

Tryhorn Consulting

February 17, 2021
TC No. 1006-900

Ms. Jackie Howe
Howe Association Management, Inc.
485 Hartz Avenue
Danville, California 94526

**RE: BIENNIAL (2019 THROUGH 2020) GEOLOGICAL SITE VISIT
MAGEE RANCH
DANVILLE, CALIFORNIA**

Dear Ms. Howe:

This letter report presents the results of our site observations at Magee Ranch in Danville, California, performed on behalf of the Magee Ranch Homeowners Association (HOA). The report covers the two-year period from March 2019 through December 2020, and includes site visits, response to requests from Board Members, and other communications. This two-year reporting period is a one-time occurrence and future reports will be on an annual basis.

The purpose of the site visits is to 1) continue to check geologic/geotechnical conditions at the HOA-managed open space areas of the subdivision, 2) follow up on previous recommendations, 3) develop recommendations for further work, as needed, and 4) observe any specific condition or location requested by the HOA or a GHAD liaison.

This report is not typical of previous annual reports in that it extends over two years. This is due to several factors:

- most importantly, we tracked status of general site conditions through regular communication with GHAD liaison Tom Sutak, and more recently Ron O'Dell;
- Danville precipitation in the 2018/19 rain year up to March 2019 was average, and from that time through 2020, rainfall was well below average (40% of historical average of 25 inches);
- we had a late annual visit start (October 2019), and;
- we also experienced scheduling restrictions due to Covid19 in 2020.

To explain the first two more important factors further, we have worked closely with Tom Sutak for more than 11 years on Magee Ranch, and we have come to rely on his keen observations and timely reporting of important changing conditions. In fact, observations of residents and others relayed to us by the Board, GHAD members or HOA management have contributed greatly to our efforts over the years. Many of the details of our previous

report recommendations were worked out verbally, with Mr. Sutak and Adrian Martinez, New West Landscape, implementing them in the field.

Most of the historical geologic instability and erosion issues at Magee Ranch have followed periods of high precipitation (notably November-February 1997-98, December 2002, November-December 2012, and November-January 2016/17), and conversely, periods of drought presented far fewer of those problems. Because of the relatively dry period of March 2019 to December 2020, most of our efforts were directed at the progress of repair or restoration at previous problem locations or looking for signs of potential instability.

We conducted site evaluations during visits in November 2019, and in February, March, May, October, and November 2020. These visits have included walking and driving over the entire HOA-managed open space area in order to prepare this report.

During our visits, we recorded observations in memo form and with photographs. Locations are described in this letter report using Lot numbers as presented in Figure 1. Features mentioned in this report, and abbreviated on grading plans and Figure 1, as appropriate, include subdrains (SB), catch basins (CB), drain inlets (DI), field inlets (FI), erosion (E) and landslide or slope features (LS). The locations of our observations and evaluation included the following:

- 1) Hillslopes (LS)– We evaluated the overall condition of natural and graded hillslopes for potential instability. We observed the condition of previously repaired landslides, cut and fill slopes throughout the subdivision, and natural hillslopes near residences, streets and drainage structures. We looked for signs of erosion, earth features associated with instability, evidence of excessive burrowing of rodents, and drainage issues.
- 2) Subdrains (SB) – The ongoing functioning of subdrains in the subdivision is important to protect slope stability and to provide drainage for engineered fills. Our engineering geologist checked visible cleanouts and subdrain outlets to observe conditions and where feasible, to measure flows. Subdrain flow and outlet conditions are summarized in Table 1.
- 3) Surface Drainage (CB, DI, FI, E) – Major surface drains in swales and drainage channels were checked for obstructions, maintenance requirements, or high erosion potential. In addition, surface ditches (concrete V-ditches) on open space slopes were checked. Surface ditches on individual lots were observed where practicable.
- 4) Detention Basin – The Detention Basin at the west end of Brightwood Lane West was constructed during grading of Magee Ranch, and receives storm drainage collected from the western portion of the development. It provides downstream protection by detention of flood flows through the outlet structure. The general conditions of the basin slopes, floor, and outlet structure were checked.



- 5) Sunhaven Trail – The condition of the open space areas near Sunhaven Trail, south of Sunhaven Road, also known the offsite sewer easement road, was checked, along with the condition of the roadside cribwall and drainage features.

In addition to site visits conducted as part of our regular annual visit protocol, we responded to several questions and requests pertaining to Magee Ranch open space. In March 2019, to answer Tom Sutak's question of the age of three eroded sedimentation basins in the open space upslope of Windover Drive, we reviewed our files, and studied historical, stereo-paired, aerial photographs. We determined that the basins were constructed between 1985 and 1994, and likely were not there prior to the development of Magee Ranch.

We also responded, in March and June 2019, to a situation of a resident on Leaffield Drive, who asked about their concrete V-ditch relative to proposed swimming pool construction. At Tom Sutak's request, we began research of our files. Ultimately, the pool location was revised, so as not to disrupt the V-ditch.

In October 2020, we met Ron O'Dell to look at the area of recent landscape tree removal between the Magee Ranch Road bridge and the new Blackhawk Meadows subdivision. The area is now a subject of research into property boundaries and maintenance responsibilities and is described more fully below.

In December 2020, we responded to Ron O'Dell and Terry Woram regarding drainage issues and historic runoff at Sunhaven trail near Northridge Estates.

OBSERVATIONS

Our observations of geologic conditions at Magee Ranch have historically focused on 1) Immediate problem areas; 2) Areas or features with potential for impacts over a season or several years; and 3) Features that need to be maintained in order to avoid drainage and erosion issues.

The first category includes active landslides, flooding, or erosion, during or after a strong weather event. During the current review period, we observed none of these.

The second category includes locations of previous landslides or severe erosion. We check repairs and revegetation efforts to verify their progress, and whether additional measures are needed. Several locations of repeated erosion and/or sedimentation exist at Magee Ranch, most notably at the headwalls of Windover Drive, Shadewell Drive, and Leaffield Road, and behind the gabion on Shadewell Drive. The most significant of these is the Windover headwall area (Location CB-1 on Figure 1), settlement basin, three check dams and the upslope sediment source. The steep, bare slopes upstream of the check dams (Location E-1) are very erodible and have at times overwhelmed the check dams and



headwall basin with sediment. We previously (2018) acquired proposals to design repair schemes at the erosion source. Because of the complexity and high costs, the decision was made to continue observation of the erosion area, while ensuring that the three, stacked-rock check dams and the headwall area were kept functional, and all collected sediment was removed as necessary prior to upcoming precipitation. The other sites in this category are regularly observed and cleaned of sediment and revegetated, as necessary.

The third category includes the extensive surface drainage system of V-ditches, inlets, pipe outfalls, and swales, and the subsurface system of subdrains and outfalls. The grasses that cover most slopes continually grow to and over the concrete V-ditches and field inlets. In order to keep these drainage elements free flowing, cleanup and cutting back of grasses and weeds is performed annually. As well, cracked or deteriorated concrete is noted and repaired as needed.

A number of repairs and erosion control methods used on slopes have been effective, and sediment that filled behind check dams, head wall basins, and gabions has been removed. Most graded slopes have revegetated; nevertheless, if a prolonged period of rain occurs, it will be important to observe these through the end of the current winter.

Specific areas of observation follow:

Landslides and Slopes

Most slopes within the subdivision are performing well. We observed no new landslide related slope movements through November 2020, our latest field visit. Areas of previous landslide activity in proximity to structures and other improvements have been repaired through tracking and smoothing with equipment. These and other minor or more remote locations were seeded or hydromulched and provided with other erosion reduction elements including wattles and straw.

We understand that there may be confusion over the term “soil creep”, and its relationship to landslide hazards. Many of the slopes at Magee Ranch exhibit soil creep, which is a common phenomenon of clay-rich soils, especially on steep slopes. It occurs as the slow, steady downhill movement of surficial soils and is distinct from landslide phenomena. It is most often observed where wood fences traverse slopes and the posts have tilted, in some locations going as far down as horizontal. Creep can also affect other structures, particularly where they have shallow foundations, or are not designed to resist the creep forces to which they are subjected. We have observed many locations at Magee Ranch where the result of soil creep is evident, such as tilted posts and rotated walls. This is not unusual given the age of original fencing and wooden walls (typically 25 years or older). Soil creep may result in damage, but creep is not generally considered to be landsliding.



During our site visit of February 2020, we observed on the slopes to the southwest of the Detention basin (LS-1), a trail that climbed up at least 400 feet long to the ridge top. The trail had been created by excavation of curves and jumps for use by trail bikes. Tire tracks were evident, and the trail surface was bare soil. We considered the trail to be a severe erosion hazard, and, working with Ron O'Dell, recommended restoration criteria. Adrian Martinez of New West Landscape performed the earthwork and re-sculpting needed to return the slope to its preexisting condition. We observed and walked over the site during our May visit. Adrian had seeded the bare soils, and added wattles, though we suggested that more seeding should be applied just prior to winter rains, and he agreed to add more.

The previously eroded locations upslope of Lot 172 (124 Shadewell, General Location LS-2) have revegetated and the capacity of the basin behind the gabion has been restored.

Two small rotational landslides occurred in winter 2017/2018 in the Windover headwall area, one about 250 feet west, near the head of an older repaired slide, and the other about 300 feet east. Both were tracked covered with jute and straw protection and have subsequently revegetated.

In late October 2020, a large mound of excavated soil spoils was placed on an HOA-managed slope (Location LS-3) near a landslide that was repaired during Magee Ranch site grading and referenced as E-3R. The soil mound was about 450 feet east of the end of Brightwood Lane East, adjacent to the fence line. The soil reportedly has been removed. Because the location is characterized by historic, mapped landslides, monitoring over this winter and beyond is advisable. The slide repair included subdrainage, and we are not aware if the slide soils or subdrains were disrupted by excavation.

Subdrains

An extensive system of deep subdrains was constructed in the subdivision during mass grading to lower the groundwater in deep fills that were placed in valleys and low-lying areas on the site. These subdrains outlet in three main areas: 1) the detention basin at the end of Brightwood Lane West; 2) a drainage depression adjacent to Sunhaven Road between Lots 79 and 80, and, 3) a storm drain endwall east of Lot 69. The subdrains at locations (1) and (2) are visible, actively draining and are functional. The subdrain at location (3) is not visible.

Where practicable, we measure and record subdrain flow, as an indicator that the system continues to function. The deep subdrain outlets, as well as a number of other, shallower outlets, are numbered SB1 through SB28, as shown in Table 1.

Flows from the deep subdrains are typically little affected by monthly or even seasonal variations in rainfall: however, prolonged changes in rainfall may be expected to be



noticeable. In fact, we have noted long-term effects, such as lesser flows during drought years, and recovery after average to above average years.

In addition to the deep subdrains, numerous shallow subdrains were constructed in landslide repair areas during mass grading of the site. Most of these shallow subdrains were dry at the time of our site visits and generally flow only during periods when rainfall infiltration reaches the zone of the subdrain. Most shallow subdrains were installed with riser cleanouts that are often visible on hillsides, as white PVC pipes with covers. Some of the outfall pipes are also visible, as they empty into V-ditches.

Three horizontal wells (hydraugers) were constructed behind Lots 54 and 55 during mass grading to drain a seepage area that was exposed on a cut slope. The wells remain functional, with a small flow from the outlet pipe into a V-ditch. The year-round moisture encourages algae and other plant growth and requires periodic cleanout.

Drainage Facilities and Inlets

The storm drain (SD) system at Magee Ranch includes surface runoff from open space, lots, and streets, and subsurface flow in pipes from headwalls, inlets and subdrains. Storm drainage from the western portion of Magee Ranch discharges into the detention basin, and storm drainage from the eastern portion discharges into the creek at Sunhaven Trail. Drainage from Magee Ranch Terrace enters the Blackhawk Road system.

Storm drain inlets intercept runoff discharging from drainage swales at headwall locations within Magee Ranch. These inlets periodically are partially or completely blocked with debris and sediment, particularly when leaves, soil and other debris gets swept to the inlet during early season rainfall: This fall, under the direction of Ron O'Dell and Terry Woram, New West Landscape performed extensive cleanout of inlets throughout Magee Ranch.

At Magee Ranch Terrace, four, shallow, storm water detention ponds step up in the swale (Location CB-2) behind 26 Mapleglen Drive (Lot 8). They were graded during development of Magee Ranch, and were built with soil berms equipped with overflow pipes. They were designed to detain storm water runoff and allow silt to collect. In doing so, downstream V-ditches, inlets, houses and yards would be protected. During our November 2020 visit, we observed that dirt bike tracks extended to all four berms, and pits were dug in the lower berm soils to create jumps. Several tools were strewn about, including shovels, rakes, pick and brooms. The berm damage is repairable; however, continued excavation and erosion may degrade the ability of the ponds to function.

In early October 2020, we met with Ron O'Dell to walk out the area near Magee Ranch Road bridge and the newly constructed Blackhawk Meadows subdivision. This area recently has been partially cleared of small trees and shrubs in preparation for new landscape planting and possible light installation on a bank of the east branch of Green



Valley Creek. We discussed the issues of erosion, maintenance responsibilities, and property boundaries. We have not noted significant erosion of Green Valley Creek at this location over the last 22 years as a consultant to the HOA; however, in the period before new landscaping is well established, some erosion could occur. With regard to property boundaries, fence lines are indistinct, and we saw no survey stakes. We have recently obtained Blackhawk Meadows subdivision map and improvement plans that will be of use to the HOA, and we expect additional documents in the future.

Surface Ditches

An extensive network of concrete surface drainage ditches (V-ditches, or B-58s) was constructed during the original grading of Magee Ranch. These provide the function of interception of surface runoff during rainfall events, and connection to the subsurface and surface storm drain system. Maintenance of these is an important, ongoing activity, and is especially crucial during periods of extreme weather. Cracked, missing, or separated concrete sections should be repaired or reported if observed by homeowners. Grass cutting for fire/weed suppression mowing should be extended along the full length of all V-ditches, and for 3 feet on each side. At locations throughout Magee Ranch, cut grass blows in or otherwise collects in V-ditches and inlets; these were systematically cleaned in October 2020, and all should be cleared annually.

Some surface ditches extend into private lots and are the homeowners' responsibility to maintain. Many reaches of ditches are not visible from outside the lots and should be checked by homeowners as indicated in the Recommendations section. A number of homeowners have installed grates or wire fabric on V-ditches, and these may create a dammed or clogged ditch condition, which may lead to overflow, erosion or misdirected drainage. Likewise, ditches commonly become partially filled with soil from burrowing animals, and from leaves that fall from nearby trees. The homeowners should maintain free-flowing conditions at all times.

Flood Control (Detention) Basin

The general conditions at the flood control basin appear relatively consistent from year to year: the interior upgradient and downgradient slopes remain armored with rip-rap, and the interior side embankments appear stable, with little change except for growth of vegetation. Subdrain water continually flows from two major subdrain outlets, and the concrete outlet structure appears solid and intact. The 12" diameter outlet is now cleared of branches and is easily accessible.

Since the initial construction, the basin has experienced growth of vegetation within the basin and on surrounding embankments. Within the basin, most of the growth is of small trees, less than 8 inches in trunk diameter, and some shrubs. Several trees reach as large



as 20 inches diameter. Although in aerial views, tree canopy covers the entire basin, at the basin floor level, the view is mostly open, and the embankments are visible. The trash rack and outlet structure were cleared of debris in 2020, and the basin appears clear and free flowing.

The gates and fencing around the basin have recently been repaired and equipped with new padlocks.

Sunhaven Trail (Off-site Sewer Easement Road)

We observed the road alignment, adjacent slopes, and drainage devices and inlets. Runoff along the sewer easement road appears to be under control. Recently, Terry Woram uncovered a buried field inlet, which directs runoff from the hills to the east, and under the road to a discharge into the creek.

At the concrete cribwall along the road, previous rodent activity has removed soil from around the structural members. We suggest that continued rodent control is advisable. The wall continues to appear even, without noticeable buckling or settlement, and it is our opinion that the wall continues to function as support for the cut slope.



RECOMMENDATIONS

The following is a list of recommendations and action items. Number designations are in accordance with numbers shown on the attached site plan, Figure 1. The items listed are given a priority ranking, suggesting importance or urgency of the recommended action. The following ranking is used:

- | | |
|-----------------|---|
| (A) Urgent | Immediate action is required. |
| (B) Important | Action during the next winter or construction season. |
| (C) Maintenance | Monitor, and correct if needed. |

Landslides and Slopes

- (A) The recently seeded slopes southwest of the Detention Basin, LS-1 on Figure 1, should be observed this winter, particularly following heavy rain periods. The bare slopes of the trail bike tracks are very erodible until vegetation is well established.
- (B) The disturbed slope area at LS-3 on Figure 1 should be monitored throughout the winter so revegetation can be established. If necessary, additional erosion control may be needed, such as wattles and silt fence.

Subdrains

- (B) The outlet of the 6-inch subdrain (SB26) is marked by a T-bar stake in the Detention Basin. It should be cleared of roots and deposits below the opening to a depth of at least four inches, to allow water measurements. The resulting hole should drain away from the outlet.

Drainage Facilities and Storm Drain Inlets

- (B) The check dams and headwall at the head of Windover (Location CB-1 on Figure 1) should be checked during the 2020//2021 winter for collection of silt, as an indicator of upstream erosion. Remedial action may be needed during the winter such as cleaning, removing sediment, or re-stacking of the rock check dams. The current erodible condition may be evaluated for long-term remediation, and work undertaken to slow significantly or cease, future erosion.
- (C) Uphill from 26 Mapleglen Drive in Magee Ranch Terrace (Location CB-2 on Figure 1), the lower two detention ponds should be monitored for erosion and to ensure that the outfall pipes are functional.



Surface Ditches

- (B) All V-ditches and Field Inlets (FI) should be cleared of vegetation and soil, and grasses and brush should be removed from a minimum three (3) feet away on each side of the ditch. Cut vegetation should not be left in V-ditches. Homeowners should check and clear debris from surface ditches that drain through their backyards periodically during the winter.

Detention Basin

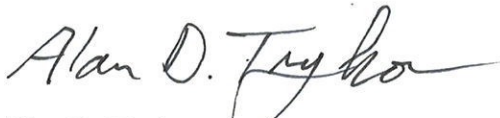
The basin slopes, floor and structures appear to be clear and functioning well, and no further work is recommended at this time.

Offsite Sewer Easement Road

- (C) The concrete cribwall should continue to be monitored for settlement or shifting of structural elements.

Please call if you have questions or require additional information.

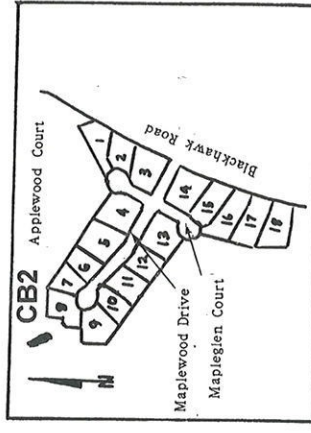
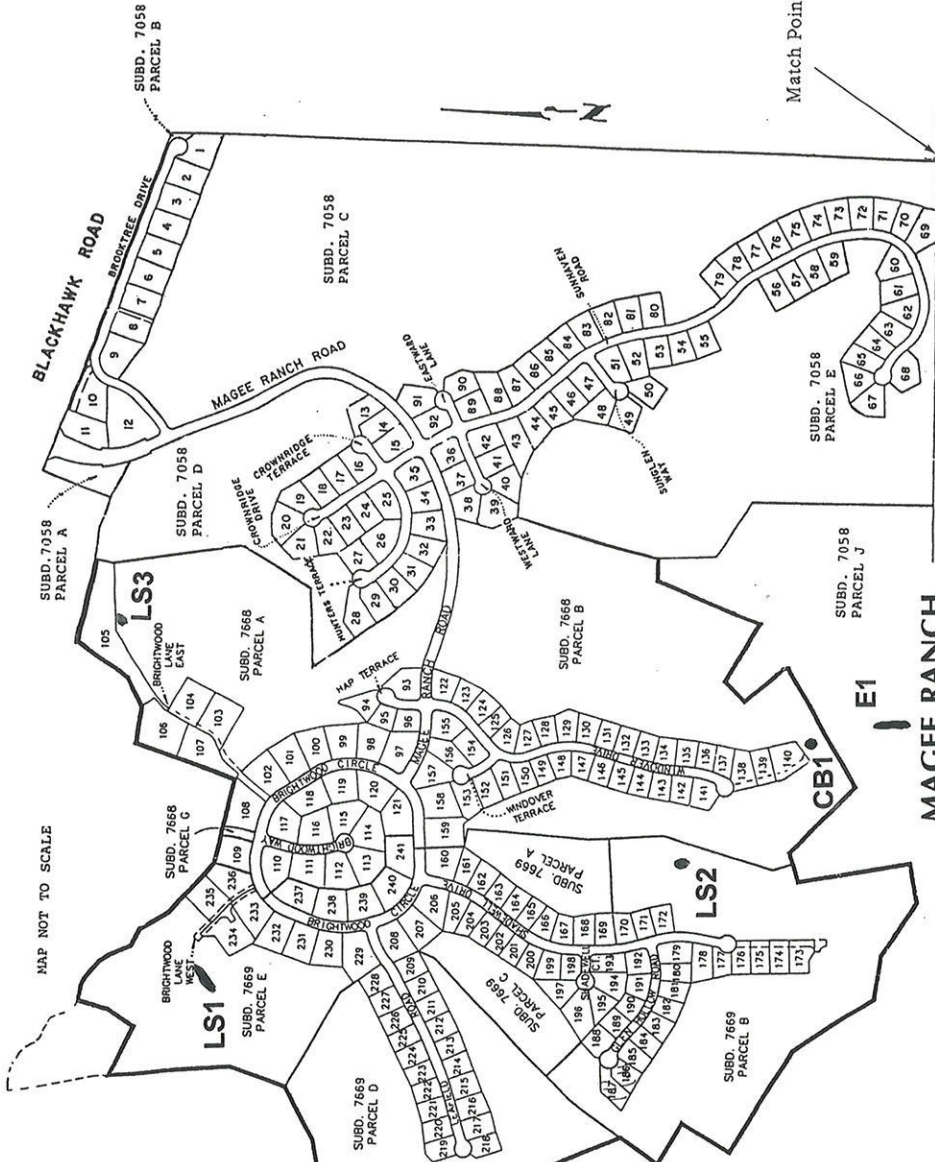
Sincerely,
TRYHORN CONSULTING



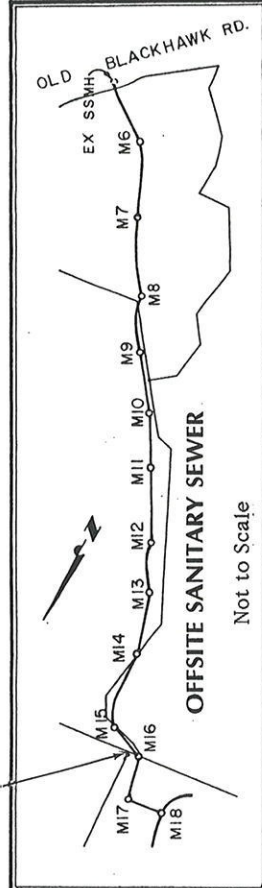
Alan D. Tryhorn, C.E.G.
President

Attachments: Figure 1
Table 1





Match Point - SE Corner of Magee Ranch



MAGEE RANCH TERRACE

MAGEE RANCH

TRYHORN CONSULTING
ENGINEERING GEOLOGY/HYDROGEOLOGY

Slope and Drainage Monitoring
February, 2021

Magee Ranch and Magee Ranch Terrace
Danville, California

Job No. 1006-900 Appr. ADT Date 2-21

FIGURE 1

Table 1

**SUBDRAINS AT MAGEE RANCH
OCTOBER 2020**

No.	Location	Plan Sheet No.	Approximate Flow Rate (gallons per day)	Remarks
1	Entry bridge slope drain (Slide F-10)	4	Dry	Good condition.
2	Slide F-9 (1)	4	Dry	Good, with cover and rocks.
3	Magee Ranch Road slide F-9(3)~ Station 11 + 20	4	Dry	Good, with cover.
4a,b	Slide F-6	5	Dry	Both good.
5	Cut slope slide F-12 above Lot 91, 1993 repair	5	-	Slope looks good, could not find outlet.
6	Magee Ranch Road Subdrain – Catch Basin 11	5	Dry	Good
7	Lot 90 curb subdrain	5	Dry	
8	Fill subdrain south of Lot 80	6	400, estimate only	Subdrain outlet partially silted. Difficult to measure.
9	Hydraugers behind Lot 54	6	10, estimate	Looks ok; persistent soil and vegetation in V-ditch.
10a	Slide C-5 behind Lot 55	6	Dry	
10b	Slide above C-4	Off 6	Dry	
11	Subdrain below Lots 53, 54, 55	6	Underground connection	Connected to storm drain underground
12	Deep fill subdrain outlet at endwall	7	-	Can't access outlet - endwall backed up with standing water.
13	Slide B-3	9	-	Did not observe.
14	Subdrain below Lots 16 & 17-Catch Basin 18	9	-	Couldn't see outlet.
15	Subdrain slide D1-1 behind Lot 123	10	-	Did not observe.
16	Subdrain D1-13	11	-	Did not observe.
17	Slide D2-11	13	Dry	
18	Slide D2-13	13	Dry	Good
19	Slide D1-8	14	-	Connections are buried.
20	Slide E-3	15	-	Could see cleanout but not outlet.
21	Slide D3-4	16	Dry	Good
22	Slide D3-3	18	Dry	Outlet in catch basin.
23	Slide D3-2	18	Dry	



**Table 1 – continued
SUBDRAINS AT MAGEE RANCH**

No.	Location	Plan Sheet No.	Approximate Flow Rate (gallons per day)	Remarks
24	Slide D3-1	18	-	Outside HOA, in fenced area.
25	Deep fill subdrain #1 (12") in detention basin	18	740	Accessible; flap held open with rock. Needs deposits removed under flap.
26	Deep fill subdrain #2 (6") in detention basin. Marked by a T-bar stake.	18	300, estimate only	Roots cleared at opening; needs soil removed under pipe for measurement purposes.
27	Slide F-4	3	Dry	Looks okay from back fence.
28	Slide F-3	3	-	Not visible due to vegetation

