose from a two-year Associate of Applied Science Degree or a 1-year Occupational Certificate upon successful completion of either program. The student will understand and be able to perform the duties and responsibilities as they relate to the propagation, feeding, care, transfer/harvest and sales of fish and other aquacultural products.

The Aquaculture Technician Program will be taught with a hands-on emphasis by utilizing a combination of classroom, lab/field and industry exposures.

Kerr's Aquafarm will provide the program with an excellent opportunity to introduce technology and to train students in the various types of culture practices and techniques currently employed in today's aquaculture industry.

The facilities at the farm include a geothermal well with a constant temperature of 97 degrees Fahrenheit for year-round fish production.

The artesian water resource, adjudicated for fish culture use, flows at a rate of 1,050 gallons per minute. The well supplies water to 30 acres of existing ponds, raceways, tanks and a greenhouse.

There is also a cold water well available on site. The nutrient enriched effluent from the fish farm is then reused to irrigate potatoes as well as award-winning Coor's Barley, which took first place at the Colorado State Fair last year.

In addition, the aquafarm and surrounding wetlands serve as a wildlife refuge for migratory geese, ducks, cranes and other waterfowl by providing habitat to sustain their seasonal activities and needs. This tremendous resource is now secured in a long-term lease to ensure all students will be involved in a rich educational experience.

For more information on the program, please contact: Aquaculture Technician Program, The San Luis Valley Educational Center at 1-800-411-8382. (Source: *Aquaculture News*, September 1996)

IDAHO

Fish and Alligator Ranching in Idaho

In the stifling, humid darkness, sweat pops out on your body. Through the murk all around you gleam the cold eyes of dozens of alligators. But this is not midnight in the Everglades. This is mid-afternoon in southern Idaho.

Though it might seem odd to be surrounded by alligators in rural Idaho, Leo Ray of Buhl finds it perfectly reasonable.

Leo is a commercial fish farmer. He studied under Dr. Howard Clemens, the dean of modern fish farming, at the University of Oklahoma. After completing his studies, he and his wife, Judith, opened their first fish farm in 1968, in California.

But when Leo visited the area around Buhl, on the Snake River, the hot artesian wells caught his interest. He thought that if all that pure, hot geothermal water could be mixed with cold surface water for an optimum temperature of 78° to 80° F, he could grow the finest fish around!

"Idaho is a desert," Leo quips, "and its most abundant resource is water. A fish is like a sponge, and absorbs the flavor of the water it's in."

If kept moving, water this pure would eliminate any off-flavors in fish.

In 1973, the Rays bought a hillside site on the bank of the Snake River, collected the water from eight artesian wells and began building a complicated series of concrete raceways and ditches cascading down the hillside. Although catfish had never been successfully raised in concrete raceways before, Leo did it.

Then he added tilapia, an Asian food fish, in raceways down the hill below the catfish. He branched out into trout at another site. Soon the family company--Fish Breeders of Idaho, Inc.--was turning out tons of fish a year, shipping them to Alaska, throughout the Pacific Northwest and even to Hawaii.

There was only one little problem.

When you raise hundreds of thousands of fish at a time, some will inevitably die, and others have to be culled out in the packing shed. What to do with these "mortalities" becomes a considerable headache. How do you dispose of all those dead fish?

The obvious answer--obvious to Leo, that is--was alligators. The big reptiles were already being farmed in Florida; but, he saw no reason he couldn't raise them in Idaho.

"What made it economical is that we had free food and free heat," he says. Last year he ordered a couple of hundred alligator hatchlings from Florida--at \$25 to \$28 a head--and built a sunken, circular pool, heated with flowing geothermal water, and with a domed roof made of spray-on insulation foam.

Florida "gator farmers" scoffed at his design. They recommended a rectangular structure, with square pens. So Leo built one of those and put more hatchlings in it. It turned out that the alligators actually did worse in a square pen. When spooked, they tend to pile up in the corners, like turkeys.

In Leo's round pit, the first batch of alligators--fed on a diet of cull fish--grew rapidly. At 18 months old, they weigh 50 pounds apiece and are six feet long--about the right size for commercial harvest for luxury leather products and meat for specialty restaurants.

But Leo is backing off on that. He says that it's because of the rising cost for alligator hatchlings; but, one suspects he might also be developing an affection for these scaly monsters.

Why keep buying expensive hatchlings, Leo explains reasonably, when he can just raise his first crop of 'gators to maturity, and start breeding his own? After all, alligators reach breeding age in only five to seven years, and the bigger they grow, the more waste fish they eat.

It's all economy of scale--or scaly economy.

So now, every day, Leo and his assistants visit the alligator pits with buckets of trout. The big alligators--thriving in the tropic heat of their circular den--continue to gorge and grow. And whenever someone enters the rectangular shed, the "small" gators--a mere two or three feet long--scramble out of the water expectantly, making a peculiar noise between a chirp and a croak, seizing thrown fish and wrestling each other for prize treats.

It's a scene straight out of the age of dinosaurs, and one Leo Ray watches with satisfaction.

After all, not every farmer can raise livestock like these. (Source: *Ruralite*, August 1996)

OREGON

Blowing Off Steam At Newberry Volcano

The decision by California Energy Co. to mothball its geothermal drilling operation at Newberry Crater is not only disappointing, it may be premature.

No one can blame the developers for being discouraged when two large-size production wells and two small-core test wells haven't yielded sufficient resources to support an economically viable plant.

But what California Energy learned about its leases by no means should foreclose further geothermal development in the Newberry Crater area.

The Newberry Volcano, in the Deschutes National Forest near Bend, has been toured by geologists for a quarter of a century as the Northwest's best hope for an economically-feasible geothermal plant.

In 1983, BPA contracted for a detailed assessment of geothermal power in the region and determined that 1,200 potentially hot sites existed. Ninety-nine sites were chosen as the most promising for further analysis. the Newberry site ranked No. 1.

The question that the Bonneville Power Administration, which pledged to buy 20 megawatts from the proposed 30-megawatt plant, should be asking is whether the developers looking for hot steam and rock fractures in precisely the right place.

The point of messing with geothermal energy at all is to establish its viability for the future. Most everyone in the energy business knows that geothermal energy today is not competitive with market prices for electricity.

In the current deregulated power market, in which natural gas seems to be getting cheaper by the day, the cost of geothermal is way off the charts.

So what to do?

BPA should encourage California Energy to reconsider its proposal to mothball the Newberry operation. Failing that, the agency should consider other proposals for the Newberry Crater area that are more promising.

The agency no doubt prefers a third option--getting out of the geothermal demonstration business altogether.

That may make a lot of sense to ratepayers for the rest of this century. But in the year 2010, when conventional thermal energy rates could be out of control, we could be very sorry we didn't give Newberry Crater more of a chance to blow off steam. (Source: *Oregonian*, September 6, 1996)

UTAH

Australian Red Claw Lobster Raised at Belmont Hot Springs, Utah

Near Fielding, Utah, north of Salt Lake City at the intersection of Interstates 84 and 15, Belmont Hot Springs is supplying heat to aquaculture ponds, a swimming pool, hot tubs and four homes. The 125° F hot spring, consisting of four big springs, produces 4000 gpm.

Red Claw Lobsters are raised in ten 60 ft x 20 ft and twenty 40 ft x 15 ft ponds and a channel 3/4 mile long, 50 ft wide and 10 ft deep maintained at 80° F. The lobsters are harvested at 1/4 in. to 9 in. in length and shipped live to various markets. In addition to the lobsters, the ponds also contain tropical fish.

A 200,000-gallon swimming pool and three 16 ft hot tubs are also supplied by the springs. Four homes utilize the geothermal water in a radiant-floor type heating system.

A unique application for one of the springs, which has a depth of 35 ft and a temperature of 92° F, is scuba diving during winter months from September through May. The spring is too hot to use during the summer months.

Owner and operator of the facility is Scott Holmgren, Belmont Hot Springs, Box 36, Fielding, UT 84311, Ph: 801-458-3200.