



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

WASHINGTON, D.C. 20555-0001

May 14, 1996

MEMORANDUM FOR: Margaret V. Federline, Acting Director  
Division of Waste Management

FROM: Norman A. Eisenberg, Senior Advisor for  
Performance Assessment  
Division of Waste Management

SUBJECT: STAFF VISIT TO AMARGOSA VALLEY: TRIP REPORT

On May 3, 1996, Division of Waste Management staff visited the northern portion of Amargosa Valley, Nevada. The staff included: N.A. Eisenberg, N.M. Coleman, M.P. Lee, and C.J. Glenn, one of NRC's on-site licensing representatives. The purpose of the visit was to tour the area in order to better understand the socioeconomics and agricultural practices in the vicinity of Yucca Mountain. The staff's intent was to acquire this information for consideration in the analyses it is undertaking pursuant to its responsibilities under the Energy Policy Act of 1992, and in response to the recent National Academy of Sciences' report, "Technical Bases for Yucca Mountain Standards."

As part of the area tour, the staff met with a knowledgeable local resident, Mr. Kenneth G. Garey. Mr. Garey is the operator of the Bar-BQ Ranch (in Amargosa Valley) as well as the Amargosa Center on-site representative for the Community Radiation Monitoring Program (CRMP).<sup>1</sup> Before retiring to Amargosa Valley, Mr. Garey worked at the Nuclear Test Site, on a nuclear engine program, for the Reynolds Electrical & Engineering Co.

Attachment 1 summarizes the staff's observations during their tour as well as their interview with Mr. Garey. This summary also reflects information recently received from DOE on the socioeconomics of the site (these references are also included, as Attachments 2-4. Attachment 4 was received from Mr. Garey). Farming and ranching are the principal industries in the Amargosa Valley area, and therefore important to the local economy. All of these activities rely on water pumped from the shallow alluvial aquifer for their water supply.

Attachments:

1. Amargosa Valley Trip Summary
2. "Summary of Socioeconomic Data Analyses Conducted in Support of Radiological Monitoring Program During Calendar Year 1994"
3. "Data Defining the Characteristics of a Critical Group in Amargosa Valley, Nevada" [memorandum]
4. "U.S. Department of Energy Nevada Operations Office Annual Site Environmental Report - 1994"

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<sup>1</sup> The CRMP, sponsored by DOE, is a cooperative project among the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency, the Desert Research Institute (NV), and the University of Utah (see Black et al., 1985).

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AMARGOSA VALLEY TRIP SUMMARY  
May 3, 1996

#### Background

Amargosa Valley is a rural, unincorporated community that lies about 128 kilometers northwest of Las Vegas and about 23 kilometers south of Yucca Mountain. It is one of about four population centers that comprise the greater Amargosa Desert area (covering 2320 square kilometers), the others being Ash Meadows, Amargosa Farms, and Lathrop Wells. The U.S. Department of Energy (1984) estimates that the population in the area is about 2300, the population in the community of Amargosa Valley is estimated to be about 1000. The major employment centers in the area are at Beatty, Pahrump, the Nuclear Test Site, Nellis Air Force Base, and greater Las Vegas. The climate is classified as a mid-latitude desert. Temperatures range from about 13 degrees Celsius (°C) in January to over 49°C in July. The annual precipitation is less than 15 centimeters. Physiographically, the area rests in an intermontane valley, within the Basin and Range. The area supports some limited farming and livestock ranching.

#### Water Availability

All of the communities cited above acquire their water supply from the Death Valley ground-water system, specifically the Alkali Flat-Furnace Creek Ranch basin. The aquifer is alluvial fill which is a lateral extension of the tuff and carbonate aquifers that generally underlie Yucca Mountain. In the Amargosa Desert and Pahrump Valley areas, the depth to the water table in the alluvial aquifer is reported to be no more than 30 meters (USGS, 1977; pp. 61-62). None of the communities have centralized public water or sewer systems. All water is provided by private wells that rely on electric pumps<sup>1</sup>. The cost of drilling a water well to the aquifer is reported to be about \$1 per foot per casing-inch for a cased, screened, cemented well. For example, a well 8 inches in diameter and 240 feet deep would cost about \$2000 to install, not including the cost of the pump, plumbing, and any water conditioning; pumping (operating) costs would be an additional consideration. A few residents use windmills to pump their ground water<sup>2</sup>, but this is the exception rather than the rule. Some residents also get their water from local springs. Every residence has a septic system.

It should be noted that all water use in Nevada is governed by the Office of the State Engineer and the Division of Water Resources. The maximum permissible water use allowed in southern Nevada, based on the State's perennial yield/recharge-use philosophy is about 1800 gallons/day per residential unit (DOE, 1988; p. 3-135). Apparently, the State is currently monitoring all water use in the area and if the water allotments permitted are not fully utilized, the State is appropriating the surplus. Absentee land owners, that do not use their full allotment of water, risk losing their allotment (including their water rights) altogether.

#### Farming

The principal agricultural crops in the Amargosa and Pahrump Valley areas is alfalfa. Alfalfa is used as fodder for livestock. The long growing season in the area (about 200 days) permits about seven cuttings per season. However, because of its low nutritional content (e.g., total digestible nutrients - TDNs), most of the crop is destined for markets outside of southern Nevada. It is understood that some percentage of the local crop is exported to markets in Japan. Other agricultural products in the area include: grain, barley,

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<sup>1</sup> Using 2-3 hp electric pumps that provide about 1100-1500 gallons/day.

<sup>2</sup> With a pumping capacity of about 300 gallons/day.

oats, hay, and hayfines, but these crops are believed to represent a smaller proportion of all total agricultural output for the area. Locally produced foods comprise no more than 10 percent of individual diets.

Many Amargosa-Pahrump Valley residents maintain "kitchen" gardens. It is estimated that at least 50 percent of the residents in the area maintain some form of a garden (or orchard) that provide more than two dozen fruits and vegetables - see Table 1. Some residents in Pahrump Valley are reported to maintain bee colonies for honey production. Most of the fruit and vegetable products grown are shared, sold, or bartered among the local residents although two households are reported to have commercial operations.

A third type of agricultural activity reported in the area is the turf farm in the Amargosa Valley, adjacent to the dairy. "Bermuda grass" is grown for the landscaping market in the greater Las Vegas area.

All of the activities described above rely upon some degree of pre-treatment of the soils, with fertilizers, acidifiers, etc., to allow these crops to grow. Hardpan (caliche) exists extensively throughout the area and limits the suitability of certain areas for agricultural use. Rough topography also restricts the extent of agriculture.

#### Livestock

In recent years, dairy farms have proven to be the major livestock activity in the area. Two dairy farms operate in Amargosa and Pahrump Valleys. The production capacity at the dairy in Pahrump Valley is about 2500 head; in Amargosa Valley, there are 3300 head producing although, the dairy is reported to have a total potential herd of about 5000. All raw dairy products are reported to be destined to processing facilities in southern California. Although the dairies provide local farmers with a dedicated market for a portion of their alfalfa crop, because of the need for feed with a high TDN, most of the dairy stock feed comes from outside of the County - principally California, Utah, and Lincoln County (Nevada).

The second major "livestock" activity in the area is a catfish farm operated by the State's Department of Conservation and Natural Resources. The catfish fry that are raised are used to stock lakes and other water ways throughout the state.

There is some beef cattle ranching in the county but it takes place principally to the north of NTS where there is more (and better) natural forage. However, there are a few range cattle in the area (estimated to be less than 100), as well as some lesser numbers of pigs, goats, sheep, chickens, rabbits, and ostriches. The pig, sheep, and ostrich were introduced into the area in the early 1990s; these operations are understood to be commercial. The other stock is raised for local/private consumption. Almost all of these activities rely, in part, upon the locally-produced alfalfa and grains to feed their stock.

#### Conclusions/Summary

None of the residents in the area appear to be living a "subsistence" lifestyle. Most, if not all residents need electricity and bottled gas to run their households and in particular, to pump water from their wells. The magnitude of personal home-grown/raised food consumption in the area is difficult to estimate. However, no resident is understood to subsist solely off the food produced from their garden or ranch. Most residents still purchase the majority of their food stuffs at local grocery stores and use the locally-grown produce/meat-poultry to supplement their diets. With a few exceptions, most residents that have gardens and ranches are essentially "weekend" farmers/ranchers.

<b>Vegetables</b>	
Beets	Onions
Broccoli	Peppers (Chili, Sweet, Banana, and Bell)
Brussels Sprouts	Potatoes
Cabbage	Pumpkins
Carrots	Radishes
Cauliflower	Squash (Summer and Winter varieties)
Corn	Tomatoes
Garlic	Turnips
Kohlrabi	Watermelon
Lettuce (Head and Loose Leaf)	Zucchini
Okra	
<b>Fruit Trees</b>	
Apple	Pear
Apricot	Plum
Grapes (Vineyard)	Pomegranate
Peach	
<b>Nut Trees</b>	
Almond	Pistachio
Pecan	

**Table 1. Garden Produce Grown in the Amargosa-Pahrump Valley Areas**

**References**

**Black, S.C., W.M. Glines, and Y.E. Townsend (eds.), "U.S. Department of Energy Nevada Operations Office Annual Site Environmental Report - 1994," Las Vegas, Nevada, Reynolds Electrical & Engineering Co., Inc., Document No. DE-AC08-94NV11432, September 1995.**

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**TRW Environmental Safety Systems Inc., "Summary of Socioeconomic Data Analyses Conducted in Support of Radiological Monitoring Program During Calendar Year 1994," Las Vegas, Nevada, Document No. DE-AC01-91RW001134, June 1995.**

**U.S. Department of Energy, "Draft Environmental Assessment: Yucca Mountain Site, Nevada Research and Development Area, Nevada," Office of Civilian Radioactive Waste Management, Nevada, DOE/RW-0012, December 1984.**

**U.S. Geological Survey, "Ground-Water Levels in the United States - 1971-74: Southwestern States," Washington, D.C., Water Supply Paper 2162, 1977.**

**ATTACHMENT 2**