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Summary of Well Permits in Rocky Mountain National Park (Permits from the Colorado Division of Water Resources)

Water well permits for locations within the boundary of Rocky Mountain National Park were compiled by searching the online databases of the Colorado Division of Water Resources. Initially, well locations and permit numbers were obtained by searching the interactive map of the Colorado Decision Support System, CDSS Map Viewer, at;
<http://water.state.co.us/pubs/datasearch.asp>

Information for each well permit and scanned images of documents for each permit are available online from the Colorado Division of Water Resources Wellview Web at;
<http://www.dwr.state.co.us/WellViewWeb/default.aspx>.

Maps accompanying this report show the approximate locations of permitted wells in the park. There may be additional wells that are not registered with the Colorado DWR. Also, it is quite likely that some of the permitted wells no longer exist; they may have been plugged and abandoned.

Some of the older wells, in particular the small yield wells, do not have limits for pumping rates or annual production. The well may have simply been permitted with a pumping rate as reported by the well driller during testing or limited by the size of the pump that was installed. In general, the permits for newer wells or wells serving larger developments will have a maximum pumping rate and a cap on the annual usage.

Well locations in this document are generally arranged in the order they would be encountered in a driving tour of the park; entering at the Grand Lake Entrance and proceeding north through the Kawneche Valley, over Trail Ridge Road, past Hidden Valley and out the Fall River Entrance, then a short side trip to the Twin Owls Trailhead and McGraw Ranch, reentering the park at Beaver Meadows and traveling through Moraine Park and Glacier Basin to Bear Lake, then back out to Hwy 7 for a trip south to Longs Peak and Wild Basin.

West Entrance – Map 1

Prior to establishment of the park, the Harbison Ranch occupied the area of the west entrance. A shallow, dug well supplied water for domestic and stock use. The well was 24 feet deep and 3 feet in diameter. NPS registered the well with the Colorado DWR; claiming the well was constructed in 1901. The permit number is **921-N**. It is believed that this well was backfilled.

NPS constructed a well for domestic use at the Grand Lake Entrance Ranger Quarters in 1938. The well was 19 feet deep. The permit number is **928-N**. It is believed that this well was plugged and abandoned.

NPS constructed a new well in 1961. The well was 75 feet deep. It supplied water for the residential and utility area. Two permits were initially obtained for this well. Permit number **9523** was cancelled in October 1961, after the error was discovered. The well was operated as permit number **9673** until it was replaced by a new well (#31207-F) in 1985. The well is capped, but unusable. A pump was reportedly dropped in the well and could not be removed. Apparently it is still there. This well should be plugged and abandoned by filling it with concrete to eliminate it as a possible pathway for contaminants to get into the aquifer.

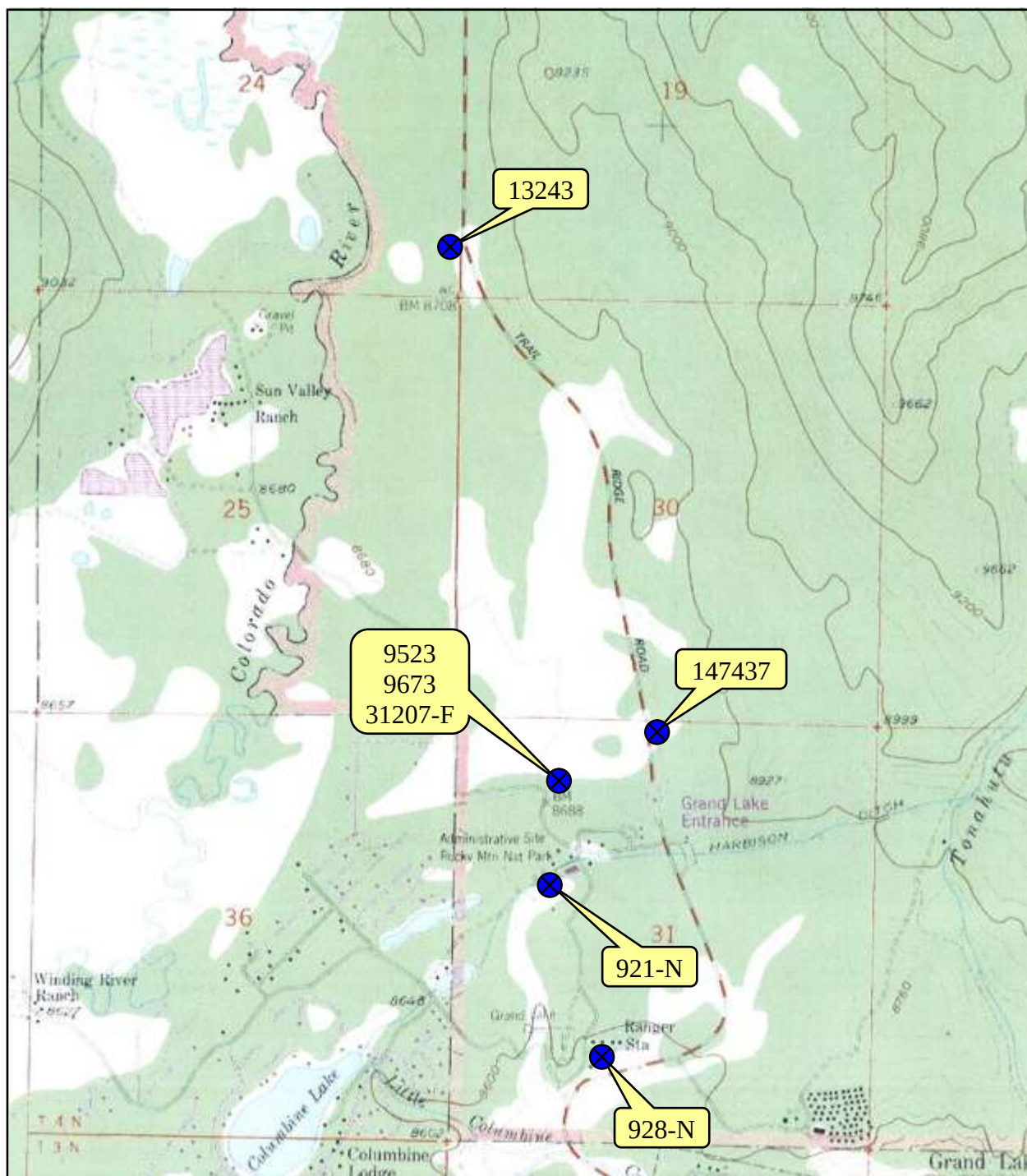
The current water-supply well was constructed in 1985, but the well permit was not obtained until 1987. This well is 114 feet deep. The permit number is **31207-F**. The well is permitted for a maximum pumping rate of 70 gpm. Usage is limited to 8.2 acre-feet per year (2.7 million gallons). This is the well currently supplying water to the NPS residential, utility, and visitor facilities at the west entrance area. The old well (#9673) was supposed to be plugged and abandoned per the requirements of the new well permit. However, the old well is still there.

In 2003, a permit was acquired for a backup well (**#59939-F**), but the well was not constructed.

A well was constructed for the Grand Lake Entrance Station in 1987. The well is 30 feet deep. The permit number is **147437**. The well is permitted for a maximum pumping rate of 15 gpm. Usage is limited to one-third acre-foot per year (108,600 gallons). This well is not being used.

Actions

1. Notify DWR that the two old wells near the entrance (921-N and 928-N) no longer exist. They were plugged and abandoned many years ago and that there is no record of their abandonment.
2. Plug the well with the pump at the bottom (9673). This can be accomplished by removing the cap and filling the well with concrete. This will eliminate a potential pathway for contamination to move from land surface to the aquifer.



Labels are the well permit number from the Colorado Division of Water Resources

Map 1. Approximate location of well permits in the vicinity of the west entrance, Rocky Mountain National Park

Harbison Meadows – Map 1

A well was constructed at the north end of Harbison Meadow in 1962. The well is 92 feet deep. The permit number is **13243**. The well was constructed to supply water for a planned campground and picnic area. I have no information regarding whether this well was ever used, or if it still exists. I could not find the well during a brief field inspection in June 2010, but I didn't have a good idea of where to look.

Actions

1. None. If the well is found someday, it should be plugged and abandoned.

Onahu and Green Mountain Ranch Area – Map 2

Wilsie Jamison had permits for two wells that supplied water for the Onahu Lodge. Well No. 1 was constructed ca. 1949 and was 130 feet deep. The well was assigned permit number **625-R**. Well No. 2 was constructed prior to 1948. It was assigned permit number **626-R**.

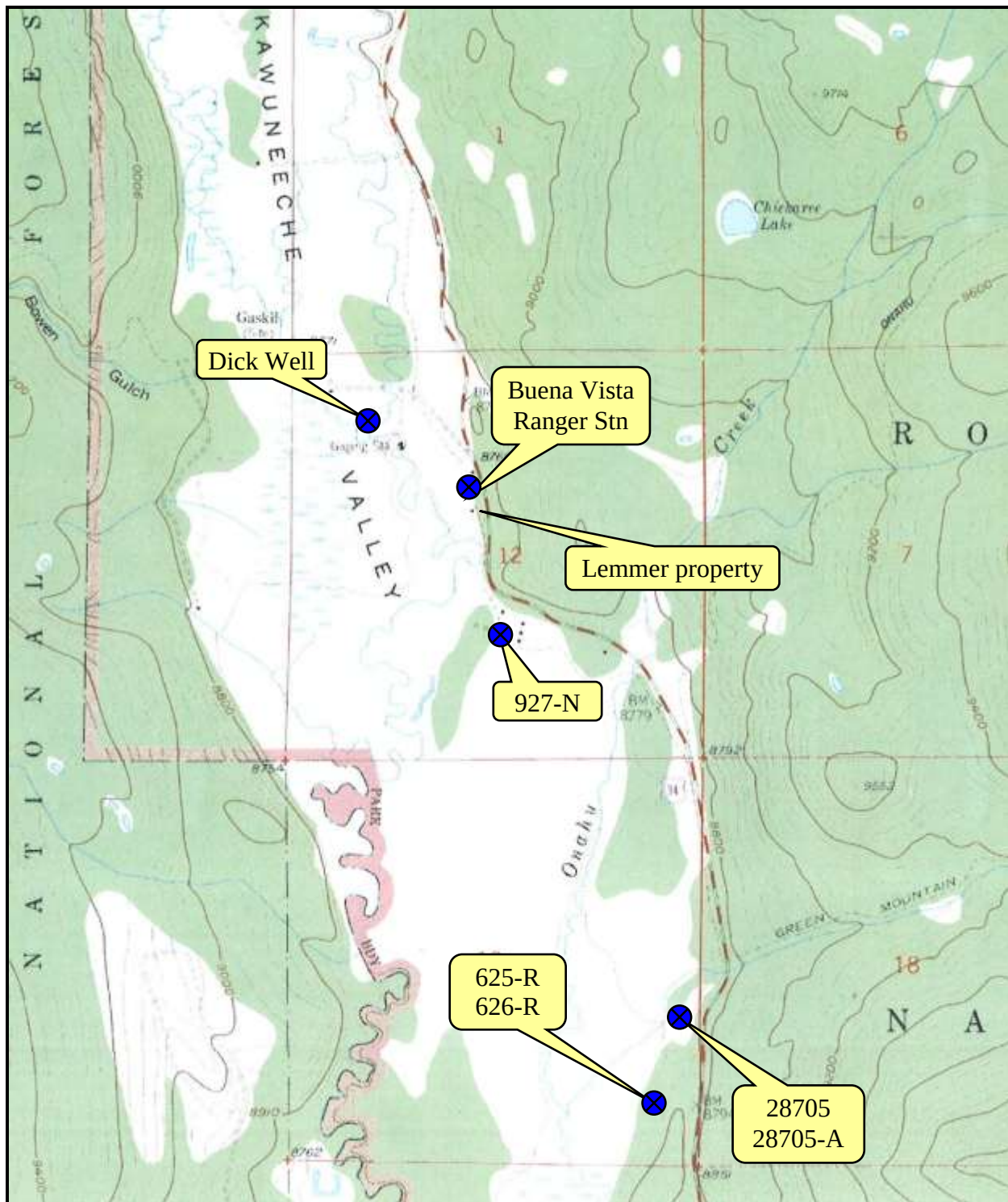
Carl Nelson had a permit for a well that was constructed in 1966 to supply water for the Green Mountain Dude Ranch. The well was 150 feet deep (permit number **28705**). NPS constructed a replacement well 1981. The new well was also 150 feet deep (permit number **28705-A**).

Rich McKenna and I conducted a site inspection of the Green Mt. area in June 2000. We noted the existence of three unused wells in the area. One well was at Building #587 south of the Onahu Lodge. One well was in a pit near the "old chlorinator building" toward the north end of the Green Mountain Ranch. The third well was adjacent to the existing well and pumphouse west of the corral. This is likely the original well #28705 drilled by Carl Nelson. It was to have been plugged and abandoned under the terms of the permit for the replacement well (#28705-A). Rich subsequently found another old well at Green Mt.

There is a project planned for the area to replace water lines and generally upgrade the water treatment and distribution system. As part of this project NPS plans to plug and abandon the four unused wells. These wells would include; 625-R, 28705, and two other wells. The original Jamison Well (626-R) was a shallow dug well and was apparently backfilled many years ago.

There were two wells associated with cabins that were acquired by NPS in the area about a mile north of the Onahu-Green Mountain Ranch facilities. These cabins have been removed and the area has been restored. There is no record of the fate of the shallow wells. If they still exist, they could be plugged by filling them with concrete. These wells were at the Kawuneeche Cabin Camp and the Buena Vista ranger station.

In 1961, NPS filed a claim for an existing well that had been constructed ca. 1936 to supply water for the Kawuneeche Cabin Camp. The well was 30 feet deep. The well was assigned permit number **927-N**. This well is called, "Kawuneeche Residence Well" in the water rights filing for water court case number CA1768. Buildings have been removed and the area has been restored. The fate of the well is unknown.



Labels are the well permit number from the Colorado Division of Water Resources

Map 2. Approximate location of well permits at the Onahu & Green Mountain Ranch, Rocky Mountain National Park

Water court case number CA1768 identified another well in the area that was granted a water right (Map 2). The Buena Vista ranger station well is claimed to be 60 feet deep and was constructed in 1950. There was no DWR permit for this well. This is approximately the location of a private inholding owned by the Lemmer Family Trust.

George and Marilyn Dick obtained a water right for the domestic well on a private inholding in this area. Application W-558 allocated 20 gpm for domestic use. NPS subsequently acquired this property. There was no DWR permit for this well. I inspected and tested this well in 2008 and determined that it was unsuitable for use. It should be plugged and abandoned and a replacement well should be constructed (requiring a new permit).

Actions

1. Plug and abandon four unused wells at the Green Mt. housing area. Notify DWR that wells associated with permits 625-R, 626-R, and 28705 and two other wells have been plugged and abandoned.
2. Plug and abandon the shallow well at the Dick property. Notify DWR. Obtain a permit if a well is constructed at the site.

Private, domestic wells in the Kawuneeche Valley – Map 3

There were/are several well permits for private, domestic wells in the Kawuneeche Valley. These wells were/are on private inholdings within the park boundary. Not all of the wells that might be on private inholdings have permits. For example, the Dick Well (mentioned in the previous section) is not recorded with DWR. The private, domestic wells that have permits are;

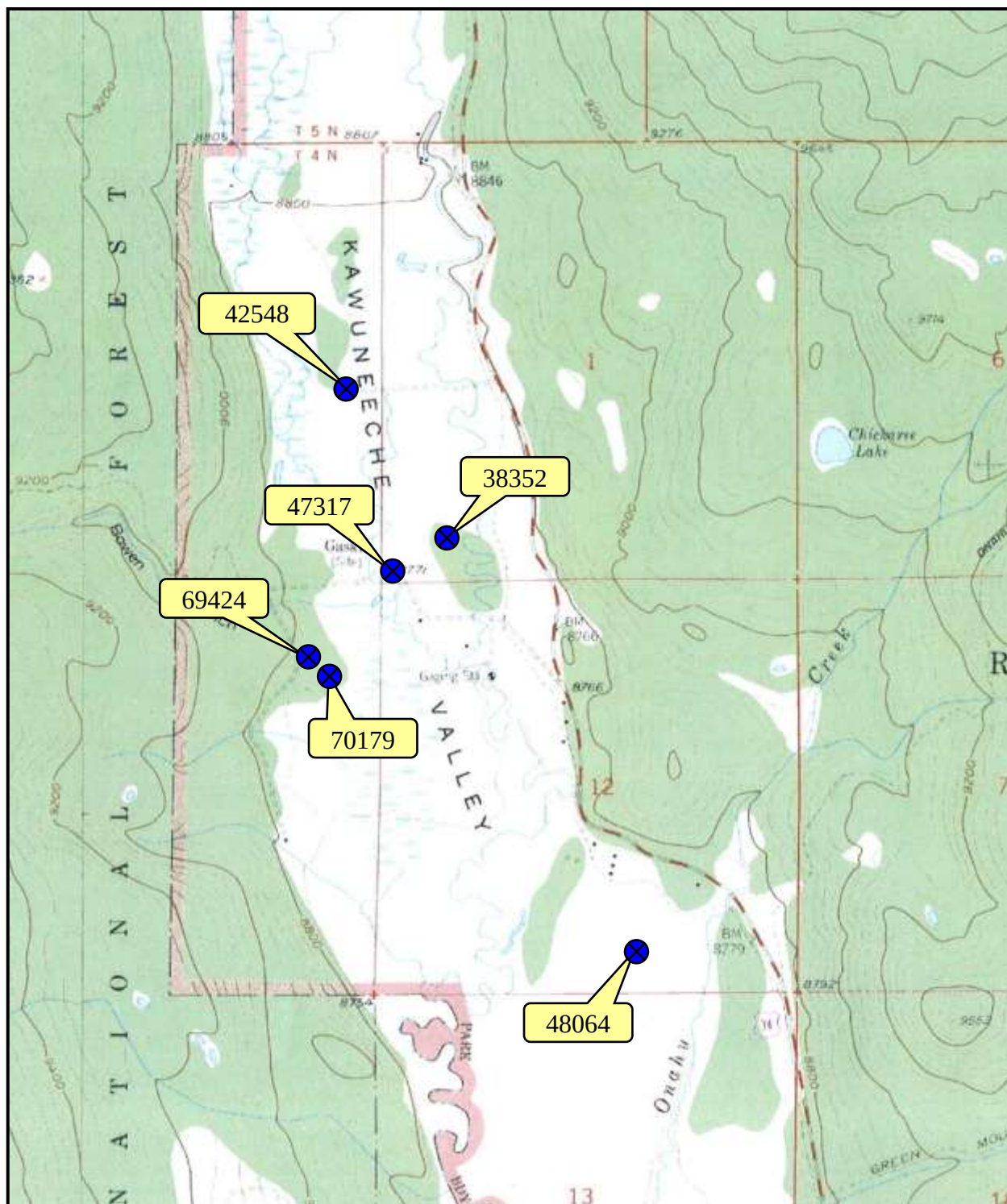
<u>Permit No.</u>	<u>Permitee</u>	<u>Depth</u>
48064	Carl Nelson	260 feet
70179	Paul Johnson	cancelled, not drilled
69424	Zada Johnson	40 feet
42548	Charles Houseman	35 feet
47317	Jack Gubbins	37 feet
38352	Joseph Wetherill	22 feet
13668	John Holzworth*	38 feet

*The location of the John Holzworth well is shown on Map 4.

NPS has acquired the Nelson, Houseman, Wetherill, and Holzworth properties and removed all of the structures and restored the areas. There is no record of plugging the wells. If they still exist, they should be plugged and abandoned. The Johnson and Gubbins properties are still privately owned.

Actions

1. Plug and abandon wells on inholdings that have been acquired by NPS. These wells can be plugged by filling them with concrete. Notify DWR after they have been plugged.



Labels are the well permit number from the Colorado Division of Water Resources

Map 3. Approximate location of well permits for private domestic wells in the Kawuneeche Valley, Rocky Mountain National Park

Timber Creek and Upper Kawuneeche Valley – Map 4

The well at Timber Creek Campground was constructed in 1966. It is 75 feet deep. The permit number is **27240**. The permit expired in May 1974; probably because the well completion form was not submitted to DWR.

In 1961, NPS filed a registration for an existing well at the Old Phantom Valley Trading Post. This well was east of the parking area for the Phantom Valley picnic area on the east side of Trail Ridge Road. The well was constructed ca. 1951 and was used for domestic purposes at the trading post. The well was 23 feet deep. The permit number was **922-N**. A new well was constructed at this locale in 1982, but in the middle of the parking area loop on the west side of Trail Ridge Road (the Colorado River Trailhead). A permit application was submitted to DWR (receipt # **7579**), but the permitting was never completed. Neither of these wells exist anymore.

In 1961, NPS filed a registration for an existing well at the employee quarters at the Phantom Valley Ranch. The well was constructed ca. 1956 and was used for domestic purposes. The well was 12 feet deep. The permit number was **926-N**. The site has been restored. All of the buildings and infrastructure have been removed. There is no record of the demolition of the well. It was probably backfilled because it was only 12 feet deep.

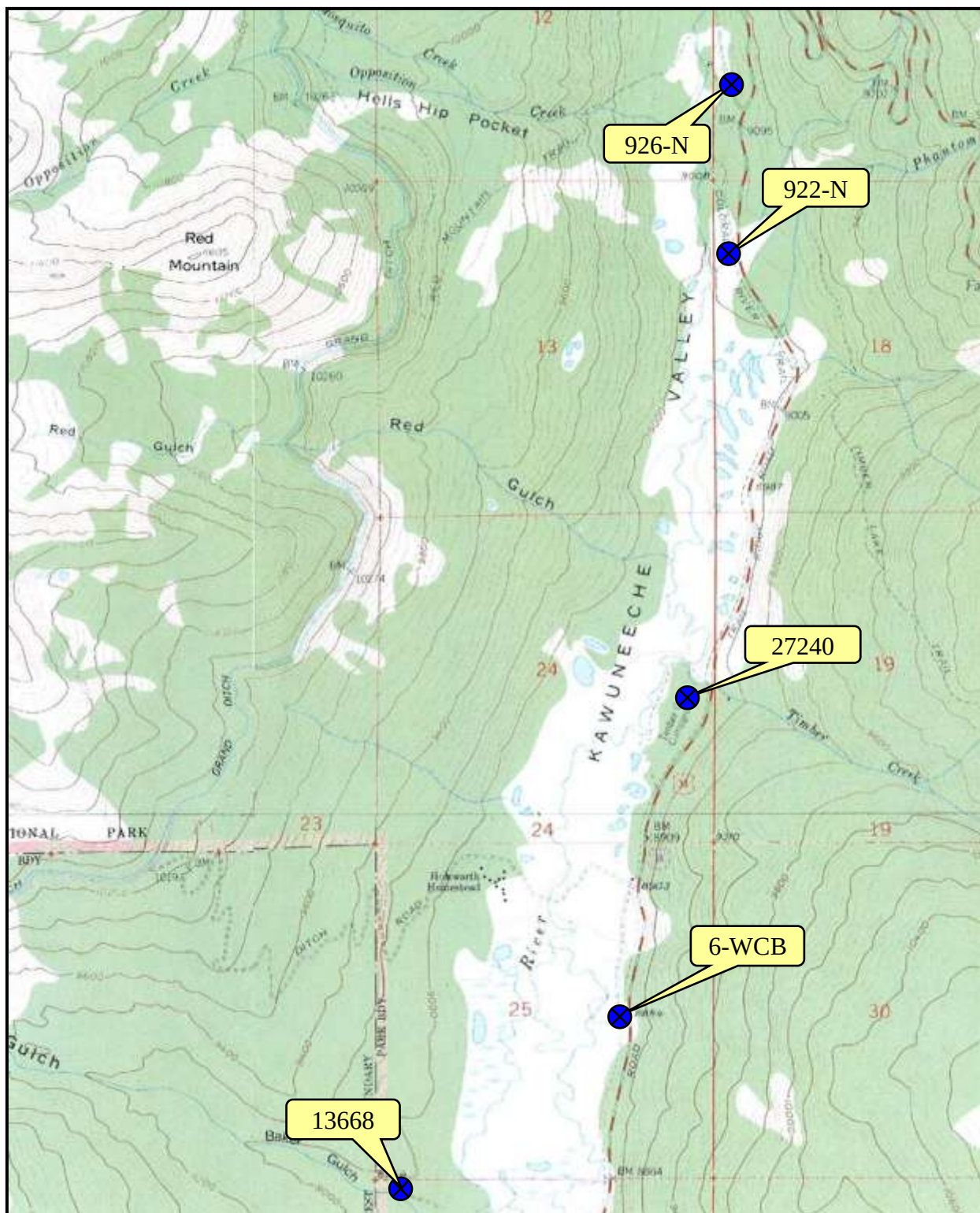
John Holzworth had a permit for a well on the east side of the valley. This may have been at the Never Summer Ranch. The well was constructed in September 1953 and was 63 feet deep. The permit number is **6-WCB**. These buildings have been removed and the site was restored. There is no record of the fate of the well, but it is believed that it no longer exists.

There is no well permit for the water system at the Holzwarth Historic Site. This is the site on the west side of the Colorado River. *(For years this ranch was known as the Never Summer Ranch when in actuality the Never Summer Ranch was on the east side of the valley near the parking lot. There is one cabin remaining near the parking lot that was the Never Summer Ranch. The Holzwarth Historic Site is the location of the 1920's guest ranch on the west side of the valley. A few years ago it was decided to be politically correct and call it by its proper name. Thus what was called the Never Summer Ranch for many years is correctly the Holzwarth Historic Site. Source: www.rmnp.com/rmnp-areas-kawuneechevalleyholzwarthhistoricsite.html).* A permit application was submitted to DWR in 1982 (receipt # **7578**) and a well was constructed at the “Holzwarth Homestead historic district”. The permitting was not completed. The well is 140 feet deep.

Note: There are two spellings in common usage for Holzworth and Holzwarth. The DWR permit applications appear to be signed as Holzworth. NPS uses the Holzwarth spelling.

Actions –

1. Obtain a valid permit for the well at the Timber Creek Campground.
2. Report to DWR that the wells associated with permits 922-N, 926-N, 6-WCB, and receipt #7579 have been plugged and abandoned, although there is no specific record of the methods for plugging them. They no longer exist.
3. Obtain a permit for the well at the Holzwarth Historic Site.



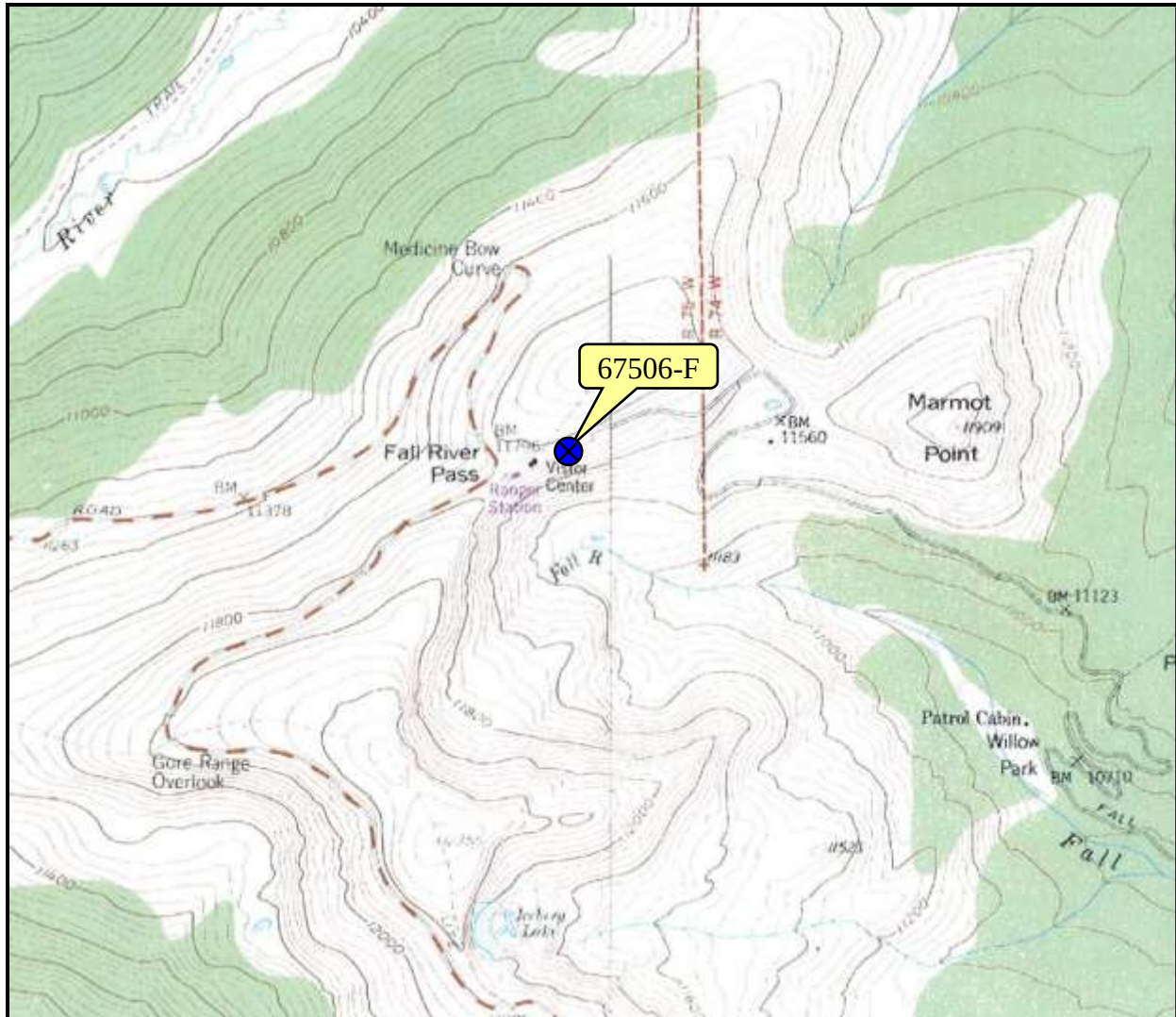
Labels are the well permit number from the Colorado Division of Water Resources

Map 4. Approximate location of well permits in the Upper Kawuneeche Valley, Rocky Mountain National Park

Fall River Pass – Map 5

The well at Fall River Pass was constructed in June 2007 to replace a surface water source for the water supply at the Alpine Visitor Center. The well is 660 feet deep and obtains water from fractures in the granitic bedrock. The well was constructed under a permit for a monitoring/test well (#273781). The test well permit was cancelled when the well was converted to a production well. The permanent well permit number is **67506-F**. The maximum permitted pumping rate for the well is 15 gpm. The annual withdrawal from the well is limited to 3 acre-feet.

Actions – None needed.



Labels are the well permit number from the Colorado Division of Water Resources

Map 5. Approximate location of the well at Fall River Pass,
Rocky Mountain National Park

Hidden Valley – Map 6

Hidden Valley Well No. 1 was constructed in November 1956. It is/was located on the north side of the creek, about 250 feet upstream from the old ski lodge. The well has a diameter of 8 feet and is 20 feet deep. There is no record of a permit from CO-DWR. The well was backfilled during the restoration project of 2003.

Hidden Valley Well No. 2 was constructed in May 1971. It was a conventional drilled well; drilled through sand and gravel to 56 feet and then granite from 56-62 feet. The 6-inch steel casing was perforated from 19-55 feet. It was test pumped at 34 gpm for 24 hours with 2½ feet of drawdown; from the static level of 8½ feet below ground surface. The well was registered with the Office of the State Engineer in 2003 and was assigned permit number **254633**. I tested this well in 2002 and found it to still be productive, but the casing was severely rusted. This well was apparently plugged and abandoned when Well No. 3 was constructed.

Hidden Valley Well No. 3 was constructed in June 2004 as a replacement for Well No. 2. It has permit number **254633-A**. Well No. 2 was to be plugged and abandoned after construction of Well No. 3. Well No. 3 is permitted for 15 gpm and up to 1 acre-foot/year (325,800 gallons). The well has 7-inch steel casing to 41 feet and a 4½-inch PVC liner to 70 feet with slotted screen from 20-40 feet and 60-70 feet. The static water level was 5 feet. This is the current water-supply well for facilities at Hidden Valley.

In August 1990, permit numbers **16738-MH**, **37591-M** and **37592-M** were issued for construction of temporary monitoring and observation holes. Well 37591-M was to be an observation well for water level monitoring during a pumping test. Well 37592-M was to be the pumping well for an aquifer test. DWR has a well log for the pumping well, #37592-M, but no information regarding the construction of the other well (or if it was constructed). These wells were to have been constructed on the west side of the entrance road to Hidden Valley, east of the creek, and southwest of Trail Ridge Road. I found no sign of these wells during a site inspection in June 2010. Because these wells were permitted as test wells, the permits expired after one year. No action is necessary as the wells don't appear to exist and the permits have expired.

Actions

1. Submit a well abandonment report to DWR for the Hidden Valley Well No. 2 (254633).

Deer Ridge Chalet – Map 6

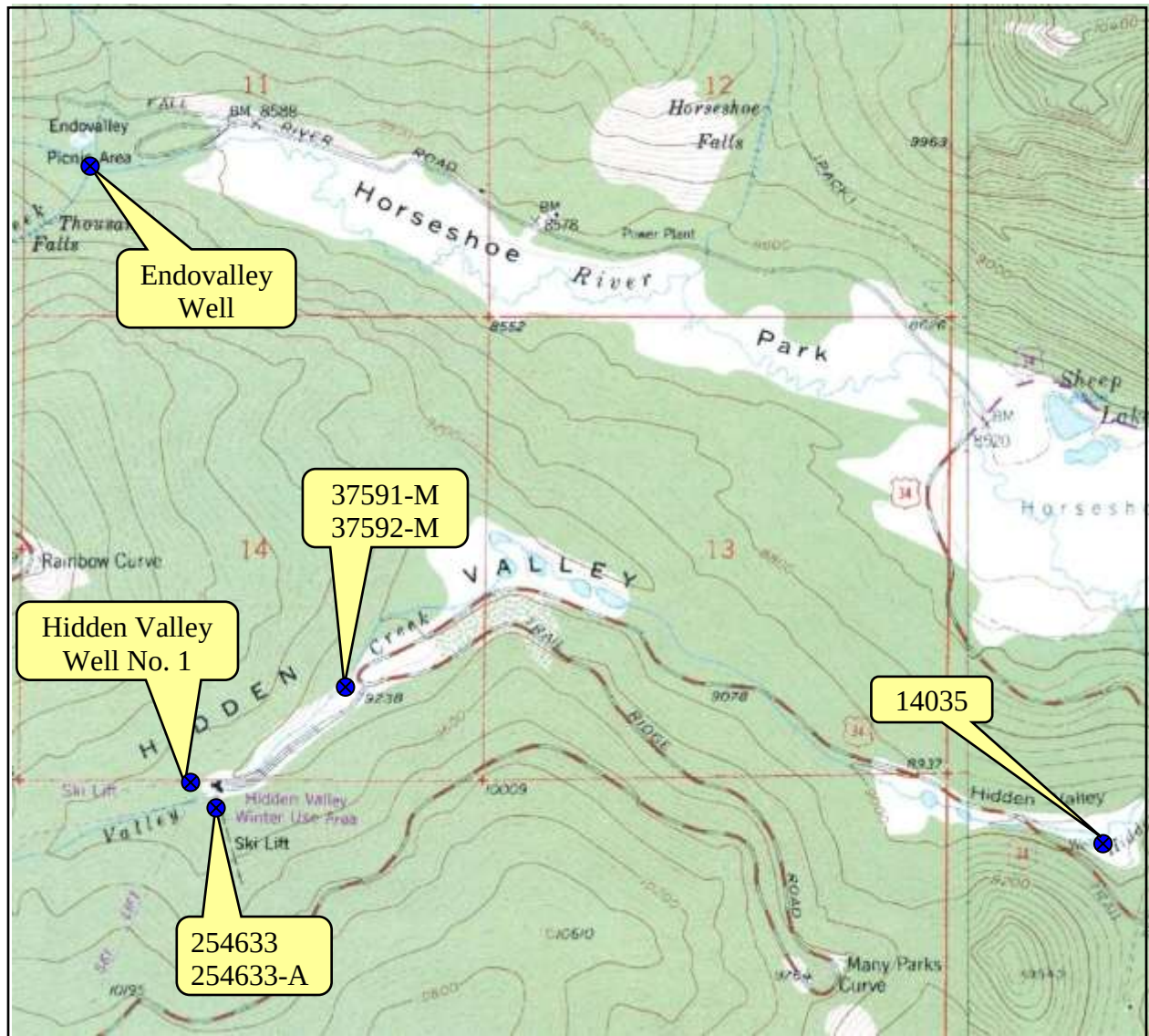
In 1962, the park acquired the Deer Ridge Chalet and registered an existing well at the site. The well had been the domestic supply for the chalet. It was assigned permit number **14035**. The well was 105 feet deep. The buildings have been removed and the site has been restored. The well still exists. It appears that a metal plate was placed over the top of the well casing and a small concrete pad was placed over it (see photo). A gap has opened between the bottom of the cement pad and the top of the casing, allowing surface water to enter the well. This well should be properly



plugged and abandoned. Remove the existing concrete pad, backfill the well with clean sand or gravel to 10 feet below ground surface and then concrete from minus 10 feet to surface.

Actions

1. Plug and abandon the well. Notify DWR.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 6. Approximate locations of well permits at Hidden Valley and Endovalley, Rocky Mountain National Park.

Endovalley – Map 6

A well was constructed at the Endovalley picnic grounds in November 1978. There is DWR permit for this well. The well is 21 feet deep. The well is probably inside the building at this site. It can be found by following an old road upstream from the far end of the loop road through the picnic area.

Actions

1. None at this time. If the well is used in the future, it will need a permit. Otherwise maintain in standby status and plug and abandon it if/when the building is removed.

Fall River Entrance & Aspenglen Campground – Map 7

The well at the Bighorn Ranger Station provides water for a permanent residence (#44) and a seasonal trailer. It also supplies water for the Fall River entrance station. The well was constructed in May 1982. The well was drilled to 128 feet and then backfilled to 110 feet. The completed well is 110 feet deep. The permit number for the well is **165966**.

Ernest & Young was the drilling contractor for the Bighorn Ranger Station well. They also drilled the well at the Twin Owls trailhead under the same contract. It appears that the well completion reports for the two wells were switched. The completion report filed with DWR for the Bighorn Ranger Station well is really the description of the Twin Owls well. The completion report for the Twin Owls well was never submitted to DWR.

Cascade Cottages is a private inholding in the park, about a half mile west of the Fall River entrance. The cottages are supplied with water from a 65-foot deep well with permit number **126984-A**.

Water for the Aspenglen campground was originally supplied from a spring on the north side of Deer Mountain with a pipeline from the spring down to the campground. A well was constructed on the south side of Fall River in 1958 to provide water for the campground. The well was 40 feet deep. The permit number for the well was **1429**. The well was long ago abandoned and obliterated; after construction of the new well in 1965.

In 1965 a new well was constructed on the north side of the river, with the apparent intent to supply water to both the campground and the Bighorn Ranger Station at the Fall River Entrance. It's unclear whether service was extended from the well to the ranger station or if the well continued to supply only the campground. This well was 101 feet deep. The well is inside the chlorinator building at the site. The permit number for this well was **23820**. There was a problem with the casing, resulting in the lower part of the well filling with sand, trapping the pump in the well.

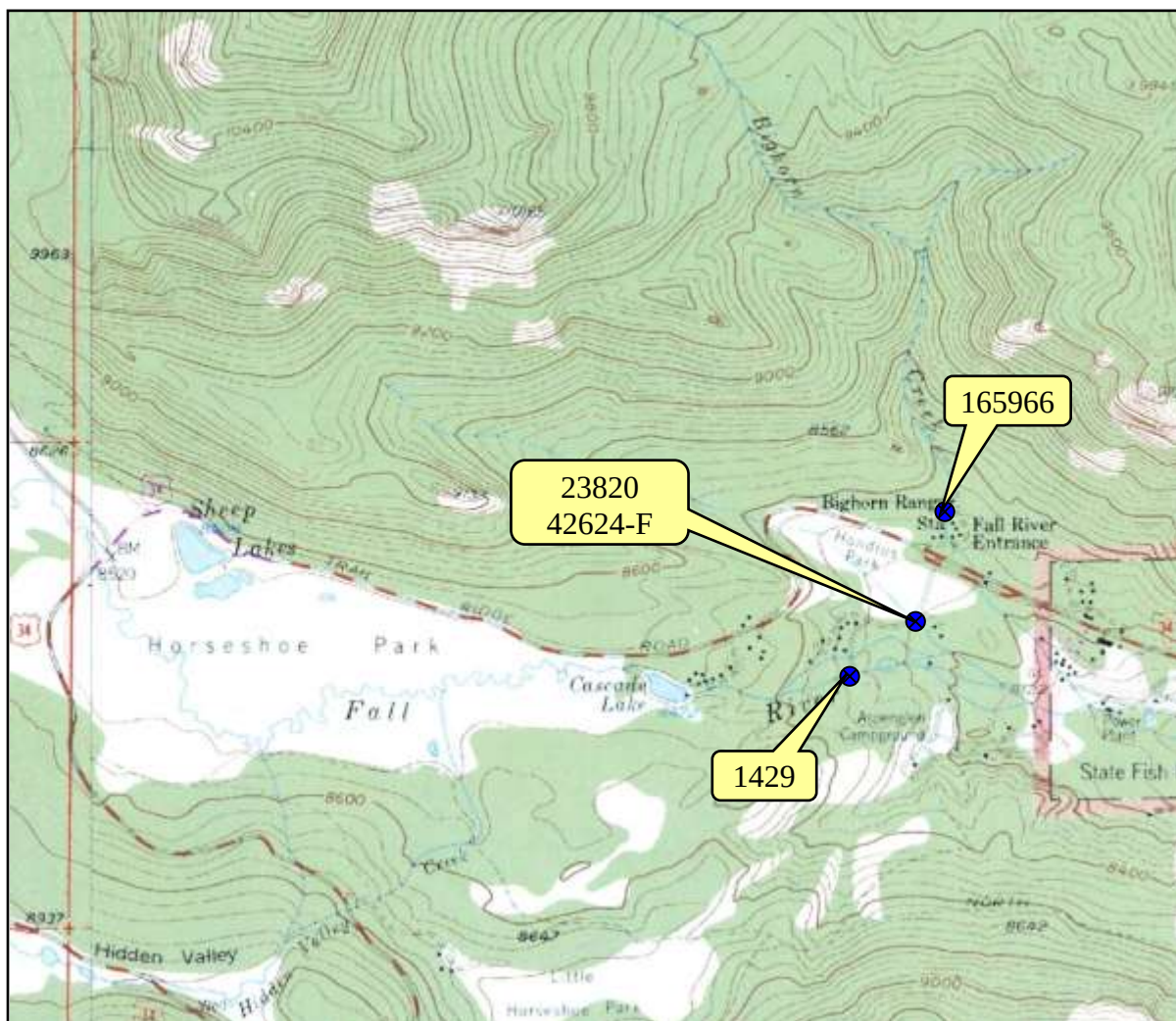
A replacement well was constructed about 10 feet east of the building in 1991 to replace the failed well inside the building. The well is still in use as the supply for the campground. The well is 78 feet deep. The well was originally assigned permit number **36651-F**, but that permit expired before the well was constructed and a new permit was issued. The well operates under permit

number **42624-F**. It appears that the permit is in good standing with DWR; with a maximum pumping rate of 55 gpm and an annual use of 2 acre-feet (751,600 gallons).

Actions

1. Submit a correct completion report for the Bighorn RS to DWR. Verify the completion by measuring the total depth of the well.
2. Notify DWR that well #1429 was plugged and abandoned long ago.
3. Plug and abandon well #23820 and notify DWR.

Two wells at the Smith Sisters cabins near the Aspenglen campground were plugged and abandoned in October 2009. Neither of the wells had permits from DWR. Well abandonment reports were submitted to DWR.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 7. Approximate locations of well permits near the Fall River Entrance and Aspenglen Campground, Rocky Mountain National Park

Twin Owls Trailhead Well – Map 8

CO-DWR issued a permit for a test hole in this area on March 29, 1982. The receipt number is 0007577. There is no permit number. It appears that the paperwork to convert the test hole to a well permit was never submitted to CO-DWR.

The well is 171 feet deep and obtains water from fractures in the granite. The sustained yield of the well was estimated to be 8 gpm. Well construction information is available in WRD files in Ft. Collins.

The Twin Owls Well has a federal reserved water right for 5 gpm for domestic use.

Actions

1. Register the well with DWR. Provide the correct well completion report to DWR.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 8. Approximate location of well at the Twin Owls Trailhead,
Rocky Mountain National Park.

McGraw Ranch Wells – Map 9

A permit to construct a well at McGraw Ranch was issued to Frank McGraw in 1966 when the property was still privately owned. Two wells were constructed in June 1966. The CO-DWR permit number is **27530**.

Well Number 1 is the western well. It was drilled to 110 feet deep in 1966 and reportedly produced 9 gpm. Well Number 2 is the eastern well. It was drilled to 235 feet deep in June 1966 and reportedly produced 4 gpm. Park staff measured the wells in 1999 and reported the western well was 215 feet deep and the eastern well was 165 feet deep. Obviously, there is some confusion regarding well names/numbers.

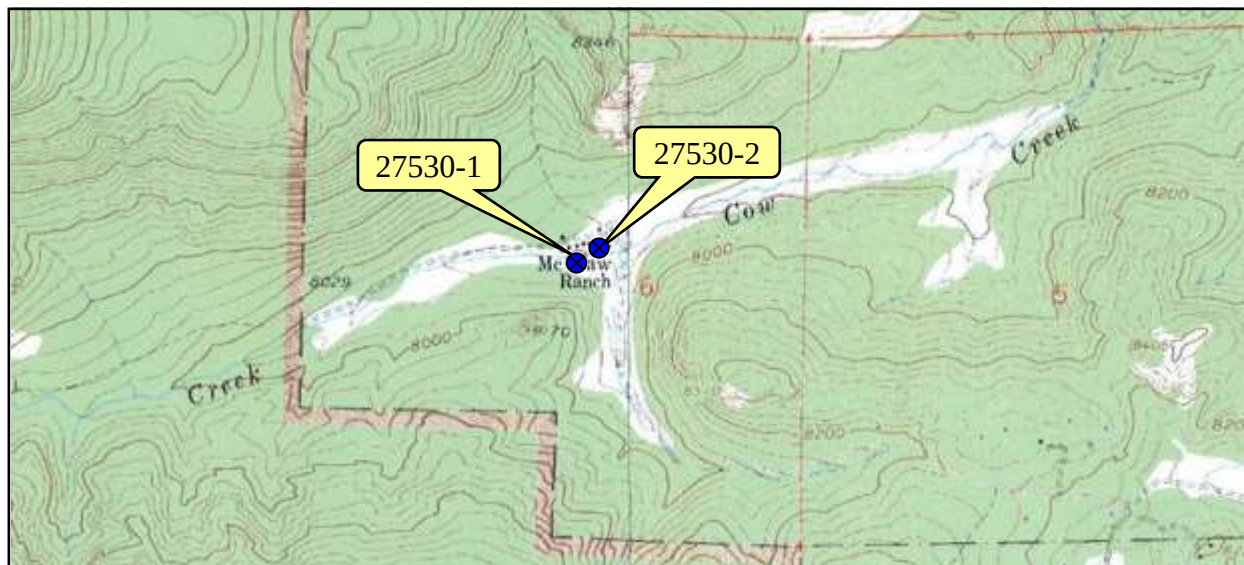
Testing in 1999 showed that the western well would quickly be pumped dry. The western well, has not been used since 1999, or for many years prior. It might be rehabbed by hydrofracking.

In 1999, the eastern well was test pumped at 14 gpm for 5 hours resulting in drawdown from a static level of 16 feet to 64 feet below ground surface; 48 feet of drawdown. The eastern well has been the water supply well for facilities at McGraw Ranch since then.

Some problems with maintaining production were reported in the winter of 2008-09. The static water level in the well had declined to about 138 feet below ground surface. When the well was pumped, the water level would be drawn down to the pump intake after about 20-40 minutes (8 gpm) and the pump would shut off. The water table had recovered to higher levels by Summer 2009 and the well was able to meet the demand throughout the summer.

Actions

1. Probably none. DWR could be notified of the change in ownership. The western well could be plugged and abandoned, or it can be maintained for possible future hydrofracking to restore the production from the well.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 9. Approximate locations of wells at McGraw Ranch, Rocky Mountain National Park.

Private domestic wells Beaver Meadows & Moraine Park – Map 10

I did not research or include well permits for private inholdings near the east entrance to the park in the Beaver Meadows area. There are probably several private wells in this area, particularly along High Drive, to the north of the park entrance road, on the southeast flank of Deer Mountain. Well permits in the CO-DWR database are generally located by quarter-quarter section and it's difficult to determine whether permits are for wells inside or outside the park boundary.

There are numerous permits for private, domestic wells on private inholdings in the Beaver Meadows and Moraine Park areas. Some of these inholdings have been acquired by NPS, but the well permits remain in the name of the previous owner. Private domestic well permits are grouped by area in the following list; the ridge between Beaver Meadows and Moraine Park, along the north side of Moraine Park, and the southeast side of Moraine Park.

Area 1, Section 32 – Ridge between Moraine Park and Beaver Meadows

<u>Permit No.</u>	<u>Owner</u>	<u>Depth</u>	<u>Date constructed</u>
7384	Stopher, Ed	160'	1961
81758	Hines, Walter	---	Expired
12622-R	Bissell, J.R.	225	1957
241696	Six, Stephen	208	2003
190-WCB	Miller, Harriet	100	1953

Area 2, Section 32 – North side of Moraine Park

<u>Permit No.</u>	<u>Owner</u>	<u>Depth</u>	<u>Date constructed</u>
12623-R	Steads Ranch	40'	1957
12624-R	Steads Ranch	10'	1955
16602-R	Steads Ranch	4'	unk
16602-S	Steads Ranch	6'	unk

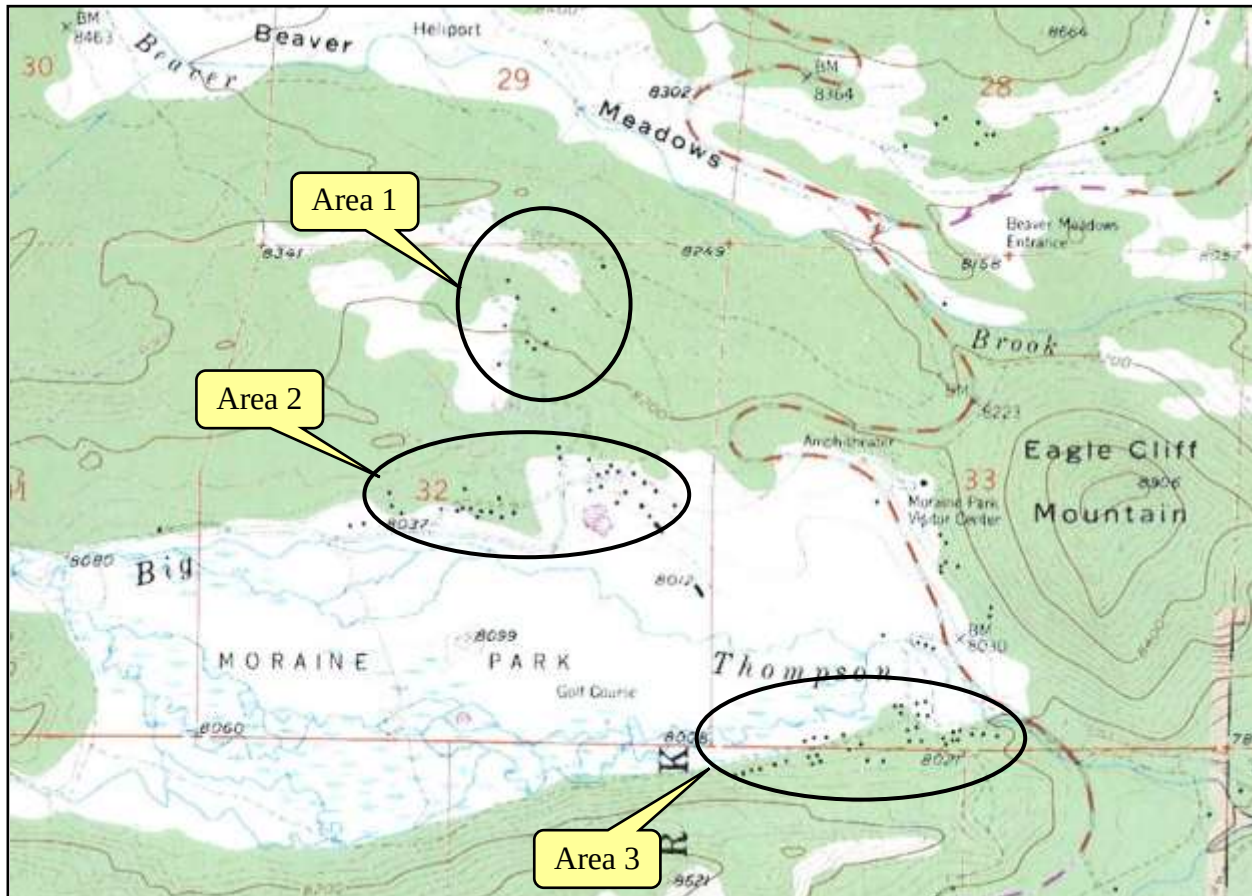
Area 3, Sections 33 and 5 – South side of Moraine Park

<u>Permit No.</u>	<u>Owner</u>	<u>Depth</u>	<u>Date constructed</u>
4364	Cravens, Naida	34'	1959
14003-R	Mey, John	40'	1954
47168	Bradt, Gordon	280'	1971
141791	Hatchette, Charles	60'	1986

Many of these properties have been acquired by NPS. Some of the properties may have been purchased by NPS but the previous owner may have retained a right to use the property. Some of the cabins have been removed and the sites have been restored. The fate of any wells associated with the old cabin sites is unknown. Any remaining unused wells should be plugged and abandoned. NPS provides water to the Black cabin and the Wuth cabin. Three other privately owned cabins maintain their own domestic wells and water supplies.

Actions

1. Investigate property records and conduct a site visit to determine which wells still exist and which likely been plugged and abandoned.
2. Change ownership on wells that have been acquired by NPS.
3. Inform DWR of changes to update their records.
4. Plug and abandon wells as necessary. File abandonment reports with DWR.



Map 10. Approximate location of private, domestic wells in the Beaver Meadows & Moraine Park area, Rocky Mountain National Park.

Moraine Park – Map 11

Two test holes were drilled on the north side of the Moraine Park campground in 1987. The test wells were drilled to 380 and 400 feet. They did not produce enough water to warrant completion as wells. Both holes were plugged and abandoned. The CO-DWR permit for these holes was **12093-TH**.

The Moraine Park campground was at one time supplied with water from a well that is 242 feet deep. It was constructed in 1962 and reportedly has a yield of 7 gpm. The permit number is **11773**. The Moraine Park campground is now part of the HQ East water system and is supplied with water from the wells in Moraine Park.

Some of the cabins along the southeast side of Moraine Park are supplied water from wells owned by NPS. Some obtain water from private wells. There are three well permits in this area that show the National Park Service as the owner.

The westernmost well is referred to as the Greenline Well. The original well was a 5-foot dug well in the meadow with a small pump house over it. The permit number for that “well” was **30411-F**. A new well was constructed about 150 feet east in 2006. The new well has permit number **251666-A**. The well is 85 feet deep. The Greenline well supplies water for several cottages that are used as seasonal quarters for NPS staff.

In 1961, NPS registered an existing well for Yordy Cabins Camp. The well is 61 feet deep and reportedly yields 10 gpm. The well was constructed ca. 1947. The permit number is **923-N**.

In 1961, NPS registered an existing well for Moraine Park Cottages. The well is 40 feet deep and reportedly yields 7 gpm. The well was first used ca. 1911 and deepened in 1957. The permit number is **924-N**.

The water supply for NPS facilities at the Beaver Meadows entrance station, Visitor Center, housing and maintenance areas, and the Moraine Park campground is from high-yield wells completed in the alluvium of the Big Thompson River in Moraine Park.

Moraine Park Well No. 1 was constructed in 1959. It was 16 feet deep and had a diameter of 6 feet. It reportedly produced 99 gpm. The permit number was **4019**.

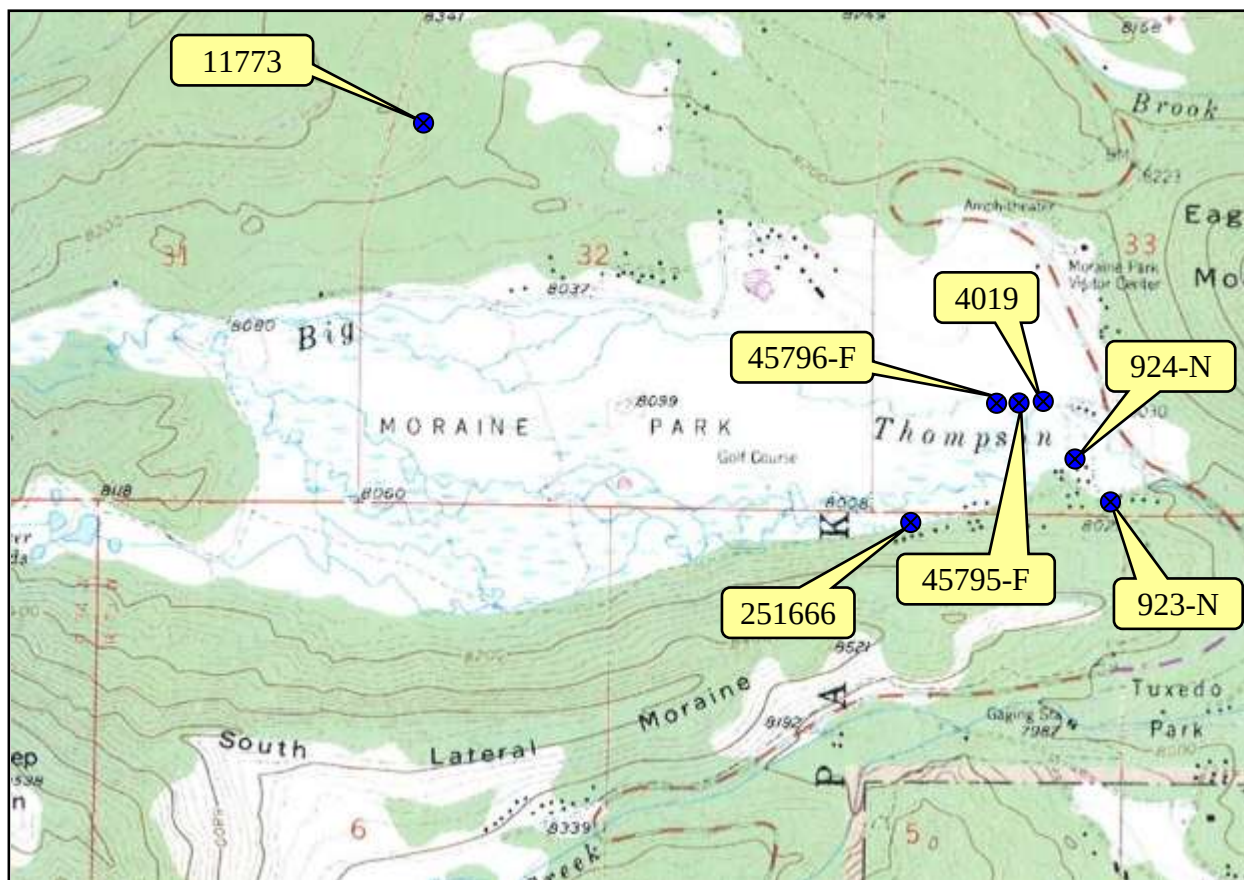
Moraine Park Well No. 2 (CO-DWR permit number **45795-F**) was constructed in 1970. The well is 86 feet deep. The well was initially test pumped at 150 gpm, but is permitted for only 80 gpm.

Moraine Park Well No. 3 was constructed in 1984 to a depth of 50 feet. The original permit application for this well (**#10514-AD**) was denied. It appears that this well was eventually permitted as **#45796-F**. The construction date and depth match up. The well is 50 feet deep. The well was initially test pumped at 100 gpm and is permitted for 99 gpm.

The permits for both Well No. 2 and No. 3 (**#45795-F** and **#45796-F**) expired on 11/30/96 because well completion reports were not submitted.

Actions –

1. Investigate the status of the former supply well for the campground (**#11773**) and inform DWR if the well has been abandoned.
2. Verify the use of 3 NPS wells on the south side of Moraine Park as the water source for various cabins in the area.
3. Submit well construction forms and any other documentation necessary to bring permits **#457965-F** and **#457966-F** into compliance. DWR records show an expiration date of 11/30/96 for both wells.
4. Update any other records for DWR as necessary.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 11. Approximate location of wells in Moraine Park, Rocky Mountain National Park.

Hallowell Park – Map 12

In 1961, NPS registered an existing well that had been constructed about 1951. The well was the water supply for the Bowen-Woods Cabin Camp. The well was 75 feet deep and had a yield of 8 gpm. The permit number for this well is **925-N**.

NPS constructed a well in Hallowell Park in May 1965 for the Job Corps Camp. The well is 122 feet deep. The estimated yield of the well is 50 gpm. The permit number for this well is **23819**.

It appears that the areas formerly occupied by the Bowen-Woods Cabin Camp and Job Corps Camp have been reclaimed. The fate of the wells is unknown. If the wells still exist, they should be plugged and abandoned.

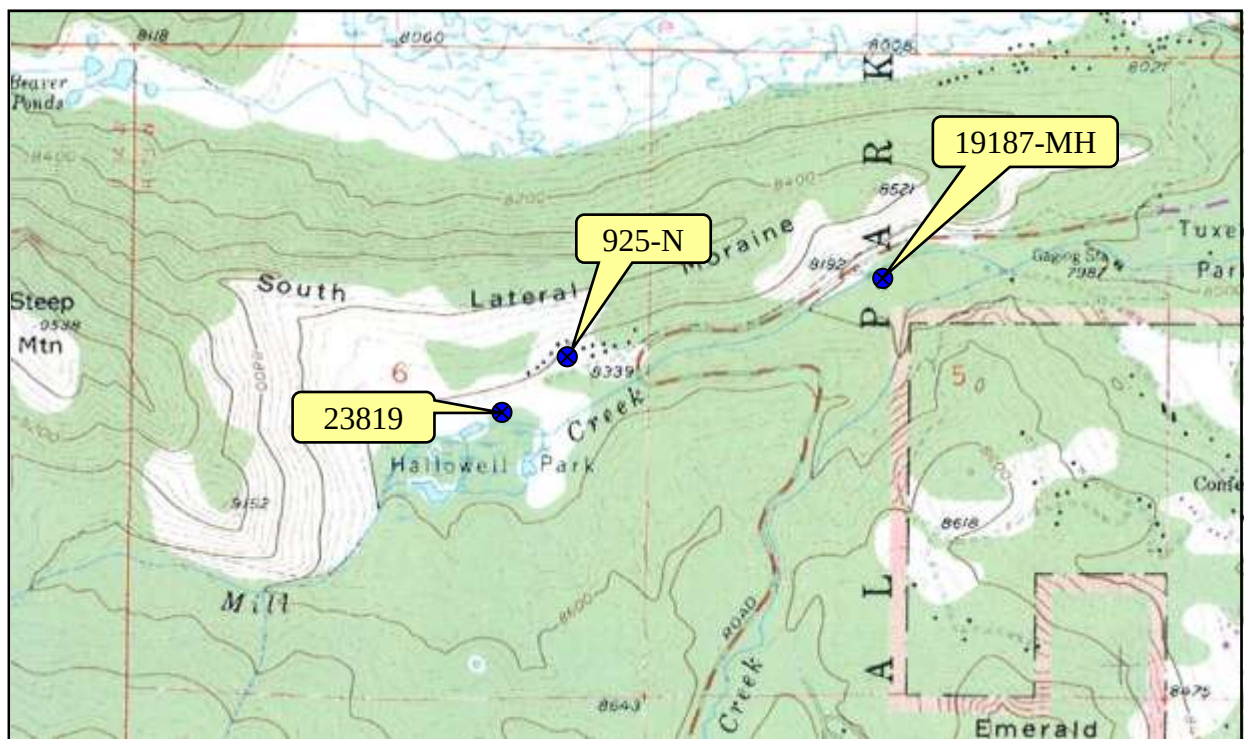
A permit application was submitted in 1990 for a domestic well in the vicinity of the Mill Creek ranger residence. No other information could be found for this application.

NPS constructed a test hole in June 1992 (permit number **19187-MH**) in the vicinity of Residence 37. (Mill Creek ranger residence?) The well is 40 feet deep and had an estimated yield of 2½ gpm. There is no record of converting the test hole to the status of a water-supply well.

Test hole permits expire after one year. There is no record of converting the test hole permit to a well permit.

Actions

1. Inform DWR that wells associated with permits 925-N and 23819 have been plugged and abandoned.
2. Apply for a permit for the well at the Mill Creek Ranger residence.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 12. Approximate location of wells in Hallowell Park, Rocky Mountain National Park.

Glacier Basin and Sprague Lake areas – Map 13

There are no permits with CO-DWR for the wells in the Glacier Basin and Sprague Lake areas. Applications were submitted, but it appears that the applications for permits were returned for additional information and those requests were not answered.

The USGS supervised construction and testing of wells at the Glacier Basin campground and Sprague Lake picnic area in 1967 (Frank Welder, 1971, Open-file report 71-001). An observation well was constructed at the campground to a depth of 66 feet. The well was screened in a sand and gravel formation from 40-42 feet. It reportedly produced 50 gpm. I don't know if this well still exists. A second test hole was constructed at the Sprague Lake picnic area. The hole was drilled to 49 feet where it was terminated because of dense clay. The hole reportedly

produced 10-50 gpm. There is no mention in the USGS report of the hole being completed as a well. I could not find any evidence of a well in this area during a site visit in June 2010.

In 1982, NPS constructed wells at the Sprague Lake picnic area and the Glacier Basin campground to replace surface water sources. Currently the Glacier Basin campground well supplies water for all facilities in the Glacier Basin and Sprague Lake areas. The Sprague Lake picnic area well is not used.

Sprague Lake picnic area well: The well at the Sprague Lake picnic area was constructed in August 1982. A pump was installed on August 3, 1984 and the well was put into service in June 1985. The well was drilled to a total depth of 63½ feet, the last 6 feet in bedrock. The well screen was installed from 45-55 feet below ground surface. The screen is an 8-inch telescoping screen, fitting inside the 8-inch casing. The well was test pumped at 12 gpm for 8 hours resulting in 25 feet of drawdown. The well screen is 10 feet of 8-inch telescope stainless steel Johnson well screen having 0.050" slot size. The well produces 5 gpm with the installed pump.

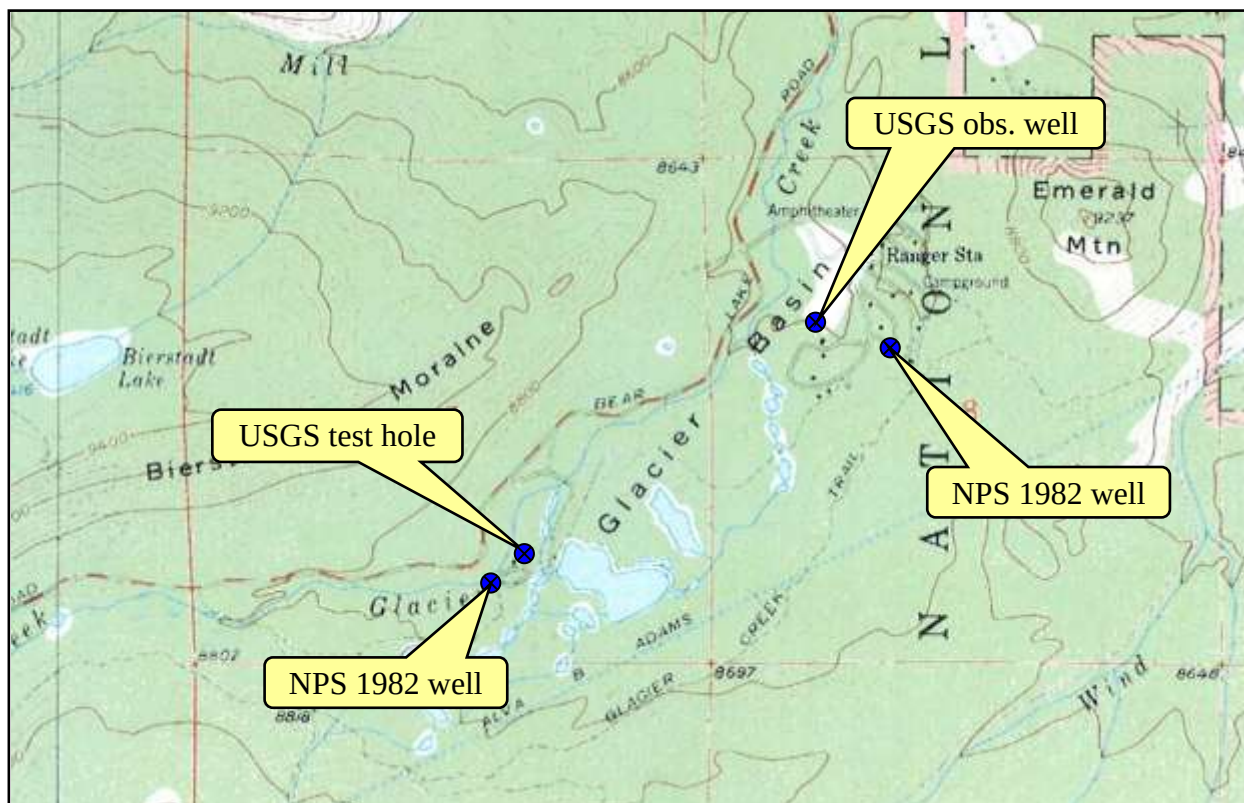
The original application for a permit for this well was made in July 1984 (**Receipt No. 0009999**). The application was returned to NPS for additional information, but apparently no further action was taken on the part of the NPS. A second application was made in March 1985, but there is no other information available regarding that application. A third application was submitted in December 1991 for late registration of an existing well and a request for a replacement well (**Receipt Nos. 0333418A and 0333418B**). These applications were also returned for additional information, but apparently no further action was taken on the part of the NPS.

Glacier Basin campground well: The well at the Glacier Basin campground was constructed in August 1982. A pump was installed and the well was put into service in August 1983. The well was drilled to a total depth of 103 feet. The well screen was installed from 73-93 feet below ground surface. The screen is an 8-inch telescoping screen, fitting inside the 8-inch casing. The well was test pumped at 38 gpm resulting in 40 feet of drawdown. The well screen is 20 feet of 8-inch telescope stainless steel Johnson well screen having 0.040" slot size.

The original application for a permit for this well was made in July 1984 (**Receipt No. 0009998**). The application was returned to NPS for additional information, but apparently no further action was taken on the part of the NPS. A second application was submitted in August 2009 (**Receipt No. 3642202**). DWR records show the status of this application as "unacceptable" with the notation that it needs an augmentation plan.

Actions

1. Conduct a site investigation to determine whether the 1967 USGS test well at the Glacier Basin campground still exists. Decide if it should be maintained or plugged and abandoned.
2. Complete the permitting process for the well at the Glacier Basin campground.
3. If the well at the Sprague Lake picnic area is going to be used, it will also need a permit from DWR.



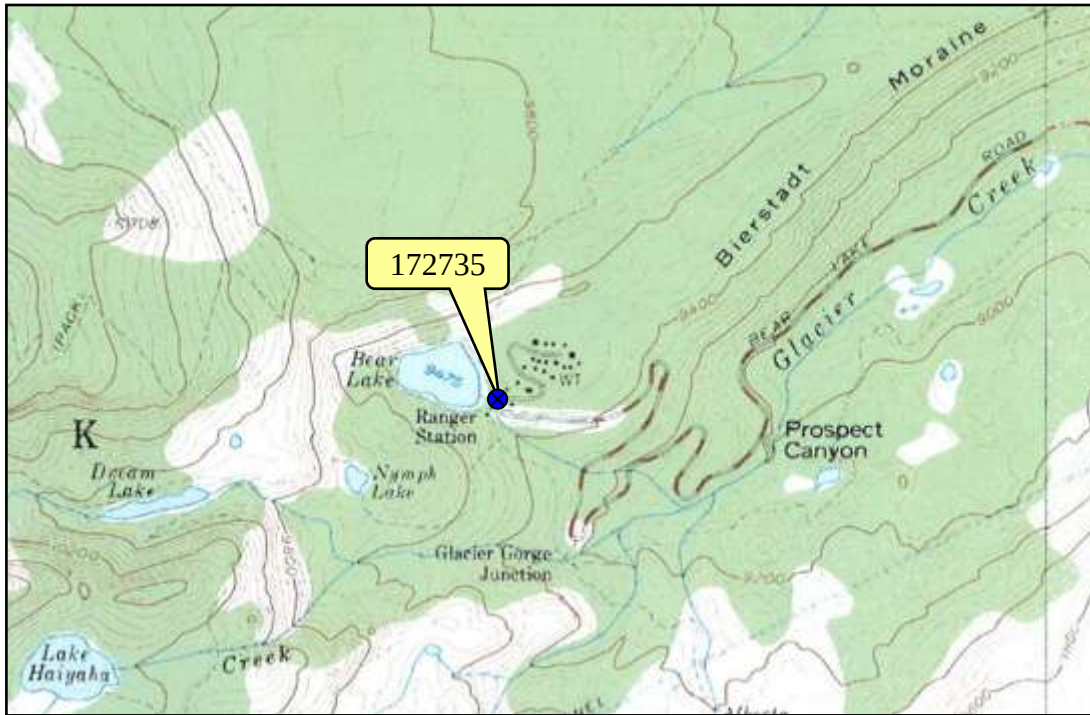
Labels are the well permit numbers from the Colorado Division of Water Resources

Map 13. Approximate location of wells in the Glacier Basin area, Rocky Mountain National Park.

Bear Lake – Map 14

A permit for a test hole (**18922-MH**) at Bear Lake was issued by CO-DWR in April 1992. The test hole permit was converted to a well permit (**172735**) in September 1993. The well is 265 feet deep and has perforated casing from 205-265 feet. The well was hydrofracked in May 1992. The post-frack production was estimated to be 2 gpm. The average annual appropriation is 0.33 acre-feet; 107,500 gallons.

Actions – None needed.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 14. Approximate location of well at Bear Lake, Rocky Mountain National Park.

Longs Peak Trailhead and Campground – Map 15

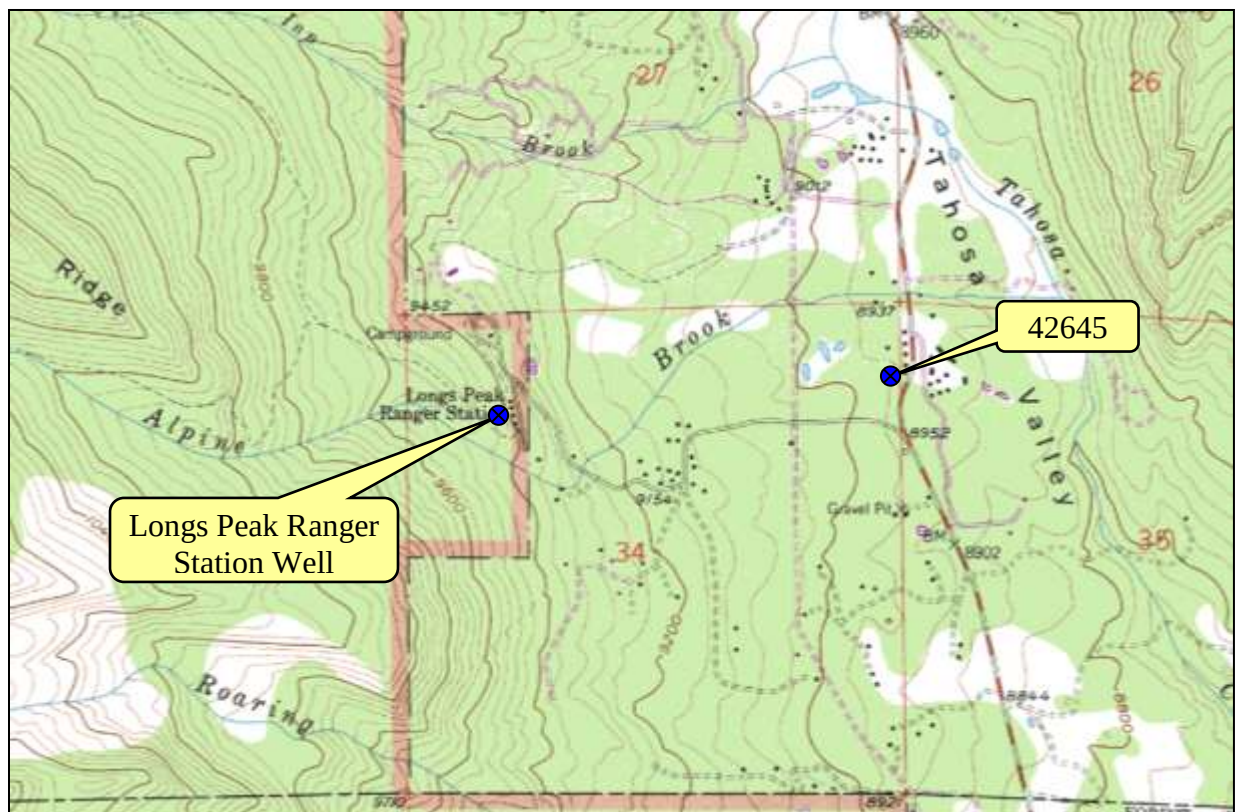
There are no well permits in the CO-DWR database for the vicinity of the Longs Peak trailhead and campground. Documents at TIC show a well next to the ranger station at the Longs Peak parking area.

There is a federal reserved water right for a well at the Longs Peak Ranger Station. The well is 270 feet deep and has a water right for 10 gpm for domestic use. Records indicate the well will produce only ½ gpm.

NPS acquired the Leiffer property by donation in 1977. It has a 230-foot well, permit no. **42645**. At one time there were plans to construct a pipeline from a well on the Leiffer property to NPS facilities at the Longs Peak campground and trailhead, but that would have been a long distance of uphill pumping. I have been told that the casing in the Leiffer well collapsed, trapping the pump, and rendering the well unusable.

A new surface water treatment system was constructed in 2007 to supply the area.

Actions – None needed.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 15. Approximate locations of wells at the Longs Peak trailhead and campground, Rocky Mountain National Park.

Wild Basin Wells – Map 16

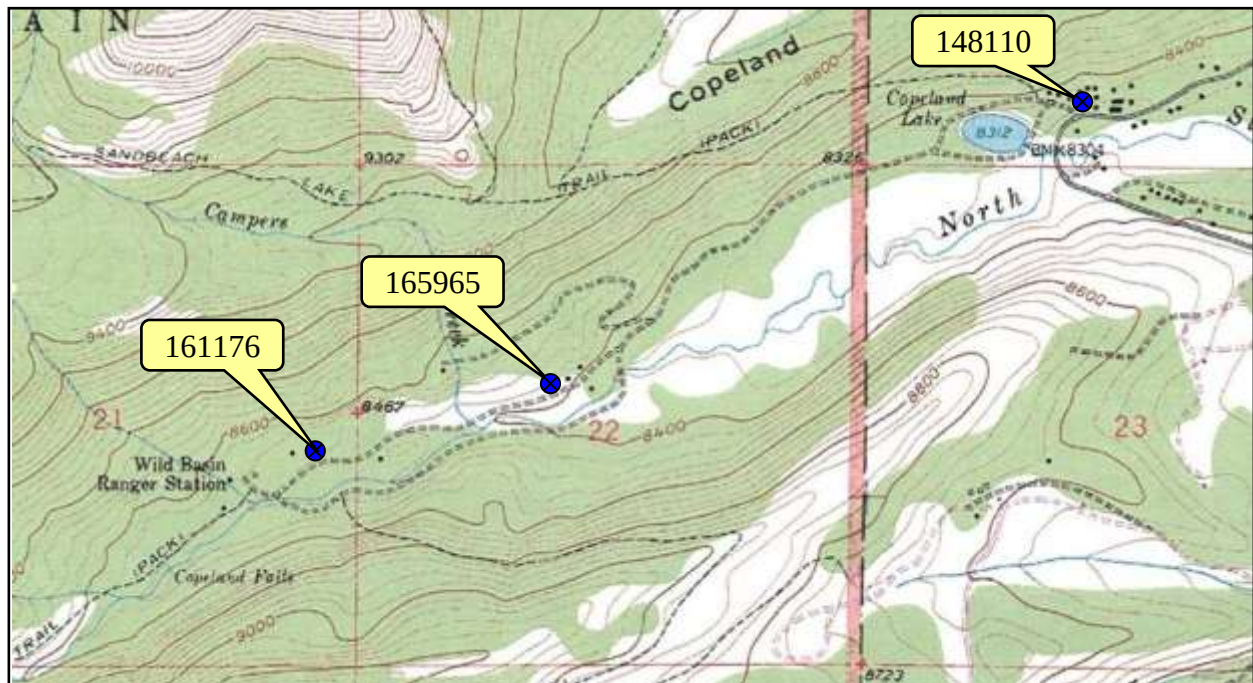
There are three well permits for this area in the CO-DWR database. Permit No. **161176** is for a well on a private inholding owned by David Russell.

Permit No. **165965** is for a well owned by NPS; called Deer Haven Well. The well was drilled in 1977 and is 90 or 150 feet deep. (there's conflicting information in the files.) The well is permitted for 10 gpm.

Permit No. **148110** is for a well at the Wild Basin Entrance, Residence # 894; also know as the “Good House” well. The well is 80 feet deep and is approved for a maximum pumping rate of 15 gpm, up to 0.33 afy (108,600 gallons).

The Wild Basin ranger station has a surface water source.

Actions – None needed, unless the preceding information is incorrect.



Labels are the well permit numbers from the Colorado Division of Water Resources

Map 16. Approximate locations of wells in Wild Basin, Rocky Mountain National Park.

Capping Wells, Plugging and Abandonment

Unused wells should be capped, or plugged and abandoned. If a well might be used again in the future, it should be capped to prevent contaminants from entering the well. If the well will not be used in the future, it should be plugged and abandoned and an abandonment report should be submitted to DWR. The intent of capping, or plugging and abandonment is to prevent contaminants from entering the aquifer through the well.

Capping a well requires more than placing an old coffee can over the top of the casing. The cap should be designed and constructed to prevent people from easily removing the cap and dropping things into the well. Commercial well caps are generally designed with a collar that is secured to the casing with set screws. A cap is then bolted to the collar. Commercial well caps cost around \$30-40. A cheaper alternative is to simply weld a steel plate over the top of the well casing.

Plugging and abandonment requires filling the well and placing an impermeable plug (usually cement) in the upper part of the well. Most of the unused wells at Rocky Mountain National Park are shallow; less than 100 feet deep, and many are less than 50 feet deep. These wells can be filled by unskilled labor using hand tools. The lower part of the well (from the bottom of the well to the top of the water) can be filled with clean sand or gravel. The part of the well above the water level should be filled with cement. A 6-inch well has a volume of $1 \text{ ft}^3/5$ feet of length. So if it is 10 feet from the top of the well to the water surface it will require 2 ft^3 of cement. A 4-inch well casing has a volume of $1 \text{ ft}^3/11$ feet of length. A 60# bag of quikrete will make $\frac{1}{3} \text{ ft}^3$ and an 80# bag will make $\frac{1}{2} \text{ ft}^3$. Generally, fewer than 5 sacks of quikrete will be required to plug a shallow well at ROMO. A larger quantity of fill material will be needed to fill the well casing to the water level. Depth of the well and depth to water can be estimated using a string with a weight. It's probably safe to assume that the water level is within 10 feet of land surface. Even if the water level is a little deeper, a 10 foot cement plug is sufficient to plug a shallow, domestic well.

A few notes about well permit suffixes

Some well permit numbers have suffixes that provide additional information regarding the well.

A – A permit to replace an existing well.

F – Indicates a non-exempt well that must have an augmentation plan.

R – Indicates and irrigation well.

WCB – Indicates a well that was constructed by the Colorado Water Conservation Board.

N & S – Are suffixes given to wells that were registered together at one time, and have no significant meaning.