DRAFT ENVIRONMENTAL ASSESSMENT

REPLACEMENT OF OLA‘A RESERVOIR NO. 2

TMK: (3rd) 1-6-002: 87 & 98, 1-6-03:27
Kea‘au, Puna District, Hawai‘i Island, State of Hawai‘i

January 2008

Hawai‘i County
Department of Water Supply
345 Kekuanaoa Street, Suite 20
Hilo, Hawai‘i 96720

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PROPOSING/
APPROVING AGENCY:

County of Hawai‘i
Department of Water Supply
345 Kekuanaoa Street, Suite 20
Hilo, Hawai‘i 96720

CONSULTANT:

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CLASS OF ACTION:

Use of County Land
Use of County Funds

This document is prepared pursuant to:

The Hawai‘i Environmental Policy Act,
Chapter 343, Hawai‘i Revised Statutes (HRS), and
Title 11, Chapter 200, Hawai‘i Department of Health Administrative Rules (HAR).

TABLE OF CONTENTS

SUMMARY ii
PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND E.A. PROCESS 1
1.1 Project Description, Location and Property Ownership 1
1.2 Purpose and Need 1
1.3 Environmental Assessment Process 5
1.4 Public Involvement and Agency Coordination 5
PART 2: ALTERNATIVES 6
2.1 No Action 6
2.2 Alternative Locations and Strategies 6
PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION 7
3.1 Physical Environment 7
3.1.1 Geology, Soils and Geologic Hazard 7
3.1.2 Drainage, Water Features and Water Quality 11
3.1.3 Flora, Fauna, and Ecosystems 12
3.1.4 Air Quality, Noise and Scenic Resources 13
3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions 14
3.2 Socioeconomic and Cultural 17
3.2.1 Socioeconomic Characteristics 17
3.2.2 Cultural Setting 17
3.2.3 Archaeology and Historic Sites 19
3.3 Infrastructure 19
3.3.1 Utilities 19
3.3.2 Roadways 20
3.4 Secondary and Cumulative Impacts 20
3.5 Required Permits and Approvals 21
3.6 Consistency With Government Plans and Policies 21
3.6.1 Hawai‘i State Plan 21
3.6.2 Hawai‘i County General Plan and Zoning 21
3.6.3 Hawai‘i State Land Use Law 22
PART 4: DETERMINATION 22
PART 5: FINDINGS AND REASONS 22
REFERENCES 24

LIST OF TABLES

TABLE 1 Findings of Records Search, Phase I ESA 15
TABLE 2 Selected Socioeconomic Characteristics 17

LIST OF FIGURES

FIGURE 1 General Location Map 2
FIGURE 2 Vicinity Map 3
FIGURE 3 New Reservoir Site Grading Plan 4
FIGURE 4 Project Site Photographs (3 Pages) 8

APPENDIX 1 Comments in Response to Pre-Consultation
APPENDIX 2 Landscape Plan
APPENDIX 3 Phase I Environmental Site Assessment of New Reservoir Site
APPENDIX 4 Lead and Asbestos Survey of Existing Reservoir

SUMMARY OF THE PROPOSED ACTION, ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The County of Hawai‘i, Department of Water Supply (DWS), plans to remove the existing 0.20 million gallon capacity (Mg) Ola‘a Reservoir No. 2 and construct a new 0.50 Mg reservoir nearby on Milo Street in Kea‘au. The improvements are necessary because the existing reservoir, pumps and supporting facilities have reached the end of their service life, are undersized for current needs, have required expensive maintenance, and do not meet current DWS standards. The new reinforced concrete reservoir will be over twice as large as the existing tank, and thus better able to meet future demands in its water service area. Landscaping will be installed to help the site match its surroundings. In addition to the reservoir itself, new or relocated improvements will include the following: a new pump station with two booster pumps, a new control building to house the motor control center and other electrical equipment and control instrumentation, an asphalt concrete pavement driveway and perimeter fencing. Offsite improvements include replacement of the existing 12-inch transite water main along Milo Street with a 12-inch ductile iron pipe to meet current DWS standards. Once existing water services are reconnected to the new tank, the existing reservoir will be demolished and the site landscaped to match the surrounding area. The improvements will promote public health and safety by improving water storage capacity for the Kea‘au area.

The contractor will obtain an NPDES permit and develop and implement a Storm Water Pollution Prevention Plan (SWPPP) to contain sediment and storm water runoff during construction. Mitigation for worker and adjacent resident exposure to arsenic, asbestos and lead will be undertaken as part of construction. Implementation of the project would have a minor effect on local traffic, possibly requiring only a short-term single-lane closure during grading and paving of vehicular access points and during installation of the new 12-inch water line. Hazardous substances will be abated by appropriate measures during construction and demolition. The new reservoir site is a former sugar cane field and an active papaya field. No significant biological, archaeological or cultural resources are present. If archaeological resources or human remains are encountered during land-altering activities, work in the immediate area of the discovery will be halted and the State Historic Preservation Division will be contacted.

PART 1: PROJECT DESCRIPTION, PURPOSE AND NEED AND ENVIRONMENTAL ASSESSMENT PROCESS

1.1 Project Description, Location and Property Ownership

As depicted in Figures 1-3, the Hawai‘i County Department of Water Supply (DWS) plans to remove the existing 0.20 million gallon capacity (Mg) Ola‘a Reservoir No. 2 on TMK 1-6-002:98 (property of DWS) on Milo Street in Kea‘au and build a new 0.50 Mg reservoir on the opposite side of the street on a roughly 1.3-acre portion of TMK 1-6-03:27, behind a row of homes and several lots to the west. This property is owned by W.H. Shipman, Ltd., and will be purchased by the DWS. While the existing tank is made of welded steel, the new reservoir will be of reinforced concrete, which is stronger and more durable. New or relocated improvements also include a new pump station with two booster pumps, a new control building to house the motor control center and other electrical equipment and control instrumentation, an asphalt concrete pavement driveway and perimeter fencing. Vehicular access will be via an existing accessway between houses on Milo Street designated as TMK 1-6-002:87. Landscaping will be installed at the new site to help the site match its surroundings. Once water services are reconnected to the new tank, the existing reservoir will be demolished and that site will also be landscaped to match the surrounding area.

In addition, the existing 12-inch transite water main along Milo Street will be replaced with about 1,880 linear feet of 12-inch ductile iron pipe to meet current DWS standards (see Figure 2 for location). Once all existing service laterals are connected to the new ductile iron pipe, the transite water main will be abandoned in place.

No firm cost estimates are yet available for construction and demolition, but the cost is expected to be in the range of $2.5 million. If approvals and funding proceed as planned, design will be finished by late 2008, and construction will start in mid-2009 and finish approximately one year later. These estimates will be refined as the project proceeds.

1.2 Purpose and Need

The facility is needed to promote public health and safety by improving water service for the Kea‘au community. The improvements are necessary because the existing reservoir, pumps and supporting facilities have reached the end of their service life, are undersized for current needs, have required expensive maintenance, and do not meet current DWS standards. The new reservoir will be over twice as large as the existing tank, and thus better able to meet future demands in its water service area.

Figure 1
General Location Map

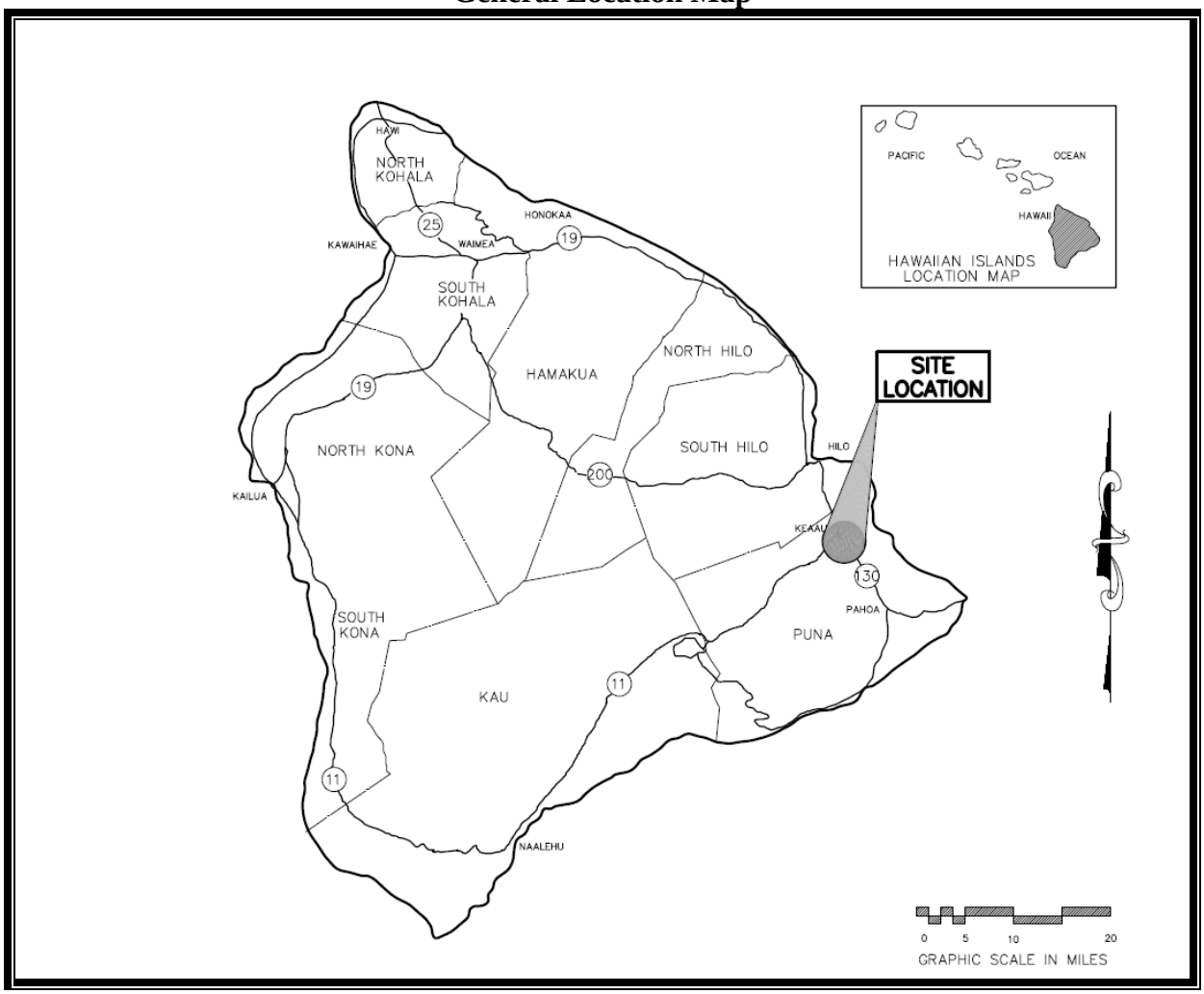


Figure 2
Vicinity Map

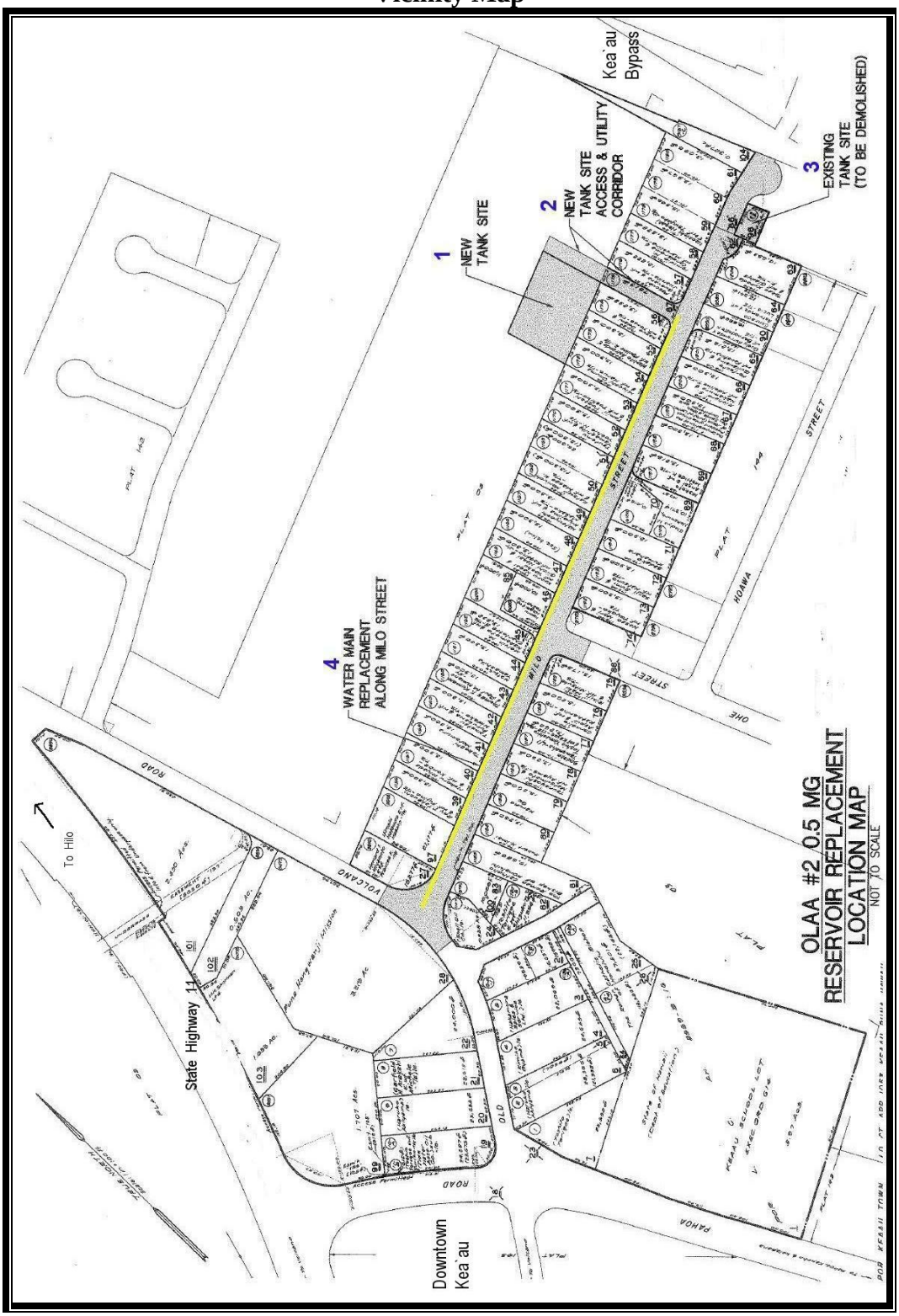
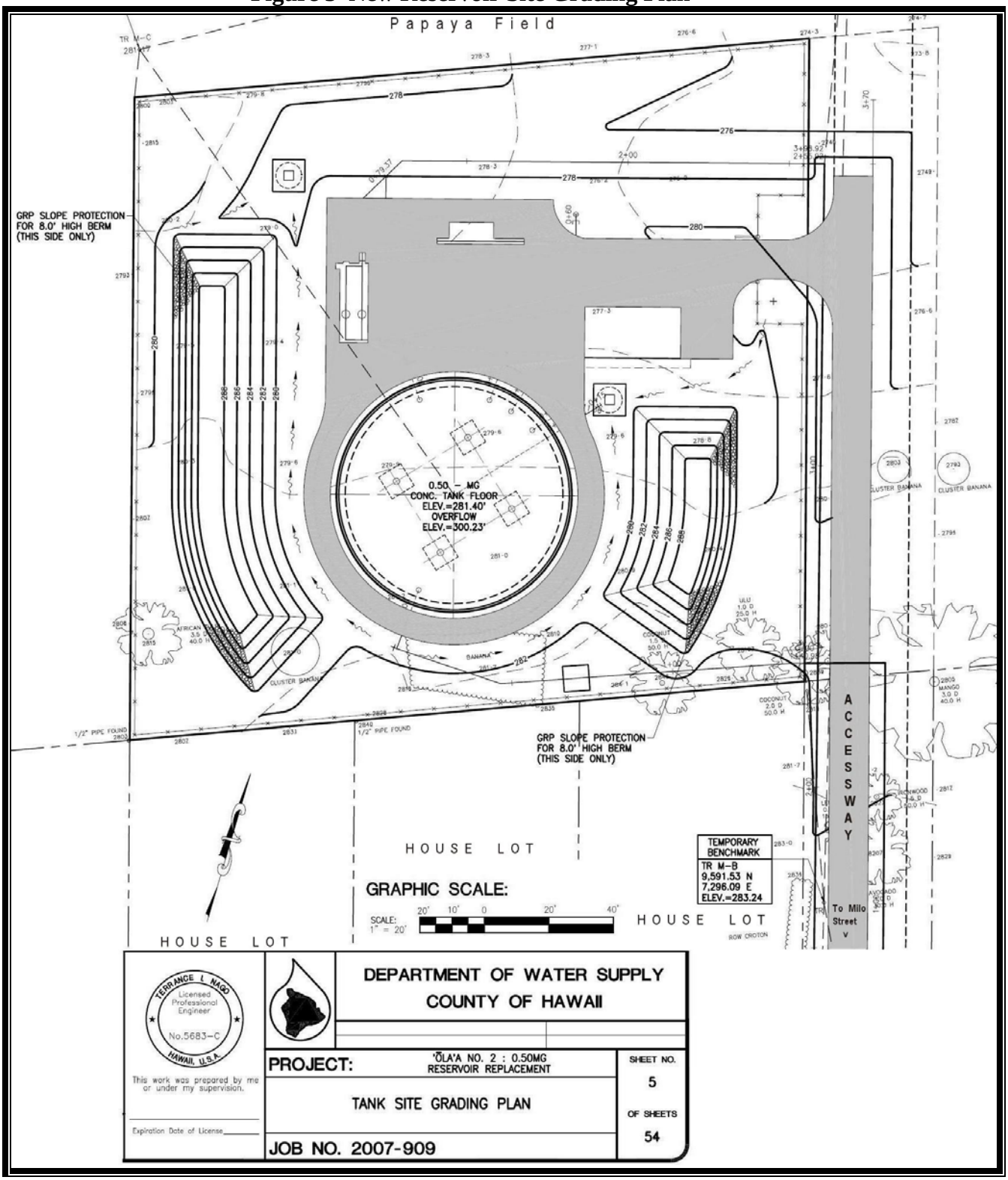


Figure 3 New Reservoir Site Grading Plan



1.3 Environmental Assessment Process

This Environmental Assessment (EA) is being conducted in accordance with Chapter 343 of the Hawai‘i Revised Statutes (HRS). This law, along with its implementing regulations, Title 11, Chapter 200, of the Hawai‘i Administrative Rules (HAR), is the basis for the environmental impact process in the State of Hawai‘i. According to Chapter 343, an EA is prepared to determine impacts associated with an action, to develop mitigation measures for adverse impacts, and to determine whether any of the impacts are significant according to thirteen specific criteria. Part 4 of this document states the anticipated finding that no significant impacts are expected to occur; Part 5 lists each criterion and presents the preliminary findings for each made by the Hawai‘i County Department of Water Supply, the proposing/approving agency. If, after considering comments to the Draft EA, the agency concludes that, as anticipated, no significant impacts would be expected to occur, then the agency will issue a Finding of No Significant Impact (FONSI), and the action will be permitted to occur. If the agency concludes that significant impacts are expected to occur as a result of the proposed action, then an Environmental Impact Statement (EIS) will be prepared.

1.4 Public Involvement and Agency Coordination

The following agencies and organizations were consulted in development of the environmental assessment:

State:
- Department of Health
- Office of Hawaiian Affairs (Honolulu and East Hawai‘i)
- State Historic Preservation Division

County:
- Planning Department
- Public Works Department
- Police Department
- County Council

Private:
- Hawai‘i Island Chamber of Commerce
- Neighboring residents

A letter was also sent to 40 neighborhood property owners.

Copies of communications received during early consultation are contained in Appendix 1.

PART 2: ALTERNATIVES

2.1 No Action

Under the No Action Alternative, the existing reservoir would not be replaced. At some point in the future the quality of water service in this part of Kea‘au may not be adequately dependable nor able to meet the normal growth in demand. Because of its mandate to provide reliable and high-quality water service to all its customers, the Hawai‘i County Department of Water Supply considers the No Action Alternative unacceptable.

However, the No Action Alternative would also avoid taking of property, disturbance of land, and temporary construction-related impacts to air quality, noise and traffic, and is an important baseline for evaluating environmental impacts of the proposed project.

2.2 Alternative Locations or Strategies

During early phases of project planning, DWS examined the Kea‘au area and determined that the Milo Street area provides the best overall location for the required function, as it is already served by a water main and is at the proper elevation. As there do not appear to be any environmental or other disadvantages associated with the specific proposed site, which has good access, a willing landowner, and no apparent environmental issues, no alternative sites have been advanced in the Environmental Assessment. There is no other approach to water storage and transmission that would accomplish the goals of the project.

PART 3: ENVIRONMENTAL SETTING, IMPACTS AND MITIGATION MEASURES

Basic Geographic Setting

The properties upon which the new reservoir would be constructed and from which the old reservoir would be removed are referred to throughout this EA as the *project sites*. The term *project area* is used to describe the general environs of Kea‘au, including the parcel containing the old reservoir to be removed.

The project sites are located at approximately 280 feet in elevation along or near Milo Street near the Kea‘au Bypass (State Highway 130). The existing water tank site is directly on Milo Street (see Figure 2 and Figure 4c), and the new reservoir site is within an existing papaya field behind a row of houses on the opposite side of Milo Street (see Figure 2 and Figure 4a), and would be connected to Milo Street via an overgrown accessway (see Figure 4b). The climate in the area is mild and moist, with an average annual rainfall of 160 inches (U.H. Hilo-Geography 1998:57). Adjacent land use is primarily residential with some scattered agriculture and undeveloped lots.

3.1 Physical Environment

3.1.1 Geology, Soils and Geologic Hazards

Environmental Setting

Geologically, this part of Kea‘au is located on the lower flank of Mauna Loa volcano near the lava divide between Mauna Loa and Kilauea volcanoes. The surface consists of weathered basalt soils on Holocene-era lava flows from Mauna Loa (Wolfe and Morris 1996). The project site soil is classified by the Natural Resource Conservation Service (formerly Soil Conservation Service) as Ola‘a extremely stony silty clay loam (OID), a well-drained soil up to 25 inches deep with a high to very high permeability. This type of soil was formerly used mostly for sugarcane cultivation (U.S. Soil Conservation Service 1973), and now supports diversified agriculture, secondary forest, or pasture. Geotechnical investigations indicate that the site of the proposed reservoir is generally underlain by an 8.0 to 13.5-foot layer of silty gravel- and sand-sized volcanic rock fragments from ‘a‘a lava, under which is intact basalt. Groundwater seepage was not found during any borings and is not anticipated to be a concern for the planned construction.

The entire Big Island is subject to geologic hazards, especially lava flows and earthquakes. Volcanic hazard as assessed by the United States Geological Survey in this area of Puna is Zone 3, on a scale of ascending risk from 9 to 1 (Heliker 1990:23). The high hazard risk is based on the fact Mauna Loa is presently an active volcano. Volcanic hazard Zone 3 areas have had 1-5 percent of their land area covered by lava or ash flows since the year 1800, but are at lower risk than Zone 2 areas because of their greater distances from recently active vents and/or because the local topography makes it less likely that flows will cover these areas.

Figure 4a
Future Reservoir Site

Figure 4b
Accessway

Figure 4c
Existing Reservoir

In terms of seismic risk, the entire Island of Hawai‘i is rated Zone 4 Seismic Hazard (*Uniform Building Code, 1997 Edition*, Figure 16-2). Zone 4 areas are at risk from major earthquake damage, especially to structures that are poorly designed or built, as the 6.7-magnitude (Richter) quake of October 15, 2006, demonstrated. The low slopes and stable soils on the project sites indicate that they are not subject to subsidence, landslides or other forms of mass wasting.

Impacts and Mitigation Measures

In general, geologic conditions impose no constraints on the proposed action, and the proposed water system improvements are not imprudent to construct. Geotechnical engineers have recommended that the building areas be excavated to three feet and the loose ‘a‘a clinker densified, followed by backfilling with compacted fill. The reservoir will designed in accordance with applicable American Water Works Association and American Concrete Institute standards for Seismic Zone 4, as well as all applicable County Building Department requirements. The wall of the tank will be wire-wound, pre-stressed concrete with seismic cables extending into the wall footing. In addition, to avoid over-stressing the top and bottom connection of the tank wall, the wall will be able to slide independently from the tank footing and roof slab on bearing pads and a specially designed interface.

3.1.2 Drainage, Water Features and Water Quality

Existing Environment

The project area has no perennial surface water bodies. No known areas of local (non-stream related) flooding are present. Local ephemeral drainages may overflow after very heavy rains. Flood Insurance Rate Maps (FIRM) have not been prepared for the project site, which is thus located entirely within Zone X, areas not known to be within the 500-year flood plain.

Impacts and Mitigation Measure

Because of the limited scale of construction and the environmental setting, the risks for flooding or impacts to water quality are negligible. No impacts to stream beds or stream waters will occur, as none are present. However, in order to minimize the potential for sedimentation and erosion, the contractor shall perform all earthwork and grading in conformance with Chapter 10, Erosion and Sediment Control, Hawai‘i County Code. Because the project will disturb more than one acre of soil, a National Pollutant Discharge Elimination System (NPDES) permit must be obtained by the contractor before the project commences. This permit requires the completion of a Storm Water Pollution Prevention Plan (SWPPP). In order to properly manage storm water runoff, the SWPPP will describe the emplacement of a number of best management practices (BMPs) for the project. These BMPs may include, but will not be limited to, the following:

- Minimization of soil loss and erosion by revegetation and stabilization of slopes and disturbed areas of soil, possibly using hydromulch, geotextiles, or binding substances, as soon as possible after working;
- Minimization of sediment loss by emplacement of structural controls possibly including silt fences, gravel bags, sediment ponds, check dams, and other barriers in order to retard and prevent the loss of sediment from the site;
- Minimizing disturbance of soil during periods of heavy rain;
- Phasing of the project to disturb the minimum area of soil at a particular time;
- Application of protective covers to soil and material stockpiles;
- Construction and use of a stabilized construction vehicle entrance, with designated vehicle wash area that discharges to a sediment pond;
- Washing of vehicles in the designated wash area before they egress the project site;
- Use of drip pans beneath vehicles not in use in order to trap vehicle fluids;
- Routine maintenance of BMPs by adequately trained personnel; and
- Proper cleanup and disposal at an approved site of material from significant leaks or spills, if they occur.

3.1.3 Flora, Fauna and Ecosystems

Existing Environment

The natural vegetation of this part of Puna was most likely lowland rain forest dominated by ‘ohi‘a (*Metrosideros polymorpha*) and koa (*Acacia koa)* (Gagne and Cuddihy 1990). These original communities, however, have been destroyed or heavily degraded by sugar cane cultivation, cattle grazing, and clearing for small farms and residences, and the vegetation of Kea‘au is now either managed vegetation (i.e., farms, pasture or landscaped grounds) or adventive “communities” of various alien weeds, with only small areas of remnant forest, mainly present in the more recent lava flows east of Kea‘au proper.

The current vegetation of the new reservoir site is a papaya field in which weeds such as Guinea grass (*Panicum maximum*), California grass (*Bracharia mutica*), wild bitter melon vine (*Momoridica charantia*), *Desmodium* spp., sleeping grass (*Mimosa pudica*), *Hyptis pectinata*, *Crassocephalum crepidioides*, and many others are managed by chopping and herbicides (see Figure 3a). The existing reservoir site has minimal landscaping (see Figure 3c). The accessway (see Figure 3b) has functioned as overflow garden space from adjacent lots and has a variety of cultivated or wild plants including ginger, warabi, pineapple, lychee, anthuriums, avocado, mango, banana, and ti, as well as many of the weeds named above.

One project site is an active papaya farm and the other an existing water tank; in general, neither provide habitat for native animals. A large variety of alien birds makes up the avifauna of this area. Cats, dogs, mice, rats and mongooses probably all visit the site occasionally. The

endangered Hawaiian Hawk (*Buteo solitarius*) and Hawaiian hoary bat (*Lasiurus cinereus semotus*) are present in the general area, as they are in most windward lowland areas of the island of Hawai‘i, but would not find the area suitable habitat.

Impacts and Mitigation Measures

Because of the lack of native ecosystems, or threatened or endangered species, no adverse impacts to biological resources would occur as a result of building the new reservoir or demolishing the existing one. A landscape plan (see major discussion in Section 3.1.4) will be implemented to preserve not only the scenic values of the area but also to mitigate any impact to the erosion control functions of the existing vegetation.

3.1.4 Air Quality, Noise, and Scenic Resources

Environmental Setting

Air pollution in East Hawai‘i is minimal, and is mainly derived from volcanic emissions of sulfur dioxide, which convert into particulate sulfate and produce a volcanic haze (vog) that occasionally blankets the district. The persistent tradewinds keep the project area relatively free of vog for most of the year.

Noise on the project site is low and derived mainly from motor vehicles, with occasional noise from residential and road maintenance activities.

The project area is not notably scenic and does not contain any sites considered significant for their scenic character in the Hawai‘i County General Plan.

Impacts and Mitigation Measures

The proposed action would not measurably affect air quality or noise levels except minimally during construction. Operationally, noise levels should improve relative to existing levels because the booster pumps will be placed behind the reservoir and eight-foot-tall berms, serving to shield the noise from existing residences. In order to minimize noise impacts to nearby sensitive receptors, construction should be conducted only during reasonable hours. Development would entail limited excavation, grading, compressors, vehicle and equipment engine operation, and construction of new infrastructure. These activities may generate noise exceeding 95 decibels at times, impacting nearby sensitive noise receptors, including residences. In cases where construction noise is expected to exceed the Department of Health’s (DOH) “maximum permissible” property-line noise levels, contractors would obtain a permit per Title 11, Chapter 46, HAR (Community Noise Control) prior to construction. DOH would review the proposed activity, location, equipment, project purpose, and timetable in order to decide upon conditions and mitigation measures, such as restriction of equipment type, maintenance requirements, restricted hours, and portable noise barriers.

The project will include removal of ornamental and weed trees in an area of about 5,000 square feet in the overgrown accessway of TMK 1-6-02:87. This will not substantially affect scenery, and no important viewplanes or scenic sites recognized in the Hawai‘i County General Plan would be affected. A landscape plan (see Appendix 2 – major discussion in Section 3.1.4) will be implemented for both the new and existing reservoir sites. The plan includes berms and extensive planting of over twenty *Harpullia pendula* and dracaena trees and shrubs to assist in matching the facility with its surroundings. These non-invasive but non-native species are being used for landscaping in this area for two reasons. First, the site is not regularly visited by DWS personnel and thus does not receive the regular maintenance necessary to properly maintain native vegetation. Second, the surrounding land use is active papaya fields, which will receive applications of herbicides that may drift onto plants on the margin of the DWS facility, and native plants would be more susceptible to damage.

3.1.5 Hazardous Substances, Toxic Waste and Hazardous Conditions

Environmental Setting, Impacts and Mitigation Measures

A Phase I Environmental Site Assessment (ESA) was performed for the new reservoir site by Myounghee Noh & Associates (MNA) in December 2007. The report is contained in Appendix 3 and summarized below. A separate report addressing lead and asbestos at the reservoir to be demolished was conducted by Muranaka Environmental Consultants Inc. It is contained in Appendix 4 and also summarized below.

A Phase I Environmental Site Assessment aims to identify *recognized environmental conditions* that exist on the project site as well existing *recognized environmental conditions* in the project area that have the potential to impact the subject property. The term *recognized environmental conditions* means the presence or likely presence of any hazardous substances or petroleum products on the property under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the property or into the ground, groundwater, or surface water of the property (American Society for Testing and Materials [ASTM], 2000). The Phase I Environmental Site Assessment performed for the project conforms to the ASTM standard.

In a Phase I Environmental Site Assessment, evidence of *recognized environmental conditions* may be obtained by execution of the following:

- A records search of federal and State databases of hazardous material use, storage, and releases, including, but not limited to, hazardous material generators, leaking underground storage tanks, and reported hazardous material releases;
- Interviews with landowners, nearby residents, and regulatory agency members concerning the subject property’s history of land use;
- Other records searches, including tax records, aerial photography, and, when available, fire insurance maps; and
- A visual survey of the property and immediately surrounding areas.

Phase I ESA Findings

The project site and adjacent properties were not listed in the federal and State databases covered by Environmental Data Resources. No other sources of offsite potential contamination were found to exist in the project area. The findings of this records search are summarized in Table 1, below.

Table 1: Findings of Records Search, Phase I ESA

Search Type	Distance Searched	Findings
Federal NPL Site List	1 mile	None
Federal RCRA CORRACTS TSD Facilities List	1 mile	None
State Hazardous Waste Sites	1 mile	1
Federal CERCLIS List	1/2 mile	None
Federal RCRA Non-CORRACTS TSD Facilities List	1/2 mile	None
State-Equivalent CERCLIS	1/2 mile	1
State Landfill and/or Solid Waste Disposal Site List	1/2 mile	None
State Registered UST List	1/4 mile	1
State Leaking UST List (LUST)	1/2 mile	2
Federal RCRA Generators List	1/2 mile	1
Federal ERNS List	Subject site	None
State Spill List	Subject site	None

See Appendix 3 for explanation of databases

MNA's findings are as follows:

- *Hazardous Materials and Regulated Wastes*: MNA observed no evidence of hazardous materials or regulated wastes on the subject and adjoining sites. Several spent herbicide containers were observed; however, these are considered farm waste and require proper handling and disposal in accordance with Hawai‘i Department of Agriculture rules (HAR 4-66-55).
- *Storage Tanks*: MNA observed no Underground Storage Tanks (USTs) in use at the subject property at the time of this ESA. No ASTs were visible at the project site. The Department of Water Supply's current drinking water reservoir is located approximately 700 feet southwest of the planned reservoir site.
- *Offsite Contamination Source*: None were detected.
- *Historical Contamination Sources:* Based on the information collected from aerial photographs, historical maps, and interviews, the subject site had previously been

used for sugar cane cultivation by the Puna-Olaa Sugar Company, Ltd. Arsenic is known to be present in former sugar cane fields. Based on a soil screening performed under this project, the surface soil contained arsenic ranging from 91 milligrams per kilogram (mg/Kg) to 170 mg/Kg. The levels exceeded the Hawai‘i Department of Health Soil Environmental Action Level of 20 mg/Kg.

The existing reservoir's control building was found to contain asbestos in four interior transite walls, the transite roof, and gaskets of the pump piping within the control building. Lead-containing paint was found on the green paint of the water tank, the pumps at the control station, and miscellaneous other locations.

Impacts and Mitigation Measures

The only evidence of *recognized environmental conditions* in connection with the new reservoir site property had to do with the historical use of the subject site as sugar cane field, which has impacted the surface soil. A soil screening confirmed that the surface soil, 0 to 12-inch depth, contained arsenic levels exceeding the Hawai‘i DOH Environmental Action Level, 20 mg/Kg.

The elevated levels of arsenic in the soil will require engineering control to prevent runoff, worker exposure, and dust migration to neighboring residents. Project monitoring, including air monitoring in workers' breathing zone and a few locations on Milo Street, may be needed during construction.

No soil remediation appears to be warranted. Worker exposures, dust migration, and potential runoff can all be minimized by engineering controls. While the correlations between the total arsenic and bioaccessible arsenic (a more accurate gauge of potential health effects) are not established for the site, the HDOH recommends that in situations where total arsenic is at or below 250 mg/kg, a bioavailability factor of 10% is appropriate. Applying this factor of 10% to the total arsenic of no more than 170 mg/kg, the maximum bioaccessible concentration of 17 mg/kg is below the concentration requiring remedial action (see Table 2 of HDOH's technical report dated August 7, 2006 entitled, "Soil Action Levels and Categories for Bioaccessible Arsenic" presented in subappendix E of Appendix 3).

Concerning the hazardous materials in the existing reservoir, the following mitigation measures will apply. When lead-containing paint or asbestos-containing materials are disturbed during demolition work, regulations including those of the Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and the State Department of Health (DOH), among others, must be complied with. All lead-containing paint must undergo testing to determine if it may be disposed of in a municipal landfill. Metal debris coated with lead paint may be sent to recyclers as scrap metal without removing the paint. For asbestos, an abatement crew will set up a containment and wearing personal protective equipment will abate the asbestos. The material will be double-bagged and then shipped off-island in appropriate containers for disposal in a landfill permitted to receive this substance.

3.2 Socioeconomic and Cultural

3.2.1 Socioeconomic Characteristics

The project would affect and benefit the district of Puna and more specifically Kea‘au. Table 2 provides information on the socioeconomic characteristics of Kea‘au along with those of Hawai‘i County as a whole for comparison, from the United States 2000 Census of Population.

Table 2: Selected Socioeconomic Characteristics

CHARACTERISTIC	ISLAND OF HAWAI`I	KEA‘AU
Total Population	148,677	2,010
Percent Caucasian	31.5	11.3
Percent Asian	26.7	57.7
Percent Hawaiian	9.7	4.4
Percent Two or More Races	28.4	25.6
Median Age (Years)	38.6	37.3
Percent Under 18 Years	26.1	28.5
Percent Over 65 Years	13.5	16.6
Percent Households with Children	21.3	37.7
Average Household Size	2.75	3.29
Percent Housing Vacant	15.5	7.7

Source: U.S. Bureau of the Census. May 2001. *Profiles of General Demographic Characteristics, 2000 Census of Population and Housing, Hawai‘i.* (U.S. Census Bureau Web Page).

Impacts

The proposed project would benefit public health and welfare in Kea‘au through improvement in water supply, a basic and required public service for a community.

3.2.2 Cultural Setting

Existing Environment

An early reference to events in the Kea‘au area comes from legends recorded by Samuel Kamakau of the time when ‘Umi-a-Liloa united the districts of the island of Hawai‘i in the mid-16th century. Kamakau (1961) reported that Hua‘a, ruler of Puna, was killed in a battle at the place called Kuolo in Kea‘au. Another significant event in the history of Kea‘au involved the

formation of the *mamala-hoa* or law of the splintered paddle, which Kamehameha I instituted following an incident at the Keaʻau shoreline and which provided protection for non-combatants during times of battle. At the time of the Mahele in 1848, the entire ahupuaʻa of Keaʻau was granted to William C. Lunalilo with the exception of one claim to Hewahewa, although other persons have at times been identified with parts of Keaʻau.

Olaʻa was the name given to the town of Keaʻau and surrounding areas during the last part of the 19th century and the first part of the last century. The ahupuaʻa of Keaʻau was known to have a sizable population during the prehistoric and early-historic period, much of it centered near trails running between Hilo, Volcano and Puna. It has long been known as a food-producing region, with Olaʻa particularly known as a source of bird feathers, olona fiber for cordage and kapa cloth. During an 1823 tour of the Keaʻau area, British missionary William Ellis (1979) described plantations of taro, sweet potatoes and sugar cane, although most of the early cultivation remnants were destroyed by plantation agriculture. The Olaʻa Sugar Company was based in Keaʻau from 1899 to 1960 and was associated with the Hilo Railroad Company, which operated from 1899 to 1916 with lines to several locations in Puna. An old railroad berm can still be seen in the Keaʻau area, although not in the vicinity of the project site.

As part of the current study an effort was made to obtain information about any potential traditional cultural properties and associated practices that might be present, or have taken place in this area of the Keaʻau Ahupuaʻa. The Office of Hawaiian Affairs (East Hawaiʻi) and the Hilo Hawaiian Civic Club have been contacted, and no properties or practices have been identified. Furthermore, as discussed in the next section, no significant archaeological remains reflecting cultural history or supporting cultural values appear to be present. Furthermore, no caves, springs, puʻu, native forest groves, gathering resources or other natural features are present on or near the project site. The vegetation is crops, infrastructure landscaping or weeds and does not contain the quality and quantity or resources that would be important for native gathering. The project site does not support any traditional resource uses, nor are there any Hawaiian customary and traditional rights or practices known to be associated with the property. In summary, it would appear that no known valuable natural, cultural or historical resources are present.

Impacts and Mitigation Measures

Although there are no indications so far from literature review or consultation with State Historic Preservation Division, the Office of Hawaiian Affairs, or any other source that there are any traditional cultural properties in the immediate vicinity of the current project area or current use of the area for traditional and customary practices, these agencies are being supplied a copy of the EA in order to help finalize this finding.

As it currently appears that no resources or practices of a potential traditional cultural nature (i.e., landform, vegetation, etc.) appear to be present on or near the project site, and there is no evidence of any traditional gathering uses or other cultural practices, the proposed construction and maintenance would not likely impact any culturally valued resources or cultural practices.

3.2.3 Archaeology and Historic Sites

Existing Environment

There are four individual areas where ground-disturbing activities are planned, as shown in Figure 2. Area 1 is the construction site for the new reservoir, which is an existing papaya field (see also Figure 4a). Area 2 will be the access road for the reservoir. This access connects to Milo Street but has become overgrown with trees and other vegetation (see Figure 4b). Area 3 is the existing reservoir, which was built in approximately 1953 and will be demolished (see Figure 4c). Area 4 is within the paved right-of-way of Milo Street.

None of these areas appear to contain any historic properties. Area 1 has been completely altered first for sugar cane agriculture in the early 20th century, then for clearing of secondary vegetation in 2007 that had grown up since sugar cane cultivation ceased in the 1980s, and then again for papaya planting later in 2007. Area 2 was an accessway until the 1980s, after which time it became overgrown. Area 3 lacks any unique architectural, engineering or historic qualities that would make it eligible for the State or National Historic Register. Area 4 is a modern paved street.

Impacts and Mitigation Measures

Based on this context, the State Historic Preservation Division (SHPD) was requested by letter to concur with the determination that the project will have no effect on historic properties. By letter of November 5, 2007 (see Appendix 1), SHPD provided this concurrence. In the unlikely event that historic resources, including artifacts, human skeletal remains, lava tubes, and lava blisters/bubbles, are encountered during future development activities within the current study area, work in the immediate area of the discovery will be halted and DLNR-SHPD contacted as outlined in Hawai‘i Administrative Rules 13§13-275-12.

3.3 Infrastructure

3.3.1 Utilities

Existing Facilities and Services

Electrical power to the facility is supplied by Hawai‘i Electric Light Company (HELCO), a privately owned utility company regulated by the State Public Utilities Commission, via their island-wide distribution network. Electrical service is available at the project site. The water source is the network operated and maintained by the County of Hawai‘i’s Department of Water Supply. Telephone service is available from Hawaiian Telcom. No wastewater system is available or necessary for the project.

Impacts and Mitigation Measures

The proposed action will require extension of County water mains and HELCO electrical service to the new reservoir site. The proposed action would not have any substantial impact on existing electrical facilities. Appropriate coordination with HELCO and Hawaiian Telcom will be conducted during design and construction. No other utilities will be affected in any way.

3.3.2 Roadways

Existing Facilities

Milo Street, a two-lane street maintained by the County of Hawaiʻi, will provide access to the reservoir for maintenance vehicles through an accessway between house lots (see Figure 2).

Impacts and Mitigation Measures

The proposed action would require construction vehicles to access the site during a period of several months for grading, hauling fill and materials, building the new reservoir, and demolishing the old one. Implementation of the project would have a minor effect on local traffic, possibly requiring only a short-term single-lane closure during grading and paving of vehicular access points and during installation of the new 12-inch water line. Construction plans will include provisions to provide access to all properties during this period. The new driveway will require a permit from the Hawaiʻi County Department of Public Works and must comply with Chapter 22 of the Hawaiʻi County Code.

Operationally, as there is already an existing reservoir on Milo Street, no increase in traffic related to occasional DWS visits is expected.

3.4 Secondary and Cumulative Impacts

The proposed project will not involve any secondary or cumulative impacts, such as population changes or effects on public facilities, because it simply fulfills the mandate of the Department of Water Supply to provide high-quality service to its customers in existing service areas. Although the project would provide some short-term construction jobs, these would almost certainly be filled by local residents and would not induce in-migration.

Cumulative impacts result when implementation of several projects that individually have limited impacts combine to produce more severe impacts or conflicts in mitigation measures. The adverse effects of the project – very minor and temporary disturbance to air quality, noise, visual quality during construction – are very limited in severity, nature and geographic scale. At the current time, according to files at the Planning Department, there do not appear to be any roadway, utility or development projects being undertaken in the Keaʻau area that would combine in such a way as to produce adverse cumulative effects or involve a commitment for larger actions.

3.5 Required Permits and Approvals

The following permits and approvals would be required:

- Hawai‘i County Building Division Approval and Building Permit
- Hawai‘i County Planning Department Approval and Subdivision Permit
- Hawai‘i County Public Works Department Grading Permit and Permit to Construct Within Right of Way
- National Pollutant Discharge Elimination System Permit (NPDES)

3.6 Consistency With Government Plans and Policies

3.6.1 Hawai‘i State Plan

Adopted in 1978 and last revised in 1991 (Hawai‘i Revised Statutes, Chapter 226, as amended), the Plan establishes a set of themes, goals, objectives and policies that are meant to guide the State's long-run growth and development activities. The three themes that express the basic purpose of the *Hawai‘i State Plan* are individual and family self-sufficiency, social and economic mobility and community or social well-being. The proposed project would promote these goals by modernizing and improving water service for the Puna district.

3.6.2 Hawai‘i County General Plan and Zoning

The *General Plan* for the County of Hawai‘i is a policy document expressing the broad goals and policies for the long-range development of the Island of Hawai‘i. The plan was adopted by ordinance in 1989 and revised in 2005 (Hawai‘i County Department of Planning). The *General Plan* itself is organized into thirteen elements, with policies, objectives, standards, and principles for each. There are also discussions of the specific applicability of each element to the nine judicial districts comprising the County of Hawai‘i. Most relevant to the proposed project are the following Goal and Policies, and Courses of Action:

<u>J. Public Facilities (1) Water Policies</u>:

- Water system improvements shall promote the County's desired land use pattern.
- Improve and replace inadequate systems.

<u>Courses of Action: Puna: Public Facilities: Water</u>

- Continue to improve inadequate water system facilities.

<u>Discussion:</u> The proposed project satisfies relevant goals, objectives, and courses of action related to water systems in the Puna District.

The *Hawai‘i County General Plan Land Use Pattern Allocation Guide (LUPAG)*. The LUPAG map component of the *General Plan* is a graphic representation of the Plan's goals, policies, and standards as well as of the physical relationship between land uses. It also establishes the basic urban and non-urban form for areas within the planned public and cultural facilities, public utilities and safety features, and transportation corridors. The project site is classified as Low Density Urban in the LUPAG. The proposed project is consistent with this designation.

Hawai‘i County Zoning. The new reservoir site is zoned A-20a (Agriculture, minimum lot size 20 acres). According to the Hawaii County Planning Department's letter of October 15, 2007 (see Appendix 1), the proposed project is a permitted use within this designation. The roughly 1.3-acre new reservoir site will be subdivided out, as legally permitted for public facilities. The property is not situated within the County's Special Management Area (SMA).

3.6.3 Hawai‘i State Land Use Law

All land in the State of Hawai‘i is classified into one of four land use categories – Urban, Rural, Agricultural, or Conservation – by the State Land Use Commission, pursuant to Chapter 205, HRS. The new reservoir site is in the State Land Use Agricultural District. The proposed use is consistent with intended uses for this Land Use District.

PART 4: DETERMINATION

The Hawai‘i County Department of Water Supply has preliminarily determined that the proposed project will not significantly alter the environment, as impacts will be minimal, and the agency intends to issue a Finding of No Significant Impact (FONSI). This determination will be reviewed based on comments to the Draft EA, and the Final EA will present the final determination.

PART 5: FINDINGS AND REASONS

Chapter 11-200-12, Hawai‘i Administrative Rules, outlines those factors agencies must consider when determining whether an Action has significant effects:

1. *The proposed project will not involve an irrevocable commitment or loss or destruction of any natural or cultural resources.* No valuable natural or cultural resources would be committed or lost. The surrounding area is largely residential, and would directly benefit from the project.
2. *The proposed project will not curtail the range of beneficial uses of the environment.* The proposed project expands and in no way curtails beneficial uses of the environment.
3. *The proposed project will not conflict with the State's long-term environmental policies*. The State's long-term environmental policies are set forth in Chapter 344, HRS. The broad goals of this policy are to conserve natural resources and enhance the quality of

life. The project is minor, environmentally beneficial, and fulfills aspects of these policies calling for an improved social environment. It is thus consistent with all elements of the State's long-term environmental policies.

4. *The proposed project will not substantially affect the economic or social welfare of the community or State.* The project would not have any adverse effect on the economic or social welfare of the County or State, and would improve the water system infrastructure of the Kea‘au area.
5. *The proposed project does not substantially affect public health in any detrimental way.* The facility would promote public health and safety by improving water storage capacity for the Kea‘au area, and would thereby enhance the quality of water service.
6. *The proposed project will not involve substantial secondary impacts, such as population changes or effects on public facilities*. No secondary effects are expected to result from the proposed action, which would simply improve water system facilities for an existing service area and would not induce in-migration or affect public facilities.
7. *The proposed project will not involve a substantial degradation of environmental quality*. The project is minor and environmentally benign, and would thus not contribute to environmental degradation.
8. *The proposed project will not substantially affect any rare, threatened or endangered species of flora or fauna or habitat.* The project site supports overwhelmingly alien vegetation. Impacts to rare, threatened or endangered species of flora or fauna would not occur.
9. *The proposed project is not one which is individually limited but cumulatively may have considerable effect upon the environment or involves a commitment for larger actions.* The project is not related to other activities in the region in such a way as to produce adverse cumulative effects or involve a commitment for larger actions.
10. *The proposed project will not detrimentally affect air or water quality or ambient noise levels.* No adverse effects on these resources would occur. Mitigation of construction-phase impacts would preserve water quality. Ambient noise impacts due to construction will be temporary and restricted to daytime hours.
11. *The project does not affect nor would it likely to be damaged as a result of being located in environmentally sensitive area such as a flood plain, tsunami zone, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal area.* Although the project is located in an area with volcanic and seismic risk, the entire Island of Hawai‘i shares this risk, and the project is not imprudent to construct, and employs design and construction standards appropriate to the seismic zone.
12. *The project will not substantially affect scenic vistas and viewplanes identified in county or state plans or studies.* No scenic vistas and viewplanes would be adversely affected by the project.
13. *The project will not require substantial energy consumption.* The construction and operation of the facility would require minimal consumption of energy. No adverse effects would be expected.

For the reasons above, the proposed action will not have any significant effect in the context of Chapter 343, Hawai‘i Revised Statues and section 11-200-12 of the State Administrative Rules.

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ENVIRONMENTAL ASSESSMENT

REPLACEMENT OF OLA‘A RESERVOIR NO. 2

APPENDIX 1

COMMENTS IN RESPONSE TO EARLY CONSULTATION

Harry Kim
Mayor

Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii
POLICE DEPARTMENT
349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-8869

October 8, 2007

Mr. Ron Terry
Geometrician Associates, LLC
P. O. Box 396
Hilo, Hawaii 96721

Dear Mr. Terry:

Subject: Early Consultation for Environmental Assessment for Ola'a No. 2: 0.50-MG Reservoir Replacement; TMK: (3rd) 1-6-003:027 (por.), Keaau, Puna, Island of Hawaii

Staff, upon reviewing the provided documents and visiting the proposed site, does not anticipate any adverse public safety concerns. Residents in this location will be minimally impacted by construction.

Thank you for the opportunity to comment.

Sincerely,

James M. Day

JAMES M. DAY
ASSISTANT POLICE CHIEF
AREA I OPERATIONS

SG/lli

PHONE (808) 594-1888 FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD07/3248

October 25, 2007

Ron Terry
Geometrician Associates, LLC
PO Box 396
Hilo, Hawai'i 96720-4221

RE: Early Consultation for Environmental Assessment, Ola'a No. 2 Reservoir Replacement, Kea'au, Puna, Hawai'i, TMK 1-6-003:027.

Dear Mr. Terry,

The Office of Hawaiian Affairs (OHA) is in receipt of the request for comments regarding early consultation for an Environmental Assessment (EA) for the Ola'a No. 2 Reservoir Replacement in Kea'au, Puna on Hawai'i. We have the following comments.

OHA would like to suggest that the project area be landscaped with native or indigenous species. Also, any invasive species should be removed. Doing so would not only serve as practical water-saving landscaping practices, but also serve to further the traditional Hawaiian concept of mālama 'āina and create a more Hawaiian sense of place.

On April 26, 2000, the Governor approved House Bill No. 2895 H.D.1 as Act 50 which amended Chapter 343 Hawaii Revised Statutes to require a cultural impact assessment to be included in the preparation of an Environmental Assessment.

According to the Guidelines for Assessing Cultural Impacts established by the Hawai'i State Office of Environmental Quality Control:

> The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both manmade and natural, which support such cultural beliefs.

As such, OHA has included the contact information of our local Community Resource Coordinator to aid you in fulfilling this requirement. However, OHA stresses that we are not the starting and stopping point for a cultural assessment as there are many of our beneficiaries who are not in contact with us.

We request assurance from the applicant that if iwi kūpuna or other cultural deposits are uncovered, work will stop and the applicant will contact the State Historic Preservation Division immediately.

Further, OHA urges the use of best management practices to mitigate any effects that the construction may have on the environment, such as dust or storm water runoff. We are also concerned about the potential effects of abandoning an entire water main in place.

Thank you for the opportunity to comment, and we look forward to continued correspondence. If you have any further questions or concerns please contact Grant Arnold at (808) 594-0263 or granta@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

C: Lukela Ruddle, Community Resources Coordinator
Office of Hawaiian Affairs, Hilo Office
162 A Baker Avenue
Hilo, Hawai'i 96720-4869

LINDA LINGLE
GOVERNOR

BARRY FUKUNAGA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRENNON T. MORIOKA
BRIAN H. SEKIGUCHI

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HAWAII DISTRICT
50 MAKAALA STREET
HILO HAWAII 96720
TELEPHONE (808) 933-8866 • FAX (808) 933-8869

IN REPLY REFER TO:
HWY-H 07-2.0942

October 2, 2007

Mr. Ron Terry
Principal
Geometrician Associates, LLC
HC 2 Box 9575
Kea'au, Hawai'i 96749

Dear Mr. Terry:

SUBJECT: Early Consultation for Environmental Assessment for Ola'a No. 2: 0.50-MG Reservior Replacement
T.M.K. 3rd Div. 1-6-003:027 por.
Project No. S-0130(2)
Old Volcano Road
Keaau, Puna, Island of Hawai'i, Hawai'i

Please be informed that this section of Old Volcano Road is under the jurisdiction of the County of Hawaii. The Department of Transportation, Highways Division remains an interested agency as the roadway connects to our highway system.

Please send copies of the Environmental Assessment to our Department for review and comment.

Our Department will then further distribute the copies to the appropriate divisions and branches at which time we will review and provide comments. After all comments are received and coordinated, a response from the director will be sent to the County Department approving agency.

Please note that at this time we will not be able to provide comments without pre-empting the departmental response.

If you have any questions please call Mr. Clinton Yamada at (808) 933-1951.

Very truly yours,

STANLEY M. TAMURA
Hawai'i District Engineer

Harry Kim
Mayor

Christopher J. Yuen
Director

Brad Kurokawa, ASLA LEED® AP
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-4224
(808) 961-8288 • FAX (808) 961-8742

October 15, 2007

Mr. Ron Terry
Geometrician Associates, LLC
P O Box 396
Hilo, Hawaii 96721

Dear Mr. Terry:

Subject: Pre-consultation for Draft Environmental Assessment (EA)
Project: Ola'a No. 2 0.50 MG Reservoir Replacement
Tax Map Key: portion of 1-6-3:27

This is in response to your letter dated September 25, 2007, in which you requested our comments on any special environmental conditions or impacts related to the proposed development.

We understand the County Department of Water Supply is proposing to remove an existing steel reservoir located on Milo Street at TMK 1-6-002:098 and construct a new, larger reinforced concrete reservoir on a portion of TMK 1-6-003:027. The site of the proposed reservoir is zoned Agricultural (A-20a) by the County of Hawaii and is in the State Land Use (SLU) Agricultural district. The site is not in the Special Management Area.

According to Hawaii Revised Statutes, Section 205-4.5(a)(7), permitted uses within the agricultural districts includes "*Public, private, and quasi-public utility lines and roadways, transformer stations, communications equipment buildings, solid waste transfer stations, major water storage tanks, and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, or treatment plants, or corporation yards, or other like structures.*" Therefore, the proposed reservoir is considered to be a permitted use on the subject parcel.

However, the Hawaii County Code, Chapter 25, Section 25-4-11(b) states that *"Any substation used by a public utility for the purpose of furnishing telephone, gas, electricity, water, radio, or television shall be a permitted use in any district provided that the use is not hazardous or dangerous to the surrounding area and the director has issued plan approval for such use."* Therefore, Plan Approval is required from the Planning Director prior to obtaining a building permit for the proposed improvements.

Please provide this office with a copy of the draft EA upon its publication. Should you have questions, please contact Maija Cottle of my staff at 961-8288 extension 253.

Sincerely,

CHRISTOPHER J. YUEN
Planning Director

MJC:cd
P:\wpwin60\Maija\EA-EIS\Pre-Consult Comments\Geometrician Olaa Reservoir Replace 1-6-3-27 Pre-cmnts doc

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

November 5, 2007
Mr. Ron Terry
Geometrician Associates, LLC
P.O. Box 396
Hilo, Hawaii 96721

LOG NO: 2007.3631
DOC NO: 0710MD10
Archaeology

Dear Mr. Terry:

SUBJECT: Chapter 6E-42 Historic Preservation Review –
Request for "no effect" determination in consultation for Environmental Assessment for Ola'a No. 2: 0.50-MG Reservoir Replacement
Kea'au Ahupua'a, Puna District, Island of Hawai'i
TMK: (3) 1-6-003:027

Thank you for the opportunity to comment on the aforementioned project, which we received on October 22, 2007. This project, by the County of Hawaii Department of Water Supply, will replace an existing and outdated water reservoir in Puna. Thank you for including site and location maps, photographs, vegetation information and information on past activities in the area (copy enclosed).

We determine that **no historic properties will be affected** by this undertaking because:

- ☒ Intensive cultivation has altered the land
- ☒ Residential development/urbanization has altered the land
- ☒ Previous grubbing/grading has altered the land
- ☐ An accepted archaeological inventory survey (AIS) found no historic properties'
- ☐ SHPD previously reviewed this project and mitigation has been completed
- ☐ Other:

In the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during the construction activities, all work needs to cease in the immediate vicinity of the find, the find needs to be protected from additional disturbance, and the State Historic Preservation Division, Hawai'i Section, needs to be contacted immediately at (808) 987-5001.

For our records, we would like to accept your offer of a copy of the EA once it is completed. If you would please include a copy of this letter with your submission, that will facilitate our recordkeeping.

Please contact Morgan Davis at (808) 987-5001 if you have any questions or concerns regarding this letter.

Aloha,

Melanie Chinen, Administrator
State Historic Preservation Division

MD:oap

Attachments

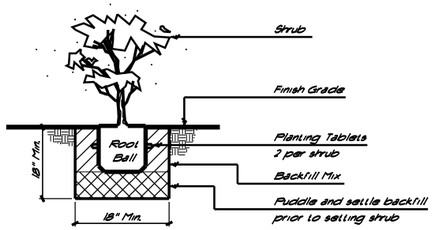
Cc (w/encl.): County of Hawaii, Department of Water Supply

ENVIRONMENTAL ASSESSMENT

REPLACEMENT OF OLA‘A RESERVOIR NO. 2

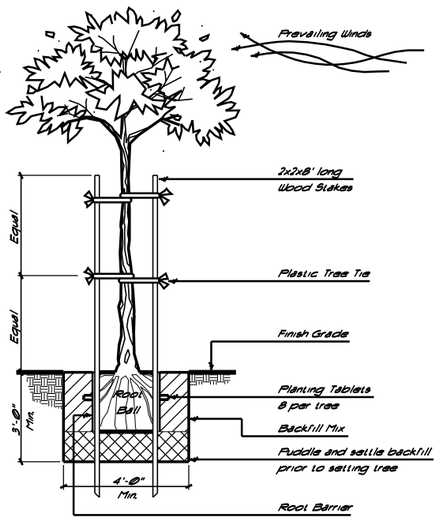
APPENDIX 2

LANDSCAPE PLAN



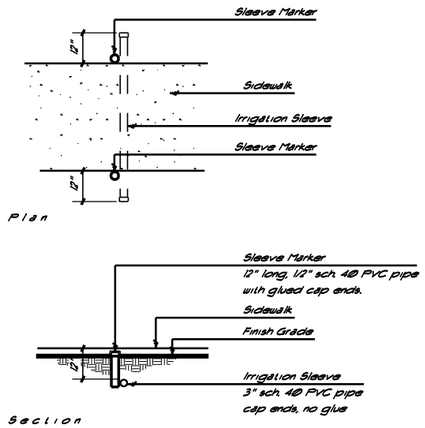
A / L1 **Shrub Detail**

Not to scale



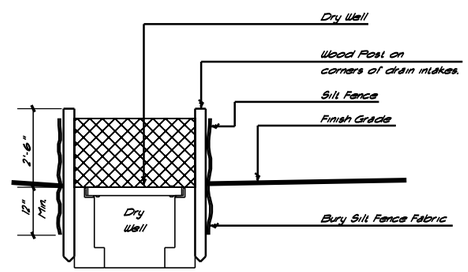
B / L1 **Tree Detail**

Not to scale



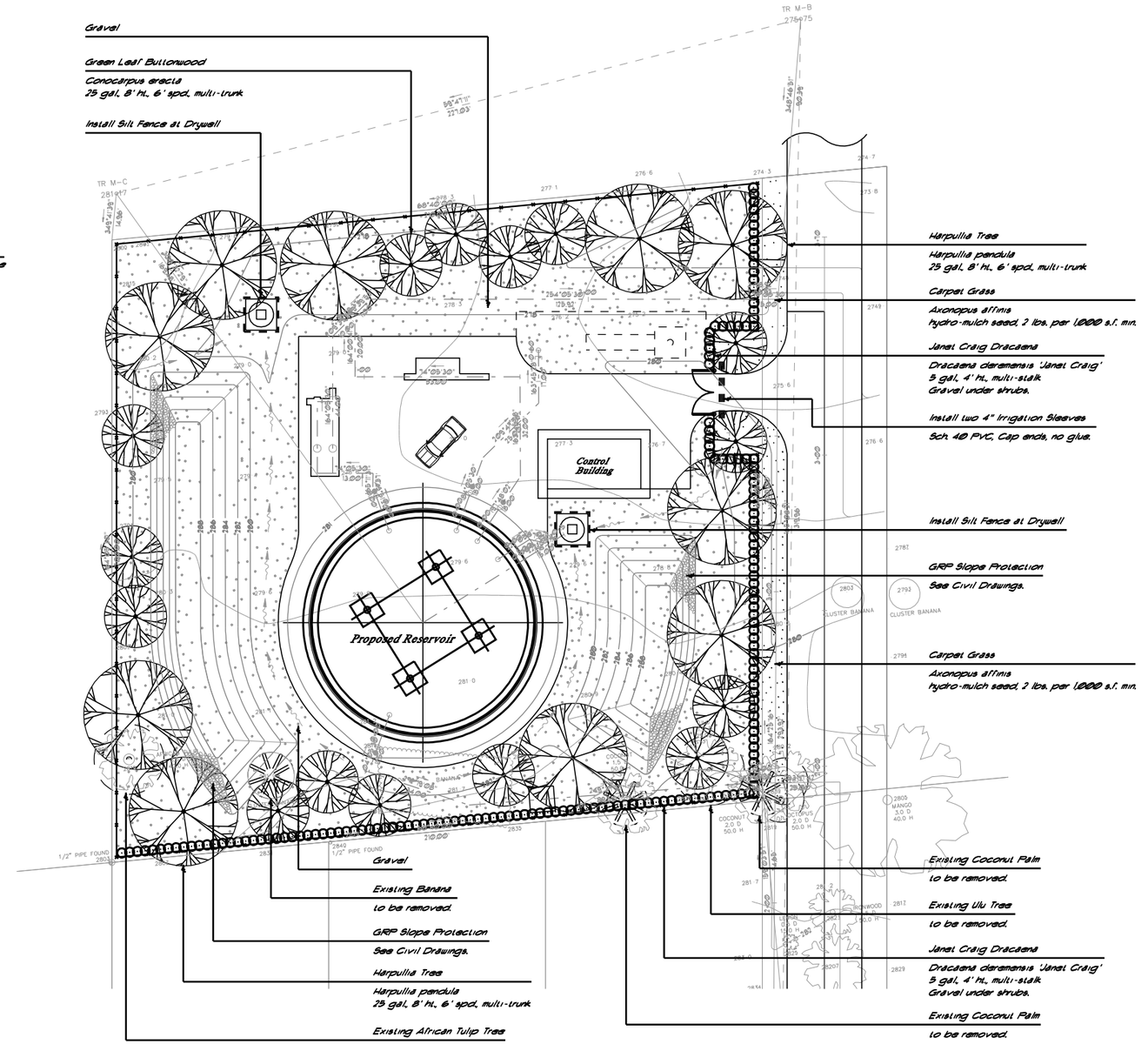
C / L1 **Irrigation Sleeve Detail**

Not to scale



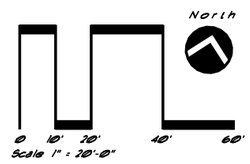
D / L1 **Silt Fence Detail**

Not to scale



Landscape Notes

1 - Verify and be aware of all utilities during all phases of work. See civil, electrical, and mechanical drawings.
2 - Coordinate all work with the General Contractor.
3 - Topsoil shall be 30% black cinder, 40% soil, and 30% well aged compost like macnut husk. Soil shall test at 6.5-6.8 ph.
4 - Install 12" min. of topsoil over all planting areas. Landscape Contractor shall be responsible for grading of subgrade to allow for 12" of topsoil.
5 - Verify all plant materials with the Landscape Architect prior to purchasing.
6 - Landscape Contractor shall provide for a 120 day maintenance period.
7 - Verify that actual top of rootball is where top of roots are attached to trunk, scrape back soil on every tree or shrub to verify before planting.
8 - All trees shall be planted with top of root balls 1"-2" above finish grade of surrounding area.
9 - Install 'Bio Barrier' root barriers on all trees with conflicts with utility lines. Follow manufacturer installation instructions.
10 - Provide temporary irrigation hook-up and a temporary irrigation system to establish all landscape planting including lawn areas. Coordinate with General Contractor to have a temporary irrigation hook-up. Provide a approved backflow prevention device for the temporary irrigation system. Temporary irrigation to be removed at the completion of the formal maintenance period.
11 - Silt fence shall be 'Mirafi' silt fence, or equal. Install silt fences at all drywells and drain inlets. Silt fences to be installed prior to the placement of topsoil. Follow manufacturer installation instructions.
12 - Install 'Spray Mall' hydro-mulch, or equal, on all lawn areas. Install following manufacturer's instructions.



SHEET
L1

DAVID Y. TAMURA
REGISTERED PROFESSIONAL LANDSCAPE ARCHITECT
No. 4436
HAWAII, U.S.A.

This work was prepared by me or under my supervision.

DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII

PROJECT: 'OLA'A NO. 2 : 0.50MG RESERVOIR REPLACEMENT

SHEET NO.

OF SHEETS

JOB NO. 2007-909

PHASE I
ENVIRONMENTAL SITE ASSESSMENT REPORT
FOR
PROPOSED WATER RESERVOIR LOCATION
MILO STREET, KEAAU, HAWAII 96749

TMK (3) 1-6-003:027

20.137 ACRES

DECEMBER 2007

Environmental Studies and Consulting Services

99-1046 Iwaena St. #210A, Aiea, Hawaii, USA 96701 • 808.484.9214

This Phase I ESA report is prepared for:

Geometrician
P.O. Box 396
Hilo, Hawaii 96720

PHASE I
ENVIRONMENTAL SITE ASSESSMENT
PROPOSED WATER RESERVOIR LOCATION
MILO STREET, KEAAU, HAWAII 96749
TMK (3) 1-6-003:027

Area: 20.137 Acres

MNA Job No. 30655

December 8, 2007

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TABLE OF CONTENTS

TABLE OF CONTENTS ii

LIST OF ABBREVIATIONS v

1.0 EXECUTIVE SUMMARY 1

1.1 FINDINGS SUMMARY 1
1.2 RECOGNIZED ENVIRONMENTAL CONDITIONS 2

2.0 INTRODUCTION 3

2.1 PURPOSE 3
2.2 DETAILED SCOPE OF SERVICES 3
2.2.1 Site History 3
2.2.2 Regulatory Records 5
2.2.3 Site Reconnaissance 5
2.2.4 Site Geology and Hydrogeology 5
2.2.5 Data Evaluation and Reporting 5
2.3 SIGNIFICANT ASSUMPTIONS 6
2.4 LIMITATIONS AND EXCEPTIONS 6
2.5 SPECIAL TERMS AND CONDITIONS 6
2.6 USER RELIANCE 6

3.0 SITE DESCRIPTION 7

3.1 LOCATION AND LEGAL DESCRIPTION 7
3.2 SITE AND VICINITY GENERAL CHARACTERISTICS 7
3.2.1 Geology 9
3.2.2 Hydrogeology 9
3.3 CURRENT USE OF THE SITE 10
3.4 STRUCTURES, ROADS, AND OTHER IMPROVEMENTS 10
3.5 PAST USES OF THE SITE 10
3.6 CURRENT AND PAST USES OF ADJOINING PROPERTIES 11

4.0 OWNER PROVIDED INFORMATION 11

4.1 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS 11
4.2 SPECIALIZED KNOWLEDGE 11
4.3 VALUATION REDUCTION 11
4.4 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION 11
4.5 REASON FOR PERFORMING A PHASE I 11

5.0 RECORDS REVIEW 12

5.1 STANDARD ENVIRONMENTAL RECORD SOURCES 12
5.1.1 General Overview 12
5.1.2 Federal National Priorities List 12
5.1.3 Federal RCRA CORRACTS TSD Facilities List 12
5.1.4 State Hazardous Waste Sites (State-equivalent NPL) 13
5.1.5 Federal CERCLIS List 13
5.1.6 Federal RCRA non-CORRACTS TSD facilities list 13
5.1.7 State Landfill / Solid Waste Disposal Sites 13
5.1.8 State Registered UST List 13

5.1.9 State Leaking UST (LUST) List *13*
5.1.10 Federal RCRA Generators List *14*
5.1.11 Federal ERNS List *14*
5.1.12 State Spill List *14*
5.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES 14
5.3 HISTORICAL USE INFORMATION ON THE SUBJECT SITE 14
5.3.1 Aerial Photographs *14*
5.3.2 Historical Topographic Maps *15*
5.3.3 Sanborn Fire Insurance Maps *15*

6.0 SITE RECONNAISSANCE 16

6.1 METHODOLOGY AND LIMITING CONDITIONS 16
6.2 GENERAL SITE SETTING 16
6.3 HAZARDOUS MATERIALS AND REGULATED WASTES 16
6.4 UNDERGROUND STORAGE TANKS (USTs) 16
6.5 ABOVEGROUND STORAGE TANKS 16
6.6 SOLID WASTE DISPOSAL 16
6.7 PHYSICAL SETTING ANALYSIS AGAINST POTENTIAL MIGRATION 17

7.0 INTERVIEWS 17

7.1 FARMERS 17
7.2 OWNER 17
7.3 FORMER KEAAU RESIDENT 17
7.4 DEPARTMENT OF WATER SUPPLY 18

8.0 ADDITIONAL SERVICE – SURFACE SOIL TESTING 18

8.1 SAMPLING PROCEDURE 18
8.2 SITE DESCRIPTION 20
8.3 LABORATORY ANALYTICAL RESULTS 20
8.3.1 TPH as Gasoline and Diesel by SW8015M *20*
8.3.2 RCRA 8 Metals by SW7010 and SW7470A *20*
8.3.3 Chlorinated Pesticides by SW8081A *20*

9.0 SUMMARY OF FINDINGS 23

10.0 OPINION 24

11.0 CONCLUSION 25

REFERENCES 26

TABLES

Table 1. Aquifer Classification System 10
Table 2. Users and Primary Uses of the Subject Sites 11
Table 3. State Leaking UST (LUST) Sites 14
Table 4. Summary of Soil Screening Samples 20
Table 5. Summary of Soil TPH and Metals Results 21
Table 6. Summary of Soil Pesticides Results 22

FIGURES

Figure 1. Site Location 4
Figure 2. Site Map 8
Figure 3. Sample Location Map 19

APPENDICES

Appendix A Regulatory Record Sources
Appendix B Users and Primary Uses of Adjoining Properties
Appendix C Photographs
Appendix D EDR Site Assessment Report
Appendix E State of Hawaii Technical Report, August 7, 2006
Appendix F Qualifications of Environmental Professionals

LIST OF ABBREVIATIONS

AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation & Liability Information System
CFR	Code of Federal Regulations
CORRACTS	RCRA Facilities that are undergoing "corrective action"
EDR	Environmental Data Resources, Inc.
EPA	Environmental Protection Agency
ERNS	Emergency Response Notification System
ESA	Environmental Site Assessment
HDOH	Hawaii Department of Health
HEER	Hazard Evaluation and Emergency Response
LUST	Leaking Underground Storage Tank
mgd	million gallons per day
mg/Kg	milligrams per kilogram
mg/L	milligrams per liter
MNA	Myounghee Noh & Associates, L.L.C.
NPL	National Priorities List
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Condition
TMK	Tax Map Key
TSD	Treatment Storage and Disposal
UIC	Underground Injection Control
USGS	United States Geological Survey
UST	Underground Storage Tank

1.0 EXECUTIVE SUMMARY

Myounghee Noh & Associates, L.L.C. (MNA), was retained to conduct a Phase I Environmental Site Assessment (ESA), for the proposed water reservoir site located at TMK (3)1-6-003:027, north of Milo Street, Keaau, Hawaii, 96749, in October – December 2007. This work was completed for Geometrician, P.O. Box 396, Hilo, Hawaii 96720. The subject site is owned by W. H. Shipman, Ltd., and was in agricultural use at the time of this ESA.

1.1 FINDINGS SUMMARY

Based on the information obtained during the site assessment performed in October-December 2007, MNA provides the following summary:

- **Database Search for Subject and Adjoining Sites**: The subject and adjoining properties were not listed in any of the federal or state databases searched by Environmental Data Resources, Inc. (EDR) (Appendix D). The findings are summarized in the table below.

Search Type	Distance Searched	Findings
Federal NPL Site List	1 mile	None
Federal RCRA CORRACTS TSD Facilities List	1 mile	None
State Hazardous Waste Sites	1 mile	1
Federal CERCLIS List	1/2 mile	None
Federal RCRA Non-CORRACTS TSD Facilities List	1/2 mile	None
State-Equivalent CERCLIS	1/2 mile	1
State Landfill and/or Solid Waste Disposal Site List	1/2 mile	None
State Registered UST List	1/4 mile	1
State Leaking UST List (LUST)	1/2 mile	2
Federal RCRA Generators List	1/2 mile	1
Federal ERNS List	Subject site	None
State Spill List	Subject site	None

- **Site Check:** During a site check conducted on October 22 and November 16, 2007, MNA observed the subject site and surrounding areas. The subject site was in use as a papaya farm (Photographs 1-2, 7). Two shacks were present on the subject parcel which appeared to be used (Photographs 5-6). An unnamed paved road, within the subject parcel, was used as access road by the farmers. At the east end of Milo Street, the current water reservoir is present which is planned to be demolished once the new reservoir is completed (Photograph 16).

  Adjoining to the subject site to the south was residential housing on Milo Street, Old Volcano Road and the Buddhist Mission to the west, more papaya fields and Haa Street to the north, and Keaau Pahoa Bypass Road to the east (Photographs 3-11).

- **Hazardous Materials and Regulated Wastes:** MNA observed no signs of hazardous materials or regulated wastes at the time of this ESA. Several spent herbicide containers

were observed; however, these are considered farm waste and require proper handling and disposal in accordance with Hawaii Department of Agriculture rules (HAR 4-66-55).

- **Storage Tanks:** MNA observed no USTs or ASTs in use at the subject property at the time of this ESA. The Department of Water Supply's current drinking water reservoir is located approximately 700 feet southwest of the planned reservoir site.

- **Historical Contamination Sources:** Based on the information collected from aerial photographs, historical maps, and interviews, the subject site had previously been used for sugarcane cultivation by the Puna-Olaa Sugar Company, Ltd. Arsenic is known to be present in former sugarcane fields.

- **Additional Service:** Based on a soil screening performed under this project, the surface soil contained arsenic ranging from 91 milligrams per kilogram (mg/Kg) to 170 mg/Kg. The levels exceeded the Hawaii Department of Health Soil Environmental Action Level of 20 mg/Kg.

- **Potential Offsite Contamination Source:** MNA found no evidence for potential offsite contamination sources that may migrate to the subject site.

1.2 RECOGNIZED ENVIRONMENTAL CONDITIONS

This assessment has revealed the following as evidence of *recognized environmental conditions* in connection with the property.

- The historical use of the subject site as a sugarcane field has impacted the surface soil. A soil screening performed under this project confirmed that the surface soil, 0 to 12 inch depth, contained arsenic levels exceeding the Hawaii DOH Environmental Action Level, 20 mg/Kg.

2.0 INTRODUCTION

This report presents the results of a Phase I ESA of the proposed water reservoir site, north of Milo Street, Keaau, Island of Hawaii (Figure 1). This ESA was conducted by Myounghee Noh & Associates, L.L.C., herein referred to as MNA, for Geometrician, P.O. Box 396, Hilo, Hawaii 96720. The subject site was owned by W.H. Shipman, Ltd., and was in agricultural use at the time of this ESA.

2.1 PURPOSE

The purpose of this Phase I ESA is to identify any *recognized environmental conditions* (REC) at the subject site, with respect to the range of contaminants within the scope of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and petroleum products. This practice is intended to permit a user to satisfy one of the requirements to qualify for the *innocent landowner defense* to CERCLA liability, "all appropriate inquiry into the previous ownership and uses of the site consistent with good commercial or customary practice." The term *recognized environmental conditions* denotes the presence, or likely presence, of any hazardous substances or petroleum products on the site under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the site or into the ground, ground water, or surface water of the site [American Society for Testing and Materials (ASTM), 2000].

The assessment was performed in accordance with the prescribed practice in *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process* (ASTM E 1527, 2005).

2.2 DETAILED SCOPE OF SERVICES

This Phase I ESA has five components: Records Review; Site Reconnaissance; Interview; Additional Service; Reporting. MNA conducted the ESA using information sources with the potential to identify past or current releases of hazardous materials at the site. MNA performed the following:

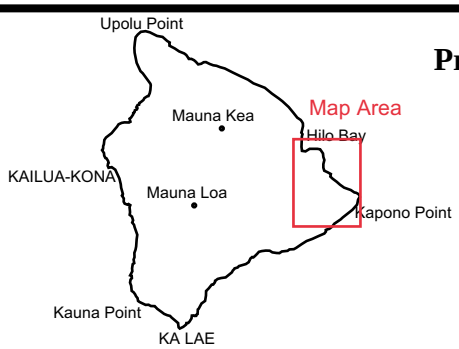
2.2.1 Site History

MNA examined documents consisting of topographic maps, tax records, and aerial photographs. The purpose of this basic research was to identify previous and current uses of the site, adjoining properties, and the surrounding area.

0 5 10 15 miles

Source: USGS Topographic Map, 1975

Figure 1. Site Location



Phase I ESA
Proposed Water Reservoir Location
Milo Street
TMK (3) 1-6-003:027
Keaau, Island of Hawaii

December 2007
Job No. 30655

Myounghee Noh & Associates, L.L.C.

2.2.2 Regulatory Records

MNA examined government records with respect to environmental conditions, citations, complaints, and permits at the subject site, at adjoining properties, and the surrounding area. MNA reviewed records from the following federal or state programs:

- National Priorities List (NPL)
- Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action" (CORRACTS)
- RCRA-Treatment, Storage, & Disposal (TSD)
- Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS) List
- Solid Waste & Landfill
- Leaking Underground Storage Tank (LUST)
- Water Wells
- RCRA-Violators/Enforcement
- Underground Storage Tank (UST) list
- Toxic Release Inventory System (TRIS)
- Emergency Response Notification System (ERNS)
- RCRA-Large Generator
- RCRA-Small Generator
- Spills

2.2.3 Site Reconnaissance

MNA performed a site reconnaissance to obtain information indicating the likelihood of contamination, to interview available site personnel, if any, and conduct a brief assessment of the adjoining properties. During the site reconnaissance, MNA looked for stained surface soil, dead or stressed vegetation, hazardous materials, aboveground and underground storage tanks, disposal areas, groundwater wells, sumps, and storm drains.

2.2.4 Site Geology and Hydrogeology

MNA reviewed published information on surface and subsurface conditions at the site and surrounding area. MNA used this information to assess topography, drainage, surface water bodies, subsurface geology, and groundwater occurrence in the area to assess the impact of migration of any potentially hazardous materials in connection with the site.

2.2.5 Data Evaluation and Reporting

MNA evaluated the information collected and prepared this report documenting the assessment. Section 2 presents the introduction, Section 3 contains the site description, Section 4 contains information obtained from the user, Section 5 records review, Section 6 site reconnaissance, Section 7 personal interviews, Section 8 additional service, Section 9 summary of findings, Section 10 opinion, and Section 11 conclusion.

2.3 SIGNIFICANT ASSUMPTIONS

The conclusion presented in this report is based upon the assumption that reasonably ascertainable and relevant information pertaining to the environmental condition of the subject site was made available to MNA during the assessment. Information obtained from government agencies and other resources is presumed to be accurate and updated.

2.4 LIMITATIONS AND EXCEPTIONS

The Phase I ESA provides a "snap shot" of the site conditions and is, by its nature, limited. Summary and conclusion apply to site conditions existing at the time of our investigation and those reasonably foreseeable. They cannot apply to site changes of which MNA is not aware of and has not had the opportunity to evaluate.

This report is based upon visual observations of the site and vicinity, and interpretation of the available historical and regulatory information and documents reviewed as well as additional service reported in Section 8.0 on testing of top soil, 0-12 inch depth. MNA cannot ensure the accuracy of the historical or regulatory information. This report is intended exclusively for the purpose outlined, and applies only to the subject site.

This ESA does not include investigations regarding asbestos, lead paint, or geotechnical concerns.

2.5 SPECIAL TERMS AND CONDITIONS

This Phase I ESA was conducted and prepared by MNA for the exclusive use of Geometrician and the County of Hawaii Department of Water Supply. This report shall not be relied upon or transferred to any other party without written authorization from Geometrician and the County of Hawaii Department of Water Supply.

2.6 USER RELIANCE

This report is an instrument of service of MNA, which summarizes its findings and opinions with respect to the subject site history and *recognized environmental conditions* at the subject site. Note that said findings and opinions are predicated on information that MNA obtained on the dates and from individuals stated herein, from public records review, a site reconnaissance, and ancillary Phase I ESA assignments. This assessment relies upon the accuracy and completeness of the information provided. The information obtained for this assessment is used without extraordinary verification. It is possible that other information exists and is discovered, or environmental conditions change subsequent to submittal of this Phase I ESA report to Geometrician, to which MNA shall not be held responsible for exclusion there from.

3.0 SITE DESCRIPTION

3.1 LOCATION AND LEGAL DESCRIPTION

The proposed water reservoir site is located within a parcel between Milo Street and the unnamed access road, north of and parallel to Milo Street, Keaau, Island of Hawaii (Figure 2). Tax Map Key of the site is Division 3, Zone 1, Section 6, Plat 003, and Parcel 027. The site's Zoning is Agriculture, Flood Zone X, outside the 500-year flood plain. According to the County of Hawaii record, the parcel consists of 877,167.72 square feet.

3.2 SITE AND VICINITY GENERAL CHARACTERISTICS

The town of Keaau is located in the eastern windward side of Hawaii and approximately six miles south of Hilo. Keaau has an area of 2.47 square miles with an elevation of 359 feet. The 2000 demographic data that states Keaau houses 2,010 people (Hawaii State Info, 2007).

Keaau was also known as "Ola'a" and has a historic background with the sugar industry. In the 1800s, B.F. Dillingham, an agricultural tycoon, commissioned the construction of the Hawaii Consolidated Railroad. This affected the economy of Keaau and many other small towns on the Big Island including Hilo, Mountain View, and Pahoa. The railroad supported the lucrative exportation of sugar (Hawaii State Info, 2007).

The sugar industry started in Keaau around 1897, and with the collective resources from W.H. Shipman, Samuel M. Damon, B.F. Dillingham, Alfred W. Carter, and Lorrin A. Thurston Olaa Sugar was incorporated on May 3, 1899. Later to be known as Puna Sugar in 1960. The central office and mill were located in Keaau. With 16,000 acres in fee simple land, nearly 7,000 acres in long leasehold land, an additional 11,000 acres from Puna Sugar holdings, and 5,000,000 dollars, Olaa Sugar was off to a promising start (Plantation Archives, 2004).

In 1919 Puna Sugar Company established the first paper mill on the Big Island. The paper mill was constructed next to the sugar factory in Keaau where the paper was transformed into paper mulch that was covered with a layer of asphalt and used for weed control. This asphalt-saturated paper save the company 50% of their labor cost in hoeing and became a prototype in Hawaii's pineapple industry. The paper mill has since been dismantled but the concept of using paper for weed control is still used today (Plantation Archives, 2004).

In 1969 American Factors (AMFAC) bought out the minority shareholders, and Puna Sugar became a wholly-owned AMFAC subsidiary. AMFAC later expanded the operation by installing a $4.5 million power plant which used refuse and other waste to generate 15,000 kilowatts of electricity. When AMFAC decided to close down Puna Sugar on January 7, 1982, the company sold the power generating plant to Hawaiian Electric Light Company in 1988 (Plantation Archives, 2004).

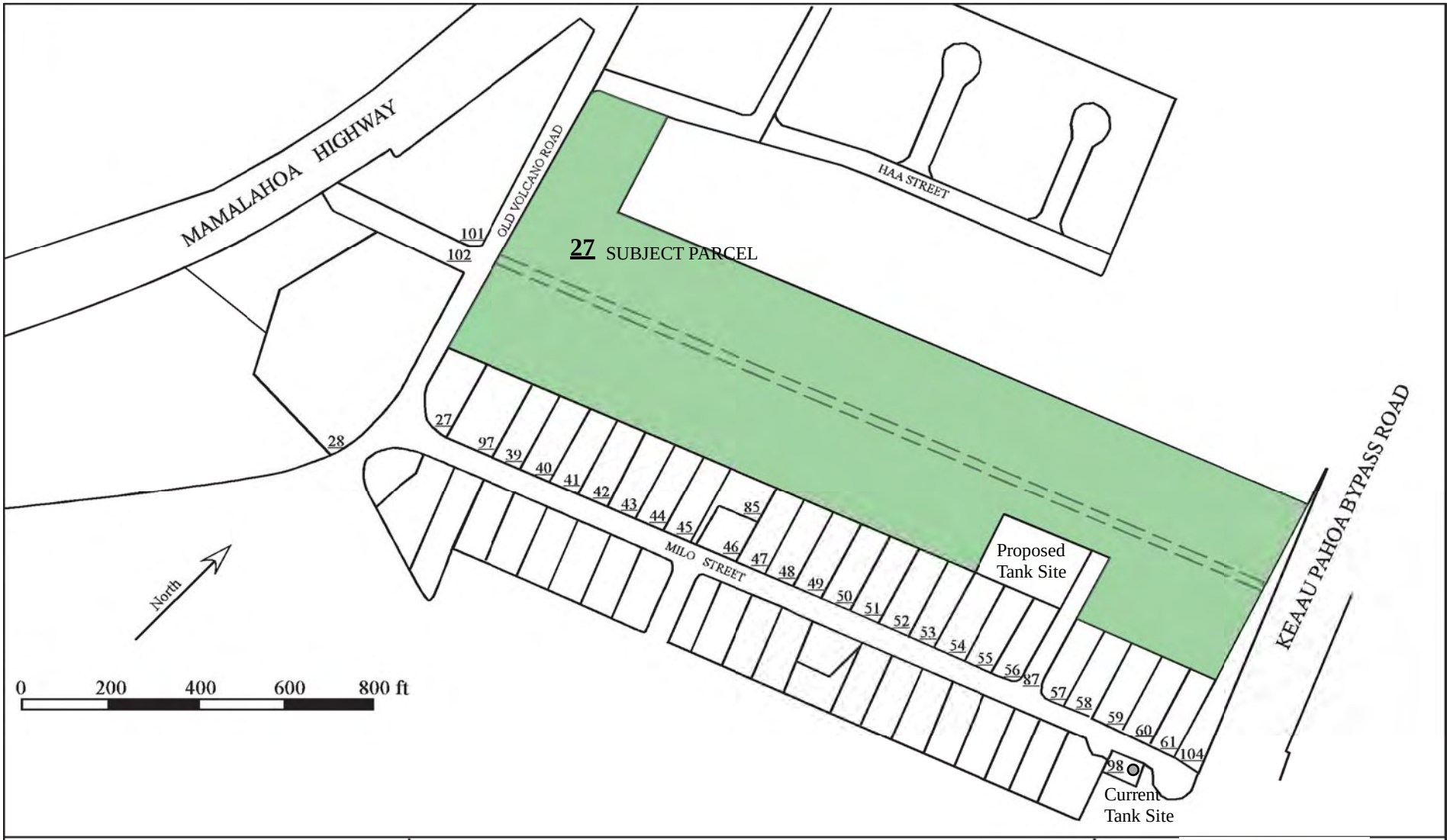


Figure 2. Site Map

Phase I ESA
Proposed Water Reservoir Location, Milo Street
TMK (3) 1-6-003:027
Keaau, Island of Hawaii
December 2007
Job No. 30655
Page 8

Myounghee Noh & Associates, L.L.C.

Since the end of the sugar plantation days, W.H. Shipman, Ltd., and the land holdings of Puna Sugar have been sold off for a growing population and has allocated some of its lands for grazing, some small lease farming, as well as commercial use. W.H. Shipman, Ltd., still owns the subject site, TMK 1-6-003-027, as well as 18,000 acres predominantly in the Puna District (English, 2000). Currently the subject site is still being used for agricultural purposes, mainly papaya farms.

3.2.1 Geology

Published geologic and hydrogeologic reports and maps were reviewed to obtain information regarding subsurface conditions in the general area of the property. The Island of Hawaii is of volcanic origin and was built by the Kohala, Mauna Kea, Mauna Loa, Kilauea, and Hualalai volcanoes and is comprised of numerous thin, extremely permeable tholeiitic basalt lava flows (Stearns, 1985).

Hawaii, the youngest and largest Hawaiian Island, is as large as all the others combined. In 1996, Hazlett and Hyndman described the island as follows:

> It sprawls over an area the size of Connecticut, spanning 90 miles from north to south and 80 miles from east to west. Five large volcanoes coalesce to make the visible part of the Big Island; a sixth lies buried beneath the surface. The southern part of the island is still volcanically active and building out along much of the coastline. To the north, volcanism is in the waning stages. Of all the Hawaiian Islands, the Big Island shows the greatest diversity of rocks and landscapes.

Virtually the entire region is covered with prehistoric lavas of Kau Basalt, onto which long tongues of historic lavas from the northeast rift have flowed. The U.S. Soil Conservation Service mapped the basic soil type of the area as Olaa silty clay loam. It is a well-drained soil with intermediate water holding capacity (EDR, 2007). The depth to groundwater is approximately 280 feet (Department of Water Supply, 2007).

3.2.2 Hydrogeology

The permanent source of potable groundwater is a basal aquifer. This aquifer is floating on and displacing salt water, which saturates the base of the island. The basal aquifer is recharged by precipitation. The precipitation percolates through soil and rock until it is either confined by an impermeable layer or floating on basal salt water (Stearns, 1985). The groundwater in the region is known to be either basal water floating on salt water or water perched on ash, soil, or alluvium and underlain with basal water (Stearns, 1985). In 1993, Water Resources Research Center described the water as follows:

> A voluminous basal lens extends at least 4 miles inland of the coast, beyond which high-level water has been encountered. The lens may reach farther inland, but it has hardly been explored. Toward the rift zone dike-impounded high-level water probably occurs. Elsewhere the high-level water is likely to be perched. The flux of groundwater in the basal lens is enormous; the fresh water springs at Hilo-Waiakea have been measured at 150 million gallons per day (mgd). The

gradient is about 5 ft/mile, and the permeability of the basalt is probably at least 5,000 ft/day.

The Hawaii Department of Health (HDOH) has established an Underground Injection Control (UIC) line to serve as a boundary between drinking and non-drinking water portions of underlying aquifers. Areas above (mauka side of) the UIC line are within drinking-water portions of the aquifer, while areas below (makai side of) the UIC are within non-drinking water portions of the underlying aquifer. Since the subject site is located on the makai side of the UIC line, it lies within a non-drinking water portion of the local aquifer, and only limited types of injection wells are allowed in the area. Furthermore, injection wells in the area require a UIC Permit or Permit Exemption from the HDOH. According to the Mink & Lau Technical Report #191, published by the University of Hawaii Water Resources Research Center, the subject site is located above one aquifer as indicated in Table 1 (Mink & Lau, 1990).

Table 1. Aquifer Classification System

Aquifer Code	**80801111**
Island Code	8 – Island of Hawaii
Aquifer Sector	08 – Kilauea
Aquifer System	01 – Pahoa
Aquifer Type, hydrogeology	1 – Basal
Aquifer Condition	1 – Unconfined
Aquifer Type, geology	1 – Flank
Status Code	**11111**
Development Stage	1 – Currently used
Utility	1 – Ecologically important
Salinity (in mg/L Cl^-)	1 – Fresh (<250)
Uniqueness	1 – Irreplaceable
Vulnerability to Contamination	1 – High

3.3 CURRENT USE OF THE SITE

Currently, the subject site is owned by W.H. Shipman, Ltd., and is being used as leased farmland primarily for papaya.

3.4 STRUCTURES, ROADS, AND OTHER IMPROVEMENTS

No roads, buildings, and structures are present on the subject site. Hawaii Electric Light Company service is available for the homes on Milo Street, as well as the County of Hawaii water and sewer services and Hawaiian Telcom telephone service.

3.5 PAST USES OF THE SITE

Information regarding past uses of the subject site was obtained from interviews, review of tax records, and aerial photographs. The current owner, W.H. Shipman, Ltd., has owned the site since 1882. Table 2 lists the users and property uses of the subject site.

Table 2. Users and Primary Uses of the Subject Sites

Period (approx.)	Property User	Acres	Primary Use
TMK 1-6-003:027			
1994-2007	W.H. Shipman, Ltd.	20.137	Diversified agriculture
1960-1994	Puna Sugar	20.137	Sugar cultivation
1951-1960	W.H. Shipman, Ltd.	20.137	Sugar cultivation

3.6 CURRENT AND PAST USES OF ADJOINING PROPERTIES

Information regarding past uses of the adjoining properties was obtained from County of Hawaii Tax Records and review of aerial photographs. The property use information is summarized in Appendix B, and the site location is depicted in Figure 2.

4.0 OWNER PROVIDED INFORMATION

4.1 ENVIRONMENTAL LIENS OR ACTIVITY AND USE LIMITATIONS

No environmental liens or activity and use limitations are known for the subject site. The subject site was assessed by MNA for *recognized environmental conditions* including petroleum and other hazardous material releases.

4.2 SPECIALIZED KNOWLEDGE

The subject site had previously been used in sugar cultivation. Presence of arsenic in former sugar land elsewhere in Keaau has been documented.

4.3 VALUATION REDUCTION

There is no information pertaining to the valuation reduction of the subject site.

4.4 OWNER, PROPERTY MANAGER, AND OCCUPANT INFORMATION

W.H. Shipman, Ltd., is the sole owner of the property, and the subject site is currently a papaya farm, leased by Peter Houle. Mr. Houle subleased the land to a contract farmer at the time of this ESA.

4.5 REASON FOR PERFORMING A PHASE I

The purpose of this Phase I ESA is to identify any *recognized environmental conditions* at the proposed water reservoir location, north of Milo Street in Keaau, particularly CERCLA impacts (from hazardous substances releases or spills), which may affect the development of the subject site.

5.0 RECORDS REVIEW

5.1 STANDARD ENVIRONMENTAL RECORD SOURCES

5.1.1 General Overview

MNA used Environmental Data Resources, Inc., (EDR) (800-352-0050) for searching standard federal and state government databases of known or potential sources of hazardous materials or waste. The record sources are listed in Appendix A, and the EDR assessment report is provided in Appendix C. MNA conducted further local searches as needed.

ASTM E 1527-05 specifies a minimum search distance for specific environmental record sources. The following sources are specified for incidents or sites within one mile of the subject site.

- Federal NPL site list
- Federal RCRA CORRACTS TSD facilities list
- State hazardous waste sites (State-equivalent NPL)

The following sources are specified for incidents or sites within one-half mile of the subject site.

- Federal CERCLIS list
- Federal RCRA non-CORRACTS TSD facilities list
- State-equivalent CERCLIS
- State landfill and/or solid waste disposal site list
- State leaking UST list

The following sources are for incidents on the subject and adjoining properties.

- Federal RCRA generators list
- State registered UST list

Finally, the following is for incidents for the subject site.

- Federal ERNS list

5.1.2 Federal National Priorities List

The NPL, compiled by the Environmental Protection Agency (EPA), is a list of sites with the highest priority for cleanup under the EPA's Hazard Ranking System [40 Code of Federal Regulations (CFR) Part 300]. EDR found no NPL sites within one mile of the subject site (EDR, 2007).

5.1.3 Federal RCRA CORRACTS TSD Facilities List

The RCRA CORRACTS TSD facilities list is compiled by the EPA. The list contains those RCRA regulated facilities, which are undergoing "corrective action" due to a release of hazardous substance. EDR revealed no facilities within one mile of the subject site (EDR, 2007).

5.1.4 State Hazardous Waste Sites (State-equivalent NPL)

The State Hazardous Waste Sites are sites or areas in which the Office of Hazard Evaluation and Emergency Response (HEER) has an interest, has investigated or may investigate. EDR revealed one facility within one mile of the subject site (EDR, 2007).

- Former Puna Sugar Mill – Milo Street, approximately 2,300 ft northeast of the subject site

5.1.5 Federal CERCLIS List

The CERCLIS list, compiled by the EPA, contains sites currently or formerly under review by the EPA for potential hazardous substance contamination for possible inclusion on the NPL. EDR found one CERCLIS site listed within 1/2 mile of the subject site (EDR, 2007).

- Former Puna Sugar Mill – Milo Street, approximately 2,300 ft northeast of the subject site

5.1.6 Federal RCRA non-CORRACTS TSD facilities list

The RCRA non-CORRACTS TSD facilities list, compiled by the EPA, contains RCRA permitted treatment, storage, and disposal facilities. EDR found no RCRA TSD site listed within 1/2 mile of the subject site (EDR, 2007).

5.1.7 State Landfill / Solid Waste Disposal Sites

The HDOH records contain an inventory of permitted landfills in the State of Hawaii. EDR found no permitted solid waste landfills, incinerators, or transfer stations within 1/2 mile of the subject site (EDR, 2007).

5.1.8 State Registered UST List

This database is compiled by the HDOH Solid and Hazardous Waste Branch, UST section. EDR's search revealed one UST site within 1/4 mile of the subject site. There are no registered USTs currently on the subject or adjoining properties (EDR, 2007).

- Hawaiian Telcom Keaau Central Office – a diesel UST, Milo Street

5.1.9 State Leaking UST (LUST) List

This database is compiled by the HDOH Hazardous Waste Branch, UST section. EDR and HDOH's database searches found two LUST sites within 1/2 mile of the subject site (EDR, 2007). A summary of these findings is presented in Table 3.

Table 3. State Leaking UST (LUST) Sites

Facility	Site	Address	Incident detail	Detail date
Nakamura Sales & Service, Ltd.	1,570 ft. SW	P.O. Box 290	Disconfirmed release	1/14/1994
Keaau Service Station, Inc.	2,331 ft. SW	4809 Hwy. 11	Cleanup initiated	10/21/1997

5.1.10 Federal RCRA Generators List

This database, compiled by the EPA, contains RCRA registered small or large quantity generators of hazardous waste. RCRA Large Quantity Generators are facilities that generate at least 1,000 kg/month of non-acutely hazardous waste (or 1 kg/month of acutely hazardous waste). RCRA Small and Very Small Quantity Generators are facilities that generate less than 1,000 kg/month of non-acutely hazardous waste. EDR's search found one generator within 1/2 mile of the subject site (EDR, 2007).

- HECO Puna Generating Station – Milo Street

5.1.11 Federal ERNS List

The ERNS list, compiled by the EPA, contains CERCLA hazardous substance releases or spills, as maintained at the National Response Center. EDR's search revealed no reported incident on the subject site (EDR, 2007).

5.1.12 State Spill List

This database is compiled by the HDOH Hazard Evaluation and Emergency Response (HEER) office. EDR and MNA's search revealed no previous spill incidents on the subject site (EDR, 2007; HEER, 2007).

5.2 ADDITIONAL ENVIRONMENTAL RECORD SOURCES

There are no further environmental record sources known to MNA that are likely to have additional environmental information pertaining to the subject property.

5.3 HISTORICAL USE INFORMATION ON THE SUBJECT SITE

5.3.1 Aerial Photographs

Aerial photographs of the subject and adjoining properties were reviewed at the R.M. Towill Corporation in Honolulu. Photographs reviewed are summarized as follows:

1951: The subject site was in use as sugarcane fields. Northeast the sugar mill was visible. Surrounding the sugar mill were residences.

1954: The subject site was still in use as sugarcane fields. The entire area was used as farmland, and more residences were visible to the southeast.

1957: No significant changes were depicted in the 1957 photograph.

1958: The subject site was still in use as sugarcane fields. More residences were visible to the south.

1974: The subject site was still in use as sugarcane fields. Residences were visible adjoining to the south on Milo Street. The sugar mill was to the northeast and wastewater from the plant was visible flowing to the east.

1987: The subject site was still in use as sugarcane fields. More residences were visible to the north.

1993: The subject site was vacant. More roadways were visible around the site and more residences were to the south.

1994: No significant changes were depicted in the 1994 photograph.

The use of the subject and adjoining sites as sugarcane fields is a *historical recognized environmental condition.*

5.3.2 Historical Topographic Maps

Historical United States Geological Survey (USGS) topographic maps for the subject site and vicinity were reviewed for the years 1963, 1981, and 1995. The maps depicted the following:

Quadrangle: Hilo, Hawaii Scale: 1:24,000 Series 7.5 Minute

1963: The subject site was in use as sugarcane fields. To the south residences were visible along Milo Street. A water tank was located on the east end of Milo Street. To the northeast the sugar mill was visible, and to the east of the mill was a wastewater pond.

1981: The subject site was still in use as sugarcane fields. To the north and south more residences were visible. To the southeast was 8 1/2 mile camp. The sugar mill was still visible and labeled as the Puna Sugar Company Mill.

1995: No significant changes were depicted in the 1995 map.

The use of the subject and adjoining sites as sugarcane fields is a *historical recognized environmental condition.*

5.3.3 Sanborn Fire Insurance Maps

Sanborn Fire Insurance maps were not available for the subject site or surrounding area.

6.0 SITE RECONNAISSANCE

6.1 METHODOLOGY AND LIMITING CONDITIONS

Myounghee Noh and Wendy Colicchia conducted the site reconnaissance. The reconnaissance focused on identifying historical, current, and potential CERCLA impacts, which may affect ownership transfer of the subject site. This includes identifying the presence, or likely presence, of any hazardous substances or petroleum products on the site under conditions that indicate an existing release, a past release, or a material threat of a release into structures on the site or into the ground, ground water, or surface water of the site (ASTM E 1527, 2005).

A survey of potential environmental hazards and conditions within the subject and adjoining sites was conducted in October 2007. Information regarding the current and previous uses of the site was obtained through a review of available records.

6.2 GENERAL SITE SETTING

The proposed water reservoir site is located within a parcel north of Milo Street, Keaau, Hawaii, and is situated between Milo Street and the unnamed road which parallels Milo Street (Figure 2). The subject parcel is bordered by the Milo Street residential housings to the south, Old Volcano Road to the west, papaya fields to the north, and Keaau-Pahoa Bypass Road to the east (Photographs 1-11).

6.3 HAZARDOUS MATERIALS AND REGULATED WASTES

MNA observed no signs of hazardous materials or regulated wastes on the subject site. Several spent herbicide containers were observed; however, these are considered farm waste and require proper handling and disposal in accordance with Hawaii Department of Agriculture rules (HAR 4-66-55).

6.4 UNDERGROUND STORAGE TANKS (USTs)

MNA observed no signs of storage tanks, such as dispenser pumps, fill pipes, or vent pipes. Four USTs at Fast Fuels, 16-499 Old Volcano Road, and Four USTs at Keaau Shell Food Mart, 16-0573 Old Volcano Road, were outside of the quarter-mile radius from the proposed tank site.

6.5 ABOVEGROUND STORAGE TANKS

MNA observed no aboveground storage tanks at the subject site. The Department of Water Supply's current drinking water reservoir is located approximately 700 feet southwest of the planned reservoir site (Photograph 16).

6.6 SOLID WASTE DISPOSAL

MNA observed approximately 25 spent herbicide containers (Photograph 12); however, these are farm waste which require proper handling and disposal procedures in accordance with the product label and HAR Title 4 Chapter 66 (HAA 4-66-55).

6.7 PHYSICAL SETTING ANALYSIS AGAINST POTENTIAL MIGRATION

MNA found no evidence for potential offsite contamination sources that may migrate to the subject site.

7.0 INTERVIEWS

7.1 FARMERS

Mr. Peter Houle currently leases the subject parcel and subleases the plots to other farmers. Mr. Houle indicated that the lease, and subsequent grading of the area, started about a year ago, and it was overgrown forest prior to the grading and clearing. No hazardous materials were found during the clearing; some debris, domestic waste, such as a refrigerator, and lots of golf balls. When asked about pesticide and herbicide uses, he indicated that Roundup® (also known as Glyphosate) is used primarily for weed control.

Mr. Florencio Simeon is the current user of the lot north of the subject site. Mr. Simeon was using herbicide sprays in his well-established papaya field. Mr. Simeon indicated that he had been leasing the property for seven years from W.H. Shipman, Ltd., and has been in Keaau since 1983. Mr. Simeon was unaware of any past uses of the proposed reservoir site but indicated that the young papaya trees that had recently been planted will be fruiting in two to three years.

7.2 OWNER

Mr. Tom English is the Chief Financial Officer, Vice President, a family member, and a historian of W.H. Shipman, Limited. Mr. English indicated that the former Puna Sugar Company cultivated sugarcane in the vicinity of Keaau-Mountain View. The former mill occupied 120 acres, and its office is now being used by Christian Liberty School, approximately 1,770 feet northeast of the proposed tank site. Mr. English's great grandfather owned the land since 1882, and the Olaa plantation started leasing in 1899.

Regarding the relatively high levels of arsenic found in Keaau, Mr. English indicated that the use of arsenic had stopped in the 1950s and suspected that the high levels might have been remains of possible spills from the rail which went by the 9 Mile Camp area or occasional misuses by individual backyard gardeners. Mr. English offered copies of an aerial photograph/field map, dated June 1, 1974 and labeled "Puna Sugar Co. Field 330," which showed the subject site as sugarcane field, Milo Street houses, and the water tank at the east end of Milo Street. The field map also showed the location of the former Puna Sugar Mill and its wastewater "pond" east of the mill.

7.3 FORMER KEAAU RESIDENT

Mr. Jimmy Arakaki was born and raised in Keaau and currently resides in Hilo. The subject parcel had been a sugarcane field as far as he can remember until the late 70s. The homes along Milo Street were built before 1958 by the plantation workers. There is a floodway running west

toward the northeast toward the end of Haa Street, according to Mr. Arakaki. Some homes were known to be flooded during heavy rains. A pesticide mixing area/warehouse was located at the Hilo-side of the mill, which is across what is now Keaau Pahoa Bypass Road. The mill's sizable motor pool was located past the mill. Keaau was a "self-contained" village and had some 2,000 residents. Commercial activities included various shops, bakery, vegetable stores, general stores, carpenter, lumber yard, dispensary, and fertilizer store. When 9-Mile Camp was closed, about 100 plantation homes were taken down.

7.4 DEPARTMENT OF WATER SUPPLY

Mr. Milton Pavao, of the Department of Water Supply, was born and raised in Keaau and resides at Paradise Park. According to Mr. Pavao, Keaau was a thriving community with shops, a theater, pool halls, two Japanese stores, a Philippino store, a post office, and many others. The subject parcel was all cane land, and the Milo Street was used for mill trucks. The narrow road in between what is now the papaya field was used for cane trucks to and from the mill. The residential lots used to be all in one parcel, but today individual homes own each lot.

Mr. Pavao recalled Shipman as a lover of trees and that no tree cutting was permitted without Shipman's approval. There used to be breadfruit trees scattered in the cane fields, and the plantation workers had to work around those trees.

8.0 ADDITIONAL SERVICE – SURFACE SOIL TESTING

MNA performed a soil screening on October 22, 2007, at the subject site. Advanced Analytical Laboratory, Inc., of Honolulu performed the analyses.

8.1 SAMPLING PROCEDURE

The entire parcel was divided into five sampling units, A to E. The units A to D represent four quadrants of the parcel south of the access road, and the unit E represents the proposed reservoir site. In units A to D, a grid system was used to select eight subsample locations. In the unit E, five biased locations were selected. The sampling procedure was as follows, and sample locations are depicted in Figure 3:

- Collected equal volume of 0-3 inch below ground surface (bgs) soil at eight subsample locations in unit A
- Combined and mixed the subsamples in a stainless steel mixing bowl
- Transferred the combined soil sample into a laboratory-supplied glass jars
- Labeled and placed the sample jars in a cooler with ice (Sample A1)
- Collected equal volume of 3-12 inch bgs soil at the same eight subsample locations in unit A
- Repeated the mixing and transfer and chilled the labeled sample jars in the cooler (Sample A2)
- Repeated the procedure for B1, B2, C1, C2, D1, and D2
- Repeated the procedure for five subsample locations at the proposed reservoir site, E1 & E2
- The chilled samples were repacked with frozen gel ice prior to transfer (via air travel) to the laboratory
- Upon arrival at Honolulu Airport, additional wet ice was added to the sample cooler

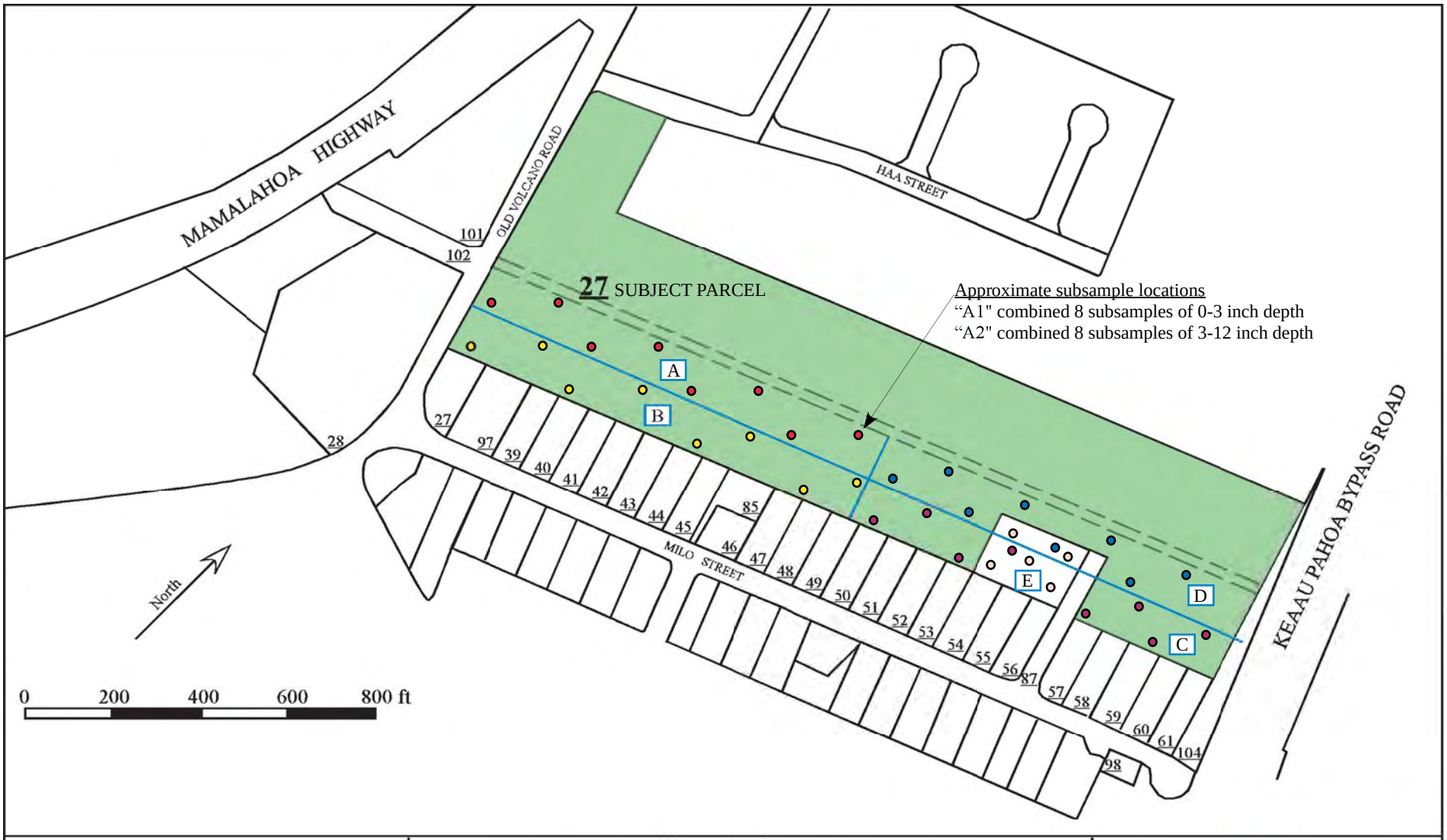


Figure 3. Sample Location Map

Phase I ESA
Proposed Water Reservoir Location, Milo Street
TMK (3) 1-6-003:027
Keaau, Island of Hawaii
December 2007
Job No. 30655
Page 19

Myounghee Noh & Associates, L.L.C.

8.2 SITE DESCRIPTION

The subject site had recently been cleared for papaya planting. The young papaya plants were 10 to 20 inches tall at the time of the soil screening (Photograph 7).

8.3 LABORATORY ANALYTICAL RESULTS

A total of 10 surface soil samples were collected. Table 4 lists the samples and analytes.

Table 4. Summary of Soil Screening Samples

Sample ID	Depth	Description	Analytes
A1	0-3”	8 subsamples at NW quadrant	Lead, Chromium, Cadmium, Barium, Silver, Arsenic, Selenium, Mercury
B1		8 subsamples at SW quadrant	
C1		8 subsamples at SE quadrant	
D1		8 subsamples at NE quadrant	
E1		5 subsamples at the proposed reservoir site	
A2	3-12”	8 subsamples at NW quadrant	TPH-Gasoline, TPH-Diesel, Lead, Chromium, Barium, Silver, Arsenic, Selenium, Mercury
B2		8 subsamples at SW quadrant	
C2		8 subsamples at SE quadrant	
D2		8 subsamples at NE quadrant	
E2		5 subsamples at the proposed reservoir site	

8.3.1 TPH as Gasoline and Diesel by SW8015M

The samples collected from 3-12 inch bgs (A2, B2, C2, D2, and E2) were subjected to total petroleum hydrocarbon (TPH) analysis. None of the five samples contained any measurable levels of TPH as gasoline or diesel. HDOH Environmental Action Levels for gasoline and diesel are 100 mg/Kg and 500 mg/Kg, respectively (Table 4).

8.3.2 RCRA 8 Metals by SW7010 and SW7470A

Reportable levels of lead (6.7 – 18 mg/Kg) and chromium (55 – 110 mg/Kg) were found in all 10 soil samples; however, the levels were well below the HDOH Environmental Action Levels of 200 mg/Kg and 500 mg/Kg, respectively. No measurable levels of cadmium, barium, silver, selenium, and mercury were found in the samples. Elevated arsenic levels, ranging 82 – 170 mg/Kg, were found in all 10 samples, however, exceeding the HDOH Environmental Action Level of 20 mg/Kg (Table 4).

8.3.3 Chlorinated Pesticides by SW8081A

None of the 10 samples contained any measurable levels of chlorinated pesticide compounds. List of 21 analytes and HDOH Environmental Action Levels are shown in Table 5.

Table 5. Summary of Soil TPH and Metals Results

Sample ID	Depths	Analytes (mg/Kg)									
		TPH-G (8015)	TPH-D (8015)	Lead (7010)	Chromium (7010)	Cadmium (7010)	Barium (7010)	Silver (7010)	Arsenic (7010)	Selenium (7010)	Mercury (7470A)
A1	0-3”	---	---	18	110	nd	nd	nd	**140**	nd	nd
A2	3”-12”	nd	nd	13	81	nd	nd	nd	**91**	nd	nd
B1	0-3”	---	---	15	67	nd	nd	nd	**120**	nd	nd
B2	3”-12”	nd	nd	10	69	nd	nd	nd	**82**	nd	nd
C1	0-3”	---	---	11	62	nd	nd	nd	**130**	nd	nd
C2	3”-12”	nd	nd	11	68	nd	nd	nd	**160**	nd	nd
D1	0-3”	---	---	9.1	64	nd	nd	nd	**150**	nd	nd
D2	3”-12”	nd	nd	9.8	60	nd	nd	nd	**98**	nd	nd
E1	0-3”	---	---	9.5	76	nd	nd	nd	**170**	nd	nd
E2	3”-12”	nd	nd	6.7	55	nd	nd	nd	**140**	nd	nd
Reporting Limit		0.10	50	1.0	2.0	1.0	10	1.0	2.0	10	0.5
HDOH Soil Action Level*		100	500	200	500	12	750	20	20	10	10

nd - none detected above the reporting limit.
--- - not tested
*According to HDOH Tier 1 Environmental Action Levels for contaminant sites; >150 meters from nearest surface water body with a groundwater utility graded “drinking water resource.”

Table 6. Summary of Soil Pesticides Results

Sample ID	Analytes (mg/Kg)																				
	alpha-BHC	Aldrin	gamma-BHC (Lindane)	beta-BHC	delta-BHC	Heptachlor	Heptachlor epoxide	Endosulfan I	4, 4'-DDE	Dieldrin	Endrin	4, 4'-DDD	Endosulfan II	4, 4' DDT	Endrin Aldehyde	Methoxychlor	Endrin ketone	Endosulfan sulfate	α-Chlordane	γ-Chlordane	Chlordane
A1	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
A2	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
B1	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
B2	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
C1	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
C2	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
D1	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
D2	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
E1	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
E2	---	--	---	---	---	---	---	---	--	---	---	--	---	--	---	---	---	---	--	---	---
Reporting Limit	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	200
HDOH Soil Action Level*	0.44	.29	0.44	0.44	0.44	0.053	0.053	0.018	2.4	0.0052	0.01	2.4	0.018	1.7	0.01	19	18	0.018	1.6	1.6	1.6

--- none detected above the reporting limit

*According to HDOH Tier 1 Environmental Action Levels for contaminant sites >150 meters from nearest surface water body with a groundwater utility graded "drinking water resource."

9.0 SUMMARY OF FINDINGS

Based on the information obtained during the site assessment performed in October - December 2007, MNA provides the following summary:

- **Database Search for Subject and Adjoining Sites**: The subject and adjoining properties were not listed in any of the federal or state databases searched by Environmental Data Resources, Inc. (EDR) (Appendix D). The findings are summarized in the table below.

Search Type	Distance Searched	Findings
Federal NPL Site List	1 mile	None
Federal RCRA CORRACTS TSD Facilities List	1 mile	None
State Hazardous Waste Sites	1 mile	1
Federal CERCLIS List	1/2 mile	None
Federal RCRA Non-CORRACTS TSD Facilities List	1/2 mile	None
State-Equivalent CERCLIS	1/2 mile	1
State Landfill and/or Solid Waste Disposal Site List	1/2 mile	None
State Registered UST List	1/4 mile	1
State Leaking UST List (LUST)	1/2 mile	2
Federal RCRA Generators List	1/2 mile	1
Federal ERNS List	Subject site	None
State Spill List	Subject site	None

- **Site Check:** During a site check conducted on October 22 and November 16, 2007, MNA observed the subject site and surrounding areas. The subject site was in use as a papaya farm (Photographs 1-2, 7). Two shacks were present on the subject parcel which appeared to be used (Photographs 5-6). An unnamed paved road, within the subject parcel, was used as an access road by the farmers. At the east end of Milo Street, the current water reservoir is present which is planned to be demolished once the new reservoir is completed (Photograph 16).

  Adjoining to the subject site to the south was residential housing on Milo Street, Old Volcano Road and the Buddhist Mission to the west, more papaya fields and Haa Street to the north, and Keaau Pahoa Bypass Road to the east (Photographs 3-11).

- **Hazardous Materials and Regulated Wastes:** MNA observed no signs of hazardous materials or regulated wastes at the time of this ESA. Several spent herbicide containers were observed; however, these are considered farm waste and require proper handling and disposal in accordance with Hawaii Department of Agriculture rules (HAR 4-66-55).

- **Storage Tanks:** MNA observed no USTs or ASTs in use at the subject property at the time of this ESA. The Department of Water Supply's current drinking water reservoir is located approximately 700 feet southwest of the planned reservoir site.

- **Historical Contamination Sources:** Based on the information collected from aerial photographs, historical maps, and interviews, the subject site had previously been used for sugarcane cultivation by the Puna-Olaa Sugar Company, Ltd. Arsenic is known to be present in former sugarcane fields.

- **Additional Service:** Based on a soil screening performed under this project, the surface soil contained arsenic ranging from 91 milligrams per kilogram (mg/Kg) to170 mg/Kg. The levels exceeded the Hawaii Department of Health Soil Environmental Action Level of 20 mg/Kg.

- **Potential Offsite Contamination Source:** MNA found no evidence for potential offsite contamination sources that may migrate to the subject site.

10.0 OPINION

It is MNA's opinion that the historical use of the subject site as a sugarcane field has impacted the surface soil. The presence of arsenic may be from the sodium arsenite and other arsenic-based pesticides used in the cane fields prior to 1947. This opinion is based on knowledge that there were no protocols in place prior to 1947 pertaining to the use of herbicides and pesticides. The Federal Insecticide, Fungicide and Rodenticide Act was enacted in 1947, and the 1988 amendments to the law strengthened the EPA's authority to enforce its rules. According to the HDOH's August 7, 2006 technical report that represents guidance on the assessment of arsenic-contaminated soils, the arsenic is generally restricted to the upper two feet of the soil column (approximate depth of plowing; Appendix E).

The elevated levels of arsenic in soil will require engineering control to prevent (1) runoff, (2) worker exposure, and (3) dust migration to neighboring residents. Project monitoring, including air monitoring in workers' breathing zone and a few locations on Milo Street, may be needed during the construction.

No soil remediation is warranted for the following reasons:

1. Worker exposures, dust migration, and potential runoff can be minimized by engineering controls.
2. While the correlations between the total arsenic and bioaccessible arsenic are not established for the site, the HDOH recommends using a bioavailability factor of 10% for total arsenic at or below 250 mg/kg. Using a bioavailability factor of 10%, the maximum bioaccessible concentration of 17 mg/kg is below the concentration requiring remedial action (see Table 2 of HDOH's technical report dated August 7, 2006 entitled, "Soil Action Levels and Categories for Bioaccessible Arsenic" presented in Appendix E).

11.0 CONCLUSION

MNA performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM E 1527-05 of the property located in Keaau, TMK 1-6-003:027. Any exceptions to, or deletions from, this practice are described in Section "2.4 LIMITATIONS AND EXCEPTIONS." This assessment has revealed the following as evidence of *recognized environmental conditions* in connection with the property:

- The historical use of the subject site as sugarcane field has impacted the surface soil. A soil screening performed under this project confirmed that the surface soil, 0 to 12 inch depth, contained arsenic levels exceeding the Hawaii DOH Environmental Action Level, 20 mg/Kg.

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APPENDIX A

Regulatory Record Sources

- National Priorities List (NPL) - The NPL is the U.S. Environmental Protection Agency's (EPA) database of uncontrolled or abandoned hazardous waste sites identified for priority remedial actions under the Superfund program. A site must meet or surpass a predetermined hazard ranking system score, be chosen as a state's top priority site, or meet three specific criteria set jointly by the U.S. Department of Health and Human Services and the EPA in order to become an NPL site.

- CORRACTS - The EPA maintains this database of Resource Conservation and Recovery Act (RCRA) facilities that are undergoing "corrective action." A "corrective action order" is issued pursuant to RCRA Section 3008(h) when there has been a release of hazardous waste or constituents into the environment from a RCRA facility. Corrective actions may be required beyond the facility's boundary and can be required regardless of when the release occurred, even if it predates RCRA.

- RCRA-Treatment, Storage, & Disposal (TSD) CORRACTS - The EPA's RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities, which report generation, storage, transportation, treatment, or disposal of hazardous waste.

- Comprehensive Environmental Response, Compensation & Liability Information System (CERCLIS) List - The CERCLIS list contains sites, which are either proposed to or on the NPL and sites, which are in the screening and assessment phase for possible inclusion on the NPL. The information on each site includes a history of all pre-remedial, remedial, removal and community relations activities or events at the site, financial funding information for the events, and unrestricted enforcement activities.

- NFRAP - NFRAP sites may be sites where, following an initial investigation, no contamination was found, contamination was removed quickly, or the contamination was not serious enough to require Federal Superfund action or NPL consideration.

- RCRA-TSD - The RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. The RCRA Facilities database is a compilation by the EPA of facilities, which report generation, storage, transportation, treatment, or disposal of hazardous waste. RCRA TSDs are facilities, which treat, store and/or dispose of hazardous waste.

- Solid Waste & Landfill - The database can be obtained from the Hawaii Department of Health (HDOH), Solid and Hazardous Waste Branch (808.586.4240).

- Leaking Underground Storage Tank (LUST) - This database can be obtained from the HDOH Solid and Hazardous Waste Branch Underground Storage Tank (UST) Section (808.586.4226).

- Water Wells - The Ground Water Site Inventory (GWSI) database was provided by the U.S. Geological Survey (USGS, 702.648.6819). The database contains information for over 1,000,000 wells and other sources of groundwater, which the USGS has studied, used, or otherwise had reason to document through the course of research.

- RCRA-Viol/Enf - The RCRA Program identifies and tracks hazardous waste from the point of generation to the point of disposal. RCRA Violators are facilities, which have been cited for RCRA Violations at least once since 1980. RCRA Enforcements are enforcement actions taken against RCRA violators.

- UST list - This database can be obtained by the HDOH UST Section (808.586.4226). The agency release date for UST Section Database was January 2002.

- Toxic Release Inventory System (TRIS) - Section 313 of the Emergency Planning and Community Right-to-Know Act (also known as SARA Title III) of 1986 requires the EPA to establish an inventory of Toxic Chemicals emissions from certain facilities. Facilities subject to this reporting are required to complete a Toxic Chemical Release Forms (Form R) for specified chemicals.

- Emergency Response Notification System (ERNS) - This is a national database containing records from October 1986 to the release date below and is used to collect information for reported releases of oil and hazardous substances (202.260.2342). The database contains information from spill reports made to federal authorities including the EPA, the U.S. Coast Guard, the National Response Center, and the Department of Transportation.

- RCRA-LgGen - RCRA Large Generators are facilities, which generate at least 1,000kg/month or non-acutely hazardous waste (or 1kg/month of acutely hazardous waste).

- RCRA-SmGen - RCRA Small and Very Small Generators are facilities, which generate less than 1,000kg/month or non-acutely hazardous waste.

- SPILL - This database can be obtained from the HDOH Hazard Evaluation Emergency Response office (HEER, 808.586.4249). The Spills list provides a short description of circumstances of each spill.

Note: For reasons of bulk, Appendices B-F are not included in this EA document. The entire Phase I ESA is on file at offices of Okahara and Associates and is available for inspection by contacting Terry Nago at (808) 961-5527.

ENVIRONMENTAL ASSESSMENT

REPLACEMENT OF OLA‘A RESERVOIR NO. 2

APPENDIX 4

LEAD AND ASBESTOS SURVEY

ASBESTOS AND LEAD SURVEY

Olaa No. 2 Reservoir
Hilo Hawaii

Prepared For:

Okahara and Associates
200 Kohola Street
Hilo, Hawaii
96720

Prepared by:

MURANAKA ENVIRONMENTAL CONSULTANTS, INC.
2850 PAA STREET SUITE 200
HONOLULU, HAWAII 96819
(808) 836-8822

Project No. 2007-0183

November 12, 2007

TABLE OF CONTENTS

		Page No.
1.0	Introduction	1
2.0	Methods	1
	2.1 Asbestos	1
	2.2 Lead Paint	2
3.0	Results	2
	3.1 Asbestos	4
	3.2 Lead Paint	6
4.0	Discussion	7
	4.1 Asbestos	7
	4.2 Lead Paint	7
5.0	Limitations	7
6.0	References	
7.0	Laboratory Data	
8.0	Photo Log	

1.0 Introduction

Muranaka Environmental Consultants Inc. (MEC) conducted a limited asbestos and lead survey on October 10, 2007 at Olaa No. 2 Reservoir. The reservoir consisted of a steel painted water tank and an existing control building.The purpose of the survey was to determine the location of asbestos-containing material and lead-containing paints on the interior and exterior surfaces of the building and water tank that will be involved in the Department of Water Supply tank replacement project.

2.0 Methodology

2.1 Asbestos

MEC collected samples in accordance with the requirements of the State of Hawaii Administrative Rules (HAR) Chapter 11-501, HAR 11-502, HAR 11-504 and the Environmental Protection Agency (EPA) publication, *560 / 5-85-030a, Asbestos in Buildings: Simplified Sampling Scheme for Friable Surfacing Materials.*

Polarized-light microscopy and the method outlined in 40 CFR 763, Appendix to Subpart F, *Interim Method for the Determination of Asbestos in Bulk Insulation Samples.* (EPA-6000/M4-82-020) was used to determine the amount of asbestos in each sample. When asbestos is not detected in a sample or contains asbestos in sizes smaller than the detection limits of the polarized light microscope (PLM), it will be reported as "No Asbestos Detected" (NAD). Vinyl floor tiles have been found to contain asbestos in smaller than detectable sizes and EPA therefore recommends reanalyzing vinyl floor tiles using transmission electron microscopy techniques (TEM) if the results are NAD. When trace amounts of asbestos (<1%) are detected, that sample shall be reported as having greater than one (1) percent asbestos (ACM) unless point counting is conducted. MEC shall assume that building components resulting in trace amounts of asbestos is ACM (>1%) unless the client desires to "point count".

The inspector wore a half-face, dual cartridge, air-purifying respirator with P-100 filters whenever friable suspect asbestos material was sampled. Each suspect asbestos-containing material was first wet with water then carefully removed from the building component and placed in a sealed container. The sampling tools were cleaned after each use to avoid cross contamination between samples. Each sample location was logged on a field data sheet with a description of the sample. Samples were then recorded onto a chain-of-custody form, properly signed, and sent to Scientific Laboratories of California Inc. in California for analysis.

2.2 Lead Paint

Paint film sampling was conducted in accordance with the U.S. Department of Housing and Urban Development's "Guidelines for the Evaluation and Control of Lead Based Paint Hazards in Housing". Locations of paint samples were selected based on the building component type and homogenous paint film.

Each sample was placed into a labeled, re-sealable plastic container. Paint samples were analyzed using flame atomic absorption (EPA method7420) to determine the amount of lead in each sample.

3.0 Observations and Results

The reservoir consisted of a steel painted tank and a control building. All areas surveyed were in poor condition.

Asbestos was found in four interior transite walls, transite roof and gaskets of the control building. See table 2 for results, section 7.0 for supporting laboratory documents and photo log.

Lead-containing paint was found on the green paint of the water tank, the pumps in the control station, the door of the control station, the tan paint on the foundation and roof edge, and the red painted pump valves inside the control station. See table 3 for results, section 7.0 for supporting laboratory documents and photo log.

Table 1
Summary of Asbestos and Lead-Containing Building Components
Olaa No. 2 Reservoir
Hilo, Hawaii

Hazardous Material	Building Component Type	Friability	Condition of Material	Amount of Material	Location
Asbestos	Transite	Non-friable	Poor	700 ft^2 (walls) 594 ft^2 (roof)	All four walls of the control station and the roof of the control station
	Gasket	Non-friable	Poor	---------	All pump gaskets inside the control station
Lead	Green paint	---------	---------	---------	Walls of the metal water tank All pumps inside the control station. The door of the control station. The walls of the control station
	Tan paint	---------	---------	---------	Foundation and roof edge of the control station.
	Red paint	---------	---------	---------	The pump valves inside the control station

Table 2
Asbestos Sampling Results
Olaa No. 2 Reservoir
Hilo, Hawaii

Sample Number	Location	Sample Description	Type (1)	Asbestos % and Type (2)	Asbestos Containing
2007-0183-01	Control station – south wall	Transite	M	15% Chrysotile	Yes
2007-0183-02	Control station – north wall	Transite	M	15% Chrysotile	Yes
2007-0183-03	Control station – east corner	Transite	M	20% Chrysotile	Yes
2007-0183-04	Roof of control station – west corner	Transite	M	15% Chrysotile	Yes
2007-0183-05	Roof of control station – south corner	Transite	M	15% Chrysotile	Yes
2007-0183-06	Roof of control station – east corner	Transite	M	20% Chrysotile	Yes
2007-0173-07	Pump in control room – west side	Gasket	M	15% Chrysotile	Yes

1 Type of material: surfacing (S), thermal system insulation (TSI), miscellaneous (M)
2 NAD = No asbestos detected

Table 2
Asbestos Sampling Results
Olaa No. 2 Reservoir
Hilo, Hawaii

Sample Number	Location	Sample Description	Type (1)	Asbestos % and Type (2)	Asbestos Containing
2007-0183-08	Pump in control room – east side	Gasket	M	15% Chrysotile	Yes
2007-0183-09	Pump in control room – north side	Gasket	M	15% Chrysotile	Yes

1 Type of material: surfacing (S), thermal system insulation (TSI), miscellaneous (M)
2 NAD = No asbestos detected

Table 3
Lead Paint Film Summary
Olaa No. 2 Reservoir
Hilo, Hawaii

Paint Chip Sample Number	Paint Chip %	Location	Paint Description	Substrate	Lead Containing?
2007-0183-L01	0.64	Wall of water tank	Green paint	Metal	Yes
2007-0183-L02	0.017	Pump	Green paint	Metal	Yes
2007-0183-L03	2.7	Foundation and roof edge of control station	Tan paint	Wood	Yes
2007-0183-L04	0.092	Control station door	Green paint	Wood	Yes
2007-0183-L05	8.4	Control station interior walls	Green paint	Transite	Yes
2007-0183-L06	26	Pump valves	Red paint	Metal	Yes

4.0 Discussion

4.1 Asbestos

When asbestos containing materials are disturbed during demolition or renovation, compliance with EPA, OSHA, State of Hawaii-Department of Health, and HIOSH State of Hawaii-Department of Labor, Division of Occupational Safety and Health regulations, is required..

4.2 Lead Paint

When affected surfaces are disturbed during demolition or renovation, compliance with EPA, OSHA, State of Hawaii-Department of Health, and HIOSH State of Hawaii-Department of Labor, Division of Occupational Safety and Health regulations, is required.

5.0 Limitations

The conclusions, observations and recommendations made in this report are based on the limitations of the contract and the condition o the property at the time of the sampling and inspection was conducted. MEC accepts no responsibility for the inaccuracy or inapplicability of any part of this report that may be attributable to a change in the condition of the property after the survey was conducted or attributable to property conditions that were not readily accessible or observable at the time of the survey. In addition, we accept no responsibility for inaccurate or missing information provided by existing documents.

MURANAKA ENVIRONMENTAL CONSULTANTS, INC.

Maureen T. Gouveia
Environmental Specialist
Asbestos Certification # - HIASB-2409
Lead Certification # - PB-0013

Section 7.0
Laboratory Reports

AmeriSci Los Angeles
24416 S. Main Street, Ste 308
Carson, California 90745
TEL: (310) 834-4868 • FAX: (310) 834-4772

PLM Bulk Asbestos Report

Muranaka Environmental Consultants, I
Attn: Mark Muranaka
2850 Paa Street
#200
Honolulu, HI 96819

Date Received 10/16/07
Date Examined 10/19/07

AmeriSci Job # 907101485
P.O. #
Page 1 **of** 2

RE: 2007-0183; Milo Street Reservoir; Asbestos Survey

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
2007-0183-01 **Location:** **Analyst Description:** Beige, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.0 % **Other Material:** Non-fibrous 85 %	907101485-01	*Yes*	15 % (by CVES) by Olga K. Katsuk on 10/19/07
2007-0183-02 **Location:** **Analyst Description:** Green, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.0 % **Other Material:** Non-fibrous 85 %	907101485-02	*Yes*	15 % (by CVES) by Olga K. Katsuk on 10/19/07
2007-0183-03 **Location:** **Analyst Description:** Beige, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 20.0 % **Other Material:** Non-fibrous 80 %	907101485-03	*Yes*	20 % (by CVES) by Olga K. Katsuk on 10/19/07
2007-0183-04 **Location:** **Analyst Description:** Black/Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.0 % **Other Material:** Non-fibrous 85 %	907101485-04	*Yes*	15 % (by CVES) by Olga K. Katsuk on 10/19/07
2007-0183-05 **Location:** **Analyst Description:** Black/Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.0 % **Other Material:** Non-fibrous 85 %	907101485-05	*Yes*	15 % (by CVES) by Olga K. Katsuk on 10/19/07

See Reporting notes on last page

AmeriSci Job #: **907101485**
Client Name: Muranaka Environmental Consultants, Inc.

PLM Bulk Asbestos Report

2007-0183; Milo Street Reservoir; Asbestos Survey

Client No. / HGA	Lab No.	Asbestos Present	Total % Asbestos
2007-0183-06 **Location:** **Analyst Description:** Black/Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 20.0 % **Other Material:** Non-fibrous 80 %	907101485-06	*Yes*	20 % (by CVES) by Olga K. Katsuk on 10/19/07
2007-0183-07 **Location:** **Analyst Description:** Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.0 % **Other Material:** Non-fibrous 85 %	907101485-07	*Yes*	15 % (by CVES) by Olga K. Katsuk on 10/19/07
2007-0183-08 **Location:** **Analyst Description:** Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.0 % **Other Material:** Non-fibrous 85 %	907101485-08	*Yes*	15 % (by CVES) by Olga K. Katsuk on 10/19/07
2007-0183-09 **Location:** **Analyst Description:** Grey, Heterogeneous, Fibrous, Bulk Material **Asbestos Types:** Chrysotile 15.0 % **Other Material:** Non-fibrous 85 %	907101485-09	*Yes*	15 % (by CVES) by Olga K. Katsuk on 10/19/07

Reporting Notes:
Analyzed By: Olga K. Katsuk _____; Date Analyzed: 10/19/2007 10/19/07
*NAD = no asbestos detected; Detection Limit <1%; Reporting Limits: CVES = 1%, 400 Pt Ct = 0.25%, 1000 Pt Ct = 0.1%; NA = not analyzed; NA/PS = not analyzed / positive stop; NVA = No Visible Asbestos; PLM (polarized light microscopy) Bulk Asbestos Analysis by EPA 600/M4-82-020 per 40 CFR 763 (NVLAP Lab #200346-0, CA-ELAP lab #2322); Note: PLM is not consistently reliable in detecting asbestos in floor coverings and similar NOB materials. TEM is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos-containing in New York State (also see EPA Advisory for floor tile, FR 59, 146, 38970, 8/1/94). NIST Accreditation requirements mandate that this report must not be reproduced except in full with the approval of the laboratory. This PLM report relates ONLY to the items tested.
Reviewed By: _____

AMERISCI
www.amerisci.com

Asbestos, Lead Analysis Chain of Custody

AMERISCI JOB #: 90710148 5

AMERISCI LOS ANGELES
24416 S Main St. Suite 30
Carson, CA 9074
Phone (310) 834-486
Fax (310) 834-477

COMPANY: Murayama Environmental Consultants

ADDRESS: P.O. Box 4341 Hon HI 96812

P.O.#:

PROJECT INFORMATION

JOB NAME: Milo Street Reservoir

JOB NUMBER: 2007-0183

JOB MANAGER: Maureen

JOB DESCRIPTION: asbestos survey

ANALYSIS TYPE	TURNAROUND TIME: RUSH	24 HR	48 HR	72 HR	5 DAY
ASBESTOS TEM AHERA					
ASBESTOS PLM BULK					
ASBESTOS PCM AIR				X	
ASBESTOS PLM 1000 P.C.					
LEAD AIR BY FLAA					
LEAD WIPE BY FLAA					
LEAD PAINT / SOLID BY FLAA					
OTHER:					

AIR FILTER INFORMATION:

MCE	
PC	
25 mm	
37 mm	
0.45 um	
0.80 um	
TEMP:	
OTHER:	

INITIAL RESULTS DELIVERY: ☐ FAX ☒ EMAIL ☐ VERBAL ☐ MAIL ONLY

REPORTS TO: Maureen

INVOICE TO: Mark Murayama

COMMENTS:

RETURN SAMPLES YES ___ NO X

PHONE: 808-836-8882

FAX: 808-836-8833

EMAIL: maureen@murayamaenv.com

PAGER/CELL:

SAMPLE ID	SAMPLE LOCATION	START TIME	STOP TIME	TOTAL TIME	X	LITERS /MIN.	=	TOTAL VOLUME	AREA SQ FT	DATE COLLECTED
2007-0183-01										10/10/07
-02										↓
-03										↓
-04										↓
-05										↓
-06										↓
-07										↓
-08										↓
-09										↓

SAMPLED BY: C. Bergantinos DATE/TIME: 10/10

RELINQUISHED BY: Mbowen DATE/TIME: 10/14/07 10:28am

RELINQUISHED BY: DATE/TIME:

RECEIVED BY: DATE/TIME:

RECEIVED BY: DATE/TIME: 10/16/07 @0940

RECEIVED IN LAB BY: DATE/TIME:

Asbestos, Environmental Chemistry and Microbiology Analysis
Boston Los Angeles New York Richmond

Page ___ of ___

Please Reply To:

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24416 S. Main Street, Ste 308
Carson, California 90745
TEL: (310) 834-4888 • FAX: (310) 834-4772

FACSIMILE TELECOPY TRANSMISSION

To: Mark Muranaka
Muranaka Environmental Consultants, Inc.
Fax #:
Email: mark.muranaka@muranakaenv.com,maureen@muranakaenv.com

From: Olga K. Katsuk
AmeriSci Job #: 907101485
Subject: PLM 3 day Results
Client Project: 2007-0183; Milo Street Reservoir; Asbestos Survey

Date: Friday, October 19, 2007
Time: 15:04:37
Comments:

Number of Pages: _____
(including cover sheet)

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Carson, California 90745
TEL: (310) 834-4868 • FAX: (310) 834-4772

AmeriSci Job #: 407101274

Date Received: 10/16/07
Date Analyzed: 10/18/07

Lead Analysis Results

Paint

EPA Method 3050/7420

Muranaka Environmental Consultants, Inc.

Honolulu, HI

Job Site: 2007-0183; Milo St. Reservoir; Lead Survey

AmeriSci # 407101274	Client Number	Sample Location	% Lead (w/w)	Lead (mg/kg = ppm)
01	2007-0183-L01		0.64	6,400
02	2007-0183-L02		0.017	170
03	2007-0183-L03		2.7	27,000
04	2007-0183-L04		0.092	920
05	2007-0183-L05		8.4	84,000
06	2007-0183-L06		26	260,000

AmeriSci Reporting Limit is 0.01%, or 100mg/kg prior to any dilutions due to high analyte concentrations or matrix interferences. AmeriSci does not correct sample results by the blank value. All analytical batch data met quality control criteria unless otherwise noted. CA ELAP No. 2322. AIHA Lab No. 100530.

Reviewed by: _____

Analyzed by: _____
Minh Phung, Inorganics Supv.

ELAP No: CA 2322

Asbestos, Lead Analysis Chain of Custody

AmeriSci
www.amerisci.com

AmeriSci Job #: 407101274

AmeriSci Los Angeles
24416 S Main St. Suite 308
Carson, CA 90745
Phone (310) 834-4866
Fax (310) 834-4772

Company: Muranaka Environmental Consultants
Address: P.O. Box 4341 HON. HI 96812
P.O.#:

Project Information	Analysis Type	Turnaround Time: Rush	24 HR	48 HR	72 HR	5 Day	Air Filter Information:	
Job Name: Milo St Reservoir	Asbestos TEM AHERA						MCE	
	Asbestos PLM Bulk						PC	
Job Number: 2007-0183	Asbestos PCM Air						25 mm	
	Asbestos PLM 1000 P.C.						37 mm	
Job Manager: Maureen	Lead Air By FLAA						0.45 um	
	Lead Wipe By FLAA						0.80 um	
Job Description: Lead Survey	Lead Paint / Solid By FLAA				X		Temp:	
	Other:						Other:	

Initial Results Delivery: ☐ Fax ☒ Email ☐ Verbal ☐ Mail Only
Reports To: Maureen
Invoice To: Mark Muranaka
Comments:

Return Samples Yes ___ No X
Phone: 808-836-8822
Fax: 808-836-8833
Email: Maureen@muranakaenv.com
Pager/Cell:

Sample ID	Sample Location	Start Time	Stop Time	Total Time	X	Liters/Min.	=	Total Volume	Area Sq Ft	Date Collected
2007-0183-001										10/10/07
-002										↓
-003										↓
-004										↓
-005										↓
-006										↓

Sampled By: C. Bergantino Date/Time: 10/10
Relinquished By: Maureen Date/Time: 10/14/07 10:
Relinquished By: Date/Time:
Received By: Date/Time:
Received By: [illegible] Date/Time: 10/10/07 @ 09:1
Received in Lab By: Date/Time:

Please Reply To:

AmeriSci Los Angeles
24416 S. Main Street, Ste 308
Carson, California 90745
TEL: (310) 834-4868 - FAX: (310) 834-4772

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To: Mark Muranaka
Muranaka Environmental Consultants, Inc.

Fax #:

Email: mark.muranaka@muranakaenv.com,maureen@muranakaenv.com

From:

AmeriSci Job #: 407101274

Subject: Lead (paint) 3 day Results

Client Project: 2007-0183; Milo St. Reservoir; Lead Survey

Date: Thursday, October 18, 2007

Time: 10:10:38

Comments:

Number of Pages: 03 (including cover sheet)

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Section 8.0
Photo Log

Photo Log

Olaa No. 2 Reservoir
Hilo, Hawaii
October, 2007

2007-0183-02

2007-0183-03

Photo No. 1: Photo of the control station. The transite walls and transite roof of the building contained Asbestos. The green paint on the door and foundation and roof edge contained lead.

Photo No. 2: View of the tan foundation of the control station. The tan paint contained lead

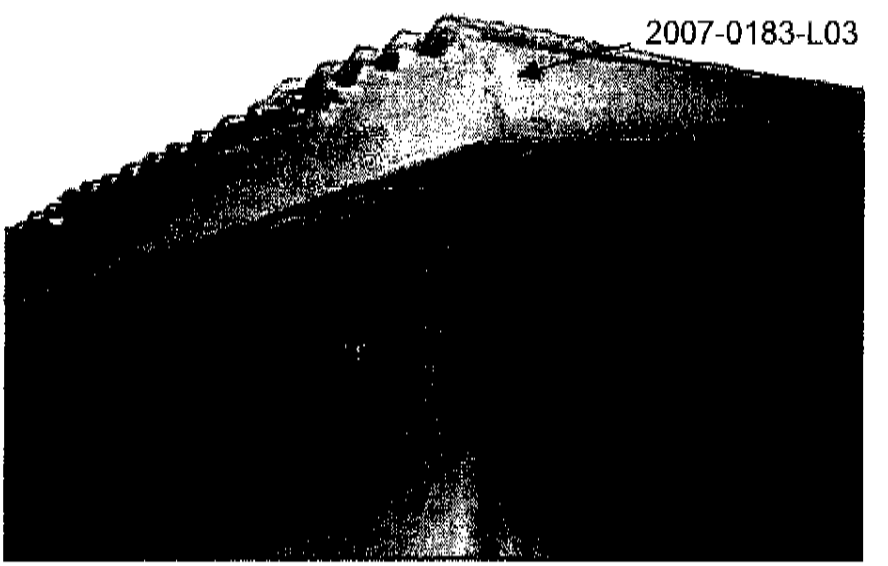

Photo No. 3: View of the tan paint on the edge of the roof. The paint contained lead.

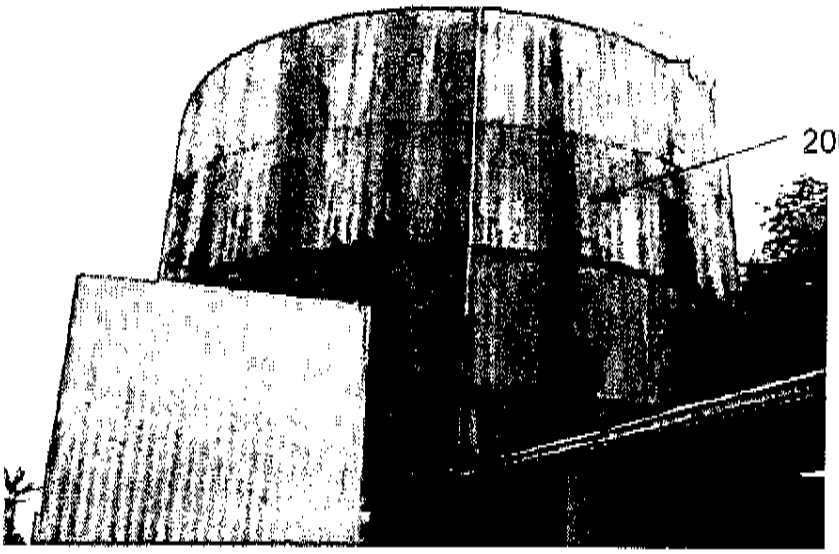

Photo No. 4: View of the water tank. The green paint on the water tank contained lead.

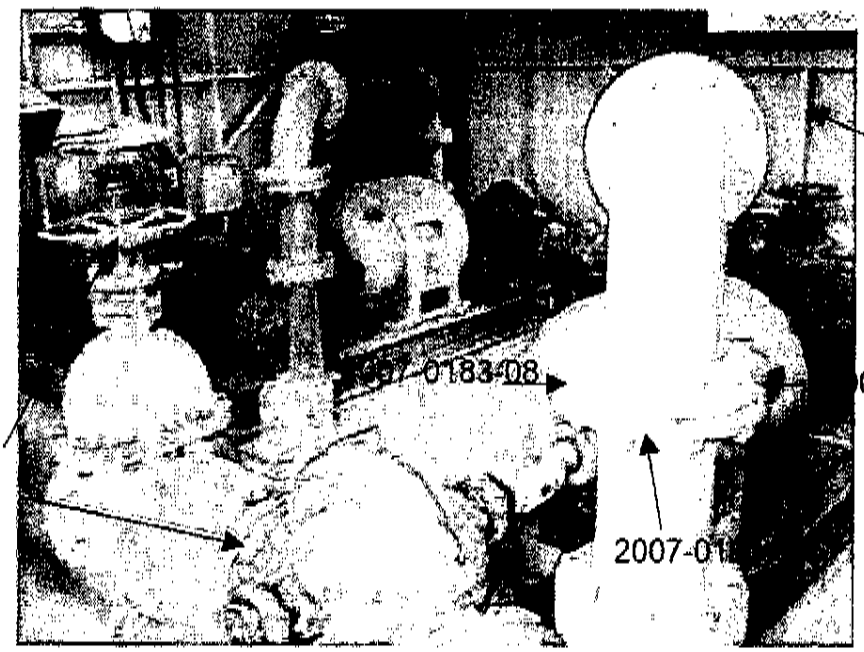

Photo No. 5: View of the pump inside the control station. The red paint on the valves and green paint on the pump contained lead. The gaskets contained asbestos.