

Project No.
4748.002.019

June 24, 2020

Ms. Laurie Sucgang
Schaefer Ranch Geologic Hazard Abatement District
100 Civic Plaza
Dublin, CA 94568

Subject: Schaefer Ranch Development
Dublin, California

GEOLOGIC HAZARD ABATEMENT DISTRICT MONITORING – SPRING 2020

Dear Ms. Sucgang:

ENGEO is pleased to submit this monitoring report for the Schaefer Ranch Geologic Hazard Abatement District (GHAD). As described in the Schaefer Ranch Plan of Control (Reference 1), the purpose of this monitoring is to observe and report on the open space and associated improvements within the Schaefer Ranch development. This monitoring event was completed on May 26, and 27, 2020.

SCOPE

Site monitoring included observation of the following.

- Open-space slopes adjacent to improvements.
- Drainage courses.
- Detention basins and water quality basins.
- Emergency vehicle access, maintenance, and access roads.
- Open space concrete structures.
- Subdrain outlets installed during mass grading.
- Concrete-lined surface drainage ditches.
- Open-space storm drain inlets.

OPEN-SPACE SLOPES, DEBRIS BENCHES, AND SWALES

Open-space slopes, debris benches, and swales were observed for evidence of slope instability, including landslides, mudflows, erosion, diverted drainage, or standing water. During our site visit, we did not observe significant distress to the slopes adjacent to the site improvements. During the winter of 2016/17, several existing landslides mapped within the open space areas reactivated and experienced movement. The landslides, located downslope of Wild Horse Court, Schaefer Heights Court, and Ridgeline Drive (Figure 2), were viewed during the winter 2016/17 as well as during the current monitoring event. Based on a review of the field conditions and the corrective grading plans it does not appear that the reactivated landslides threaten site improvements. During our most recent monitoring event, these landslides appeared not have experienced significant movement are re-vegetating. The reactivated landslides will be viewed during future scheduled monitoring events to identify significant changes to these areas, if any.

There are a number of unrepaired landslides within the ungraded portions of the GHAD-owned parcels. These landslides have moved in the past and will likely do so in the future when wet conditions occur. Except as described above, the landslides within the ungraded portion of the site appear to be in a similar condition to that described during development of the site.

Seeps were observed in a number of locations as shown on Figure 2. No indications of slope instability was associated with the seeps. However, saturated soils significantly reduce the slope stability and performance over time and can lead to failures. The GHAD will continue to monitor the slope areas with seeps for indications of slope instability and provide additional subsurface drainage as slope conditions warrant.

Evidence of previous saturation of soil was observed in this area in the open space south of Ridgeline Drive. At the time of the visit, the area was saturated with water tolerant vegetation and ponded water in the concrete-lined ditch (Figure 2, Site Condition A, Photograph 1). The slope adjacent to the seep appears to be performing well.

A significant seep was located northeast of Marshall Canyon Court (Figure 2, Site Condition B, Photograph 2). This seep appears to have been active since grading was completed in this area in 2007 (Reference 3). As part of the mass grading, Subdrain SD-40 was installed in this area and the outlet is located in a storm drain inlet on Marshall Canyon Court. The slope remains highly saturated with moisture-tolerant vegetation. The slope did not appear to display signs of significant movement, and a gravel surface access road is situated between the slope and the houses. A significant amount of sediment has been deposited in the concrete-lined drainage ditch downslope of the seep. The GHAD will schedule removal of the sediment and clearing of vegetation adjacent to the ditch.

A seep south of 10138 Lilly Pad Court, which has been periodically monitored and showed signs of increased flow and animal rooting (Figure 2, Site Condition C, Photograph 3). A small depression has developed at the base of the seep within the debris bench and it has filled with water from the seep. The GHAD will fill the depression and continue monitoring this area.

There is evidence of a minor seep northwest of Marshall Canyon Drive. At the time of our most recent monitoring event, the seep appeared to be dry. This area will continue to be monitored during future visits (Figure 2, Site Condition D).

There are several areas with dense concentrations of animal burrows (Figure 2, Site Condition E). Burrows allow for the rapid infiltration of water into the near-surface soil, which can cause the loss of cohesion and lead to unstable slope conditions. The GHAD will consider burrowing animal population control if we identify signs of slope instability in accordance with the requirements of the Final Mitigation and Monitoring Plan and Perpetual Conservation Easement Deed (References 5 and 6).

Erosion, in the form of rills, etc., was observed in various locations around the property (Figure 2, Site Condition F). Specifically, on the slope east of the beginning of the trail at the Donlon Point Staging Area, there is erosion exposing bare soils, possibly due to animal grazing paths or shallow bedrock (Photograph 4). In general, the erosional features were relatively minor; however, erosion can create a positive feedback loop in which erosion leads to further erosion. These areas will continue to be monitored, and as needed, erosional slopes will be repaired as a part of regular GHAD maintenance.

A fire pit and some litter were observed during the spring monitoring event within the open space south of 7639 Ridgeline Drive and south of 10138 Lilly Pad Lake Court (Figure 2, Site Condition G, Photographs 5 and 6). Homeowner and human activity on GHAD-owned land in undesignated areas is not allowed; therefore, the GHAD will has removed these materials.

Erosion and a minor failure with a scarp measuring approximately 6 feet wide has formed at the back of 9779 Reimer Way downslope of the barbed-wire behind the property (Figure 2, Site Condition H, Photograph 6). The soil loss does not appear to be impacting the nearby improvements but we will continue to monitor the area for signs of further de-stabilization of the slope.

DRAINAGE COURSES

Several unnamed tributaries to Hollis Canyon cross the GHAD open space. In general, the creeks have slightly to moderately incised channels with a moderate to dense vegetation cover. Some segments of the creek banks are oversteepened due to previous down cutting and generally in a marginally stable condition. We expect that creek bank failures will continue to occur in the future as the creek banks adjust to lowered creek bed levels. As stated in the Plan of Control, the GHAD shall not have responsibility to control isolated or remote slope instability that does not involve damage to or pose a significant threat to damage to site improvements. In our most recent monitoring, we did not observe areas of the creek channel with the potential to affect site improvements.

DETENTION AND WATER QUALITY BASINS

Three detention basins are located within the boundaries of the Schaefer Ranch GHAD. In the referenced Water Quality-Detention Basin Monitoring and Maintenance letter, the basins are identified as Basin “A” (APN 941-2837-5), Basin “B” (APN 941-2832-18), and Basin “C” (APN 941-2833-1 and 941-2833-2). Monitoring of the detention basins (Figure 2) was conducted as part of the open space monitoring. The observed conditions for the detention basins are described in the attached monitoring reports.

ACCESS ROADWAYS

We observed the condition of the gravel-covered access roadways within the GHAD and the gravel surfaced roadways appeared to be in good condition. Vegetation removal and ongoing vegetation management is included in the GHAD’s routine scheduled maintenance.

SUBDRAIN OUTLETS

The following subdrain outlets were observed and monitored during the site visit. Discharge levels flowing from the subdrain outlets are shown on Table 1. Location of the subdrain outlets labeled “Unable to Locate,” is included as part of the scope of services within current GHAD request for proposals.

TABLE 1: Subdrains

LABEL	FLOW (GALLONS/DAY)	COMMENTS
SD-1	--	Unable to measure; pipe partially submerged; outlets off GHAD property
SD-2	--	Unable to measure; partially submerged

LABEL	FLOW (GALLONS/DAY)	COMMENTS
SD-3	--	Unable to measure; pipe damaged above outlet
SD-4	--	Unable to locate; covered by annual vegetation
SD-5	23	Outlets ~30 feet upslope from barbed-wire fence
SD-6	0	Outlets on slope
SD-7	0	Outlets to pond
SD-8	--	Unable to locate; covered by annual vegetation
SD-9	--	Unable to locate; covered by annual vegetation; outlets on slope
SD-10	--	Unable to monitor; dense vegetation; moderate flow audible
SD-11	0	Outlets to slope; partially buried
SD-12	--	Unable to locate; partially buried
SD-13	0	Outlets to slope
SD-14	0	Outlets to slope
SD-15	--	Unable to locate
SD-16	0	Outlets to slope
SD-17	--	Unable to locate
SD-18	0	Outlets in storm drain inlet in earthen-lined drainage ditch
SD-19	0	Partially blocked with debris; outlets in storm drain inlet
SD-20	--	Unable to monitor - subdrain pipe partially submerged in storm drain inlet
SD-21	--	Unable to Monitor - subdrain Pipe Partially Submerged in Storm Drain Inlet
SD-22	--	Unable to locate
SD-23	--	Outlets in storm drain inlet; unable to access
SD-24	--	Outlets in storm drain inlet; unable to access
SD-25	--	Outlets in storm drain inlet; unable to access
SD-26	--	Outlets to slope; wet; partially buried; unable to access
SD-27	--	Outlets in storm drain inlet; unable to access
SD-28	0	Outlets in storm drain inlet at end of concrete-lined drainage ditch
SD-29	--	Unable to measure; no visible pipe in catch basin, moderate flow in catch basin
SD-30	--	Unable to locate
SD-33	0	Outlets in storm drain inlet
SD-34	0	Outlets in storm drain inlet, moist
SD-35	0	Outlets in storm drain inlet
SD-36	--	Unable to locate
SD-37	--	Unable to locate, tied into storm drain line with no surface access
SD-38	--	Located within swale, wet; unable to locate outlet
SD-39	0	Outlets in storm drain inlet
SD-40	0	Outlets in storm drain inlet; moist
SD-41	0	Outlets in storm drain inlet

*Estimated Flow Rate

LINED SURFACE DRAINAGE DITCHES

Concrete-lined drainage ditches were checked for accumulation of debris/sediment and for obvious distress such as cracking or shifting of the concrete. As shown on Figure 1, there are approximately 50,000 lineal feet of concrete-lined drainage ditch within the Schaefer Ranch GHAD. As part of the scheduled routine site maintenance, the GHAD has removed vegetation and other unwanted material from the concrete-lined ditches. We observed minor cracks in the concrete ditches. These minor cracks do not appear to compromise the integrity of the concrete-lined drainage ditches at this time. With the exception of the concrete-lined drainage ditch segment above Marshall Canyon Court, excessive sediment was not observed in the ditches.

A burrow has been excavated adjacent to the concrete-lined drainage ditch (Figure 2, Site Condition I, Photograph 7). The concrete-lined drainage ditch did not appear to be distressed at the time of our recent monitoring; however, these voids may allow water to infiltrate underneath the concrete-drainage ditch and cause distress. We will fill the animal burrows as needed to protect support for the concrete-lined drainage ditch.

STORM DRAIN INLETS

Storm drain inlets within the open space area of the GHAD appeared to be relatively clear of debris. The storm drain inlets are cleaned as part of routine vegetation maintenance.

FENCES, LOCKS, AND SIGNAGE

The fences, locks, and signage within the GHAD were checked for function, damage, and misplacement and they appear to be in good condition.

If you have any questions concerning the observations made during this reconnaissance, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated



Mary Bromfield, GIT
mb/eh/cjn



Eric Harrell, CEG



Attachments: List of Selected References
Site Photographs
Figures 1 and 2
Detention Basin Monitoring Reports

LIST OF SELECTED REFERENCES

1. ENGEO; Plan of Control for Schaefer Ranch Geologic Hazard Abatement District (GHAD), Dublin, California, November 1, 2006, Project No. 4748.1.500.01.
2. ENGEO; Water Quality – Detention Basin Monitoring and Maintenance, Schaefer Ranch, Dublin, California, November 1, 2006, Project No. 4748.1.500.01.
3. ENGEO; Final Testing and Observation during Mass Grading, Phase I and II, Tract 6765, Schaefer Ranch, Dublin, California, February 15, 2008, Project No. 4748.110.101.
4. ENGEO; Geologic Hazard Abatement District Monitoring – Fall 2019, Schaefer Ranch Development, Schaefer Ranch Geologic Hazard Abatement District, Dublin, California, March 4, 2020, Project No. 4748.002.019.
5. LSA and Balance Hydrologics, Inc., Final Mitigation and Monitoring Plan (Revised), Schaefer Ranch Project, Dublin, California, Corps File 23054S, RWQCB File Nos. 2198.11 and 2199.9446, September 14, 2005.
6. Schaefer Ranch Holdings, LLC Perpetual Conservation Easement Deed, August 6, 2012.

SITE PHOTOGRAPHS

PHOTO 1: Site Condition A.



Seep with standing water and vegetation above concrete-lined drainage ditch.

PHOTO 2: Site Condition B.



Seep with continuous flow on to slope east of Marshall Canyon Court.

PHOTO 3: Site Condition C.



Seep with ponded water south of 10138 Lilly Pad Lake Court.

PHOTO 4: Site Condition F.



Bare soils exposed north of trailhead at Donlon Point Staging Area.

PHOTO 5: Site Condition G.



Signs of previous human activity within GHAD-owned open space within conservation easement south of 7639 Ridgeline Drive.

PHOTO 6: Site Condition H.



Shallow slope failure below barbed-wire fence downslope of 9779 Reimers Way.

PHOTO 7: Site Condition I.

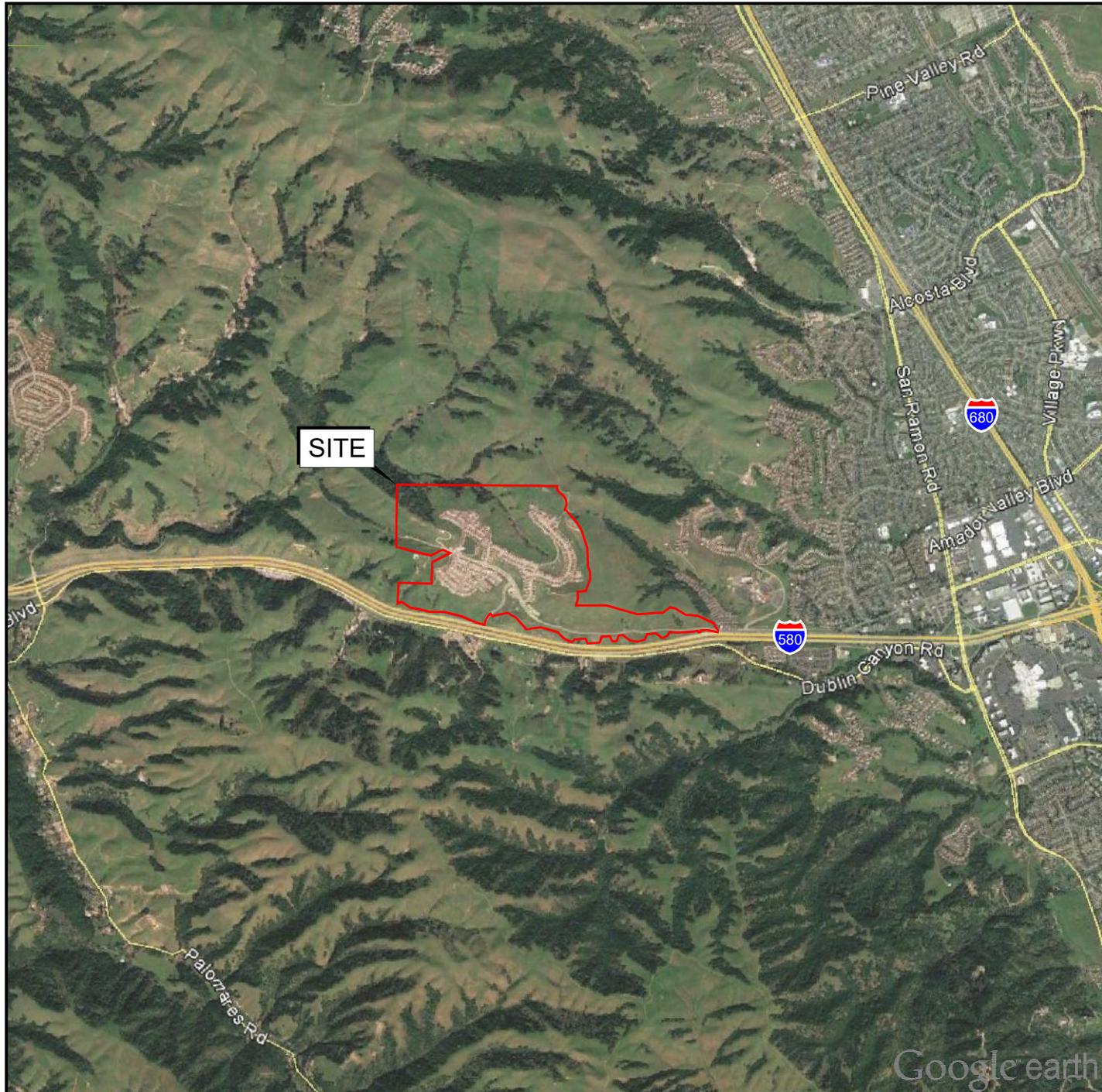


Burrow beside concrete-lined drainage ditch

FIGURES

Figure 1 – Vicinity Map
Figure 2 – Site Plan

COPYRIGHT © 2018 BY ENGEO INCORPORATED. THIS DOCUMENT MAY NOT BE REPRODUCED IN WHOLE OR IN PART BY ANY MEANS WHATSOEVER, NOR MAY IT BE QUOTED OR EXCERPTED WITHOUT THE EXPRESS WRITTEN CONSENT OF ENGEO INCORPORATED.



BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE



VICINITY MAP
 SCHAEFER RANCH GHAD
 DUBLIN, CALIFORNIA

PROJECT NO.: 4748.002.019

SCALE: AS SHOWN

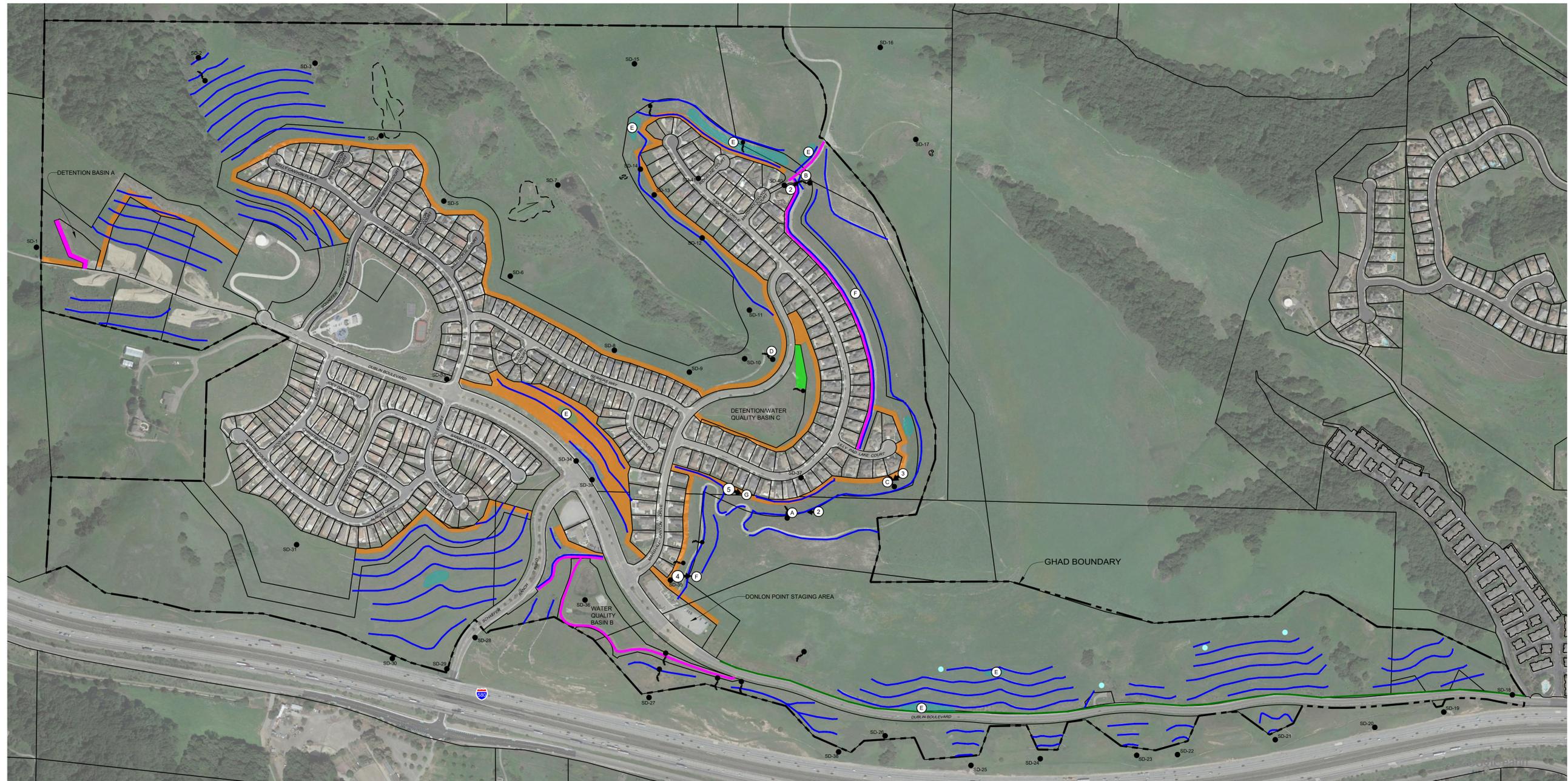
DRAWN BY: GLJ

CHECKED BY: EWH

FIGURE NO.

1

COPYRIGHT © 2020 BY ENGEO INCORPORATED. THIS DOCUMENT MAY NOT BE REPRODUCED IN WHOLE OR IN PART BY ANY MEANS WHATSOEVER, NOR MAY IT BE QUOTED OR EXCERPTED WITHOUT THE EXPRESS WRITTEN CONSENT OF ENGEO INCORPORATED.



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- CONCRETE-LINED DRAINAGE DITCH
- EARTHEN-LINED DRAINAGE DITCH
- GRAVEL-SURFACED EMERGENCY VEHICLE ACCESS/MAINTENANCE ROAD
- EARTH-SURFACED MAINTENANCE ROAD
- VEGETATION MANAGEMENT ZONE
- AREA OF DENSE ANIMAL BURROWS
- SD-# SUBDRAIN OUTFALL
- C SITE CONDITION
- LANDSLIDE SHOWING RECENT ACTIVITY
- SEEP
- LOCATION AND DIRECTION OF PHOTOGRAPH
- SUBDRAIN CLEANOUT

ORIGINAL FIGURE PRINTED IN COLOR

DETENTION BASIN MONITORING REPORTS

MONITORING REPORT

**APN 941-2837-5 (Basin "A")
Schaefer Ranch
Dublin, CA**

**DETENTION BASIN OPERATIONS AND MAINTENANCE
SITE MONITORING AND MAINTENANCE
REPORT FORM**

Inspector: Mary Bromfield **Date:** May 26, 2020
Weather Conditions: Sunny
Days since last rainfall: 8
Basin Water Level: 0
Dry season/Wet season: Dry
Noteworthy Sediment Accumulated since Last Monitoring Event: None

MONITORED CONTROL	YES	NO	N/A	COMMENTS/SUGGESTED MAINTENANCE
1. Are inlet and outlet structures functioning properly, allowing the basin to drain and are they in satisfactory condition?	X			
2. Are access roads in satisfactory condition?	X			
3. Is all perimeter fencing in good condition without breaks, gaps or damage?	X			
4. Have the debris racks been cleaned and are they in good condition?	X			
5. Is the embankment surrounding the basin in good condition without rills or failures?	X			
6. Is vegetation less than 5 feet in height?	X			
7. Are embankment slopes protected with mulch or vegetation?	X			
8. Has sediment removal been undertaken in the last 3 months?		X		

MONITORED CONTROL	YES	NO	N/A	COMMENTS/SUGGESTED MAINTENANCE
9. Is there evidence of chemical sheen or odor, contaminated runoff, litter or blowing debris in or near the basin?		X		
10. Do any basin devices require maintenance to provide more effective function?		X		
11. Are there signs of leaking irrigation systems?			X	
12. Are there any signs of vandalism?		X		
13. Are mosquitoes evident?		X		
14. Has mosquito abatement been undertaken since the last monitoring event?		X		
15. Are there other remedial/repair tasks that should be undertaken in the near future?		X		
16. Is there any evidence or information received in the last 3 months to indicate a lengthy drain time?		X		

“No” answers to Items 1-7 or “Yes” answers to Items 8-16 may require a corrective action.

MONITORING REPORT

**APN 941-2832-18 (Basin "B")
Schaefer Ranch
Dublin, CA**

**DETENTION BASIN OPERATIONS AND MAINTENANCE
SITE MONITORING AND MAINTENANCE
REPORT FORM**

Inspector: Mary Bromfield **Date:** May 26, 2020
Weather Conditions: Sunny
Days since last rainfall: 8
Basin Water Level: Less than approximately 6 inches
Dry season/Wet season: Dry
Noteworthy Sediment Accumulated since Last Monitoring Event: None

MONITORED CONTROL	YES	NO	N/A	COMMENTS/SUGGESTED MAINTENANCE
1. Are inlet and outlet structures functioning properly, allowing the basin to drain and are they in satisfactory condition?	X			
2. Are access roads in satisfactory condition?	X			
3. Is all perimeter fencing in good condition without breaks, gaps or damage?	X			
4. Have the debris racks been cleaned and are they in good condition?	X			
5. Is the embankment surrounding the basin in good condition without rills or failures?	X			
6. Is vegetation less than 5 feet in height?		X		
7. Are embankment slopes protected with mulch or vegetation?	X			
8. Has sediment removal been undertaken in the last 3 months?		X		

MONITORED CONTROL	YES	NO	N/A	COMMENTS/SUGGESTED MAINTENANCE
9. Is there evidence of chemical sheen or odor, contaminated runoff, litter or blowing debris in or near the basin?		X		
10. Do any basin devices require maintenance to provide more effective function?		X		
11. Are there signs of leaking irrigation systems?			X	
12. Are there any signs of vandalism?		X		
13. Are mosquitoes evident?		X		
14. Has mosquito abatement been undertaken since the last monitoring event?		X		
15. Are there other remedial/repair tasks that should be undertaken in the near future?		X		
16. Is there any evidence or information received in the last 3 months to indicate a lengthy drain time?		X		

“No” answers to Items 1-7 or “Yes” answers to Items 8-16 may require a corrective action.

MONITORING REPORT

**APNs 941-2833-1 and 941-2833-2 (Basin "C")
Schaefer Ranch
Dublin, CA**

**DETENTION BASIN OPERATIONS AND MAINTENANCE
SITE MONITORING AND MAINTENANCE
REPORT FORM**

Inspector: Mary Bromfield **Date:** May 26, 2020
Weather Conditions: Sunny
Days since last rainfall: 8
Basin Water Level: Approximately 6 inches
Dry season/Wet season: Dry
Noteworthy Sediment Accumulated since Last Monitoring Event: None

MONITORED CONTROL	YES	NO	N/A	COMMENTS/SUGGESTED MAINTENANCE
1. Are inlet and outlet structures functioning properly, allowing the basin to drain and are they in satisfactory condition?	X			
2. Are access roads in satisfactory condition?		X		Remove vegetation and treat with herbicide to maintain gravel surfaced road in a weed free condition.
3. Is all perimeter fencing in good condition without breaks, gaps or damage?	X			
4. Have the debris racks been cleaned and are they in good condition?	X			
5. Is the embankment surrounding the basin in good condition without rills or failures?	X			
6. Is vegetation less than 5 feet in height?		X		Cattails within the central, bottom areas of the basin are greater than 5 feet in height.
7. Are embankment slopes protected with mulch or vegetation?	X			
8. Has sediment removal been undertaken in the last 3 months?		X		

MONITORED CONTROL	YES	NO	N/A	COMMENTS/SUGGESTED MAINTENANCE
9. Is there evidence of chemical sheen or odor, contaminated runoff, litter or blowing debris in or near the basin?		X		
10. Do any basin devices require maintenance to provide more effective function?		X		
11. Are there signs of leaking irrigation systems?			X	
12. Are there any signs of vandalism?		X		Minor trash in basin.
13. Are mosquitoes evident?		X		
14. Has mosquito abatement been undertaken since the last monitoring event?		X		
15. Are there other remedial/repair tasks that should be undertaken in the near future?		X		
16. Is there any evidence or information received in the last 3 months to indicate a lengthy drain time?		X		

“No” answers to Items 1-7 or “Yes” answers to Items 8-16 may require a corrective action.