

**Casa Del Norte, L.P.
Amended Application for Transfer No. 81800
Expert Witness Report**

Prepared for

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**Applicant's
Exhibit**

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1. WATER RIGHTS SYNOPSIS

1.1. Introduction

The Cold Springs Creek Farm hold water rights from various surface- and ground-water sources for irrigation of 1,586 acres. A spreadsheet titled "Casa Del Norte Cold Springs Creek Farm Water Rights" is included in Appendix A, providing a summary of the rights, their authorized quantities, and combined use limits. The following describes the rights and are grouped by source.

1.2. Cold Springs Creek

There are two groups of Cold Springs Creek water rights. The large group consists of twelve water rights that authorize use of Cold Springs Creek at 5 points of diversion. These rights include: 61-332, 61-333, 61-334, 61-335, 61-336, 61-337, 61-338, 61-339, 61-340, 61-343, 61-364, and 61-2008. Together, these rights authorize 18.96 cfs for irrigation of 847.3 acres. These rights are conditioned that when used with certain other surface- and ground-water rights, the combined rights are limited to 16.95 cfs for the irrigation of 1368 (or 1371) acres. (Most rights list a combined area of 1368 acres, but 61-11854 lists 1371 acres.)

The small group of Cold Springs Creek water rights includes 61-211 and 61-11885. These rights together provide 1.5 cfs for irrigation of 215 acres. These rights are overlapped with hot groundwater right 61-301B, providing 1.02 cfs for the same 215 acres. The area covered by these rights may be referred to in this report and elsewhere as the "Bull Pasture."

1.3. Cold Groundwater

The Farm has three groundwater wells diverting from "cold" (not exceeding 85°F) groundwater used for irrigation. Water right 61-11847 authorizes diversion of 0.6 cfs for irrigation of 30.6 acres. This well is referred to as "House Well" and is located at T04S R09E Sec 03 SENE.

Water rights 61-2095A, 61-2199A, 61-2209A, and 61-11887A together authorize diversion of 9.34 cfs for irrigation of 800.9 acres from two cold groundwater wells. These wells are commonly called "Upper Bench" to the west at T04S R09E Sec 10 NWNW, and "Trout Pond" to the east at T04S R09E Sec 10 SWNE. The BLM owns the "B" portions of four associated water rights, totaling 0.19 cfs for 16 acres, which cover the portion on BLM lands of a center pivot located at T04S R09E Sec 9 NESW.

1.4. Springs

The Farm has two water rights authorizing diversion from springs for irrigation. Right 61-10363 authorizes diversion of 3.25 cfs for irrigation of 246.6 acres and is overlapped by 61-301A, a hot groundwater right. Right 61-11854 authorizes diversion of 0.42 cfs

for irrigation of 161 acres. Both of these are included within the large 1368-acre place of use.

1.5. Unnamed Stream

Water right 61-11844 provides 0.54 cfs for irrigation of 50.6 acres. This place of use is within the large 1368-acre place of use.

1.6. Hot Groundwater

Two groundwater wells provide irrigation water that is considered "hot" (exceeding 85°F). Water right 61-301B authorizes diversion of 1.02 cfs for irrigation of 215 acres, the area referred to as the "Bull Pasture," from a well located at T04S R09E Sec 8 NWNE and commonly referred to as the "Walker Well" and/or the "Little Hot Well."

Water right 61-301A authorizes diversion of 5.38 cfs for irrigation of 246.6 acres from a well located at T04S R09E Sec 9 SESE and commonly referred to as the "Two-Plus Well" and/or the "Big Hot Well." The 246.6-acre place of use authorized by this right is overlapped by spring right 61-11854. These rights are within the large 1368-acre place of use separate from the "Bull Pasture."

2. IRRIGATION SYSTEM OVERVIEW

2.1. Mainline System and Regulating Ponds

Irrigation water is primarily pressurize-applied with a series of full- and part-circle center pivots, wheel lines, and handlines with some gravity flow application. Early in the irrigation season when surface water runoff is sufficient, surface water supplies (Cold Springs Creek, springs, and unnamed stream) provide the primary source for many acres with groundwater also used as a primary source on remaining acres. As the irrigation season progresses, surface water flows diminish and groundwater use continues.

Irrigation of all sprinkler irrigated lands with the farm is accomplished using a single interconnected pressurized mainline system. A trunk section of 18-inch mainline parallels Cold Springs Creek through the farm, with branch mainlines supplying individual sprinkler systems.

The mainline system is divided into two pressure zones. The upper (high-pressure) zone serves lands north of the Trout Pond. The low-pressure zone serves lands south of the Trout Pond. With only a few minor exceptions, all of the water sources (Cold Springs Creek, springs, cold groundwater, and hot groundwater) can flow (by gravity or pump) into the mainline system.

Several small regulating ponds are utilized as part of the irrigation water management. These include the Trout Pond, the Hot Pond, and the Lower Pond. The ponds are used

as temporary storage locations, from which water can be repumped into the sprinkler system. The Trout Pond and Hot Pond can overflow to the Lower Pond, where the water is pumped into the pressure mainline system, or can flow south through a mainline to gravity irrigate lands in Section 29 (i.e., the "Lower Desert").

The high-pressure and low-pressure portions of the mainline are separated by a pressure sustaining valve at the Trout Pond. When pressure on the high-pressure side of the valve exceed the valve set-point pressure (70 psi+/-), the valve will bleed water into the low-pressure portion of the mainline. A booster pump on the low-pressure side of the mainline can pump water into the high-pressure side of the mainline to provide pressure to sprinklers and pivots north and northeast of the Pond if supply or demand on the high-pressure side cause the pipeline pressure to fall to below about 65 psi.

When pressures in the low-pressure side of the mainline exceed approximately 45 psi, a pressure relief valve will open and discharge water into the Trout Pond. Water from the Trout Pond can later be pumped back into low-pressure mainline as needed to meet demands (in the high- or low-pressure zones) or can overflow through a ditch to the Lower pond, where it can be re-pressurized and pumped back into the low-pressure portion of the mainline system.

Because of the ability to supply water from the low-pressure zone to the high-pressure zone, and vice-versa, any source of water can supply any sprinkler irrigated land within the farm. This provides flexibility to maximize use of surface water sources when in priority, and to supplement with groundwater when surface water supplies are diminished.

2.2. Cold Springs Creek

The primary Cold Springs Creek diversion is located upstream of the place of use, where the creek canyon opens at T03S R09E Sec 35 SWNE. Diverted flows are directed to the creek's left (east) side, through a bubbler to remove debris, and into an 18-inch diameter pipeline. Diverted flow is measured with a Siemens F M Mag 8000 magnetic flowmeter. On the creek's right (west) side near the irrigation point of diversion, flow is diverted into a small ditch for stockwater use and is measured with a rectangular weir. The elevation of the primary diversion point is adequate to provide gravity pressure for sprinkler and pivot irrigation in the upper (high-pressure) portion of the mainline system.

The lowest Cold Springs Creek diversion is located at T04S R09E Sec 16 NENE where diverted flow is directed into the Lower Pond where it is subsequently pumped back into the irrigation system. A magnetic flow meter is used to measure diversion rate. This pond also collects water from upstream sources (springs, Trout Pond overflow, Hot Pond overflow) where it can be pumped into the irrigation system.

2.3. Hot Water Wells

Water from the Two-Plus (aka Big Hot) Well, located at T04S R09E Sec 9 SESE, flows into the Hot Pond where it is allowed to cool before being pumped into the irrigation

system mainline. The well is equipped with a pump, but early in the season will flow under artesian pressure.

Water from the Walker (aka Little Hot) Well flows into a pond near the Bull Pasture where it is allowed to cool before being gravity applied to pumped into the irrigation system. Under current irrigation practices, this well is rarely if ever used for irrigation.

2.4. Cold Water Wells

The Trout Pond well has a 300-hp pump that discharges into the low-pressure side of the pressurized mainline adjacent to the Trout Pond at adequate pressure (40 psi+/-) for sprinklers and pivots south and west of the Pond

The Upper Bench well has a 100-hp pump that discharges into a pipeline that connects into the high-pressure side of the 18-inch mainline. As such, water from the Upper Bench Well can also be used on any sprinkler-irrigated land on the farm. Note that a replacement Upper Bench well is currently under construction.

2.5. Springs

Springs in the vicinity of the Lower Pond can flow to the Lower Pond where the water is then pumped into the pressurized irrigation system.

3. TRANSFER 81800

3.1. Transfer Summary

Casa del Norte (the Applicant) is seeking changes to the description of its water rights to match current practice. The Applicant submitted its amended application for transfer #81800 on July 2, 2018.

The current practice associated with the transfer consists of irrigating a 174-acre field using a center-pivot sprinkler (i.e., the Bull Pasture pivot) supplied from the common pressurized irrigation system. The water demand for the pivot is between 0.015 and 0.020 cfs/acre (2.61 to 3.48 cfs total), but the water rights currently authorized for use on the lands provide only 1.02 cfs of groundwater and 1.50 cfs of junior-priority Cold Springs Creek water. To allow full irrigation of the 174-acre field, Transfer #81800 proposes to supply 3.48 cfs of groundwater to the field. The junior priority Cold Springs water rights will continue to be used, but will be consolidated from 215 acres to 174 acres. Both hot wells (Walker and Two Plus) are proposed as points of diversion, although in practice the Two Plus well will continue to be the primary water source.

The water rights subject to transfer #81800 are summarized in Table 1 below. The rights as they were decreed prior to the transfer are shown in Figure 1.

Water Right No.	Priority Date	Source	Diversion Rate (cfs)	Irrigated Area (ac)	Annual Diversion Volume (ac-ft)	Decreed Conditions
61-301A	6/10/1955	Ground Water	5.38	246.6	984.0	Limited to 4.92 cfs and 1,368 acres when used with other rights listed
Total			5.38	246.6	984.0	
61-301B	6/10/1955	Ground Water	1.02	215.0	433.0	
61-2111	7/5/1955	Cold Springs Creek	1.02		436.6	
61-11885	7/5/1955	Cold Springs Creek	0.48			
Total			2.52	215.0	869.6	

Table 1. Water Rights Subject to Transfer

The subject water rights currently authorize irrigation in two discreet areas.

- Water right 61-301A diverts water from the Two-Plus Well (Figure 1) for irrigation of 246.6 acres located in Sections 15, 16, and 29. These lands are located within a 1368-acre common place of use for Cold Springs Creek rights.
- Water rights 61-301B, 61-2111, and 61-11885 divert water from the Walker Well and from Cold Springs Creek for the irrigation of a combined total of 215 acres.

Upon approval, transfer #81800 will (1) describe an integrated water delivery system that uses the Two Plus and Walker wells in combination with deliveries from Cold Springs Creek, (2) describe changes to the place of use for the four water rights, (3) increase the authorized hot groundwater diversion rate to the Bull Pasture pivot shown in Figure 2 while reducing the authorized hot groundwater rate by an equal amount to lands in Section 29, (4) decrease the irrigated area under Bull Pasture Cold Springs Creek water rights from 215 acres to 174 acres, and (5) decrease the irrigated area under water right 61-301B from 215 acres to 174 acres. The proposed changes are shown in Figure 2.

A summary of changes to the elements of the subject rights is presented in Table 2. As shown in Table 2, there is a no change in total diversion rate, and a total net decrease in annual diversion volume and irrigated area for the sum of the transferred rights, thus no enlargement is proposed.

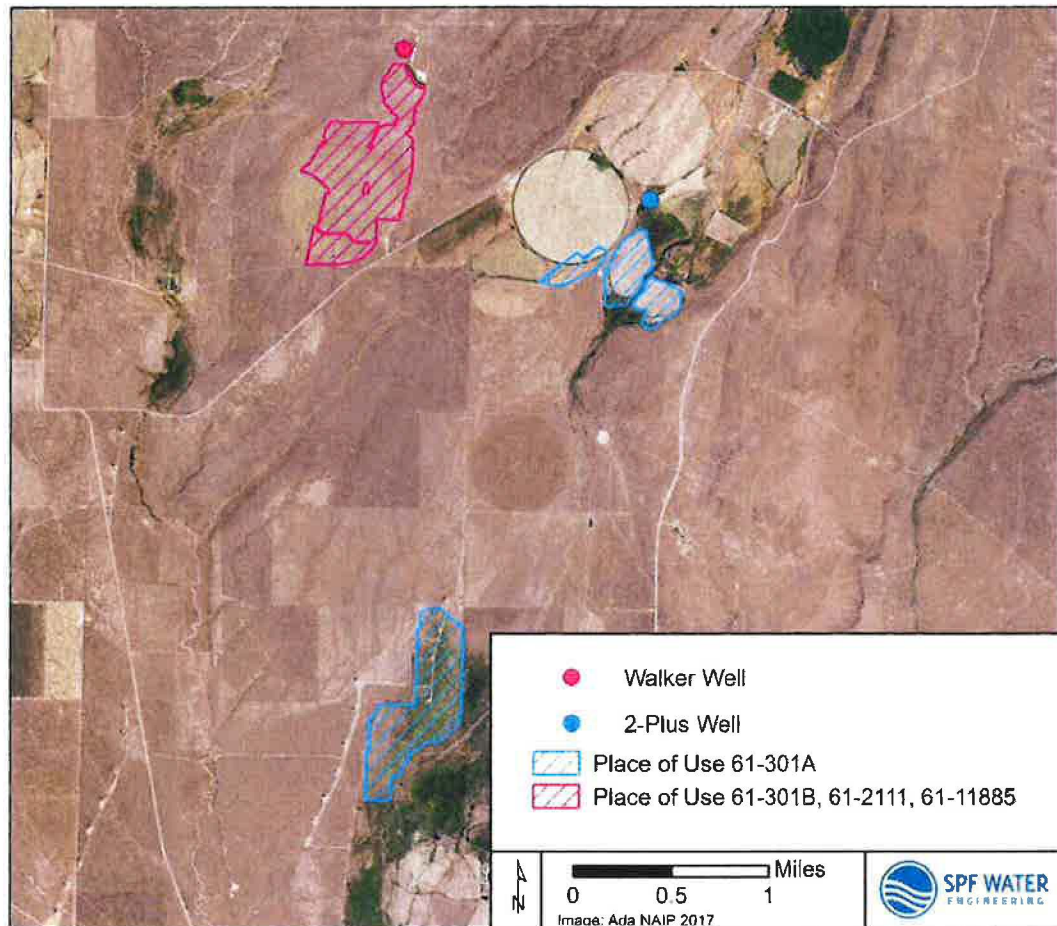


Figure 1. Points of Diversion and Places of Use before Proposed Transfer.

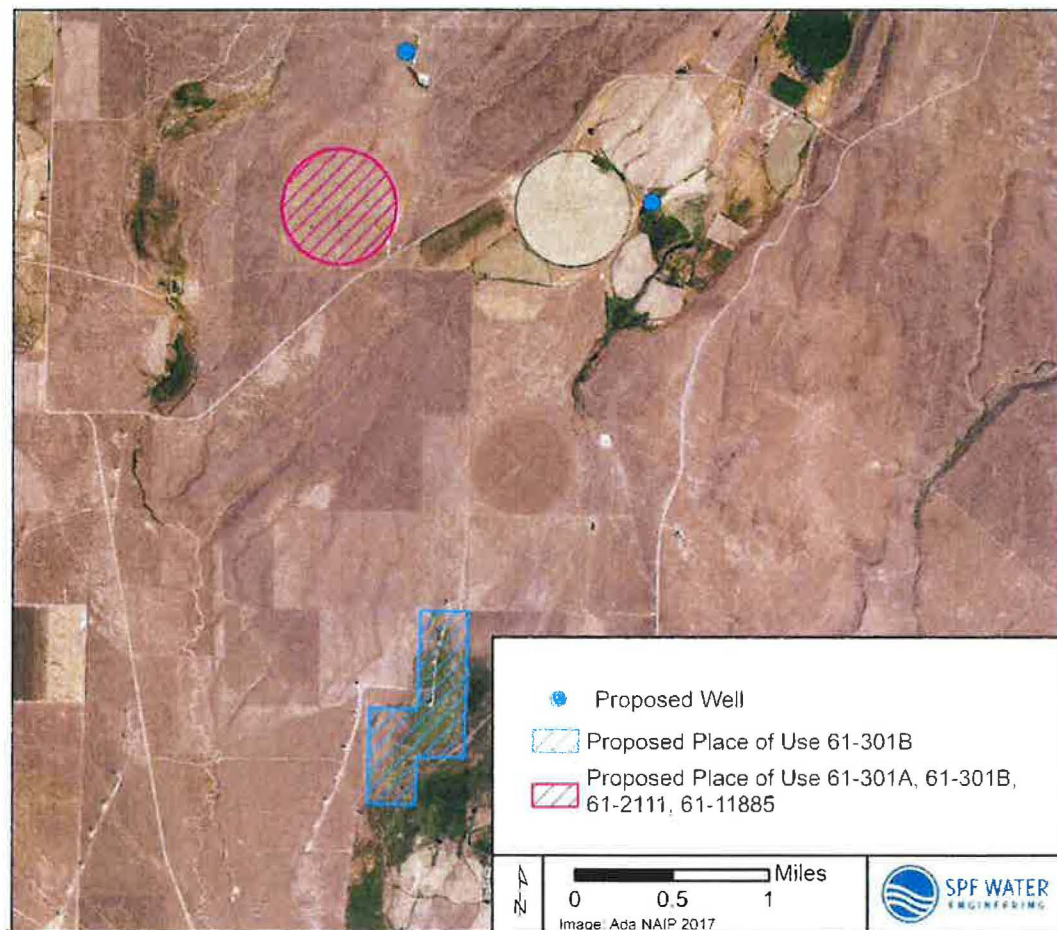


Figure 2. Water rights after Proposed Changes.

ELEMENTS			BEFORE				AFTER			
Water Right No.	Priority Date	Source	Diversion Rate (cfs)	Combined Diversion Rate** (cfs)	Diversion Volume (ac-ft)	Place of Use (acres)	Diversion Rate (cfs)	Combined Diversion Rate** (cfs)	Diversion Volume (ac-ft)	Place of Use (acres)
61-301A (Part 1)	6/10/1955	Ground Water	5.38	4.92	984	246.6	3.51	4.92	642***	174
61-2111	7/5/1955	Cold Springs Creek	1.02		436.6	215.0	1.02		437***	
61-11885	7/5/1955	Cold Springs Creek	0.48				0.48		***	
61-301B (Part 1)	6/10/1955	Ground Water	1.02		433		0.26		110***	
61-301B (Part 2)	6/10/1955	Ground Water						0.76		
61-301A (Part 2)	See Above		See Above				1.87*	4.92	342*	85.5*
Total			7.90	4.92	1,853.6	461.6	7.90	4.92	1,361	420.5
* unchanged portion										
** combined use limit 61-301A, 332, 333, 334, 335, 336, 337, 338, 339, 340, 343, 2008, 2095A, 2095B, 2199, 2209A, 2209B, 10363, 11844, 11847, 11854, & 11887.										
*** combined use volume of 696 afa recommended for 174 irrigated acres.										

Table 2. Before and After Proposed Changes.

4. GEOTHERMAL AQUIFER SYSTEM AND WATER RIGHTS

4.1. Development History

The geothermal aquifer system that supplies water rights 61-301A and 61-301B was developed primarily in the 1950s by two wells: the Lee Well located near Bennett Creek and the Walker Well located between Ryegrass Creek and Cold Springs Creek. Both

wells flowed under artesian pressure. Due to the highly confined nature of the aquifer, flowing either well caused interference drawdown in the other well resulting in a water right dispute. The dispute was settled by a 1967 decree that authorized a first-priority right (61-300) of 125 miner's inches (2.5 cfs) at the Lee Well, a second-priority right (61-301) of 320 miner's inches (6.4 cfs) to the Walker Well, and a third-priority right (61-302) of 1000 miner's inches (20 cfs) to the Lee Well. The third priority right was conditioned such that it must be reduced to ensure a continued artesian flow from the Walker Well of 320 miner's inches. The decree also prohibited pumping of the wells without authorization of the other water right holder.

In 1976, the Two-Plus Well was drilled on the Cold Springs Ranch. The Two-Plus well is located at a lower elevation than the Walker Well. Use of the Two-Plus decreased the flow from the Walker well but increased the overall geothermal artesian supply to the Cold Springs Ranch. In a letter to IDWR dated October 15, 1996, the owner at that time W.H. McGrew noted "For twenty years, we have been using the 2+ well in lieu of the Walker hot well, which has essentially ceased to flow."

4.2. Aquifer Characteristics

Artesian flow testing of the aquifer has been tested at least three times, beginning with Anderson in 1964, then Castelin in 1978, and again by Castelin in 1993. Results of the testing are summarized in Castelin's May 1993 memo, which demonstrates that the geothermal aquifer is highly confined (calculated storage coefficient of 0.00006), with high local permeability (325,000 gpd/ft short-term transmissivity measured at the Two-Plus well) but limited aquifer extent (i.e., boundaries result in an apparent transmissivity of approximately 30,000 gpd/ft). The aquifer is capable of high short-term artesian flow rates, but rates decline with continued production.

The high temperature and low storage coefficient suggest that there is very limited hydraulic connection to overlying cold water aquifers.

4.3. SRBA

Water right 61-301 was decreed in the SRBA as 61-301A (Two-Plus Well) and 61-301B (Walker Well).

- The basis of the 61-301A recommendation is described in a March 28, 1997 memorandum prepared by Ron Howerton and Mel Schulte. Their investigations found (1) a 6.25 cfs flow rate from the Two Plus Well, (2) 5.38 cfs ditch capacity leading from the well to the place of use, and (3) an irrigated area of 246 acres. Based on these findings, water right 61-301A was recommended for a maximum diversion rate of 5.38 cfs, of which 4.92 cfs (246 acres x 0.02 cfs/ac) was allocated to irrigation and 0.46 cfs was allocated to ditch loss.
- The basis of the 61-301B recommendation of 1.02 cfs was the remaining diversion rate available to the Walker Well under original right 61-301 (i.e., 6.40

cfs) after subtracting the 5.38 cfs flow rate under 61-301A. The place of use, in combination with Cold Springs rights, was found to be 215 acres.

An error occurred on the decree for 61-301A. The error consists of a condition limiting total combined diversion under all water rights (Cold Springs Creek, springs, and cold groundwater) within the 1368-acre combined place of use to 4.92 cfs. Combined diversion rate should be 16.95 cfs (as listed under the other water rights with the 1368-acre place of use). The 4.92 cfs should be a field head gate limitation.

5. INJURY ANALYSIS

This transfer changes the place of use of several water rights to reflect water use as it has been occurring for the past twenty years. The proposed diversion and use of surface and ground water sources is not increased. In fact, the transfer consolidates the "Bull Pasture" area so that 41 fewer irrigated acres are proposed with a corresponding decreased total annual diversion volume. These changes more closely reflect the originally-developed irrigation system where the Walker geothermal well provided the main irrigation sources for the 215 acres in the "Bull Pasture" area. If they were even available, the Cold Springs Creek water rights with a 1955 priority date would have been curtailed early in the irrigation season. The proposed change of using the 2-Plus well, which diverts from the same geothermal aquifer system as the Walker Well, as the main source results in a nearly identical impact to the resources as when the Walker Well was used. Consolidating acres irrigated at Bull Pasture from 215 to 174 acres is not anticipated to cause injury to other water users.

The springs and Cold Springs Creek sources appurtenant to the 161 acres in Section 29 remain unchanged. Geothermal groundwater remains available to these lands at a reduced diversion rate.

6. CONCLUSIONS AND RECOMMENDATIONS

1. The transfer is structured to prevent enlargement and injury.
2. The 4.92 cfs combined use limitation on 61-301A should be corrected to 16.95 cfs through the transfer process.
3. The main pressurized irrigation system serves the Bull Pasture. This irrigation system receives Cold Springs Creek water from both the upper and lower Cold Springs Creek points of diversion. The transfer should be amended to include the lower Cold Spring Creek point of diversion.

4. 61-301A should be split as follows:
 - 61-301A(1): 3.51 cfs (i.e., 5.38 cfs x 161/246.6) and 161 acres, with a maximum rate 3.48 cfs at the field headgate in combination with water rights 61-301B(1), 61-2111 and 61-11885.
 - 61-301A(2): 1.87 cfs (i.e., 5.38 x 85.6/246.6) and 85.6 acres, with a combined use limit of 16.95 cfs and 1368 acres in combination with 61-301B(2), 61-332, 333, 334, 335, 336, 337, 338, 339, 340, 343, 364, 2008, 11847, 11844, 2095A, 2199A, 2209A, 11887A, 11854, and 10363.
5. 61-301B should be split as follows
 - 61-301B(1) - 0.26 cfs and 13 acres (consolidated from 54 acres), with a maximum rate 3.48 cfs at the field headgate in combination with water rights 61-301A(1), 61-2111 and 61-11885.
 - 61-301B(2) - 0.76 cfs (i.e., 1.02 cfs x 161/215) and 161 acres, with a combined use limit of 16.95 cfs and 1368 acres in combination with 61-301A(2), 61-332, 333, 334, 335, 336, 337, 338, 339, 340, 343, 364, 2008, 11847, 11844, 2095A, 2199A, 2209A, 11887A, 11854, and 10363.
6. The transfer should be conditioned to limit the field headgate delivery rate from both geothermal wells to 5.94 cfs. The remaining 0.46 cfs of water under water right 61-301A should be identified as conveyance loss.
7. At any time that irrigation is occurring on the Bull Pasture pivot, geothermal water must be pumped into the combined pressurized system at a rate of not less than the Bull Pasture pivot flow rate minus contribution of inflow of the Cold Springs Creek water rights 61-2111 and 61-11885 (when in priority). Given that the Cold Springs Creek water right no. 61-2111 and 61-11885 are junior in priority, the geothermal wells will need to be operated at most times that irrigation is occurring at the Bull Pasture.
8. A future transfer is recommended to create a permissible place of use for all water rights delivered through the irrigation system.

7. REFERENCES

Castelin, Paul, 1993 (1). Memorandum to Lee-Walker-Hall File. Results of field visit March 23, 1993. March 24, 1993.

Castelin, Paul, 1993 (2). Memorandum to Lori Graves. Two-Plus Aquifer Test Results. May 27, 1993.

Castelin, Paul, 1978. Open File Report, Results of Walker – Lee – Two-Plus Well Test, Elmore County, Idaho. Idaho Department of Water Resources. April 1978.

APPENDIX A

Casa Del Norte Cold Springs Creek Farm Water Rights																														
Xfer Rights	61-332	61-333	61-334	61-335	61-336	61-337	61-338	61-339	61-340	61-343	61-364	61-2008	61-11847	61-11844	61-2095A	61-2199A	61-2209A	61-11887A	61-11854	61-301A	61-10363	61-301B	61-2111	61-11885						
Priority Rank							2																							
Enlargement Rt	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	n	y	n	n	n	n	n	n						
cfs	2.72	0.54	0.5	0.48	0.8	2.4	1.84	1.5	0.5	0.6	0.12	6.96	0.6	0.54	3.05	5.88	0.41	2.36	0.42	5.38	3.25	1.02	1.02	0.48						
Div. Vol.													120		1260					984		433	436.6							
Acre Limit (if less than POU acres)	-	-	-	-	-	-	-	-	-	-	-	247.3			315			206.9	-		-									
POU Acres	847.3												30.6	50.6	800.9					161	246.6		215							
combined use limits	1368 acres																		1371 ac limit (used for xfer)		4.92 cfs limit Error?									
	16.95 cfs limit																													
	847.3 acres												4.92 cfs (includes BLM rights listed below)																	
													3.22 cfs (lists whole rts, not splits) Error?																	
													246 ac limit Error?																	
													401 acres																	
													800.9 acres, 9.34 cfs, 3203.6 af limits																	
													596 acres, 2392 af limits																	
													1.02 cfs (lists whole rights not splits) Error?																	
													215 acres limit (used for xfer)																	
common POU	"61-332 Group"												"61-2095A Group"					"61-301A Group"			"61-301B Group"									
Duty (cfs/acre)	0.022												0.020	0.011	0.012					0.003	0.020	0.013	0.012							
Duty (cfs/acre)																										0.005			0.005	0.002
Duty (gpm/acre)													5.2																	
Duty (af/acre)													4.0																	
source	Cold Sp. Creek & Spring	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	Cold Sp. Creek	GW	Unnamed Stream	GW	GW	GW	GW	Springs	GW	Springs	GW	Cold Sp. Creek	Cold Sp. Creek						
diversion name													House Well		Upper Bench (West); Trout Pond (East)	Upper Bench (West); Trout Pond (East)	Upper Bench (West); Trout Pond (East)	Upper Bench (West); Trout Pond (East)		2-Plus Well aka Big Hot Well		Walker Well aka Little Hot Well								
gw hot/cold													Cold		Cold	Cold	Cold	Cold		Hot		Hot								
priority	5/18/1875	5/1/1885	5/1/1886	5/1/1889	5/1/1895	12/1/1895	6/30/1870	5/1/1875	6/30/1887	6/30/1888	5/1/1887	2/26/1908	3/15/1957	2/15/1911	3/7/1953	7/19/1966	9/12/1966	3/15/1977	4/1/1910	6/10/1955	3/15/1870	6/10/1955	7/5/1955	7/5/1955						
season of use	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	2/15-11/15	3/15-11/15	2/15-11/15	3/15-11/15	4/1-11/1	4/1-11/1	3/15-11/15	2/15-11/15	4/1-11/1	2/15-11/15	4/1-11/1	2/15-11/15	2/15-11/15						
nature of use																														
BLM Rights															61-2095B	61-2199B	61-2209B	61-11887B												
cfs															0.06	0.12	0.01	0.05												
div. vol.															24															
acres															6	16	16	16												
combined acres															12 acres, 48 af limits															
source															GW	GW	GW	GW												
priority															3/7/1953	7/19/1966	9/12/1966	3/15/1977												