Drinking Water Source Assessment
Well Source

Public water system: Muir Beach Community Services District ID No.: 2100508

Name of source: 2002 Well ID No.: 2100508-003

Assessment date: Jun 8, 2011 Assessment conducted by Leighton Hills

Water System Contact Name: Leighton Hills Phone #: 415-388-7804

Water System Contact Address: 19 Seacape Dr., Muir Beach, CA 94965

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

X Delineation of groundwater protection zones

X Well Data Sheet

X Possible Contaminating Activities (PCA) inventory form

X Assessment map with source location and protection zone

_____ 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 (CDPH or LPA) office (minimum)
- X Copy in public water system office (recommended)
- _____ Copy in public library/libraries
- X Internet (indicate Internet address: www.muirbeachcsd.com/about)
- _____ Other (describe)

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

Delineation of Ground Water Protection Zones

Procedures

Three zones are delineated around a well (see specific guidance for springs and horizontal wells), using the Calculated Fixed Radius method. The default shape of these zones is circular and the radius of the zones is based on the Time of Travel (TOT) of water from a point in the aquifer to the well. The three zones are defined as:

Zone A (2 year TOT)
Zone B5 (5 year TOT)
Zone B10 (10 year TOT)

For porous media aquifers (consisting primarily of rocks, sands, gravels and clays), the radius also considers the pumping rate of the well (Q in gallons per minute), the screened interval of the well (H in feet), and the effective porosity of the aquifer (η - assumed to be 0.2). For fractured rock aquifers, the procedures are the same, but the radius of the zones is increased by 50%.

There are more complicated methods for determining the size, shape and location of zones. Water systems interested in these methods should consult with a hydrogeologist or other knowledgeable professional.

The following table has been developed to assist water systems and regulators in determining the procedures to use in delineating protection zones.

TABLE 1

Aquifer Media	Type of System	Pumping Rate (Q gpm)	Radius Zone A (R_2 feet)	Radius Zone B5 (R_5 feet)	Radius Zone B10 (R_{10} feet)
Porous Media			600'min.	1,000'min.	1,500'min.
	Transient Noncommunity	Any	600'	-----	-----
	Non-Transient Noncommunity	0 to 100 gpm	Calculate or Refer to Table 2		
	Non-Transient Noncommunity	> 100 gpm	Calculate		
	Community	0 to 100 gpm	Calculate or Refer to Table 2		
	Community	> 100 gpm	Calculate		
Fractured Rock			900'min.	1,500'min.	2,250 min.
	Transient Noncommunity	Any	900'	-----	-----
	Non-Transient Noncommunity	0 to 100 gpm	Calculate or Refer to Table 3		
	Non-Transient Noncommunity	> 100 gpm	Calculate		
	Community	0 to 100 gpm	Calculate or Refer to Table 3		
	Community	> 100 gpm	Contact CDPH*		

GROUND WATER ASSESSMENT – WELL SOURCE

Delineation of Ground Water Protection Zones

Public water system: Muir Beach Community Serv. District ID No.: 2100508

Name of source: 2002 Well ID No.: 2100508-003

Delineation date: June 8, 2011 Delineation conducted by Leighton Hills, Muir Beach CSD

Equation

Porous Media Aquifers

$$R_T = \sqrt{\frac{QT}{\pi \eta H}}$$

Fractured Rock Aquifers

$$R_T = 1.5 \times \sqrt{\frac{QT}{\pi \eta H}}$$

R_T = Radius (in feet) of zone for Time of Travel T
T = Time of Travel (years) (2, 5, or 10 years)
Q = Pumping capacity of well (in ft3/year)
(ft3/year = gpm x 70,267)

$\pi = 3.1416$
η = Aquifer effective porosity (default = 0.2)
H = Well screened interval (in feet) (10' min.)

Calculations

Aquifer Material (select one) X Porous Media ____ Fractured Rock

Pumping Rate Q = 60 gpm (if unknown use Table 2 or Table 3)

Screened Interval H = 25 feet (if unknown assume 10%Q or use Table 2 or Table 3)

Porous Media Aquifer

Zone	TOT (years)	Equation	Use one or the other		Minimum	Value (use larger)
			Calculated Radius	Table 2 Radius		
A	2	$473\sqrt{Q_{gpm}/H_{ft}}$	733'		600	733'
B5	5	$748\sqrt{Q_{gpm}/H_{ft}}$	1,159'		1,000	1,159'
B10	10	$1058\sqrt{Q_{gpm}/H_{ft}}$	1,639'		1,500	1,639'

Fractured Rock Aquifer (Increase size of zones by 50%)

Zone	TOT (years)	Equation	Use one or the other		Minimum	Value
			Calculated Radius	Table 3 Radius		
A	2	$709\sqrt{Q_{gpm}/H_{ft}}$			900	
B5	5	$1122\sqrt{Q_{gpm}/H_{ft}}$			1,500	
B10	10	$1586\sqrt{Q_{gpm}/H_{ft}}$			2,250	

DEFAULT PROTECTION ZONES

POROUS MEDIA AQUIFERS
TABLE 2

Q	H (feet) (default minimum)	Radius Zone A (feet)	Radius Zone B5 (feet)	Radius Zone B10 (feet)
< 10 gpm	10	600	1,000	1,500
10 to 20 gpm	10	669	1,056	1,500
21 to 30 gpm	10	819	1,295	1,832
31 to 40 gpm	10	946	1,496	2,115
41 to 50 gpm	10	1,058	1,672	2,365
51 to 60 gpm	10	1,158	1,832	2,590
61 to 70 gpm	10	1,251	1,978	2,798
71 to 80 gpm	10	1,338	2,115	2,991
81 to 90 gpm	10	1,419	2,243	3,173
91 to 100 gpm	10	1,496	2,365	3,344

FRACTURED ROCK AQUIFERS
TABLE 3

Q	H (feet) (default minimum)	Radius Zone A (feet)	Radius Zone B5 (feet)	Radius Zone B10 (feet)
< 10 gpm	10	900	1,500	2,250
10 to 20 gpm	10	1,003	1,587	2,250
21 to 30 gpm	10	1,228	1,943	2,747
31 to 40 gpm	10	1,418	2,244	3,172
41 to 50 gpm	10	1,585	2,509	3,546
51 to 60 gpm	10	1,737	2,748	3,885
61 to 70 gpm	10	1,876	2,968	4,196
71 to 80 gpm	10	2,005	3,173	4,486
81 to 90 gpm	10	2,127	3,366	4,758
91 to 100 gpm	10	2,242	3,548	5,015

WELL DATA SHEET Sheet 1 of 3

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.
** Indicates items required for Source Water Assessment*
*** Indicates additional items required for assessments and Ground Water Rule*

	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
DATA SHEET GENERAL INFORMATION		
System Name	Muir Beach CSD	*from CDPH database*
System Number	2100508	*from CDPH database*
Source of Information *(well log, CDPH/County files, system, etc)*	System	
Organization Collecting Information *(CDPH, County, System, other)*	System	
Date Information Collected/Updated	June 8, 2011	
WELL IDENTIFICATION		
* Well Number or Name	2002 Well	*from CDPH database*
* CDPH Source Identification Number (**FRDS ID No.**)	2100508-003	
DWR Well Log on File? ("YES" or "NO")	Yes	
State Well Number (from DWR)		
Well Status (Active, Standby, Inactive)	Active	*from CDPH database*
WELL LOCATION		
Latitude	37.873	*from CDPH database*
Longitude	-122.584	*from CDPH database*
Ground Surface Elevation (ft above Mean Sea Level)	40'	
Street Address	Frank Valley Rd	
Nearest Cross Street	Highway 1	
City	Muir Beach	
County	Marin	
* Neighborhood/Surrounding Area *(see Note 1)*	Rural (Ru)	
Site plan on file? ("YES" or "NO")	Yes	
DWR Ground Water Basin		*to come from DWR*
DWR Ground Water Sub-basin		*to come from DWR*
SANITARY CONDITIONS		
** Distance to closest Sewer Line, Sewage Disposal, Septic Tank (ft)	None (within 2,000+ ft)	
Distance to Active Wells (ft)	70'	
Distance to Abandoned Wells (ft)	None (properly destroyed)	
Distance to Surface Water (ft)	100'	
** Size of controlled area around well (square feet)	State Park	
* Type of access control to well site *(fencing, building, etc)*	Small wood fence	
* Surface Seal? (Concrete slab)("YES", "NO" or "UNKNOWN")	Yes	
* Dimensions of concrete slab: Length(ft)/ Width(ft)/ Thick(in)	5' x 5' x 6"	
* Within 100 year flood plain? ("YES", "NO" or "UNKNOWN")	No per FEMA Map	
* Drainage away from well? ("YES" or "NO")	Yes	
ENCLOSURE/HOUSING		
Enclosure Type *(building, vault, none, etc.)*	None	
Floor material	Not applicable	
Located in Pit? ("YES" or "NO")	No	
Pit depth (feet) (if applicable)		

WELL DATA SHEET Sheet 2 of 3

WELL CONSTRUCTION	*(separate multiple entries in field with semi-colon)*	Actual, Estimated or Default?
Date drilled	Nov 5, 2002	Actual
Drilling Method	Mud rotary	Actual
Depth of Bore Hole (feet below ground surface)	60'	Actual
Casing Beginning Depth/Ending Depth(ft below surface); 2nd Casing Beginning Depth/Ending Depth; 3rd Casing, etc.	+2' to 60'	Actual
Casing Diameter (inches); 2nd Casing Diameter; 3rd Casing, etc.	10"	Actual
Casing Material; 2nd Casing Material; 3rd Casing, etc.	PVC	Actual
Conductor casing used? ("YES", "NO" or "UNKNOWN") *(See Note 2)*	No	Actual
Conductor casing removed? ("YES", "NO" or "UNKNOWN")	Not applicable	
* Depth to highest perforations/screens (ft below surface) (or "UNKNOWN")	32'	
Screened Interval Beginning Depth/Ending Depth (ft below surface); 2nd Screened Interval Beg. Depth/Ending Depth; 3rd Screened Interval, etc.	32' to 57'	Actual
* Total length of screened interval (ft) *(default = 10% pump capacity in gpm)* (or "UNKNOWN")	25'	Actual
* Annular Seal?("YES", "NO" or "UNKNOWN") *(See Note 3)*	Yes	
* Depth of Annular Seal (ft)	28'	Actual
Material of Annular Seal *(cement grout, bentonite, etc.)*	Cement 2', Bentonite 2'-28'	Actual
Gravel pack, Depth to top (ft below ground surface)	28'	Actual
Total length of gravel pack (ft)	32'	Actual
AQUIFER		
* Aquifer Materials *(list all that apply: sand, silt, clay, gravel, rock, fractured rock)*	Clay, sand & gravel	Actual
* Effective porosity (decimal percent) *(default = 0.2)* (or "UNKNOWN")	Unknown	
* Confining layer (Impervious Strata) above aquifer? ("YES", "NO" or "UNKNOWN")	Yes	Estimated
Thickness of confining layer, if known (ft)	11' (17' to 28' clay)	Actual
Depth to confining layer, if known (ft below ground)	17'	Actual
* Static water level (ft below ground surface)	12'	Actual
Static water level measurement: Date/Method	11/5/2002, tape measure	Actual
Pumping water level (ft below ground surface)	22'	Estimated
Pumping water level measurement: Date/Method		Estimated
WELL PRODUCTION		
Well Yield (gpm)	90 gpm	Actual
Well Yield Based On (i.e., pump test, etc.)	Bailed 3 hours	
Date measured	11/5/2002	
Is the well metered? ("YES" or "NO")	Yes	
Production (gallons per year)	9 million	Estimated
Frequency of Use (hours/year)	2,190 hours/year	Estimated
Typical pumping duration (hours/day)	6 hours	Estimated
PUMP		
Make	Grundfos	
Type	Submersible	
Size (hp)	15 hp	

WELL DATA SHEET Sheet 3 of 3

PUMP (continued)		
* Capacity (gpm)	60 gpm	Actual
Depth to suction intake (ft below ground surface)	57'	Actual
Lubrication Type	Sealed	
Type of Power: *(i.e., electric, diesel, etc.)*	Electric	
Auxiliary power available? ("YES" or "NO")	No	
Operation controlled by: *(i.e., level in tank, pressure, etc.)*	Level in tank	
Pump to Waste capability? ("YES" or "NO")	Yes	
Discharges to: *(i.e., distribution system, storage, etc.)*	Ground	

REMARKS AND DEFECTS (use additional sheets as necessary)

NOTES

1. Neighborhood/Surrounding Area (list all that apply): A= Agricultural, Ru = Rural, Re = Residential, Co = Commercial, I = Industrial, Mu = Municipal, P = Pristine, O = Other

2. Conductor Casing - Oversized casing used to stabilize bore hole during well construction. Should be removed during installation of annular seal.

3. Annular Seal - Seal of grout in the space between the well casing and the wall of the drilled hole. Sometimes called "sanitary seal".

Please Note:

The information on this Well Data Sheet is considered confidential. To allow the information to be included in the permit report, or made available subject to a public information act request, the waiver clause below has to to be signed and dated by the owner (public water system). In lieu of this signature, the WDS has to be retained in a confidential file, or the information shown in the shaded rows has to be "blacked out."

I/We, (Name) Leighton Hills for Muir Beach CSD ***certify that I/We am/are the present owners of the well described on this well data sheet. I/We have reviewed the information presented on this well data sheet and I/We take no exception to having the information included in the Department of Public Health' Engineering Report. I/We understand that by including the well data sheet in the Engineering Report, it will be part of a public document that can be reviewed and copied subject to the public information act request.***

Leighton Hills — June 8, 2011

(Signature) (Date)

TRIPLICATE
Owner's Copy

Page 1 of 1

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. 769868

DWR USE ONLY — DO NOT FILL IN

STATE WELL NO./ STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. Well #1

Date Work Began 10/31/2002, Ended 11/5/2002

Local Permit Agency Marin Co Environ Health

Permit No. 02/03-20A Permit Date 10/25/2002

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL ___ HORIZONTAL ___ ANGLE ___ (SPECIFY)

DRILLING METHOD MUD ROTARY FLUID Bentonite

DEPTH FROM SURFACE Ft.	to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0	12	Rich brown topsoil
12	17	Sands and fine blue and gray gravel
17	28	Brown-dark brown clays
28	32	Clays with embedded gravels
32	45	Sands, brown and multi-colored gravels
45	47	Sandy tan clay
47	60	Extra hard franciscans

TOTAL DEPTH OF BORING 60 (Feet)

TOTAL DEPTH OF COMPLETED WELL 60 (Feet)

WELL OWNER

Name Muir Beach Community Services Di

Mailing Address 19 Seascape Drive

Muir Beach CA

CITY STATE ZIP

WELL LOCATION

Address 53 Muir Woods Road

City Muir Beach CA

County Marin

APN Book 199 Page 150 Parcel 11

Township ___ Range ___ Section ___

Latitude ___ DEG. MIN. SEC. ___ DEG. MIN. SEC.

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. **PLEASE BE ACCURATE & COMPLETE.**

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
___ Deepen
___ Other (Specify)

___ DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG"

PLANNED USES (✓)

WATER SUPPLY
___ Domestic ✓ Public
✓ Irrigation ___ Industrial

___ MONITORING
___ TEST WELL
___ CATHODIC PROTECTION
___ HEAT EXCHANGE
___ DIRECT PUSH
___ INJECTION
___ VAPOR EXTRACTION
___ SPARGING
___ REMEDIATION
___ OTHER (SPECIFY)

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER ___ (Ft.) BELOW SURFACE

DEPTH OF STATIC WATER LEVEL 12 (Ft.) & DATE MEASURED 11/5/2002

ESTIMATED YIELD 90+ (GPM) & TEST TYPE BAILED

TEST LENGTH 3 (Hrs.) TOTAL DRAWDOWN 20 (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft.	to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0	60	17 1/2								
+2	60		✓				PVC	10	CL200	
32	57			✓						.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft.	to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0	2	✓			
2	28		✓		
28	60			✓	8 x 16 sand

ATTACHMENTS (✓)

___ Geologic Log
___ Well Construction Diagram
___ Geophysical Log(s)
___ Soil/Water Chemical Analysis
___ Other ___

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Weeks Drilling & Pump
(PERSON, FIRM, OR CORPORATION) (TYPED OR PRINTED)

P.O. Box 176 Sebastopol CA 95473
ADDRESS CITY STATE ZIP

Signed ___ 11/12/02 177681
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Possible Contaminating Activities (PCA) Inventory Form

Ground Water Source

Public water system name: Muir Beach Community Serv. District ID No. 2100508

Name of drinking water source: 2002 Well ID No. 2100508-003

Inventory date: June 8, 2011 Inventory conducted by: Leighton Hills, Muir Beach CSD

Indicate PCAs pertinent to the drinking water source protection zones, from the following tables, as applicable:

Commercial/Industrial	
Residential/Municipal	
Agricultural/Rural	X
Other (required for all)	X

Proceed to appropriate checklist or checklists. Indicate whether the PCA is located in the zone by placing a Y (yes), N (no), or U (unknown) in the appropriate boxes.
Example:

Zone A	Zone B5	Zone B10
Y	N	N
N	**Y**	**U**
U	N	N

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

PCA Checklist COMMERCIAL/INDUSTRIAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Automobile- Body shops (H)				
Automobile- Car washes (M)				
Automobile- Gas stations (VH)				
Automobile- Repair shops (H)				
Boat services/repair/ refinishing (H)				
Chemical/petroleum pipelines (H)				
Chemical/petroleum processing/storage (VH)				
Dry cleaners (VH)				
Electrical/electronic manufacturing (H)				
Fleet/truck/bus terminals (H)				
Furniture repair/ manufacturing (H)				
Home manufacturing (H)				
Junk/scrap/salvage yards (H)				
Machine shops (H)				
Metal plating/ finishing/fabricating (VH)				
Photo processing/printing (H)				
Plastics/synthetics producers (VH)				
Research laboratories (H)				
Wood preserving/treating (H)				
Wood/pulp/paper processing and mills (H)				
Lumber processing and manufacturing (H)				
Sewer collection systems (H, if in Zone A, otherwise L)				
Parking lots/malls (>50 spaces) (M)				
Cement/concrete plants (M)				
Food processing (M)				
Funeral services/graveyards (M)				
Hardware/lumber/parts stores (M)				
Appliance/Electronic Repair (L)				
Office buildings/complexes (L)				
Rental Yards (L)				
RV/mini storage (L)				

PCA Checklist RESIDENTIAL/MUNICIPAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Airports - Maintenance/ fueling areas (VH)				
Landfills/dumps (VH)				
Railroad yards/ maintenance/ fueling areas (H)				
Septic systems - high density (>1/acre) (VH if in Zone A, otherwise M)				
Sewer collection systems (H, if in Zone A, otherwise L)				
Utility stations - maintenance areas (H)				
Wastewater treatment plants (VH in Zone A, otherwise H)				
Drinking water treatment plants (M)				
Golf courses (M)				
Housing - high density (>1 house/0.5 acres) (M)				
Motor pools (M)				
Parks (M)				
Waste transfer/recycling stations (M)				
Apartments and condominiums (L)				
Campgrounds/ Recreational areas (L)				
Fire stations (L)				
RV Parks (L)				
Schools (L)				
Hotels, Motels (L)				

PCA Checklist AGRICULTURAL/RURAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Grazing (> 5 large animals or equivalent per acre) (H in Zone A, otherwise M)	N	N	N	
Concentrated Animal Feeding Operations (CAFOs) as defined in federal regulation1 (VH in Zone A, otherwise H)	N	N	N	
Animal Feeding Operations as defined in federal regulation2 (VH in Zone A, otherwise H)	N	N	N	
Other Animal operations (H in Zone A, otherwise M)	N	N	N	
Farm chemical distributor/ application service (H)	N	N	N	
Farm machinery repair (H)	N	N	N	
Septic systems - low density (<1/acre) (H in Zone A, otherwise L)	N	N	N	
Lagoons / liquid wastes (H)	N	N	N	
Machine shops (H)	N	N	N	
Pesticide/fertilizer/ petroleum storage & transfer areas (H)	N	N	N	
Agricultural Drainage (H in Zone A, otherwise M)	N	N	N	
Wells - Agricultural/ Irrigation (H)	N	N	N	
Managed Forests (M)	N	N	N	
Crops, irrigated (Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable) (M)	N	N	N	
Fertilizer, Pesticide/ Herbicide Application (M)	N	N	N	
Sewage sludge/biosolids application (M)	N	N	N	
Crops, nonirrigated (e.g., Christmas trees, grains, grass seeds, hay, pasture) (L) (includes drip-irrigated crops)	N	N	N	

PCA Checklist OTHER ACTIVITIES

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
NPDES/WDR permitted discharges (H)	N	N	N	
Underground Injection of Commercial/Industrial Discharges (VH)	N	N	N	
Historic gas stations (VH)	N	N	N	
Historic waste dumps/ landfills (VH)	N	N	N	
Illegal activities/ unauthorized dumping (H)	N	N	N	
Injection wells/ dry wells/ sumps (VH)	N	N	N	
Known Contaminant Plumes (VH)	N	N	N	
Military installations (VH)	N	N	N	
Mining operations - Historic (VH)	N	N	N	
Mining operations - Active (VH)	N	N	N	
Mining - Sand/Gravel (H)	N	N	N	
Wells - Oil, Gas, Geothermal (H)	N	N	N	
Salt Water Intrusion (H)	N	N	N	
Recreational area - surface water source (H)	N	N	N	
Underground storage tanks - Confirmed leaking tanks (VH)	N	N	N	
Underground storage tanks - Decommissioned - inactive tanks (L)	N	N	N	
Underground storage tanks - Non-regulated tanks (tanks smaller than regulatory limit) (H)	N	N	N	
Underground storage tanks - Not yet upgraded or registered tanks (H)	N	N	N	
Underground storage tanks - Upgraded and/or registered - active tanks (L)	N	N	N	
Above ground storage tanks (M)	N	N	N	
Wells - Water supply (M)	Y	N	N	Approved active well
Construction/demolition staging areas (M)	N	N	N	
Contractor or government agency equipment storage yards (M)	N	N	N	
Dredging (M)	N	N	N	
Transportation corridors - Freeways/state highways (M)	N	N	N	
Transportation corridors - Railroads (M)	N	N	N	
Transportation corridors - Historic railroad right-of-ways (M)	N	N	N	
Transportation corridors - Road Right-of-ways (herbicide use areas) (M)	N	N	N	
Transportation corridors - Roads/ Streets (L)	Y	N	N	Frank Valley Rd.
Hospitals (M)	N	N	N	
Storm Drain Discharge Points (M)	N	N	N	
Storm Water Detention Facilities (M)	N	N	N	

PCA Checklist OTHER ACTIVITIES (continued)

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Artificial Recharge Projects - Injection wells (potable water) (L)	N	N	N	
Artificial Recharge Projects - Injection wells (non-potable water) (M)	N	N	N	
Artificial Recharge Projects - Spreading Basins (potable water) (L)	N	N	N	
Artificial Recharge Projects - Spreading Basins (non-potable water) (M)	N	N	N	
Medical/dental offices/clinics (L)	N	N	N	
Veterinary offices/clinics (L)	N	N	N	
Surface water - streams/ lakes/rivers (L)	Y	N	N	Redwood Creek
Wells - monitoring, test holes (L)	U	N	N	Locked pipes (2) to measure water table

Instructions for Groundwater Assessment Map

The assessment map for a groundwater source should be submitted on USGS topographic maps ("quad maps") at 1:24,000 scale. The map should show:

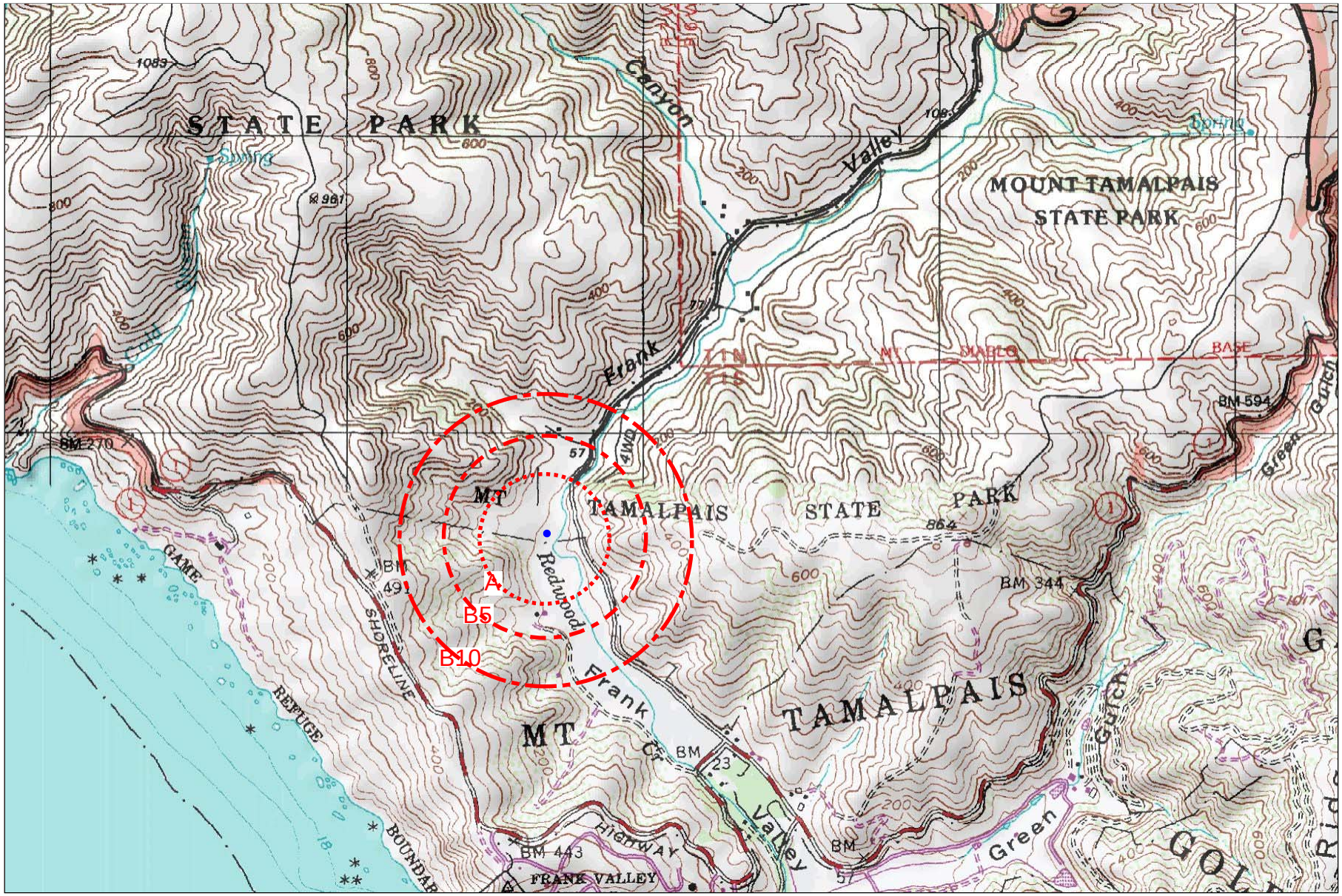
- Location of the source
- Protection Zones
- Significant Possible Contaminating Activities (PCAs) within the zone (optional, but recommended)

The protection zone for groundwater sources are a set of three circles surrounding the source. (For springs and horizontal wells, if determined to be groundwater sources, the protection zones need not include those portions of the circles down gradient of the source.) The radius of the protection zone is determined in the Delineation section of the assessment and depends upon the aquifer material, well pumping rate, screened interval, and aquifer porosity.

USGS quad maps may be obtained from map or backpacking retailers. There are also several computer software programs that include USGS quad maps.

At the discretion of the regulatory agency, the water system may request that the regulatory agency prepare a map displaying the source and zones.

An example map for a well source is attached.



Muir Beach CSD Well Site
2002 Well 2100508-003
2008 Well 2100508-004
Frank Valley Rd.
Muir Beach, CA 94965

Drinking Water Source Assessment
Well Source

Public water system: Muir Beach Community Services District ID No.: 2100508

Name of source: 2008 Well ID No.: 2100508-004

Assessment date: Jun 8, 2011 Assessment conducted by Leighton Hills

Water System Contact Name: Leighton Hills Phone #: 415-388-7804

Water System Contact Address: 19 Seacape Dr., Muir Beach, CA 94965

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

X Delineation of groundwater protection zones

X Well Data Sheet

X Possible Contaminating Activities (PCA) inventory form

X Assessment map with source location and protection zone

_____ 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 (CDPH or LPA) office (minimum)
- X Copy in public water system office (recommended)
- _____ Copy in public library/libraries
- X Internet (indicate Internet address: www.muirbeachcsd.com/about)
- _____ Other (describe)

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

Delineation of Ground Water Protection Zones

Procedures

Three zones are delineated around a well (see specific guidance for springs and horizontal wells), using the Calculated Fixed Radius method. The default shape of these zones is circular and the radius of the zones is based on the Time of Travel (TOT) of water from a point in the aquifer to the well. The three zones are defined as:

Zone A (2 year TOT)
Zone B5 (5 year TOT)
Zone B10 (10 year TOT)

For porous media aquifers (consisting primarily of rocks, sands, gravels and clays), the radius also considers the pumping rate of the well (Q in gallons per minute), the screened interval of the well (H in feet), and the effective porosity of the aquifer (η - assumed to be 0.2). For fractured rock aquifers, the procedures are the same, but the radius of the zones is increased by 50%.

There are more complicated methods for determining the size, shape and location of zones. Water systems interested in these methods should consult with a hydrogeologist or other knowledgeable professional.

The following table has been developed to assist water systems and regulators in determining the procedures to use in delineating protection zones.

TABLE 1

Aquifer Media	Type of System	Pumping Rate (Q gpm)	Radius Zone A (R_2 feet)	Radius Zone B5 (R_5 feet)	Radius Zone B10 (R_{10} feet)
Porous Media			600'min.	1,000'min.	1,500'min.
	Transient Noncommunity	Any	600'	-----	-----
	Non-Transient Noncommunity	0 to 100 gpm	Calculate or Refer to Table 2		
	Non-Transient Noncommunity	> 100 gpm	Calculate		
	Community	0 to 100 gpm	Calculate or Refer to Table 2		
	Community	> 100 gpm	Calculate		
Fractured Rock			900'min.	1,500'min.	2,250 min.
	Transient Noncommunity	Any	900'	-----	-----
	Non-Transient Noncommunity	0 to 100 gpm	Calculate or Refer to Table 3		
	Non-Transient Noncommunity	> 100 gpm	Calculate		
	Community	0 to 100 gpm	Calculate or Refer to Table 3		
	Community	> 100 gpm	Contact CDPH*		

GROUND WATER ASSESSMENT – WELL SOURCE

Delineation of Ground Water Protection Zones

Public water system: Muir Beach Community Serv. District ID No.: 2100508

Name of source: 2002 Well ID No.: 2100508-004

Delineation date: June 8, 2011 Delineation conducted by Leighton Hills, Muir Beach CSD

Equation

Porous Media Aquifers

$$R_T = \sqrt{\frac{QT}{\pi\eta H}}$$

Fractured Rock Aquifers

$$R_T = 1.5 \times \sqrt{\frac{QT}{\pi\eta H}}$$

R_T = Radius (in feet) of zone for Time of Travel T
T = Time of Travel (years) (2, 5, or 10 years)
Q = Pumping capacity of well (in ft3/year)
(ft3/year = gpm x 70,267)

$\pi = 3.1416$
η = Aquifer effective porosity (default = 0.2)
H = Well screened interval (in feet) (10' min.)

Calculations

Aquifer Material (select one) X Porous Media ____ Fractured Rock

Pumping Rate Q = 60 gpm (if unknown use Table 2 or Table 3)

Screened Interval H = 30 feet (if unknown assume 10%Q or use Table 2 or Table 3)

Porous Media Aquifer

Zone	TOT (years)	Equation	Use one or the other		Minimum	Value (use larger)
			Calculated Radius	Table 2 Radius		
A	2	$473\sqrt{Q_{gpm}/H_{ft}}$	669'		600	669'
B5	5	$748\sqrt{Q_{gpm}/H_{ft}}$	1,058'		1,000	1,058'
B10	10	$1058\sqrt{Q_{gpm}/H_{ft}}$	1,496'		1,500	1,496'

Fractured Rock Aquifer (Increase size of zones by 50%)

Zone	TOT (years)	Equation	Use one or the other		Minimum	Value
			Calculated Radius	Table 3 Radius		
A	2	$709\sqrt{Q_{gpm}/H_{ft}}$			900	
B5	5	$1122\sqrt{Q_{gpm}/H_{ft}}$			1,500	
B10	10	$1586\sqrt{Q_{gpm}/H_{ft}}$			2,250	

DEFAULT PROTECTION ZONES

POROUS MEDIA AQUIFERS
TABLE 2

Q	H (feet) (default minimum)	Radius Zone A (feet)	Radius Zone B5 (feet)	Radius Zone B10 (feet)
< 10 gpm	10	600	1,000	1,500
10 to 20 gpm	10	669	1,056	1,500
21 to 30 gpm	10	819	1,295	1,832
31 to 40 gpm	10	946	1,496	2,115
41 to 50 gpm	10	1,058	1,672	2,365
51 to 60 gpm	10	1,158	1,832	2,590
61 to 70 gpm	10	1,251	1,978	2,798
71 to 80 gpm	10	1,338	2,115	2,991
81 to 90 gpm	10	1,419	2,243	3,173
91 to 100 gpm	10	1,496	2,365	3,344

FRACTURED ROCK AQUIFERS
TABLE 3

Q	H (feet) (default minimum)	Radius Zone A (feet)	Radius Zone B5 (feet)	Radius Zone B10 (feet)
< 10 gpm	10	900	1,500	2,250
10 to 20 gpm	10	1,003	1,587	2,250
21 to 30 gpm	10	1,228	1,943	2,747
31 to 40 gpm	10	1,418	2,244	3,172
41 to 50 gpm	10	1,585	2,509	3,546
51 to 60 gpm	10	1,737	2,748	3,885
61 to 70 gpm	10	1,876	2,968	4,196
71 to 80 gpm	10	2,005	3,173	4,486
81 to 90 gpm	10	2,127	3,366	4,758
91 to 100 gpm	10	2,242	3,548	5,015

WELL DATA SHEET Sheet 1 of 3

Complete as much information as possible. Leave blank if information is not available, use N.A. if not applicable.
** Indicates items required for Source Water Assessment*
*** Indicates additional items required for assessments and Ground Water Rule*

	(separate multiple entries in field with semi-colon)	Actual, Estimated or Default?
DATA SHEET GENERAL INFORMATION		
System Name	Muir Beach CSD	*from CDPH database*
System Number	2100508	*from CDPH database*
Source of Information *(well log, CDPH/County files, system, etc)*	System	
Organization Collecting Information *(CDPH, County, System, other)*	System	
Date Information Collected/Updated	June 8, 2011	
WELL IDENTIFICATION		
* Well Number or Name	2008 Well	*from CDPH database*
* CDPH Source Identification Number (**FRDS ID No.**)	2100508-004	
DWR Well Log on File? ("YES" or "NO")	Yes	
State Well Number (from DWR)		
Well Status (Active, Standby, Inactive)	Active	*from CDPH database*
WELL LOCATION		
Latitude	37.873	*from CDPH database*
Longitude	-122.584	*from CDPH database*
Ground Surface Elevation (ft above Mean Sea Level)	37'	
Street Address	Frank Valley Rd	
Nearest Cross Street	Highway 1	
City	Muir Beach	
County	Marin	
* Neighborhood/Surrounding Area *(see Note 1)*	Rural (Ru)	
Site plan on file? ("YES" or "NO")	Yes	
DWR Ground Water Basin		*to come from DWR*
DWR Ground Water Sub-basin		*to come from DWR*
SANITARY CONDITIONS		
** Distance to closest Sewer Line, Sewage Disposal, Septic Tank (ft)	None (within 2,000+ ft)	
Distance to Active Wells (ft)	70'	
Distance to Abandoned Wells (ft)	None (properly destroyed)	
Distance to Surface Water (ft)	100'	
** Size of controlled area around well (square feet)	State Park	
* Type of access control to well site *(fencing, building, etc)*	Small wood fence	
* Surface Seal? (Concrete slab)("YES", "NO" or "UNKNOWN")	Yes	
* Dimensions of concrete slab: Length(ft)/ Width(ft)/ Thick(in)	5' x 5' x 6"	
* Within 100 year flood plain? ("YES", "NO" or "UNKNOWN")	No per FEMA Map	
* Drainage away from well? ("YES" or "NO")	Yes	
ENCLOSURE/HOUSING		
Enclosure Type *(building, vault, none, etc.)*	None	
Floor material	Not applicable	
Located in Pit? ("YES" or "NO")	No	
Pit depth (feet) (if applicable)		

WELL DATA SHEET Sheet 2 of 3

WELL CONSTRUCTION	*(separate multiple entries in field with semi-colon)*	Actual, Estimated or Default?
Date drilled	Oct 8, 2008	Actual
Drilling Method	Mud rotary	Actual
Depth of Bore Hole (feet below ground surface)	60'	Actual
Casing Beginning Depth/Ending Depth(ft below surface); 2nd Casing Beginning Depth/Ending Depth; 3rd Casing, etc.	+3' to 60'	Actual
Casing Diameter (inches); 2nd Casing Diameter; 3rd Casing, etc.	5"	Actual
Casing Material; 2nd Casing Material; 3rd Casing, etc.	PVC	Actual
Conductor casing used? ("YES", "NO" or "UNKNOWN") *(See Note 2)*	No	Actual
Conductor casing removed? ("YES", "NO" or "UNKNOWN")	Not applicable	
* Depth to highest perforations/screens (ft below surface) (or "UNKNOWN")	30'	
Screened Interval Beginning Depth/Ending Depth (ft below surface); 2nd Screened Interval Beg. Depth/Ending Depth; 3rd Screened Interval, etc.	30' to 60'	Actual
* Total length of screened interval (ft) *(default = 10% pump capacity in gpm)* (or "UNKNOWN")	30'	Actual
* Annular Seal?("YES", "NO" or "UNKNOWN") *(See Note 3)*	Yes	
* Depth of Annular Seal (ft)	25'	Actual
Material of Annular Seal *(cement grout, bentonite, etc.)*	Cement 8', Bentonite 8'-25'	Actual
Gravel pack, Depth to top (ft below ground surface)	25'	Actual
Total length of gravel pack (ft)	35'	Actual
AQUIFER		
* Aquifer Materials *(list all that apply: sand, silt, clay, gravel, rock, fractured rock)*	Clay, sand & gravel	Actual
* Effective porosity (decimal percent) *(default = 0.2)* (or "UNKNOWN")	Unknown	
* Confining layer (Impervious Strata) above aquifer? ("YES", "NO" or "UNKNOWN")	Unknown	Estimated
Thickness of confining layer, if known (ft)		
Depth to confining layer, if known (ft below ground)		
* Static water level (ft below ground surface)	5'	Actual
Static water level measurement: Date/Method	10/8/2008, tape measure	Actual
Pumping water level (ft below ground surface)	22'	Estimated
Pumping water level measurement: Date/Method		Estimated
WELL PRODUCTION		
Well Yield (gpm)	40 gpm	Actual
Well Yield Based On (i.e., pump test, etc.)	Bailed 1 hour	
Date measured	10/8/2008	
Is the well metered? ("YES" or "NO")	Yes	
Production (gallons per year)	9 million	Estimated
Frequency of Use (hours/year)	3,650 hours/year	Estimated
Typical pumping duration (hours/day)	10 hours	Estimated
PUMP		
Make	Grundfos	
Type	Submersible	
Size (hp)	10 hp	

WELL DATA SHEET Sheet 3 of 3

PUMP (continued)		
* Capacity (gpm)	40 gpm	Actual
Depth to suction intake (ft below ground surface)	57'	Actual
Lubrication Type	Sealed	
Type of Power: *(i.e., electric, diesel, etc.)*	Electric	
Auxiliary power available? ("YES" or "NO")	No	
Operation controlled by: *(i.e., level in tank, pressure, etc.)*	Level in tank	
Pump to Waste capability? ("YES" or "NO")	Yes	
Discharges to: *(i.e., distribution system, storage, etc.)*	Ground	

REMARKS AND DEFECTS (use additional sheets as necessary)

NOTES

1. Neighborhood/Surrounding Area (list all that apply): A= Agricultural, Ru = Rural, Re = Residential, Co = Commercial, I = Industrial, Mu = Municipal, P = Pristine, O = Other

2. Conductor Casing - Oversized casing used to stabilize bore hole during well construction. Should be removed during installation of annular seal.

3. Annular Seal - Seal of grout in the space between the well casing and the wall of the drilled hole. Sometimes called "sanitary seal".

Please Note:

The information on this Well Data Sheet is considered confidential. To allow the information to be included in the permit report, or made available subject to a public information act request, the waiver clause below has to to be signed and dated by the owner (public water system). In lieu of this signature, the WDS has to be retained in a confidential file, or the information shown in the shaded rows has to be "blacked out."

I/We, *(Name)* Leighton Hills for Muir Beach CSD ***certify that I/We am/are the present owners of the well described on this well data sheet. I/We have reviewed the information presented on this well data sheet and I/We take no exception to having the information included in the Department of Public Health' Engineering Report. I/We understand that by including the well data sheet in the Engineering Report, it will be part of a public document that can be reviewed and copied subject to the public information act request.***

Dustin Hills
(Signature)

June 8, 2011
(Date)

TRIPLICATE
Owner's Copy

Page 1 of 1

STATE OF CALIFORNIA

WELL COMPLETION REPORT

Refer to Instruction Pamphlet

No. e0080725

DWR USE ONLY --- DO NOT FILL IN

STATE WELL NO./ STATION NO.

LATITUDE LONGITUDE

APN/TRS/OTHER

Owner's Well No. WELL #1

Date Work Began 9/30/2008, Ended 10/8/2008

Local Permit Agency Marin County Environmental

Permit No. 07/08-36A Permit Date 4/17/2008

GEOLOGIC LOG

ORIENTATION (✓) ✓ VERTICAL — HORIZONTAL — ANGLE — (SPECIFY)

DRILLING METHOD Mud Rotary FLUID Bentonite

DEPTH FROM SURFACE Ft. to Ft.	DESCRIPTION *Describe material, grain, size, color, etc.*
0 2	Brown sandy topsoil
2 10	Brown and multi-colored sand and gravel
10 18	Gray sand and gray clay
18 23	Blue sand and gravel
23 29	Multi-colored sand and gravel
29 38	Large gravels with some gray clay
38 45	Brown fractured rock
45 60	Blue and gray rock, shale (very hard)

TOTAL DEPTH OF BORING 60 (Feet)

TOTAL DEPTH OF COMPLETED WELL 60 (Feet)

WELL OWNER

Name Muir Beach Community Service

Mailing Address 19 Seascape Drive

Muir Beach CA

CITY STATE ZIP

WELL LOCATION

Address 53 Muir Woods Road

City Muir Beach CA

County Marin

APN Book 199 Page 150 Parcel 11

Township ____ Range ____ Section ____

Latitude ____ DEG. MIN. SEC. ____ DEG. MIN. SEC.

LOCATION SKETCH

NORTH / WEST / EAST / SOUTH

Illustrate or Describe Distance of Well from Roads, Buildings, Fences, Rivers, etc. and attach a map. Use additional paper if necessary. PLEASE BE ACCURATE & COMPLETE.

ACTIVITY (✓)

✓ NEW WELL

MODIFICATION/REPAIR
— Deepen
— Other (Specify)

— DESTROY (Describe Procedures and Materials Under "GEOLOGIC LOG"

PLANNED USES (✓)

WATER SUPPLY
✓ Domestic — Public
— Irrigation — Industrial

MONITORING —
TEST WELL —
CATHODIC PROTECTION —
HEAT EXCHANGE —
DIRECT PUSH —
INJECTION —
VAPOR EXTRACTION —
SPARGING —
REMEDIATION —
OTHER (SPECIFY) —

WATER LEVEL & YIELD OF COMPLETED WELL

DEPTH TO FIRST WATER N/A (Ft.) BELOW SURFACE 1

DEPTH OF STATIC WATER LEVEL 5 (Ft.) & DATE MEASURED 10/8/2008

ESTIMATED YIELD * 40 (GPM) & TEST TYPE Bailed

TEST LENGTH 1 (Hrs.) TOTAL DRAWDOWN 50 (Ft.)

May not be representative of a well's long-term yield.

CASING (S)

DEPTH FROM SURFACE Ft. to Ft.	BORE-HOLE DIA. (Inches)	TYPE (✓) BLANK	SCREEN	CONDUCTOR	FILL PIPE	MATERIAL / GRADE	INTERNAL DIAMETER (Inches)	GAUGE OR WALL THICKNESS	SLOT SIZE IF ANY (Inches)
0 60	7-7/8"								
0 60	14-1/2"								
+3 60		✓				PVC	5	SDR21	
30 60			✓						.032

ANNULAR MATERIAL

DEPTH FROM SURFACE Ft. to Ft.	TYPE CEMENT (✓)	BENTONITE (✓)	FILL (✓)	FILTER PACK (TYPE/SIZE)
0 8	✓			
8 25		✓		
25 60			✓	8x16 SAND

ATTACHMENTS (✓)

— Geologic Log
— Well Construction Diagram
— Geophysical Log(s)
— Soil/Water Chemical Analysis
— Other ____

ATTACH ADDITIONAL INFORMATION, IF IT EXISTS.

CERTIFICATION STATEMENT

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief.

NAME Weeks Drilling & Pump
(PERSON, FIRM, OR CORPORATION) (TYPEO OR PRINTED)

P.O. Box 176 Sebastopol CA 95473
ADDRESS CITY STATE ZIP

Signed Melissa G Lopez 10/16/08 177681
WELL DRILLER/AUTHORIZED REPRESENTATIVE DATE SIGNED C-57 LICENSE NUMBER

DWR 188 REV. 11-97

IF ADDITIONAL SPACE IS NEEDED, USE NEXT CONSECUTIVELY NUMBERED FORM

Possible Contaminating Activities (PCA) Inventory Form

Ground Water Source

Public water system name: Muir Beach Community Serv. District ID No. 2100508

Name of drinking water source: 2008 Well ID No. 2100508-004

Inventory date: June 8, 2011 Inventory conducted by: Leighton Hills, Muir Beach CSD

Indicate PCAs pertinent to the drinking water source protection zones, from the following tables, as applicable:

Commercial/Industrial	
Residential/Municipal	
Agricultural/Rural	X
Other (required for all)	X

Proceed to appropriate checklist or checklists. Indicate whether the PCA is located in the zone by placing a Y (yes), N (no), or U (unknown) in the appropriate boxes.
Example:

Zone A	Zone B5	Zone B10
Y	N	N
N	**Y**	**U**
U	N	N

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

PCA Checklist COMMERCIAL/INDUSTRIAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Automobile- Body shops (H)				
Automobile- Car washes (M)				
Automobile- Gas stations (VH)				
Automobile- Repair shops (H)				
Boat services/repair/ refinishing (H)				
Chemical/petroleum pipelines (H)				
Chemical/petroleum processing/storage (VH)				
Dry cleaners (VH)				
Electrical/electronic manufacturing (H)				
Fleet/truck/bus terminals (H)				
Furniture repair/ manufacturing (H)				
Home manufacturing (H)				
Junk/scrap/salvage yards (H)				
Machine shops (H)				
Metal plating/ finishing/fabricating (VH)				
Photo processing/printing (H)				
Plastics/synthetics producers (VH)				
Research laboratories (H)				
Wood preserving/treating (H)				
Wood/pulp/paper processing and mills (H)				
Lumber processing and manufacturing (H)				
Sewer collection systems (H, if in Zone A, otherwise L)				
Parking lots/malls (>50 spaces) (M)				
Cement/concrete plants (M)				
Food processing (M)				
Funeral services/graveyards (M)				
Hardware/lumber/parts stores (M)				
Appliance/Electronic Repair (L)				
Office buildings/complexes (L)				
Rental Yards (L)				
RV/mini storage (L)				

PCA Checklist RESIDENTIAL/MUNICIPAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Airports - Maintenance/ fueling areas (VH)				
Landfills/dumps (VH)				
Railroad yards/ maintenance/ fueling areas (H)				
Septic systems - high density (>1/acre) (VH if in Zone A, otherwise M)				
Sewer collection systems (H, if in Zone A, otherwise L)				
Utility stations - maintenance areas (H)				
Wastewater treatment plants (VH in Zone A, otherwise H)				
Drinking water treatment plants (M)				
Golf courses (M)				
Housing - high density (>1 house/0.5 acres) (M)				
Motor pools (M)				
Parks (M)				
Waste transfer/recycling stations (M)				
Apartments and condominiums (L)				
Campgrounds/ Recreational areas (L)				
Fire stations (L)				
RV Parks (L)				
Schools (L)				
Hotels, Motels (L)				

PCA Checklist AGRICULTURAL/RURAL

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Grazing (> 5 large animals or equivalent per acre) (H in Zone A, otherwise M)	N	N	N	
Concentrated Animal Feeding Operations (CAFOs) as defined in federal regulation1 (VH in Zone A, otherwise H)	N	N	N	
Animal Feeding Operations as defined in federal regulation2 (VH in Zone A, otherwise H)	N	N	N	
Other Animal operations (H in Zone A, otherwise M)	N	N	N	
Farm chemical distributor/ application service (H)	N	N	N	
Farm machinery repair (H)	N	N	N	
Septic systems - low density (<1/acre) (H in Zone A, otherwise L)	N	N	N	
Lagoons / liquid wastes (H)	N	N	N	
Machine shops (H)	N	N	N	
Pesticide/fertilizer/ petroleum storage & transfer areas (H)	N	N	N	
Agricultural Drainage (H in Zone A, otherwise M)	N	N	N	
Wells - Agricultural/ Irrigation (H)	N	N	N	
Managed Forests (M)	N	N	N	
Crops, irrigated (Berries, hops, mint, orchards, sod, greenhouses, vineyards, nurseries, vegetable) (M)	N	N	N	
Fertilizer, Pesticide/ Herbicide Application (M)	N	N	N	
Sewage sludge/biosolids application (M)	N	N	N	
Crops, nonirrigated (e.g., Christmas trees, grains, grass seeds, hay, pasture) (L) (includes drip-irrigated crops)	N	N	N	

PCA Checklist OTHER ACTIVITIES

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
NPDES/WDR permitted discharges (H)	N	N	N	
Underground Injection of Commercial/Industrial Discharges (VH)	N	N	N	
Historic gas stations (VH)	N	N	N	
Historic waste dumps/ landfills (VH)	N	N	N	
Illegal activities/ unauthorized dumping (H)	N	N	N	
Injection wells/ dry wells/ sumps (VH)	N	N	N	
Known Contaminant Plumes (VH)	N	N	N	
Military installations (VH)	N	N	N	
Mining operations - Historic (VH)	N	N	N	
Mining operations - Active (VH)	N	N	N	
Mining - Sand/Gravel (H)	N	N	N	
Wells - Oil, Gas, Geothermal (H)	N	N	N	
Salt Water Intrusion (H)	N	N	N	
Recreational area - surface water source (H)	N	N	N	
Underground storage tanks - Confirmed leaking tanks (VH)	N	N	N	
Underground storage tanks - Decommissioned - inactive tanks (L)	N	N	N	
Underground storage tanks - Non-regulated tanks (tanks smaller than regulatory limit) (H)	N	N	N	
Underground storage tanks - Not yet upgraded or registered tanks (H)	N	N	N	
Underground storage tanks - Upgraded and/or registered - active tanks (L)	N	N	N	
Above ground storage tanks (M)	N	N	N	
Wells - Water supply (M)	Y	N	N	Approved active well
Construction/demolition staging areas (M)	N	N	N	
Contractor or government agency equipment storage yards (M)	N	N	N	
Dredging (M)	N	N	N	
Transportation corridors - Freeways/state highways (M)	N	N	N	
Transportation corridors - Railroads (M)	N	N	N	
Transportation corridors - Historic railroad right-of-ways (M)	N	N	N	
Transportation corridors - Road Right-of-ways (herbicide use areas) (M)	N	N	N	
Transportation corridors - Roads/ Streets (L)	Y	N	N	Frank Valley Rd.
Hospitals (M)	N	N	N	
Storm Drain Discharge Points (M)	N	N	N	
Storm Water Detention Facilities (M)	N	N	N	

PCA Checklist OTHER ACTIVITIES (continued)

PCA (Risk Ranking)	PCA in Zone A?	PCA in Zone B5?	PCA in Zone B10?	Comments
Artificial Recharge Projects - Injection wells (potable water) (L)	N	N	N	
Artificial Recharge Projects - Injection wells (non-potable water) (M)	N	N	N	
Artificial Recharge Projects - Spreading Basins (potable water) (L)	N	N	N	
Artificial Recharge Projects - Spreading Basins (non-potable water) (M)	N	N	N	
Medical/dental offices/clinics (L)	N	N	N	
Veterinary offices/clinics (L)	N	N	N	
Surface water - streams/ lakes/rivers (L)	Y	N	N	Redwood Creek
Wells - monitoring, test holes (L)	U	N	N	Locked pipes (2) to measure water table

Instructions for Groundwater Assessment Map

The assessment map for a groundwater source should be submitted on USGS topographic maps ("quad maps") at 1:24,000 scale. The map should show:

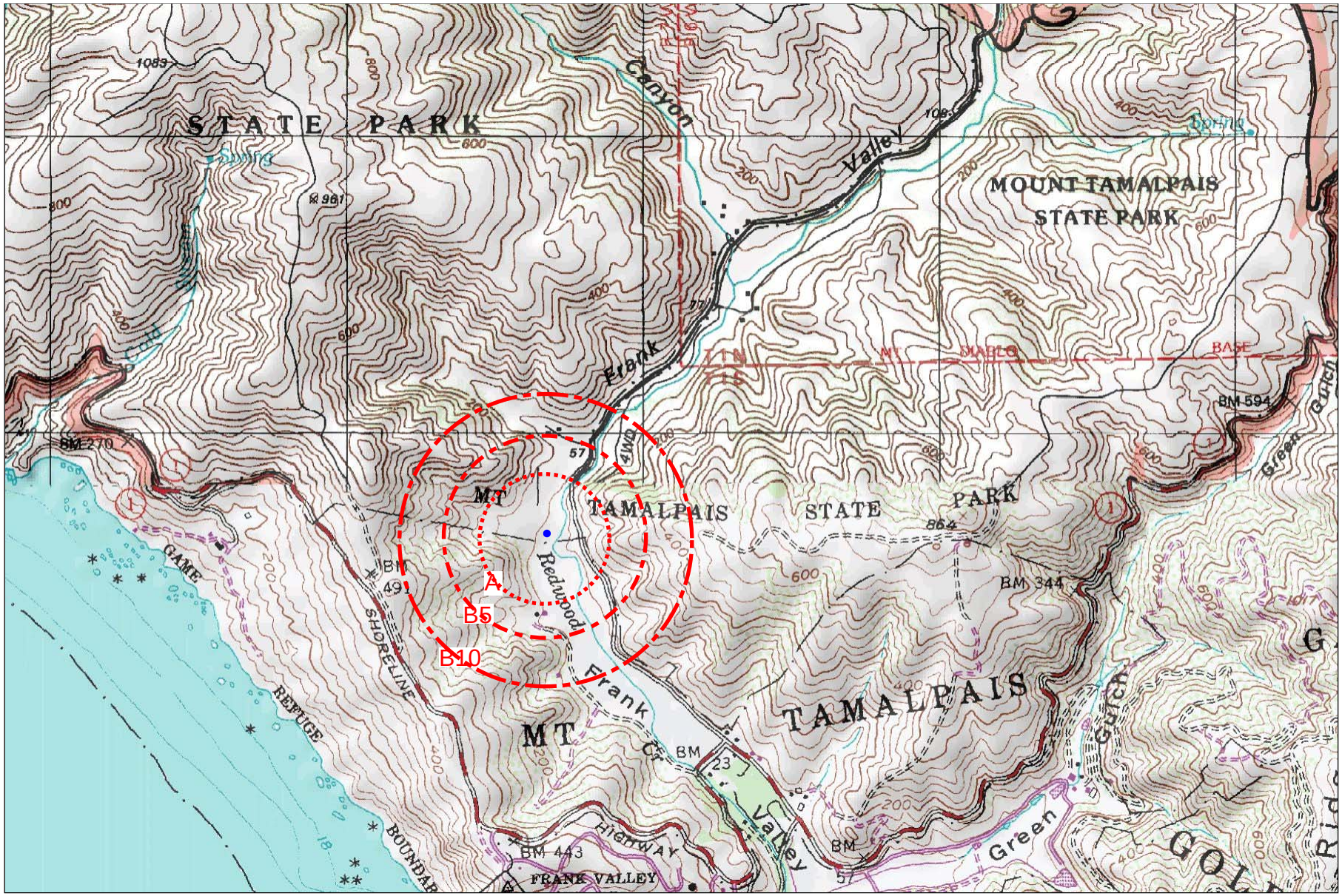
- Location of the source
- Protection Zones
- Significant Possible Contaminating Activities (PCAs) within the zone (optional, but recommended)

The protection zone for groundwater sources are a set of three circles surrounding the source. (For springs and horizontal wells, if determined to be groundwater sources, the protection zones need not include those portions of the circles down gradient of the source.) The radius of the protection zone is determined in the Delineation section of the assessment and depends upon the aquifer material, well pumping rate, screened interval, and aquifer porosity.

USGS quad maps may be obtained from map or backpacking retailers. There are also several computer software programs that include USGS quad maps.

At the discretion of the regulatory agency, the water system may request that the regulatory agency prepare a map displaying the source and zones.

An example map for a well source is attached.



Muir Beach CSD Well Site
2002 Well 2100508-003
2008 Well 2100508-004
Frank Valley Rd.
Muir Beach, CA 94965