



## **Contents**

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# Portuguese Bend Landslide Complex

Approx location of: Portuguese Bend,  
Klondike Canyon & the Beach Club Landslides



3d – View



2d – View



Weekly Updates from PB-Landslide Committee

[RPV Landslide Complex Working Group | Rancho Palos Verdes, CA - Official Website \(rpvca.gov\)](http://rpvca.gov).

## Executive Summary:

### Committee Focus: Coordination of communities to help mitigate the Portuguese Bend Landslide Complex

### Committee Members:

- Portuguese Bend HOA
- Seaview HOA
- PBC HOA
- ACLAD
- KCGHAD
- RPV

### Issue: (PBC)

#### Excess Water in the land – Klondike Canyon

##### Rainfall

- Typical rainfall KCGHAD ~33M+ gallons
- 2023 rainfall ~83M+ gallons KCGHAD vicinity

##### Ruptured Water Pipes

- Total water that has leaked “unknown”
- 8” pipe like the one that broke behind Dauntless in Sept flows at approx. 2,800 gal/min or 4M gal/day
  - ✓ ~2 days = 8M gal or about 250 swimming pools

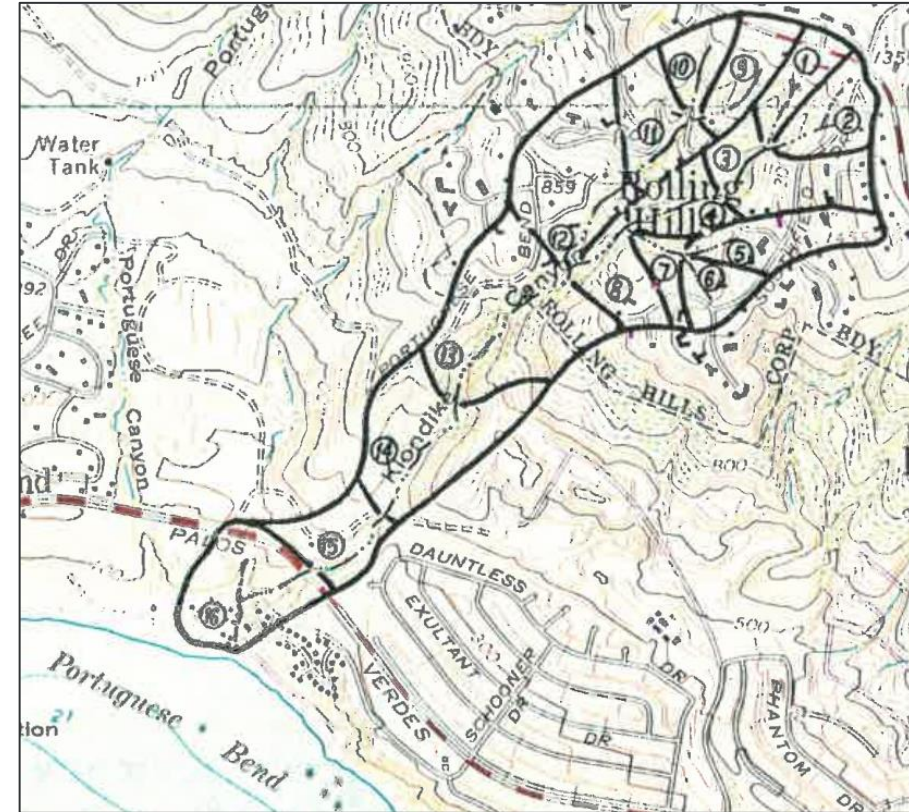
– ref <https://resources.hy-techroof.com/blog/how-much-water-can-flow-through-a-pipe>

##### Slide Risk to RPV Community

- 107 homes in KCGHAD could be lost to slide (\$200M+)
- PV South could be rendered impassible to all traffic (business & safety risk to all)



## Klondike Canyon



**Problem Statement:**  
- Excess Water in the land

**Issues:**

1. Record Rainfall in early 2023
2. Numerous Water Line Breaks in the Area



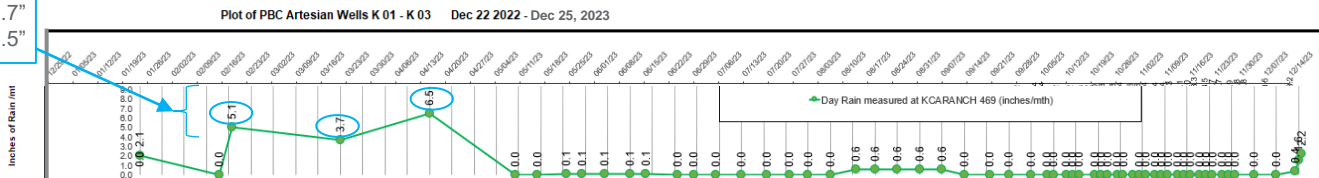
**Problem 1 - Record Rainfall 2023**

#	Day	K 01-PBC Klondike Artesian Well (Outside Klondike Lot) Depth to Water (ft)	K 02-PBC Klondike Artesian Well (Near Court 3) Depth to Water (ft)	K 03-PBC Klondike Artesian Well (In pump box) Depth to Water (ft)	K 03-PBC Klondike Artesian Well (In pump box) GPM	Day	Rain measured at KCARANCH 469 (inches/mth)	
1	Thursday	12/22/22	127.0	91.4	97.5	37	12/22/22	2.1
2	Friday	01/20/23	127.0	86.5	91.2	37	01/20/23	5.1
3	Thursday	02/23/23	127.0	84.9	91.4	41	02/23/23	3.7
4	Thursday	03/23/23	127.0	76.0	82.9	47	03/23/23	6.5
5	Wednesday	04/19/23	120.2	12.0	60.7	65	04/19/23	0.0
6	Wednesday	04/26/23	119.0	12.5	63.7	66	04/26/23	0.0
7	Friday	05/05/23	127.0	15.0	59.9	64	05/05/23	0.1
8	Wednesday	05/10/23	127.0	15.0	56.8	60	05/10/23	0.1

**Problem 1:**

- 2023 - Rain measured (KCARANCH 469) - Portuguese Bend (PB) Area ~ (25")
- Typical Annual Rain in Portuguese Bend Area ~ (8" - 12")
  - Ref: NOAA - appendix pg 13
  - Note: 2021 & 2022 were very dry years

Feb 2023 - 5.1"  
Apr 2023 - 3.7"  
Mar 2023 - 6.5"



**Problem 2 - Water Breaks (ex Sept 2023 Water break)**



- Legend**
- 1 Location of ruptured Water Pipe
  - A Access Road to repaired pipe
  - B View of slide area from Conqueror Trail
  - 2 View to New Klondike slide from Dauntless Trail
  - 3 New Conqueror Trail Slide (sliding into Klondike Canyon)
  - 4 New raised section of PV South (exactly at Klondike Canyon) – occurred recently
  - 5 New raised section on Yacht Harbor – in front of gate.

**Problem 2:**

- Numerous Water Line Breaks in the Area

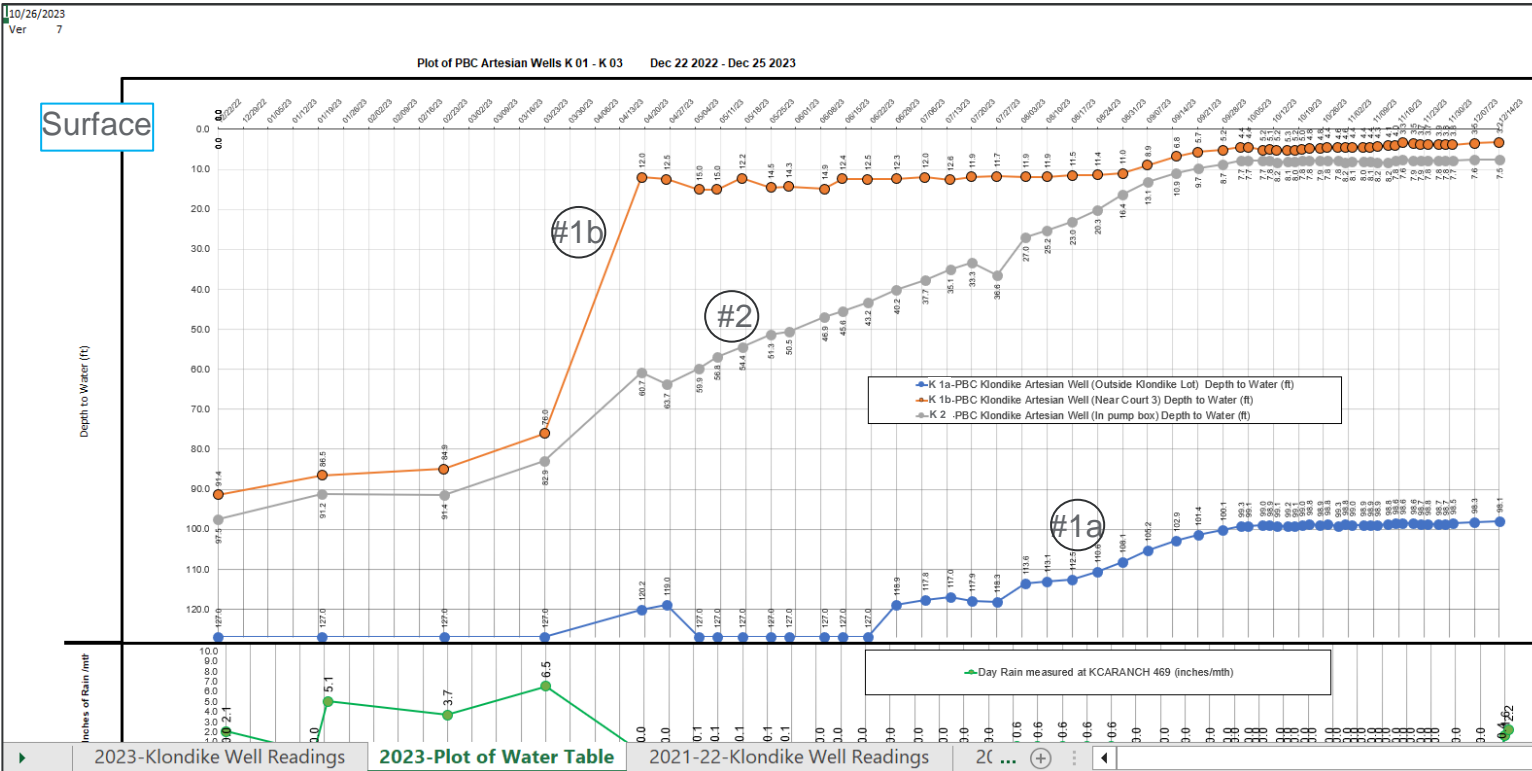


**Problem Statement:**

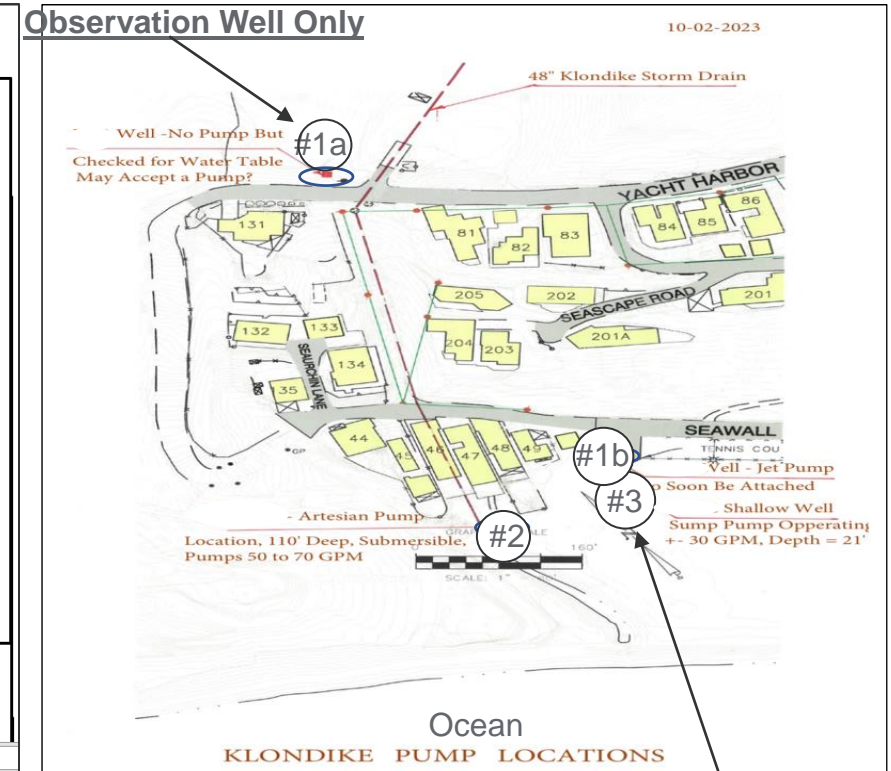
- Data showing PBC Wells & Rain over 2023



**PBC Well Data & Rainwater 2023**



**Location of PBC Wells**



**Notes:**

- KC Pumps #1b & #2 water depth have remained only a few feet below the surface at the beach since March 2023
- KC Pumps #1b & #2 are active: (approx. 60-80 gal/min) – assume 70 gal/min avg  
 $70 \text{ gal/min} \times 60 \text{ min/hr} \times 24 \text{ hr/day}$   
 $100,800 \text{ gal/day}$
- KC Pump #1a – measurement only
- KC Pump #3 – online Dec 27 2023

New

Ref: PBC Well Data

Note: Calculations are estimates



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Executive Summary:



**KCGHAD Plan Forward: Klondike Canyon Geologic Hazard Abatement District (emergency measures)**

**Step 1** \$1,275K - Temp 16" flex pipe in Klondike Canyon from PV South to head of Klondike Canyon Slide

**Step 2** \$1,000K - Add 3 new water extraction wells at beach in Klondike & 1 observation well at Dauntless

**Step 3** \$1,000K - Fill fissures at head of Klondike Slide & Remove dirt at interface of Portuguese PB & KC Slide in PBC

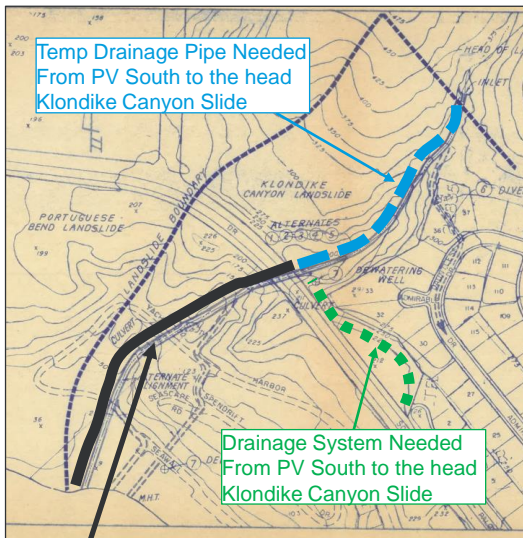
**Step 4** \$900K - Create Storm Drain at the head of the Beach Club Slide that channels the water to the Klondike

**Step 5** \$1,185K - 4 additional tactical drain items to help mitigate slide (added by Steve C Feb 2024)

**~\$5,400K - Total**

**Step 1 & Step 4**

**Klondike Canyon - Drainage Map**



..... **Step 1**  
 ..... **Step 4**

**Current Klondike Canyon – Drain**  
**Extends from PV South to the Beach**

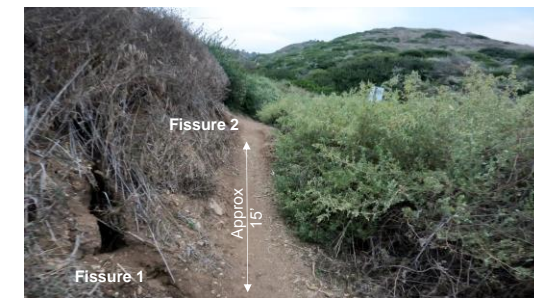
**Step 2**

5 active Wells ~ 400K Gal/day  
 210 days to remove 2023 rains (we have 2.5 now)

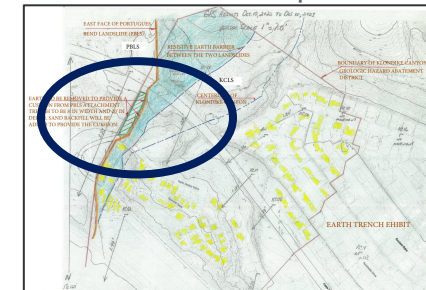


**Step 3**

**Fill Fissures Head of Klondike Slide**



**Remove earth to relieve pressure in PBC**



**Step 5**

Repair rain damage to Klondike  
 48" storm drain System damage and 3 other rainwater related items

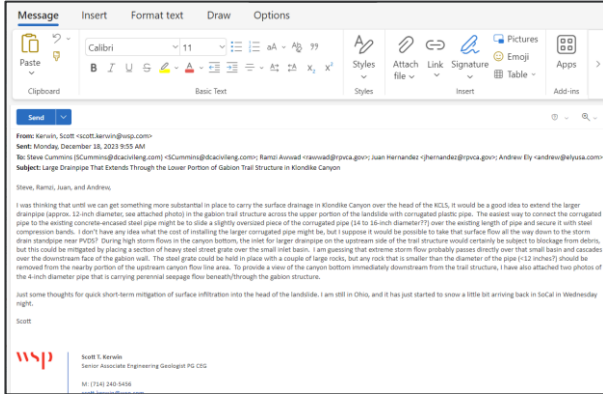
# KCGHAD Plan Forward:

## Step 1: - Minimize water entering into Klondike canyon



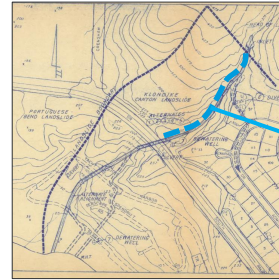
### Install a Temporary pipe at the basin of Klondike Canyon – from PV South to the head of the Klondike Slide (see blue dashed line)

From Scott K – KCGHAD Geologist  
this is the #1 priority (email below)



Temporary drainpipe in basin of Klondike  
No intact pipe exists today

Flex pipe (base of Klondike)





# KCGHAD Plan Forward:

## Step 2: - Maximize pumping at PBC beach (base of Klondike)



### Pumping at the Beach Current & Projected

#### Options:

- I. Adding 3 “new”, 1 planned, 2 proposed” wells – 5 total
- II. Adding 1 “new” 1 planned well – 3 total

Preferred Option

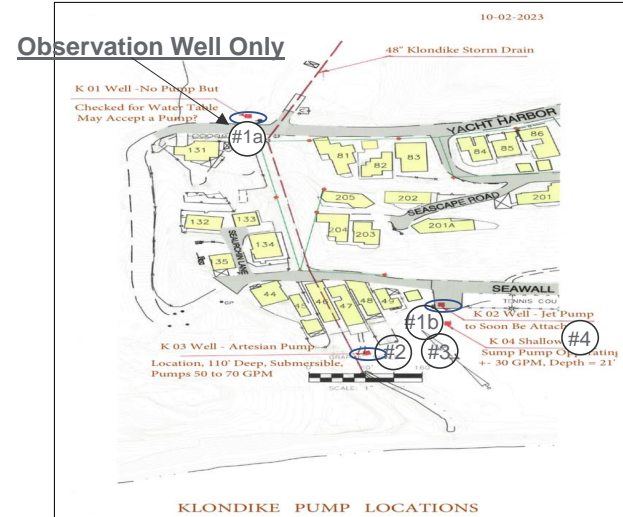
#### Option I): - 5 active pumps (3 new)

- Wells #1b & #2 - Assume stays at 100,000 gal/day {current 2 active wells}
- Well #3 - Online on Dec 27 2023 – 100,000 gal/day {“new” – was a planned well}
- Wells #4 & #5 - Need – will produce an additional 200,000 gal/day (“needed”)
- **Wells 1b-5 Approx (400,000 gal/day)**

#### Option II): - 3 active pumps (1 new)

- Wells #1b & #2 - Assume stays at 100,000 gal/day {current 2 active wells}
- Well #3 - Online on Dec 27 2023 – 100,000 gal/day {“new” – was a planned well}
- **Wells 1b-3 Approx (200,000 gal/day)**

Proposed 5 PBC Wells



### Range of Estimated Rainwater to be removed from 2023 rains – (years to remove)

Option	Days to remove (just rainwater from 2023 storms) (assumes 83M gal (1) - amount to be removed)	Comments
I	210	3 new pumps (total pump/volume - 400,000 gal/day)
II	415	1 new pumps (total pump/volume - 200,000 gal/day)

Funding needed for new wells #3, #4, #5 to remove water

Note: (1) Calculations showing 83M gallons from previous page

# KCGHAD Plan Forward:

## Step 3: Filling the fissures at Klondike Canyon head & Establishing an Earth Trench to relieve pressure at PB/Klondike slides in PBC Filling Fissures

12/03/23 – Klondike Canyon Trail



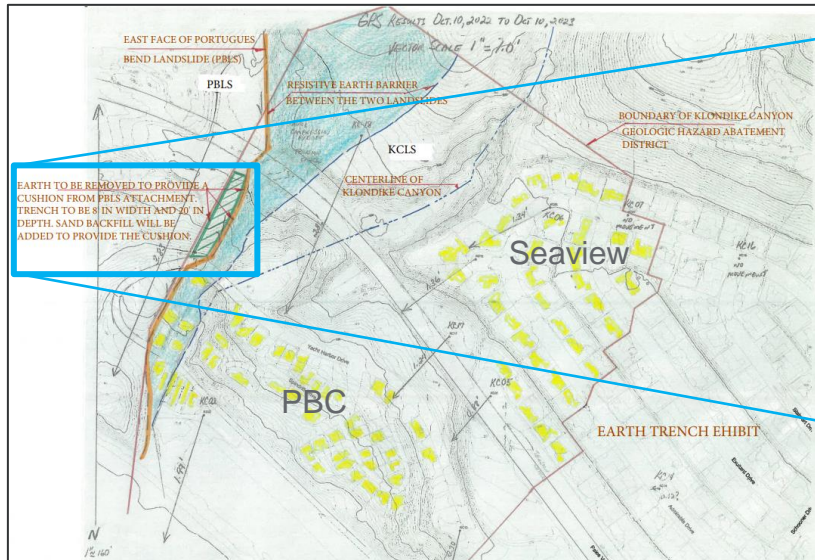
12/03/23 – Panorama Trail



Last Update 12/03/23  
 Pictures from Go-Pro on select  
 trails (Klondike/Portuguese Bend  
 Slide side)



### Relieve Pressure at interface of Portuguese Bend & Klondike Canyon slides



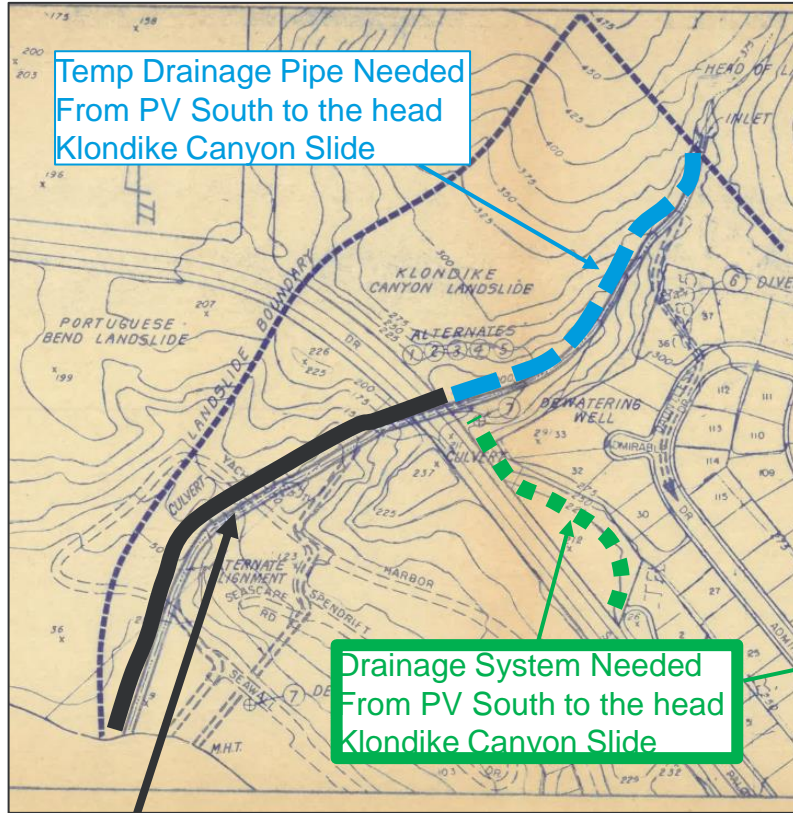
# KCLAD Plan Forward:

**Step 4:** Create a Storm Drain from the head of the Beach Club Slide to the Klondike Canyon Storm Drain



## Beach Club Slide Proposed Storm Drain

### Klondike Canyon - Drainage Map



### Storm Drain / V-Ditch



### Current Klondike Canyon – Drain Extends from PV South to the Beach

Ref: Sikand Engineering Associates  
1982 Klondike Canyon Drainage Map and Hydrology Study (Nov)



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### **3. FEMA Funding: Benefit to Seaview**

**I. FEMA Funding helps KCGHAD mobilize steps to mitigate Klondike slide**

**II. FEMA Funding - 5 steps (~\$5,400M)**

**III. Process we have followed:**

- **Submitted plan to city – KCGHAD Landslide Mitigation Plan (5 Steps)**
  - Steve C submitted in Dec 2023
- **Submitting receipts to RPV for FEMA disbursement ~ \$344K so far**
  - **Receipts for Step 4 – filling Fissures & partial earth removal.**
  - **Receipts for portions of Step 2 – Portions of Wells**
    - ✓ 1 of 3 new wells already in, total when done will be 5

**Date:** April 2024  
**Ver:** 5  
**Contents:** Seaview town Hall – Land Movement Update



Date: Mar 13 2024		Head of the slide down the canyon - initial steep drop		300		
for Step 1 Install Water Removal Channel/Pipe in Northern Portion of Klondike Canyon (PV South to Head of Slide)		Remaining flatter surface extending to basin at PV S.		600		
Step	Description	Cost estimate per foot	Equipment Rental	Material Estimate	Labor Estimate	Totals
1	1a Permits & Inspection	\$20.00		\$18,000.00		\$18,000.00
	1b Installation of 16" Flex Pipe to divert water to catch basin while main long term HDPE & V-Ditch is created to divert water down Klondike Canyon	\$150.00		\$90,000.00	\$45,000.00	\$135,000.00
	1c Design & engineering of Final Storm Drain System (900'-from head of slide to the Klondike Canyon basin located next to PV South)	\$300.00			\$270,000.00	\$270,000.00
	1d Equipment for trenching final Storm Drain System (900 feet)	\$300.00		\$270,000.00		\$270,000.00
	1e Labor install HDPE pipe & create cement v-ditch for final storm drain system (900 feet)	\$300.00			\$270,000.00	\$270,000.00
	1f Materials for HDPE pipe & Cement for v-ditch for final Storm Drain System (900 feet)	\$350.00		\$315,000.00		\$315,000.00
Sub Total			\$0.00	\$693,000.00	\$585,000.00	\$1,278,000.00
for Step 2 3 new deep water extraction wells at base of slide & 1 observation well head of slide						
Step	Description	Cost estimate per foot or unit	Equipment Rental	Material Estimate	Labor Estimate	Totals
2	2a Permits	\$25.56		\$11,500.00		\$11,500.00
	2b Drill 1 new well at base of slide (at beach) & repair existing well - 3x150' deep water extraction wells	\$1,233.33	\$300,000.00		\$255,000.00	\$566,500.00
	2c 3 Water Extraction Pump	\$90,000.00		\$270,000.00		\$270,000.00
	2d 3 Pump Electrical Boxes	\$20,750.00		\$62,250.00		\$62,250.00
	2e Observation Well at the head of the Side (off Dauntless Dr)	\$150,000.00			\$90,000.00	\$90,000.00
Sub Total			\$300,000.00	\$343,750.00	\$345,000.00	\$1,000,250.00
for Step 3 Fill fissures at head of Klondike Slide & Remove dirt at interface of Portuguese PB & KC Slide in PBC						
Step	Description	Cost estimate per foot or unit	Equipment Rental	Material Estimate	Labor Estimate	Totals
3	3a Permits	\$8,000.00		\$8,000.00		\$8,000.00
	3b Labor engineering devise optimum earth removal to minimize impact of Portugese Bend Slide applying pressure to Klondike Slide	\$500.00	\$300,000.00		\$350,000.00	\$650,000.00
	3c Equipment for filling/covering Fissures and Earth Removal	\$470.00	\$300,000.00			\$300,000.00
	3d Tarps and tie downs for tarps to cover fissures	\$14,000.00		\$42,000.00		\$42,000.00
Sub Total			\$600,000.00	\$50,000.00	\$350,000.00	\$1,000,000.00
for Step 4 Create Storm Drain at the head of the Beach Club Slide that channels the water to the Klondike						
Step	Description	Cost estimate per foot or unit	Equipment Rental	Material Estimate	Labor Estimate	Totals
4	4a Permits	\$10.00		\$4,150.00		\$4,150.00
	4b Labor engineering to create V-Ditch at head of Beach Club Slide - to divert water to Klondike Canyon drain	\$900.00			\$373,500.00	\$373,500.00
	4c Equipment for trenching & cement (415 feet)	\$460.00	\$190,900.00			\$190,900.00
	4d Labor create V-Ditch	\$450.00			\$186,750.00	\$186,750.00
	4e Materials for Cement	\$350.00		\$145,250.00		\$145,250.00
Sub Total			\$190,900.00	\$149,400.00	\$560,250.00	\$900,550.00
for Step 5 Repair rain damage to Klondike 48" storm drain System damage and 3 other rainwater related items						
Step	Description	Cost estimate per foot or unit	Equipment Rental	Material Estimate	Labor Estimate	Totals
5	5a Permits	\$10.00		\$3,000.00		\$3,000.00
	5b Labor engineering to design repair of damaged 48" Klondike Canyon Drain pipe	\$900.00			\$270,000.00	\$270,000.00
	5c Equipment & Materials for repair of 48" pipe	\$725.00	\$217,500.00			\$217,500.00
	5d Backfill of damaged area around 48" pipe exit location to ocean	\$840.00			\$252,000.00	\$252,000.00
	5e 3 water extraction pumps for catch basin of 48" pipe (at base of slide)	\$90,000.00		\$360,000.00		\$360,000.00
	5f 3 Pump Electrical Boxes	\$20,750.00		\$83,000.00		\$83,000.00
Sub Total			\$217,500.00	\$446,000.00	\$522,000.00	\$1,185,500.00
Grand Total:				\$5,504,500.00		\$5,504,500.00
Rounded Total:						\$5,400,000.00

~\$5.400M

Note: Calculations are estimates



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## 4. Requests of Seaview Owners - How you can help (power in numbers)

1. **Support the 5-Step Plan** – (individual and community)
2. **Make calls and send emails to I-IV below**

Current KCGHAD support Letters:

- WPS – Geology (Scott Kerwin) 40 yr history with KCGHAD – supporting the 5 step plan
- DCA – Engineering Study supporting the 5-Step Plan & reinforcing that it can be accomplished for the outlined fees within a year period
- RPV Mayor Cruikshank – Supporting the 5 – Step Plan
- AL MURATSUCHI – Assemblymember California Legislature - 66th District – supporting the 5 – Step Plan

### I. Call's & emails you can make/send

#### State CA

1. **Andrew Wilson** – RPV asked for support for KCGHAD
2. **Brandy Villanueva** - Area G Disaster Management Area Coordinator (DMAC)  
Office: 310-316-0055, Cell: 310-625-7995  
Address: 3868 Carson Street, #106, Torrance, CA 90503  
[bvillanueva@areag-laco.org](mailto:bvillanueva@areag-laco.org)
3. **Nancy Ward** - Director of the California Governor's Office of Emergency Services (Cal OES) Public Safety Communications - Main Office  
601 Sequoia Pacific Blvd, Sacramento, California, 95811 / (916) 894-5209

Request of Cal OES: 3/20/24 – RPV requested support from Cal OES – letter was sent to Andrew

Cal OES Reply: Their response was “no” – it is in “conflict” with their current submission

Cal OES Mission: Cal OES serves as the state's leadership for all major emergencies and disasters. This includes state and federal resources and mutual aid assets across all regions to support the diverse communities across the state.

Question you can ask: How do we get your support

#### LA County

1. **Leslie Luke** – RPV asked for support for KCGHAD.  
DEPUTY DIRECTOR LOS ANGELES COUNTY OFFICE OF EMERGENCY MANAGEMENT  
323-980-2269  
[LLUKE@CEOEM.LACOUNTY.GOV](mailto:LLUKE@CEOEM.LACOUNTY.GOV)

Request of LACOEM: 3/20/24 – RPV requested support from LA County Office Of Emergency Management – (LACOEM) – letter was sent to Leslie

LACOEM Reply: Their response was “no” – it is in “conflict” with their current submission

LACOEM Mission: LACOEM has the responsibility of comprehensively planning for, responding to and recovering from large-scale emergencies and disasters that impact Los Angeles County

Question you can ask: How can an organization about the people be in conflict to support the people???





## 4. Requests of Seaview Owners - How you can help (power in numbers)

### II. Call & email your City Mayor & City Council Members / phone (310-544-5200)

- John Cruikshank / Mayor [john.cruikshank@rpvca.gov](mailto:john.cruikshank@rpvca.gov)
- Eric Alegria / Mayor Pro Tem [eric.alegria@rpvca.gov](mailto:eric.alegria@rpvca.gov)
- David Bradley / Councilmember [david.bradley@rpvca.gov](mailto:david.bradley@rpvca.gov)
- Barbara Ferraro / Councilmember [barbara.ferraro@rpvca.gov](mailto:barbara.ferraro@rpvca.gov)
- Paul Seo / Councilmember [paul.seo@rpvca.gov](mailto:paul.seo@rpvca.gov)

### III. Call & email your City Manager

- Ara Mihranian / City Manager [aram@rpvca.gov](mailto:aram@rpvca.gov) / 310-544-5202

***Let them know you support the KCGHAD - 5 Step Landslide Mitigation initiative & Ask them to help secure FEMA funding right ASAP***

### IV. Call & email your Governor - too

- **Governor Gavin Newsom**  
1021 O Street, Suite 9000  
Sacramento, CA 95814  
**Phone:** [\(916\) 445-2841](tel:9164452841)
- **Website - <https://www.gov.ca.gov/contact/>**

By Email

What is your request or comment about?

Topic: OTHER

What is the purpose of your message?

Request for Comment

Request for Help

Next

#### Suggested Message:

Rancho Palos Verdes is in desperate need of funds to help slow/stop the land movement due to the extreme rains we received. Several homes are already red tagged. **Klondike Canyon Geological Hazard Abatement District (KCGHAD)** as projects ready to be funded to save the 107 homes in the Klondike slide zone. We are just waiting on the money. The longer we wait, the more houses we will lose. Thank you for your prompt attention to this important issue.



# Appendix



October 2023

Burma Road



October 2023



Note: Calculations are estimates



- Over 100+ homes at risk
- Potential loss of PV South Access

Note: Calculations are estimates

### 3D - Visual Showing Approx location of Portuguese Bend, Klondike Canyon & the Beach Club Landslides

