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KAPOLEI PROPERTY DEVELOPMENT, LLC

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAI'I

In the Matter of the Petition of

KAPOLEI PROPERTY DEVELOPMENT, LLC

To Amend the Agricultural Land Use District
Boundaries into the Urban Land Use District for
Approximately 344.519 Acres in Ewa District,
Island of Oahu, Tax Map Key Nos. (1) 9-1-
014:033 (por.), 034, 035 and (1) 9-1-015:020
(por.)

DOCKET NO. A06-763

**KAPOLEI PROPERTY DEVELOPMENT, LLC'S
WRITTEN DIRECT TESTIMONY OF JEFFREY C. MORRELL, P.E.**

EXHIBIT "33"

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**WRITTEN DIRECT TESTIMONY OF
JEFFREY C. MORRELL, P.E.**

BACKGROUND QUESTIONS

1. *Please state your name and business address for the record.*

Jeffrey C. Morrell, P.E.
LFR Inc.
220 South King Street, Suite 1290
Honolulu, Hawaii 96813

2. *What is your current occupation?*

I am currently practicing as a Civil and Environmental Engineer. I am a Principal Engineer and the Operations Manager for LFR's Honolulu office.

3. *Are you a licensed professional engineer?*

I hold professional engineering licenses for California (No. 042637) and Hawaii (No. 8426).

4. *Do you specialize in a specific area of engineering?*

I specialize in civil and environmental engineering.

5. *How long have you been an environmental engineer by profession?*

I have been an environmental engineer for the past 25 years.

6. *Could you briefly describe your educational background?*

I obtained a B.S. in Civil Engineering from Pennsylvania State University, Pennsylvania in 1981 and an M.S. in Environmental Engineering from Stanford University, California in 1983.

7. *Could you briefly summarize your work experience for us?*

For the past 15 years, I have managed the LFR Honolulu office conducting a variety of civil and environmental projects. Prior to that, I worked for 10 years for Hewlett-Packard as an environmental engineer, engineering manager, and manager of chemical and mechanical manufacturing processes. Prior to attending graduate school, I worked for the Aluminum Company of America (ALCOA) as a civil engineer in charge of the start-up of a 20-million-gallon-per-day potable water treatment plant. Below are some highlights of my recent work experience.

- 1 • Project Director for numerous projects involving investigation and
2 remediation of petroleum impacted soil and groundwater. Directed projects
3 involving a variety of investigation methods for rapidly assessing the extent of
4 impact from petroleum contamination. Projects involved field investigation,
5 hydrogeologic modeling, and assessment of ecological and human health
6 risks. Conducted the investigation of a large oil refinery in Hawaii. Prepared
7 an Integrated Contingency Plan for a facility storing over one million gallons
8 of oil. Conducted an assessment of crisis preparedness, and developed a crisis
9 management plan for a major U.S. company.
10
- 11 • Project Director and Project Manager for civil engineering projects including
12 the design and installation of septic systems and leachfields at active service
13 station sites, design and installation of a 6.5-acre engineered composite cap on
14 a hazardous waste landfill, and design and installation of piping and
15 containment systems for above-ground petroleum storage tanks and piping
16 systems.
17
- 18 • Project Manager for multiphase investigation, remediation, and closure of
19 CERCLA/RCRA regulated former steel manufacturing facility in O'ahu. The
20 project involved characterization of metals in groundwater, soils, and
21 sediments. Remediation work included facility decommissioning, dredging of
22 affected sediment, and closure of a waste pile area. The project required
23 extensive negotiation with U.S. EPA Region IX and the Hawaii Department
24 of Health.
25
- 26 • Prepared remedial investigation/feasibility study (RI/FS) report for CERCLA-
27 nominated site, Hawaii. The evaluation required developing remedial designs
28 and cost estimates for petroleum, chlorinated solvent, and metals-impacted
29 soil and groundwater.
30
- 31 • Managed design, construction, and operation of state-of-the-art, \$1.2 million
32 industrial wastewater treatment system for effluent from electronics industry
33 specialty plating facility. The plant was awarded the 1988 California Water
34 Pollution Control Federation annual design excellence award.
35

36 **8. *Did you provide a copy of your curriculum vitae for purposes of this hearing?***

37
38 I provided a copy of my curriculum vitae for this hearing.
39

40 **9. *Is Petitioner's Exhibit "34" a true and accurate copy of your curriculum vitae?***

41
42 The Petitioner's Exhibit 34" is a true and accurate copy of my curriculum vitae.
43

44 **10. *Where are you currently employed?***

45
46 I am currently employed at LFR Inc.

1 **11. What is your title or position?**

2
3 My current title in the company is Operations Manager and Principal Engineer.
4

5 **12. Could you briefly describe what LFR Inc. ("LFR") does?**

6
7 LFR Inc. is an environmental management and consulting engineering company.
8 LFR has a staff of 400 employees at offices across the country performing Phase I
9 and Phase II assessments, designing and building treatment systems, and
10 providing compliance assistance.
11

12 **13. Could you briefly describe your duties and responsibilities?**

13
14 I manage LFR Inc.'s Honolulu office and direct a wide variety of environmental
15 and civil projects in Honolulu and the Pacific involving engineering and design,
16 construction, operations and maintenance, and regulatory compliance.
17

18 **14. Could you briefly describe the type of work you currently perform as an**
19 **environmental engineer?**

20
21 Major environmental projects that I am currently responsible for include the
22 closure and cleanup of a former wood treatment facility on Maui, and the
23 permitting, start-up, and operation of a high-vacuum multi-phase extraction
24 system at three (3) service station sites on O'ahu.
25

26 **15. Could you briefly describe the types of projects in which you have recently**
27 **worked on?**

28
29 My most recent civil engineering projects have been the ongoing reconstruction
30 of the spillway and abutment of a large earthen dam on Kauai, and the Phase I
31 inspections of approximately 50 earthen dams on Maui and Kauai.
32

33 **16. Do you possess specialized knowledge within the field of environmental**
34 **engineering?**

35
36 My areas of technical expertise include design of environmental management
37 systems, management of hazardous materials and wastes, soil and groundwater
38 investigation and remediation, and potable water and wastewater treatment. In
39 the field of civil engineering my areas of expertise include hydraulics and
40 hydrology and construction of asphalt and concrete structures.
41

42 **17. Have you previously been qualified and/or testified as an expert witness in the**
43 **field of environmental engineering?**

44
45 Yes.

1 **18. If yes, on approximately how many occasions have you been qualified to testify**
2 **as an expert in the field of environmental engineering?**

3
4 Two (2) cases.
5
6

7 **KAPOLEI HARBORSIDE CENTER PROJECT**
8

9 **19. Are you familiar with the Kapolei area located in the 'Ewa district on the island**
10 **of O'ahu?**

11
12 I am familiar with the Kapolei area located in the 'Ewa district on the island of
13 O'ahu.
14

15 **20. Are you familiar with the Kapolei Harborside Center project ("Project") located**
16 **in the 'Ewa district on the island of O'ahu?**

17
18 I am familiar with the Kapolei Harborside Center project.
19

20 **21. How did you become familiar with the Project?**
21

22 LFR Inc. was retained by Group 70 International to assist Kapolei Property
23 Development, LLC ("KPD") with the preparation of a draft environmental impact
24 statement ("EIS") as part of a petition for a state land use boundary amendment
25 from Agricultural to Urban district and a subsequent county change of zoning
26 request. As part of the EIS process, LFR was asked to prepare an Environmental
27 Summary Report for two (2) sites within the Project.
28
29

30 **ENVIRONMENTAL SUMMARY REPORT**
31

32 **22. Did you prepare a report about the Project?**
33

34 LFR Inc. prepared an Environmental Summary Report dated July 6, 2006 for the
35 Project.
36

37 **23. Was this report prepared by you or under your supervision?**
38

39 I prepared this report.
40

41 **24. Is Petitioner's Exhibit "35" a true and correct copy of your report?**
42

43 The Petitioner's Exhibit "35" is a true and correct copy of my report.
44

1 **25. *Could you please summarize the scope of your report?***
2

3 The Environmental Summary Report summarized the former and current
4 conditions at two (2) sites within the proposed development: the former Hawaiian
5 Western Steel waste pile and the petroleum impacted property north of Malakole
6 road adjacent to the Chevron Refinery. The report included background
7 information on each area, the history of releases and the nature and extent of
8 impacted soil and groundwater, the actions which were taken to contain and
9 remediate the releases, the present condition of the sites, the status of regulatory
10 agency decisions and involvement, and the nature of potential environmental and
11 exposure risks. The evaluation focused on the proposed land use changes and
12 considered the effects of conditions at the impacted sites on the proposed land
13 use.
14

15 **26. *Could you describe the methodology used to prepare your report?***
16

17 LFR prepared a bibliography of available reports and documents related to the
18 investigation. LFR and I were previously involved with the investigation and
19 cleanup of both sites, so LFR documents were assembled and reviewed. Other
20 professionals and companies involved with the remediation of the sites were
21 interviewed, and regulatory agency records were requested and reviewed. LFR
22 inspected the waste pile and the Malakole Road sites. Following the collection of
23 the information described above, LFR prepared a summary report.
24

25 **27. *Is the methodology you employed consistent with accepted industry standards?***
26

27 Yes.
28
29

30 **WESTERN STEEL WASTE PILE**
31

32 **28. *Are you familiar with the Hawaiian Western Steel ("HWS") Waste pile ("Waste
33 Pile")?***
34

35 I am familiar with the HWS Waste Pile.
36

37 **29. *Could you briefly describe the HWS Waste Pile?***
38

39 The HWS Waste Pile is located on an approximately 6.5 acre parcel of land
40 within the Campbell Industrial Park, Kapolei, O'ahu, Hawaii. The Waste Pile is
41 associated with the former Hawaiian Western Steel facility and is located one (1)
42 mile north of the HWS plant site (91-150 Hanua Street), just north of Malakole
43 Road. The Waste Pile is bounded by the remnants of a large coral pile to the west
44 and a wholesale nursery to the east. Hanua Street Extension, providing access to
45 the Grace Pacific rock quarry to the north, bisects the Waste Pile.
46

1 Beginning in 1959, HWS built and operated a secondary steel mill in the
2 Campbell Industrial Park to convert scrap metal into steel reinforcement bar
3 (rebar). In approximately 1970, HWS began using the Waste Pile area for the
4 disposal of plant-generated waste (e.g. wet scrubber material, mill scale [iron
5 oxide], slag, scrap steel, electrode remnants, and furnace bricks). In 1976, a
6 baghouse was installed at the plant site to collect arc furnace condensed off-gasses
7 and dust, and the baghouse dust was disposed in the Waste Pile area. HWS
8 discontinued disposal operations at the Waste Pile in 1986; plant operations
9 ceased in 1991. A total of approximately 100,800 cubic yards of material had
10 been disposed at the Waste Pile during its operation.

11
12 **30. Are you aware of remedial activities that were conducted at the Waste Pile?**

13
14 I am aware of remedial activities that were conducted at the Waste Pile. A
15 summary of remedial activities are listed below:

16
17 **a) EPA Administrative Order on Consent, Comprehensive Environmental Response,**
18 **Compensation and Liability Act (CERCLA) Order Number 92-10, February 24,**
19 **1992.**

20
21 On February 24, 1992, the Environmental Protection Agency ("EPA"),
22 Region IX issued an Administrative Order on Consent ("the Order") pursuant
23 to Sections 104 and 106 of the Comprehensive Environmental Response,
24 Compensation, and Liability Act of 1980 (CERCLA Order Number 92-10) as
25 amended by United States Code Sections 9604 and 9606. The Order required
26 HWS to conduct waste removal at other HWS locations; consolidate the waste
27 at the Waste Pile; grade and compact the waste materials; and install a
28 CERCLA cap over the waste as part of closure of the Waste Pile.

29
30 **b) Expanded Work Plan, Hawaiian Western Steel Limited, 'Ewa Beach, O'ahu,**
31 **Hawaii, March 18, 1992.**

32
33 Beginning in April 1992, HWS conducted investigation and cleanup activities
34 at the plant site and other HWS locations. HWS' cleanup activities included
35 removal of approximately 26,570 cubic yards ("cy") of baghouse dust, slag,
36 mill scale, and chemically-impacted soil and sediment for disposal at the
37 Waste Pile. Including this material, a total of approximately 100,800 cy of
38 material had been disposed at the Waste Pile during its operation (Remcor,
39 August 6, 1993). In accordance with paragraph 29 of the Order, the waste
40 was subsequently segregated, consolidated, and compacted in preparation for
41 the installation of the CERCLA cap.

42
43 In November 1992, construction of a cap over the Waste Pile was initiated.
44 The waste was graded, and a 6- to 8-inch layer of compacted coral fines was
45 placed over the waste. A 30- and 40-mil high-density polyethylene ("HDPE")
46 geomembrane liner was then installed, followed by a 6- to 9-inch layer of
47 compacted coral fines; later during RCRA closure activities in 1995, five (5)

1 additional capping layers were added. RCRA closure activities were completed
2 in November 1995.

3
4 *RCRA Closure Plan Implementation*

5
6 LFR recommended capping the three (3) additional areas with coral fines and
7 asphalt in conjunction with final closure of the Waste Pile. The final
8 construction of the RCRA cap over the Waste Pile was performed in accordance
9 with the revised *RCRA Closure Plan* (LFR, 1994b) by LFR between July and
10 October 1995. The five (5) remaining layers of the cap were installed,
11 including, from bottom to top: a polypropylene non-woven geotextile; a 6-inch
12 layer of coral base material; asphalt prime coat; a 2.5- to 3.0-inch layer of
13 asphaltic concrete; and asphalt seal coat. In conjunction with completion of the
14 cap, a perimeter drainage pipe was installed, the HDPE geomembrane liner was
15 extended to the Hanua Street Extension roadway, and the coverage of the cap
16 was increased. LFR also directed the disposal of sinkhole soil and construction-
17 derived residuals.

18
19 *c) Post-Closure Cap Inspections and Maintenance.*

20
21 Inspections were conducted on a quarterly basis from 1996 to 1998, have been
22 conducted on a semi-annual basis since 1998, and will continue for the
23 remainder of the 30-year post-closure period. An inspection form is
24 completed at the time of the inspection and a brief inspection report to file is
25 written following inspection and completion of any required maintenance and
26 repairs.

27
28 Periodic maintenance was planned and budgeted for as part of the post-closure
29 plan for the Waste Pile facility. The asphalt cap is scheduled to be re-sealed
30 in years 5, 10, 15, 20, 25 and 30 although the actual frequency is based on the
31 results of the periodic inspections. Two (2) major repair events, requiring the
32 replacement of the asphalt seal coat over significant portions of the cap were
33 also anticipated and will be performed as needed, based on the periodic
34 inspections.

35
36 **31. *What is the current condition and regulatory status of the Waste Pile?***

37
38 The waste material is encapsulated in a 2- to 3-foot-thick engineered containment,
39 consisting of compacted coral, a geomembrane, a geotextile and a 2.5- to 3.0-inch
40 asphaltic concrete cap. The portion of the waste pile that is transected by Hanua
41 Street Extension is lined with concrete bollards to prevent vehicular entrance to
42 the site. The facility is inspected on a semi-annual basis and repairs are made as
43 needed. The facility is currently in its tenth year of post-closure care of a 30-year
44 period required by the RCRA program. An application for a RCRA Post Closure
45 Permit has been prepared and was submitted to the Hawaii Department of Health
46 ("DOH") in 2006. An inspection by the DOH on September 26, 2006 found no
47 deficiencies and no violations.

1
2 **32. *In your report, did you make any recommendations regarding the future use of***
3 ***the Waste Pile?***

4
5 Past releases of hazardous chemicals were addressed through a combination of
6 institutional controls, containment, and remediation in the former HWS Waste
7 Pile area. At the former HWS Waste Pile, residual chemical concentrations
8 require that the institutional controls and containment systems be maintained.
9 The integrity of the engineered containment system must be maintained through
10 the post-closure period and the deed restrictions controlling access and excavation
11 must be maintained in perpetuity.
12

13 **33. *Can the Waste Pile be developed?***

14
15 The Waste Pile can only be used for very limited activities which will not
16 adversely affect the integrity of the composite cap over the hazardous waste.
17 Examples of the type of uses that might be acceptable include long-term storage
18 and parking of vehicles or storage containers, or use of the area as household
19 recyclables collection center.
20

21 **34. *What will it take to allow development on the Waste Pile to occur?***

22
23 Any development or substantial change of use of the Waste Pile would require a
24 petition to the U.S. Environmental Protection Agency ("U.S. EPA") and the
25 DOH. The DOH is currently finalizing a post-closure permit which will define
26 the requirements for implementation of the existing post-closure inspections,
27 maintenance and site use. Changing the site use would require re-negotiating the
28 conditions of the permit. Deed restrictions would have to be amended, and
29 notification of the Land Court would be required.
30

31 The heavy metals in the Waste Pile cannot be easily treated to make the waste less
32 toxic or less mobile. If stabilization or encapsulation were technically feasible,
33 the volume of waste would be increased by at least one-third. During the site
34 closure process, stabilization and shipment of the waste to a mainland hazardous
35 waste disposal facility were investigated and eliminated from further
36 consideration because the costs of these options were estimated to be tens of
37 millions of dollars. Development of the Waste Pile to accommodate a building
38 would require extensive engineering to ensure that the building foundations could
39 be installed without compromising the cap or exposing the underlying waste.
40
41

1 **MALAKOLE STREET SITE ADJACENT TO CHEVRON REFINERY**

2
3 35. *Are you familiar with the areas in and around the Malakole Street site adjacent*
4 *to the Chevron Refinery ("Malakole Site")?*

5
6 I am familiar with the areas in and around the Malakole Site.

7
8 36. *Could you briefly describe the Malakole Site?*

9
10 The Malakole Site located on the north side of Malakole Road, adjacent to the
11 Chevron Refinery, occupies approximately 25 acres within TMK Parcel 9-1-
12 014:033 (Figure 3 of my Report). TMK Parcel 9-1-014:033 encompasses an area
13 of approximately 137 acres. The parcel is leased by Grace Pacific for use as a
14 sand and gravel storage area, and by Hawaiian Earth Products, Ltd. for use as a
15 green waste composting facility. A pipeline corridor is also located along the
16 Malakole side of the parcel with pipelines owned and operated by Tesoro,
17 Chevron, and Hawaiian Electric Company ("HECO").
18

19 37. *Are you aware of remedial activities that were conducted at the Malakole Site?*
20 *If so, what were they?*

21
22 In the mid 1990s, Chevron conducted an investigation of the area north of
23 Malakole Road and designed a remediation system for the portion of the plume
24 that was not on Chevron property. The following is a summary of the most
25 significant environmental investigations previously conducted at the Malakole
26 Site.
27

28 Between August and October 1996 Chevron conducted an investigation of the
29 area north of Malakole Road to define the boundary of the separate phase
30 hydrocarbon ("SPH") plume and collect information required to conduct a risk
31 assessment (Dames and Moore, 1997a). Chevron installed 26 soil borings to
32 depths ranging from 14 to 27 feet below ground surface ("bgs"), and converted
33 five (5) of the borings into permanent groundwater monitoring wells. Chevron
34 collected soil samples from each boring near the surface and at the interval in the
35 vadose zone immediately above the water table. Chevron analyzed the samples
36 for benzene, toluene, ethylbenzene, and total xylenes ("BTEX") and polynuclear
37 aromatic hydrocarbons ("PAHs"). Chevron also measured the thickness of the
38 SPH in the wells and borings, and collected groundwater samples from the
39 monitoring wells.
40

41 Following the 1996 investigation of areas outside the boundaries of the Chevron
42 refinery, Chevron recognized that the soil and groundwater underlying property
43 that was not owned by Chevron was impacted by significant levels of chemicals
44 of potential concern ("COPCs") and light nonaqueous phase liquid ("LNAPL").
45 In conjunction with the off-site investigation of the area north of Malakole Road,
46 Chevron conducted the initial phases of an ecological and human-health risk

1 assessment (Dames & Moore 1997b). The risk assessment report concluded that
2 there were no significant completed exposure pathways from the off-refinery
3 plume that would result in ecological risk. The risk assessment also concluded
4 that potential construction worker exposure could be adequately addressed using
5 “institutional controls” (in this case a health and safety plan for the construction
6 activities and personal protective equipment.) Finally, the risk assessment
7 concluded that indoor air vapor inhalation by future indoor workers in a
8 commercial building at the site would not pose an unacceptable health risk.
9

10 While Chevron argued that on the basis of the risk assessment no off-site
11 remediation was required, negotiations with DOH, EPA, and the Campbell Estate
12 resulted in Chevron agreeing to install and operate an active skimming
13 remediation system at the Malakole Site.
14

15 An active skimming remediation system consisting of three (3) trenches
16 containing approximately 950 linear feet of horizontal slotted collection pipe was
17 installed in the area north of Malakole Road in the autumn of 1997, began phase-
18 separated hydrocarbon (“PSH”) recovery on January 27, 1998 and was officially
19 shut down on May 8, 2000. PSH that drained by gravity into the horizontal
20 collection pipe flowed into six (6) sumps outfitted with hydrophobic density
21 skimmer pumps and was pumped into a 10,000-gallon storage tank located within
22 an HDPE-lined earthen containment enclosure (Dames & Moore 1997d).
23

24 The remediation system was expected to operate for a period of three (3) to five
25 (5) years and was to be shut down when the product recovery rate dropped below
26 levels that could be economically justified. The results of the operation of the
27 remediation system are summarized in an “Operation and Maintenance Review”
28 letter report prepared for Chevron in December 2000 (URS, 2000). Data in the
29 letter report indicates that the system operated for a total of 707 days between
30 January 27, 1998 and May 8, 2000 and recovered a total of 6,494 gallons of
31 “product”. During that period, the recovery system was operational for 669 days
32 and experienced 38 days of downtime (94.6% uptime).
33

34 During an investigation conducted in December 2005, URS observed that the
35 above-ground storage tank, the containment system and the above-ground piping
36 had been removed, some areas of the site had been graded, and there were no
37 remnants of many of the original monitoring wells. The access agreement with
38 Campbell Estate called for the sumps to be cut-off two (2) feet below the ground
39 surface and filled with rock or grout, but it is not certain that this requirement was
40 fulfilled. LFR has assumed that the sumps and the horizontal collection pipes
41 were left in the ground onsite.
42

43 **38. *What is the current condition and regulatory status of the Malakole Site?***
44

45 In December 2005 Chevron installed soil borings and temporary monitoring wells
46 near 13 of the locations where wells and borings had been installed in 1996.

1 Chevron collected soil and groundwater samples from each of the soil
2 borings/monitoring wells, measured the thickness of PSH in the new wells, and
3 analyzed the samples for total petroleum hydrocarbons as gasoline ("TPHg"),
4 total petroleum hydrocarbons as diesel ("TPHd"), BTEX, and PAHs. The results
5 of the 2005 sampling indicate that the concentrations of BTEX and PAHs have
6 decreased significantly in most of the areas that were sampled with the sampling
7 locations around the former remediation system showing the greatest change. No
8 measurable thickness of PSH was detected in any of the wells.
9

10 The only exception to the decreasing chemical concentrations was observed in
11 soil boring/well F2-OBLO20A which is located 110 feet upgradient from most
12 upgradient (northeasterly) former recovery trench in an area where there was
13 previously 0.2 to 0.4 feet of PSH. The ethylbenzene and naphthalene
14 concentrations measured in the soil samples from this location increased from 8.4
15 to 11.6 milligrams per kilogram ("mg/kg") for ethylbenzene and from < 0.4
16 mg/kg to 5.06 mg/kg for naphthalene. TPHg concentrations in this soil sample
17 were above the current DOH environmental action levels ("EALs"). The
18 measured concentrations of TPHg in the groundwater sample from this location
19 also exceeded the EALs. This result is not unexpected, but indicates the
20 persistence of hydrocarbon compounds in areas where LNAPL was most recently
21 present.
22

23 Overall, the results indicate that the active remediation skimming system was
24 successful in reducing the amount of LNAPL in the soil and in reducing the
25 source of dissolved petroleum compounds in the groundwater. The results also
26 indicate that natural bioattenuation is occurring at the site and the area of
27 impacted soil and the dissolved plume are stable and slowly receding.
28

29 **39. *In your report, did you make any recommendations regarding the future use of***
30 ***the Malakole Site?***
31

32 The area north of Malakole Street adjacent to the Chevron refinery is where past
33 releases of hazardous chemicals were addressed through a combination of
34 institutional controls, containment, and remediation. Remaining elevated
35 petroleum hydrocarbon concentrations in a limited portion of the area north of
36 Malakole Road will require some ongoing institutional controls. Specifically,
37 future subsurface utility work or building construction which includes excavation
38 to depths greater than five (5) feet in the vicinity of boring/well F2-OBLO20A
39 will require the following precautions: First, construction workers at the site must
40 have hazardous materials training ("HAZWOPER") as required by 40 CFR
41 1910.120, and must prepare a health and safety plan prior to conducting any work
42 at the site. Any soil that is excavated from depths greater than four (4) feet will
43 have to be sampled and characterized for proper re-use onsite or off-site disposal.
44 Finally, any groundwater that is pumped during de-watering activities must be
45 treated before it is disposed onsite or off-site to avoid worker exposure or
46 regulatory violations.

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40. Can the Malakole Site be developed?

Yes, with the implementation of the procedures described above.

41. What will it take to allow development on the Malakole Site to occur?

Future subsurface utility work or building construction which includes excavation to depths greater than five (5) feet in the vicinity of boring/well F2-OBLO20A will require the following precautions: First, construction workers at the site must have HAZWOPER as required by 40 CFR 1910.120, and must prepare a health and safety plan prior to conducting any work at the site. Any soil that is excavated from depths greater than four (4) feet will have to be sampled and characterized for proper re-use onsite or off-site disposal. Finally, any groundwater that is pumped during de-watering activities must be treated before it is disposed onsite or off-site to avoid worker exposure or regulatory violations.

42. In your professional opinion, based on your findings and proposed mitigation measures, will the Waste Pile and Malakole Site have a substantial impact on the environment or people working in the Project Area?

No. In my professional opinion, there is very low risk of exposure to dangerous levels of toxic chemicals at either site as long as the containment, institutional controls, and construction procedures described above are maintained and enforced. Over time, the petroleum chemicals at the Malakole Site will continue to naturally degrade and the exposure risk will continue to diminish.

The inorganic metal contaminants (lead and cadmium) at the Waste Pile will not naturally degrade, and the restrictions on this site will have to be maintained indefinitely. The Waste Pile poses little risk as long as the containment, institutional controls, and construction restrictions are maintained and enforced. Catastrophic events like a major flood, hurricane, or act of terrorism could release the chemicals into the environment necessitating a costly cleanup. However, the risk of exposure, even in these unlikely scenarios, can be managed and minimized.