

Project No.  
**4748.002.021**

March 4, 2022

Schaefer Ranch Geologic Hazard Abatement District Board of Directors  
Chair Melissa Hernandez  
Vice Chair Jean Josey  
Boardmember Shawn Kumagai  
Boardmember Sherry Hu  
Boardmember Michael McCorriston

Subject: Schaefer Ranch Geologic Hazard Abatement District  
Dublin, California

## **RESERVE FUND STUDY**

Dear Chair Hernandez and Boardmembers:

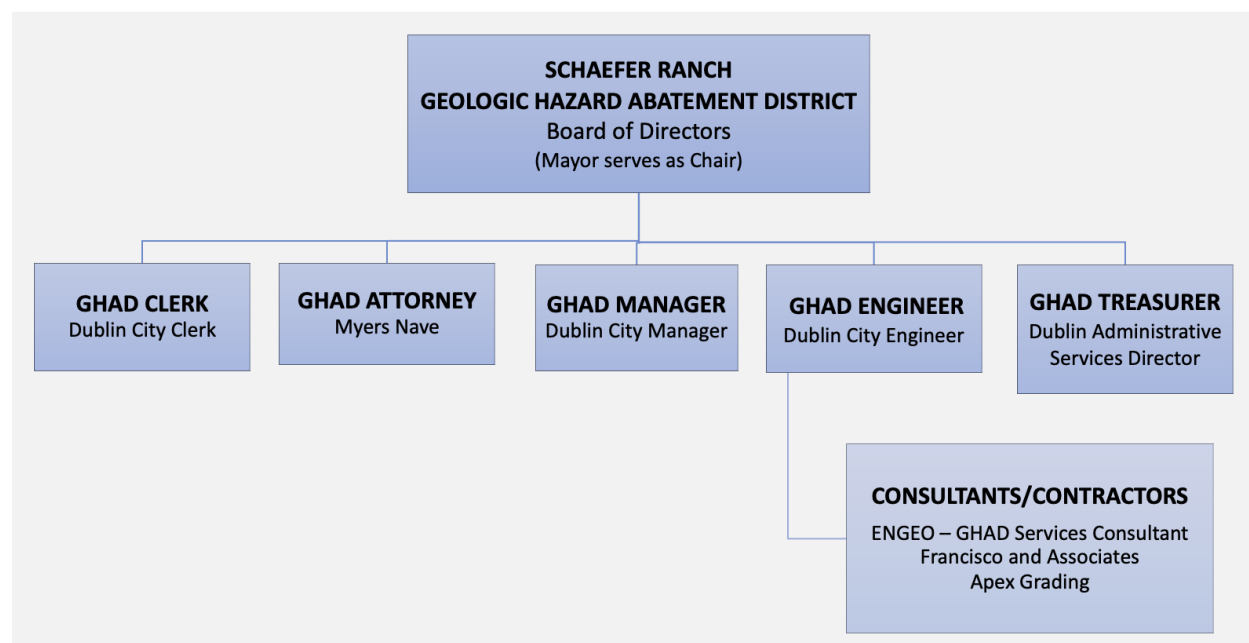
ENGEO, the Schaefer Ranch Geologic Hazard Abatement District (GHAD) Services Consultant, is pleased to provide this Reserve Fund Study for the GHAD in Dublin, California. The Schaefer Ranch GHAD was formed in 2006. The boundary of the GHAD encompasses a total of approximately 445 acres with GHAD ownership of approximately 297 acres. The GHAD includes 419 constructed or planned single-family residences. The GHAD accepted monitoring, maintenance, and ownership responsibilities for selected parcels in 2014 and has been providing services to the accepted parcels since that time as anticipated in the adopted Plan of Control (Reference 1).

This reserve study was undertaken to forecast expenses that can reasonably be expected in the decades ahead, and to confirm that sufficient funds are being set aside in the GHAD's reserve to pay for these expenses.

The reserve fund study is based on:

- Expenditures expected to address future monitoring, maintenance, and repair responsibilities as outlined in the Plan of Control (Reference 1).
- Long-term reserves to address larger geologic events. The projected long-term reserve requirement is based on the published work, "Estimating an Appropriate Geologic Hazard Abatement District (GHAD) Reserve" and is provided as an attachment to this study.

The structure of the Schaefer Ranch GHAD is shown below.



## REVENUE

### GHAD Assessments

As listed in the initial Engineer's Report (Reference 2) for FY 2007/2008, initial assessment limits for the GHAD were established at \$1,475 for single-family residences and \$0.50 per square foot of habitable commercial building areas. The initial assessment limits for residential units are adjusted annually on June 30 to reflect the percentage change in the San Francisco-Oakland-Hayward Consumers Price Index (CPI) for All Urban Consumers. The inflation adjustments to the assessment limits are shown on Table 1.

**TABLE 1: Assessment Limit Inflation Adjustments**

FISCAL YEAR	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
ANNUAL CPI (JUNE)	210.4	218.485	218.528	224.239	227.658	234.237	239.533	245.711
SF/OAK, 1967=100		3.84%	0.02%	2.61%	1.52%	2.93%	2.22%	2.58%
ADDITIONAL 0.5%		0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
TOTAL ADJUSTMENT		4.34%	0.52%	3.11%	2.02%	3.43%	2.72%	3.08%
ASSESSMENT LIMIT (SINGLE-FAMILY)	\$1,475.00	\$1,539.05	\$1,547.05	\$1,595.22	\$1,627.52	\$1,683.33	\$1,729.15	\$1,782.39
COMMERCIAL (per square foot)	\$0.5000	\$0.5217	\$0.5244	\$0.5408	\$0.5517	\$0.5706	\$0.5862	\$0.6042

**TABLE 1: Assessment Limit Inflation Adjustments (Cont.)**

FISCAL YEAR	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
ANNUAL CPI (JUNE)	252.273	260.289	269.483	277.414	289.896	297.007	302.948
SF/OAK, 1967=100	2.67%	3.18%	3.53%	2.94%	4.50%	2.45%	2.00%
ADDITIONAL 0.5%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
TOTAL ADJUSTMENT	3.17%	3.68%	4.03%	3.44%	5.00%	2.95%	2.50%
ASSESSMENT LIMIT (SINGLE-FAMILY)	\$1,838.90	\$1,906.57	\$1,983.41	\$1,245.42	\$1,307.69	\$1,346.30	\$1,379.66
COMMERCIAL (per square foot)	\$0.6234	\$0.6463	\$0.6723	\$0.4241	\$0.4453	\$0.4585	\$0.4699

The average annual inflation rate since approval of an assessment limit in 2007 has been 3.14 percent. On April 3, 2018, the GHAD Board of Directors approved Resolution 02-18 that approved a revised Engineer's Report that reduced the assessment limit for residential units and commercial space by approximately 40%. The reduction was justified by an increase in assessed units shown in the original development plans from 302 units to 419 units as currently planned.

The FY 2021/22 assessment roll identifies 399 residences levied at a rate of \$1,379.66 per residential unit. The total levy for the 2021/22 FY is \$550,604.04. No commercial structures have been constructed within the GHAD.

Assessments are levied on the first fiscal year after issuance of a building permit for a residential parcel. Based on a review of planned construction, an additional 20 single-family residential units will ultimately be subject to the levy of an assessment. With these additional units, the residences subject to assessment would total 419, the same unit count anticipated in the revised 2018 Engineer's Report (Reference 3).

### Inflation and Investment Estimates

Table 2 provides the projected investment returns, inflation, and real rate of return used to prepare the pro-forma budgets for the 2007 Engineer's Report and updated 2018 Engineer's Report and this Reserve Study.

**TABLE 2: Inflation and Investment Estimates**

ENGINEER'S REPORT (2007 AND 2018) RESERVE STUDY (2022)	2007	2018	2022
Investment Return	6.0%	4.5%	1.5%
Inflation	3.0%	3.0%	2.5%
Real Rate of Return	3.0%	1.5%	-1.0%

For this Reserve Study, we are estimating an annual investment return of 1.5 percent for the 40-year pro forma budget. For inflation, we are estimating an annual inflation rate of 2.5%. This is near the inflation target of 2 percent adopted by the Federal Open Market Committee in

January 2012 (Reference 6). In their recent economic projections, Federal Reserve Bank policymakers forecast that inflation for the next three years would be at 2.6% in 2022, 2.3% in 2023 and 2.1% in 2024, which is in line with the estimates used in this reserve study, although the reserve study pro forma budget analyzes a period of 40 years.

## **GHAD RESPONSIBILITIES**

Based on the District's Plan of Control (Reference 1), GHAD responsibilities include:

- Open space slopes including landslides and erosion control
- Concrete-lined drainage ditches including maintenance and replacement
- Detention and water quality basins
- Storm drain inlets and outlets within the open space including maintenance and replacement
- Subdrains and subdrain outlets
- Emergency vehicle access and maintenance roads

In addition to GHAD responsibilities to abate, mitigate, prevent, and control geologic hazards, the GHAD has responsibilities as a landowner within the GHAD-owned parcels, including:

- Vegetation management for fire suppression
- Litter and debris collection
- Fencing

## **PROJECTED EXPENSES**

ENGEO prepared the initial 2007 Engineer's Report used to establish the assessment limit for the GHAD. By resolution, the GHAD Board of Directors approved the Engineer's Report and ordered the assessment in 2007. In 2018, the Board of Directors approved a revised Engineer's Report that reduced the assessment limit, due to an increased unit count, and reduced some of the estimated expenses to fund GHAD-maintained improvements. Since the transfer of Plan of Control responsibilities from the developer to the GHAD, ENGEO has completed biannual site-monitoring events (Reference 4) to observe and summarize site conditions.

In general, expenses have been lower than estimated in the approved 2007 Engineer's Report and the revised 2018 Engineer's Report. We attribute the additional reserve accumulation to a number of factors including: (1) The Schaefer Ranch GHAD has not accepted monitoring and maintenance responsibilities for all of the improvements within Unit 2 (Tract 8000) and Unit 3 (Tract 8136), (2) ten of the 14 years since the completion of mass grading have had below-average rainfall; therefore, there has been a reduced level of slope instability and erosion, (3) fees for contracted GHAD services have been less than anticipated in the 2007 Engineer's Report, and (4) a large-scale repair (estimated at \$1,000,000 in 2007 dollars every 13 years) has not yet been necessary within the GHAD-maintained areas.

Additional details for each of the items contributing to lower actual expenses are provided below.

### Transfer of Plan of Control Responsibilities from the Developer to the GHAD

The Schaefer Ranch GHAD has maintenance and monitoring responsibilities for all the parcels within the Schaefer Ranch development with the exception of the parcels listed in Table 3.

**TABLE 3: Parcels where Plan of Control Responsibilities remain with the Developer**

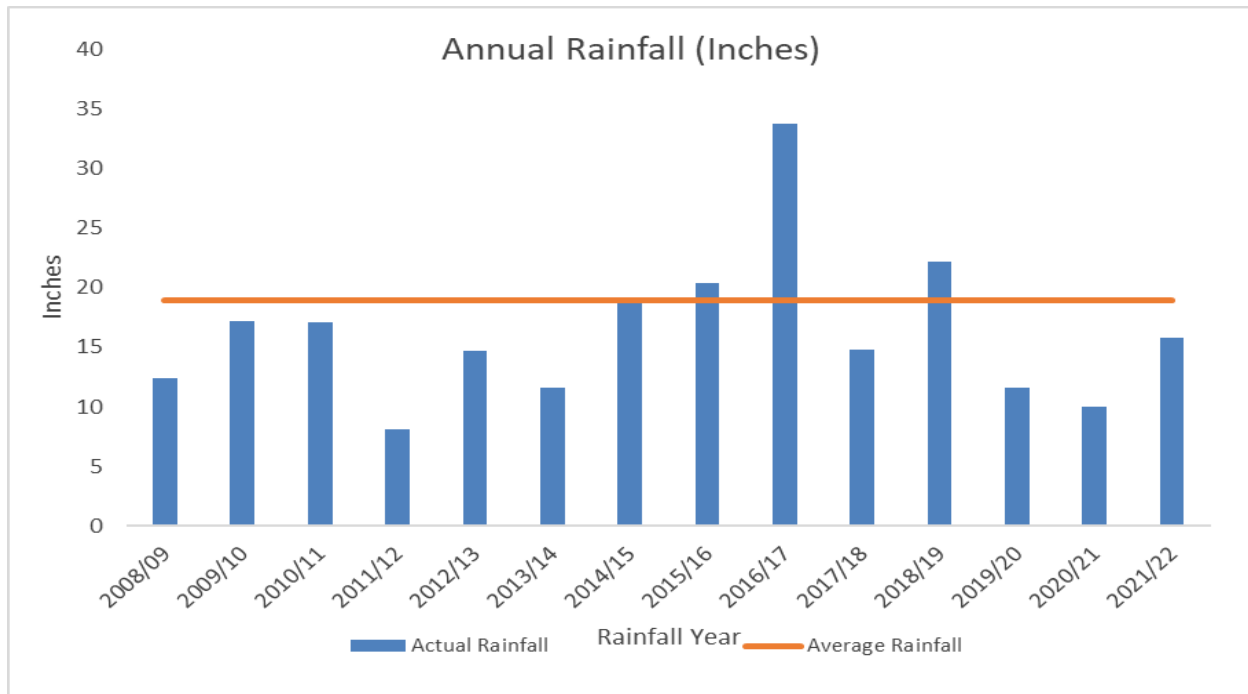
ASSESSOR'S PARCEL NUMBER OR LOT NUMBER	DESCRIPTION
941-2847-1	Parcel A, Tract 8000
941-2847-2	Parcel A-1, Tract 8000
941-2847-3-1	Parcel B, Tract 8000
941-2848-1 and 941-2848-2	Parcel C, Tract 8000
941-2848-3	Parcel D, Tract 8000
941-2848-4	Parcel E, Tract 8000
Lots 1 through 18	Tract 8136

As residential construction within the Schaefer Ranch development nears completion, we anticipate that the remaining parcels within the GHAD will be offered for transfer from the developer to the Schaefer Ranch GHAD in FY 2021/22 or 2022/23. The transfer of the remaining parcels from the developer to the GHAD will result in additional GHAD expenses that were anticipated in the 2005 and 2018 Engineer's Reports and are included in the estimates for this reserve study. The parcel containing the School of Imagination at 9801 Dublin Boulevard (APN 941-2832-027-00) is not subject to a GHAD assessment and does not receive GHAD services.

### Annual Rainfall Data since the Completion of Mass Grading

Annual rainfall data for the Dublin area are shown on Graph 1. The readings are from measurements taken at the San Ramon Valley Fire Protection District on Alcosta Boulevard for each rainfall year (July 1 to June 30). The average rainfall in the Dublin area is approximately 18.9 inches per year. Mass Grading for the Schaefer Ranch development was completed in 2008 and the majority of Plan of Control responsibilities were transferred from the developer to the GHAD in 2014. Since the completion of mass-grading activities, 10 of the 14 years have had below-average rainfall by an average of approximately 14%. Since 2014, when the GHAD accepted maintenance responsibilities, average rainfall over that period has been around the historical average. The projected expenses used in this study assume average rainfall totals, which may include more slope instability than has occurred since the completion of mass grading activities.

**GRAPH 1: Dublin Area Rainfall Years 2008/09 to 2021/22 (to date)**



### Expense Estimates

To prepare the current GHAD reserve fund amount, we reviewed the initial and revised Engineer's Reports, the existing site conditions, and revenue and expense information. Most of the initial expense estimates remain valid, but some amounts have been adjusted to account for site performance over the past 8 years and contracted expenses which differed from the earlier estimates. Adjusted for inflation, annualized GHAD expenses calculated from the adopted 2007 Engineer's Report with approved revisions in 2018 would be \$633,433. As shown in Exhibit A and used in the calculations for Exhibit B, the annualized GHAD expenses are \$471,686, approximately a 25% decrease in estimated expenses.

### Large-Scale Repair

A large-scale landslide or other geologic hazard (estimated at \$1,000,000 in 2007 dollars every 13 years to repair) has not occurred within the GHAD-maintained areas. Based on the site performance since mass grading, we have extended the reoccurrence interval for large scale repairs from 13 to 20 years for estimating expenses for this reserve study.

### RESERVE ESTIMATION AND METHODOLOGY

For the 2007 Engineer's Report and in the 2018 Engineer's Report update, we estimated the reserve (R) appropriate for the Schaefer Ranch GHAD using the following factors from the attached paper titled, "Estimating an Appropriate GHAD Reserve" dated June 1999 (Exhibit C).

- Number of assessed units (n)
- Level of geotechnical risk within the development boundaries (g)

- Average value of assessed properties (v)
- Relative density of construction (d)

Table 4 provides the inputs and target reserve amounts calculated in 2007, 2018, and 2022 dollars respectively.

**TABLE 4: Target Reserve Calculations**

SCHAEFER RANCH GHAD TARGET RESERVE	R=v(d+gn)		
	<u>2007</u>	<u>2018</u>	<u>2022</u>
NOMINAL NUMBER OF ASSESSED UNITS (n)	302	419	419
AVERAGE VALUE OF EACH RESIDENCE (v)	\$850,000	\$1,226,700	\$2,064,900
GEOTECHNICAL RISK FACTOR (g)	0.003	0.002	0.002
DENSITY FACTOR (d)	2	2	2
TARGET RESERVE (Rounded)	\$2,470,000	\$3,481,000	\$5,860,000

For the current reserve study, we updated the reserve calculation inputs, as appropriate. As assumed in the approved 2018 Engineer's Report update, 419 residential units are expected to be subject to the levy of a GHAD assessment. The average value of assessed residential properties is used as a surrogate index to represent construction costs over time. The average value of assessed properties is based on current values derived from web-based sources. In the initial Engineer's Report, it was estimated that the assessed values would track with inflation. The current survey of property values allows for an adjustment, as the value of assessed properties has not tracked with the consumer price index measure of inflation.

Items considered in determining the level of geotechnical risk include:

- Site geology including seismic hazards
- Corrective grading and other geotechnical mitigation measures
- Proximity of geologic hazards to GHAD-maintained improvements
- Performance of the site improvements

An earthquake of moderate to high magnitude generated within the San Francisco Bay region could cause considerable ground shaking at the site, similar to that which has occurred in the past, possibly damaging GHAD-maintained improvements and causing seismically induced landslides. The Calaveras fault is located approximately 1.4 miles east of the limits of the Schaefer Ranch GHAD and the Hayward fault is located approximately 5.5 miles to the west. Predictions for the nearby segments of the Calaveras fault indicate that there is approximately a 12 percent chance of a 6.7 magnitude earthquake in approximately the next 30 years. For the Hayward fault, there is a 28 percent chance in the same time period.

The corrective grading and geotechnical mitigation improvements are not significantly different from those completed during the mass grading for the development and as accounted for in the initial Engineer's Report. Likewise, the proximity of geologic hazards to GHAD-maintained improvements does not appear significantly different from those encountered during mass grading for the site. The GHAD-maintained slopes and improvements appear to be performing



somewhat better than anticipated in 2007; therefore, we have reduced the geotechnical risk factor from 0.003 to 0.002.

The existing configuration of the development footprint is similar to that on the site plans available at the time the initial Engineer's Report was prepared; therefore, the relative density value has not been adjusted.

Based on these parameters, we estimate that an appropriate long-term reserve for the GHAD for 419 units would be approximately \$5,860,000 in current dollars. The \$5,860,000 reserve amount would allow the GHAD to respond to anticipated events within the GHAD, while still having funds to continue its other administration, maintenance, and monitoring functions.

## DISCUSSION AND CONCLUSIONS

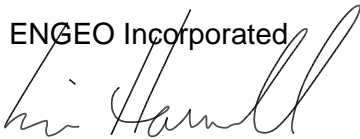
With an estimated GHAD account balance of approximately \$5,842,000 at the end of the 2021/22 fiscal year, an adequate reserve appears to have been achieved. In 2007, it was forecast that an adequate reserve would be accumulated over approximately 40 years, but based on lower GHAD expenses, this has been achieved in a little under 15 years. Since the revised reserve target has been reached, the GHAD Manager recommends that the GHAD Board of Directors consider lowering the levy on residences within the GHAD for FY 2022/23 to \$1,302 per residential unit and \$0.4434 per square foot for habitable non-residential building area. The FY 2022/23 assessment limit for habitable non-residential building area is \$0.4922 per square foot. There is currently no assessed habitable non-residential building area within the GHAD. The School of Imagination building is not subject to a GHAD assessment and receives no GHAD services.

As provided in the 2007 Engineer's Report, the annual assessment and assessment limit will be adjusted for inflation. Ongoing assessments, even at an amount lower than the assessment limit, will allow the GHAD to continue funding its other administration, maintenance, and monitoring functions including a larger repair. We are not recommending that the assessment limit be lowered at this time. The assessment limit would continue to be adjusted for inflation as provided in the approved Engineer's Report.

If you have any questions regarding the contents of this letter, please do not hesitate to contact us.

Sincerely,

ENGEO Incorporated



Eric Harrell, CEG  
eh/ue/dt



Uri Eliahu, GE

Attachments: List of Selected References  
Exhibit A: Expense Details  
Exhibit B: Pro Forma Budget with \$5,860,000 Reserve (2022/23 dollars)  
Exhibit C: Estimating an Appropriate GHAD Reserve



## 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; Engineer's Report for Schaefer Ranch Geologic Hazard Abatement District, Dublin, California; November 20, 2007; Project No. 4748.1.500.01.
3. ENGEO; Engineer's Report for Schaefer Ranch Geologic Hazard Abatement District, Dublin, California; November 20, 2007, Latest Revision March 23, 2018; Project No. 4748.002.017.
4. Dublin, City of; Schaefer Ranch Geologic Hazard Abatement District (5302), Fiscal Year 2021-22 Budget; May 6, 2021.
5. ENGEO; Geologic Hazard Abatement District – Fall 2021, Schaefer Ranch Geologic Hazard Abatement District (GHAD), Dublin, California; November 15, 2019; Project No. 4748.002.021.
6. National Oceanic and Atmospheric Administration (NOAA), National Centers for Environmental Information, Dublin Museum Station Details, July 1, 2001 through April 14, 2020.
7. United States Federal Reserve Board of Governors, Federal Open Market Committee Statement of Longer-Run Goals and Policy Strategy, Press Release, January 25, 2012.

**EXHIBIT A**  
**Expense Details**

The Schaefer Ranch Geologic Hazard Abatement District (GHAD) Budget  
Reserve Study Expense Details

Item No.	Description	Unit	Quantity	Unit Price	Total Cost	Reoccurrence Interval (Years)	Annual Total Budget	Comments
1	<b>Administration and Accounting</b>							
	GHAD Manager	monthly	12	\$500	\$6,000	1.0	\$6,000	Contract with City of Dublin to staff and provide GHAD Manager services.
	GHAD Engineer	monthly	12	\$3,000	\$36,000	1.0	\$36,000	Contract with City of Dublin to staff and provide GHAD Engineering services.
	GHAD Treasurer	quarterly	4	\$1,000	\$4,000	1.0	\$4,000	Contract with City of Dublin to staff and provide GHAD Treasurer services.
	GHAD Clerk	ls	1	\$4,000	\$4,000	1.0	\$4,000	Contract with City of Dublin to staff and provide GHAD Clerk services.
	GHAD Services Consultant	monthly	12	\$4,000	\$48,000	1.0	\$48,000	Contract with ENGEO to support day-to-day operations of the GHAD as the GHAD Services Consultant.
	GHAD Attorney	ls	1	\$10,000	\$10,000	1.0	\$10,000	Contract with Meyers Nave to provide legal services to the GHAD.
	Insurance - Open Space Areas	acre	297	\$12	\$3,564	1.0	\$3,564	This cost estimate is based on fees currently charged to GHADs in California through the California Association of GHADs.
	Membership dues for the California Association of Geologic Hazard Abatement Districts	ls	1	\$205	\$205	1.0	\$205	This cost estimate is based of membership fees currently charged by the California Association of GHADs (\$100 plus \$0.25/residential parcel).
	Assessment Roll and Levy Update	ls	1	\$1,750	\$1,750	1.0	\$1,750	This cost estimate is based on fees currently charged to the Schaefer Ranch GHAD.
					<b>Subtotal</b>		<b>\$113,519</b>	

The Schaefer Ranch Geologic Hazard Abatement District (GHAD) Budget  
Reserve Study Expense Details

Item No.	Description	Unit	Quantity	Unit Price	Total Cost	Reoccurrence Interval (Years)	Annual Total Budget	Comments
2	<b>Professional Services</b>							
	GHAD Monitoring Event including instrumentation - April and October	ls	1	\$8,000	\$8,000	0.5	\$16,000	The frequency of monitoring is based on the adopted Plan of Control requirements for Schaefer Ranch development. Monitoring budget estimates are based on the fees these services are currently being provided to the GHAD and are based approved Engineer's Report.
	Heavy Rainfall Event Monitoring	ls	1	\$4,000	\$4,000	1.0	\$4,000	The frequency of monitoring is based on the adopted Plan of Control requirements for Schaefer Ranch development. Monitoring budget estimates are based on the fees these services are currently being provided to the GHAD and are based approved Engineer's Report.
	Biological Monitoring	ls	1	\$10,000	\$10,000	1.0	\$10,000	The frequency of monitoring is based on the Long-Term Open Space Management Plan for Schaefer Ranch development. Monitoring budget estimates are based on the fees these services are currently being provided to the GHAD and are based on the approved Engineer's Report.
						<b>Subtotal</b>	<b>\$30,000</b>	

The Schaefer Ranch Geologic Hazard Abatement District (GHAD) Budget  
Reserve Study Expense Details

Item No.	Description	Unit	Quantity	Unit Price	Total Cost	Reoccurrence Interval (Years)	Annual Total Budget	Comments
3	<b>Maintenance &amp; Operation</b>							
	Subdrains and outlets	each	30	\$100	\$3,000	1.0	\$3,000	We do not anticipate regular maintenance on the subdrain outfalls which tend to have low flow volumes, but this budget figure allows for maintenance or repair as may be necessary.
	Sediment/Debris Removal concrete-lined drainage ditches.	lf	50,000	\$0.264	\$13,200	1.0	\$13,200	Services currently contracted by the GHAD with an inflation adjustment.
	Vegetation Management on Gravel-Surfaced Roadways (Approximately 4,500 Lineal feet)	ls	1	\$9,750	\$9,750	1.0	\$9,750	Vegetation removal and herbicide treatment. Services currently contracted by the GHAD with an inflation adjustment.
	Vegetation Management on Earth-Surfaced Roadways (Approximately 400 Lineal feet)	ls	1	\$2,250	\$2,250	0.5	\$4,500	Vegetation cutting and removal. Services currently contracted by the GHAD with an inflation adjustment.
	Slope Stabilization	ls	1	\$75,000	\$75,000	1.0	\$50,000	This budget items provides for ongoing slope stabilization that may include minor landslide repair activities. This estimate is based on the approved Engineer's Report and the performance of the site.
	Erosion Repairs	ls	1	\$50,000	\$50,000	1.0	\$50,000	This budget items provides for ongoing erosion repairs and protection. This estimate is based on the approved Engineer's Report and the performance of the site.
	Maintenance of the 3 onsite detention basins including sediment, vegetation, and debris removal.	ls	1	\$23,250	\$23,250	1.0	\$23,250	Services currently contracted by the GHAD with an inflation adjustment.
	Open Space Vegetation Management - Fire Suppression	ls	1	\$27,750	\$27,750	1.0	\$27,750	Two cuttings per year. Services currently contracted by the GHAD with an inflation adjustment.
	Open Space Litter Collection and Removal	each	1	\$750	\$750	0.3	\$3,000	Two cutting per year. Services currently contracted by the GHAD with an inflation adjustment.
						<b>Subtotal</b>	<b>\$184,450</b>	

The Schaefer Ranch Geologic Hazard Abatement District (GHAD) Budget  
Reserve Study Expense Details

Item No.	Description	Unit	Quantity	Unit Price	Total Cost	Reoccurrence Interval (Years)	Annual Total Budget	Comments
4	<b>Capital Improvements</b>							
	Concrete-lined drainage ditch replacement	lf	50,000	\$50	\$2,500,000	75.0	\$16,667	We have provided for a 75-year replacement cycle for the concrete-lined drainage ditches for 50 percent of the ditches. This replacement quantity applies to concrete lined drainage ditch that is not involved with slope instability. Drainage ditches that are involved with slope instability would be repaired or replaced during corrective work for the individual events.
	Open space storm drain pipeline, inlet, and outfall replacement.	ls	1	\$500,000	\$500,000	75.0	\$3,333	We have provided for a 75-year replacement cycle for 50 percent of the open space storm drain pipelines and associated facilities. This replacement quantity applies to system components that are not damaged due to slope instability.
	Gravel-surface roadways	sf	54,000	\$4	\$216,000	30.0	\$7,200	We anticipate a 3-inch overlay of class 2 aggregate base rock on roadways.
					<b>Subtotal</b>		<b>\$27,200</b>	

The Schaefer Ranch Geologic Hazard Abatement District (GHAD) Budget  
Reserve Study Expense Details

Item No.	Description	Unit	Quantity	Unit Price	Total Cost	Reoccurrence Interval (Years)	Annual Total Budget	Comments
5	<b>Major Repair (Annualized)</b>	ls	1	\$1,620,000	\$1,620,000	20.0	\$81,000	This figure represents the annualized repair cost estimate for a \$1,620,000 repair event (\$1,000,000 in 2007 dollars) that occurs on average every 20 years. As with the other cost estimate items this budget item is indexed to the Consumer Price Index. This figure is based on our experience, the geology of the site, the performance of the graded site and the configuration of the site improvements. The major repair cost estimate is not isolated from the slope instability and erosion control items which plan for an additional \$125,000 per year for slope maintenance and repair operations.
<b>Subtotal</b>							<b>\$81,000</b>	
<b>Contingency (10%)</b>							<b>\$35,517</b>	
<b>TOTAL</b>							<b>\$471,686</b>	



**EXHIBIT B**

**Pro Forma Budget with \$5,860,000 Reserve  
(2022/23 dollars)**

The Schaefer Ranch Geologic Hazard Abatement District (GHAD)

Estimated Budget - March 3, 2022

YEAR (Starting July 1)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047
Cumulative No. of Units (Equivalent)	400	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419	419
A. INCOME																										
Assessment	520,955	562,071	578,933	596,301	614,190	632,616	651,594	671,142	691,276	712,015	733,375	755,376	778,038	801,379	825,420	850,183	875,688	901,959	929,018	956,888	985,595	1,015,163	1,045,617	1,076,986	1,109,296	1,142,574
B. PROJECTED EXPENSES																										
1. Administration and Accounting	113,519	116,357	119,266	122,248	125,304	128,436	131,647	134,938	138,312	141,770	145,314	148,947	152,670	156,487	160,399	164,409	168,520	172,733	177,051	181,477	186,014	190,664	195,431	200,317	205,325	210,458
Alameda County Assessor's Fees	8,856	9,555	9,842	10,137	10,441	10,754	11,077	11,409	11,752	12,104	12,467	12,841	13,227	13,623	14,032	14,453	14,887	15,333	15,793	16,267	16,755	17,258	17,775	18,309	18,858	19,424
2. Professional Services	30,000	30,750	31,519	32,307	33,114	33,942	34,791	35,661	36,552	37,466	38,403	39,363	40,347	41,355	42,389	43,449	44,535	45,649	46,790	47,960	49,158	50,387	51,647	52,938	54,262	55,618
3. Maintenance & Operation	80,621	86,561	88,725	90,943	93,217	95,547	97,936	100,385	102,894	105,466	108,103	110,806	113,576	116,415	119,326	122,309	125,366	128,501	131,713	135,006	138,381	141,841	145,387	149,021	152,747	156,566
4. Slope-Erosion Stabilization	95,465	102,500	105,063	107,689	110,381	113,141	115,969	118,869	121,840	124,886	128,008	131,209	134,489	137,851	141,297	144,830	148,451	152,162	155,966	159,865	163,862	167,958	172,157	176,461	180,873	185,394
5. Repair	-	-	-	-	-	1,832,881	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3,003,389
6. Capital Improvement	25,967	27,880	28,577	29,291	30,024	30,774	31,544	32,332	33,141	33,969	34,818	35,689	36,581	37,496	38,433	39,394	40,379	41,388	42,423	43,483	44,570	45,685	46,827	47,997	49,197	50,427
7. Misc. Expenses	33,906	36,405	37,315	38,248	39,204	40,184	41,189	42,218	43,274	44,356	45,465	46,601	47,766	48,960	50,184	51,439	52,725	54,043	55,394	56,779	58,199	59,654	61,145	62,674	64,240	65,846
SUBTOTAL - EXPENSES	388,334	410,008	420,306	430,863	441,685	2,285,661	464,153	475,812	487,765	500,017	512,578	525,455	538,656	552,188	566,061	580,283	594,862	609,808	625,130	640,837	656,939	673,447	690,369	707,717	725,502	3,747,123
RESERVE	5,974,620	152,063	158,627	165,438	172,505	(1,653,045)	187,441	195,330	203,512	211,997	220,797	229,921	239,382	249,190	259,359	269,900	280,826	292,151	303,888	316,051	328,655	341,716	355,248	369,269	383,794	(2,604,548)
EARNINGS	87,630	90,934	94,579	98,377	102,334	106,457	83,258	87,318	91,558	95,984	100,604	105,425	110,455	115,702	121,176	126,884	132,836	139,041	145,508	152,249	159,274	166,593	174,217	182,159	190,431	199,044
CUMULATIVE RESERVE	6,062,250	6,305,247	6,558,452	6,822,267	7,097,106	5,550,517	5,821,217	6,103,865	6,398,934	6,706,916	7,028,316	7,363,662	7,713,499	8,078,392	8,458,927	8,855,710	9,269,372	9,700,563	10,149,959	10,618,260	11,106,189	11,614,498	12,143,963	12,695,392	13,269,616	10,864,112

ASSUMPTIONS

Total No. of Units	419																									Reserve in
Annual Assessment per Unit	\$1,302																									2,022
Commercial (square feet)	0																									Dollars: 5,860,000
Annual Assessment per square foot	\$0.41																									
Annual Increase in Assessment	3.00%																									
Inflation	2.50%																									
Investment Earnings	1.5%																									
Initial Seed Fund	\$5,842,000																									
Amount Financed	\$0																									
Borrowing Rate	8.0%																									
Term of Loan (yrs.)	10																									
Frequency of Large-Scale Repair (yrs.)	5																									
Cost of Large-Scale Repair (current \$)	\$1,620,000																									
Assessment Cap (per residential unit)	9999																									
Expense Deferral Period (Yrs.)	0																									

ESTIMATED ANNUAL EXPENSES IN 2022/23 DOLLARS	PROFORMA CATEGORY
Administration & Accounting	Administration & Accounting
GHAD Monitoring Program	Professional Services
Sediment/Debris Removal Drainage Improvements	Maintenance and Operation
Detention Basins	Maintenance and Operation
Subdrain Outlets	Maintenance and Operation
Revegetation and Vegetation Control	Maintenance and Operation
Erosion -Slope Stabilization (incl. minor landsliding)	Slope Stabilization and Erosion Protection
EVA and Access Roadway Gravel Overlay	Capital Improvement
Open Space Ditch and Storm Drain Replacement	Capital Improvement
Major Repair (Annualized)	Major Repair
Misc. & Contingency (10%)	Miscellaneous Expenses
TOTAL	

## **EXHIBIT C**

### **Estimating an Appropriate GHAD Reserve**

# ESTIMATING AN APPROPRIATE GHAD RESERVE

Uri Eliahu G.E., ENGEO Incorporated, June 1999

An important parameter in establishing initial GHAD budgets and in assessing the financial health of mature GHADs is the appropriate level of reserve needed to address probable future geologic events. The reserve must be unique to each GHAD, and must consider several factors, not all of which are geotechnical in nature.

As an initial approach, a loss history can be compiled based on records of actual losses that have occurred in the region in the last 20 years. If the last 20 years can be assumed to be representative of future years, this loss history can be distilled to obtain a current net present value (NPV) of the statistically-expected loss over a given time period. This can be expressed per dwelling unit, per parcel, or per dollar value of improvements. If, based on historic geologic and rainfall records, it is believed that the last two decades do not represent the full range of expected geologic activity, a correction factor can be applied to the calculated risk to arrive at the expected loss rate.



In converting the expected loss rate to an estimated reserve (**R**), consideration must be given to the following factors.

## Number of assessed units (**n**) in the GHAD.

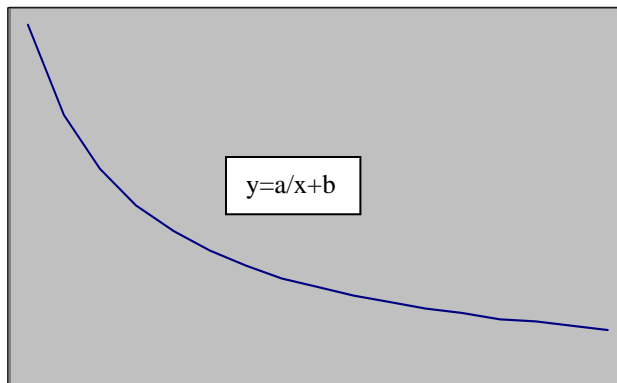
The reserve per dwelling unit (**R/n** or **average reserve**) should, in theory, diminish asymptotically with increasing unit count to a “floor” value.

Level of geotechnical risk (**g**) within the GHAD boundaries. Depending on geology, terrain, prior mitigation measures, grading techniques, irrigation and age, geotechnical risk may vary, even within a particular region.

Average value of assessed properties (**v**). In areas of high property values, repair or reconstruction of private improvements may be more costly and may require greater average reserves.

Relative density of construction (**d**). The number of units likely to be affected during a major geologic event will have an impact on the total reserve.

In consideration of the foregoing, an expression describing the average reserve may take the general hyperbolic form,  $y = a/x + b$



Intuitively, this general expression may be applied to a GHAD reserve formula by substituting  $R/n$  for  $y$ ,  $n$  for  $x$ ,  $dv$  for  $a$ , and  $gv$  for  $b$ , to arrive at the relationship  $R/n = dv/n + gv$  where:

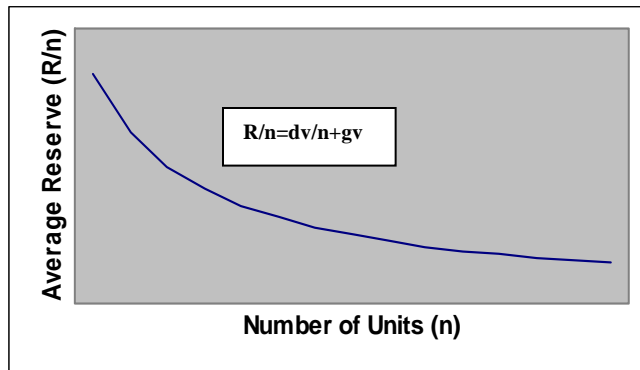
$R$  is the total reserve

$n$  is the total number of assessed parcels

$v$  is the average value of each residence

$g$  is the geotechnical risk factor

$d$  is a density factor related to the maximum number of units expected to be impacted in a major geologic event (eg. landslide)



This formula can be simplified to  $R = dv + gvn$  or  $R = v(d + gn)$

To apply this to a specific situation,  $g$  can be estimated based on historical data as described above, and  $d$  can be estimated by comparing regional landslide sizes to average lot sizes. Preliminarily, it appears that  $d$  may range from approximately 2 to 10 and  $g$  may range from 0.001 to 0.01, depending on the physical characteristics of the assessed areas as described above.

