

**Rich Esses, Lab Manager**  
**Energy and Geoscience Institute University of Utah**

Interviewer—John Howe

Rich let's start out by just telling me what you guys are doing today. What's the process, and why are you out here?

Rich Esses

Well, today we've come out here to Crystal Geyser near Green River, Utah to basically use this site as a natural analog for an anthropogenic CO<sub>2</sub> sequestration test site. There's natural CO<sub>2</sub> here at Crystal Geyser that is essentially making its way to the surface along a pre-existing fault. We're going to use this scenario here at Crystal Geyser to basically tell us if CO<sub>2</sub> that we're sequestering at one of our test sites, if it encounters a defect in the crust, if it's going to make it to the surface or if it's going to naturally seal that fault through precipitation of calcite.

Interviewer—John Howe

Rich, tell me about Crystal Geyser here itself, why is this an appropriate site for your study?

Rich Esses

Crystal Geyser is an appropriate site for our sequestration studies because it is a natural source of CO<sub>2</sub>. CO<sub>2</sub> already exists here subsurface, it's basically similar to the levels, the depths, at which we'd inject CO<sub>2</sub> as part of our sequestration studies. So, if we're seeing CO<sub>2</sub> coming to the surface here at Crystal Geyser along crustal defects like a fault, we can use that analogy here to test what's going to happen with CO<sub>2</sub> we're sequestering at one of our test sites.

Interviewer—John Howe

Just tell me about the CO<sub>2</sub> sequestration process. Why is this important, and why do we care about it?

Rich Esses

The CO<sub>2</sub> sequestration process is very important right now globally because global temperatures are rising. Over the last fifty or a hundred years they've already risen a few degrees, and the hypothesis is that man made CO<sub>2</sub> pumped into the atmosphere is generating a greenhouse effect on the earth. And so one of the proposed ideas for minimizing the effects of global warming is to capture and sequester the CO<sub>2</sub> from coal fired power plants, and other sources of man made CO<sub>2</sub>. We'll be injecting man-made CO<sub>2</sub> from coal-fired power plants and other sources deep within the sub surface. The idea is that CO<sub>2</sub> will remain there for long periods of time, and essentially help mitigate the effects of global warming really.

Interviewer—John Howe

Tell me a little bit about the costs involved and any other concerns that some critics might have of that process.

Rich Esses

There are a number of critics out there right now who are questioning whether CO<sub>2</sub> sequestration is really all that feasible. Both because of risks associated with injecting large quantities of CO<sub>2</sub> in the subsurface, and because of the costs. The risks associated could be something like that sequestered CO<sub>2</sub> encountering a crustal defect like a fault or a man-made well, and making it's way either to the surface or to ground water-drinking supply for a town, and contaminating that. Economically it requires a lot of energy and thus a lot of cost to both capture and sequester CO<sub>2</sub> at the source at a coal fired power plant, and then either transport it to an injection site or pump it underground. The costs are significant.

Interviewer—John Howe

Tell me what we're actually seeing in these core samples that you've taken today.

Rich Esses

The core samples we're sampling here at Crystal Geyser we're hoping are a natural analog to what we'll be seeing or could potentially see at some of our sequestration sites. The travertine we see at the surface is essentially historical in age from the well that was drilled here back in 1947. We'll be using the chemistry of that and comparing it to the chemistry of core that that was collected from travertine or site that precipitated in faults that are of significant age—one thousand, ten thousand, a hundred thousand years old. We'll be comparing those two samples and trying to determine if the precipitation rate is significantly different between the two, that will hopefully tell us something about whether CO<sub>2</sub> making its way to the surface at our sequestration sites will rapidly precipitate calcite and thus seal the faults, and preventing the CO<sub>2</sub> from making its way to the surface.

Interviewer—John Howe

What do you see for the future of CO<sub>2</sub> sequestration? What would you like to see happen over the next decade or so?

Rich Esses

Where I see the working of carbon sequestration over the next ten or twenty years, really over the next five years I see a significantly more research involved with the technical aspects of CO<sub>2</sub> sequestration. Beyond that, I see the need for government to really get involved and start taxing CO<sub>2</sub> emissions, basically building up a credit so that a lot of these sites and operations can be paid for so that we can start injecting CO<sub>2</sub>, and really start mitigating the problem of global warming.