

**Supplemental Information for Beneficial Use Field Exam
Permit Nos. 37-20834, 37-8136, and 37-8532**

Owner: Walker Sand & Gravel

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This purpose of this supplemental report is to provide additional details of the water usage under the above-referenced permits, and calculations of the recommended annual volume requirements for the rights. The original field exam was submitted to IDWR in September of 2007.

An additional field investigation was made on July 15, 2008, which included meetings with Jim Walker (owner) and Terry Hampton (plant manager). Both men are knowledgeable about the Walker Sand & Gravel operation and about the two other operations on the site – Idaho Concrete and Valley Paving. These two companies lease sites from Walker Sand & Gravel and utilize water from the common system. Information regarding these operations was obtained from Bert Heath, the owner of Valley Paving, and the plant manager of the Idaho Concrete plant.

The field investigation included a determination of the nature and extent of each of the various components of water usage from the wells. In addition, the location and size of distribution system components was determined. A schematic of the system showing the wells, distribution system components, and location and type of water usage is included with this report. A variety of different types of water uses occur within the facility. Each water use is described below.

Walker Sand & Gravel

The large majority of water is used in the gravel crushers and sand separators for the purposes of dust control and removing the fine material from the raw material being processed. Raw material is first classified by the primary separator into natural 2" minus material and larger material that requires crushing. No water is used in this process. The natural material is directed to a sand separator and classifier which divides the material into different gradation groups. Water is used in this process for dust control and to remove the unwanted fine material. The larger material from the primary separator is directed to one of three crushers to reduce the material size. Another sand separator and classifier further divides the material and water is used for the purposes described above. Water used in the crushers and classifiers is discharged to buried wastewater pipes and flows to the infiltration pond. During the hours when the plant is operating, the crushers and classifiers generally operate continuously, and water flows continuously to these units. Walker staff indicate that the crushers take all the water they can give them and could use more. The north classifying tank has a rated capacity of 4,500 gpm. This is some indication that a continuous-run assumption is reasonable. Normally, the plant operates for 10 hours per day, 5 days per week. In the summer, if demand is high, the plant will operate 6 days a week. In a recent high-demand year, the plant operated 6 days per week for 3 months in the summer.

In addition to the crusher/classifier water usage operating continuously, several intermittent water uses occur on a demand basis. These include truck filling for dust control, an automatic spray bar for adding water to truck loads, truck and equipment washing, intermittent manual spray-down of gravel, various frost-free hydrants on the site, and potable water usage in the shop/office complex. Since these demands are very small relative to the crusher/classifier demand, their intermittent operation will not appreciably affect the flow to the crusher/classifier; rather, the operating point of the well pump will move rightward slightly on the performance curve, and the total flow will increase to meet the intermittent demand. Therefore, it appears reasonable to assume a constant flow for the crusher/classifier.

The season of use for Walker Sand & Gravel depends upon the weather. Operation generally ceases in the wintertime due to the inability to efficiently process gravel under freezing conditions. The typical maximum operation season historically achieved is March 15 through November 30. At 5 days per week normally and 6 days per week for 12 weeks in the summer, this equates to approximately 198 days of operation.

Other Companies

Idaho Concrete operates a concrete production plant and office, and utilizes water from the system as an ingredient in the concrete batches. In addition, water is carried in the trucks to the job site, and a small amount of clean-up is done when the trucks return. The season of use for the concrete plant is year-round. Water usage was calculated by the Idaho Concrete staff based on the number of gallons per yard of concrete actually produced. Water ratios in concrete batches are tightly controlled so this should provide a reasonably accurate estimate.

Valley Paving operates an asphalt production plant and uses water for dust control at the plant, in the shop and office, and at a truck washing station. The season of use for the asphalt plant depends upon the weather, since asphalt cannot be laid during very cold conditions. The typical maximum operation season for the asphalt plant is April 1 through November 15, 5 days per week, which equates to 164 days. Water usage was calculated based on a flow of 260 gpm for the total hours of production. The hours of production was calculated from the number of tons of asphalt produced, divided by the plant production rate of 150 tons per hour.

Ancillary Water Uses

In addition to the industrial uses, a small amount of water is used from the Valley Paving well in a trailer/RV park located just east of the canal from the facility. This park is used for temporary housing for employees – chiefly those of Valley Paving. The land is owned by Walker Sand & Gravel. The park contains 20 water hookups. Only one person per unit is allowed; no families are allowed.

The Valley Paving well is also used to irrigate land east of the canal under a separate water right 37-20833.

Volume Calculations

Evaluation of volumetric usage is complicated by the variety of different water uses, most of which are intermittent, and the fact that totalizing meters are present. Specifying an appropriate volume for each of the three water rights is further complicated by the growth of the facility since the first permit was issued in 1983. Although Proof of Beneficial Use was timely filed for all permits, IDWR did not conduct field examinations to verify actual usage near the time of filing.

Based on the best available information, the table below outlines volume estimates for each of the various uses, along with data sources and assumptions for each.

Water Use	Data Source & Assumptions	Calculation
Gravel Processing (Crushers, Classifiers, Scrubbers)	Crusher Well and Shop Well run continuously 6 days per week for 12 weeks, and 5 days per week for the remainder. Crusher Well capacity was measured on July 27, 2008 at 5.23 cfs when delivering to the separators/classifiers only. The Shop Well capacity was previously determined to be 0.40 cfs. Valley Paving well discharge not included.	Total flow to crushers/classifiers = 5.63 cfs. 5.63 cfs x 198 days/yr x 10 hrs/day x 3600 sec/hr / 43560 ft ³ /af = 921.3 ac-ft/year
Truck Fill	4,500-gallon trucks are used for dust control, 3 to 4 fillings per day (assume 3.5 average), 198-day season.	4500 gal/truck x 3.5 trucks/day x 198 days/yr = 3,118,500 gal/yr = 9.6 ac-ft/year
Spray Bar	150 trucks per day utilize the spray bar, stopping for an average of 3 minutes. The spray bar is a 2" pipe with 20 holes, 5/16" diameter, situated 12 feet above ground. System pressure at the Shop Well is 37.5 psi, less 12 feet of head equals 32.3 psi at the spray bar, or 74.5 feet of head. Orifice equation used to estimate discharge through holes. Discharge coefficient Cd = 0.60.	$Q = C_d A \sqrt{2gH}$ Q = 199 gpm (0.442 cfs) 150 trucks/day x 3 min per truck = 450 min. or 7.5 hours/day. V = 199 gpm x 450 min/day x 198 days/yr = 17,730,900 gal/yr = 54.4 ac-ft/year
Equipment Washing	Natural-gas powered hot pressure washer – Alkota Model 6000. No information was available from Alkota on this model. Assume 5 gpm, which is a typical flow from a commercial pressure washer. 4 trucks or loaders per day, 1 hour per cleaning.	V = 5 gpm x 60 min/day x 4 trucks/day x 198 days/yr = 237,600 gal/yr = 0.7 ac-ft/year
Shop/Office	Shop includes 3 bathrooms, 1 sink. 12 employees at 50 gpcd, or 600 gpd.	V = 600 gpd x 198 days/yr = 118,800 gal/yr = 0.4 ac-ft/year
Concrete Plant	Based on number of yards produced and gallons of water used for each yard. Data from Idaho Concrete plant manager for the last 5 years (attached with this report). Maximum year was 2005. Clean-up: 5 trucks twice per week, 10 gpm for 15 minutes each truck. Potable use: 7 employees at 50 gpcd. Season is year-round, 5 days per week.	V = 1,613,310 gal (concrete) Clean up: V = 10 trucks/week x 52 weeks/yr x 10 gpm x 15 min/truck = 78,000 gal Potable: V = 350 gpd x 5 days/week x 52 weeks/yr = 91,000 gal Total Volume = 1,782,310 gal/yr = 5.5 ac-ft/year

Valley Paving	Based on tonnage production, production rate in tons per hour, and flow rate during production (see attached data). Add 5% for warm-up and shut-down. Maximum year was 2004. Potable use: 5 permanent employees at 20 gpcd and 30 transient employees at 10 gpcd, or 400 gpd. Season is April 1 through November 15, 164 days.	$V = 36000 \text{ tons} / 150 \text{ tons/hr} \times 260 \text{ gpm} \times 60 \text{ min/hr} \times 1.05 = 3,931,200 \text{ gal/yr.}$ Potable: $V = 400 \text{ gpd} \times 164 \text{ days} = 65,600 \text{ gal/yr.}$ Total Volume = 3,996,800 gal/yr = 12.3 ac-ft/year
Trailer/RV Park	20 units, 1 person/unit at 75 gpcd. Assume 7 days/week for season April 1 – November 15 (229 days)	$V = 20 \text{ persons} \times 75 \text{ gpcd} \times 229 \text{ days/yr} = 343,500 \text{ gal/yr} =$ 1.1 ac-ft/year.
	TOTAL	327,451,000 gallons 1,005.3 acre-feet

Recommended Volume for Each Permit

The above table provides the best estimate of a total annual volume under the newest permit 37-20834. However, annual volume for the older permits must be based on the history of facility development and the estimated usage that had been developed at the time of the Proof filing. A timeline of well development and water right acquisition was provided in the original beneficial use report.

37-8136

At the time of Proof filing for this permit (3/8/1989), the Shop Well and VP Well were in place and operational. The asphalt plant and the concrete plant were operational and at essentially the same production level as today. The Walker gravel operation was in place with all of the uses listed in the table above, with two exceptions: the largest (north) classifier was not installed until later in 1989, and the shop/office was not constructed. However, even without the north classifier the system demand was very likely greater than the diversion rates from the Shop Well and VP Well (0.97 cfs – see the original beneficial use report). The annual volume on this permit should therefore include all of the volumes listed above, minus the small shop/office use, and with the exception that the crusher/classifier volume should be limited to 0.97 cfs run continuously 10 hrs/day for the 198-day operational period of the gravel operation (158.7 ac-ft). Total volume 242.3 ac-ft/year.

Since a small amount of water is used in the employee trailer/RV park, it may be appropriate to license this use as a domestic use, separate from the industrial use.

37-8532

By the time of Proof filing for this permit (7/1/1993), the Old Crusher Well had been drilled (June 1989), the additional classifier installed (1989), and the shop constructed (1990). The operation was essentially the same as it is today. It is impossible to determine the capacity of the Old Crusher Well because IDWR failed to conduct a field exam in a timely manner and this well is no longer operational. Walker has no record of measured discharge from this well in the operational state; however, their records indicate that the pump supplier in 1989 installed a pump rated at 600 gpm (1.34 cfs). Assuming this is true, the discharge from the Old Crusher Well plus the VP Well (the two PODs on this permit) exceeds the permit rate of 1.43 cfs. The system demand at the gravel plant definitely exceeded the permit rate, based on the evaluation of the present system. The annual volume on this permit should include the incremental volume developed for the crusher/classifier demand, plus the Walker shop/office requirement. All other volumes are covered by 37-8136. This volume would be 1.43 cfs run continuously 10 hrs/day for the 198-day operational period of the gravel operation, which equates to 234.0 ac-ft/year, plus 0.4 ac-ft/yr for the shop/office, for a total of 234.4 ac-ft/year.

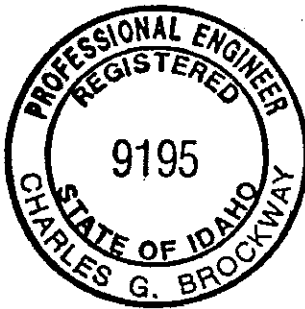
With the volume calculated in this manner, no combined-use limit is warranted between 37-8136 and 37-8532.

37-20834

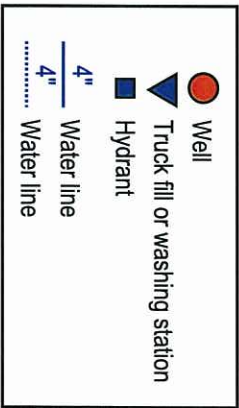
This permit represents the facilities in their current condition, as they have been operated since approximately the early 1990s. This permit provides additional water for the crusher/classifier system. All other volumes are covered by the earlier permits. The total system capacity is 6.46 cfs; however, all rights in combination should be limited to 5.87 cfs (see original beneficial use report). The full 3.47 cfs allowed by 37-20834 has been developed. This permit should reflect the remainder of the volume needed to equal the total developed volume of 1005.3 ac-ft/year as shown in the above table. This volume is 528.6 ac-ft/year.

Summary of Licensing Recommendations

Right No.	Rate (cfs)	Volume (afa)	POD	POU
37-8136	0.97	Industrial 241.1 Domestic 1.1	NENWSW (Shop Well) SWNESW (VP Well)	SW1/4 Sec. 24
		Total 242.3		
37-8532	1.43	Industrial 234.4	NENWSW (Shop Well) SENWSW (Crusher Well) SWNESW (VP Well)	SW1/4 Sec. 24
37-20834	3.47	Industrial 528.5	NENWSW (Shop Well) SENWSW (Crusher Well) SWNESW (VP Well)	SW1/4 Sec. 24
TOTALS	5.87 cfs	1005.0 afa		
No combined-used conditions appear to be warranted				



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PERMITS 37-8136, 37-8532, AND 37-20834

Idaho Concrete Water Usage

2003-----1,475,660

2004-----1,607,910

2005-----1,613,310

2006-----1,499,430

2007-----1,562,760

2008-----625,400

Truck Washing-----5 Trucks Twice a week for a Year = 78,000

7 Employee's personal Water Usage ??????

Valley Paving Water consumption in hot plant

Year	gallons per year
2004	3,888,000.00
2005	3,399,999.90
2006	3,110,400.00
2007	3,132,000.00
Est: 2008	4,600,800.00



0 350 700 1,400 Feet

BENEFICIAL USE EXAM
37-20834, 37-8136, 37-8532
NAIP 2004 AERIAL

- Legend**
- Infiltration Pond
 - Township Range
 - Sections
 - 1N18E
 - Place of Use
 - Wells





Automatic spray bar



Crusher Well from NW



Sand Separator and Classifier - North



Bar-Mac Crusher



Crusher Well, 10" Pipeline, Sand Separator & Classifier North



Sand Separator and Classifier South



Conveyor / Scrubber #16



Truck Filling Station



Primary Separator



Wastewater Pipe Discharge



Idaho Concrete Plant



Valley Paving Plant



Valley Paving Shop/Office



Truck/Equipment Wash Station



Truck Watering the Yard



Trailer/RV Park