

Project No.
4365.002.024

December 2, 2024

Orinda Geologic Hazard Abatement District Board of Directors
 Chair Darlene K. Gee
 Vice Chair Latika Malkani
 Board Member Brandyn Iverson
 Board Member Inga Miller
 Board Member Janet Riley

Orinda Geologic Hazard Abatement District
 22 Orinda Way
 Orinda, CA 94563

Subject: Orinda Oaks Development
 Orinda, California

**ORINDA GEOLOGIC HAZARD ABATEMENT DISTRICT
 MONITORING – FALL 2024**

Dear Chair Miller and Board Members:

ENGEO is pleased to submit this monitoring report for the Orinda Geologic Hazard Abatement District (GHAD). As described in the Orinda Oaks Plan of Control (Reference 1), the purpose of this monitoring is to observe and report the conditions on the GHAD-accepted parcels and associated improvements. The site-monitoring event was completed on October 22, 2024, and included the GHAD-accepted parcels as listed in Table 1.

TABLE 1: Parcels

ASSESSOR'S PARCEL NUMBER	DESCRIPTION
273-110-016	Lot 12, 218 Stein Way
273-110-017	Lot 1, 305 Miller Court
273-110-018	Lot 2, 315 Miller Court
273-110-019	Lot 3, 325 Miller Court
273-110-020	Lot 4, 335 Miller Court
273-110-021	Lot 5, 345 Miller Court
273-110-022	Lot 6, 350 Miller Court
273-110-029	Lot 7, 340 Miller Court
273-110-030	Lot 8, 330 Miller Court
273-110-031	Lot 9, 320 Miller Court
273-110-032	Lot 10, 310 Miller Court
273-110-028	Lot 11, 300 Miller Court

The parcels listed above are owned by individual property owners and maintained by the Orinda GHAD in accordance with the First Amended Plan of Control (Reference 1).

SCOPE

The site monitoring included the following tasks.

- Geologic reconnaissance of the site slopes for indications of erosion or slope failure
- Observation of the stormwater systems, as shown in Figure 1
- An inspection of concrete-lined drainage ditches
- Observation of subdrain and horizontal drain outlets and measurement of the flow volume, where possible
- A reconnaissance of creek channels and corridors for indications of slope instability that could impact site improvements
- Observation of the detention basin, including outfall
- Inspection of bioretention areas and flow-through planters

OPEN-SPACE SLOPES

Slopes within the open space are in relatively good condition. The slopes appeared to be moderate to well-vegetated and free from significant failures, erosion, or creep. Throughout the open space of 345 Miller Court (Lot 5), areas of animal burrows were observed. Excessive animal burrows pose a risk to shallow slope stability in heavy rains; however, no areas of immediate concern were recognized as a threat to GHAD-maintained improvements. These areas will continue to be monitored in the future.

During previous monitoring events, we observed that areas on the northeastern slope of 345 Miller Court (Lot 5) were saturated, and seeping water and soil had accumulated near the curb of Stein Way. During this monitoring event, water was not observed to be seeping from the slope into the curb and gutter of Stein Way. The saturated soil is likely due to excess irrigation but does not pose a threat to slope stability at this time. The GHAD will continue to monitor this slope area in the future.

STORM DRAIN INLETS

Storm drain inlets accessible within the open-space area of the development are in relatively good condition. Storm drain inlets were cleared of debris as part of the annually scheduled GHAD maintenance.

CONCRETE-LINED SURFACE DRAINAGE DITCHES

The drainage ditches were checked for accumulation of debris/sediment and for obvious distress, such as cracking or shifting of the concrete. The ditches appeared to have minor soil deposits from animal burrowing activity.

As shown in Figure 1, there are approximately 800 linear feet of drainage ditches currently maintained by the GHAD. As part of the scheduled routine site maintenance, the GHAD will remove vegetation and other unwanted material from the concrete-lined ditches.

We have previously observed moderate cracks and offsets in the concrete ditch on the western portion of 320 Miller Court (Lot 9). We noted the offset in the concrete-lined drainage ditch on Lot 9 remained unchanged, with a measured ½-inch vertical displacement and ¼-inch horizontal displacement (Figure 1, Site Condition A). During this monitoring event, we observed an offset in the concrete-lined drainage ditch on Lot 11, with a measured 2-inch vertical displacement and 1-inch horizontal displacement (Figure 1, Site Condition B). The cracks and offsets do not appear to compromise the integrity of the concrete-lined drainage ditches. The GHAD will continue to monitor these conditions in future monitoring events.

We observed in our previous monitoring events that soil at the uphill side of the concrete-lined drainage ditch on the eastern edge of the GHAD boundary was creeping and deposited into the concrete-lined drainage ditch. In Spring 2022, we observed wooden shoring and debris in the ditch, impacting the flow of runoff. At the time of this monitoring event, the drainage ditches were cleared of debris. We will continue to monitor this slope area for impacts to the drainage ditch.

EARTHEN-LINED SURFACE DRAINAGE DITCHES

The earthen-lined surface drainage ditches were observed for proper shape and debris blocking the drain inlets. At the time of our monitoring, minor amounts of sediment and debris were observed within the earthen ditch. The earthen ditch was in overall good condition and performing well, and sediment and debris should be removed during maintenance.

SUBDRAIN AND HORIZONTAL DRAIN OUTLETS

The following subdrain outlets were observed and monitored during the site visit. Discharge levels flowing from the subdrain outlets were measured and are reported in Table 2.

TABLE 2: Subdrains

LABEL	FLOW (gallons/day)	NOTES
SK-1	46	
SK-2	--	Unable to monitor; In homeowner's backyard (Lot 7)
SK-3	457	Estimate; Unable to measure; Outlets into storm drain inlet in the detention basin
SK-6	799	
SK-23	46	
Lot 9	--	Unable to monitor; Connected to area drain in homeowner's backyard (Lot 9)

Subdrain outlets are located on private properties and monitored and maintained, as allowed, per GHAD responsibilities in the Plan of Control for the Orinda Oaks development. As necessary, the GHAD will locate and mark the accessible subdrain outlets.

DRAINAGE COURSES

There is a slightly to moderately incised channel with moderate vegetation cover on the northeastern portions of 305 and 315 Miller Court (Lots 1 and 2). Minor to moderate areas of erosion and shallow slope instability were observed to be unchanged during this monitoring event, though some slope seepage was observed originating from Subdrain Outlet SK-1 (Figure 1, Site Condition C). The channel banks are oversteepened, and erosion and shallow failures will likely

occur in the future as the channel flows downslope. We did not observe areas of the channel with the potential to impact site improvements at this time and will continue to monitor this drainage course.

A drainage channel bisects 218 Stein Way (Lot 12). The channel is moderately incised with dense vegetation cover. Some segments of the creek banks are oversteepened due to previous downcutting and are generally in a stable condition. 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 of damage to site improvements. During this monitoring, we did not observe areas of the creek channel with the potential to impact site improvements.

DETENTION BASIN

There is one detention basin located within the GHAD-maintained open space. The detention basin is located south of Stein Way and on the northeastern portion of 315 and 325 Miller Court (Lots 2 and 3). In Fall 2023, we observed an exposed irrigated pipe and an area with actively growing annual grasses and excess water that was not typical in the dry season. During our previous monitoring event, the irrigation pipe was repaired, and the detention basin was performing as designed. At the time of this monitoring event, the detention basin was performing as designed, and the GHAD will continue to monitor this area in future monitoring events.

BIOFILTRATION FACILITIES

Bioretention areas and flow-through planters were observed for erosion, sediment accumulation, vegetation and mulch condition, percolation, irrigation, vector control, and debris in the cell and around the storm drain inlet. In general, the biofiltration facilities were observed to be in good condition and appeared to be performing well.

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

Sincerely,

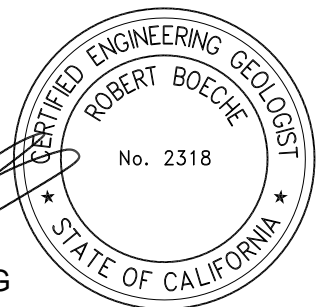

ENGEO Incorporated



Quinlan Parker

qp/rhb/jg

Attachments: Selected References
Appendix A – Site Conditions
Figure 1 – Site Plan



Robert H. Boeche, CEG

SELECTED REFERENCES

1. ENGEO. 2013. First Amended Plan of Control, Orinda Geologic Hazard Abatement District (GHAD) Plan of Control for Orinda Oaks. April 5, 2013, Revised May 22, 2013. Project No. 9192.000.001.
2. ENGEO. 2014. Testing and Observation Services, Orinda Oaks, Orinda, California. May 9, 2014. Project No. 9192.000.001.
3. ENGEO. 2016. Geologic Hazard Abatement District (GHAD) Plan of Control Transfer Monitoring, Orinda Oaks, Orinda, California. August 15, 2016. Project No. 4365.002.016.
4. Darwin Myers Associates, Orinda Geologic Hazard Abatement District, Orinda Oaks (12 Lot Residential Subdivision) 3rd Party Review Letter, Inspection of Lands Proposed to be Transferred to the GHAD, Orinda, California. DMA Project #3043.16. August 10, 2016.
5. ENGEO. 2017. Orinda Geologic Hazard Abatement District - Plan of Control Transfer Acceptance, Orinda Oaks, Orinda, California. February 28, 2017. Project No. 4365.002.016.
6. ENGEO. 2017. Report on Testing and Observation Services during Slope Repair, Lot 9, 320 Miller Court, Orinda Oaks, Orinda, California. October 25, 2017. Project No. 9192.000.001.
7. ENGEO. 2022. Orinda Geologic Hazard Abatement District Monitoring – Fall 2022, Orinda Oaks, Orinda, California. October 31, 2022. Project No. 4365.002.022.
8. ENGEO. 2023. Orinda Geologic Hazard Abatement District Monitoring – Spring 2023, Orinda Oaks, Orinda, California. May 25, 2023. Project No. 4365.002.022.
9. ENGEO. 2023. Orinda Geologic Hazard Abatement District Monitoring – Fall 2023, Orinda Oaks, Orinda, California. October 30, 2023. Project No. 4365.002.023.
10. ENGEO. 2024. Orinda Geologic Hazard Abatement District Monitoring – Spring 2024, Orinda Oaks, Orinda, California. June 17, 2023. Project No. 4365.002.023.
11. Ruggeri-Jensen-Azar, Site Plan, IMP Flow through Planter Detail, Subdivision 8101, Orinda Oaks, Lot 6, 350 Miller Court, City of Orinda, Contra Costa County, California. May 7, 2014, revised January 27, 2016. Job No. 111032.

APPENDIX A
SITE CONDITIONS

Site Condition: A
Observation Date: 10/22/2024
Description: Crack and offset in concrete-lined drainage ditch west of Lot 9.
Recommendation: Continue to monitor.
Field Representative: QP



Site Condition: B
Observation Date: 10/22/2024
Description: Offset of concrete drainage ditch behind Lot 11.
Recommendation: Continue to monitor.
Field Representative: QP



Site Condition: C
Observation Date: 10/22/2024
Description: Seepage on slope coming from Subdrain SK-1.
Recommendation: Continue to monitor.
Field Representative: QP



FIGURE 1
SITE PLAN



EXPLANATION	
	GHAD Boundary
	Parcel Line (2023)
	Bioretention Basin
	Concrete-Lined Drainage Ditch
	Earthen Drainage Ditch
	Storm Drain Line
	Perforated
	Solid
	Site Condition (Fall 2024)
	Subdrain Cleanout
	Subdrain Outlet