Geologic Setting of the Proposed Fallon Forge Site, Nevada: Suitability for EGS Research and Development

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ABSTRACT

The proposed Fallon FORGE site lies within and adjacent to the Naval Air Station Fallon (NASF) directly southeast of the town of Fallon, Nevada, within the large basin of the Carson Sink in west-central Nevada. The site is located on two parcels that include land owned by the NASF and leased and owned by Ormat Nevada, Inc. The Carson Sink in the vicinity of the Fallon site is covered by Quaternary deposits, including alluvial fan, eolian, and lacustrine sediments. Four wells penetrate the entire Neogene section and bottom in Mesozoic basement. Late Miocene to Quaternary basin-fill sediments are 0.5 to >1 km thick and overlie Oligocene-Miocene volcanic and lesser sedimentary rocks. The volcanic section is 0.5 to 1.0 km thick and dominated by Miocene mafic lavas. The Neogene section rests nonconformably on heterogeneous Mesozoic basement, which consists of Triassic-Jurassic metamorphic rocks intruded by Cretaceous granitic plutons. The structural framework is dominated by a gently west-tilted half graben cut by moderately to steeply dipping N- to NNE-striking normal faults that dip both east and west. Quaternary faults have not been observed within the proposed FORGE site.

Fallon was selected for a potential FORGE site due to its extensional tectonic setting, abundance of available data, existing infrastructure, and documented temperatures, permeability, and lithologic composition of potential reservoirs that fall within the ranges specified by DOE for FORGE. Since the early 1970s, more than 45 wells have been drilled for geothermal exploration within the area. Four exploration wells within the FORGE site are available for use in the project. Several additional wells are available for monitoring outside the central FORGE site within the NASF and Ormat lease area, including numerous temperature gradient holes. There is an existing, ten-station micro-seismic earthquake (MEQ) array that has been collecting data since 2001; the MEQ array can be expanded to encompass the entire Fallon project. The well data indicate that a sizeable area (~4.5 km^2) has adequate temperatures in crystalline basement but lacks sufficient permeability within the proposed FORGE site. There are two possible, competent target formations in Mesozoic basement for stimulation in the FORGE project area: 1) Jurassic felsic metavolcanic rocks/and or metaquartzite; and 2) Cretaceous granitic intrusions. These units make up at least 3 km^3 in the project area and have target temperatures of ~175-215ºC. The abundant well data and detailed geophysical surveys (e.g., gravity, MT, and seismic reflection) provide significant subsurface control for the site and will permit development of a detailed 3D model. The documented temperatures, low permeability, and basement lithologies, as well as abundant available data facilitate development of a site dedicated to testing and improving new EGS technologies and techniques, thus making Fallon an ideal candidate for FORGE.

Introduction

The Frontier Observatory for Research in Geothermal Energy (FORGE) offers a unique opportunity to develop the technologies, techniques, and knowledge needed to make enhanced geothermal systems (EGS) a commercially viable electricity generation option for the USA. The objective of this project is to establish and manage FORGE as a dedicated site, where the subsurface scientific and engineering community will be eligible to develop, test, and improve new technologies and techniques in an ideal EGS environment. This will allow the geothermal and other subsurface communities to gain a fundamental understanding of the key mechanisms controlling EGS success, in particular how to generate and sustain fracture networks in the spectrum of basement rock formations using different stimulation technologies and techniques. This critical knowledge will be used to design and test methodologies for developing large-scale, economically sustainable heat exchange systems, thereby paving the way for a rigorous and reproducible approach that will reduce industry development risk. Essential to this process is a comprehensive site characterization, monitoring instrumentation, and data collection effort that will capture a higher-fidelity picture of EGS creation and evolution processes than any prior demonstration. Finally, a dedicated FORGE allows for the highly integrated comparison of technologies and tools in a controlled and well-characterized environment, as well as the rapid dissemination of technical data to the research community, developers, and other interested parties.

The proposed Fallon FORGE site lies within and adjacent to the Naval Air Station Fallon (NASF) directly southeast of the town of Fallon, Nevada, within the large basin of the Carson Sink in west-central Nevada (Fig. 1). The Carson Sink lies directly northeast of the Walker Lane belt (Stewart, 1988; Faulds and Henry, 2008), a system of strike-slip faults that accommodates ~20% of the dextral motion between the North American and Pacific plates (Hammond and Thatcher, 2004). As the Walker Lane terminates progressively northwestward in this region, dextral shear is transferred to northwest-trending extension in the northwestern part of the Great Basin (Fig. 2; Faulds et al., 2004). High rates of extension and transtension in this region promote high heat flow. Accordingly, this region has a greater density of known high-enthalpy systems (>150ºC) than other parts of the Basin and Range province and currently hosts about a dozen geothermal power plants (Fig. 3; Faulds et al., 2012). Most of the geothermal activity in this region is considered to be amagmatic (i.e., no middle to upper crustal magmatic heat sources), as volcanism generally ceased 3-10 Ma.

Although high heat flow (Blackwell and Richards, 2004) and high extensional to transtensional strain rates (Kreemer et al., 2012) have generated relatively high geothermal gradients in the Carson Sink and surrounding parts of northwest Nevada (e.g., Coolbaugh et al., 2005), development of conventional hydrothermal systems in this region is still challenging, as hot dry wells abound and are locally proximal to wells with adequate permeability and flow rates. Finding sufficient permeability for geothermal production is clearly more of an impediment than temperature in this region. Although progress has recently been made on characterizing favorable structural settings (e.g., Faulds et al., 2006, 2013) and geophysical signatures (e.g., Wannamaker et al., 2013) for geothermal systems throughout the Great Basin, it is clear that favorable settings for sufficient permeability and fluid flow comprise a small fraction of the region and involve limited volumes of hot rock. The challenge of finding sufficient permeability is even more profound in large basins, such as the Carson Sink, where young basin-fill sediments obscure the overall structural architecture and hinder identification of favorable settings or structural sweet spots for geothermal activity in underlying crystalline rocks (e.g., Faulds et al., 2011, 2013). Such basins make up over 50% of this high heat-flow region.

Fallon was selected for the FORGE site due to its extensional tectonic setting, abundance of available data, existing infrastructure, and documented temperature, permeability, and lithologic composition of potential reservoirs, as described in greater detail below. All of these

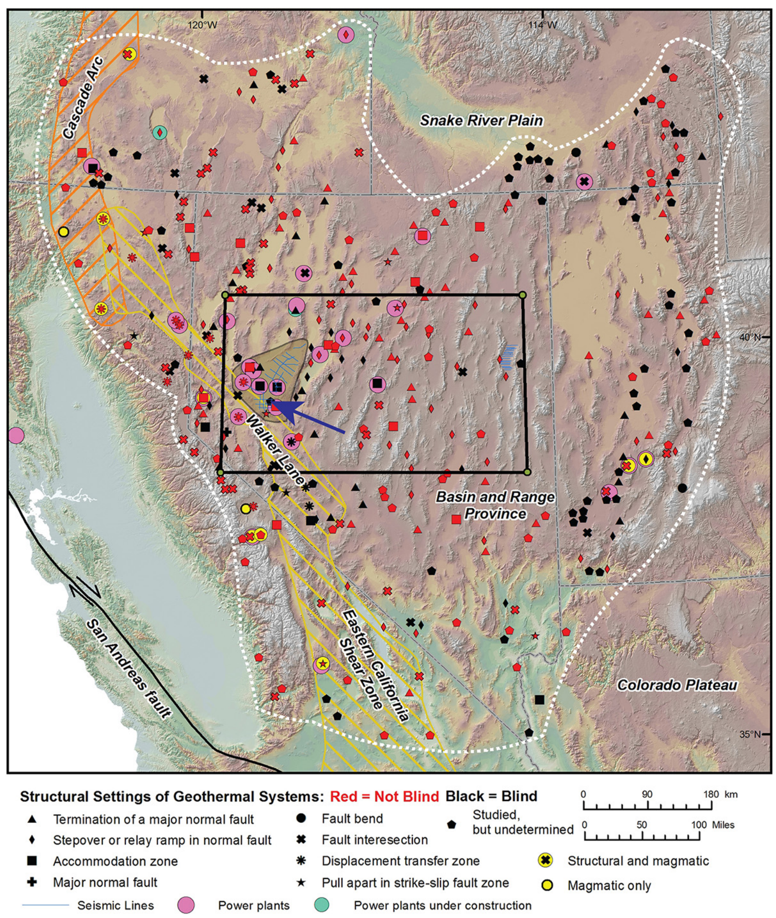

Figure 1. Structural settings of known geothermal systems (blind and not blind) in the Great Basin region (adapted from Faulds et al., 2013). Black box outlines the area under investigation in a complementary DOE-funded geothermal study. Brown shaded area outlines the Carson Sink area. Thin blue lines show seismic reflection profiles in the Carson Sink basin. Dark blue arrow indicates location of the Fallon FORGE site.

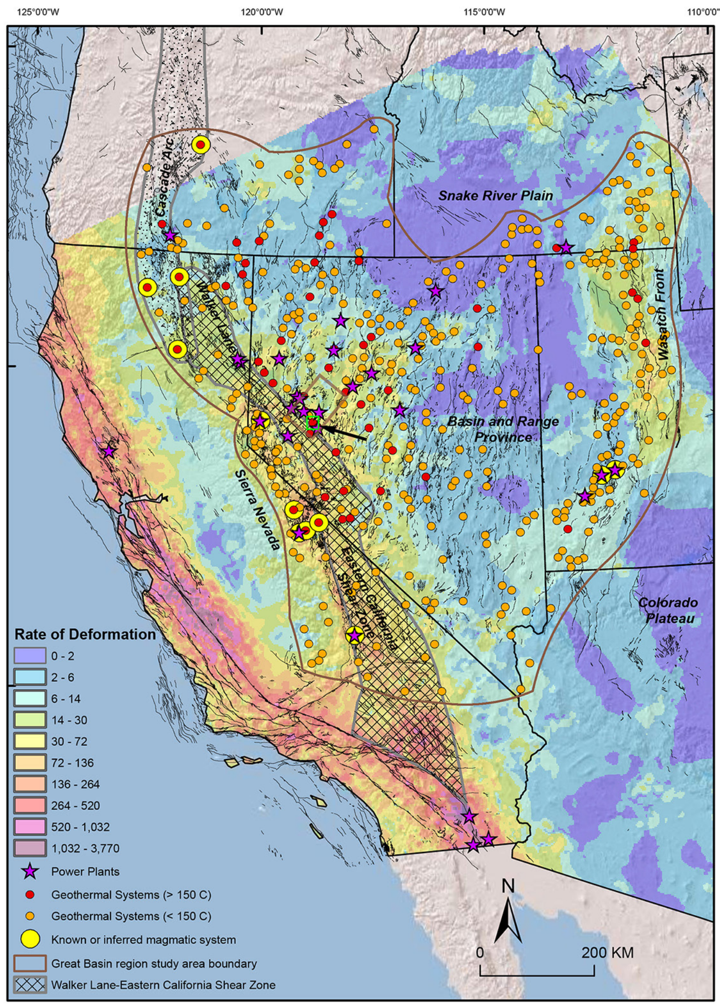

Figure 2. Map showing strain rates and geothermal systems in the Great Basin and adjacent regions (from Faulds et al., 2012). Strain rates reflect the second invariant strain rate tensor (10^{-9}/yr; from Kreemer et al., 2012). Light brown box encompasses the Carson Sink. Small bright green box surrounds the Fallon FORGE site (see black arrow).

attributes facilitate development by the subsurface scientific and engineering community of a site dedicated to testing and improving new EGS technologies and techniques. It is also noteworthy that the Carson Sink area has some of the higher strain rates in the Great Basin region (Fig. 2). High strain rates and rocks that are critically (or near critically) stressed for frictional failure in the current stress field not only favor conventional geothermal energy production (Hickman et al., 1998; Barton et al, 1998) but also facilitate EGS research and development. The reason for this is that permeability enhancement due to reactivation of shear fractures during hydraulic stimulation is more readily accomplished under such conditions (e.g., Hickman and Davatzes, 2010; Chabora et al., 2012; Dempsey et al., 2013).

Previously completed and ongoing research projects in the region provide a strong platform from which to launch the proposed FORGE investigation at Fallon. For example, detailed studies of the stratigraphic and structural framework of the region, including in-depth analyses of most of the known geothermal fields in the area, such as Desert Peak, Brady's, Soda Lake, and Salt Wells (e.g., Hinz et al., 2008, 2010, 2011, 2014; Faulds et al., 2006; 2010, 2011, 2012; McLachlan et al., 2011; Blake and Davatzes, 2012), have been completed. In addition, a detailed gravity survey (Fig. 4A) and derivative depth-to-basement maps of the entire Carson Sink were recently completed. We also note that other DOE-funded geothermal projects complement the proposed FORGE analysis at Fallon. The play fairways project involves detailed analysis of the geothermal potential of the Carson Sink and surrounding region (Fig. 1), including interpretation of several hundred miles of existing seismic reflection profiles and integration of all

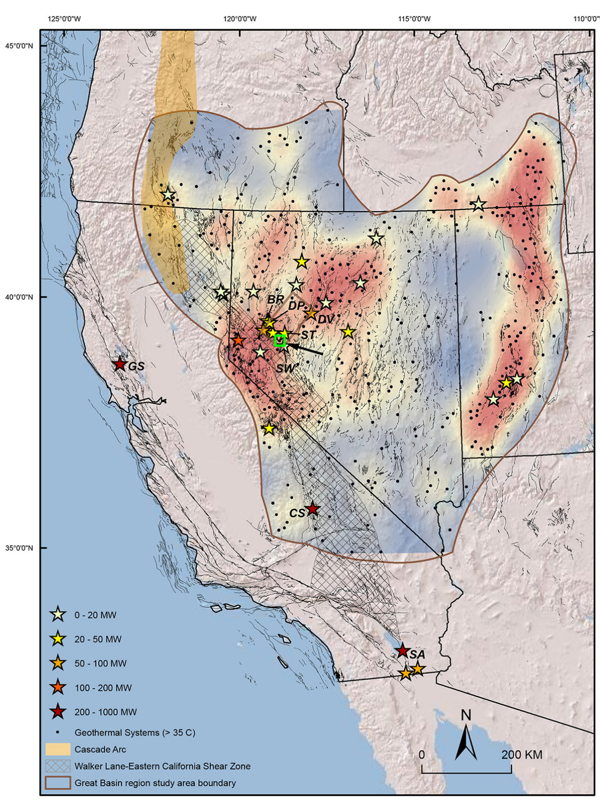

Figure 3. Density of known high-temperature (≥150°C) geothermal systems in the Great Basin region (from Faulds et al., 2012). Density values were calculated using a kernel density plot in which the number of geothermal systems with temperatures ≥150°C within a radius of ~30 km was calculated for each 3 km cell in a grid. Warmer colors represent progressively greater geothermal system densities. Power plants and relative capacities are shown by stars. Light brown box encompasses the Carson Sink. Small bright green box surrounds the Fallon FORGE site (see black arrow). Labeled geothermal systems: BR, Brady's; DP, Desert Peak; DV, Dixie Valley; CS, Coso; GS, The Geysers; SA, Salton Trough; ST, Stillwater; SW, Salt Wells.

available geological and geophysical data for the region into a regional 3D model of the Carson Sink. These data are critical for further evaluating the stratigraphic and structural framework and determining depths to suitable rock for EGS research and development in the Fallon area. Moreover, NASF has been the site of focused geothermal exploration and development activities since the 1990s, but drilling data obtained to date indicate a hot but low permeability resource suitable for EGS research.

Area of Operations

The Fallon FORGE site is located on two parcels that include land owned by the NASF and Ormat Nevada, Inc. Ormat has both privately held land and geothermal leases. The FORGE site lies on the eastern margin of the Fallon agricultural district, which has been developed with irrigation water imported into the Carson Sink. The project area is bounded by the Fallon agricultural district on the north and west, Lahontan and Bunejug Mountains to the east, and the Carson Lake wetlands at the base of the White Throne Mountains to the south (Figs. 4B and 5).

Figure 5 shows the area of the main FORGE site. Most of the surrounding lands in the Ormat lease area and NASF are open to monitoring and instrumentation activities. However, the area of the airstrip on the NASF northwest of the proposed FORGE site and the northeastern part of the Ormat lease block are both "no surface occupancy" zones. Nonetheless, this leaves ~4.5 km^2 for development of infrastructure on the FORGE site and another ~40 km^2 for monitoring and instrumentation on the surrounding lands. The proposed area is fully accessible, with an excellent network of paved and dirt roads (Fig. 5), which facilitates significant research and development activities. U.S. Highway 50 lies ~1 to 5 km to the east and northeast of

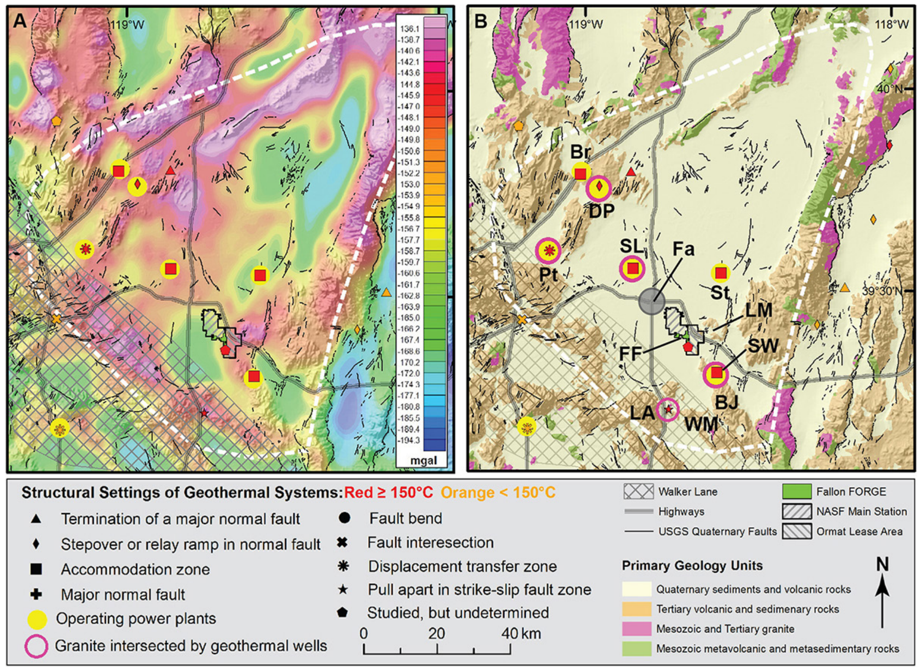

Figure 4. Complete Bouguer anomaly gravity map (A) and generalized geologic map (B) of the Carson Sink area, showing geothermal power plants and Fallon FORGE site. Dashed white line surrounds the Carson Sink and outlines area covered by detailed gravity survey. Labels for geothermal systems: Br, Brady's; DP, Desert Peak; LA, Lee-Allen; Pt, Patua; SL, Soda Lake; St, Stillwater; SW, Salt Wells. Other abbreviations: BJ, Bunejug Mountains; Fa, City of Fallon; FF, Fallon FORGE site (shown in greater detail in Figure 5); LM, Lahontan Mountains; WM, White Throne Mountains.

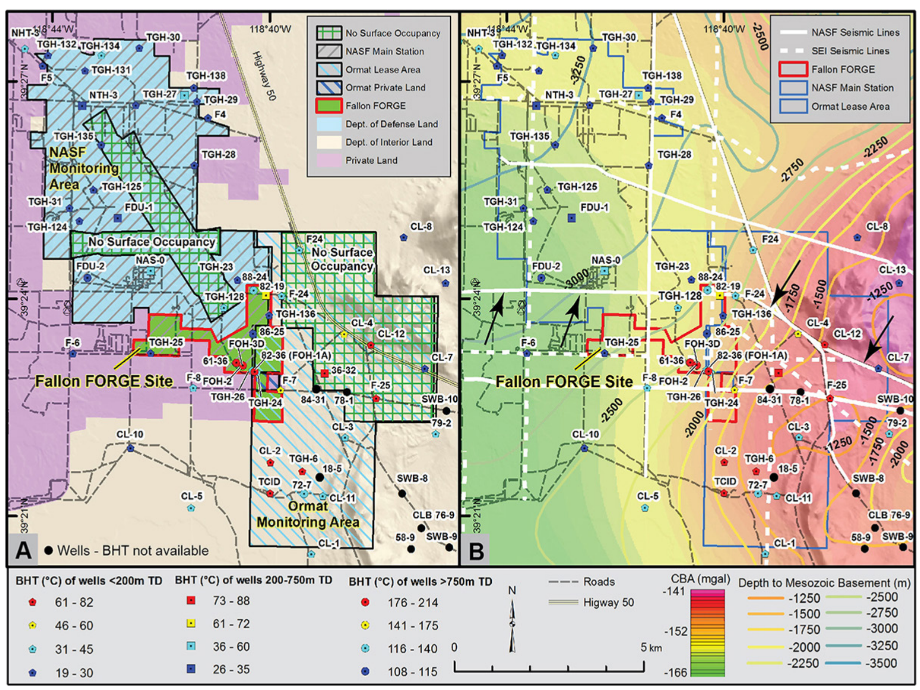

Figure 5. Fallon FORGE site with adjacent NASF and Ormat lease area. A. Fallon FORGE site (in green and outlined in red), land ownership, and geothermal wells. Note that no surface occupancy is permitted in the vicinity of the runways at NASF or in the northeastern part of the Ormat lease area. Other parts of the NASF and Ormat lease block are accessible for instrumentation and monitoring, and full research and development is allowed on the Fallon FORGE site. B. Fallon FORGE site (outlined in red) showing geothermal wells, Bouguer gravity (shaded colors), depth to basement (colored contours), and available seismic reflection profiles (white lines). Black arrows denote seismic reflection profile shown in Figure 6.

the primary FORGE site and cuts through the northeastern part of the Ormat lease area. The proximity to the town center of Fallon, which lies ~12 km to the northwest, affords superior infrastructure to the project, including abundant hotels, restaurants, and stores for personnel and supplies. Furthermore, the Reno metropolitan area, only 100 km west of Fallon, offers all the accoutrements of a major city in terms of needed resources and equipment for FORGE research activities, development, conference and workshop facilities, and a major university. The Navy Geothermal Program Office (GPO) has a dedicated Project Manager and available office space on NASF.

Geologic Setting

The Fallon site lies in the southeastern part of the large composite basin of the Carson Sink in west-central Nevada (Figs. 1 and 4). Although high temperatures (>175ºC) have been encountered at depths of 1.5 to 3.0 km beneath the site, the lack of permeability has hampered conventional development of this resource. This makes it an ideal test site for EGS research and development. It is also important to note that no hot springs or fumaroles are present at the surface. In addition, no indications of paleo-hot spring activity, such as sinter or travertine, have been observed on the surface in the area. Thus, there is no evidence for a recent, conventional hydrothermal system at Fallon.

The Carson Sink in the vicinity of the Fallon site is covered by Quaternary deposits, including alluvial fan, eolian, and lacustrine sediments (Morrison, 1964; Bell and House, 2010). No bedrock units crop out in the proposed site. Four wells (61-36, FOH-3D, 82-36, and 84-31) penetrate the entire Neogene section and bottom out in Mesozoic basement. Late Miocene to Quaternary basin-fill sediments are 0.5 to >1 km thick and overlie late Oligocene to late Miocene volcanic and lesser sedimentary rocks. The volcanic section is 0.5 to 1.0 km thick and dominated by middle Miocene mafic lavas, with lesser intermediate composition flows. The lower part of the Tertiary section may locally contain late Oligocene ash-flow tuffs that fill paleovalleys cut into Mesozoic basement. As evidenced by drill holes, seismic reflection profiles, and gravity data, the total thickness of the Neogene section ranges from ~1.7 to 2.8 km in the project area. The Neogene section rests nonconformably on heterogeneous Mesozoic basement, which consists of medium- to high-grade Triassic-Jurassic metasedimentary and metavolcanic rocks intruded by granitic plutons of probable Cretaceous age. Mesozoic granitic plutons are widespread in the area and comprise a large proportion of the basement rocks (Fig. 4B; Page, 1965; Stewart and Carlson, 1978; Satterfield, 2002; Hinz et al., 2008, 2010, 2014). Many of the deep (>1 km) wells drilled for geothermal and oil-gas exploration in the Carson Sink region penetrate these Mesozoic granites.

The structural framework of the FORGE site is dominated by a gently west-tilted half graben cut by moderately to steeply dipping N- to NNE-striking normal faults that dip both east and west, as evidenced by seismic reflection profiles and gravity data (Fig. 6; Gray et al., 2013). Gray et al. (2013) referred to this system of faults as the Lahontan fault zone and constructed a 3D model of the fault system. A large concealed east-dipping normal fault probably bounds the west-tilted half graben to the west of the site. The west-tilted half graben appears to comprise the western limb of a northerly trending extensional anticline (cf., Faulds and Varga, 1998) that lies directly east of the primary FORGE site beneath the Ormat lease area (Hinz et al., 2014). Extensional anticlines result from the overlap of oppositely dipping systems of normal faults that dip toward one another.

Quaternary faults have not been observed within the proposed FORGE site, and no significant historic seismicity has occurred at the site. The nearest Quaternary scarp lies ~5 km southeast of the southeastern corner of the primary FORGE site and cuts late Pleistocene lacustrine sediments (Hinz et al., 2011). The USGS Quaternary fault and fold database (USGS, 2006) does show a Quaternary fault 2.5 km east of the FORGE site, but recent analysis indicates that this scarp is probably a late Pleistocene shoreline rather than a fault (Bell and Hinz, unpublished data). The Rainbow Mountains fault ~10-15 km east of the site ruptured in a M6.9 earthquake in 1954, accommodating oblique normal-dextral motion (Caskey et al., 2004). The Rainbow Mountains fault terminates southward in the vicinity of the Salt Wells geothermal field. Increased permeability associated with the horse-tailing southern end of this fault probably accounts for the hydrothermal activity at Salt Wells (Hinz et al., 2014). It is notable that most geothermal systems in the Great Basin region are proximal to recent faults (Bell and Ramelli, 2007). The absence of Quaternary faulting at the Fallon FORGE site may explain the lack of sufficient permeability in the area.

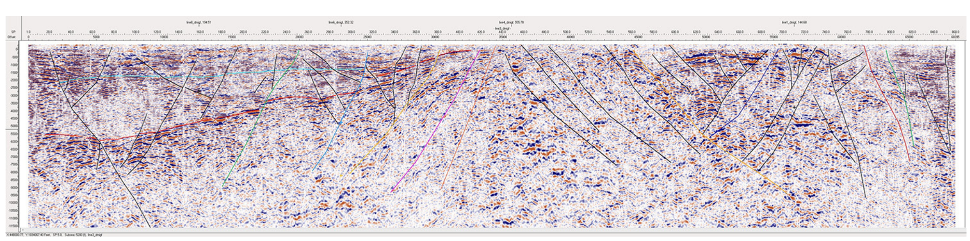

Figure 6. Approximately east-west-trending, interpreted seismic reflection line NAS-94-003 (from Gray et al., 2013), which extends through both the NASF and Ormat lease area. The profile crosses the northeastern-most part of the FORGE site, but most of the FORGE site lies directly south of the western half of this profile (see Fig. 5 for location). Profile view is to the north, with west on the left and east to the right. The west-tilted half graben is evident in the profile as are several steeply east- and west-dipping normal faults.

Borehole data and kinematic analysis of fault surfaces indicates an approximately west- to west-northwest-trending least principal stress in the area. Borehole breakouts and tensile fractures in well FOH-3D within the FORGE site (Fig. 5) indicate a least principal stress trending N83ºW (Blake and Davatzes, 2012). Similarly, inversion of fault slip data and the orientation of silica veins from the nearby Bunejug Mountains yield a least principal stress trending N80-82ºW (Hinz et al., 2014). Directly northwest of the Carson Sink in the Hot Springs Mountains (Fig. 4), a similar west-northwest-trending least principal stress orientation is suggested by both borehole breakout data (Robertson-Tait et al., 2004; Davatzes and Hickman, 2009) and inversion of fault-slip data (Faulds et al., 2010a, b). Determination of the magnitudes and directions of the principal stresses is crucial for 1) determining the slip and dilation tendency of faults and fractures in the area, 2) defining the parameters (injection pressures, duration of injection, etc.) for EGS stimulation experiments, and 3) predictive modeling of such experiments, including induced seismicity. In this regard, analyses of borehole televiewer and formation microscanner logs in Fallon Well FOH-3D (Blake and Davatzes, 2012) revealed abundant natural fractures and foliation planes that are well oriented for normal faulting in the current stress field, and thus amenable to shear stimulation during future EGS operations. The availability of these data is another reason that Fallon is an ideal site for the FORGE initiative.

Geothermal Exploration/Drilling/Evaluation Surveys

Geothermal exploration in this portion of the Carson Sink has been ongoing since 1973, when Phillips Petroleum conducted a drilling program that included 28 shallow gradient holes (e.g., Katzenstein and Bjornstad, 1987; Combs et al., 1995). This early work included a shallow artesian (72ºC) well in the southern portion (NW ¼ Sec 7 T17N R30E) of the Ormat lease area and investigations in the vicinity of hydrothermal deposits in Eight-Mile Flat (NE ¼ Sec14 T17N R30E) ~10 km to the east, which now houses the 14 MW Salt Wells power plant operated by ENEL (Fig. 4). The structural setting of the producing hydrothermal system at Salt Wells area differs significantly from that at Fallon. Since the 1990s (as mentioned above), NASF has been the site of geothermal exploration and development activities. However, a geothermal development project was put on hold in 2013 as a result of low permeabilities in otherwise hot rocks.

Since the early 1970s, more than 45 wells have been drilled for geothermal exploration within the NASF and Ormat lease area. These include 4 temperature gradient wells and 7 additional wells on the FORGE site and 27 temperature gradient wells and 10 additional wells on the NASF and Ormat monitoring areas. Four exploration wells within the FORGE site (82-36, 61-36, 88-24, and 86-25) are available for use in the project. Several additional wells are available for monitoring outside the central FORGE site within the NASF and Ormat lease area, including numerous temperature gradient holes. Some additional well sites have been permitted but not yet drilled. In addition, there is an existing, ten-station micro-seismic earthquake (MEQ) array that has been collecting data since 2001; the MEQ array can be expanded to encompass the entire Fallon project. The abundant well data and detailed geophysical surveys (e.g., gravity, MT, MEQ, and seismic reflection) provide significant subsurface control for the site. Data from the wells will be merged with available geophysical and geological data to generate a detailed 3D model of the FORGE site during Phase I of the project.

Substantial drilling and analysis has established that a sizeable area (~5 km^2) has adequate temperatures in crystalline basement for geothermal development but lacks sufficient permeability in the proposed FORGE site (Fig. 5). At least three wells show temperatures in the range (~175-215ºC) required for the FORGE site (Fig. 5; FOH-3D, 82-36, and 61-36). Flow testing demonstrates limited permeability of ~10^{-16}/m^2 in the deep wells, including FOH-3D and 82-36. For example, the 82-36 well has maximum temperatures of 189ºC at TD (2914 m), but the wellbore failed to penetrate fractures or permeable formations that could sustain commercial rates of production. Other wells, such as FOH-3D, in the FORGE site also have low permeabilities. These results suggest that a conventional hydrothermal system does not underlie the FORGE site, but hot (~175-215ºC) dry rock abounds at FORGE target depths of 1.5 to 3.0 km.

Although the west-tilted half graben is cut by several faults (Fig. 6; Gray et al., 2013), it appears that the faults in the FORGE project area lack significant discontinuities that would be favorable for generating a hydrothermal system, such as stepovers or terminations (e.g., Faulds et al., 2011). The lack of major terminations or steps in gravity anomalies supports this premise. Geophysical surveys (primarily gravity, seismic, and magnetic surveys; as well as the thermal profiles developed in gradient holes and slim holes) substantiate that the Mesozoic granitic basement is the dominant unit within the temperature and depth limits of the FORGE project. We therefore envision an east-west elongated area, corresponding with the FORGE site, containing adequate temperatures but devoid of the requisite hydrothermal activity and permeability for commercial geothermal development. Considering the favorable basement lithologies that exist at depth, as further discussed in the following section, the size of the high-temperature, low permeability volume that would be suitable for FORGE probably exceeds ~3 km^3 at Fallon.

Target Formations

There are two possible competent target formations for stimulation in the FORGE project area: 1) Jurassic felsic metavolcanic rocks and/or metaquartzite (Boyer Ranch Formation) in the Mesozoic basement; and 2) Cretaceous granitic intrusions, also in Mesozoic basement. Competent felsic metavolcanic rocks occur in the Mesozoic basement throughout the region. Basement rocks encountered in the FOH-3D well include a mixture of Triassic/Jurassic metavolcanic rocks (dominantly rhyolites) with associated metasedimentary and intrusive units. The 82-36 and FOH-3D wells at Fallon bottom out in thick sections (1.6 and 1.9 km, respectively) of metavolcanic rock. This assemblage is probably equivalent to basement units that crop out to the south of this area (Hinz et al., 2010) and also to those acting as reservoir host rocks for the nearby Desert Peak geothermal field (Fig. 4), with geomechanical properties, fracture orientations, and stress conditions that contributed to a successful EGS stimulation at that site (Davatzes and Hickman, 2009; Lutz et al., 2010; Hickman and Davatzes, 2010; Chabora et al., 2012). The Boyer Ranch Formation is a continentally derived quartzite that interfingers with the Sierran backarc rocks (Speed and Jones, 1969) and may be one of the reservoir rocks at the Brady's geothermal field (Faulds and Hinz, unpublished data). However, more detailed analyses of cuttings and core are needed to determine whether some of the metasedimentary rocks at Fallon correlate with the Boyer Ranch Formation. Silicified Triassic argillite may also be competent enough to sustain significant EGS stimulation. The best target for stimulation at Fallon, however, is probably the Cretaceous granites, which were intersected by three wells at the FORGE site, have been penetrated in most of the other geothermal fields in the Carson Sink area (Fig. 4B), and comprise ~50% of the Mesozoic basement rocks in the region. The 61-36 well at Fallon penetrates 671 m of granite and bottoms out in granite. The 82-36 well intersects an approximately 1 km thick section of granite. Granitic rocks have been successfully stimulated at Soultz in the Rhine graben in France (e.g., Genter et al., 2010). The basement rocks at Fallon lie within the required temperature window for FORGE (175-225^{o}C) and lack sufficient permeability for commercial development without stimulation. Thus, the competent basement units, which comprise at least 3 km^3 in the proposed FORGE project area, are the preferred target formations (Fig. 5).

Outcomes and Impacts

This project will analyze the feasibility of EGS development of a site near Fallon, Nevada. The site will be open to the broad scientific and engineering community to improve our understanding of subsurface conditions, stimulation technologies, and reservoir characterization methodologies conducive to generation of efficient and sustainable geothermal reservoirs. The project will hopefully result in technologies, techniques, and knowledge needed to make enhanced geothermal systems (EGS) a commercially viable electricity generation option. Ultimately, the scope of the project is to: 1) confirm the suitability of the Fallon site for FORGE and ensure that all environmental requirements are met for this site, 2) develop detailed plans for FORGE activities; 3) complete site characterization with associated data systems, and plan for R&D solicitations; and 4) develop and operate an EGS test facility at the Fallon FORGE site, including R&D work resulting from the competitive R&D solicitation that the Fallon FORGE team will implement. In all phases, data generated by the project will be archived and distributed in a fair and open manner.

EGS has the potential to provide a substantive, baseload, renewable energy source for our Nation. The establishment of FORGE near Fallon, Nevada, will provide the geothermal community with a field laboratory where the science and engineering needed for widespread commercialization of EGS can be developed and refined.

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