Drinking Water Source Assessment

Water System

Snowcrest Heights Improvement Association

San Bernardino County

Water Sources

Chapman Spring

Minnich Spring

Irongate Spring

Assessment Date

October 15, 2025

California Department of Health Services Drinking Water Field Operations Branch DHS ____
District 36

District No.	**36**
System No.	CA3600262 **Source No.**
PS Code	1. CA3600262_004_004 2. CA3600262_001_001, 3. CA3600262_005_005

Checklist for Drinking Water Source Assessment - Ground Water Source

District Name _____ District No. 36_ County San Bernardino
System Name *Snowcrest Heights Improvement Association* System No. CA3600262
Source Name *1. Chapman 2. Minnich 3. Irongate Springs*
Source No._____
PS Code: 1. CA3600262_004_004 2. CA3600262_001_001, 3. CA3600262_005_005

Completed by Mark McReynolds Date October 15, 2025

The following information should be contained in the drinking water source assessment submittal.

X Cover Page

X Checklist *(this form)*

X Assessment Summary

X Vulnerability Summary

No Source Location Form *(not currently available, contact DHS for information)*

X Delineation of groundwater protection zones

_____ Source Data Sheet (select appropriate

_____ form) Well Data Sheet

X Spring Data Sheet – explanation in SHIA Use of Springs Doc

_____ Horizontal Well Data Sheet

X Physical Barrier Effectiveness Checklist

X Possible Contaminating Activities (PCA) inventory form

X Vulnerability Ranking

X Assessment map with source location and protection zone

No Additional maps (optional) (e.g. local maps of zones and PCAs, recharge area maps, or maps indicating direction of ground water flow)

X Means of Public Availability of Report (indicate those that will be used)

X Notice in the Consumer Confidence Report* (minimum)
X Copy in regulatory agency (DHS or LPA) office (minimum)
_____ Copy in public water system office (recommended)
_____ Copy in public library/libraries
_____ Internet (indicate Internet address: _____)
_____ Other (describe)

*The CCR should indicate where customers can review the assessments.

Assessment Summary

District Name _____ District No. 36 County *San Bernardino*
System Name *Snowcrest Heights Improvement Association* System No. CA3600262
_____ Source Name *1. Chapman 2. Minnich 3. Irongate Springs*
Source No. _____ PS Code: 1. CA3600262_004_004 2. CA3600262_001_001, 3. CA3600262_005_005.

Completed by Mark McReynolds_____ Date October **15**, 2025_____

Description of System and Sources

The Snowcrest Heights Improvement Association water system is located in San Bernardino County and serves the USFS Recreational Residence Tracts northeast of the mountain village of Mt Baldy: Manker, Icehouse Canyon, San Antonio Falls, Upper San Antonio Falls, Glacier and a small privately-owned group of cabins. Every cabin in the tracts belongs to the Snowcrest Improvement Association, a non-profit that distributes water and conducts other community business. There are approximately 120 service connections serving a seasonally variable population of 600.

The drinking water sources for the Snowcrest Heights Improvement Association Water system are Chapman, Minnich and Irongate Springs located in the uppermost regions of the San Antonio Creek watershed of the Angeles National Forest. The recharge area for the sources includes approximately 2.88 sq. miles above 5,500 ft. in elevation. An average of 25.5 inches of precipitation (2018-2024) has been recorded at 4,200 ft. (San Antonio Water Company data). Higher elevations, from which SHIA gets its water, have higher precipitation levels. General land use is forested with some of the area designated as national monument. The entire area is largely undeveloped aside from the recreational use cabins, the ski lifts, Snowcrest Lodge, Harwood Lodge and the Zen Center.

Assessment Procedures

The assessment of the sources (Chapman, Minnich, Irongate Springs) was conducted by SHIA and reviewed by the California Rural Water Association. The following sources of information were used in the assessment: water system files, previous studies, and internet and publicly available data sources.

Contents of this Assessment

Yes ▲ **Assessment Summary**

Yes ▲ **Vulnerability Summary**

Yes ▲ **Source Location Form**

Yes	☒		**Delineation of Protection Zones**
Yes	☒		**Physical Barrier Effectiveness Checklist**
	No	☒	**Source Data Sheet**
Yes	☒		**Inventory of Possible Contaminating Activities**
Yes	☒		**Vulnerability Ranking**
Yes	☒		**Assessment Map**

Comments: Each spring is considered separately below.

Chapman Spring

Via interpretation of the Geologic Map of the Telegraph Peak Quadrangle by Dibblee 2003, Chapman Spring is directly within the fault zone of the northeasterly trending San Antiono Fault. The fault separates large stretches of cataclastic gneiss to the southwest from Pelona schist to the northwest, both are metamorphic rock. The ski lift line follows Sugar Pine Canyon to the Lodge at the beginning of the canyon. Chapman Spring's box is buried below the surface of Sugar Pine Canyon and at the junction of the Hocumac Canyon tributary. Water runs down Sugar Pine Canyon during snowmelt, but otherwise it is dry the rest of the year with water running through underground sediments. Hocumac Canyon has at least one spring in it and groundwater from it may connect with the Sugar Pine Canyon groundwater. One study says this: Chapman Spring "exists because of bedrock barriers or "dams" that force groundwater contained in alluvium or talus to the surface. At Chapman Spring flow is enhanced by favorably oriented bedrock fracture systems that channel deep-seated groundwater into narrow, near-surface conduits" (Nourse, 2003). This spring delivers less water as the season turns to summer and may go dry in the fall or winter. Data on use and overflow from a 2011 report done by hydrogeologist Robbie Warner, but use has not changed since the number of users has remained the same. This spring's watershed is approximately 140 acres.

Dibblee, Thomas W., Jr., 2002, Geologic Map of the Mt. Baldy Quadrangle California: Thomas W. Dibblee Foundation, Santa Barbara, California.

Nourse, Jonathan, 2003. Evaluation of Groundwater Flow Near Chapman Spring, San Gabriel Mountains, California, With Recommendations for Enhancing the Water Collection System. Report for SHIA Dept. of Geological Sciences, Cal Poly Pomona.

Vulnerability Summary: Chapman Spring

District Name _____ District No. 36___ County: San Bernardino

System Name *Snowcrest Heights Improvement Association* System No. CA3600262

Source Name Chapman Spring Source No. PS Code: CA3600262_004_004

Completed by Mark McReynolds Date October 15, 2025

THE FOLLOWING INFORMATION MUST BE INCLUDED IN THE SYSTEM CONSUMER CONFIDENCE REPORT

An updated source water assessment was conducted for the *Chapman Spring* of the *SHIA* water system in *October 2025*.

There have been no contaminants detected in this spring's water supply, however the source is still considered vulnerable to activities located near the drinking water source. SHIA monitors the Chapman Spring area on a monthly or more frequent basis. This spring is underground and can not be fenced due to it being in a ski path and because fencing it will draw attention to the water source with hikers commonly skirting the spring on their way up Sugarpine Canyon. Now all that can be seen is an unobtrusive pipe (that protects the valves) and a boulder strewn canyon bottom.

The source is considered most vulnerable to the following ranked activities not associated with any detected contaminants:

Mining Operations – Historic. There are large areas within the upper watershed that were subject to hydraulic mining for placer gold. In theory mercury may have been used in processing the fine gold that was concentrated. There have been no indications of significant mercury in any water

testing.

Water wells are a possible contamination source, but these are well maintained by the Mt. Baldy Ski Lifts and no indication of contamination have been traced to them.

While there is a small dirt road, the traffic on it is mainly hikers as it is gated and locked.

Recreation contamination is possible if large numbers of hikers contaminate the area with feces, but so far that has not been an issue resulting in coliform readings.

Not listed in the state PCAs is the impact of firefighting sprays. Some contain toxics for wildlife and include PFAs – a class of chemicals we are only beginning to understand and regulate in drinking water. Heavy use of firefighting sprays and retardants that contain PFAs could contaminate surface and eventually groundwater.

Delineation of Ground Water Protection Zones

District Name District No. 36 County: San Bernardino

System Name *Snowcrest Heights Improvement Association* System No. CA3600262

Source Name Chapman Spring Source No. PS Code: CA3600262_004_004

Completed by Mark McReynolds Date October 15, 2025

Indicate the method used to delineate the zones:

(X Calculated Fixed Radius (Default) (Show calculations below)

Calculated Fixed Radius Equation

Chapman Spring has no associated well. Water is collected by perforated pipes and is then gravity-fed into the water system so there is no pump. Q, maximum pumping capacity in the calculation below, was therefore assumed to be the avg. maximum consumptive use in ft^3/year plus total avg. overflow in ft^3/year.

Chapman Spring Fixed Radius is R_2 = 2,367 ft., R_5 = 3,743 ft., R_{10} = 5,293 ft.

The equation for the calculated fixed radius (R) is $R_t = \sqrt{Q\,t / \pi\,\eta\,H}$

R_t = R_2, R_5, or R_{10} corresponding to t (Calculate R for each travel time)

Q = maximum pumping capacity of well
ft^3/year = (used 5.8 ac ft. yr + overflow
34.6 ac ft. yr) = 1,759,824 ft^3/year

t = time of travel (years), 2, 5 and 10 years

π = 3.1416

η = effective porosity, unknown, assumed to be 0.2

H = screened interval of well (feet). Not a well, but used10 ft minimum.

Calculated Fixed Radius Delineation Method (Default)

Using the equation presented above, calculate the size of zones for the appropriate aquifer setting of the source.

Porous Media Aquifer

Zone A (2 year TOT) R_2 = 2,367 ft., minimum = 600 ft —use larger: 2,367 ft.
Zone B5 (5 year TOT) R_5 = 3,743 ft., minimum = 1,000 ft—use larger: 3,743 ft.
Zone B10 (10 year TOT) R_{10} = 5,293 ft., minimum = 1,500 ft—use larger: 5,293 ft.

Physical Barrier Effectiveness Checklist - Ground Water Source

District Name _____ District No. 36___ County: San Bernardino
System Name *Snowcrest Heights Improvement Association* System No. CA3600262
Source Name Chapman Spring_____ Source No. _____ PS Code: CA3600262_004_004

Drinking Water Source Assessment and Protection (DWSAP) Program

Completed by Mark McReynolds Date October 15, 2025

Physical Barrier Effectiveness (PBE) – Ground Water, page 1 of 2

Source Name: Chapman Spring PS Code: CA3600262_004_004

PARAMETER	*POINTS*			
	Unconfined		Confined	
A. TYPE OF AQUIFER Confinement *(up to **50** points maximum)* choose one				
a. Unconfined, Semi-confined, Fractured Rock, Unknown	0	X		
b. Confined			50	
B. AQUIFER MATERIAL (Unconfined Aquifer) Type of materials within the aquifer *(up to **20** points maximum)* choose one				
1. Porous Media (Interbedded sands, silts, clays, gravels) with continuous clay layer minimum 25' thick above water table within Zone A	0			
2. Porous Media (Interbedded sands, silts, clays, and gravels)	0	X		
3. Fractured rock * (* Low Physical Barrier Effectiveness - no further questions required)	0			
C. PATHWAYS OF CONTAMINATION (All Aquifers) Presence of Abandoned or Improperly Destroyed Wells *(up to **10** points maximum)*				
1. Are they present within Zone A (2-year time of travel (TOT) distance)?				
a. Yes or unknown	0		0	
b. No	0	X	5	
2. Are they present within Zone B5 (2- to 5-year TOT distance)?				
a. Yes or unknown	0		0	
b. No	0	X	3	
3. Are they present within Zone B10 (5- to 10-year TOT distance)?				
a. Yes or unknown	0		0	
b. No	0	X	2	
D. STATIC WATER CONDITIONS (Unconfined Aquifer) Depth to static Water (DTW) = 10 feet *(up to **10** points maximum)* choose one				
1. 0 to 20 feet	20	X		
2. 20 to 50 feet	0			
3. 50 to 100 feet	0			
4. > 100 feet	0			
E. WELL OPERATION (Unconfined Aquifer). Chapman Spring is not a well. Perforated pipe is buried. "Pumping rate" below is avg. flow. H is an estimate. Depth to Uppermost Perforations (DUP) DUP = 10 feet; Maximum Pumping Rate of Well (Q) Q = 25 gallons/minute; Length of screened interval (H) H = 20 feet; [(DUP – DTW) / (Q/H)] = *(up to **10** points maximum)* choose one				
1. < 5	0			
2. 5 to 10	5			
3. > 10	10	X		

PARAMETER	*POINTS*	
	Unconfined	Confined

F. HYDRAULIC HEAD (Confined Aquifer) What is the relationship in hydraulic head between the confined aquifer and the overlying unconfined aquifer? (i.e. does the well flow under artesian conditions?) *(up to **20** points maximum)* choose one				
1. head in confined aquifer is higher than head in unconfined aquifer under all conditions			20	
2. head in confined aquifer is higher than head in unconfined aquifer under static conditions			10	
3. head in confined aquifer is lower than or same as head in unconfined aquifer			0	
4. unknown			0	
G. WELL CONSTRUCTION (All Aquifers) 1. Sanitary Seal (Annular Seal) Depth = 10____ feet *(up to **10** points maximum)* choose one				
a. None or less than 20 feet deep	10	X	0	
b. 20 to 50 ft deep	0		10	
c. 50 ft or greater	0		10	
2. Surface seal (concrete cap) *(up to **4** points maximum)* choose one				
a. Not present or improperly constructed	0	X	0	
b. Watertight, slopes away from well, at least 2' laterally in all directions	4		4	
3. Flooding potential at well site *(up to **1** point maximum)* choose one				
a. Subject to localized flooding (i.e. in low area or unsealed pit or vault) or Within 100 year flood plain	0	X	0	
b. Not subject to flooding	1		1	
4. Security at well site *(up to **5** points maximum)* choose one				
a. Not secure	0		0	
b. Secure (i.e. housing, fencing, etc.)	5	X	5	
Maximum Points Possible	70		100	
POINT TOTAL FOR THIS SOURCE	45			

Physical Barrier Effectiveness SCORE INTERPRETATION

Point Total		Effectiveness	
____**0 to 35**	=	**Low**	(includes all sources in Fractured Rock)
__**X**__**36 to 69**	=	**Moderate**	
____**70 to 100**	=	**High**	

Possible Contaminating Activities (PCA) Inventory Form - Ground Water

District Name _____ District No. 36___ County: San Bernardino

System Name *Snowcrest Heights Improvement Association* System No. CA3600262

Source Name Chapman Spring_____ Source No. _____ PS Code: CA3600262_004_004

Completed by Mark McReynolds Date October 15, 2025

Check the PCA tables that will be used for this drinking water source (assessment must include the "Other" checklist and at least one of the remaining three checklists):

Commercial/Industrial _____

Residential/Municipal _____

Agricultural/Rural X____

Other (required for all) X____

Risk Ranking of PCAs, where VH = Very High Risk, H = High Risk, M = Moderate Risk, L = Low Risk

PCA Checklist AGRICULTURAL/RURAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Septic systems - low density (<1/acre) (H in Zone A, otherwise L)	None	No impact to this spring.	No impact to this spring.	The Mt Baldy Ski Lodge at Baldy Notch has a septic system that runs north and does not drain into this watershed. Manker Flat Tract cabins to SW are far from the watershed and much lower in elevation
Mining operations - Historic (VH)	Yes	Yes	No impact to this spring. Outside watershed.	Surface hydraulic gold placer mining, no significant residues ever detected of Hg. This mining largely occurred outside Zone A
Campgrounds/ Recreational areas (L)	Yes	Yes	No impact to this spring. Outside watershed.	The entire area is heavily used by hikers, backpackers and skiers. There are tent cabins associated with the Mt Baldy Ski Lodge.
Wells - Water supply (M)	Yes	Yes	No impact to this spring. Outside watershed.	Mt Baldy Ski Lifts has a water well within the watershed of this spring. Other SHIA springs are in Zone A. Manker Springs (two sites) are not used by SHIA anymore and can not influence this spring.
Transportation corridors - Roads/ Streets (L)	Yes	Yes	No impact to this spring. Outside	In Zone A, a dirt road, little used by vehicles, goes to the Mt Baldy

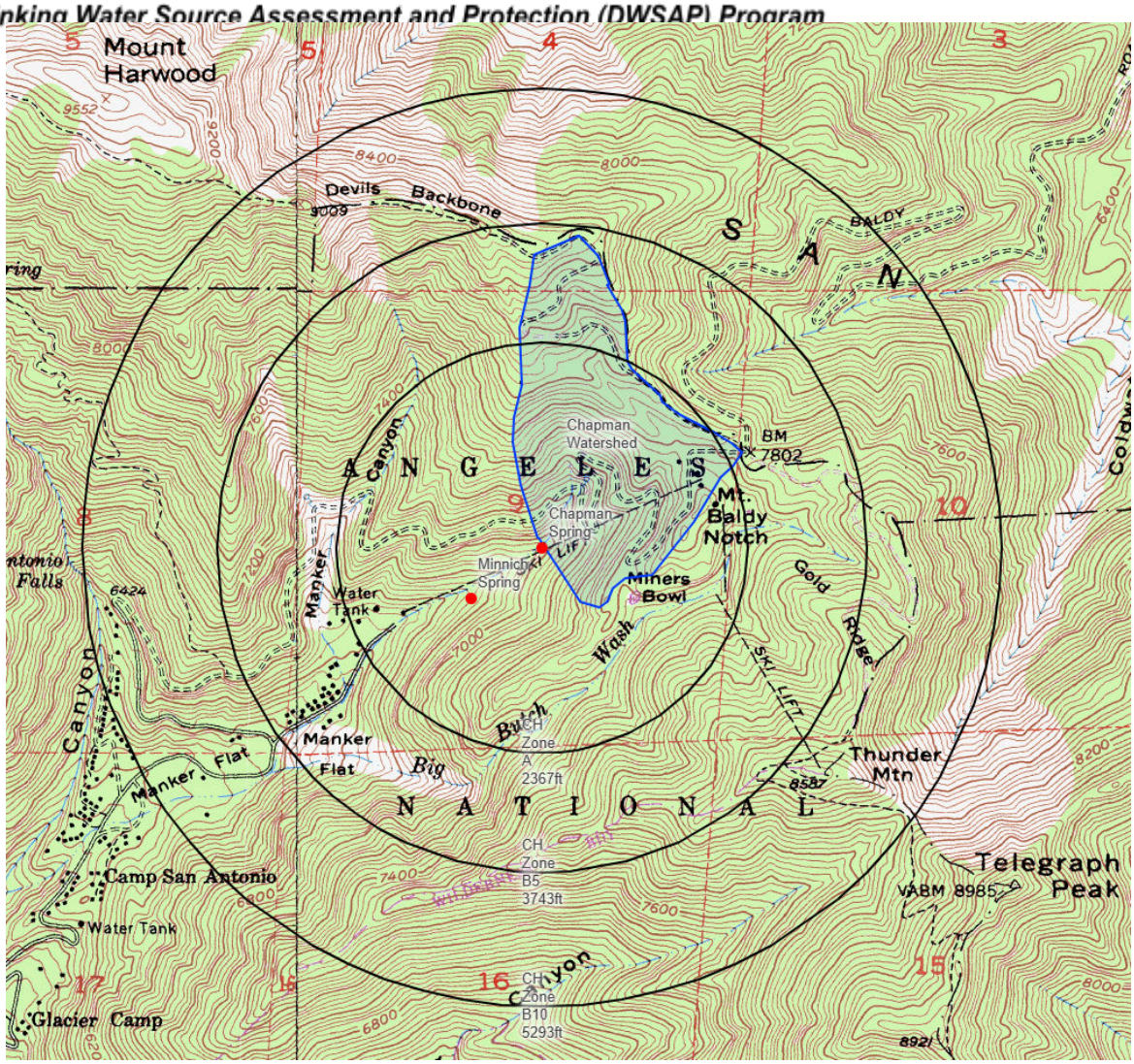
			watershed.	Notch. Hiker use is heavy. Zones B5 and B10 have roads but they are all lower in elevation than this spring.
Surface water - streams/ lakes/rivers (L)	Yes	Yes	No impact to this spring. Outside watershed.	Several small canyons have seasonal watercourses within Zone A. Only Sugar Pine Canyon (what the ski lift goes up) and Hocumac Canyon, a minor tributary of Sugar Pine Canyon, flow within this watershed. 90% of Zone B5 and all of B10 are outside the watershed for this spring.

Vulnerability Ranking – Ground Water

Zone	PCA (Risk)	PCA Risk Points VH = 7 H = 5 M = 3 L = 1	Zone Points A = 5 B5 = 3 B10 = 1 Unknown = 0	PBE Points L = 5 M = 3 H = 1	Vulnerability Score Risk + Zone + PBE points
A	Mining operations - Historic (VH)	7	5	3	15
B5	Mining operations - Historic (VH)	7	3	3	13
A	Wells – Water supply (M)	3	5	3	11
A	Campgrounds/ Recreational areas (L)	1	5	3	9
A	Transportation Corridors- Roads/ Streets (L)	1	5	3	9
A	Surface water - streams/ lakes/rivers (L)	1	5	3	9
B5	Wells – Water supply (M)	3	3	3	9
B5	Campgrounds/ Recreational areas (L)	1	3	3	7
B5	Surface water - streams/ lakes/rivers (L)	1	3	3	7
B5	Transportation Corridors- Roads/ Streets (L)	1	3	3	7

Groundwater Assessment Map

Chapman Spring Protection Zones Delineation map
CalTopo Software https://caltopo.com/m/99473G5



Minnich Spring

Via interpretation of the Geologic Map of the Telegraph Peak Quadrangle by Dibblee 2003, Minnich Spring is on the edge or within the fault zone of the northeasterly trending San Antiono Fault. The fault separates large stretches of cataclastic gneiss to the southwest from Pelona schist to the northwest, both are metamorphic rock. Minnich Spring is approximately 50 feet above the bed of Sugar Pine Canyon, a seasonal stream and so is not impacted by it, except possibly by catastrophic flooding. The ski lift line follows Sugar Pine

Canyon to the Lodge at the beginning of the canyon. Field observations are that the spring lies at the bottom of a large and long talus slope. It appears water seeps through the rocky talus slopes above and exits at the spring where talus quits and the San Antonio Fault is encountered. This spring delivers less and less water as the season turns to summer and may go dry. Data on use and overflow from a 2011 report done by hydrogeologist Robbie Warner, but use has not changed since the number of users has remained the same. This spring's watershed is approximately 200 acres.

Dibblee, Thomas W., Jr., 2003, Geologic Map of the Telegraph Peak Quadrangle California: Thomas W. Dibblee Foundation, Santa Barbara, California.

Vulnerability Summary: Minnich Spring

District Name _____ District No. 36___ County: San Bernardino
System Name *Snowcrest Heights Improvement Association* System No. CA3600262
Source Name Minnich Spring_____ Source No. _____ PS Code: CA3600262_001_001

Completed by Mark McReynolds_____ Date October 15, 2025_____

THE FOLLOWING INFORMATION MUST BE INCLUDED IN THE SYSTEM CONSUMER CONFIDENCE REPORT

An updated source water assessment was conducted for the _____*Minnich Spring*_____ of the _____*SHIA*_____water system in *October 2025*.

There have been no contaminants detected in this spring's water supply, however the source is still considered vulnerable to activities located near the drinking water source. SHIA monitors the Minnich Spring area on a monthly or more frequent basis. This spring was fenced September 2025.

The source is considered most vulnerable to the following ranked activities not associated with any detected contaminants:

Mining Operations – Historic. There are large areas within the watershed that were subject to hydraulic mining for placer gold. In theory mercury may have been used in processing the fine gold that was concentrated. There have been no significant indications of mercury in any water testing.

While there is a small dirt road, the traffic on it is mainly hikers as it is gated and locked.

Recreation contamination is possible if large numbers of hikers contaminate the area with feces, but so far that has not been an issue resulting in coliform readings.

Not listed in the state PCAs is the impact of firefighting sprays. Some contain toxics for wildlife and include PFAs – a class of chemicals we are only beginning to understand and regulate in drinking water. Heavy use of firefighting sprays and retardants that contain PFAs could contaminate surface and eventually groundwater.

Delineation of Ground Water Protection Zones

District Name _____ District No. 36___ County: San Bernardino

Drinking Water Source Assessment and Protection (DWSAP) Program

System Name *Snowcrest Heights Improvement Association* System No. CA3600262

Source Name Minnich Spring_____ Source No. _____ PS Code: CA3600262_001_001

Completed by Mark McReynolds_____ Date October 15, 2025_____

Indicate the method used to delineate the zones:

(X_____Calculated Fixed Radius (Default) (Show calculations below)

Calculated Fixed Radius Equation

Minnich Spring has no associated well. Water is collected by perforated pipes and is then gravity-fed into the water system so there is no pump. Q, maximum pumping capacity in the calculation below, was therefore assumed to be the avg. maximum consumptive use in ft^3/year plus total avg. overflow in ft^3/year. To summarize: for this spring Q is the total avg. annual flow.

Minnich Spring Fixed Radius is R_2 = 1,494 ft., R_5 = 2,362 ft., R_{10} = 3,341 ft.

The equation for the calculated fixed radius (R) is $R_t = \sqrt{Q\,t / \pi\,\eta\,H}$

R_t = R_2, R_5, or R_{10} corresponding to t (Calculate R for each travel time)

Q = maximum pumping capacity of well
ft^3/year = (used 2.3 ac ft. yr + overflow 13.8 ac ft. yr) = 701,306 ft^3/year

t = time of travel (years), 2, 5 and 10 years

π = 3.1416

η = effective porosity, unknown, assumed to be 0.2

H = screened interval of well (feet). Not a well, but used10 ft. minimum).

Calculated Fixed Radius Delineation Method (Default)

Using the equation presented above, calculate the size of zones for the appropriate aquifer setting of the source.

Porous Media Aquifer

Zone A (2 year TOT) R2 = 1,494 ft., minimum = 600 ft. —use larger: 1,494 ft.

Zone B5 (5 year TOT) R5 = 2,362 ft., minimum = 1,000 ft.—use larger: 2,362 ft.

Zone B10 (10 year TOT) R10 = 3,341 ft., minimum = 1,500 ft.—use larger: 3,341 ft.

Physical Barrier Effectiveness Checklist - Ground Water Source

District Name _____ District No. 36___ County: San Bernardino

System Name *Snowcrest Heights Improvement Association* System No. CA3600262

Source Name Minnich Spring_____ Source No. _____ PS Code: CA3600262_001_001

Completed by Mark McReynolds_____ Date October 15, 2025_____

Physical Barrier Effectiveness (PBE) – Ground Water, page 1 of 2

Source Name: Minnich Spring_____PS Code: CA3600262_001_001___

PARAMETER	*POINTS*			
	Unconfined		Confined	
A. TYPE OF AQUIFER Confinement *(up to **50** points maximum)* choose one				
a. Unconfined, Semi-confined, Fractured Rock, Unknown	0	X		
b. Confined			50	
B. AQUIFER MATERIAL (Unconfined Aquifer) Type of materials within the aquifer *(up to **20** points maximum)* choose one				
1. Porous Media (Interbedded sands, silts, clays, gravels) with continuous clay layer minimum 25' thick above water table within Zone A	0			
2. Porous Media (Interbedded sands, silts, clays, and gravels)	0	X		
3. Fractured rock * (* Low Physical Barrier Effectiveness - no further questions required)	0			
C. PATHWAYS OF CONTAMINATION (All Aquifers) Presence of Abandoned or Improperly Destroyed Wells *(up to **10** points maximum)*				
1. Are they present within Zone A (2-year time of travel (TOT) distance)?				
a. Yes or unknown	0		0	
b. No	0	X	5	
2. Are they present within Zone B5 (2- to 5-year TOT distance)?				
a. Yes or unknown	0		0	
b. No	0	X	3	
3. Are they present within Zone B10 (5- to 10-year TOT distance)?				
a. Yes or unknown	0		0	
b. No	0	X	2	
D. STATIC WATER CONDITIONS (Unconfined Aquifer) Depth to static Water (DTW) = _____1 feet *(up to **10** points maximum)* choose one				
1. 0 to 20 feet	20	X		
2. 20 to 50 feet	0			
3. 50 to 100 feet	0			
4. > 100 feet	0			
E. WELL OPERATION (Unconfined Aquifer). Chapman Spring is not a well. Perforated pipe is buried. "Pumping rate" below is avg. flow. H is an estimate. Depth to Uppermost Perforations (DUP) DUP = 10_____ feet Maximum Pumping Rate of Well (Q) Q = 10_____ gallons/minute Length of screened interval (H) H = 20_____ feet [(DUP – DTW) / (Q/H)] = *(up to **10** points maximum)* choose one				
1. < 5	0			
2. 5 to 10	5			
3. > 10	10	X		

PARAMETER	*POINTS*			
	Unconfined		Confined	
F. HYDRAULIC HEAD (Confined Aquifer) What is the relationship in hydraulic head between the confined aquifer and the overlying unconfined aquifer? (i.e. does the well flow under artesian conditions?) *(up to **20** points maximum)* choose one				
1. head in confined aquifer is higher than head in unconfined aquifer under all conditions			20	
2. head in confined aquifer is higher than head in unconfined aquifer under static conditions			10	
3. head in confined aquifer is lower than or same as head in unconfined aquifer			0	
4. unknown			0	
G. WELL CONSTRUCTION (All Aquifers) 1. Sanitary Seal (Annular Seal) Depth = 10_____ feet *(up to **10** points maximum)* choose one				
a. None or less than 20 feet deep	10	X	0	
b. 20 to 50 ft deep	0		10	
c. 50 ft or greater	0		10	
2. Surface seal (concrete cap) *(up to **4** points maximum)* choose one				
a. Not present or improperly constructed	0	X	0	
b. Watertight, slopes away from well, at least 2' laterally in all directions	4		4	
3. Flooding potential at well site *(up to **1** point maximum)* choose one				
a. Subject to localized flooding (i.e. in low area or unsealed pit or vault) or Within 100 year flood plain	0	1	0	
b. Not subject to flooding	1	X	1	
4. Security at well site *(up to **5** points maximum)* choose one				
a. Not secure	0		0	
b. Secure (i.e. housing, fencing, etc.)	5	X	5	
Maximum Points Possible	70		100	
POINT TOTAL FOR THIS SOURCE	46			

Physical Barrier Effectiveness SCORE INTERPRETATION

Point Total		**Effectiveness**	
_____**0 to 35**	**=**	**Low**	(includes all sources in Fractured Rock)
__**X**__**36 to 69**	**=**	**Moderate**	
_____**70 to 100**	**=**	**High**	

Drinking Water Source Assessment and Protection (DWSAP) Program

Possible Contaminating Activities (PCA) Inventory Form - Ground Water

District Name _____ District No. 36___ County: San Bernardino
System Name *Snowcrest Heights Improvement Association* System No. CA3600262
Source Name Minnich Spring_____ Source No. _____ PS Code: CA3600262_001_001
Completed by Mark McReynolds_____ Date October 15, 2025

Check the PCA tables that will be used for this drinking water source (assessment must include the "Other" checklist and at least one of the remaining three checklists):

Commercial/Industrial _____

Residential/Municipal _____

Agricultural/Rural X____

Other (required for all) X____

Risk Ranking of PCAs, where VH = Very High Risk, H = High Risk, M = Moderate Risk, L = Low Risk

PCA Checklist AGRICULTURAL/RURAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Septic systems - low density (<1/acre) (H in Zone A, otherwise L)	None	None.	None	The Mt Baldy Ski Lodge at Baldy Notch has a septic system that runs north and does not drain into this watershed. Manker Flat Tract cabins to SW are far from the watershed and much lower in elevation
Mining operations - Historic (VH)	Yes	Yes	Yes	Surface hydraulic gold placer mining, no significant residues ever detected of Hg. This mining largely occurred outside Zone A, B5 and B10 but the mining areas are within the watershed
Campgrounds/ Recreational areas (L)	Yes	Yes	Yes	The entire area is heavily used by hikers, backpackers and skiers. There are tent cabins associated with the Mt Baldy Ski Lodge.
Wells - Water supply (M)	Yes	Yes	No impact to this spring. Outside watershed.	Chapman Spring is above and in the Minnich's watershed, but not hydrologically connected to Minnich due to Minnich's elevation above the Sugar Pine Canyon – about 30 feet.
Transportation corridors - Roads/ Streets (L)	Yes	Yes	Yes	In Zone B5, a dirt road, little used by vehicles, goes to the Mt Baldy

				Notch. Hiker use is heavy.
Surface water - streams/ lakes/rivers (L)	Yes	Yes	Yes	Several small canyons have seasonal watercourses within Zone A, B5 and B10. Sugar Pine Canyon (what the ski lift goes up) and Hocumac Canyon, a minor tributary of Sugar Pine Canyon, flow within this watershed. 50% or more of Zones A, B5 and B10 are outside the watershed for this spring.

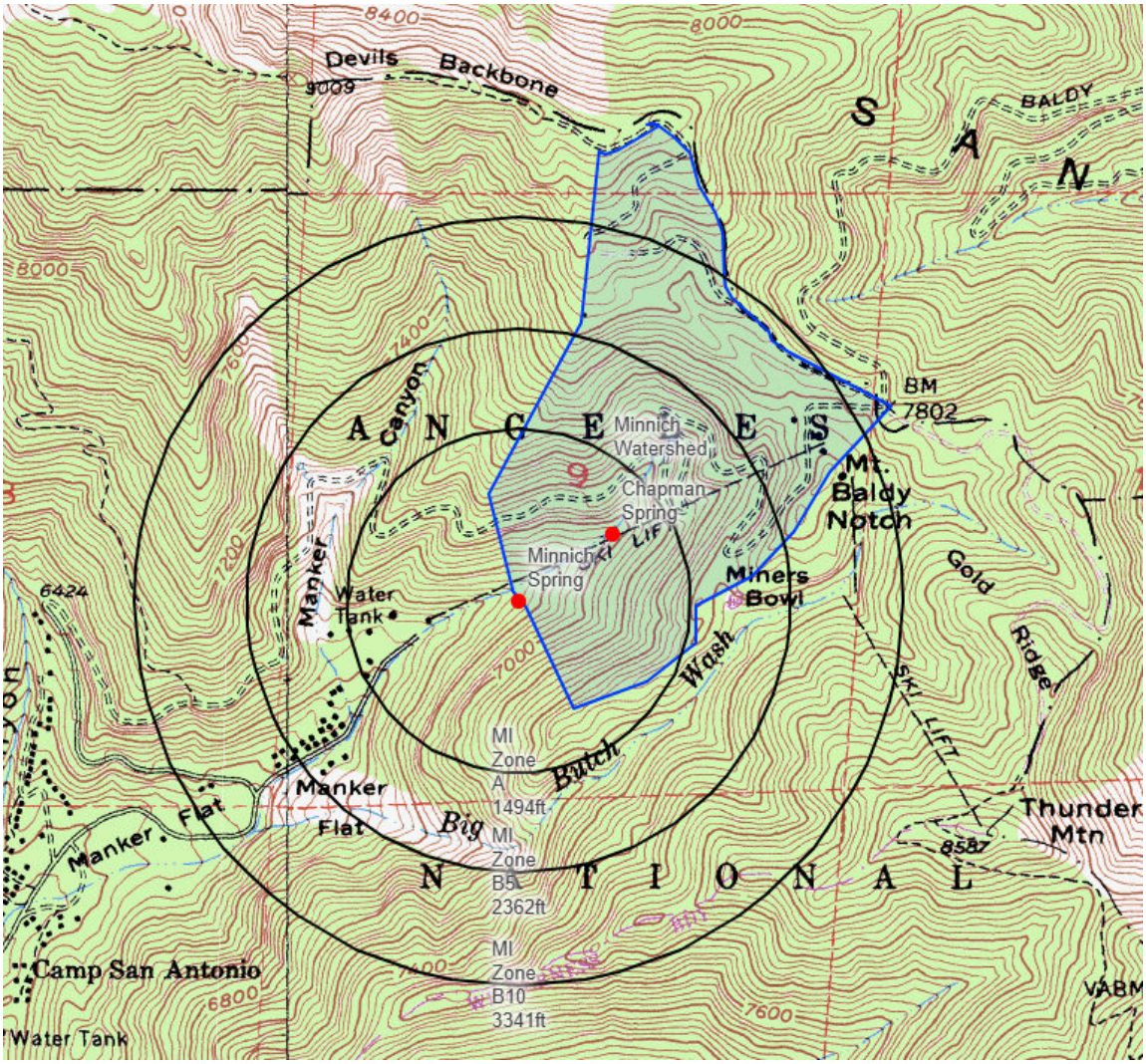
Vulnerability Ranking – Ground Water

Source Name: Minnich Spring | Source No. | | PS Code: | CA3600262_001_001

Zone	PCA (Risk)	PCA Risk Points VH = 7 H = 5 M = 3 L = 1	Zone Points A = 5 B5 = 3 B10 = 1 Unknown = 0	PBE Points L = 5 M = 3 H = 1	Vulnerability Score Risk + Zone + PBE points
A	Mining operations - Historic (VH)	7	5	3	15
B5	Mining operations - Historic (VH)	7	3	3	13
B10	Mining operations - Historic (VH)	7	1	3	11
A	Campgrounds/ Recreational areas (L)	1	5	3	9
A	Surface water - streams/ lakes/rivers (L)	1	5	3	9
B5	Campgrounds/ Recreational areas (L)	1	3	3	7
B5	Transportation Corridors- Roads/ Streets (L)	1	3	3	7
B5	Surface water - streams/ lakes/rivers (L)	1	3	3	7
B10	Campgrounds/ Recreational areas (L)	1	1	3	5
B10	Transportation Corridors- Roads/ Streets (L)	1	1	3	5
B10	Surface water - streams/ lakes/rivers (L)	1	1	3	5

Groundwater Assessment Map

Minnich Spring Protection Zones Delineation map
CalTopo Software



Irongate Spring

Via interpretation of the Geologic Map of the Mount San Antonio Quadrangle by Dibblee 2002, the Irongate Spring lies directly atop the San Antonio Canyon Fault and at the very edge of a large geomorphic structure that Dibblee says is “late Pleistocene older undissected surficial sediments”, but is actually “very old landslide deposits” which fell from the eastern reaches of the Baldy Bowl area, filled the San Antonio Creek and created a large hill in the canyon, Morton and Miller (2003). Mt Baldy Road starts to switchback up the toe of the landslide past the entrance to Icehouse Canyon. The Manker Flats Avalanche deposits are unstratified and composed of various particle sizes from gravel to 10 foot plus boulders which creates geological strata that is very porous Gentile (2018).

San Antonio Creek, at least 100 ft. from and approximately 40 ft. higher from the San Antonio Creek channel, does not influence Irongate Spring, though it might intersect it a very large flood situation. Water from this spring could be percolation through the avalanche material that hits bedrock and is forced out there. It could also be connected to the San Antonio Fault that it sits atop. This spring runs continuously year-round and

even when maximum pumping occurs it still overflows into the ravine which carries its water to San Antonio Creek. An undeveloped, natural, spring occurs just north of the Big Butch Wash confluence on the same side of San Antonio Creek as the Irongate Spring, and it is in the same geomorphological conditions as the Irongate

Spring. That spring may be hydrologically connected to Irongate Spring. Big Butch Wash likely has springs in its bottom reaches since water occurs there and not further up in the wash unless there has been recent precipitation or snowmelt. These possible springs in Big Butch Wash, and the two other springs mentioned, including Irongate Spring, appear to source water from the bottom of this landslide which. Surface runoff watershed that could impact the Irongate Spring is quite small at 12 acres so it is clear the spring is groundwater.

Data on use and overflow from a 2011 report done by hydrogeologist Robbie Warner and uses the same numbers to describe use and overflow for both Chapman and Irongate Springs. Irongate Spring use has not changed since the number of users has remained the same.

Dibblee, Thomas W., Jr., 2002, Geologic Map of the Mount San Antonio Quadrangle California: Thomas W. Dibblee Foundation, Santa Barbara, California.

Gentile, Christopher Ryan, 2018, A Study of Rock Avalanche Deposits in San Antonio Canyon, San Gabriel Mountains, California. UC Riverside thesis. https://escholarship.org/uc/item/3cx7m4bv

Morton, D.M., and Miller, F.K. 2003, Preliminary geologic map of the San Bernardino 30' x 60' quadrangle, California: U.S. Geological Survey Open-File Report 03-293.

Vulnerability Summary: Irongate Spring

District Name _____ District No. 36___ County: San Bernardino
System Name *Snowcrest Heights Improvement Association* System No. CA3600262
Source Name Irongate Spring_____ Source No. _____ PS Code: CA3600262_005_005
Completed by Mark McReynolds_____ Date October 15, 2025_____

THE FOLLOWING INFORMATION MUST BE INCLUDED IN THE SYSTEM CONSUMER CONFIDENCE REPORT

An updated source water assessment was conducted for the _____*Irongate Spring*_____ of the _____*SHIA*_____water system in *October 2025*.

There have been no contaminants detected in this spring's water supply, however the source is still considered vulnerable to activities located near the drinking water source. SHIA monitors the Irongate Spring area on a monthly or more frequent basis. This spring was fenced September 2025.

The source is considered most vulnerable to the following ranked activities not associated with any detected contaminants:

Mining Operations – Historic. There are large areas upstream within the watershed that were subject to hydraulic mining for placer gold. In theory mercury may have been used in processing the fine gold that was concentrated. There have been no significant indications of mercury in any water testing.

Numerous cabins and associated septic systems or pump out tanks are within the watershed. Nine active cabins are sited elevationally above the spring atop the avalanche strata and on a drainage slope that physically intersects the spring. All other cabins in Manker Flats, and the Zen Center, Harwood Lodge and Snowcrest Heights Lodge would have little possibility of

impact as their surface drainages do not intersect with the spring, but flow down San Antonio Canyon, Big

Butch Wash and another unnamed southerly headed intermittent seasonal creek.

Recreation contamination is possible if large numbers of hikers contaminate the area upstream with feces, but so far that has not been an issue resulting in coliform readings. Few people venture off trail to the bottom of San Antonio Canyon where the Irongate Spring lies.

Not listed in the state PCAs is the impact of firefighting sprays. Some contain toxics for wildlife and include PFAs – a class of chemicals we are only beginning to understand and regulate in drinking water. Heavy use of firefighting sprays and retardants that contain PFAs could contaminate surface and eventually groundwater.

Delineation of Ground Water Protection Zones

District Name _____ District No. 36___ County: San Bernardino
System Name *Snowcrest Heights Improvement Association* System No. CA3600262
Source Name Irongate Spring_____ Source No. _____ PS Code: CA3600262_005_005
Completed by Mark McReynolds_____ Date October 15, 2025_____

Indicate the method used to delineate the zones:

(X_____Calculated Fixed Radius (Default) (Show calculations below)

Calculated Fixed Radius Equation

Irongate Spring has no associated well. Water is collected by perforated pipes and is under natural pressure when it hits the surface. System use is via a pump which moves water from this spring to the entire system. This spring is not used year-round, but does flow year-round. It is used primarily used when Minnich and Chapman Springs slow down or dry out beyond what is needed in the summer and fall. Q, maximum pumping capacity is impacted by the pump which can put out 30 gpm – about 10 gpm more than normal system use. Despite full power pumping, excess water flows into a ravine and into San Antonio Canyon. In the calculation below, Q was therefore assumed to be the avg. maximum consumptive use in ft^3/year plus total avg. overflow in ft^3/year.

Irongate Spring Fixed Radius is R_2 = 2,367 ft., R_5 = 3,743 ft., R_{10} = 5,293 ft.

The equation for the calculated fixed radius (R) is $R_t = \sqrt{Q\,t / \pi\,\eta\,H}$

R_t = R_2, R_5, or R_{10} corresponding to t (Calculate R for each travel time)

Q = maximum pumping capacity of well
ft^3/year = (used 5.8 ac ft. yr +
overflow 34.6 ac ft. yr) = 1,759,824
ft^3/year

t = time of travel (years), 2, 5 and 10 years

π = 3.1416

η = effective porosity, unknown, assumed to be 0.2

H = screened interval of well (feet). Not a well, but used10 ft minimum).

Calculated Fixed Radius Delineation Method (Default)

Using the equation presented above, calculate the size of zones for the appropriate aquifer setting of the source.

Porous Media Aquifer

Zone A (2 year TOT) R_2 = 2,367 ft., minimum = 600 ft —use larger: 2,367 ft.

Zone B5 (5 year TOT) R_5 = 3,743 ft., minimum = 1,000 ft—use larger: 3,743 ft.

Zone B10 (10 year TOT) R_{10} = 5,293 ft., minimum = 1,500 ft—use larger: 5,293 ft.

Physical Barrier Effectiveness Checklist - Ground Water Source

District Name _____ District No. 36___ County: San Bernardino

System Name *Snowcrest Heights Improvement Association* System No. CA3600262

Source Name Irongate Spring_____ Source No. _____ PS Code: CA3600262_005_005

Completed by Mark McReynolds_____ Date October 15, 2025_____

Physical Barrier Effectiveness (PBE) – Ground Water, page 1 of 2

Source Name: Irongate Spring_____CA3600262_005_005_____

PARAMETER	*POINTS* Unconfined		Confined	
A. TYPE OF AQUIFER Confinement *(up to **50** points maximum)* choose one				
a. Unconfined, Semi-confined, Fractured Rock, Unknown	0	X		
b. Confined			50	
B. AQUIFER MATERIAL (Unconfined Aquifer) Type of materials within the aquifer *(up to **20** points maximum)* choose one				
1. Porous Media (Interbedded sands, silts, clays, gravels) with continuous clay layer minimum 25' thick above water table within Zone A	0			
2. Porous Media (Interbedded sands, silts, clays, and gravels)	0	X		
3. Fractured rock * (* Low Physical Barrier Effectiveness - no further questions required)	0			
C. PATHWAYS OF CONTAMINATION (All Aquifers) Presence of Abandoned or Improperly Destroyed Wells *(up to **10** points maximum)*				
1. Are they present within Zone A (2-year time of travel (TOT) distance)?				
a. Yes or unknown	0		0	
b. No	0	X	5	
2. Are they present within Zone B5 (2- to 5-year TOT distance)?				
a. Yes or unknown	0		0	
b. No	0	X	3	
3. Are they present within Zone B10 (5- to 10-year TOT distance)?				
a. Yes or unknown	0		0	
b. No	0	X	2	
D. STATIC WATER CONDITIONS (Unconfined Aquifer) Depth to static Water (DTW) = _____1 feet *(up to **10** points maximum)* choose one				
1. 0 to 20 feet	20	X		
2. 20 to 50 feet	0			
3. 50 to 100 feet	0			
4. > 100 feet	0			
E. WELL OPERATION (Unconfined Aquifer). Chapman Spring is not a well. Perforated pipe is buried. "Pumping rate" below is avg. flow. H is an estimate.				

Depth to Uppermost Perforations (DUP) DUP = 10_____ feet Maximum Pumping Rate of Well (Q) Q = 30_____ gallons/minute Length of screened interval (H) H = 20_____ feet [(DUP – DTW) / (Q/H)] = *(up to **10** points maximum)* choose one				
1. < 5	0			
2. 5 to 10	5			
3. > 10	10	X		

PARAMETER	*POINTS*			
	Unconfined		Confined	
F. HYDRAULIC HEAD (Confined Aquifer) What is the relationship in hydraulic head between the confined aquifer and the overlying unconfined aquifer? (i.e. does the well flow under artesian conditions?) *(up to **20** points maximum)* choose one				
1. head in confined aquifer is higher than head in unconfined aquifer under all conditions			20	
2. head in confined aquifer is higher than head in unconfined aquifer under static conditions			10	
3. head in confined aquifer is lower than or same as head in unconfined aquifer			0	
4. unknown			0	
G. WELL CONSTRUCTION (All Aquifers) 1. Sanitary Seal (Annular Seal) Depth = 10_____ feet *(up to **10** points maximum)* choose one				
a. None or less than 20 feet deep	10	X	0	
b. 20 to 50 ft deep	0		10	
c. 50 ft or greater	0		10	
2. Surface seal (concrete cap) *(up to **4** points maximum)* choose one				
a. Not present or improperly constructed	0	X	0	
b. Watertight, slopes away from well, at least 2' laterally in all directions	4		4	
3. Flooding potential at well site *(up to **1** point maximum)* choose one				
a. Subject to localized flooding (i.e. in low area or unsealed pit or vault) or Within 100 year flood plain	0	X	0	
b. Not subject to flooding	1		1	
4. Security at well site *(up to **5** points maximum)* choose one				
a. Not secure	0		0	
b. Secure (i.e. housing, fencing, etc.)	5	X	5	
Maximum Points Possible	70		100	
POINT TOTAL FOR THIS SOURCE	54			

Physical Barrier Effectiveness SCORE INTERPRETATION

Point Total		Effectiveness	
_____	0 to 35 =	**Low**	(includes all sources in Fractured Rock)
__X__	36 to 69 =	**Moderate**	
_____	70 to 100 =	**High**	

Possible Contaminating Activities (PCA) Inventory Form - Ground Water

District Name _____ District No. 36___ County: San Bernardino

System Name *Snowcrest Heights Improvement Association* System No. CA3600262

Source Name Irongate Spring_____ Source No. _____ PS Code: CA3600262_005_005

Completed by Mark McReynolds_____ Date October 15, 2025

Check the PCA tables that will be used for this drinking water source (assessment must include the "Other" checklist and at least one of the remaining three checklists):

Commercial/Industrial _____

Residential/Municipal _____

Agricultural/Rural X____

Other (required for all) X____

Risk Ranking of PCAs, where VH = Very High Risk, H = High Risk, M = Moderate Risk, L = Low Risk

PCA Checklist AGRICULTURAL/RURAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Septic systems - low density (<1/acre) (H in Zone A, otherwise L)	Yes	Yes.	Yes	Many recreational use only cabins in Zones A, B5 and B10, but many used year-round. Upstream there are only 12-15 in the surface watershed drainage area, but Zen Center (Camp San Antonio), Harwood Lodge, and cabins in Manker Flat tract could have an impact.
Mining operations - Historic (VH)	Yes	Yes	Yes	Surface hydraulic gold placer mining occurred upstream outside Zone A, B5 and B10 but tailings were likely washed into Manker Flat. No significant residues of Hg have been detected.
Campgrounds/ Recreational areas (L)	Yes	Yes	Yes	The entire area is heavily

				used by hikers, backpackers and skiers. Hiker use is heavy on portions of trails to Baldy Notch and the Sierra Club Ski Hut which are in B5 and B10. USFS Manker Flats Campground is in B10.
Transportation corridors - Roads/ Streets (L)	Yes	Yes	Yes	Zones A, B5, and B10 are impacted by numerous dirt roads associated with cabins and Harwood Lodge, The Zen Center (Camp Antonio) and Snowcrest Lodge. A dirt road, little used by vehicles, goes to the Mt Baldy Notch. A paved county road runs through all zones.
Hotel/Motel	Yes	No	No	Commercial Snowcrest Lodge, Harwood Lodge (Sierra Club), and the Zen Center (Camp San Antonio) are all within Zone A.
Surface water - streams/ lakes/rivers (L)	Yes	Yes	Yes	San Antonio Creek flows by the spring. This main creek is fed by the headwaters in Baldy Bowl and by intermittent seasonal streams in Manker and Sugar Pine Canyons and Big Butch Wash. None of these surface waters directly impact Irongate Spring except during large floods.

Vulnerability Ranking – Ground Water

VULNERABILITY RANKING MASTER LIST - Ground Water

District Name:	District No.	36	County	San Bernardino
System Name: Snowcrest Heights Improvement Association	System No.	CA3600262		
Source Name: Chapman Spring	Source No.		PS Code:	CA3600262_004_004

Zone	PCA (Risk)	PCA Risk Points VH = 7 H = 5 M = 3 L = 1	Zone Points A = 5 B5 = 3 B10 = 1 Unknown = 0	PBE Points L = 5 M = 3 H = 1	Vulnerability Score Risk + Zone + PBE points
A	Mining operations - Historic (VH)	7	5	3	15
A	Septic systems – low dens.(<1/acre) (H in Zone A, otherwise L)	5	5	3	13
B5	Mining operations - Historic (VH)	7	3	3	13
B10	Mining operations - Historic (VH)	7	1	3	11
A	Transportation Corridors- Roads/ Streets (L)	1	5	3	9
A	Surface water - streams/ lakes/rivers (L)	1	5	3	9
A	Hotels, Motels (L)	1	5	3	9
A	Campgrounds/ Recreational areas (L)	1	5	3	9
B5	Campgrounds/ Recreational areas (L)	1	3	3	7
B5	Septic systems – low dens. (<1/acre) (H in Zone A, otherwise L)	1	3	3	7
B5	Transportation Corridors- Roads/ Streets (L)	1	3	3	7
B5	Surface water - streams/ lakes/rivers (L)	1	3	3	7
B10	Campgrounds/ Recreational areas (L)	1	1	3	5
B10	Transportation Corridors- Roads/ Streets (L)	1	1	3	5
B10	Surface water - streams/ lakes/rivers (L)	1	1	3	5
B10	Septic systems – low dens. (<1/acre) (H in Zone A, otherwise L)	1	1	3	5

Groundwater Assessment Map

Irongate Spring Protection Zones Delineation map
CalTopo Software