

# A

## Infiltration Guidelines

As a stormwater management method, infiltration means ***retaining or detaining water within soils*** to reduce runoff. Infiltration can be a cost-effective method to manage stormwater – if the conditions on your site allow. This appendix includes the following information:

- Groundwater quality concerns related to stormwater infiltration;
- Stormwater controls that promote infiltration;
- General guidelines for selecting and designing infiltration devices;
- Infiltration devices and Class V injection well requirements;
- Specific Santa Clara Valley Water District (Valley Water) guidelines;
- Fact sheet with EPA guidelines on Class V injection wells; and
- Map showing depths to groundwater in the Santa Clara Valley.

### A.1 Groundwater Quality Concerns

Infiltration facilities allow rain and runoff to infiltrate into the soil, helping to reduce the amount of runoff from a development site, and, in some areas, provide groundwater recharge. Infiltration facilities that allow runoff to be filtered through surface soils, such as those incorporated into landscaping, are encouraged where feasible. These include: bioretention and bioinfiltration areas, microdetention in landscaping, and pervious paving on surface soils.

Nonetheless, in some situations infiltration facilities can pose a risk of contaminating groundwater. Before approving their use, municipalities need to work with applicants to determine if the appropriate conditions exist for employing infiltration methods. Protecting groundwater quality is a major concern in the Santa Clara basin, where groundwater provides approximately half of the drinking water supply for 1.7 million residents. Valley Water strictly

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regulates the siting and construction of deep infiltration devices such as stormwater drainage wells.<sup>1</sup>

Figure A-1, at the end of this appendix, shows groundwater depths throughout Santa Clara Valley. In general, the risks associated with infiltration can be managed by:

- Selecting stormwater treatment measures that are appropriate for the land use and location of the development site;
- Locating infiltration devices a minimum of 100 feet horizontally away from any known water supply wells, septic systems, and underground storage tanks;
- Maintaining a vertical distance of at least 10 feet from the base of any infiltration device to the seasonal high groundwater mark;
- Designing landscape drainage features so that they promote infiltration of runoff, but do not inject runoff or provide a direct conduit such that runoff bypasses the natural processes of filtering and transformation that occur in surface or near surface soils; and
- Taking steps to prevent the illegal discharge of wastes to drainage systems, including pollution prevention and source control measures.

### A.2. Stormwater Controls that Promote Infiltration

A wide-range of site-design measures and stormwater treatment measures allow stormwater infiltration and can be categorized as described below.

- A. **Site design measures** – methods such as clustering development or otherwise laying out the site to reduce impervious area, routing drainage from building roofs to landscaped areas, and using pervious pavement.
- B. **Indirect infiltration methods** (also known as **infiltration measures**) allow stormwater runoff to percolate into surface soils. The infiltrated water may either percolate down into subsurface soils, or it may be drained into subsurface pipes. Examples of indirect infiltration methods include bioretention areas, self-treating and self-retaining areas, and unlined detention basins used for infiltration purposes.
- C. **Direct infiltration methods** (also known as **infiltration devices**<sup>2</sup>) are designed to bypass surface soils and transmit runoff directly to subsurface soils and eventually groundwater. These types of devices must be located and designed to limit the potential for groundwater contamination. Examples of direct infiltration methods include dry wells, injection wells, and infiltration trenches (includes French drains).

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<sup>1</sup> SCVWD, 1993. Stormwater Infiltration Devices, Supplement to Standards for the Construction and Destruction of Wells and Other Deep Excavations in Santa Clara County., Attachment 4, Santa Clara Valley Water District Final Draft Well Standard.

<sup>2</sup> The reissued MRP defines “infiltration device” as any structure that is designed to infiltrate stormwater into the subsurface and, as designed, bypass the natural groundwater protection afforded by surface soil.

### A.3 Guidelines for Selecting and Designing Infiltration Devices

Special guidelines must be met if your project proposes to use infiltration devices, including:

- Dry wells;
- Infiltration basins;
- Infiltration and exfiltration trenches (includes french drains);
- Unlined retention basins (i.e., basins with no outlets); and
- Unlined or open-bottomed vaults or boxes installed below grade (includes bubble ups, permeable pavement with underground storage, and subsurface infiltration systems).

In general, do not select infiltration devices for areas where any of the following conditions exist.

- Area is in proximity to or accepting runoff from locations used for chemical use or storage, washing, or waste disposal activities or is located where this may occur in the future;
- Surface and or subsurface soil of the area is contaminated (groundwater remediation site);
- Area has been recently disturbed and not stabilized or landscaped and therefore may have a high sediment load in the runoff; or,
- Soil does not permit infiltration measures to drain standing water within seventy-two (72) hours.

If the site is free of these general site conditions, municipalities must also confirm that the necessary design considerations have been met before approving the proposed infiltration device. General design considerations for stormwater infiltration devices include:

- Infiltrate through surface or near surface soils;
- Incorporate underdrains to convey excess infiltrated stormwater to the storm drain if needed;
- Provide stormwater pretreatment (i.e. sediment removal) if needed; and
- Prevent illegal discharge into infiltration areas through education, signage (such as “No Dumping” stencils), and source controls.

### A.4. Infiltration Devices and Class V Injection Well Requirements

In order to protect underground sources of drinking water, the USEPA regulates some infiltration devices as Class V wells under its Underground Injection Control (UIC) Program. A ***Class V injection well*** is defined as “... any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid

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distribution system.”<sup>3</sup> Infiltration trenches are typically not considered Class V injection wells because they are longer than they are wide. The USEPA’s regulations state that stormwater drainage wells are “authorized by rule” (40 CFR 144), which means they do not require a permit from USEPA if they do not endanger ***underground sources of drinking water***, and they comply with federal UIC requirements. (However, a permit may be required from the Santa Clara County Department of Environmental Health.) For more information, the USEPA’s fact sheet, “When Are Storm Water Discharges Regulated as Class V Wells?” is included at the end of this Appendix.

If your project includes one or more infiltration devices that are regulated as Class V injection wells, you will need to submit basic inventory information about the device(s) to the regional office of the USEPA. Instructions for submitting this information are available on the USEPA Region 9 website at <https://www.epa.gov/uic/underground-injection-control-regulations-and-safe-drinking-water-act-provisions> . Project sponsors are responsible for constructing, operating and closing the infiltration device in a manner that does not risk contaminating underground sources of drinking water. The USEPA may place additional requirements on the infiltration device. Project sponsors should contact the appropriate USEPA staff, identified on the Internet link provided above, to learn what inventory information should be submitted and when.

### **A. 5. Valley Water Infiltration Device Guidelines**

The Santa Clara Valley Water District (Valley Water) manages drinking water resources and provides stewardship for Santa Clara County’s watersheds, reservoirs, streams and groundwater basins. As such, Valley Water is responsible for groundwater quality protection. Concerns regarding the contamination of groundwater may limit the types and locations of stormwater treatment measures that may be used on a project site. The treatment measures of most concern are “infiltration devices”, defined as structures that are designed to bypass the natural filtration of surface soils and to transmit runoff directly to subsurface soils and groundwater aquifers. Other treatment measures that treat stormwater prior to subsurface infiltration, including landscape measures that utilize infiltration through surface or imported soils (indirect infiltration), and treatment measures that discharge directly to storm drains without infiltration pose minimal risk to groundwater quality.

Valley Water’s guidelines for infiltration devices are provided in Table A-1. The guidelines include required horizontal setbacks from drinking water wells, septic systems, underground storage tanks and known contamination sites; required vertical separation from seasonally high groundwater; and whether pretreatment prior to infiltration is required. Pretreatment can be provided by infiltration through surface soils, such as the use of an indirect infiltration measure. ***If the guidelines are not met, i.e., if there are any variances from the required setbacks or separations, Valley Water review and approval of the stormwater treatment plan is required.***

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<sup>3</sup> USEPA Office of Ground Water and Drinking Water, “When Are Storm Water Discharges Regulated as Class V Wells?” June 2003.

**Table A-1 – Valley Water Guidelines for Stormwater Infiltration Devices**

Site Use/Condition		Required Horizontal Setbacks (feet)				Required Vertical Separation from Seasonally High Groundwater (feet)	Pretreatment Required <sup>i</sup>
		Drinking Water Wells	Septic Systems	Underground Storage Tanks	Known Contamination Site <sup>d</sup>		
Residential	Single Residential Lot (<10,000 sq. feet)	Exempt from setback and separation requirements; however, should still comply with construction and maintenance BMPs					
	Single Residential Lot (10,000 sq. feet to 1 acre)	600 <sup>e</sup>	100 <sup>g</sup>	Dependent upon depth to water <sup>h</sup>	Regulatory Agency Approval Required if within 1,500 feet	10	No
	Residential Subdivision (>1 acre)	600 <sup>e</sup>	100 <sup>g</sup>	Dependent upon depth to water <sup>h</sup>	Regulatory Agency Approval Required if within 1,500 feet	10	Individual Residences - No Runoff from Subdivision Roads - Yes
Commercial, Industrial, and Transportation	Transportation Corridor - Main Roads <sup>a</sup>	1,500 <sup>f</sup>	100 <sup>g</sup>	Dependent upon depth to water <sup>h</sup>	Regulatory Agency Approval Required if within 1,500 feet	30	Yes
	Transportation Corridor - Minor Roads <sup>a</sup>	1,500 <sup>f</sup>	100 <sup>g</sup>	Dependent upon depth to water <sup>h</sup>	Regulatory Agency Approval Required if within 1,500 feet	10	Yes
	Transportation Corridor - Other <sup>a</sup>	Not Allowed					
	High Risk Commercial/Industrial <sup>b</sup>	Not Allowed					
	Other Commercial/Industrial <sup>c</sup>	1,500 <sup>f</sup>	100 <sup>g</sup>	Dependent upon depth to water <sup>h</sup>	Regulatory Agency Approval Required if within 1,500 feet	30	Yes
Other	Known Contamination Sites <sup>d</sup>	Not allowed					

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**General Notes:**

1. A stormwater infiltration device is any structure that is designed to bypass surface soils and to transmit runoff directly to subsurface soils and eventually groundwater.
2. District review is required for any variances from the required setbacks or separations.
3. Wells used to inject non-hazardous fluids underground are Class V injection wells as defined by the USEPA. A Box Below Grade (BBG) or any infiltration basin or trench that includes a subsurface distribution system is also classified as a Class V injection well. All stormwater infiltration devices meeting the EPA definition of a Class V injection well must comply with the requirements of the EPA Underground Injection Control (UIC) Program. New and existing dry wells are also required to obtain a District well permit.
4. Additional design guidelines will include guidance on setbacks to other stormwater infiltration devices, horizontal conduits, structures, and property lines. Slope restrictions may also apply.

**Specific Notes:**

- a. Definitions for transportation corridors are as follows:
  - Main Road: A major road for any form of motor transport. Average Daily Traffic flow (ADT) <25,000
  - Minor Road: Smaller roads leading off major roads. ADT <15,000
  - Other: Railroad and light rail corridors
- b. Site use under this category includes automobile-related activities, gas stations, and petroleum processing and storage, chemical processing and storage, dry cleaners, metal plating, finishing, and fabricating, and plastics and synthetics production.
- c. Other Commercial/Industrial includes all other commercial and industrial sites not included in the High Risk Commercial/Industrial category (see Note b).
- d. Known contamination sites include all open or closed sites with known environmental releases, including the area overlying the associated soil and/or groundwater plumes. Regulatory agencies overseeing contaminated sites in Santa Clara County include the Regional Water Quality Control Boards, Department of Toxic Substance Control, Environmental Protection Agency, and County of Santa Clara.
- e. Based on California Department of Public Health Drinking Water Source Assessment Program fixed radius for Zone A, which is meant to protect wells from viral, microbial and direct chemical contamination (based on a 2 year travel time).
- f. Based on California Department of Public Health Drinking Water Source Assessment Program fixed radius for Zone B10, which is meant to protect wells from long term contamination from chemicals (based on 5 to 10 year travel time).
- g. Consistent with Santa Clara County Sewage Disposal System Requirements.
- h. Setback from active Underground Storage Tanks (USTs) is dependent upon the depth to groundwater. Setback is designed to minimize the potential for the groundwater table to come into contact with the UST system. Setbacks are presented in table below:

Depth to Groundwater	Setback from UST
0-15	250
> 15	100

- i. Landscape or structural systems designed to treat or remove pollutants in stormwater. Treatment controls include detention basins, water quality wetlands, vegetated swales, bioretention, filters, and solid separators.