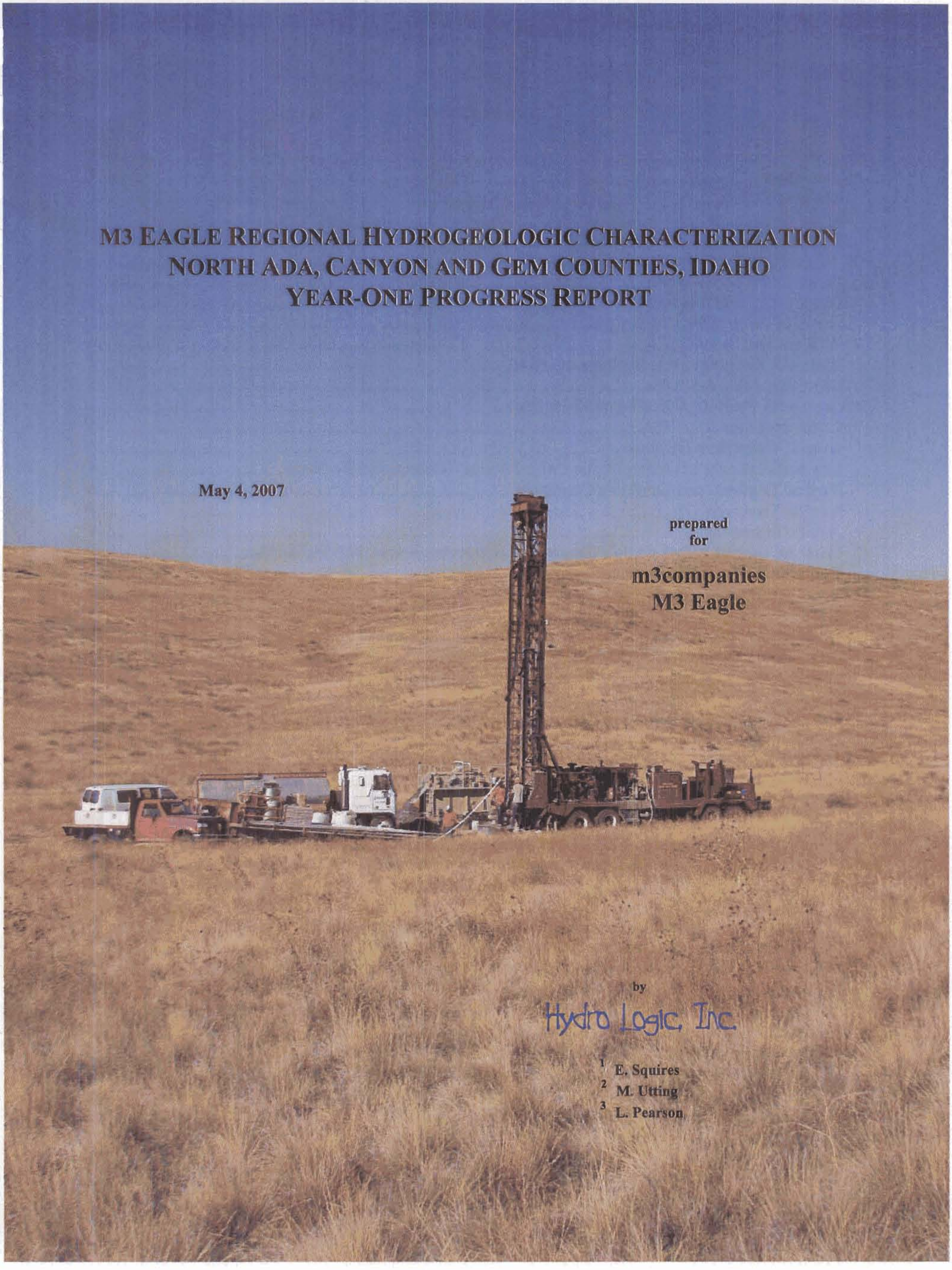

M3 EAGLE REGIONAL HYDROGEOLOGIC CHARACTERIZATION
NORTH ADA, CANYON AND GEM COUNTIES, IDAHO
YEAR-ONE PROGRESS REPORT

May 4, 2007

prepared
for

m3companies
M3 Eagle

by

Hydro Logic, Inc.

[1] E. Squires
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Last, but not least, we are thankful for the insights and guidance offered by Sean Vincent of the Idaho Department of Water Resources during our previous meetings and field trip to the north Ada County foothills.

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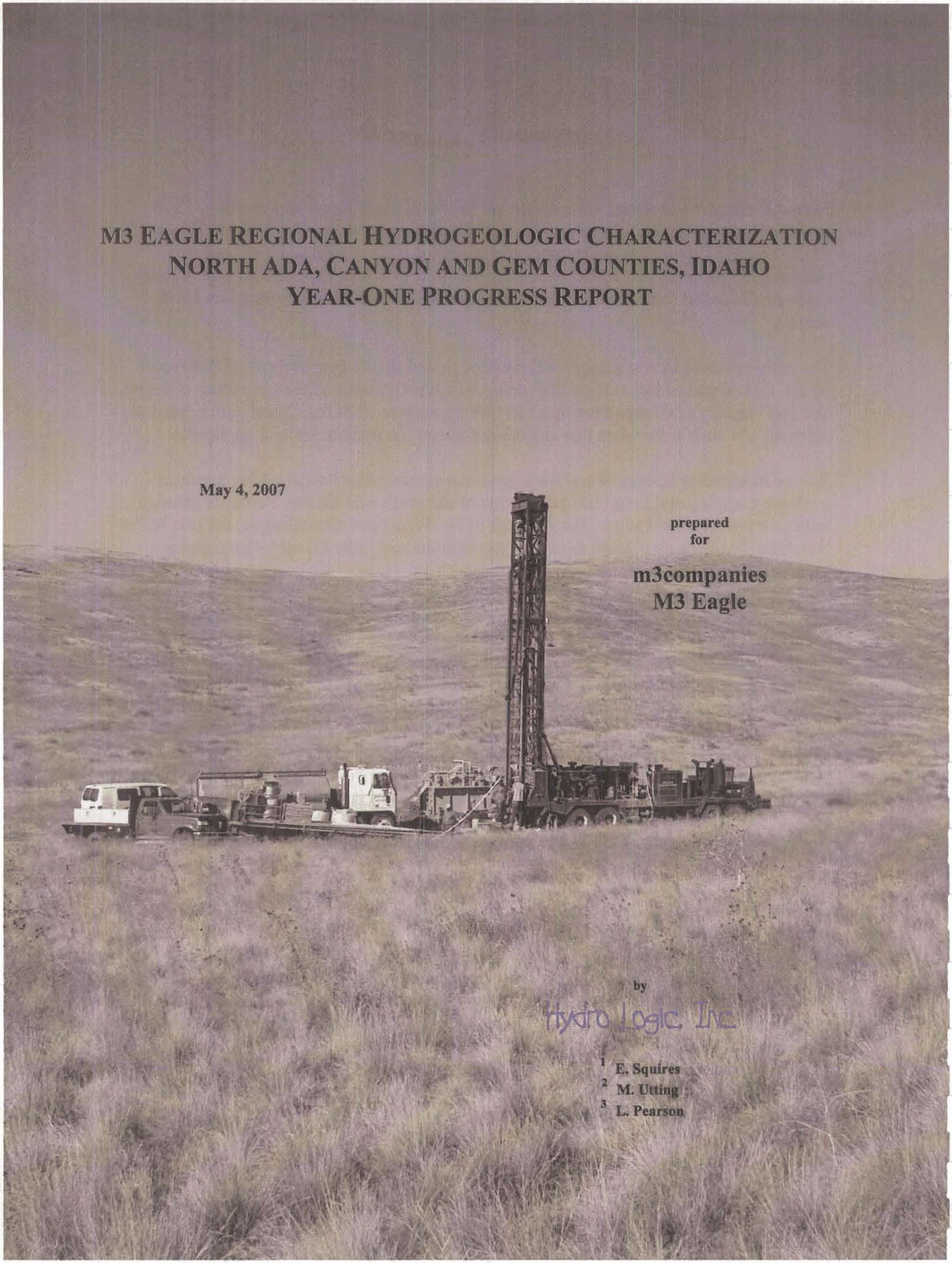

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M3 EAGLE REGIONAL HYDROGEOLOGIC CHARACTERIZATION NORTH ADA, CANYON AND GEM COUNTIES, IDAHO YEAR ONE PROGRESS REPORT – MAY 4, 2007

Overview

Hydrogeologic studies commissioned by M3 Eagle in the North Ada County area have delineated a highly productive regional sand aquifer with good water quality that underlies the area near Eagle and Star and the proposed M3 Eagle planned community. This aquifer, herein named the Pierce Gulch Sand Aquifer, underlies the north Ada County Foothills where it extends continuously from the Eagle-Star area to the Payette River Valley. Because the Payette Valley near Letha is almost 300 feet lower than the Boise Valley near Eagle, ground water flows out of the Boise River Basin and into the Payette River Basin through the sands of this aquifer. This conclusion is supported in this report by corresponding water level measurements in wells, by several exploratory test well drilling projects, by borehole geophysical surveys, and by other hydrogeologic analyses. Because the Pierce Gulch Sand Aquifer underlies this area, it appears highly likely that the M3 Eagle planned community will be able to develop its entire water needs from beneath its site without transporting water from the Valley areas of either basin. Extensive water-level monitoring in the area shows water levels in wells to be stable under current levels of use. The ground water proposed to be withdrawn by M3 Eagle for its development will be from subsurface flow that has already departed the Boise Basin, on its way to the Payette Basin, so that impacts to existing area water users in the lowlands near Eagle are predicted to be small. M3 Eagle has already implemented a significant ground water monitoring program to document aquifer conditions prior to development and to be able to assess any future impact to the aquifer from its proposed withdrawals over time. M3 Eagle is committed to continue its monitoring of aquifer pressures throughout the proposed development and beyond build out. Hydro Logic, Inc. has been commissioned by M3 Eagle to provide additional water studies to include future aquifer tests, numerical modeling, and ground water geochemistry modeling.

Introduction

Scope of Work. Hydro Logic, Inc. (HLI) was hired by M3 Eagle in March of 2006 to conduct a regional scale hydrogeologic characterization study to determine the ground water development potential for a proposed 8,160-unit planned community in the foothills area north of Eagle, Idaho. M3 Eagle's regional water study is divided into the following five sections: 1) characterization of the hydrogeologic framework, 2) aquifer testing and characterization, 3) development of a long-term water level monitoring network, 4) geochemical modeling, and 5) numerical modeling. Progress and findings for all five sections of the investigation are discussed below. This interim progress report concludes with a Summary of Preliminary Conclusions developed to date (April 1, 2007).

The ground water study was commenced to evaluate where and how the M3 Eagle project could obtain adequate water supplies for its proposed development. As such, it is a regional scale study intended to provide a broadened understanding of the aquifer system for the entire Eagle community and a larger regional area. All analyses conducted to date by HLI indicate a high likelihood that adequate ground water supplies are present beneath the M3 Eagle site to support the planned community without importing water from outside the area and without causing unreasonable impacts to existing water rights. A final comprehensive report for the study is being developed as supporting documentation for M3 Eagle's municipal water right application to the Idaho Department of Water Resources (IDWR), filed November 21, 2006. The preliminary findings of this study are set forth in this report in keeping with M3 Eagle's intentions to ensure that the public is well informed of its on-going studies and interim conclusions. We particularly want to inform the City of Eagle's Planning and Zoning Commission, the City of Eagle's Mayor and Council, the City of Star, United Water Idaho, Inc., Eagle Water Company, the IDWR, NACFA, and other water users in the Eagle area of Hydro Logic, Inc.'s findings to date. On behalf of M3 Eagle, HLI will be continually updating these findings and providing the results to all interested parties through ongoing presentations and reports such as this one.

Study Goals. An extensive hydrogeologic characterization program has been conducted by a number of entities on behalf of M3 Eagle as part of its plan to develop 6005 acres in the foothills north of Eagle, Idaho (see Figure 1). This program, commenced in March, 2006, has used the services of Hydro Logic, Inc., the University of Idaho, and Boise State University to develop an in-depth understanding of the groundwater flow system over an area extending from south of the Boise River near Eagle to north of the Payette River near Emmett. In addition, HLI has reviewed all available hydrogeologic studies completed to date and all available well information, from the region.

The purposes of M3 Eagle's water studies are to:

1) Develop an understanding of the three-dimensional hydrogeologic framework beneath the area
2) Assess the groundwater development potential for the planned community
3) Describe and quantify the occurrence and flow of groundwater throughout the study area
4) Provide data and scientifically-based conclusions to accompany M3 Eagle's water right request to IDWR for a supply that will average about 7.5 million gallons per day (mgd), equivalent to an average annual diversion rate of about 3,600 gallons per minute (gpm), at the end of the planned 20-to-30-year period of development[1].
5) Assess the impacts to existing wells from the proposed M3 Eagle water development.
6) Assess the total ground water development potential within the study area.

[1] This diversion rate is based on preliminary engineering assessments that are based on preliminary housing densities that are under discussion with the City of Eagle. This rate may be changed for future analyses.

This Report. This first-year Progress Report presents an overview and the major findings to date of the HLI ground water studies. A comprehensive report is anticipated to be completed in time to be presented in support of IDWR's review of M3 Eagle's water right application. HLI's comprehensive report will contain the supporting data files and findings based upon additional well tests, hydrological data collected from additional well studies and completion of a ModFlow numerical model. In the mean time, and as the water study progress, additional reports will be issued to document and present refinements of the findings presented here.

Hydrogeologic Framework

Pierce Gulch Sand Aquifer. This study has determined that a significant regional sand aquifer underlies the M3 Eagle site. All hydrogeologic evidence obtained to date indicate a high likelihood that all of the water needed for the planned development is available from beneath the M3 Eagle properties utilizing 6-to-10 on-site production supply wells. The Pierce Gulch Sand Aquifer consists of a 150-to-275-foot thick sequence of stratified sand layers with inter-bedded thin and locally discontinuous layers of silt and clay. The base of the dipping aquifer is typically 480-to-700 feet deep beneath land surface of the M3 Eagle site. The aquifer sand thickens and descends deeper beneath the land surface to the south and southwest in the Eagle-Star-Meridian area and is believed to do the same to the northwest toward Payette River. The Pierce Gulch Sand Aquifer is a very productive aquifer as evidenced by the many large bore production supply wells which are completed into it including the City of Star's wells, the City of Eagle's wells, and the public water utility wells of United Water Idaho and Eagle Water Company, all located throughout the area (see Figure 5).

Geophysical Log "Signature". Natural gamma-ray, single-point resistance, and electrical resistivity borehole geophysical logs of exploratory test wells and of water wells in the greater Eagle-Star-M3 area show a clear and identifiable "geophysical signature" of the basal sand section of the Pierce Gulch Sand Aquifer and the underlying sediments of the Terteling Springs Formation (Figure 2). This signature is characteristic of the thick sand sequence originally deposited as river and lake sediments in an ancient lake system (referred to as "Lake Idaho," by geologists) that formerly occupied what is now the Boise-Snake-Payette River Basins. This sand sequence is the same 250-ft thick medium-to-coarse grained sand unit that caps the foothills to the east of Eagle, named the Pierce Gulch Sand Member of the Idaho Group of formations (Wood and Clemens, 2002; Wood, 2004). The entire sedimentary sequence has dropped downward several hundred feet by structural faulting and now lies buried beneath the Boise River Valley and much of the western Snake River Plain where it is more difficult to identify and map. The geophysical signature recognized in this study (see Figure 2) provides a new means to map the areal extent of the aquifer over a vast area. We now know that the Pierce Gulch Sand Aquifer is the same aquifer that supplies the Eagle-Star-Meridian area and extends northwest beneath the M3 Eagle site to the Payette River Valley at least as far west as the City of Payette.

Extent of the Aquifer. The Pierce Gulch Sand Aquifer is bounded on its northeast side by the geologic fault system shown in Figure 3, originally named the West Boise-Eagle fault by Wood and Anderson (1981). The base of the aquifer is underlain (and bounded) by the thick clays and mudstones of the Terteling Springs Formation. The base of the aquifer shown in Figure 3 is inclined about 100 ft per mile downward to the southwest. This structural dip explains why the municipal wells in Star are deeper than they are in Eagle. In the Boise River Valley near Eagle and Star, the Pierce Gulch Sand Aquifer is overlain by clays, some other minor sand aquifers, and a shallow surficial flood-plain-gravel aquifer (the present day floodplain of the Boise River). Beneath most of the M3 Eagle site, the aquifer is overlain by clay layers with no shallow surficial aquifer present. Figure 4 shows a simplified conceptual diagram of the regional aquifer. The figure is a cross-sectional schematic of the aquifer beneath the Boise River Valley extending to the Payette River Basin. The West Boise-Eagle Fault and the projection of the contact between the bottom of the aquifer and the underlying clay are also depicted on this "block" diagram.

Willow Creek Aquifer. A foothills aquifer, informally named the "Willow Creek Aquifer" (SPF, 2004) is a thick sand sequence that overlies granite and volcanic bedrock in the area northeast of the West Boise-Eagle fault system. Hydro Logic, Inc.'s concept of this aquifer is shown in Figure 5. It is an older geologic unit and stratigraphically deeper (older in time) than the Pierce Gulch Sand Aquifer. It is probably correlative to the sand facies of the Terteling Springs Formation described by Wood and Clemens (2002). The Willow Creek Aquifer consists of highly permeable sands and gravels (SPF, 2004) that appear to us to be bounded by (or grade laterally into) the clays underlying the Pierce Gulch Aquifer to the southwest and bedrock lying to the northwest of a major regional fault system, shown in Figure 3. The upper part of the Willow Creek Aquifer is exposed along the upturned section near the West Boise-Eagle fault system and in the foothills northeast of the fault. The approximate areal extent of this aquifer is shown by the shaded-turquoise region of Figure 6.

Hydraulic Interconnection Between Aquifers. In the Big Gulch area, the Willow Creek Aquifer has water levels that are more than 150 feet lower than water levels in nearby wells of the Pierce Gulch Sand Aquifer, as shown by the triangular water level symbols in Figure 5. The measured offset in water levels in the two aquifers is shown to occur over horizontal distances as short as one-quarter mile, suggesting a hydraulic disconnection between the two aquifers. The geochemistry of the ground waters in the two aquifers is also very different (see the section below on Geochemical Modeling). The differences in water levels and water chemistry, in concert with low-permeability clay strata between the two aquifers demonstrate that the Willow Creek Aquifer is distinct and separate from the Pierce Gulch Sand Aquifer. The differences in water chemistry also show that ground water in the Pierce Gulch Sand Aquifer does not flow in significant quantities to the Willow Creek Aquifer. The limited and bounded areal extent of the Willow Creek Aquifer, its high pumping lifts and associated energy costs, and the small amount of available recharge serves to limit its potential as a source for significant groundwater supply. The SPF (2004) report estimated that the total recharge to this aquifer is 3,300 acre feet annually (equivalent to about 3 million gallons per day or 2,000 gallons per minute). SPF estimated that a fourth of this recharge is from direct infiltration of precipitation and the remainder from up-basin runoff or ground water underflow source (a highly speculative conclusion in our opinion). In contrast, the Pierce Gulch Aquifer is areally extensive, benefits from a strong source of recharge from the southeast from surface water irrigation diversions and the upper Boise River and has the additional advantage of reasonably high water levels with relatively low pumping lifts.

Sub-Surface Cross-Section. Figure 5 presents one of thirteen cross-sections of the subsurface geology developed as part of the characterization program using existing well data. (The other cross-sections will be included in a future report). The line of section for this cross-section for this sketch, which shows HLI's interpretation of the regional aquifer beneath the M3 site, is shown on Figure 1. The cross section depicts the Pierce Gulch Sand Aquifer dipping to the southwest and rising to the northeast where it projects to ground surface between Spring Valley Ranch test wells #6 and #7 in Big Gulch. The dashed green line in Figures 3 and 4 represents the approximate position of the base of the Pierce Gulch Sand Aquifer where it crops out at land surface.

Pierce Gulch Sand Aquifer Characterization

Conceptual Model. Using the derived aquifer transmissivity values and the measured water levels in wells to derive a ground water gradient, our analyses indicate that 20 to 30 mgd (million gallons per day (equivalent to approximately 22 thousand to 34 thousand ac ft/yr. (acre feet per year)) of ground water currently flows in a northwesterly direction through the Pierce Gulch Sand Aquifer beneath a five-mile wide strip of the M3 site between State Highway 16 and the inferred edge of the pierce Gulch Sand Aquifer (shown as a dashed green line on Figure 6). This quantity represents three to four times the projected demand at build out. The five mile swath approximates the expected width of the capture zone (cone of depression from pumping) for M3-Eagle's proposed on-site production wells. This ground water flows from south of Eagle and areas south of the Boise River toward the Payette River Valley where it ultimately discharges. Most of this groundwater originates as recharge in the east and south Boise regions augmented by leakage from canals south and east of Meridian and recharge from the Boise River in the Boise area. There is likely some localized shallow aquifer recharge from area canals such as the Farmers Union Ditch and from flood irrigation although these sources are believed to recharge only the uppermost floodplain terrace gravel in the lowland Eagle area and ultimately discharge quickly to the Boise River. This localized recharge is not believed to be significant to ground water flow beneath the M3 Eagle site. Contrary to popular notion, the deeper (Pierce Gulch) aquifer is not recharged by the Boise River in the Eagle-Star area. In fact, the opposite is true. Owing to the upward ground water gradient in the area (increasing potential with depth) the Boise River actually gains water from the aquifers underlying it. It is this upward ground water flow from below that makes the River a "gaining stream" in the Eagle reach and also is the source of Eagle's many flowing artesian wells, as discussed in Petrich and Urban (2004).

Ground Water Flow Direction. Figure 6 indicates the general ground water flow directions and water level contours for the Pierce Gulch Sand Aquifer, the Willow Creek Aquifer and the undifferentiated localized aquifer(s) within granitic and volcanic rocks and local sedimentary aquifers of the foothills to the northeast of the M3 site. These contours were generated from data derived from two sources. The first and primary source is a series of 167 water levels measured by HLI and the University of Idaho in the M3-Eagle-Star vicinity during the summer of 2006. The second source of water level data is from IDWR's on-line data base, for wells located further away from the project area. The IDWR data consists of levels measured by IDWR and levels reported on Well Driller's Reports. Our level of confidence in the interpretation of ground water flow in the area where HLI collected water level data (the Eagle-Star-M3 area) is much higher than in the regions to the west (the Caldwell-Meridian and northward area). Lower confidence is noted by the dashed contour lines in the regions of less reliable (driller) data.

The combined water level data are contoured to show the potentiometric surface with arrows indicating the inferred ground water directions, based on ground water flow at right angles to the contours (ground water flow from higher pressure levels to lower pressure levels). The water level contour map illustrates that although the Willow Creek Aquifer is adjacent to the Pierce Gulch Aquifer, only small quantities of ground water flow from the Pierce Gulch Sand Aquifer to the Willow Gulch Aquifer. In our conceptual model, low-permeability clay and mudstone strata underlying the Pierce Gulch Sand Aquifer significantly restricts ground water flow to the Willow Creek Aquifer; the steep hydraulic gradient (close to 1.0) between the aquifers in the Big Gulch area notwithstanding. The contours shown for the Willow Creek Aquifer, and the undifferentiated upland zone in the northeast, are only approximate because of the limited number of water level data points available for contouring.

Interbasin Transfer of Ground Water Under Natural Gradients and Recharge. Prior to the HLI study, the prevailing conceptual models indicated that recharge to the ground water system beneath the Eagle area originated primarily in the foothills to the north and east of Eagle (Petrich and Urban, 2004; and SPF, 2004). In HLI's view of ground water flow (conceptualized on Figure 7), the previous conceptual models are incorrect. In other words, regional ground water *does not* flow from the uplands in the northeast to the valley in the southwest. Instead, ground water flows from southeast to northwest beneath the City of Eagle and the M3 Eagle site through the Pierce Gulch Sand Aquifer because the northwest ground water flow gradient is toward the Payette Valley. The gradient is driven by the higher pressures ("head" or water levels in wells) in the aquifer to the south beneath the Boise Valley and the lower aquifer pressures in the aquifer to the northwest beneath the Payette Valley. The water levels in the aquifer beneath the Payette Valley are lower because the land surface of the Payette Valley near Letha is about three hundred feet lower than the Boise Valley near Eagle (see Figures 7). The existence of significant ground water flow from the Boise Basin to the Payette Basin was discounted by Newton (1991) and again by Petrich and Urban (2004) although Urban acknowledges (personal communication, 2007) that he believed such an exchange could happen, "there just was not sufficient data at that time to substantiate it".

Vertical Gradients and Confining Conditions. Although Figure 6 shows the general horizontal components of ground water flow in the region, vertical flow gradients are not yet fully understood and are not illustrated in this report. A significant observation, however, is that there is an upward vertical gradient within all three of the test well piezometer nests drilled beneath the M3 Eagle project site, as part of the HLI characterization study. Even though these vertical gradients are relatively small (typically less than a foot difference over a vertical difference of 100 to 200 feet), the upward gradient indicates that ground water beneath the M3 Eagle site is under similar confining conditions to those in the Eagle-Star Valley areas. These measured vertical gradients that exist in the foothills region also serve to refute the prevailing notion of the foothills as a recharge area for the City of Eagle's water supply. Because the M3 Eagle project site ground surface is at higher elevations than the Valley, water levels in upland wells of the

Pierce Gulch Aquifer do not rise to the surface and flow as they do throughout the lowland areas of the Cities of Eagle, Star and Meridian. Figure 7 shows this relationship with aquifer water levels ("potentiometric surface") above the Boise and Payette Rivers but below ground surface beneath the M3 Eagle site and adjacent uplands.

Aquifer Transmissivity. HLI analyzed the data from fifteen well pumping tests of other workers in the study area (including three on the M3 Eagle site). The locations for the analyzed wells (including selected observation wells) are shown in Figure 8. These analyses indicate that individual well yields from the Pierce Gulch Sand Aquifer are high – in excess of 1,000 gpm and at some locations as high as 2,000 gpm. The calculated transmissivities (a property that helps to quantify how much water can flow through an aquifer) for the entire aquifer thickness are estimated by us to be on the order of 100,000 gallons per day per foot (gpd/ft) and in some areas values of 200,000 gpd/ft and higher were derived. Figure 8 shows eighteen calculated transmissivity values in map view by location for the various tests. Several of the tests included multiple observation wells which allowed evaluations of transmissivity at more than one location per test. The range of calculated transmissivity values compare reasonably well with those of Baker (1991) for the Eagle area. HLI's analyses for the fifteen pumping tests will be released by M3 Eagle as a separate, stand-alone report in the near future.

Large values of aquifer transmissivity indicate that the draw down (cone of depression) of a pumping well will translate into relatively smaller water level/pressure declines around and at distance from the pumping well and that the decline will be spread over a larger area. In other words, large transmissivity generally results in smaller impacts (well interference effects) to other wells in the area. Because of the relatively undeveloped foothills area surrounding the proposed M3 Eagle development, and also because a one mile wide strip of BLM desert land separates the M3 Eagle site from the City of Eagle, interference effects to existing domestic wells are lessened simply due to the distances to nearby wells. The largest potential for interference effects to existing wells is on the west side of the M3 Eagle lands near State Highway 16. Although the actual extent of any future impacts cannot be truly known until actual pumping wells are in place, M3 Eagle has constructed a multi-level monitoring well at this location. This piezometer nest and several other local domestic wells are being measured, and will continue to be measured to determine the extent of any well interference impacts that do occur. It is anticipated that M3 Eagle will drill, construct, and test a large bore supply well within the next sis month period.

Aquifer Storativity. Figure 8 indicates computed short-term and estimated long-term storativity coefficients calculated for the greater project area. Storativity is an aquifer property that indicates how much water is released from the aquifer to a well when it is pumped. The results of the short-term pumping tests (a few days or less) all indicate storativities on the order of 0.001 or less, demonstrating "confined to semi-confined conditions." Confined conditions generally cause the effects of pumping to be spread out relatively rapidly from the pumping well and over a large area, as water is drawn toward the pumping well. Confined conditions can also mean that the effects of pumping would be somewhat-to-completely attenuated in overlying aquifers. A confining layer, typically lower-permeability clay and/or mudstone, allows only minor leakage across the stratigraphic layering such that the effects of pumping take longer to reach the overlying shallow ground water zones. In other words, a clay layer between two aquifers slows down and reduces the draw down effects in one aquifer when the other aquifer is pumped.

Two longer-term aquifer tests have been conducted in the Eagle area (CH2M-Hill, 1991, Holladay Engineering Company, 2006). HLI's re-analysis of these tests, generated aquifer storativity values of 0.01 and higher, indicating "semi-confined" to "unconfined conditions" under longer-term pumping. The larger storativities with longer-term pumping indicate that the confining clay layers are likely discontinuous over a broad region allowing the draw down pressure gradients from the pumping well to propagate upwards into shallow less confined-to-unconfined aquifers and/or surface water sources with the result that the water level in the pumping well ceases to draw down under continued pumping. In other words, the cone of depression ceases to expand so that interference effects to surrounding wells are arrested.

High-quality long-term pump testing has not yet been conducted beneath the M3 Eagle site. However, hydrogeologic data from two of the M3 Eagle exploratory test wells indicate the northeast edge of the aquifer is defined by an unconfined water table or a water level that is only slightly above the overlying (confining) clay. These conditions suggest that long-term pumping could lead to unconfined conditions near some of the proposed M3 Eagle pumping wells in the Pierce Gulch Sand Aquifer. Pumping under unconfined conditions generally results in smaller interference effects to other wells in the area, especially to those at more distal locations (several miles), compared to pumping under confined conditions.

Predicted Impacts of M3 Eagle's Ground Water Development at Full Build-Out. We have used the results of the pumping tests to estimate the effects of yet-to-be-constructed production wells on the M3 Eagle site. The drawdown effects of each pumping well are additive. The impact at any given site or well location will be the sum of the impacts caused by all pumping wells. Figures 9 and 10 show the collective predicted drawdown (cone of depression) that could be caused by six hypothetical production wells completed in the Pierce Gulch Sand Aquifer on the M3 Eagle site. These proposed supply wells are labeled PS1 through PS6 in the figures. Based on the understanding that the Pierce Gulch Sand Aquifer is bounded along its northeast edge (as shown by the green line in Figures 9 and 10), the proposed well locations lie within the southwest portion of the M3 Eagle site, oriented at right angles to ground water flow. These locations and orientations were chosen to allow for an optimal yield while minimizing impacts to off-site wells. The actual well locations, total quantity of water pumped from individual wells, and the actual number of wells constructed will be determined as the water supply for the project is developed and as additional wells are drilled and tested. M3 Eagle's existing monitoring network will also be utilized to understand the impacts of newly completed wells to the aquifer system. The predicted drawdown interferences were generated using an analytical model that calculated drawdowns at one-mile centers within a 42 square mile area surrounding the M3 Eagle project. The predicted drawdowns within each one square mile area were then contoured to show lines of equal predicted drawdown-inference throughout the region shown in Figures 9 and 10. The model used the method of Theis (1935) and image well theory to replicate the effects of the pumping wells and the northeastern edge of the aquifer that acts as a no-flow boundary. A total of 12 wells were used in the simulation (six pumping wells and six "image" wells). The image wells (not shown in the figures) were used to simulate the effects of the aquifer boundary.

The analysis used a range of transmissivity and storativity coefficients calculated from the fifteen pumping-test results for the Pierce Gulch Sand Aquifer. The best-case analysis was based on an aquifer transmissivity of 200,000 gpd/ft while the worst case used a transmissivity of 100,000 gpd/ft. This worst-case is based on lower values calculated from short-term pumping tests conducted in the regional aquifer while the best case is based on the upper-end values calculated from the long-term tests. The actual results are likely to lie somewhere between the two end-point predictions.

Two values of storativity were used in the analysis. A best-case value of 0.01 was used to represent semi-confined-to-unconfined conditions that have been observed during long-term testing and are likely to occur over a season of pumping. As a worst case, a value of 0.005 was used in the analysis. This value is slightly larger than those calculated from short-term test data but smaller than those calculated from the longer tests that better represent our best understanding of how the aquifer will behave during extended pumping. Since the Pierce Gulch Sand Aquifer is leaky and likely to become locally unconfined over time, we believe that the actual effective storativity will fall within the range of values reflected in the best- and worst-case analyses.

Figure 9 shows the predicted drawdowns at full M3 Eagle build out for the best (least drawdown) case scenario. This analysis indicates collective drawdowns of 6 to 8 feet are likely one mile from the project boundaries. Figure 10 shows the worst-case predictions with interference drawdowns on the order of 10 to 16 feet one mile from the project. Additional aquifer testing planned for summer of 2007 will help to refine these predictions. The actual real-world inference drawdowns will be measured and reported as the project develops. As new wells are put into service and the water demand increases over time, the in-place monitoring program (discussed below) will allow for actual measurement of interference drawdowns. Any potential impacts to the small number of domestic wells adjacent to the M3 Eagle site would be able to be predicted and identified through this monitoring program because M3 Eagle has commenced a monitoring program that includes wells in all areas of potential impact.

It should be noted that the predictions shown in Figures 9 and 10 are for wells completed into the Pierce Gulch Sand Aquifer and do not directly address impacts to shallow wells (most often domestic wells) that may be completed into overlying aquifer zones that are separated from the main body of the Pierce Gulch Sand Aquifer by low-permeability sediments (clay layers). Interference draw downs in wells completed within an overlying aquifer unit would be expected to be reduced in magnitude and delayed from those predicted in Figures 9 and 10. If the overlying aquifer is separated from the regional aquifer by a clay layer that is low in permeability, the interference effects of deeper pumping wells could remain small, or even be immeasurable over time, in wells completed into the shallower aquifer units. Conversely, if the layers separating the regional and shallow aquifer are leaky and permeable, interference in shallow wells could possibly approach the same levels as those predicted for wells completed in the Pierce Gulch Sand Aquifer after an extended period of pumping. With an eye toward potential impacts to shallow domestic wells, M3 Eagle has constructed monitoring wells that monitor all saturated aquifer units at a given location to be able to asses the effects of deep well pumping to shallower sub-aquifer units. M3 Eagle's monitoring plan utilizes continuous measurements from digital data loggers with periodic calibration checks (hand measurements) rather than relying on a few "spot" measurements of a well through time. Therefore, on-going monitoring is in place to better assess impacts (if any) to shallow wells; even if such effects are delayed.

Domestic Wells. A records survey of over 1,600 domestic (single family household) wells in the greater project area from Eagle to Emmett shows that the preponderance of domestic wells are located up-gradient (toward Eagle and Star) from the M3 site (see Figure 11). That is to say, ground water flow in the aquifer encounters these wells first before flowing to the M3 site. Water levels would likely be lowered to some degree in some of these wells under long-term pumping, as discussed above. Wells close to the M3 site would be expected to be impacted to a larger extent than wells at a distance from the pumping centers. While it is conceivable that a few nearby wells may require mitigation to honor their pre-existing water rights, we believe that the existing water level monitoring network is adequate to predict such interference effects before anyone would experience an actual water shortage and M3 Eagle's proactive pre-development water level monitoring of local area domestic wells will be instrumental in assessing such interference effects. M3 Eagle is absolutely committed to mitigating unreasonable and damaging interference effects that would be a result of its water development whether this would require lowering of a pump in a nearby well and/or even deepening of the well in an extreme case.

Long Term Aquifer Monitoring

M3 Eagle Aquifer Monitoring. M3 Eagle commenced long-term monitoring of groundwater pressures (water levels in wells) in the Big Gulch and Little Gulch areas in March 2006. To date, three, multi-level, long-term designated monitoring wells have been installed and instrumented by M3 Eagle at a cost of over $100,000 per well. Water levels at various depths of the Pierce Gulch Sand Aquifer are currently being monitored in these wells. Figure 12 shows the details of well construction for one of the M3 Eagle monitoring wells. In addition HLI is monitoring levels in five other Pierce Gulch Sand Aquifer wells in the area. As of February 2007, a total of 17 separate wells are being monitored with electronic data loggers by HLI for M3 Eagle. These data loggers have helped in the assessment of seasonal water level trends, changes in water levels caused by pumping and even changes resulting from changes in weather patterns and daily earth tides. These wells will provide good documentation of predevelopment aquifer water levels. They will also be used in longer-term aquifer testing in conjunction with one or more high-capacity test wells that will be installed at some future date. Local residents and well owners, along with IDWR, will be advised of the tests and invited to participate.

Other Monitoring. The United States Geological Survey (USGS), IDWR, United Water of Idaho (UWID), and others also are monitoring ground water levels in wells of the Eagle area. It is estimated that approximately 70 wells are currently being monitored in the uplands and lowlands in and around the City of Eagle. In general, water levels in wells appear to be stable with no apparent declines over the last ten years. (Bendixsen, 2007).

This ongoing monitoring, along with additional pumping tests associated with new well installations, studies by faculty and students at the Boise State University, and numerical modeling by the University of Idaho, will allow for refinements in the understanding, and better management of the ground water system in the entire Eagle-Star-M3 area. As this understanding is improved, supplemental reports will be released by M3 Eagle to regulatory agencies and the public.

Ground Water Geochemistry Modeling

Drinking Water Quality. All ground water samples collected and analyzed from the Pierce Gulch Sand Aquifer indicate that water quality is excellent and will meet all state and federal drinking water standards. To date, HLI has collected and had analyzed eleven ground water samples from test wells M3-TW#1 and M3-TW#3 and the Kling Irrigation well. The results all indicate that ground water from the Pierce Gulch Aquifer beneath the M3 site meets the drinking water standards of the United States Environmental Protection Agency (USEPA) Safe Drinking Water Act and will require no treatment to meet the administrative rules of the Idaho Department of Environmental Quality (IDEQ) for Public Drinking Water Systems.

Geochemical Flow Paths. Comparison of ground water chemistry analyses for water samples from both the Pierce Gulch Sand Aquifer and the Willow Creek Aquifer, supports the conclusion that the ground water in the Willow Creek Aquifer cannot have evolved from the ground water in the Regional Aquifer. The ground water in the Willow Creek Aquifer has a much lower concentration of dissolved solids than the ground water from the Pierce Gulch Sand Aquifer. The dissolved solids in ground water tend to increase along a flow path, because of "residence time" that a given ground water is in contact with the aquifer host rocks. This is why the concentration of total dissolved solids is greater in the Pierce Gulch Sand Aquifer compared to the Willow Creek Aquifer. Figure 6 demonstrates that the flow path in the Pierce Gulch Sand Aquifer is much longer than the flow path in the Willow Creek Aquifer (longer residence time = ground water in contact with the aquifer rocks longer = more dissolution of minerals into the ground water). The water level contour map shows ground water flows through the Pierce Gulch Sand Aquifer from south of Eagle (and off the map) to the M3 Eagle site where the samples were collected, a distance of many miles. The highly bounded Willow Creek Aquifer has no such long-distance flow path. Instead, its ground water recharge is believed by us to originate mostly from the infiltration of local precipitation and from upland streams infiltrating the top of the unit; a theory shared in part by previous researchers (SPF, 2004). The flow paths, and thus the residence times, are much shorter for the Willow Creek Aquifer. These geochemical observations support our understanding of the ground water flow paths demonstrated by the water level contour map (Figure 6) and discussed throughout this report. Our preliminary geochemical analyses also support our contention that the Boise River near Eagle does not locally recharge the Pierce Gulch Sand Aquifer.

Natural Separation of Aquifer Waters. In addition to the measured total dissolved solids concentration, nitrate concentrations in the samples from the Pierce Gulch Sand Aquifer are elevated compared to those from the Willow Creek Aquifer. Nitrate is a conservative "tracer" in that it does not react or become significantly adsorbed onto the aquifer matrix along a flow path. The lack of nitrate in the Willow Creek Aquifer also appears to support our contention that groundwater does not flow *from* the Pierce Gulch Sand Aquifer *to* the Willow Creek Aquifer in any significant quantity, even through a steep water level gradient (much lower water levels in the wells completed in the Willow Creek Aquifer compared to the Pierce Gulch Aquifer) exists between the two aquifers. These ground water quality parameters support the conclusion that the two aquifer flow systems are, for all practical considerations, separate and that their source waters (recharge) are different. Ground water in the Pierce Gulch Sand Aquifer enters the M3 Eagle area primarily through underflow of ground water from southeast of Eagle while recharge to the Willow Creek Aquifer is primarily through limited infiltration of precipitation and runoff from the uplands to the northeast via intermittent streams and seasonal snowmelt.

Geochemical Modeling. As soon as the final geochemical analyses are available, the ground waters from selected well locations will be modeled using "the Geochemists Work Bench" software to obtain further insights into the regional ground water flow paths. The results and interpretations from this work will be included in HLI's future comprehensive project report.

Computer Modeling

HLI has been working with the University of Idaho's Department of Geological Sciences (U of I) to provide data for their use in developing a computerized numerical ground water flow model for the M3 Eagle development and surrounding communities. M3 Eagle commissioned the U of I to develop a detailed numerical model independent of HLI's ongoing modeling efforts and has additionally funded a Master's Thesis at U of I's Department of Geological Sciences in response to a request by local-area residents to have an independent unbiased model constructed. All the data collected to date by the HLI team has been shared with the U of I modelers and regular review meetings are conducted. The U of I modelers have reviewed HLI's conceptual understanding of ground water flow presented in this Hydrogeologic Characterization Progress Report and are using it in the development of their computer model. They are basing their model on "Modflow 2000," the current *de facto* standard for regional computer flow models, developed by the United States Geological Survey and used extensively throughout the United States for regional modeling and aquifer management.

It is anticipated that the U of I model will be available for predictive use in 2008, although preliminary testing of hypotheses may be possible sooner. To be able to test our aquifer theories on an ongoing basis, HLI is simultaneously developing simplified models using a variety of software packages that will be able to be compared to the U of I model when it is completed in the future. It is anticipated in the mean time, however, that the HLI model simulations will be adequate and available to support M3 Eagle's water right application pending before IDWR. The predictions made by the models will include estimates of general water level and flow changes that would be caused by the pumping of new wells drawing from the Pierce Gulch Sand

Aquifer. After the U of I model is completed in 2008, additional time-series data will likely be needed to verify model calibration. This verification would increase the certainty of model predictions, which at this time can only be based on the available data from the site and the greater Eagle-Star area. Additional planned aquifer testing and water level collection, followed by adjustment of the Modflow model to better replicate known hydrologic events, will improve confidence that the model can accurately predict long-term response to pumping. HLI and M3 Eagle intend for the model to be a predictive tool to assist in aquifer characterization. It is our conviction that the actual and real results from the aquifer testing and high quality monitoring of water levels in wells will provide the best information on the sustainability of the aquifer.

Preliminary Conclusions

Based on the work conducted to date, we present the following preliminary conclusions:

1) A single, regionally extensive aquifer underlies Eagle, Star and portions of the M3 project site.
    a. The aquifer, designated the "Pierce Gulch Sand Aquifer" (after a significant geologic unit of the same name) underlies the M3 Eagle site. The aquifer has been delineated by a series of exploration test wells, surface geologic mapping, geophysical surveys, analyses of pumping tests, collection of water level data, ground water geochemical analyses, and computer modeling.
    b. The aquifer is comprised of granitic sands, with inter-bedded thin and locally discontinuous clay layers, that range from 150 to 275 feet in total thickness in the project area.
    c. The aquifer dips at low angles to the southwest so that it lies at a deeper level beneath land surface at Star than beneath Eagle.
    d. The aquifer sands are approximately 275 feet thick under the M3 Eagle site but appear to thicken down dip to the southwest. The aquifer as a whole may be effectively "thicker" in terms of aquifer transmissivity in parts of the Eagle and Star area where overlying saturated zones are hydraulically interconnected.

2) Ground water in the Pierce Gulch Sand Aquifer flows beneath the Boise River, beneath the City of Eagle, and beneath the M3 Eagle lands from south of the Boise River, northwestward to the Payette River Basin.
    a. The major source of ground water in the aquifer in the vicinity of Eagle is ground water underflow from areas south and east of the Boise River at Eagle.
    b. This ground water originates as direct infiltration from the Boise River in the east-central Boise area and through leakage from irrigation canals south and east of Eagle.

3) The Boise River near Eagle and Star does not recharge the Pierce Gulch Sand Aquifer.
    a. The Boise River receives discharge *from* the Pierce Gulch Sand Aquifer and a shallow surficial aquifer via the upward vertical ground water gradients that prevail within the Eagle area.

b. The upward ground water gradient (increasing potential with depth) is most easily recognized in the preponderance of flowing artesian wells in the Eagle and Star areas and by the fact that the Boise River is a "gaining stream" in the Eagle reach.
c. Recharge that occurs through infiltrated precipitation, applied surface water irrigation, and from canal leakage in the Eagle area mostly enters the shallow surficial aquifer which lies above the Pierce Gulch Aquifer and is believed to drain to the Boise River without significant effect to the underlying deeper aquifers.

4) <u>Water levels in wells completed within the Pierce Gulch Sand Aquifer appear stable at the current level of ground water withdrawal in the Eagle area.</u>
   a. The monitoring of 70 wells by state and federal agencies, local water utilities, and others, show generally stable or rising water levels in wells (Bendixsen, 2007).
   b. Water level monitoring by UWID, of a designated monitoring well completed into the Pierce Gulch Sand Aquifer at the intersection of State and Linder in Eagle, shows water levels to be constant for the last ten year period (Roger Dittus, personal communication, 2007).Perceived and/or alleged declines in above-ground artesian pressures of some local area wells are likely true in some cases but are considered to be most likely the result of poorly constructed (unsealed) air-rotary-drilled wells and corrosion of thin-wall steel casing used for most wells in the area historically. A "water level change map" of measured water levels in comparison to water levels reported on driller's reports is planned for HLI's comprehensive report.
   c. A water level change map developed by HLI supports these conclusions where the only apparent pressure declines are where a well field of unsealed domestic wells allows artesian pressure to escape through unsealed annular spaces of air-rotary and cable-tool drilled wells.

5) <u>Ground water in the Pierce Gulch Sand Aquifer under the M3 Eagle site is of excellent quality for all purposes.</u>
   a. Tested waters meet all drinking water standards of the USEPA Safe Drinking Water Act.
   b. No treatment will be required to use this water in a Public Drinking Water System under current Idaho Department of Environmental Quality's administrative rules.

6) <u>The Pierce Gulch Sand Aquifer is moderately to highly productive.</u>
   a. Yields from properly designed and constructed wells are projected to be on the order of 1,000 gpm to 2,000 gpm (1.5 to 3 mgd) or more.
   b. Calculated Transmissivity values from 15 pumping tests show a range from 30,000 gpd/ft to over 300,000 gpd/ft.

7) <u>Sufficient quantities of ground water appear to be present beneath M3 to supply its development.</u>

a. At the current level of understanding of the aquifer it appears possible, if not likely, that the full M3Eagle water demand can be obtained from 6-to-10 on-site water supply wells.
b. At "full build-out" of the M3 project (20 to 30 years), a total average daily water demand of about 7½ mgd will be needed to supply the project or about 25 % to 30% of the 20 to 30 mgd daily flow underlying the property.
c. Based on the work completed to date, it is deemed unlikely that water would have to be transported from wells in the lowlands of the Valley near Eagle and Star to supply the proposed development.
d. Calculated northwest groundwater flow beneath a five-mile wide section of the Pierce Gulch Aquifer beneath the M3 area is on the order of 20 to 30 mgd.

8) <u>Impacts to existing water users from the M3 Eagle development are expected to be few and small-to-moderate in magnitude.</u>
   a. The majority of ground water proposed to be withdrawn by M3 Eagle, will be water that would have already departed the Boise Basin and become tributary to the Payette River Valley.
   b. Most existing wells in the area are up-gradient in the flow system from the M3 Eagle site such that ground water flows to the Eagle area wells before it flows to the M3 site. After flowing beneath the M3 site, groundwater continues toward the Payette River Valley.
   c. A best-case analysis using upper-end aquifer parameter values derived from numerous tests conducted in the Pierce Gulch Sand Aquifer indicate that reductions in water levels in wells one mile from the project boundaries caused by a six hypothetical supply wells, each pumping at 1,000 gpm well for 90 days, could be on the order of 6 to 8 feet.
   d. A worst-case analysis using lower-end aquifer parameter values indicates these reductions could be on the order of 8 to10 feet, one mile from the site.
   e. The actual impacts will likely lie between these two analyses. Additional aquifer testing, scheduled for late summer 2007, and on-going monitoring are planned to refine these estimates of impacts to adjacent wells.

9) <u>M3's monitoring program is adequate to document the impacts of its water withdrawals.</u>
   a. M3 Eagle has commenced long-term monitoring of aquifer water levels with the installation of three monitoring well nests and 17 electronic data loggers.
   b. These loggers are currently collecting data from a total of eight wells, each monitoring one to five depth zones in the Pierce Gulch Aquifer, to measure and document the changes to the aquifer caused by M3 Eagle's ground water development.
   c. As each new supply well is added, additional monitoring and testing will be employed to assess the impacts to other groundwater users in the area as well as the ability of the Pierce Gulch Sand Aquifer to supply the needed water from wells completed on the M3 Eagle property.

10) Additional drilling and long-term pumping tests of one or more high-capacity supply wells are planned to better refine the properties of the Pierce Gulch Aquifer beneath the M3 Eagle property.
    a. These studies will better predict long-term yield and impacts to existing wells.
    b. Local well owners and IDWR will be advised of, and invited to participate in these tests.

11) The on-going monitoring, testing, and numerical ground water modeling and calibration will be used to refine the current understanding of groundwater flow and potential yield of the regional flow system that underlies the M3 site and the greater Eagle-Star areas.

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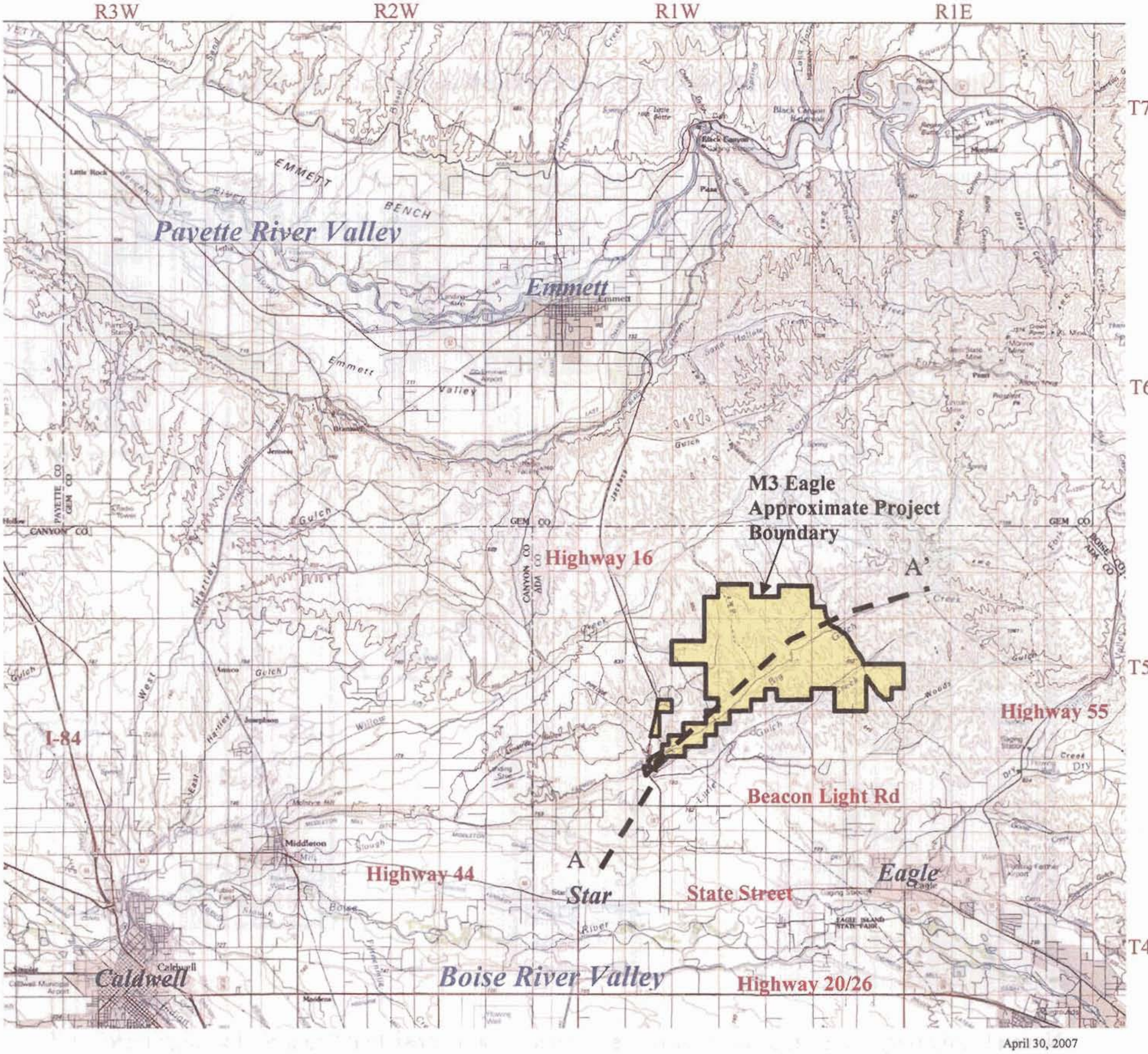
FIGURES



This regional map shows the location of the M3 Project and its relationship to Eagle, Star, the Boise River Valley, Payette River Valley and surrounding area.

N = 1 Mile A A' Geologic Cross-Section Location for Figure 5

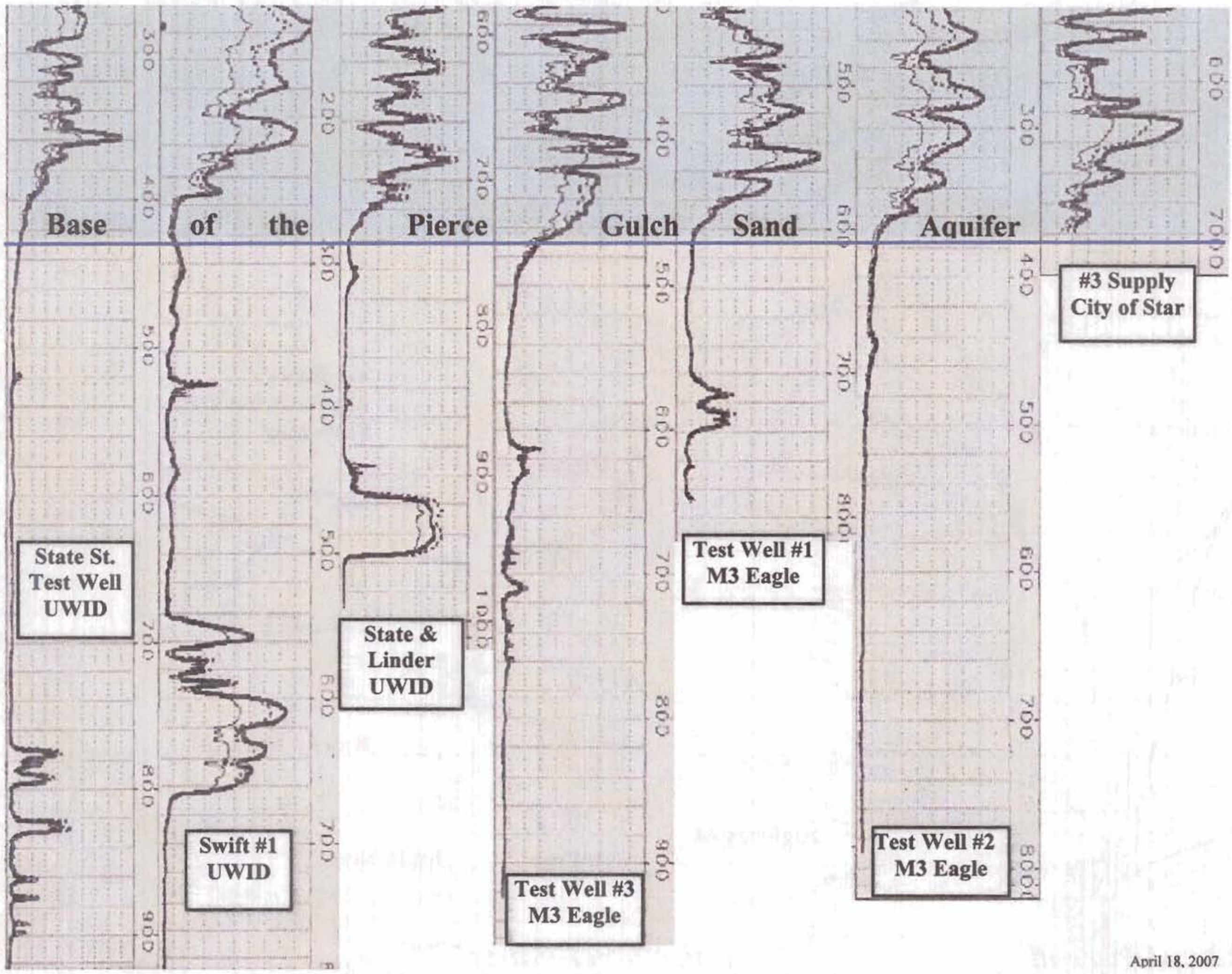
Figure 1.

Hydro Logic, Inc

Boise, Idaho

Figure 1. M3 Eagle Project-Area Location Map

Figure 2. Geophysical Resistivity Logs From Seven Wells in the Eagle Area



Normal resistivity traces at three electrode spacings show a consistent "geophysical signature" at 7 wells completed to different depths over a 50 square miles confirming the presence and base of the Pierce Gulch Sand Aquifer (regional aquifer) over the greater Eagle-Star-Meridian-M3 area. The borehole geophysical logs from these seven wells have been plotted side by side for clarity of correlation. In actual fact, the Pierce Gulch Aquifer is tilted so that it descends deeper below ground to the south and west as shown on Figures 3, 4 and 5. The geophysics also show a less extensive thin sand aquifer at depth beneath the Pierce Gulch Sand Aquifer. Wells completed into the lower sand unit have shown severe hydraulic boundary effects and poor-quality ground water for drinking water purposes.

Figure 2.

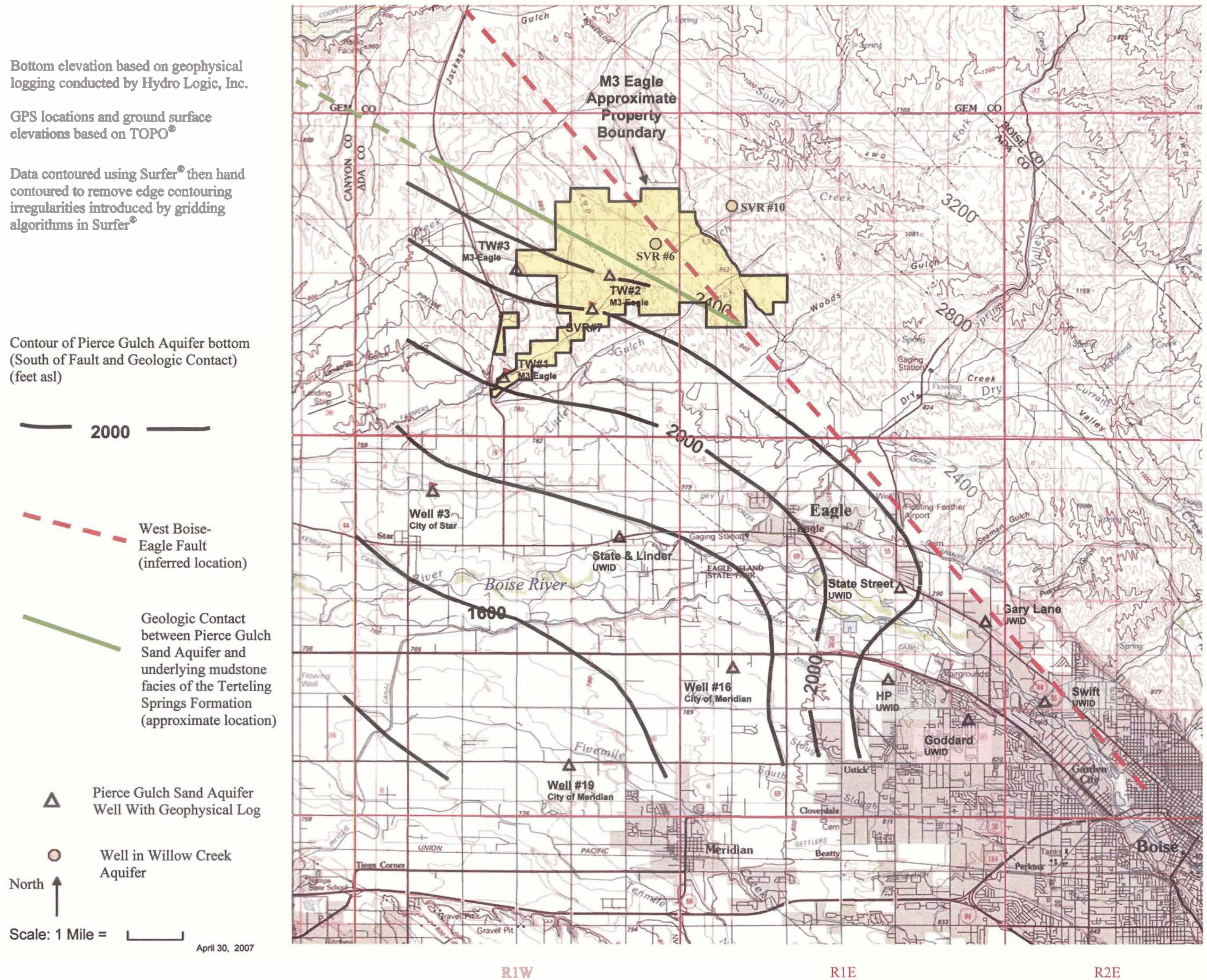


Figure 3. Contours on the Bottom of the Pierce Gulch Sand Aquifer In the Greater M3 Eagle Project Area

Structural contours of the base of the Pierce Gulch Sand Aquifer (regional aquifer) beneath the Eagle area north of the Boise River. The contours are based upon the analysis of drill-cuttings and borehole geophysical logs from thirteen test wells (see Figure 2). The contoured surface represents the base of the regional cold water aquifer. In other words, the occurrence of significant quantities of drinking- water-quality ground water is not likely beneath the contoured depths southwest of the red-dashed fault line.

Figure 3.

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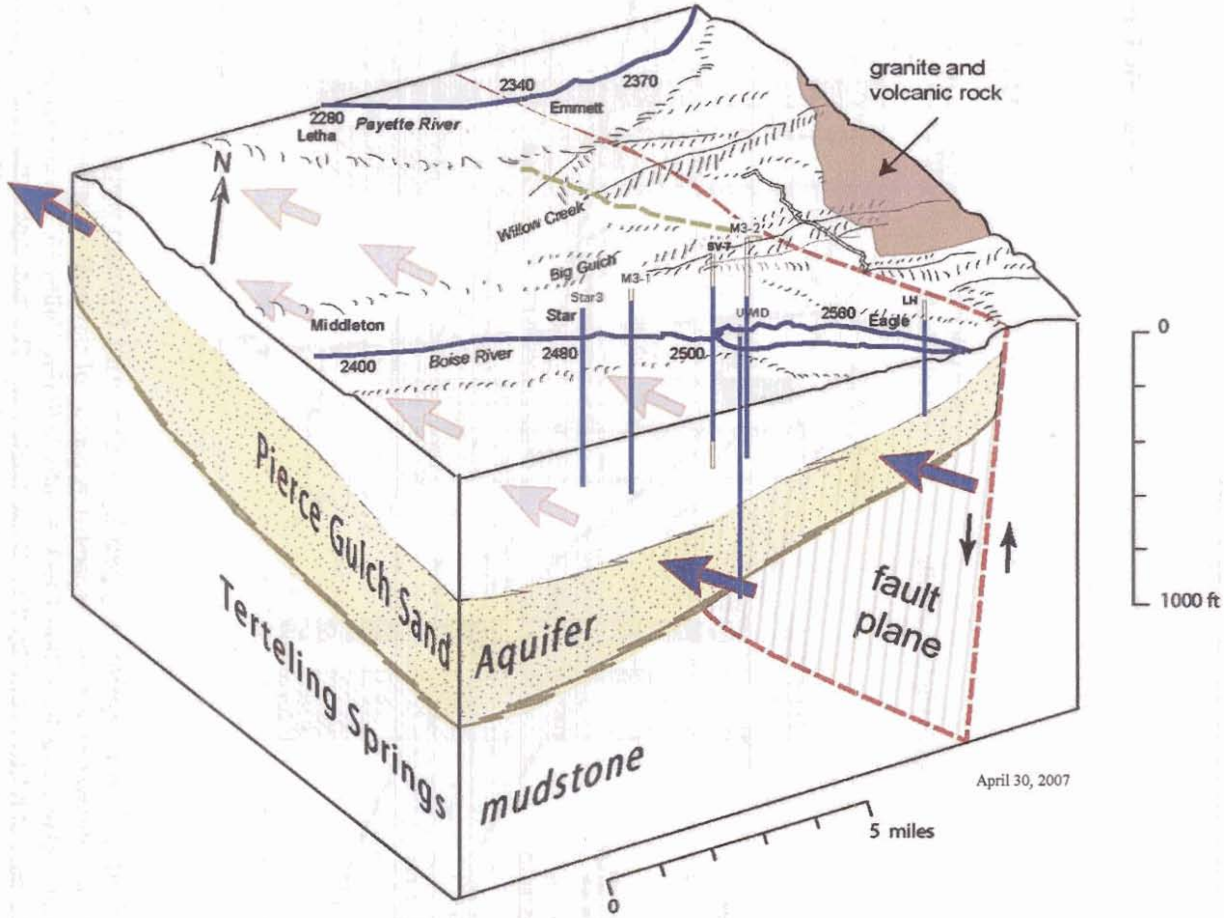
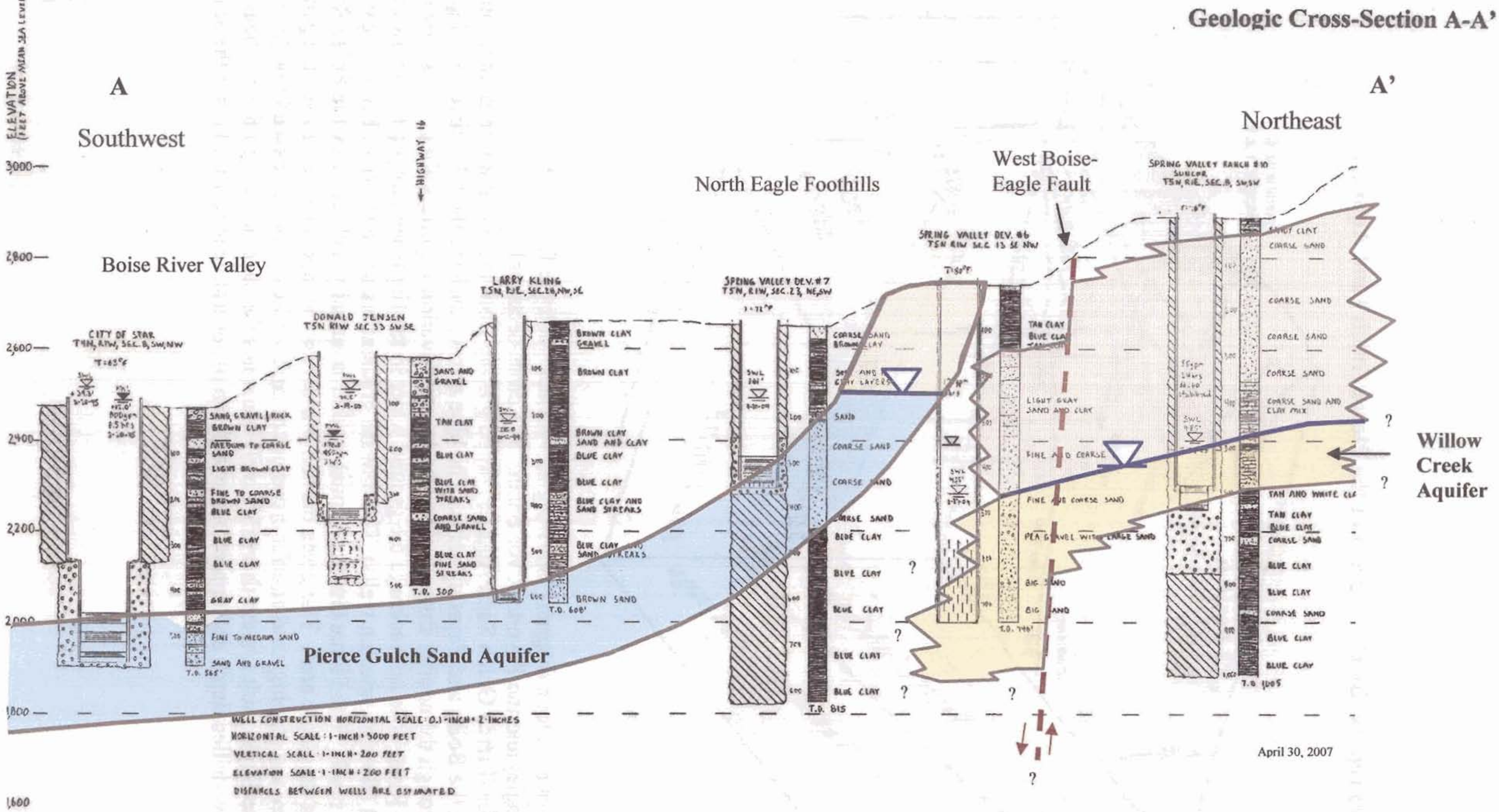
Boise, Idaho

Figure 4. Conceptual Block Diagram of the Pierce Gulch Sand Aquifer.



Three-dimensional "block diagram" showing sub-surface geologic features between the Boise River Basin (near Eagle) and the Payette River Basin. The cross-sectional "cut-away" views depict the regional aquifer (Pierce Gulch Sand Aquifer) dipping away from the mountain front in a continuous layer between the Boise and Payette basins. The blue arrows indicate the NW direction of ground water flow through the aquifer from Eagle to the lower elevation Payette Valley. These arrows show that the Boise River does not recharge the ground water in the Eagle area owing to an upward ground water gradient (flowing artesian wells). The upward gradient results in the river being a "gaining" stream in this reach. The Pierce Gulch regional aquifer is actually recharged by the Boise River miles upstream from the Eagle area. The green dashed line across the land surface denotes the general locations where the dipping sand aquifer crops out at land surface. The red dashed line (plane) shows the West Boise-Eagle fault system that effectively truncates the sand aquifer on the northeast. Vertical blue lines show drilled depth and approximate location of several deep test wells into the aquifer.

Figure 5. **Geologic Cross-Section through the M3 Eagle Site**



Southwest to northeast cross-section showing Pierce Gulch Sand Aquifer tapped by Valley and Upland wells. Note: Pierce Gulch Sand Aquifer continues to northwest, west and south off figure. Spring Valley #6 taps Willow Creek Aquifer separated by contact of clay underlying the Pierce Gulch Aquifer. Clay *below* the Pierce Gulch Aquifer in Spring Valley #7 is believed to be equivalent to clay *above* the Willow Creek Aquifer in Spring Valley #6. The coarser-grained upper portion of the Willow Creek Aquifer is unsaturated at Spring Valley Ranch #10 because of relative uplift by West Boise-Eagle fault. The fault dips to the southwest at about 70 degrees but because of 10:1 vertical exaggeration (to allow well logs to be readable) true dip angle is not shown. The tops of the Willow Creek Aquifer and the Pierce Gulch Sand Aquifer in the northwest are defined by the water table. Unsaturated sands lie above the water table at these locations. The exact lateral extent of the Willow Creek Aquifer is not precisely known but is believed to be defined by a facies change to clay to the southwest and by granitic bedrock to the northeast. An accurate delineation of its boundaries was beyond the scope of this study and not considered to be critical to the assessment of the Pierce Gulch Aquifer. See Figure 1 for cross-section location.

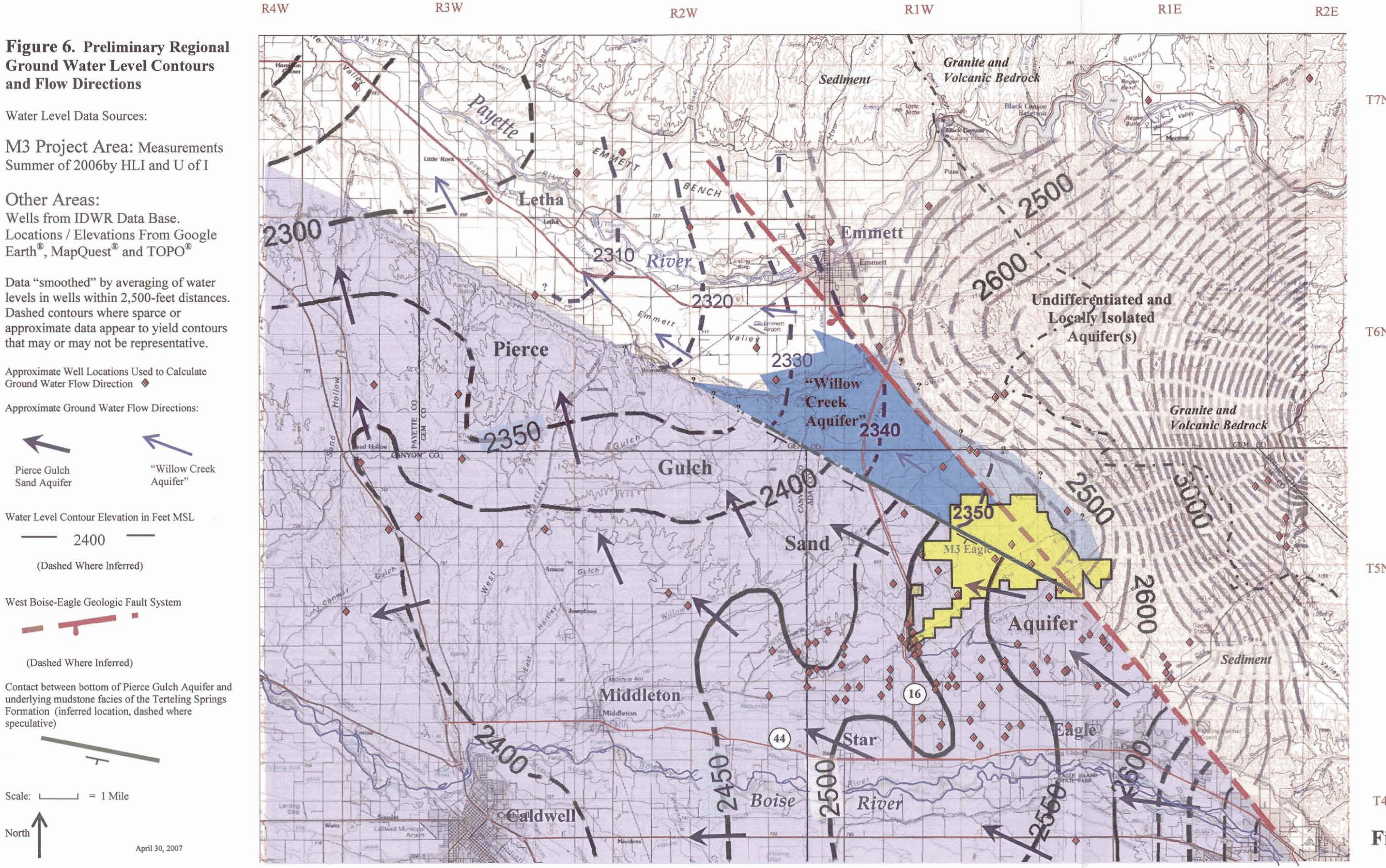


Figure 6.

Dashed grey 50-foot contours to the right side of the map depict the steep gradient and negligible ground water movement through the mudstone facies of the Terteling Springs Formation mudstone and the volcanic tuffs of the Boise Volcanic Assemblage. The black-colored, 50-foot water level contours inside blue shading indicate the northwesterly movement of ground water from the Boise Basin to the Payette Basin north of the Cities of Star, Eagle, and Middleton through the Pierce Gulch Sand Aquifer. The blue-colored and dashed 10-foot water-level contours inside the turquoise area illustrate the relatively flat ground water gradient within the recharge-limited informally named "Willow Creek Aquifer" isolated between low-permeability sediments of the uplands lying to the east of the M3 site and by stratigraphic layering (a day-lighting clay stratum) on the southwest (green solid and dashed line). The boundaries of this aquifer have not been defined as indicated by the "?" symbol.

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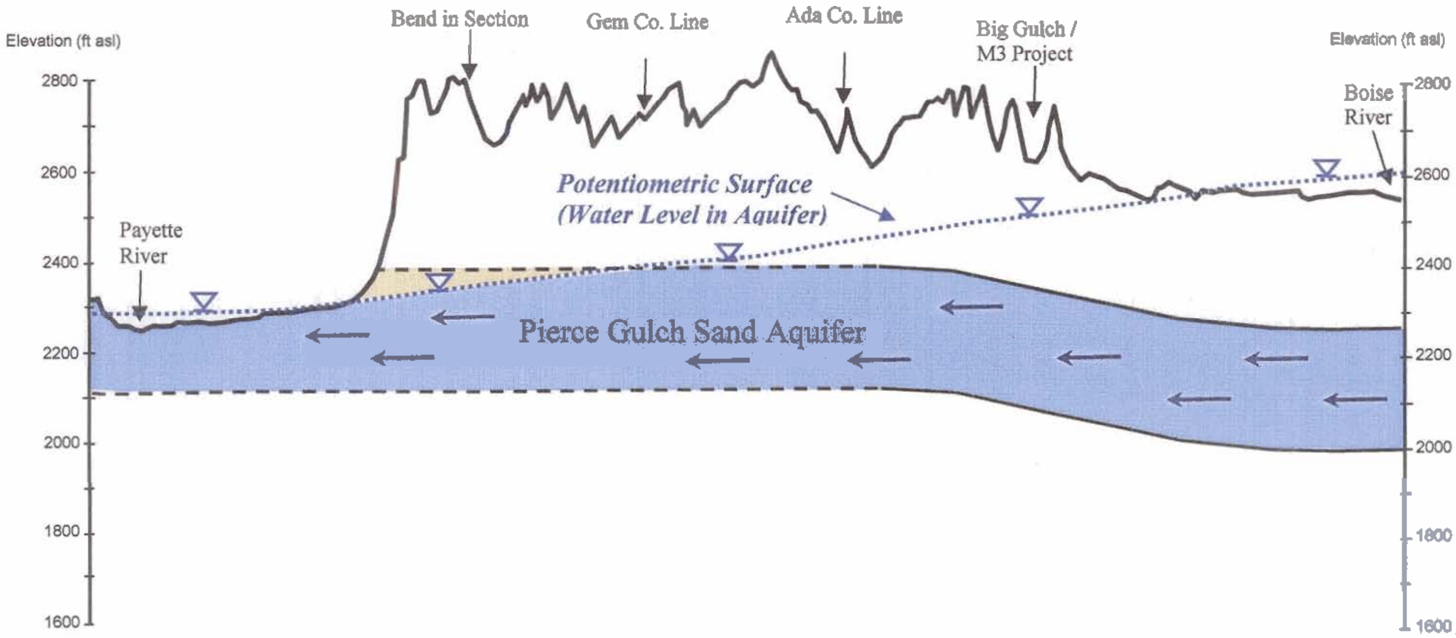
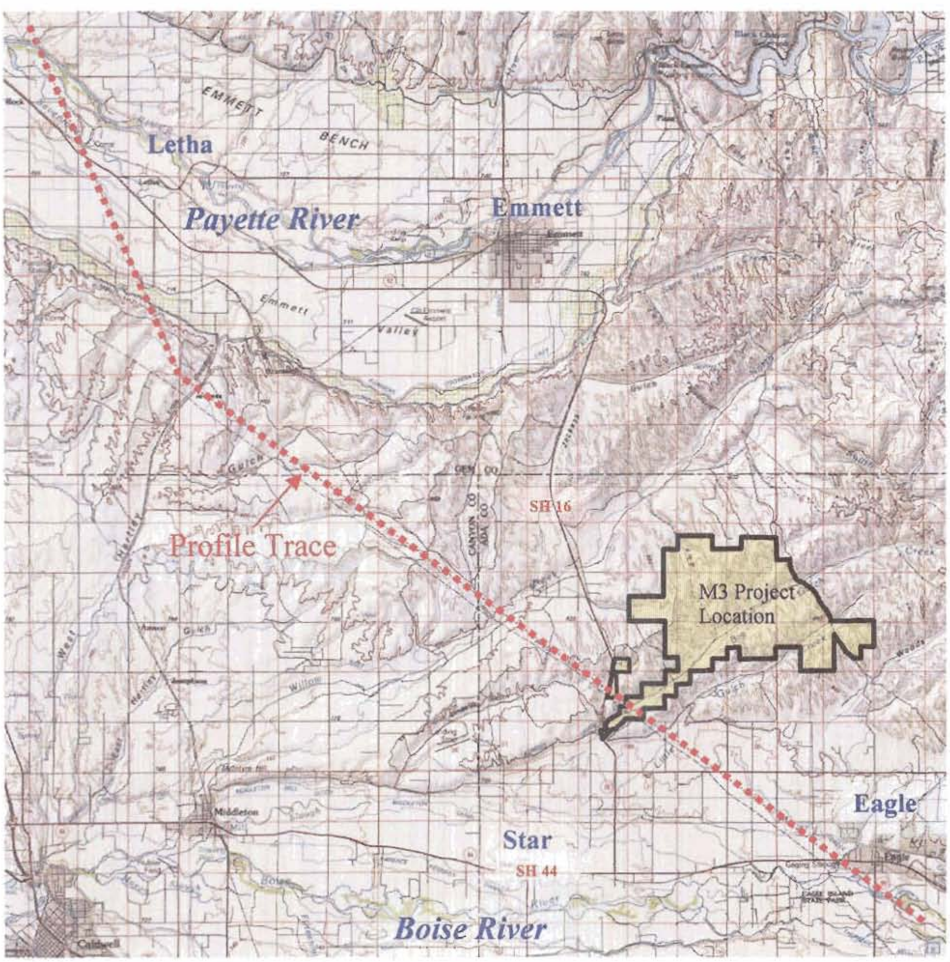
Figure 7. Conceptual Profile of Pierce Gulch Sand Aquifer Between Boise and Payette Rivers





Conceptual profile of the Pierce gulch Sand Aquifer through the M3 Eagle project area from Eagle in the Boise River Valley to north of Letha in the Payette River Valley. This profile (generally along strike of the aquifer) demonstrates that ground water flow is elevation driven with water levels in wells (shown as the "potentiometric surface") near Eagle in the Boise River Valley around 300 feet higher than those in wells completed in the Payette River Valley near Letha. The profile trace bends to better show the current understanding of groundwater flow path as shown in Figure 6.

= 5 Miles (Map and Section)

N

April 30, 2007

Figure 7.

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Boise, Idaho

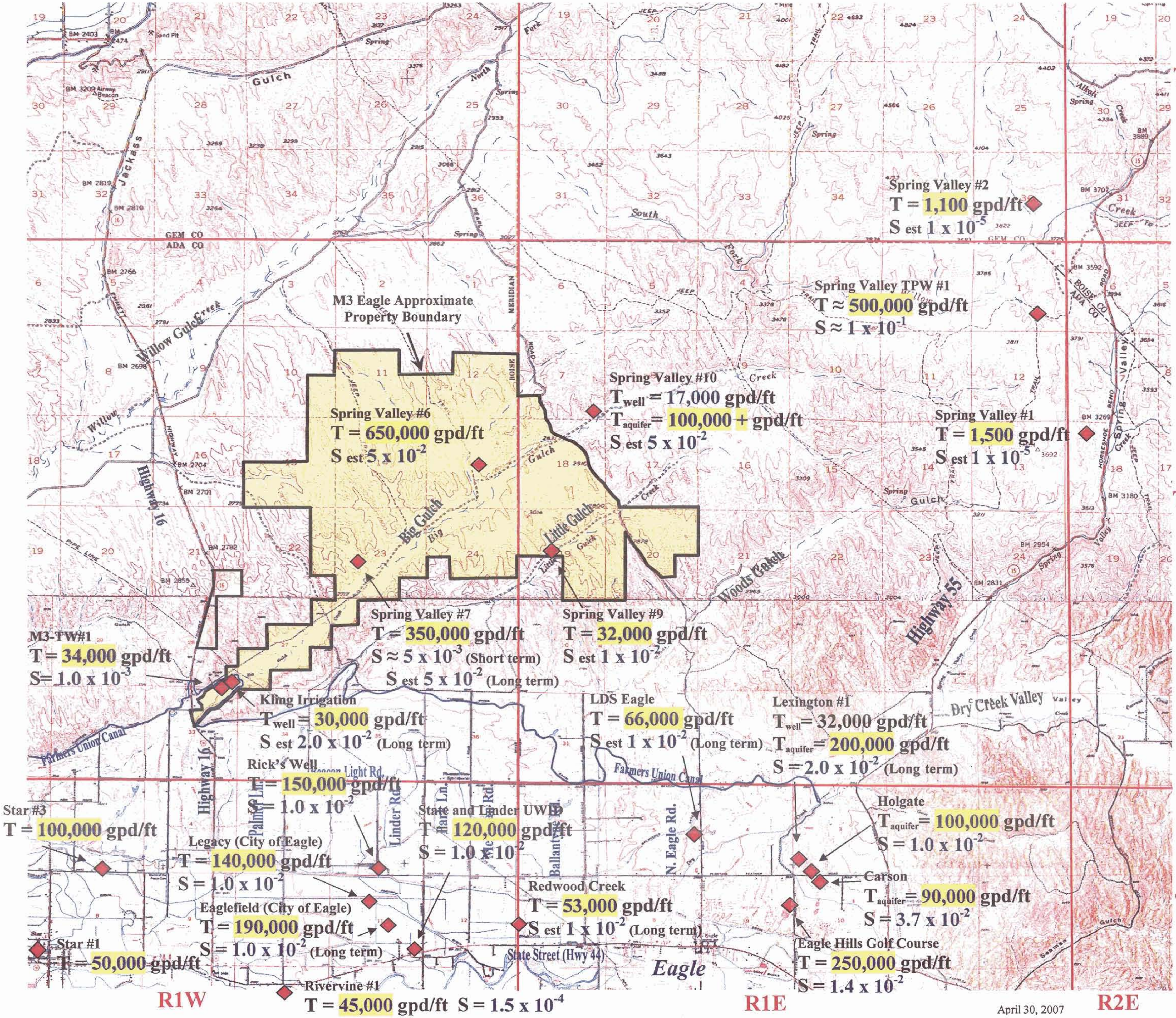


Figure 8. Calculated Values of Transmissivity and Storativity for Selected Wells in the Greater M3 Eagle Project Area

Location map for aquifer transmissivity values calculated from pump tests in the vicinity of the proposed M3 Eagle Development. The tests were conducted by various entities but all tests were reanalyzed by HLI and presented here. Where poor quality tests or poor well construction appeared to give misleading data, "whole-aquifer" values for the entire aquifer thickness were estimated and presented here. These whole aquifer values are presented to support an understanding of total flow of water through the aquifer and would only represent the value that would be indicated by a well that fully screened the entire thickness of the aquifer. See text of report for details.

Wells were surveyed using a GPS system. Base map is (1:62,500 scale) USGS 15 minute map

◆ Wells Analyzed for Aquifer Parameters of Transmissivity and (where possible) Storativity.

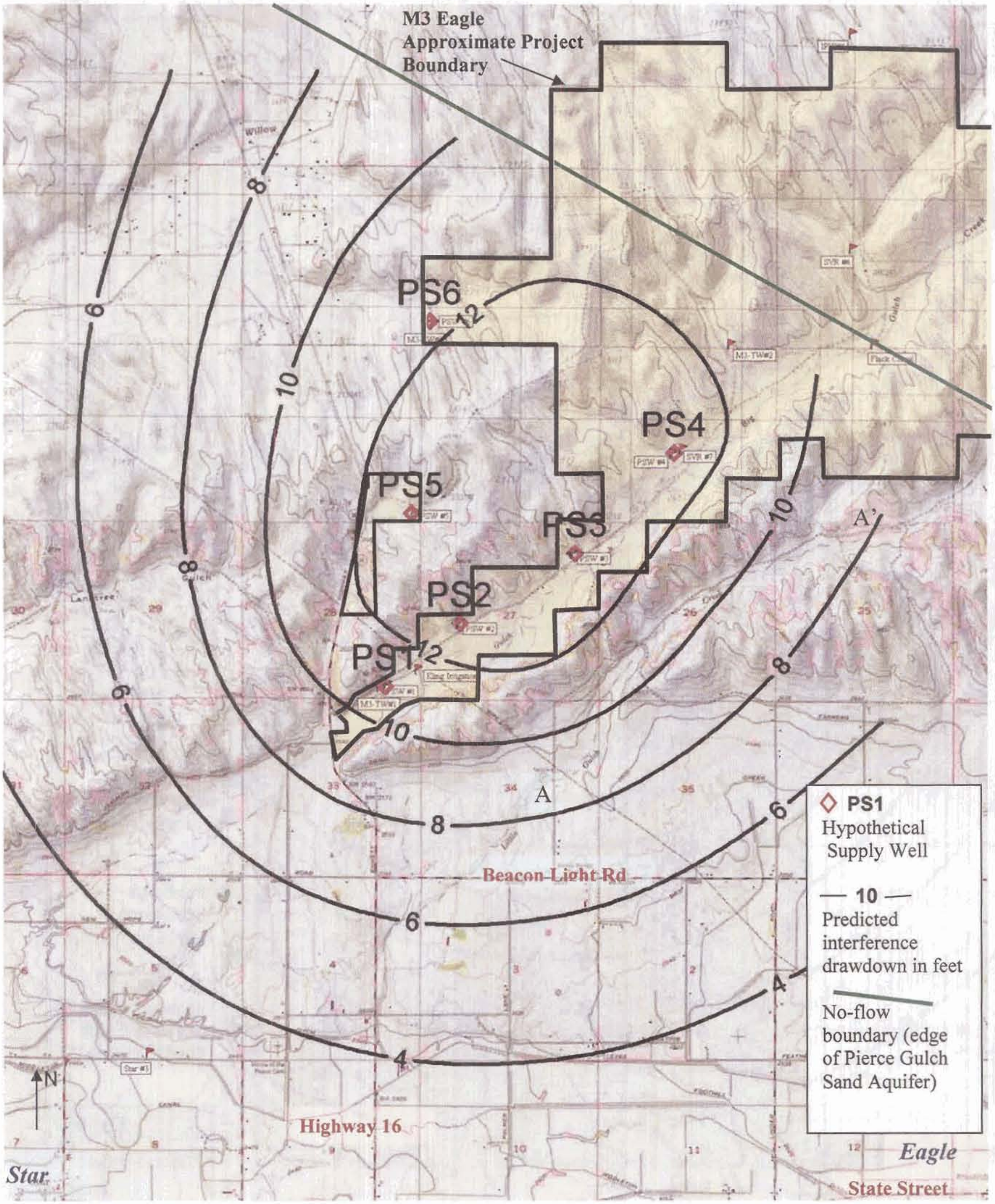
one mile

N

Figure 8.

Hydro Logic, Inc.
Boise, Idaho

Figure 9. Best-Case Predicted Interference from Six Hypothetical Wells



April 18, 2007

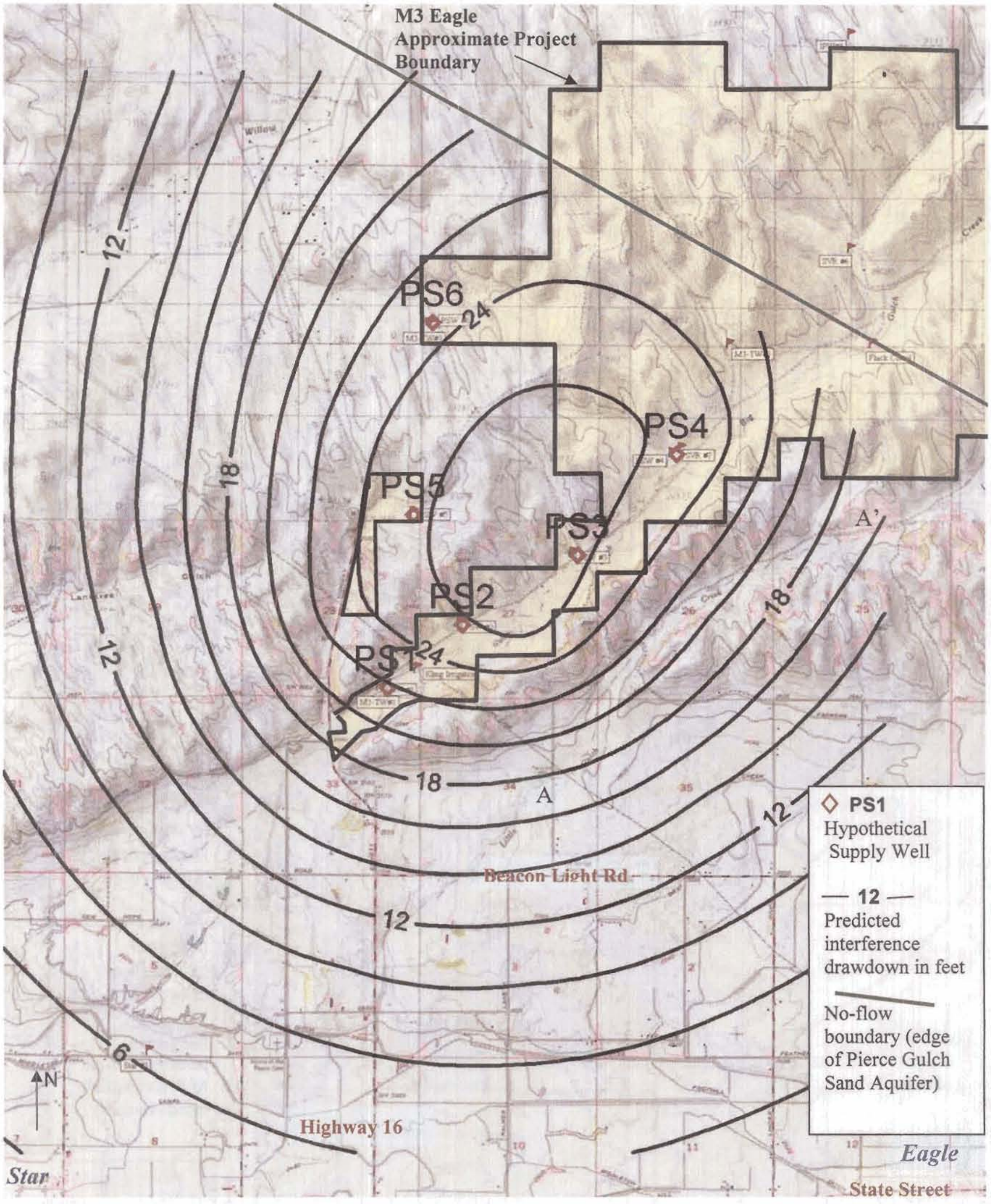
Map showing predicted interference drawdowns at full project build out from 6 hypothetical supply wells pumping at 1,000 gpm for 90 days within the Pierce Gulch Sand Aquifer with a possible high-end transmissivity of 200,000 gpd/ft, a storativity of 0.01 and a "no-flow" (edge of aquifer) boundary along the northeast. Drawdowns in domestic and other wells in overlying aquifers will likely be less to unmeasurable. See text for details.

Figure 9.

Hydro Logic, Inc

Boise, Idaho

Figure 10. Worst-Case Predicted Interference from Six Hypothetical Wells



Map showing predicted interference drawdowns at full project build out from 6 hypothetical supply wells pumping at 1,000 gpm for 90 days within the Pierce Gulch Sand Aquifer with a possible low-end transmissivity of 100,000 gpd/ft, a storativity of 0.005 and a "no-flow" (edge of aquifer) boundary along the northeast. Drawdowns in domestic and other wells in overlying aquifers will likely be less to unmeasurable. See text for details.

Figure 10.

Hydro Logic, Inc
Boise, Idaho

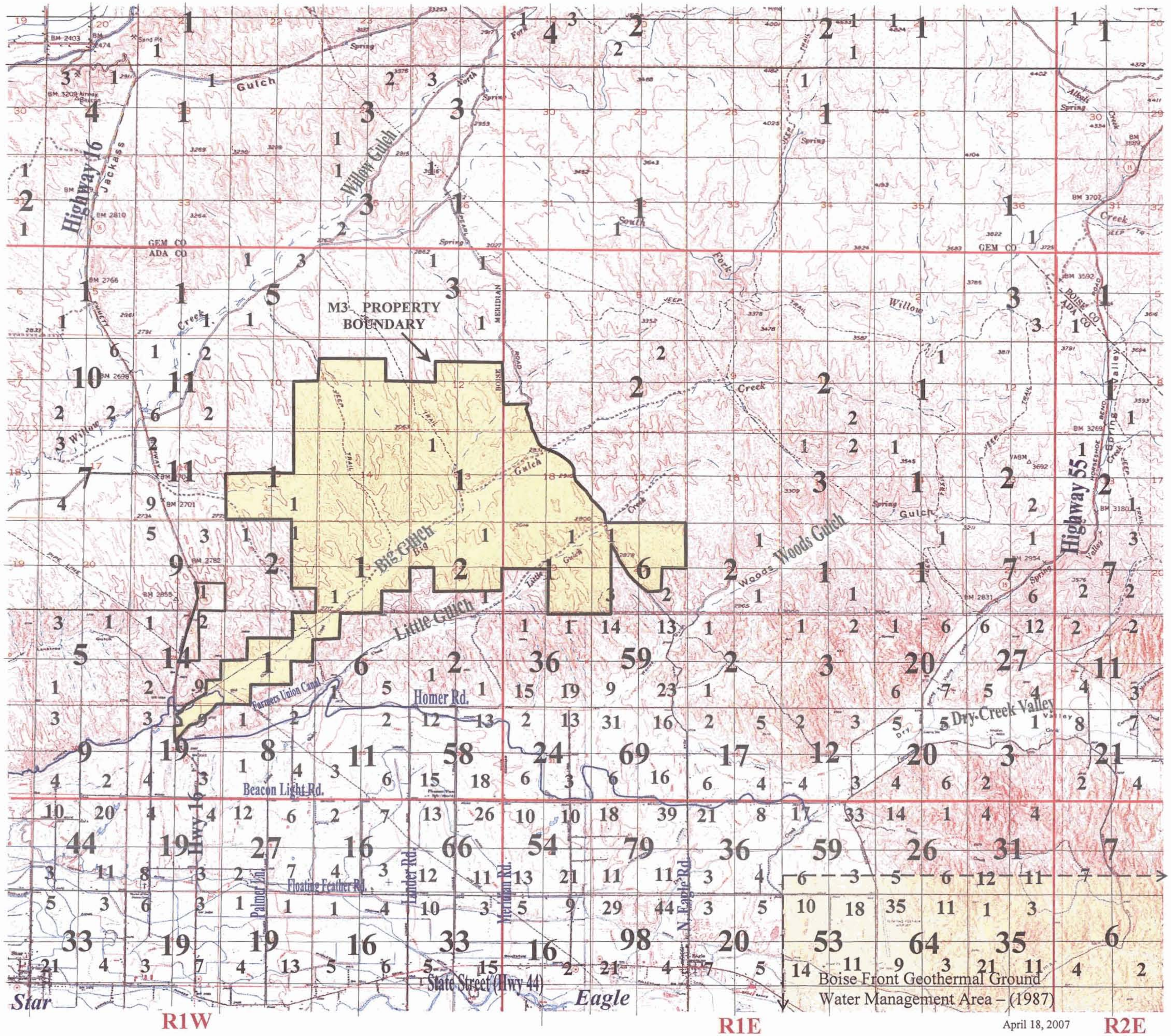


Figure 11. Number of Wells by Section and Quarter Section in the M3 Project Area

The total number of wells in each Section is shown by the larger numerals at the center of each Section. The number of wells within each Quarter-Section is indicated by the smaller numerals on the grid. Data were derived from the Idaho Department of Water Resources Driller's Report file from the Western Regional Office and IDWR on-line database as of July 2006. Some wells may be missing and others may be mislocated.

Township and range boundaries are denoted in red, and the approximate boundary of the proposed development is gray with yellow shading.

USGS 15 -minute (1:62,500 scale) quadrangle base map.

Figure 11.

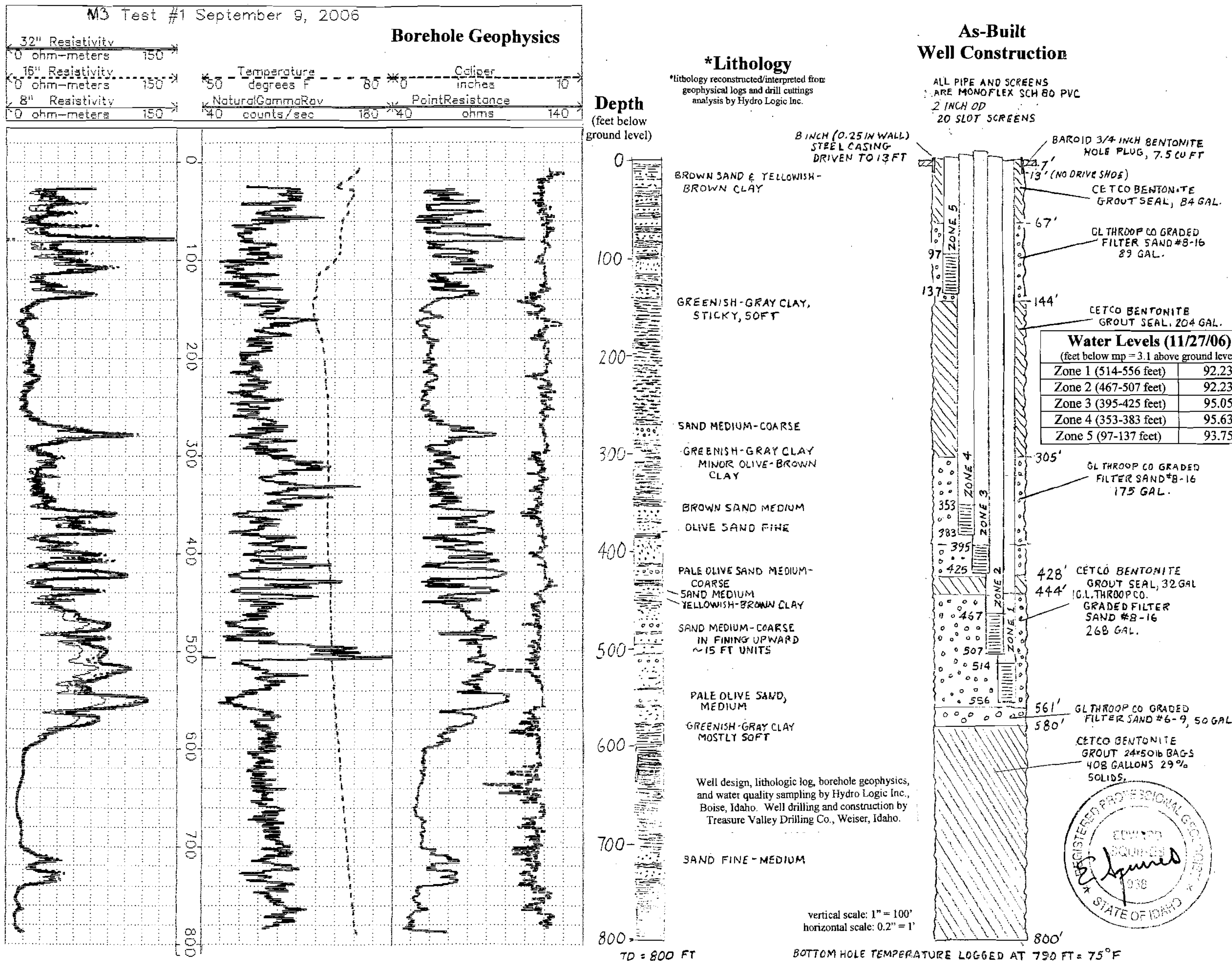
Hydro Logic Inc.
Boise, Idaho

M3 Eagle - Test Well #1

T. 5 N., R. 1 W., Section 28, SE ¼, SE ¼

September, 2006

(N43° 44' 12.2", W116° 27' 26.9")



Water Levels (11/27/06)

(feet below mp = 3.1 above ground level)

Zone 1 (514-556 feet)	92.23
Zone 2 (467-507 feet)	92.23
Zone 3 (395-425 feet)	95.05
Zone 4 (353-383 feet)	95.63
Zone 5 (97-137 feet)	93.75

Water Chemistry

Analyte (mg/L unless noted)	Zone 1 516-556 feet	Zone 2 467-507 feet
Alkalinity	133.0	125.0
Ammonia as N	0.37	0.06
Arsenic	<0.003	<0.003
Calcium as CaCO3	84.4	85.5
Chloride	3.42	3.22
Conductivity (uS/cm)	302	297.0
Corrosivity	-0.40	-0.44
Fluoride	0.69	0.60
Hardness	111.0	109.0
Iron (dissolved/filtered)	0.23	<0.01
Magnesium	6.50	5.73
Manganese (dissolved)	0.10	0.02
Nitrate as N	<0.10	<0.10
Nitrite as N	<0.01	<0.01
pH (SU)	7.47	7.48
Potassium	2.26	2.21
Silica	31.8	30.7
Sodium	22.1	21.7
Sulfate	17.2	20.7
Sulfide	<0.05	<0.05
Total Dissolved Solids	173.0	188.0
Total Kjeldahl Nitrogen	0.39	0.13
Total Organic Carbon	<1.0	<1.0
Field Temperature (°F)	67.1	66.0
Field Conductivity (uS)	305	295
Dissolved Oxygen	+1.7	+2.6
Field pH (S.U.)	7.19	7.19

Analyses by Alchem Laboratories, Boise, Idaho.
Zones 1 to 3 sampled 10/09/06. Zones 4 & 5 sampled 10/9/06.
Field measured parameters by Hydro Logic, Inc.

Analyte (mg/L unless noted)	Zone 3 395-425 feet	Zone 4 352-382 feet	Zone 5 98-138 feet
Alkalinity	119.0	114.0	119.0
Ammonia as N	0.04	<0.01	<0.01
Arsenic	<0.003	0.0049	0.0081
Calcium as CaCO3	77.7	81.3	85.9
Chloride	3.57	3.54	4.36
Conductivity (uS/cm)	282.0	285.0	281.0
Corrosivity	-0.50	-0.61	-1.16
Fluoride	0.60	0.50	0.24
Hardness	102.0	105.0	111.0
Iron (dissolved/filtered)	0.01	<0.01	<0.01
Magnesium	5.83	5.85	6.22
Manganese (dissolved)	<0.01	<0.01	<0.01
Nitrate as N	0.30	0.33	2.30
Nitrite as N	<0.01	<0.01	<0.01
pH (SU)	7.84	7.40	6.91
Potassium	2.07	2.10	2.74
Silica	29.5	28.7	38.0
Sodium	21.1	17.9	13.6
Sulfate	21.4	22.3	12.0
Sulfide	<0.05	<0.05	<0.05
Total Dissolved Solids	185.0	203.0	208.0
Total Kjeldahl N	<0.10	<0.10	<0.10
Total Organic Carbon	<1.0	<1.0	<1.0
Field Temperature (°F)	64.7	63.8	57.4
Field Conductivity (uS)	274	268	265
Dissolved Oxygen	+4.9	+2.63	+ 9.51
Field pH (S.U.)	7.27	7.07	6.72

Figure 12. M3 Eagle Test Well #1

Aquifer Test of the M3 Eagle Kling Irrigation Well

November 2006