Consultants in natural resources and the environment

Denver • Boise • Durango • Western Slope

Response to SPF's Memorandum Entitled "Response to IDWR Staff Memo Regarding the Sufficiency of Water Supply For Water Right Applications and Transfers Along the I-84 Corridor," November 15, 2012

Prepared for—

Idaho Power Company

Prepared by—

David B. Shaw and Norman C. Young

ERO Resources Corporation 3314 Grace Street Boise, Idaho 83713 (208) 373-7983

ERQ

ERO Resources Corp.

3314 Grace Street

Boise, ID 83703

(208) 373-7983

Fax: (208) 373-7985

www.eroresources.com

eroboise@eroresources.com

January 31, 2013

January 31, 2013

This report is submitted on behalf of Idaho Power Company (IPCo) to further assist the Idaho Department of Water Resources (IDWR) and its hearing officer in reviewing the six applications for permit to appropriate ground water and two applications for transfer under consideration in the consolidated hearing (IDWR, January 24, 2012). SPF Water Engineering, LLC (SPF) submitted a memorandum (SPF, November 15, 2012) responding to the Idaho Department of Water Resources staff Memorandum (IDWR, May 31, 2012) on behalf of Mayfield Townsite LLC (Application for Permit No. 63-32499), Nevid LLC (Applications for Permit Nos. 61-12095 and 61-12096) and Mayfield Townsite/ARK Properties (Application for Permit No. 63-33344). The opinions and conclusions in SPF's memorandum relate to the three general questions used as the outline in this report.

The size, nature and arid location of the proposed projects provide added incentive to seek sound technical data and exercise appropriate technical methodology to insure that the estimate used to determine the adequacy of the water supply for the proposed projects is within the amount actually available and sustainable from the source of supply. Investors in the projects, purchasers of lots and homes, families that move into the new communities and those that presently rely upon the limited water resources in the area will be at risk if the estimate overstates the actual water supply. After the lots are sold, the houses, shops and other facilities are built and families have moved into the new community is not an acceptable time for determining that the estimate of water availability was too optimistic.

QUESTION NO. 1. Should IDWR's estimate of the volume of ground water available for appropriation in the consolidated hearing study area be increased?

SPF suggests a number of reasons for either increasing IDWR's estimate of the volume of ground water available for appropriation or for at least considering IDWR's estimate as conservatively low. ERO responds to SPF's suggested reasons as follows:

a. Does upwelling geothermal water add to the supply?

SPF requests that IDWR's estimate of the average rate of annual recharge to the consolidated hearing study area be increased by 550 afa to include upwelling geothermal water (Page 2, Item No. 1 and Pages 7 and 8, Items No. 16 and 17).

Response: The basis for this request is a suggestion in a recent report (Welhan, February 2012, Page 2) that elevated temperatures in some wells may be caused by mixing of geothermal water originating outside of the consolidated hearing study area. An earlier study (IDWR, September 1976) found that elevated ground-water temperatures in southern Idaho, including wells in the study and comparison areas, are attributable to the upward movement of heat without always having an associated upwelling of heated ground water from sources of deep circulation.

January 31, 2013

Welhan references the IDWR report, but concludes that water temperatures observed in shallow wells in the consolidated hearing study area are too high to exist without circulating water (Welhan, February 2012, Page 19). However, the 21-25° F range in temperature increase observed in shallow wells in the area is equal to 12-14° C rather than 38-45° C (final paragraph, Page 19, Welhan, February 2012). A 14° C temperature increase in a 600 feet deep well requires a temperature gradient of 76° C/km. This revised temperature gradient, though high, is consistent with that listed for some wells in and near the consolidated hearing study area in IDWR's earlier report (IDWR, 1976, for example see Pages 90 to 94).

If some or all of the elevated temperature is attributable to regional heat flow through conductivity and not entirely from mixing of upwelling geothermal water, the estimate of the percentage of geothermal water will be lower than Welhan suggested. Given the uncertainty regarding the volume, if any, of upwelling geothermal water, IDWR's recharge estimate is appropriately conservative in not including this factor.

b. Should the estimate of ground water supply be increased if DCMI uses are not fully consumptive?

SPF requests that IDWR's estimate of the average rate of annual recharge to the consolidated hearing study area be increased by 180 afa because not all water diverted for "DCMI" purposes is consumptively used and some of the irrigation assumed by IDWR is on land without water rights (Page 2, Item No. 2 and Page 8, Item No. 18).

Response: IDWR's estimate of water availability should not be increased in reliance upon unconsumed water returning to the aquifer. The timely return to the regional aquifer in the consolidated hearing study area of water diverted but not consumed is not assured because of layers of fine sediment and other low permeability materials overlaying the regional aquifer. Such layers impede the downward movement of water and can encourage lateral movement potentially making the water unavailable for rediversion by wells in the consolidated hearing study area.

The documents posted by IDWR for this matter include drillers' reports for some wells constructed in and near the area proposed for development (Item 9, Other EAC Logs). Attached are additional drillers' reports downloaded from IDWR's electronic record of drillers' reports for other wells in this area that IDWR did not included in the posted information for this matter. Most of these reports show that wells in the area penetrate a significant thickness of clay and other fine-grained materials above the water-producing zone developed by the well. Typically, the post-construction static water level is reported to be significantly above the level water was first encountered in the well. This confirms that the low permeability materials above the producing zone cover a significant area. Water percolating downward from the surface would have to overcome the hydraulic pressure of the producing zone to re-enter the regional aquifer, but the drillers' reports do not identify the extensive depth of saturated materials needed. Such conditions, described in some but not all drillers' reports in the consolidated hearing study area,

January 31, 2013

indicate that hydrogeology of the consolidated hearing study area is complex and water once diverted may not have a direct path back to the aquifer. For this reason, water diverted from the regional aquifer should not be considered to be available for further diversion and use without information to accurately estimate the amount, timing and location of unconsumed water reaching the regional aquifer.

Further, IDWR's estimate should not be adjusted because some of the estimated water use occurred on land without valid water rights. Conversely, IDWR's estimate does not include water use on acres authorized to use water under valid existing rights that were not irrigated in 2011. IDWR assumed that long-term annual withdrawals of ground water can be accurately estimated from the use of water observed in the consolidated hearing study area in a single year instead of conservatively recognizing that diversion and use of ground water can occur under all valid water rights. This concept is particularly applicable to the consolidated hearing study area because rights found to be valid in the SRBA are unlikely to have been lost by abandonment or forfeiture in the relatively short time since the partial decrees were issued. In addition, holders of existing rights are motivated to use water to protect their water rights, at least in part, because of the demand created by the projects under consideration in the consolidated hearing. Accordingly, the full volume authorized by existing rights should be recognized when determining whether un-appropriated water is available for new uses.

Assuming all valid rights are fully used and that unconsumed water is not available for re-diversion from the aquifer, the volume of water available for appropriation for new uses is only 3,000 afa if the consolidated hearing study area is indeed a water source separated from the Cinder Cone Butte Critical Ground Water Area (CGWA) comparison area as implied by the separate estimates of water supplies for the two areas in IDWR's staff report (May 31, 2012). However, because information is not available to confirm that the areas are separate, the water supply is over-appropriated by 23,000 afa by existing and permitted uses (ERO, November 14, 2012, Table D).

### c. Is the volume of evapotranspiration accurately estimated?

SPF expresses concern that, because the rate of evapotranspiration is the most uncertain parameter in the water budget, an overestimate of this parameter could result in a substantial underestimate of aquifer recharge (Page 2, Item No. 3). SPF does not suggest a more credible estimate for this parameter.

Response: IDWR used the best available data for estimating evapotranspiration in preparing its estimate. It is just as likely that the volume of evapotranspiration is too small, and hence the volume of aquifer recharge is too large in IDWR's estimate.

In the event that there is precipitation that exceeds evapotranspiration at times, reliable information is not available to estimate how much actually reaches the regional aquifer for use within the consolidated hearing study area. Precipitation in excess of evapotranspiration is retained in the soil profile to support vegetative growth during the

January 31, 2013

growing season when precipitation is limited. This is particularly true for the generally southwest facing slopes of the recharge area that are likely to warm earlier than either Arrowrock or Anderson Ranch weather stations and are thus better able to use the early season moisture to exhibit higher evapotranspiration than at either weather station. All precipitation in excess of that needed for on-going evapotranspiration and to fill the root zone may not accrue as recharge to the regional aquifer because significant layers of sediment, previously discussed in this report, can prevent water from reaching the regional aquifer at a location to allow diversion and use within the consolidated hearing study area.

d. Will failure to develop existing permits free up water for the pending applications?

SPF asserts that the net annual recharge is larger than IDWR's estimate if existing permits are not developed, but does not provide an estimate of the additional volume that will become available if the permits are not fully developed (Page 2, Item No. 5 and Page 9, Item No. 20).

Response: ERO identified only four active permits in the consolidated hearing study area (Table E, Page 37 and 38, ERO November 14, 2012). IDWR has now issued licenses confirming development of essentially the permitted amount for two of the permits (63-12447 Ark Properties/Mayfield Townsite and 63-12494 Danskin Properties). The remaining two permits (61-12090 Nevid and 63-32225 Intermountain Sewer) are associated with developments under consideration in the consolidated hearing. These permits, having priorities earlier in time than the pending applications for the same projects, can be expected to be fully developed before or in conjunction with developing the applications (if the applications are approved). There is no basis for concluding that the existing permits will not be fully developed to justify an increase in IDWR's estimate of net annual recharge.

e. Is recharge greater than estimated in certain parts of the non-recharge area?

SPF suggests that portions of the "non-recharge area" may have greater infiltration rates than recognized in IDWR's recharge estimate (Page 7, Item 15). SPF does not provide an estimate of the land area involved or the increase in volume of recharge water that should be considered.

Response: IDWR describes the separation between the recharge and non-recharge areas as the 3,600-foot land surface contour representing the transition between the foothills and the plateau (IDWR, May 31, 2012, Page 5) and uses this as a boundary between areas of significant recharge potential and areas of limited recharge potential. This arbitrary separation of the recharge area from the non-recharge area makes it is as likely that infiltration rates are over estimated as under estimated.

January 31, 2013

SPF observes that the beds of streams entering the non-recharge area can have high seepage rates. However, an increase in the estimate of recharge from precipitation falling directly on the non-recharge area is not justified because the portion of the area occupied by stream channels is insignificant compared to the entire non-recharge area. Percolation in stream channels in the non-recharge area of flow originating upstream in the area delineated as the recharge area is already included in the estimate of recharge for that area.

ERO reiterates its contention that the total volume of recharge in the non-recharge area should not be considered as water available for the developments under consideration in the consolidated hearing because most of the area is down gradient from the proposed development. All of the recharge is available only if the draw down resulting from ground water withdrawal for the developments is so severe as to reverse the gradient of the aquifer.

QUESTION NO. 2. Do ground water levels in the consolidated hearing study area behave differently than in the CGWA comparison area?

SPF points to ground water levels in the consolidated hearing study area that are more stable than those in the CGWA as a basis for asserting that ground water is available for the proposed projects and suggests the following as reasons why IDWR should give weight to this phenomenon to justify approval of the pending applications:

a. Are results from recent, more extensive data collection efforts adequate to show that water levels are stable?

SPF notes that the more extensive collection of hydrologic data in the area for recent years indicates "relatively stable groundwater levels" (Page 6, Items 9 and 10).

Response: An abundance of data related to recent conditions during a period of above average precipitation does not substitute for a long-term record.

b. Are ground water level decline problems only associated with a limited area, remote from the proposed development area?

SPF noted that the area of greatest ground water level declines is limited to the southern portion of the CGWA and that the affects of "approximately four decades" of pumping in the CGWA have not propagated into the portion of the consolidated hearing study area in which appropriations are sought (Pages 5 and 6, Item No. 8 and Page 11, Item No. 26).

Response: Existing ground water withdrawals in the CGWA are concentrated in the area noted by SPF, and as would be expected, ground water declines are also greater in this area. However, information and studies are available showing the spread of declines beyond the immediate area of pumping into the consolidated hearing study area. This information suggests that the rate of decline resulting from existing uses in the CGWA is

January 31, 2013

increasing and that if ground water withdrawals are increased as proposed in the applications under consideration in the consolidated hearing, the rate of decline of ground water levels and the consequent impacts to the flow of Snake River will continue to increase.

IDWR's ground water change maps (IDWR, May 31, 2012 Page 7) show that ground water declines have migrated out of the CGWA into the consolidated hearing study area. These maps show that the area exhibiting the largest decline experienced more than 90 feet of decline in the latest decade compared to about 30 feet in the previous decade. This is because, at least in part, annual ground water pump withdrawals have not been at the maximum authorized rate every year during the four decades since development began (ERO, November 14, 2012 Pages 8 and 16). Figure 9 on Page 19 of IDWR's staff memorandum (IDWR, May 31, 2012) shows that the downward trend in ground water levels in the CGWA continues unabated decades after further development was halted.

The aquifer analysis done by ERO (ERO, November 14, 2012 Pages 18 and 19) shows ground water declines of more than 20 feet in a hypothetical observation well located north of I-84 on the boundary between IDWR's consolidated hearing study area and CGWA comparison area resulting from 20 years of withdrawals under existing rights. Adding the affects of using ground water during the same 20-year period as proposed in the applications under consideration in the consolidated hearing more than doubles the ground water level decline at this location.

The boundaries of the CGWA and the Mountain Home Ground Water Management area were drawn based upon information available to IDWR in the early 1980s. The continuing ground water declines and the spread of the declines beyond the boundaries justify a review to expand the boundaries.

c. Can ground water declines to the extent now occurring in the CGWA be expected to occur in the area proposed for development?

SPF takes exception to IDWR's conclusion that ground water declines similar to those observed in the CGWA will occur in the consolidated hearing study area if the applications are approved. SPF notes that estimated withdrawals in the CGWA are about triple IDWR's estimate of recharge in the CGWA comparison area while the present withdrawals of ground water in the consolidated hearing study area are only a fraction of the estimated recharge to the consolidated hearing study area (Page 3, Item No. 8 and Page 12, Item No. 29). SPF calculated that the annual volume that will be depleted from the aquifer if the proposed projects are all fully developed is an additional 14,200 afa. This amount is double the average recharge estimate for the consolidated hearing study area aquifers (Pages 2 and 3, Item No. 6 and Pages 10 and 11, Item Nos. 23, 24 and 25).

Response: SPF's estimate of water required for the proposed uses is lower than the volumes authorized under the vested rights being transferred and its own volume estimates in reports filed on behalf of the applicants concerning the adequacy of the water

January 31, 2013

supply for the requested projects. Table A, Page 31, of ERO's first report submitted in this matter indicates that a total of about 19,000 afa is sought by the applications pending in the consolidated hearing (ERO, November 14, 2012). In any case, IDWR is not authorized to issue permits for a quantity of water exceeding the average rate of future natural recharge whether exceeded by "only" twice the amount as asserted by SPF or the 10-fold amount found by IDWR (§42-237ag, Idaho Code).

d. Do IDWR's water level decline maps accurately define the extent of ground water declines in the consolidated hearing study area from pumping in the CGWA?

SPF suggested that the ground water declines "extending west and southwest (i.e., outside) of the CGWA in the consolidated cases study area" are "software interpolations unsupported by actual ground water-level data" (Page 5, Item No. 4). SPF also questioned whether the observed ground water level declines in the southwestern portion of the CGWA are associated with all of the aquifer zones encountered within the open interval of the wells or with only individual aquifer zones (Page 5, Item No. 5).

Response: Relative to IDWR's estimate of ground water declines in the area west and southwest of the CGWA, ground water level data are not available from this area to support or refute the results of IDWR's water level analysis. The program used by IDWR to estimate the location of the contour lines is supportable unless ground water level decline data or technical information is available to show that faults or changes in aquifer properties skew the results.

SPF does not elaborate on how the open aquifer interval issue has significance relative to ground water levels and the ground water supply available in the area. The well SPF references as having an open interval of over 1000 feet is apparently misidentified. Without information to document that some of the aquifer zones encountered have separate water sources, this matter will not alter IDWR's finding that water supplies in the CGWA comparison area are over appropriated by existing water rights.

e. Are ground water level changes in the consolidated hearing study area caused by regional or local conditions?

SPF notes that water levels have risen about 10 feet since 1993 in well 02S4E-09DDD2 (Page 5, Item No. 7). SPF further notes "It is unclear whether this rise reflects regional or local conditions."

Response: IDWR's hydrographs for other wells in the CGWA nearest to well 02S4E-09DDD2 exhibit declines in water level throughout the period of record indicating that the anomalous increase noted for well 02S4E-09DDD2 is related to "local" conditions such as pumping of a nearby well (note the greater yearly fluctuation in water level observed in IDWR's hydrograph for this well since the early 1980s).

January 31, 2013

QUESTION NO. 3. How will development and use of ground water as proposed in the applications affect flows in Snake River?

SPF found that the depletion of flows to the Snake River will not exceed 9.8 cfs (i.e. IDWR's estimate of average annual natural recharge to the consolidated hearing study area although SPF argues for a higher estimate), that this depletion is insignificant in comparison to flows in this reach of Snake River and will not be realized for decades in the future (Page 3, Item No. 7 and Page 12, Item No. 28).

Response: SPF's estimate understates the likely amount of the depletion of Snake River flows. More importantly, comparing the amount of this depletion in flow to the normal flow in the reach or even to the established minimum flows has little if any relevance to IDWR's responsibility to prevent injury to senior priority water rights, including minimum stream flows, and to reallocate trust water. Said another way, an actual depletion of any amount, even if not measurable, reduces water availability to senior priority water rights whenever flows are not adequate to satisfy all rights calling for water. The following factors should be considered when evaluating whether and under what conditions further depletions to Snake River flows can be allowed:

- a. A year-round reduction in flow of 9.8 cfs (the reduction will likely be higher as discussed below) resulting from development of the projects as proposed in the pending applications is a significant share of the 600 cfs of trust water and of the 150 cfs increment of trust water reserved for DCMI purposes. When the Swan Falls Agreement was signed in 1984, these flow rates were expected to be available year-round to support future development in southern Idaho. Decisions on the pending applications must incorporate the criteria set out in Idaho law for appropriating water and for reallocating trust water.
- b. The affects of pumping will reach outside of the consolidated hearing study area to tap ground water supplies not included in the estimate (ERO November 14, 2012, Page 19) thereby ultimately further reducing inflow to Snake River. If the projects as applied for are approved and developed from ground water, SPF's estimated depletion of 14,200 afa will ultimately reduce the average rate of flow in Snake River by 19.6 cfs (SPF, November 15, 2012, Page 11, Item No. 25).
- c. Flow in the Snake River could be drawn into the aquifer if pumping levels fall below the level of the river. A substantial lowering of ground water levels will be required to induce flow from Snake River into the regional aquifer, but a municipality pressed for adequate water supplies may find that chasing ground water even to these levels is the most feasible way of obtaining water to sustain the community.
- d. Larger diversion rates could be sought from Snake River as an alternate source to save the communities created as a result of approval of all or some of the pending applications if ground water supplies are not adequate to complete or sustain the projects. The diversion rate sought from Snake River would likely approximate the

January 31, 2013

diversion rates applied for in the applications (including those for irrigation) totaling nearly 85 cfs (ERO November 14, 2012, Table A). Other projects (such as those evidenced by withdrawn, rejected and voided applications and lapsed permits, most of which are associated with the individuals and entities that are applicants for the pending applications in the consolidated hearing) can be expected to join in a project to bring water into the area using a Snake River diversion. Potential projects already identified by inactive filings total another 57 cfs (ERO November 14, 2012 Table B) and additional projects could be identified if a pipeline from Snake River is seriously pursued.

Applications filed subsequent to those included in the consolidated hearing are another indication of continuing interest in diverting water for use in the consolidated study area. IDWR's electronic record lists two such applications: Application for Permit No. 61-12271 seeking 1.25 cfs for domestic and fire protection (voided October 1, 2012) and Application for Permit No. 61-12275 seeking 6 cfs to irrigate 320 acres.

e. IDWR is obligated to fully protect the portion of IPCo's water rights not subordinated in the Swan Falls Agreement and the matching minimum stream flow rights held by the IWRB. At this time, nearly three decades after the Agreement, it is beginning to be realized that the minimum stream flow at Murphy Gage may constrain water diversions even for presently existing uses. Thus, the postulated increment of 600 cfs of "firm" trust water estimated at the time of the Agreement may never have been available, may have been reduced by changed conditions, such as droughts and conservation practices, in the Snake River watershed that have reduced base flows in the reach, and/or has been substantially depleted by the additional diversion and use of water developed since the Agreement (in part through permits issued for use of trust water).

ERO's analysis of Snake River flow (ERO November 14, 2012, Pages 22 to 26) shows that the average daily winter flow of 5600 cfs at Murphy Gage required by the agreement will not be met by 2025 if the rate of decline noted since 1981 continues. Similarly, if the rate of decline continues, the 3900 cfs summertime flow at Murphy Gage required by the agreement will not be met by average daily flow during low flow periods of the year by 2025 or sooner. The affect on water availability represented by the continuing decline in base flows must be considered as IDWR evaluates applications for new consumptive uses that will have the effect of further reducing these flows during the upcoming decades.

f. While routine violations of the minimum stream flows at Murphy Gaging Station are in the near future, short-term violations during critical flow periods are already a concern. The preliminary order issued creating Water District No. 2 in the Milner to Murphy reach of Snake River found that "Snake River flows measured at Murphy Gaging Station have diminished over time and, in recent years, have approached the minimums established as part of the Swan Falls Agreement" (IDWR, May 1, 2012,

January 31, 2013

Page 1, Finding 2). Responding to exceptions to the preliminary order, IDWR determined that although a water distribution crisis has not yet occurred in the Milner to Murphy reach of Snake River, the "potential for significant water administration is real" (IDWR, July 10, 2012). New consumptive uses depleting flows in this reach, including the projects under consideration in the consolidated hearing, will hasten administration by priority in Water District No. 2 causing curtailment of diversions under existing senior priority water rights that otherwise would have had water available.

g. Permits and licenses issued by IDWR to use trust water are subject to a term condition such as: "This right is for the use of trust water and is subject to review 20 years after issuance of the permit to determine availability of water and to re-evaluate the public interest." Some permits and the license subsequently issued have reached or are approaching the time for such review. IDWR has notified holders of such rights that reviews will be initiated.

A list prepared by IDWR dated March 28, 2011 identifies 680 permits and licenses that have been issued with a term condition (IDWR Staff Memorandum, March 28, 2011 accessed in IDWR's electronic file for Permit No. 35-8359). The total diversion rate authorized under these permit and licenses is more than 1100 cfs. Of these, 486 have an irrigation component, totaling more than 800 cfs. About 90 percent of these filings have priority dates earlier than July 28, 2006, the earliest date of filing for the applications in the consolidated hearing. The continued availability of water will be a vital consideration as IDWR conducts the term review of these rights. Under the appropriation doctrine during times of scarcity, trust water flows are available for use by senior priority rights, including those subject to term review, in preference to junior priority rights.

In addition to the permits and licenses already issued for trust water, IDWR's water right records list over 850 pending applications seeking, in total, nearly 2500 cfs of trust water (IDWR electronic data base query). About 90 percent of these filings were made prior to July 28, 2006, the earliest date of filing for the applications in the consolidated hearing. To the extent that these filings and the pending applications in the consolidated hearing seek trust water and/or water sources interconnected with trust water, the additional water depletion if any or all of these earlier applications are ultimately approved must be considered in determining water availability for the applications pending in the consolidated hearing.

### LIST OF REFERENCES

ERO, November 14, 2012. Water Supply Evaluation for Proposed Projects Along the I-84 Corridor. David B. Shaw and Norman C. Young, ERO Resources Corp.

IDWR, September 1976. Geothermal Investigations in Idaho, Part 8, Heat Flow in the Snake River Plain Region, Southern Idaho. Charles Brott, David D. Blackwell (Southern Methodist University) and John C. Mitchell, Idaho Department of Water Resources.

IDWR, March 28, 2011. Memorandum in Response to Request for Staff Memorandum (Permit No. 35-8359). Shelley W. Keen, Idaho Department of Water Resources.

IDWR, January 24, 2012. Order Creating Contested Case and Consolidating Protested and Unprotested Applications. Gary Spackman, Interim Director, Idaho Department of Water Resources.

IDWR, May 1, 2012. Preliminary Order in the Matter of the Creation of Water District No. 2, Snake River from Milner Dam to the Murphy Gage Below Swan Falls Dam. Jeff Peppersack, Hearing Officer, Idaho Department of Water Resources.

IDWR, May 31, 2012. Sufficiency of Water Supply for Water Right Applications and Transfers along the I-84 Corridor. Craig Tesch, Hydrology Section, State Office, Idaho Department of Water Resources.

IDWR, July 10, 2012. Final Order in the Matter of the Creation of Water District No. 2, Snake River from Milner Dam to the Murphy Gage Below Swan Falls Dam. Gary Spackman, Interim Director, Idaho Department of Water Resources.

SPF, November 15, 2012. Response to IDWR Staff Memo regarding the sufficiency of water supply for water right applications and transfers along the I-84 corridor. Christian R. Petrich, Ph.D., P.E., P.G., SPF Water Engineering LLC.

Welhan, February 2012. Preliminary Hydrologic Analysis of the Mayfield Area, Ada and Elmore Counties, Idaho. John A. Welhan, Idaho Geological Survey.

Form	238-7
11/97	

### IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

PO	RT			Twp	ected by	Rge	Sec _		
					_ 1/4	1/4	1/4		
11.		. TES ump		Lat:	: :	Long: Flowing	: :		]
<del></del>	reld gai		Dallel			ng Leve:		in t	
13.			1.2 ft	· · · · · · · · · · · · · · · · · · ·	486.2		4.5	hou	rs
			1.44.10		LUNIE				
Water	Temp.			Excel	lent	Bottom h	ole temp.		
Waler	Quality	test or	comments:						
						pth first Wate		r <u>520</u>	6_
12.	LITHC	LOGI	C LOG: (C	escribe)	e repairs	bnede 10	onment)	Wa	ter
Bote	Frem	1 a	Remarks: Lill	holony	Water Qui	iliv & Tem	wrature	Y	١,
10	1	175 ft				,			N
8		126 ft							ħ
6	426	620 ft						Y	i
	336	357	Sands and S	ilts, C	ving, i	an			1
	357	386	Basalt, Med	ium H	ard, Gre	y			1
	386	401	Granitic Sar	nd and	Clay P	ed Brown			1
-	401	424	Basalt, Med	ium H	ard. Gre	:V			1
	424	523	Sandy Silts	& Silt	Sands,	Brown-T	an		ī
	523	526	Clay, Grav Sand, Clay	relly 8	& Sandy	y. Brown			Ţ
	526	532	Sand, Clay	/ey, B	rown			Y	Γ
	532	534	Clay, Grav	velly,	Grey				J
			Clay, Grav						1
	537	547	Sand, Clay	yey, B	rown			Y	L
			Sandy Sil		ilty Sa	nds, Brov	vn	Y	1
	562.	5 588	Basalt, Br	rown_					1
	588	597	Cinders, S	and, t	hen Cla	y, Brown	<u>1</u>	LY.	1
	597	609	Clay, Grav	relly.	Brown				1
			Sand, Coa		oorly S	ortea		Y	Ļ
	019	019.5	Clay, Brov	<u>vn</u>					1
	<u> </u>				REC	EIVE	)	-	╀
		·							╁
					<del>oct</del>	<del>1 0 200</del> :	2	-	╁
	ļ				WATER	RESOURCE		<del> </del>	╁
						NR Kee J.		╁──	t
					***************************************		·····	1-	t
	D	EC	FIVED	)					T
			Line I . M. Jone W		***************************************			1	T
		nct	18 2002						T
		001							Τ
	Dan	rimont	ol Water Reso	URCES					
	ngh	aithioin.							L
	L	<u> </u>	<u>,, , , , , , , , , , , , , , , , , , ,</u>						L
Con	pleted		epth 619.					surat	ole
Date	e: Sta	ried _	March 11,	2002	Co	mpleted_Se	pt. 3,	20	<u>O</u>
	ertify th		CERTIFI			were compti	ed with at	<u> </u>	
nac			Artesian	Co.		<b>c.</b> _	318	}	
-ompi	any Nar	™/	ـــــــــــــــــــــــــــــــــــــ		.: <u></u>	Firm	NO	•	
Firm (	Official ,	N.	yph H	nd	eno	ate 10/	8/0.	2	
	or Ope	rator	Hugh Ha	rden	Date	Octob	er 8,20	02	

Office Use Only

						**	<b></b>	Pa	ge 2 (	of 2 Page
1. WELL	TAG NO	). D _	0	0197	24					
DRILLIN	G PERMI	NO								
Other IDI	WR No		~							
2. OW Name		Ken	neth V	V. La	nge					
Address	15888 Boise	E. Mo	nroe /	ve	HC:	34				
Civ	Boise		·			.51	210	D 7	8371	16
3. LOC	CATION nap locati	ÓF V	VELL	by	legal	desci	ript			
	<b>%</b> ·									
		710	n 1	S.	И	orth:		or	Snui	DK I
		Ro	e. 4	É.	. E	ast .		Ot	. Wes	Ih ; . SE 1/4
<b>'</b>	X	- E ''9		Q.	· •	<b>13</b> 7 1	14 N	VI VII/	1/4	SE 1/4
	-   -	- Go	vi lo	· / · )	<u>. ب</u>	XII.	ייי ביי	Cre.	135	% som
		ia	 !		:	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	M.	nore	;	
	5	_								
	Orchard To-	AL In Sile (N	ioress E Side of	RK nack	en one	15895.E.	Mon Or	ue Ave- ubard	-1 mile S	EQC
(G-++ 1	Orchard To-	read + E	Sarce la l	ant or t	יו מינישטע	CII	y			
	_									
Lt	E	IIX		Su	D. Na	ime				
4. USE ⊞D ⊟T	i: )omestic hermal	∵ M ∵ In	unicip jection	af 1	Mon	itor		Irrigal	lion	
5, TYP!	E OF W	ORK III Mo	check dify	all th	at appl Dandom	y ment		(Repl	acemer ner	nt etc.)
	. METHO ir Rolany		ab <del>le</del>		Mud Ro	lary		Other		
7 05		2200	rnii	250						
1. 52/					1		_			
	SEAL/FR		Frem		Sacks		1	ì	PETHOL	•
<u></u>	Enteria:			To	Pour	ds	1_			
Bentonit Native of			4	168.6 168.6	1					tained crbore—
148tive t			*	100.0	2700					full hole
Was drive Was drive	shoe used shoe sea	? .ችነ at tester	7 ∵ 3? 🟂	N SI	hoe Dep N	#h(s) How?	68.6 Jun	y did s	ot leak	into well
8. CAS	SING/LII	NER:								
Diameter	From	To	Gaug	e li	isterial	Casi	10	Liner	Welder	d Threades
8 5/8	+1.4	168.6	0.25	0 Stee	:)	X	•	•		
	+1.75	563.0		U Stee		iX		v	:	
59/16 59/16	537.\ 574.17	608.2		8 Stee	4 <del>-1.0p-p</del>	Τ <b>Ρ</b> Έ		X	•	
Length o	l Headpip					of Tai	lnin		0.97	
	RFORA				-	J. 141	، دو ، سو .	<del>-</del>		
	enorations			n E E N ethod	13					
Scree					уреСи	itinuou	s Slo	t Wire	Woun	d
From	10	Stat S	ize Hu	mber 0	rameter	Malere		Casi		l iner
608.28	618.53	0.025				Stainte			•	Liner-Assbl
~~~	1.,			I						

10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:

Depth flow encountered fit. Describe access port or control devices: 6" I.D. of casing by removing well cap.

485.0 II. below ground Arlesian pressure \_\_\_\_\_ lb.





# IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

Use Typewriter or Ball Point Pen

56757

1. DRILLING PERMIT NO. 61 - 94 - W - 0027 - 000 Other IDWR No.		ELL.		<b>rs:</b> □ Baller	<u>⊠</u> Air	□ Flowing /	Artesian		
2. OWNER:		d gal./m		Drawdown		Pumping Lovel		me	
Name LEONARD BISEMAN		35					5)	ur,	
Address 802 East Pennsylvania Ave.									
City Boise State ID Zip 83706									
	Water T	emn			Botton	hole temp			
3. LOCATION OF WELL by legal description:				r comments:					
Sketch map location must agree with written location.	***************************************								
N	12. LI	THO	LOG	IC LOG: (De	scribe re	epairs or abando	(Inemne	War	
	Bore								
Twp. 1 North C or South C	Dia.	rom	To	Remarks: Lith	ology, Wa	ter Quality & Tem	perature	γ	N
Rge. 4 East ⊠ or West □	8" 0	2	<u>}</u> 1	Topsoil					
Sec. 15 , 1/4 NE 1/4 NE 1/4 NE 1/4 OVE	<b>"</b> 2		1.	Brown Cl	ay				
Gov't Lot County E1 1707 C			.81	Sand & G	ravel				
		8' 2		Brown CJ	ay			•	
Address of Well Site Simo Rd.	n 2		13.	Sand & G	ravel		i		
City Mayrother in Thomas			55'	Clay w/S				n	
(Give at least name of road + Distance to Road or Landmark)			י08	Coarse S	and		EIV		
Lt. Blk. Sub. Name		ع رو		Sandy cl		8.44		anh	
		4. 1			cavel		50	דכמ	
4. PROPOSED USE:				Sandy cl		1111		INCE	
☑ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation				Coarse s		WK	ER FESO STERN B	GION	
☐ Thermal ☐ Injection ☐ Other				Sand w/c		W.	-51-111-		
5. TYPE OF WORK	" 1	<u>55י</u> 55	61'	Sandy cl	ay				
New Well  ☐ Modify or Repair ☐ Replacement ☐ Abandonment				Coarse s	e bas	/clay			
6. DRILL METHOD		9012			sand	& gravel			
☐ Mud Rotary ② Air Rotary ☐ Cable ☐ Other		03   2				gravel			
	<del></del>	28'2			and				
7. SEALING PROCEDURES		<u>40' 3</u>			ie				
SEAL/FILTER PACK AMOUNT METHOD		<u> 30' 3</u>							
Material From To Sacta or				Brown cl					
Pentonite 0 250 20 overrbore		<u>56'</u> 3			<u>sand</u>		···		
	" 3	<u>65   3</u>	75	Brown cl	ay	<del>.</del>			
				Coarse s					
Was drive shoe used? YZ N 🗅	" 3	<u>86' 4</u>	109	Clay w/s	and s	eams	•		
Was drive shoe seal tested? Y- N□ How?	" 4	09:4	15'	Brown cl	.ay				
8. CASING/LINER:	" 4	15中	281	Coarse s	and			<u>X</u>	
Diameter From To Gauge Material Casing Liner Welded Throaded	" 4	28 4	130	Brown cl	ay				
8.625 0 250' 250 steel	6" 4	30'H	391	Coarse s	and	RECEL	VED	<u>X</u>	
The state of the s				Brown cl		AAT			<u> </u>
		41 4		Sand & G		OCI 17	1994	X	
Length of Headpipe 7 Length of Tailpipe 5		58'4	67'	Brown c	ay D	oparment of Was	a ilemi	<del>2'</del> -	ļ
Length of Headpipe 7 Length of Tailpipe 5  9. PERFORATIONS/SCREENS MAY 0 8 1995	1-1-					-L entoin as it in		<u> </u>	
	1-1/			455				<u></u>	<u> </u>
Screen Type V-wire  V-wire  ✓	Comp	leted (	Depth.	4581	00:			surab	
From To Slot Size Number Diameter - Material Casing Liner	Date:	Starte	d Ji	une 11, 1	.994	_CompletedJ	une 2	0,'9	<del>/1</del>
	40/								
453' 448 .040 5.57 S.S. 436' 431 .030 5.57 S.S. 2				CERTIFIC				ا فديدا	
	:90 9¥ÇIL. emît edî	rary in	et all i	minimum well : removed.	construct	ion standards we	re compl	ied W	ıın at
	**********	. u.e. 11	y ***a3	161110480.					
	Firm Na	me	Hide	dleston 8	Son,	Inc.	_Firm No	<u>. 35</u>	
10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:			N	7 50	1%	11	_ ,		
335 ft. below ground Artesian pressurelb.	Firm Off	ficial_	///	all SI	ida	10 0 Date	<u> </u>	9/	94
Depth flow encounteredft. Describe access port or	and '						,		
control devices:	Supervi	sor or	Opera	etor		Date	)		
•			•		if Firm Offi	cial & Operator)			

## Pg 1 of 2

## IDAHO DEPARTMENT OF WATER RESOURCES **WELL DRILLER'S REPORT**

1. WELL TAG NO. D 0052631						12. STATIC WATER LEVEL and WELL TESTS:								
Drilling Permit No	o. <b>903</b>	350-85033	38							<b>516</b> ' S				. 2
Water right or inj	jection wa	ii# <u>63-33</u>	3036			Water temp. (°F) See Pg. 2 Boftom hole temp. (°F) 78.59°F  Describe access port 3 - 2" Tube Wells inside Locked Well Head								
2. OWNER						Descri	be acce	ss port	3 - 2" T	ube Wells in	side Loc	ked Wel	l Head	
Name Pacific				Well #1		Well to	est:				Test meth	ıod:		
Address 911 H						Drawdo	own (feel)		charge or	Test duration	_			Flowing
City Bainbrie		and	_ State	WA ZIp 9	8110	-	Pump	, y;	eld (gpm) esting	(minutes) Other			Air i	arlesian
3. WELL LOCA		_					han		-Lifting					لسا
Twp. 1	North _	or South	X Rge.	East 2	S or West ☐		ımp		amples	anu				
Sec. 8		NW	_ 1/4 _ S	W 1/4 N	IE 1/4					s: See Table	Po 2			
Gov't Lot		TU acres	aus Adauvauv	aes 160 8	icres					d/or repairs		onment		h
al	N43	° 21.237	Pri	/Dog and Do	rimal minutoe)	Bore		.0010	LOGAN	dioi repails	OI EDUIN	Othiotic	-	
Gov't Lot Lat. Long.	W116	0.243	)	(Deg. and De (Den. and De	erimal minutes)	Dia.	From	To		rks, lithology or d	lescription o	of repairs o	r L'	Water
Address of Wall Site	2.3 m م	5 of 184	Lan S Or	chard Acces	is Rd. &	(in)	(ft)	(ft)		abandonmen	t, water tem	р.		N
200 ft. E. of Ord	chard		City B	oise		20 16	10			rown Sand				X
Plant of local dames of read + District	in to Roos of Lan	iopi.	0.0,			16	19 26			rown Sand			_	Î
	Blk		Sub. Nam	e		16				rse Sand &	Clav		-	X
4. USE:		. KZI		. <del>-</del>	. 🗀	16				rse Sand				X
Domestic D			or   Imga	ition   Them	nal   Injection	16	73	86	Gravel v	vith Some Sa	and			X
Other Piezo						16		105	Sticky T	an Clay				X
5. TYPE OF WO					eplacement etc.)	16			Basalt					X
New Well					• Im•	16				& Dark Bro		ers		X
Abandonment	L On	e Men r	resign by	riyalo Logi	C <sub>i</sub> INC.	12				asalt & Hard actured Bas				X
6. DRILL METH  ☐ Air Rotary   ☐	TALLED	RECT	abla [7]	wher AD 440	' to 340'	12				alt Cinders	ait			$\frac{\hat{x}}{x}$
7. SEALING PR		INDES	ane 🗀 c	mei WILLO	10 310	12			Basalt	LIL GIVIGOTO				X
			Quantity (lbs o	n³) Placemen	t method/procedure	12	200	208	Sand, G	ravel, & Bas	alt			X
3/4" Baroid				,		12	208	220	Brwn Cl	ay,Sandℜ	ddish-Br	wn Cind	ers	X
Chips	O'	19'	11.9 ft.	1 1	Poured	12	220	300	Coarse	Sand & Grav		<u> </u>		X
						10		338	Coarse	Sand & Grav	elnc	CEI	VE	UX
B. CASING/LIN	ER:			- measured	J	10	338	390	Tan Clay	/ Sand 8 Tag /	Clar A44	W 'A B	-	X
Diameter From	To Ga	nge/		1		10	432	451	Coarse	Sand & Tan	Clay M	W Z Z	<del>-2008</del>	Ŷ
		edule 0 Stee	Material I	¬	Threaded Welded	10	451	527	Dark Ta	n Clay	WATE	R RESC	HIBCE	x X
		5 Stee				10	527	568	Small &	Coarse Sand	d WES	TERN R	EGIO	
	95 .25						568	616	Clayey 1	an Sand				K
Was drive shoe use						10	616	652	White S	and with Tar	Clay Be	ds		X .
9. PERFORATION				n(s)		10	652	597	Large W	hite Coarse	Sano			X
Perforations									Small S	and Clayey Tan S	and	······································		X
Penorations Manufactured scree		v Th	Tunn 2"	OVC SCHOOL	Slotted	10	732	748	Medium	Gray Sand	Pallu			<del>x</del>
manulaculed scree Method of installatio		1 114	Type Z	TO OCHOO	oiottea	10	748	772	Sticky C	rayish Sand	v Blue C	lav		X
			Nome'		7	10	772	824	Small G	ray Sand			7	X
	Slot size	Number/ft	Diameter (nominal)	Material	Gauge or Schedule					Sandy Blue				X
932' 1052'	.020	Zone1	2"	PVC	Sch80				·	Dark Gray S	Sand			X
732' 822'	.020	Zone2	2"	PVC	Sch80				easurable)					1082'
575' 645'	.020	Zone3	2"	PVC	Sch80		Started		712008		Completed	3/21/2	2008	
Length of Headpipe	None	)	_Length of	Tailpipe None	2				CERTIFIC					
Packer 🗌 Y 🛭	N	Гуре							ninimum w removed.	ell construction	standards v	were cour	med wil	n ai
10. FILTER PAC										/alley Drilling	n	Co No	560	
Filter Material	From (H)		uantity (lbs or	fl³) Place	ment method	-	-		Vaddie 1		<u></u>			
	See	Table F	'g. 2			*Princ	ipal Drill	er				Date	4/2/2	008
44 El 600/556	Mare .	481.				*Drille	r	- 0				Date	4/2/2	800
11. FLOWING A				more no	D., 4	*Oper	ator II					Date		
Flowing Arteslan?					rg. 2	•								
Describe control des	VICE LO	CK60 2160	ETCIOS	nte		Opera	itor I			\		Date		
								- 81	onature of F	rincipal Driller a	nd no opera	tor are red	uired.	

Form 238-7 6/07 Pg 2 o F 2

## IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 0052631	12. STATIC WATER LEVEL and WELL TESTS:				
Drilling Permit No. 903350-850338	Depth first water encountered (ft) 516' Statis water level (ft) See Belo				
Water right or injection well # 63-33036	Water temp. (°F) See Below Bottom hole temp. (°F) 78.59 F				
2. OWNER	Describe access port 3 - 2" Tube Wells inside Locked Well He	ad			
Name Pacific West Land, LLC Test Well #1	Well test: Test method:	A CONTRACTOR OF THE PARTY OF TH			
Address 911 Hildebrand Lane NE #203	Drawdown (feet) Discharge or Test duration yield (gpm) (minutes) Pump Bailer Air	Flowing arlesian			
City Bainbridge Island State WA Zip 98110	No Pump Testing Other	$\Box$			
3. WELL LOCATION:	Than Air-Lifting and				
Twp. 1 North ☐ or South ☒ Rge. 4 East ☒ or West ☐	Pump Samples				
Sec. 8 NW 1/4 SW 1/4 NE 1/4	Water Quality test or comments: See Table Below				
Gov't Lot         County         Ada           Lat.         N 43 ° 21.237" (Deg. and Decimal minutes)           Long.         W 116 ° 0.243" (Deg. and Decimal minutes)	13. LITHOLOGIC LOG and/or repairs or abandonment:				
Lat. N 43 ° 21.237" (Deg. and Decimal minutes)	Bore				
Long. W 116 ° 0.243" (Deg. and Decimal minutes)	Dia. From To Remarks, lithology or description of repairs or (fit) (fit) abandonment, water temp.	Water Y N			
Address of Wall Sile 2.3 mi. S of 184 on S. Orchard Access Rd. &	10 992 1027 Medium Sand with Some Blue Clay	X			
200 ft. E. of Orchard City Bolse  Elementary street consultrate changes in feature transmit  City Bolse  Sub Name	10 /027 /063 Medium Gray Sand	X			
Lol Blk Sub. Name	10 / 063 / 087 Sticky Blue Clay	X			
4. USE:	GEALING ODGGEDUIGES	1			
☐ Domestic ☐ Municipal ☒ Monitor ☐ Imgation ☐ Thermal ☐ Injection	SEALING PROCEDURES: 0 19 11.9 Ft 3/4" Bentonite Chips Poured				
Other Piezometer Nest	105 110 1.9 Ft 3/4" Bentonite Chips Poured	1-1-1			
5. TYPE OF WORK check all that apply (Replacement etc.)	0 105 4.0 CY Cement Grout Pumped				
New Well Replacement well Modity existing well	0 300 3.2 CY Cement Grout Pumped				
Abandonment Other Well Design by Hydo Logic, inc.	895 877 8.3 Ft 30% Bentonite Grout Pumped				
6. DRILL METHOD: DREET Cable Other AR 110' to 310'	877 862 6.7 Ft Cement Grout Pumped				
	862 828 9.9 Ft 30% Bentonite Grout Pumped 709 689 8.2 Ft 30% Bentonite Grout Pumped	+			
7. SEALING PROCEDURES  Seal material From (fi)   To (fi)   Quantity (tibs or fi <sup>3</sup> )   Placement method/procedure	689 672 6.7 Ft Cement Grout Pumped	++-			
3/4" Baroid	672 645 9.5 Ft 30% Bentonite Grout Pumped				
Chips 0' 19' 11.9 ft. Poured	532 493 9.9 Ft 30% Bentonite Grout Pumped				
	0 493 7.2 CY Cement Grout Pumped				
8. CASING/LINER:	FILTER PACK:	IVED			
Diameter From To Gauge/	1002 POE "Directed" #9.416				
(nominal)     (ft)     (ft)     (ft)     Schedule     Material     Casing Liner     Threaded     Webber       2"     +2'     932     Sch80     PVC     ☒     ☒     ☒     ☒	828 729 "Birdseed" #8-#16 MAY Z	2 2008			
2" +2' 732 Sch80 PVC 🛛 🖂 🖂	645 532 "Birdseed" #8-#16 WATER BY	SOURCES			
2" +2' 575 Sch80 PVC 🗵 🖂 🖂	WATER LEVEL, TEMPERATURE,	N REDION			
Was drive shoe used? Y N Shoe Depth(s)	CHEMISTRY				
9. PERFORATIONS/SCREENS:	Z-1 (052 932 SWL=523.8, 70.0F pH=8.53; 275µS				
Perforations Y N Method	Z-2 822 732 SWL=522.6'; 65.0F; pH=8.50; 259µS				
Manufactured screen Y N Type PVC Sch80 Slotted	Z-3 645 575 SWL=516.21'; not meas.; not meas;				
Method of installation Lowered & Tagged into Place	ARTESIAN PRESSURES:	+			
From (R) To (R) Slot size Number/R Diameter (nominal) Material Gauge or Schedule	Z-1 371 Ft. or 161 psig	+			
932' 1052' .020 Zone1 2" PVC Sch80	Z-2 186 Ft. of 81 psig				
732' 822' .020 Zone2 2" PVC Sch80	Z-3 16 Ft. or 7 psig				
575' 645' .020 Zone3 2" PVC Sch80	Completed Depth (Measurable)	1082			
Length of Headpipe None Length of Tailpipe None	Date: Started 1/7/2008 Completed 3/21/2008	3			
Packer Y X N Type	14. DRILLER'S CERTIFICATION				
10. FILTER PACK:	I/We certify that all minimum well construction standards were complied the time the rig was removed.	with at			
Filter Material From (fi) To (ft) Quantity (lbs or ft <sup>b</sup> ) Placement method	Company Name Treasure Valley Drilling Co. No. 58	80			
See Table		2/2008			
11. FLOWING ARTESIAN:		2/2008			
Flowing Artesian? Y N Artesian Pressure (PSIG) See Table	*Operator II Date 41/				
Describe control device Locked Steel Enclosure					
	Operator I Date  * Signature of Principal Driller and rig operator are required				

Form 238-7 3/95-C96

## 869365-7700500 IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

	Office	Use Or	ily	
Inspec	ted by			
Twp_	Rge		Sec	
	1/4	_1/4		1/4
Lat:	-: <del>-:</del>	Lone:	:	-:

1. DRILLING PERMIT NO	11	SECRET O	יספור !	Lat: : Long: :	:	
Other IDWR No. D0019379	11.	WELI	u i ilio Pump		nt	
2. OWNER:	Yield	eal/min		awdown Pumping Level Time		コ
Name JIM PHAGAN	17			560 2 HRS		_
Address 4200 PASADENA DR. #30			_			4
City BOISE State ID Zip 83705	27/24	To		Determination of the second		_
3. LOCATION OF WELL by legal description:	Wate	er Cuali	its teet	Bottom hole temp or comments:		,
Sketch map location must agree with written location	** (11)	or Quan	ity two	Depth first Water Encountered 487		
N	12.	LITHO	TOG	IC LOG: (Describe repairs or abandonme	nt)	<b>,,,,</b>
Twp. 1 North 🛛 or South 🗌	2.2.2.2		200	20 20 01 (D) (D) (D) (D) (D) (D) (D)	,	
Prog. 4 Fact St. or Wast	Wat	er				-
E Age. 4 East Of West	Bore Dia	From	To	Remarks:Lithology, Water Quality & Temp.	Y	N
W E Rge. 4 East ☑ or West ☐ Sec. 33 1/4 NE 1/4 NW 1/4	10	o	3	BROWN TOPSOIL		젃 _
	10	3	14	BROWN SANDY CLAY		
S Gov't lot County ADA	10	14	18	TAN SANDY CLAY		Ŕ
Lat: : Long: : :	8	18	29	TAN SANDY CLAY		$\overrightarrow{A}$
Address of Well Site 23735 DESERT WIND	8	29	57	BROWN CLAY, SAND & SMALL	ΠĬ	
City BOISE  (Give at least name of road + Distance to Road or Landmark)				GRAVEL		又 し
	8	57	81	BLACK LAVA		X
Lt Blk Sub. Name REGINA HEIGHTS	8	81	212	TAN CLAY W/SAND		X
	8	212	244	STICKY TAN CLAY		X
4. USE:	8	244	309	STICKY TAN CLAY W/STRIPS BROWN		
Domestic Municipal Monitor Irrigation				SAND		$\boxtimes$
☐ Thermal ☐ Injection ☐ Other  5. TYPE OF WORK check all that apply (Replacement etc.)	8	309	376	BROWN SAND W/SMALL STRIPS		_
5. TYPE OF WORK check all that apply (Replacement etc.)  ☑ New Well ☐ Modify ☐ Abandonment ☐ Other				TAN CLAY		<b>X</b>
6. DRILL METHOD	8	376	421	CEMENTED BROWN SAND		XI .
☐ Air Rotary ☐ Cable ☐ Mud Rotary ☐ Other	8	421	480	STRIPS BROWN SAND & TAN CLAY		XI
7. SEALING PROCEDURES	6	480	487	STRIPS BROWN SAND & TAN CLAY		즤
SEAL/FILTER PACK AMOUNT METHOD	6	487	511	FINE BROWN & CLEAR QUARTZ SAND	XI,	_
Material From To Sacks or	6	511	539	STICKY TAN CLAY		XI .
Pounds BENTONITE 0 18 9 SACKS OVERBORE	6	539 541	541	VERY FINE BROWN & MICA SAND	X	-
BENTONITE 0 18 9 SACKS OVERBORE	P -	341	545	DIRTY BROWN SAND & SOFT TAN CLAY		
	6	545	562	MEDIUM STICKY TAN CLAY		$\Theta$
	6	562	572	COARSE CLEAR QUARTZ SAND &	╌╟	4
Was drive shoe used? ⊠ Y □ N Shoe Depth(s) Was drive shoe seal tested? □ Y ☒ N How?		302	312	PEA GRAVEL	X	$\dashv$
8. CASING/LINER:				1D/1 OKCIVILL	쓔	$\dashv$
Dismeter From To Gauge Material Casing Liner Welded Threaded	-			RECEIVED		ᅱ
6 +2 560 250 ST 🗵 🗆 🖸					╁	_
				JAN 0 3 2002		$\neg$
				<del>-</del> "	H	7
Length of Headpipe 10'8" Length of Tailpipe				WATER RESOURCES WESTERN REGION		一
9. PERFORATIONS/SCREENS		pleted		r: 569 (Measurable)		
Perforations Method	-	: Starte				
Screens Screen Type telescoping				CERTIFICATION		
From To Slot Size Number Diameter Material Casing Liner				minimum well construction standards were		
From To Slot Size Number Diameter Material Casing Liner 559 569 20 5" ST ST	comp	olied wi	th at th	e time the rig was removed.		
31.01	Finn	Nama 6	פרופ זוי	'elldrilling & Pump Co Firm No.	217	<b>)</b>
	A III III	14mme j	OUS W	STREET HERE OF CHIEF CO.		l
	Firm	Officia	1 7	rank Skinner Date 13	2	5-11
10. STATIC WATER LEVEL OR ARTESIAN						لكنست
PRESSURE:	Supervisor or Operator Date 1227					27
181 ft. below ground Artesian Pressure Ib Depth flow encountered ft. Describe access port or control	(Cinn care of Cine (Cinial & Chamble)					
devices:	Date	12/5/01	Time:12	2:12 PM		
		,,,				

1.	WELL OWNER Name Neil Helmick	7. WATER LEVEL Static water level 340 teet below land surface.						
	Address HC 34 Mayfield, Boise, ID 83706	F	lowing	? D		flow		_ <u>·</u> _
	Drilling Permit No. 61-92-W-044	Controlled by: ☐ Valve ☐ Cap ☐ Plug						
	Water Right Permit No.	TemperatureoF. Quality						
2.	NATURE OF WORK	8. V	VELL '	TEST I				
_	☐ New well ☐ Deepened ☐ Replacement ☐ Well diameter increase ☐ Modification			пр		Other		
	Abandoned (describe abandonment or modification procedures such as liners, screen, materials, plug depths, etc. in lithologic log, section 9.)	Discharge G.P.M. Pumping Level Hours 20 5HR					- umpeo	
3.	PROPOSED USE							
	☐ Domestic ☐ Irrigation ☐ Monitor ☐ Industrial ☐ Stock ☐ Waste Disposal or Injection			.OGIC	082	452	····	
	□ Other(specify type)	Bore		pth To		}	Wa Yes	
<u> </u>		Diam.	Prom		Top Soil		TES	No
4.	METHOD DRILLED	ii.	2	10	Brown Clay			
	☐ Rotary ☐ Alr ☐ Auger ☐ Reverse rotary	11	10		Cozrse Sand			
	☐ Cable ☐ Mud ☐ Other	8-6	11		Erown Clay			
	(backhoe, hydraulic, etc.)	8	40 105		Clay & Sand Seams Sand & & Gravel			
	WELL CONSTRUCTION		120		Cement and Sand			
٥.		"	143	162	Clay Tan			
	Casing schedule: 🖾 Steel 🗆 Concrete 🖼 Other <u>PVC</u> Thickness Diameter From To	11	162		Sand & Gravel			
	.250 inches 6 5/8 inches + 3 feet 404 feet	17	190 200		Tan Clay Tan Sand & Gravel			
	Sch 40 Inches 4 inches 240 feet 300 feet	11	260		Tan Clay			
-	inches inches feet feet	· #1-	268		Tan Sand			==
ļ	Was casing drive shoe used? ☑ Yes ☐ No Was a packer or seal used? ☐ Yes ☑ No	11	298	305	Clay			
	Perforated?	11	305		Tan Sand			
	How perforated? ☐ Factory ☐ Knife ☐ Torch ☐ Gun	11	336	375	Tan Clay		7-	
	Size of perforation?inches byinches	- "	420		Tan Coarse Sand Clay - Sand Seam		X	
	Number From To feet feet			310	City - State Section		Λ.	
	perforations feet feet							
	perforations feet feet							
	Well screen installed? ∰ Yes □ No							
	Manufacturer <u>Joinnson</u> Type <u>FVC</u> Top Packer or Headpipe <u>240</u>	<b></b>						
	Bottom of Tailpipe510				1		-	
					Gusta	1, 11		
	Diameter $\frac{4"}{4"}$ Slot size $\frac{.010}{.020}$ Set from $\frac{410}{.020}$ feet to $\frac{.020}{.020}$ Set from $\frac{.020}{.020}$ feet to $\frac{.020}{.020}$		? E C	EI	VED AMB 18 198	2	,	
	Gravel packed? ☐ Yes ☐ No ☐ Size of gravel	<del>  </del>	AUG	17	1992 Department of Water Pe	******		
	Placed fromfeet tofeet	<del> </del>			HENNIE III	"TOB		
	Surface seal depth 38 Material used in seal:   Cement grout	Dep	atment	of Wate	r Hesources			
	□ Bentonite □ Puddling clay □ □							
	Sealing procedure used:   Slurry pit				the transmission of the contract of the contra			
	☐ Temp. surface casing ☑ Overbore to seal depth							
	Method of joining casing: PVC☐ Threaded ☐ Welded ☐ Cemented between strata					l		Ц.
1	Describe access port <u>Top of 6"</u>	10.	Nork B	tarted	7-29-92 finished	8-7-92		
		[			DIGITOR			
	Sketch map location must agree with writer location Subdivision Name  DEC 0.3 1992		/We c	ertify to ed with	that all minimum well construction at the time the rig was removed the construction of	d.		vere
	Lot No Block No	,	o pddres:	s Mtr	1 Home, ID 83647 Date	8-10-	-92	
	County Elegan		Ĭ		・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・・			

Form 238-7

JUN 0 8-1999 DAHO DEPARTMENT OF WATER RESOURCES

Use Typewriter or

WELL DRILL	ER'S REPORT Bail Point Pen
WATER RESOURCES WESTERN REGION PAGE	D of 3 PAGES 95106
1. DRILLING PERMIT NO. 61 - 98 - W- 0075 - 000 Other IDWA No. 0000 7483	10. WELL TESTS:  OF Pump
	Yield gal/min. Drawdown Pumping Depth Time
2. OWNER: Name FRANK BONESSA	9.7 <   FT 500.8 12 HRS
Address 1979 BORCHERS DRIVE	
City SAN JOSE State CA ZIP 95124	
	Temperature of water 66 TWas a water analysis done? Yes □ No □
3. LOCATION OF WELL by legal description:	By whom?
Sketch map location must agree with written location.	Water Quality (odor, etc.) EXCEUENT
N	Bottom Hole Temperature 66°F
	11, STATIC WATER LEVEL:
T. 1S North or South	500 ft. below surface Depth artesian flow found
FR. 3E East or West	Artesian pressureib. Describe access port 8" CASING
Sec. 13 , SE 1/4 NE 1/4 NE 1/4	BY REHOVING WELL CAP
Gov't Lot County A DA	
S	12. LITHOLOGIC LOG: (Describe repairs or abandonment)
Address of Well Site / HILE WEST OF ORCHARD	
ACCESS RD ON ORCHARD RANCH LANE; THE I	No Dia From To Remarks: Lithology, Water Quality & Temperature
	\$ 0 551'
Lot No Block No Subd. Name	6 557 634
4. PROPOSED USE:	2 6 SOIL, SUBSOIL, CLAVEY HARDAN
GrDomestic □ Municipal □ Monitor □ Irrigation □ Thermal □ Injection □ Other	6 8 SANDY CLAY
5. TYPE OF WORK	· 8 16 CLAY
New Well  Modify or Repair Replacement Abandonment	i in Co.
6. DRILL METHOD	18 345 SAUDY CLAY
☐ Mud Rotary ☐ Air Rotary ☐ Cable ☐ Other	35 ROCK
7 CE 1 (NO DOCCEDIDO	35 63 CLAYEY SAND
7. SEALING PROCEDURES  SEAL/FILTER PACK AMOUNT METHOD	63 64 GRAVEL
Metarial Fram To Sacks or	64 69 CLAYEY SAND
NEAT CEMENT 124. GAT 17 EN THEOUGH 8"	70 96 CLAYEY SAND
GROUT TO 115 PA + BAGS CASING	at land on any
BENTONITE 115 4 16 BAGS SLUARY PIT	KOT IN CLAY
NEAT CEMENT GOUT 0-4'1BK POURED	116 122 GRAVEL
Was drive shoe seal tested? YO No? How?	122 94 BASALT Department of Water Resources
8. CASING/LINER:	194 197 RUBBLE & CINTERS
	216 217 BASALT, CREVKED, REDINSEAMS
Diameter From To Guege Casting Liner Steel Pleastic Welded Threaded	21728 BASALT
65/8 1 551 0.28 V 0 0 0 0 0	255257 BOULDERS, HARD, REDMATRIX
53/16 54 629.70.188 - 4 0 0	257272 BASALT, RED IN SEAMS
4/2 5602 58140.227	272 273 RUBBLE & CINDERS
Final location of shoes 8"SNOE I 124 GA'	ZI331 BASALT
Top Packer or Headpipe 5 14 Bottom Tailpipe 629.71	BIL BIZ RUBBLE & CINDERS
9. PERFORATIONS/SCREENS	Date: Started Nov 30, 1998 Completed SEE PAGE 3
Perforations Method SAWED IN PVC, TORCH	13. DRILLER'S CERTIFICATION
Type Joh With Material CONTINUOUS SLOT WIFE WOOM D	
From To Slot Size Number Diameter Tele/Pipe Casting Liner	the time the rig was removed.
410 550 3/32 1064 65/8 PIPE I	Firm Name ARTESIAN CO Firm No.318
560,21570.45 .020 N.A 59/6 (6"TELESCOPING) =	
SAN 5010 342 72 4% PIOF D	Firm Official HUGH HARDER Date Thema 19
MICROPILME	Dand Supervisor or Operator Hugh Harder Date 7 June 199
	Supposed of Operator Several Serval S
AUG 2.5 1990	2. (Sign once if Firm Official & Operator)

Form	23	38-7
B/93		Ξ.

RECEIVEDIDAHO DEPARTMENT OF WATER RESOURCES

OF

JUN 0 8 1999

WELL DRILLER'S REPORT

JUN 1 4 1999

Ball Point Pen

			_	
- 71	H	n	0	1999
JL	JN	u	Ω	

	IDWR No	MATERIA	EGION -			075-00	10. WE	LL TE	STS:		C Ale		07 urces	iso	
			/+2	75			<u></u>	rump	C) Bai	er	□Alr		lowing Artes		
2. 0	WNER			D			Yiold	pal./min.		nwdown.		Pumping (	ARJUN	Time	
				Bene	SSA		ļ								
Addre	SS										—— <u> </u>				
City			·	_State	Zip		L								
3.:LC	DCATION OI	WELL	y legal c	jescripi	ion:		Temperat By whom			_Was a	water a	analysis do	ne? Yes []	No □	
	h map location <u>s</u>		•				•								
0,10,0	·		. )	rocasion.					nperature_						
rifu	OFFICE	ICE AN	HV				OOMM 11	018 1 611	iperature						
				7			11. ST/	ATIC V	NATER	LEVE	L:				
h	property.			orth 🗆	or §	South 🗆			w surface				found		
		R		ast 🗆		West □		pressu	Jre	_lb. D	escribe	access	oorttroc		
H-P	1018 Pa	Sec	13	1/4_	1	/41/4	Describe	- Contr	olling De	vlces:_					
6	<u></u>	Gov't Lot_	Z_Count	y		100 8008									
_	ZEJA	E 1/4 N E	E_1/4				12 LITI	HOL O	GIC I O	G- ma	cerika r	enaire ne	abandonme	ent)	
Artrino	ss of Well Site_	-	انسسب	•				,	<u> </u>	we loc			are in the state of the state o	W	AT
, .mai 63	OI 11611 OILE			<del></del>			Bore Dia. From	пТо	Remarks	: Lithok	ogy, Wat	er Quality i	& Temperatu	ne am	- AL
	(Give a	I least Oirection	1 + Distance to	Road or Lan	dmark)	•		31-7	BASA	4.5	Sar	=TFP	BRO	45)	1
t ot No	Block	No	. Guhal M	ame	•								GREY		ナラ
			GUDG. N	AHI6									BROW		1
	OPOSED U		T 14	itar "	7 Juni	_	2.0	7 22	. C 12		ا <i>ناچ</i> لاز ح	EA U	ARD, G	ا ليو	+-
	l Domestic [	-			Irrigation		270		PA		= F	CAN PROPERTY	S BRA	- <del></del> 1	+
		Injection	COme	r			22	723	CLA		200	- ( N LACY	- , 5KA	- L	+-
	PE OF WOF						25	124	CAN'	<u>تو رح</u>	LI .	0 P		<del></del>	+5
	lew Weli 🗆 l		pair 🗀 Re	Diacemen		Abandonment						లా, క	eown		+-
	ILL METHO	-	<b>—</b> - :		-				SAND						+-
U	Mud Rotary	Air Rotary	∐ Cab	le 🗓	Other		57	7 3	CLA	<u> </u>	AN				1
7 C=	ALING PRO	CEDITOS	:e			•			SAN						+-
, , JE	SEAL/FILTER		AMOU	NT	9.00097-10	00			CLAY			-	4.5.5		1
	Material	From	To Sacks	Or	METH	ν						0,72	.K/		+
	eresegi Pili		Pount	ts :			133	45	CLAN	<u>, , 7</u>	AN_				+
<b> </b>												TAN			<del>  -</del>
							43	343	CON	460F	<u>YERI</u>	ATE,	TAN	<del></del>	
					<del></del>		1 43	2471	CLAY	2 2	ANE	), TA	<u> </u>		<u></u>
<u></u>												ATE			+-
Was dr	ive shoe seal te	sted? YO 1	WD How?	·			477	479	CLAS	762	SAL	VD, TA	N		1
	OILIOA HIFF	<b>.</b> _		,			47	1483	CLAY	7	AN_				
	SING/LINEF			-			18	4984	SANE	77	AN				1
Diamet	er From To	Guage (	Casting Line	_	Plastic W	elded Threaded					NAK	77. ۵			+-
	<del></del>						18		2 SA			TAN			1
	<del></del>				_		478		O CLA		· >4	ND	TAN		1
							50		2_5 A				TAN	<del></del>	1
		777				3					Y 56	BONE	CLAY		1
	cation of shoes	_				9.551FT			2 SA				TAN		+
Top Pa	cker or Headpip	е		3ottom Ta	iilpipe	<del></del>	<u> </u>	<b>\$51</b>			Y 5A		TAN		1-
) PF	RFORATION	S/SCRE	ENS			-	Date: St	arted	PAGE	·/		Complet	ed Pag	2.3	
	☐ Perforations		hod												
	□ Screens	Тур		Materia	al				'S CERT						
(		- 3 -			_						onstruc	tion stand	ards were o	ompiled v	with at
(		Number	Diameter	Tele/Pipe Size	Caeting	Liner		_	as remove						
(	To Stot Size				1 1		Fire Stone	Λ	0756	- 5 67	_			3/	18
(	To Stot Size		1				Lillia Main	a 71	PE ( C. P.	77717	40		Fire	INO 🕶 i	
( (	To Stot Size				0		rim Nam	e //	F- 1 A F		40		Fire	1 No. 🕶 1	
( (	To Stot Size						Firm Office		and	Ha	Das	·	Firm	head !	199
(	To Stot Size						Firm Office	ial 📈	RTES	Ha	co rfei	ά	Firm	tecap 1	99
(	To Stot Size				MER		Firm Office  and  Supervisor		•	Ha	rfei	<b>'</b>	Date Date	tuas 1	199

RECEIVED
IDAHO DEPARTMENT OF WATER RESOURCES Use Typewriter Form 238-7 OF ₽/93 . ≠ **Ball Point Pen WELL DRILLER'S REPORT** WATER RESOURCES
WESTERN REGION 61-98-W 95408 OF 3 PAGES -0075-000 1. DRILLING PERMIT NO. 10. WELL TESTS: Other IDWR No. D 0000 7483 □ Baller ☐ Flowing Artesian ☐ Pump Pumping Depth Yleid gal/min. Drawdown 2. OWNER: 1979 BORCHERS DRIVE City DAN JOSE State CA Zip 95 124 Temperature of water\_\_\_ Was a water analysis done? Yes \( \) No \( \) 3. LOCATION OF WELL by legal description: By whom? Water Quality (odor, etc.) witten location. OFFICE USE ONLY Bottom Hole Temperature 11. STATIC WATER LEVEL: North South ft. below surface Depth artesian flow found East | West Artesian pressure \_\_\_ lb. Describe access port Describe Controlling Devices:\_ 1/4 \_\_\_\_1/4 12. LITHOLOGIC LOG: (Describe repairs or abandonment) Address of Well Site **上口** From Remarks: Lithology, Water Quality & Temperature To (Give at least Direction + Distance to Road or Landmark) TAN SAND CLAYEY SAND , TAN Lot No. .. Block No. Subd. Name 5/8 524 5243 SAND , TAN 4. PROPOSED USE: -☐ Domestic ☐ Municipal SATSIE CLAYEY SAVO. ☐ Monitor ☐ Imigation SAND, TAN. ☐ Thermal ☐ Injection ☐ Other ROCK BASALT 5. TYPE OF WORK □ New Well □ Modify or Repair □ Replacement SAND, TAN □ Abandonment 6. DRILL METHOD SET SANDY CLAY SAND TAN ☐ Mud Rotary ☐ Air Rotary ☐ Cable □ Other ROCK CONGLOMERATE 7. SEALING PROCEDURES SEAL/FILTER PACK AMOUNT METHOD CONGLOMERATES Sacks or Pounds Material From CLAYEY GRAVEL CLAYEY -SAND -ALTERNATING LAYERS SANDECLAY 2 CLAYEY GRAVEL سة 602 GOA CLAY, TAN 64 65 SAUD, TAN Was drive shoe seal tested? Y□ N□ How? 44200 A LTERNATING LAYERS SANDECA VLINER: HANGER 5.0 COUPLING Diameter From Guage Casting Liner HARDFACED <u>क्रभण</u>ेख RECEIVED <del>2221 + 1 MUL</del> Final location of shoes - 4" LINES Department of Water Resources Top Packer or Headpipe Bottom Tailpipe 9. PERFORATIONS/SCREENS PIPE AXE, CHANFERED PAGE 1 Date: Started SEE Completed JUNE 1, 1999 -Method INTERNALLY & GROUND - Perforations 13. DRILLER'S CERTIFICATION D. Sereens -Material I/We certify that all minimum well construction standards were complied with at the time the rig was removed. Slot Size Number Diameter Tele/Pipe Size Casting Liner Firm Name ARTESIAN CO  $\Box$  $\Box$ MEROFILMED Firm Officia SY and Supervisor or Operator Date

Form 238-7 3/95-C96

# IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

nspc	ted by	У										
[wp		Rge		Sec								
	1/4		1/4	1/4								
at:	:	;	Long:	: :								

771187

1. DRILLING PERMIT NO	11.	WELL			_			
Other IDWR No. D0018592					X Air Flow	ving Artesian		7
2. OWNER:	50+	gai/min	. Dr	awdown	Pumping Level	1 hr		-
Name Linda McFain	301		+			†*** <u> </u>		1
Address 250 S. Bobwhite Ct., Ste #350			<b></b>					1
City Boise State ID Zip 83706	Wair	er Temp			Bottom hole ter	np.		-4
3. LOCATION OF WELL by legal description:	Wate	er Qualit	ty test	or comments:				_
Sketch map location must agree with written location				Dep	oth first Water Enc	ountered 610'		_
17	12. J	LITHO	LOG	IC LOG: (D	escribe repairs or	abandonme	nt)	
Twp. 1 North or South X							ater	
	Bore	From	То	Remarks:Lit	hology, Water Qua	lity & Temp.	YN	1
	1)ia 10	0	2	Topsoil			X	<u> </u>
Sec. 20 1/4 SW1/4 NW1/4	10	2	60	Sand & gra	vel		_x	
	10	60	65	Brown clay			x	
S Gov't lot County Ada	10	65	89	Sand & gra			_x	1
Lat: : : Long: : :	10	89	93	Brown clay			-x	
Address of Well Site 30000 Orchard Access Rd	10	93	120	Sand & gra			x	
City Boise	10	120	300	Gray lava			<del> </del> -х	
(Uive at least name of road + Distance to Road or Landmark)	8	300	320	Red sandste	one		\_X	- 1
Lt Blk Sub. Name	8	320	340	Coarse sand			x	
	8	340	400	Fine sand			X	
4. USE:	8	400	580	Gray lava			$-\mathbf{x}$	1
X Domestic Municipal Monitor Irrigation	6	580	610					- 1
☐ Thermal ☐ Injection ☐ Other	6	610	680	Fine sand			χÏ	7
5. TYPE OF WORK check all that apply (Replacement etc.)	6	680	684	Brown clay			X	
X New Well Modify Abandonment Other	6	684	715	Coarse san		•	_x	1
6. DRILL METHOD	6	715	718	Brown clay			x	
X Air Rotary Cable Mud Rotary Other	6	718	730	Coarse sand		<del></del>	X	
7. SEALING PROCEDURES	6	730	736	Brown clay			X	1
SEAL/FILTER PACK AMOUNT METHOD	6	736	745	Sand, coars			$\mathbf{x} \stackrel{?}{\Gamma}$	$\dashv$
Material From To Sacks or		750		Cano, com			<del>-</del>	
Bentonite 0 120 40scks overbore							╌├──├	-
Bentonite 0 120 40scks overbore							┿┼	4
	I						╁╌├	-
	<b> </b>				RECEIV	F	┾┷┾	-
Was delicated and D. V.V. (T. M. Charles David)	<del>                                     </del>				TILOEIV	CU	╁╌┝	-
Was drive shoe used? X Y □ N Shoe Depth(s)  Was drive shoe seal tested? X Y □ N How? Air	ļ				WAY 1 A 2	· · · · · · · · · · · · · · · · · · ·	┼┼	-{
8. CASING/LINER:					NUT 14-2	2001	╌├╌╌├╴	-}
Diameter From To Gauge Materia Casing Liner Welded Threaded					WATER RESOU	RCFS	╬╌╬	$\dashv$
8.625 +1 120 332 Steel X					WESTERN REC	ION	╌├──├	$\dashv$
6.625 +2 736 250 Steel X								ᅱ
Y and the SY load from the system of the sys	Con	nleted	Denti	1: <b>736</b> °		Measurable)		-
Length of Headpipe Length of Tailpipe 9, PERFORATIONS/SCREENS		Started	-			oleted 10/05/		-
Perforations Method				CERTIFIC		pretect 1 Williams	<del>V</del>	
Screens Screen Type					Il construction sta	ndards were		
C. Sergeria Correcti 13ho					was removed.			
From To Slot Size Number Diameter Materia Casing Liner	•							
	Firm	Name I	Tiddl	eston & So	n, Inc -Boise	Firm No	o. <u>35</u>	
	•	•		11 11/1	$\lambda$	·	4 . /	,
	Fiim	Official	1/	1.6. C.S	Heatre	Date_	11/	12./61
10. STATIC WATER LEVEL OR ARTESIAN PRESSURE:			•	~ ` `	71-31	,		
505ft. below ground Artesian Pressure 1b  Depth flow encountered Describe access port or control	Super	rvisor o		ator 🖖 🚶 🛶	(1)	, Date	. /	
Depth flow encountered Describe access port or control				(Sign once if F	irm Official & Opera	ator)	•	: :

Form 238-7 3/95-C96

## 970655~775948 IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

	(	Office	Use Or	ıly		
Inspec	eted by	y				
Twp		Rge		Sec	_	
	1/4		1/4		1/4	
Lat:	_:	:	l.ong:	:		:

1. DRILLING PERMIT NO	11.	WELL	TES	TS: Lat: : Long: :	
Other IDWR No. D0019537			unp		
2. OWNER:	-	1 gal/mir	ı. Dı	awdown Punping Level Time	
Name Bob Wickham	20			. 1 hr	
Address 730 S. Prairie Grass Dr.	<u> </u>	•	_		
City Boise State ID Zip 83716	Wat	er Temp	. 68	Bottom hole temp.	
3. LOCATION OF WELL by legal description:		•		or comments:	
Sketch map location must agree with written location				Depth first Water Encountered 415'	
· ·	12.	LITHO	LOG	IC LOG: (Describe repair or abandonment	1)
Twp. 1 North or South X					
W X E Rgc. 4 Fast X or West Sec. 1 1/4 SW 1/4 NW 1/4	Wat				( T T T T T T T T T T T T T T T T T T T
Sec. 1 1/4 SW 1/4 NW 1/4	Bore	From	To	Remarks:Lithology, Water Quality & Temp.	YN
10 acres 40 acres 100 acres	Pia,	U	2	Top Soil	X
the state of the s	10"	2	7	Cleache	x
Gov't lot County Elmore		7	_18	Sand & Gravel	_X
Lat: : : Long: : :	6"	18	30	Sand & Gravel	X
Address of Well Site 730 S. Prairie Dr.	6"	30	34	Brown Clay	X
City Mtn Home  (Oive at least name of road + Distance to Road or Landmark)	6"	34	225	Sand & Gravel w/ Clay Scams	<b>X</b>
	6"	225	236	Brown Clay	X
Lt Blk. Sub. Name	6"	236	250	Tan Sand Stone	x
	6"	260	415	Sand & Gravel w/ Clay Scams	<b>X</b>
4. USE:	6"	415	428		X []
X Domestic Municipal Monitor Irrigation	6"	428	441	Brown Clay	$\mathbf{X}$
Thermal Injection Other	6"	441	455		X
5. TYPE OF WORK check all that apply (Replacement etc.)	6"	455	460	Brown Clay	X
X New Well Modify Abundonment Other 6. DRILL METHOD					
X Air Rotary Cable Mud Rotary Other 7. SEALING PROCEDURES					
SEAL/FILTER PACK AMOUNT METHOD					
Material From To Sacks or					
Pounds					
Bentonie 0 20 700 lbs. Overbore					
Was drive shoe used? XY N Shoe Depth(s)				RECEIVED	
Was drive shoe seal tested? Y X N How?					
8. CASING/LINER:				APR 2 6 2002	<u> </u>
Diameter From To Gauge Material Casing Liner Welded Threaded				WATER RESOURCES	
6.625 +1 444 .250 Steel X	ļ			WESTERN REGION	<u>                                     </u>
					<b>}_</b>  _
Length of Headpipe 6' Length of Tuilpipe 3'			Dank	n: 455' (Measurable)	1
9. PERFORATIONS/SCREENS	1	npieteo : Starteo	-		
Perforations Method				CERTIFICATION	
X Screens Screen Type Johnson				minimum well construction standards were	
From To Slot Size Number Diameter Materia Casing Liner				e time the rig was removed.	
From To Slot Size Number Diameter Material Casing Liner  445   450   .030   5"   SS	-01116	,.,			
1.15 14.16 156.00   5   53   1   1   1   1   1   1   1   1   1	Finn	Name I	diddle	ston & Son, Inc. / Firm No	. 35
		····	!	/	
10. STATIC WATER LEVEL OR ARTESIAN	Firm	Officia	1 ×	and Haller Date of	4-22-02
PRESSURE:				0 Tal 1000	17
337 ft. below ground Artesian Pressure 1b	Supe	rvisor o		ator Man Date Date	-11-9
Depth flow encountered ft, Describe access port or control devices:				(Sign once if Firm Official & Operator)	
UCVICES.					



Form 238-7 6/07

# IDAHO DEPARTMENT OF WATER RESOURCES WELL DRILLER'S REPORT

1. WELL TAG NO. D 0060330				EVEL and WELL TEST				
Drilling Permit No. 913940-862568	Depth first water encountered (ft) 300 Static water level (ft) 243							
Water right or Injection well #  2. OWNER: LORD Ranch LLP	Water temp. (°F) 58 Bottom hole temp. (°F) Describe access port Through top of well seal							
2. OWNER: Lord Ranch LLP	Descri	e acces	Thous	hrough top of well so	eal			
Name Jeff Lord	Well to				Test met			
Address 1171 Mayfield Road		lown (feet)	Dis	charge or Test duration	Pump		Air	Flowing
City Boise State ID. zip 83716	13		15	(minutes) 60	1 🗖		×	artesian
3.WELL LOCATION:	-	***************************************	<del>                                     </del>					
				mments:			···	<u></u>
Twp. 1 North ☑ or South ☐ Rge. 5 East ☒ or West ☐ Sec. 30	13. LITI Bore	HOLOG		and/or repairs or aband			<del></del>	
	Dla.	From (ft)	To (ft)	Remarks, lithology or desc abandonment, w		alrs or	, Y	Nater N
Gov't Lot County Elmore	(in) 10"	0		Topsoil			- <del>  '</del>	X
Lat. 43 0 23.35 (Deg. and Decimal minutes)  Long115 054.15 (Deg. and Decimal minutes)	10"	2'		Caleche				$\frac{1}{X}$
Long115 o54.15 (Deg. and Decimal minutes)	10"	5'		Sand and gravel	,		_	<del>X</del>
Address of Well Site 1.6 miles NE. off Base Line Road	10"	35'		Brown clay				X
(City Mayfield	6"	40'	43'	Brown clay				X
Lot Blk Sub. Name	6"	43'	136'	Sand and gravel tan				X
	6"	136'		Tan clay				X
4. USE:  ☑ Domestic ☐ Municipal ☐ Monitor ☐ Irrigation ☐ Thermal ☐ Injection	6"	138'		Sand and gravel				X
Other	6"	296'		Brown clay			<del>  ,,</del>	X
5, TYPE OF WORK:	6"	299'	307	Tan sand with pea g	ravel		X	
■ New well								<del>- </del>
Abandonment Other								
6. DRILL METHOD:  Air Rotary  Mud Rotary  Cable  Other							_	
						***************************************		+
7. SEALING PROCEDURES:  Seal material From (it) To (fit) Quantity (libs or fit') Placement method/procedure							$\neg$	<u> </u>
Bentonite #5 0 40' 1350 lbs Overbore Pour								1
B. CASING/LINER:								
Diameter Gauge/								
(nominal) From (n) 16 (n) Schedute Material Casing Linar Infrased Welged								
0 0/8 12 200 1200 01001								
							_	
		RF	CF	IVED				<del> </del>
			<u> </u>	IVED			$\dashv$	
Was drive shoe used? ⊠ Y ☐ N Shoe Depth(s) 298 feet		12	N 2	6 2912				
9. PERFORATIONS/SCREENS:			111	D - 7.311/2			_	
		WATE	RRE	OURCES				
Perforations Y N Method				REGION				
Manufactured screen ☐ Y ☒ N Type								
Method of Installation								
From (ft) To (ft) Slot size Number/ft   Diameter (nominal)   Material   Gauge or Schedule	Comple	eled Dept	h (Meas	<sub>urable):</sub> 303 Feet				
	D-1- C	tarted: 1	/17/2	011 24-5-	ipleted:Dec	c 30, 2	2011	
					ibieteo:			
				TIFICATION: imum well construction sta	ndards wer	e comt	olied wil	hat
Length of Tallpipe Length of Tallpipe		e the rig						
	Comp	anu Alam	, Hidd	lleston Drilling	Ce	. No. <u>3</u>	15	
Packer Y X N Type			- 4	VI 1817 ME		,	1	/
10.FILTER PACK:	*Princi	pal Drille	14	INUX SUPP	Da	ate	[[][	17
Filter Material From (ft) To (ft) Quantity (lbs or ft <sup>3</sup> ) Placement method	*Drillei	$\mathcal{N}$	1071	T Jallo	Jano	ate (	/16	1/2
		-7	7	0000			1,,	17
	*Opera	ator# 4	De de	- Horn	Da	ate <u> </u>	110	110
11. FLOWING ARTESIAN:	Opera	lor l /			Da	ite		
Flowing Artesian? Y N Artesian Pressure (PSIG)	101		Dela-1	al Dellos and sic		rnel		
Describe control device	៦រដ្ឋា	arnie Oi	concip	al Driller and rig operator	are reda	ieu.		