

**U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
FINAL ENVIRONMENTAL ASSESSMENT
and
FINDING OF NO SIGNIFICANT IMPACT**

Special Permit Information:

Docket Number: PHMSA-2017-0155
Requested by: Hawaiian Electric Company, Inc.
Operator ID #: 31057
Date Requested: November 13, 2017
Original Issuance Date: October 2, 2018
Effective Dates: October 2, 2018 to October 2, 2028
Code Section(s): 49 CFR 195.571 and 195.573

I. Background

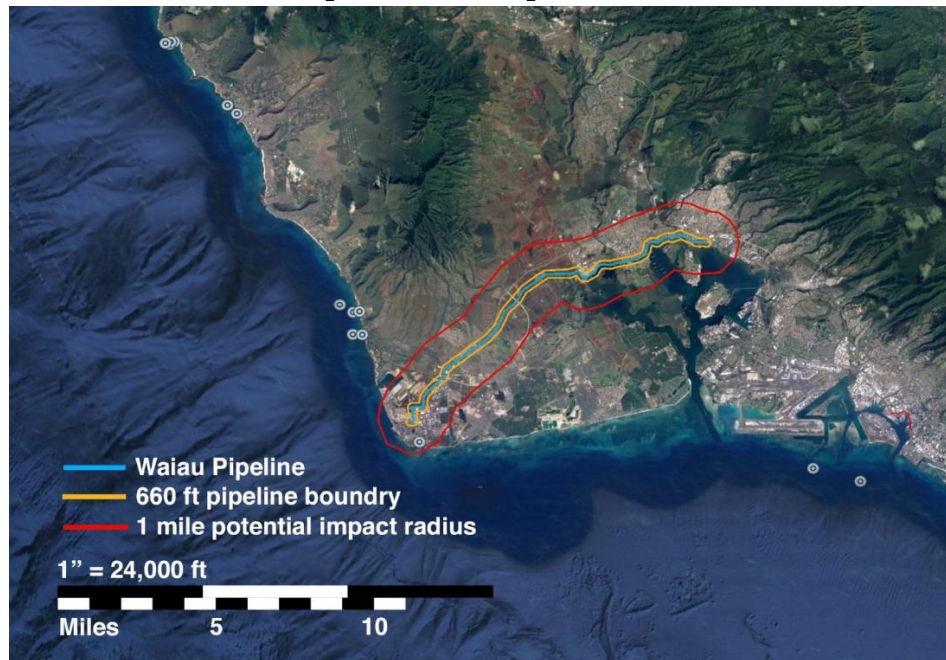
The National Environmental Policy Act (NEPA), 42 United States Code (USC) §§ 4321 – 4375, Council on Environmental Quality regulations, 40 Code of Federal Regulations (CFR) §§ 1500-1508, and U.S. Department of Transportation (DOT) Order 5610.1C, requires the Pipeline and Hazardous Materials Safety Administration (PHMSA) to analyze a proposed action to determine whether the action will have a significant impact on the human environment. PHMSA analyzes special permit requests for potential risks to public safety and the environment that could result from our decision to grant, grant with additional conditions, or deny the request. As part of this analysis, PHMSA evaluates whether a special permit would impact the likelihood or consequence of a pipeline failure as compared to the operation of the pipeline in full compliance with the Pipeline Safety Regulations. PHMSA developed this assessment to determine what effects, if any, our decision would have on the environment.

Pursuant to 49 U.S.C. § 60118(c) and 49 CFR 190.341, PHMSA may only grant special permit requests that are not inconsistent with pipeline safety. PHMSA will impose conditions in the special permit that are necessary for safety, environmental protection, or are otherwise in the public interest. If PHMSA denies a special permit, it is because the special permit request is inconsistent with pipeline safety.

II. Site Description

The Waiau Fuel Pipeline (Waiau Pipeline) is an intrastate, onshore, hazardous liquid pipeline which is solely located within the City and County of Honolulu, on the island of Oahu in the State of Hawaii. The Waiau Pipeline is owned and operated by the Hawaiian Electric Company (“HECO”). The Waiau Pipeline is approximately 13 miles long and runs from the Barbers Point Tank Farm (BPTF) in Kapolei, Oahu to the Waiau Power Station in Pearl City, Oahu. The pipeline passes through commercial areas, industrial areas, farm lands, grasslands, and the Hawaii State Energy Corridor. The following map shows the 13-mile pipeline route.

Map 1 – Waiau Pipeline Route



Map 2 – Areas that are potentially down gradient of Waiau Pipeline corridor (highlighted in red)



The Waiau Pipeline delivers fuel oil from BPTF Station to the Waiau Generating Station and was constructed in 2004. The pipeline fill volume is 4,200 U.S. barrels. The pipeline is constructed from API 5L X42 steel pipe with a nominal outside diameter of 8.625 inches. The pipeline has a wall thickness of 0.322 inches, with 0.500 inches at waterway and roadway crossings. The pipe's X42 rating means that the pipe has a specified minimum yield strength of 42,000 pounds per square inch (psi). The pipeline's designated maximum operating pressure is 1350 pounds per square inch gauge (psig), but normally operates at an average pressure of 175 psig at a flow rate ranging from 150 to 400 barrels per hour.

The Waiau Pipeline has a factory-applied fusion bonded epoxy (FBE) coating, 2 inches of urethane foam thermal insulation, and 80-millimeter high density polyethylene outer jacket. The pipeline transports low sulfur fuel oil (LSFO) and diesel. The product in the pipeline is heated to reduce the fluid viscosity. The polyethylene thermal insulation plus the outer jacket ("thermal jacketing") on the pipeline reduces heat loss during transport.

It has become clear that the thermal jacketing has high electrical resistance properties that inhibits the cathodic protection current flow to areas of the pipeline where the FBE coating has disbonded. In these areas, water migration and corrosion may occur. Although annual cathodic protection (CP) inspections currently indicate that the Waiau Pipeline has adequate levels of cathodic protection, the recent failure on the pipeline caused by corrosion and inline inspection (ILI) tool metal loss data from 2004, 2009, 2013, and 2018 demonstrate that CP alone is not an effective corrosion control method.

This special permit application is for the entire 13-mile length of the Waiau Pipeline from its origin at the Barbers Point Tank Farm in Kapolei to the receiving facility at the Waiau Power Plant in Pearl City, Hawaii.

The entire Waiau Pipeline is located in one or more 49 CFR 192.450-designated high consequence areas (HCAs). A release from the pipeline could affect the marine and beach environments, freshwater wetland habitat, and residential and commercial areas. It parallels or traverses major transportation corridors as well, and potentially could affect Pearl Harbor and the military and industrial operations there. Lastly, this pipeline is a key fuel supply source for the HECO power plant that serves this area of Oahu.

On January 9, 2018, PHMSA issued a Notice of Proposed Safety Order (NOPSO) mandating that HECO adopt certain corrective measures for the pipeline while the special permit request was being reviewed and determined. Coincidentally, immediately following issuance of the NOPSO, the pipeline leaked for over six (6) hours. The spill was not detected by HECO's leak detection system and was discovered by a landowner. While not a large spill, the cause appears to have been caused by external corrosion due to ineffective cathodic protection, which was identified and described in the NOPSO as a potentially uncontrolled risk that could rapidly degrade the integrity of the pipeline.

III. Purpose and Need

The intent of the Special Permit is to allow Hawaiian Electric Company to continue operation of the Waiau Pipeline with the existing CP system while requiring more frequent and comprehensive inspections and assessments to determine the condition of the pipeline and the rate of corrosion. Furthermore, the repair criteria to address any potential integrity threats will be made more stringent.

49 CFR 195.571 and 195.573 require CP testing and monitoring at discreet, dedicated test stations at isolated locations along the length of the pipeline. Waiau Pipeline CP systems apply electrical current to the pipeline to prevent or greatly reduce metal corrosion and wall loss. The Waiau Pipeline has thermal jacketing that interferes with or "shields" the limits the effectiveness and ability to apply CP to the pipeline and monitor the CP system. In certain circumstances, pipeline systems without effective CP can experience rapid corrosion.

This request for special permit seeks waiver of full compliance with 49 CFR 195.571 and 195.573. The shielding caused by the thermal jacketing in some areas of the pipeline prevents adequate CP levels from reaching the pipeline to prevent corrosion. HECO will continue to apply CP to the pipeline, but HECO cannot effectively ensure that the required CP levels uniformly cover the pipeline, as required by 49 CFR 195.751, nor can it meet the regulatory standards for monitoring requirements, as described in 49 CFR 195.573. HECO is not proposing any construction activity or change to their system.

The special permit will provide relief from CP testing requirements in exchange for increased in-line inspections and enhanced maintenance activities. The operator will benefit by allowing continued operation of the pipeline through improved corrosion assessment monitoring, albeit at significantly increased maintenance costs. These requirements will improve public and environmental protections, as the use of increased ILI-based corrosion monitoring will identify specific locations of pipeline anomalies, provide quantitative corrosion rate monitoring, and detect other corrosion and geometry concerns which could be targeted for repair or remediation. ILI tools provide a physical measurement of external corrosion, whereas cathodic protection, when coverage is complete, prevents corrosion from occurring.

The special permit will add requirements for utilizing both ultrasonic testing (UT) and magnetic flux leakage (MFL) ILI tools and introduce enhanced operation and maintenance activities. The UT ILI tool will supplement the MFL ILI tool technology currently being used by HECO to provide the added ability to more accurately detect and size metal loss in the pipeline external surface should further corrosion occur under the insulation. The UT ILI will also better detect any corrosion by-product that is held tightly against the pipeline exterior and may assist with more accurate sizing of any corrosion anomalies.

The special permit specifies and formalizes requirements regarding enhanced ILI assessments including higher frequency and more comprehensive types of tool runs, and mandate more stringent criteria for pipeline remediation or repair for any defects or anomalies detected by the tools or follow up digs. In the absence of a special permit, 49 CFR 195.452, minimum integrity assessment requirements, requires the use of ILI tools capable of detecting metal loss and deformation on a maximum cycle of five (5) years.

IV. Alternatives

- **Alternative 1: “Do Nothing/No Action” Alternative**

The “no action” alternative would require HECO to fully comply with 49 CFR Part 195, meaning that all CP application and monitoring requirements would be enforced, regardless of current pipeline coating or thermal insulation that is inhibiting this protective measure.

If the special permit is not issued, the pipeline may not be able to achieve required performance standards and would require significant design changes to meet Federal pipeline safety regulations and ensure continued safe operation. If such changes proved economically infeasible, HECO could ultimately opt to cease pipeline operation, in accordance with 49 CFR 195.59 and other applicable regulations. Without pipeline fuel delivery to the power plant, Oahu would be significantly impacted. The capacity of power plant would be negatively impacted and/or fuel would be delivered by truck, requiring additional fuel handling and on-road transportation at Barbers Point Tank Farm and the Waiau Power Plant.

Although CP is generally known to be ineffective for thermally insulated pipe, portions of the pipeline system, such as transitions and valves, may benefit from protection from the existing CP system. The impressed CP system meets the 100 mV shift criteria, and LSFO is a non-corrosive refined product, so the non-insulated buried portions of the pipeline should have adequate corrosion protection. HECO intends to fully maintain the existing CP system on the Waiau Pipeline.

It is of utmost importance to the Island of Oahu, Honolulu, and HECO to maintain a reliable and safe pipeline for fuel delivery to the Waiau Power Plant. For this reason, PHMSA rejected the “No Action Alternative.”

When PHMSA was preparing the draft environmental assessment (DEA), PHMSA was awaiting updated and accurate in-line inspection tool data from the Waiau Pipeline to inform the development of the proposed special permit conditions. However, HECO experienced two (2) tool runs that did not yield accurate data. Therefore, due to time constraints, PHMSA had to publish the DEA before it had access to the latest tool data following the January 9, 2018 spill. For this reason, as PHMSA explained in the DEA, PHMSA described 2 “action” alternatives. “Alternative 2” included various conditions that exceeded Code requirements and was consistent with the applicant’s special permit request. “Alternative 3” proposed more stringent conditions that would be necessary if the anticipated tool data showed ongoing corrosion or other integrity threats. As discussed below, in response to the 2018 ILI tool data results, PHMSA has opted for a “Selected Alternative” and combines the Proposed Alternatives 2 and 3.

- **Alternative 2: Applicant’s Proposed “UT/MFL Alternative”**

In this alternative, the requested special permit would have allowed Hawaiian Electric to continue to operate the Waiau pipeline for the duration of the permit, with additional inspection and remediation criteria to address difficulties presented by the pipeline design that interfere with achieving full compliance with 49 CFR 195.571 and 195.573.

In this alternative, the special permit would have required HECO to perform the following actions:

- In-line inspections (ILI) technology every four (4) years, rotating between Axial or Circumferential Magnetic Flux Leakage (MFL) and Ultrasonic (UT) technologies.
- Two verification and direct examination digs to verify and validate each ILI run.
- Anomalies of greater than 40% wall loss would require examination within 180 days.
- 3rd party review of ILI reports, verification dig data integration, development of unity plots, and measured field findings.
- Corrosion growth rate analysis of pipeline anomalies after each ILI inspection.
- Utilization of a NACE-certified expert to evaluate whether any alternating current (AC) or direct current (DC) interference or shorting is occurring that could contribute to external corrosion. If needed, propose methods to mitigate those sources of potential corrosion.
 - This evaluation report would be conducted every two (2) years with the first analysis being conducted and submitted within six (6) months.
 - Any required interference/shorting remediation must be completed within six (6) months after HECO receives the report from the NACE-certified expert.
- Weekly pipeline right of way inspections/patrols by foot or vehicle, as required under the NOPSO.
- HECO intends to maintain and operate its existing cathodic protection system to regulatory and industry standards to the greatest extent possible.

If selected, this alternative would have exceeded the current Federal pipeline regulations by integrating MFL-A/MFL-C and UT ILI tools, a significantly shortened inspection interval, more

frequent surface patrols, prescriptive current interference investigations/remediation, and applying more stringent repair criteria for corrosion anomalies. The use of multiple ILI technologies is not required by the Federal pipeline regulations and has a significant time and cost implication due to the numerous cleaning activities required for a successful run, increased vendor costs, and increased data analysis requirements.

- **Alternative 3 PHMSA’s Proposed Alternative “Enhanced UT/MFL ILI Alternative”**

In addition to the measures that would be required in the Alternative 2 “UT/MFL ILI Alternative,” this third alternative would have imposed further protection and integrity requirements for the pipeline pending completion of the accident investigation and the results to the upcoming ILI survey:

- Conducting yearly ILI surveys (instead of every 4 years) utilizing alternating technologies (axial or circumferential magnetic flux leakage (MFL) and ultrasonic (UT) technologies).
- Using analytical criteria that requires the ILI vendor to utilize methods suitable for both pitting and general corrosion.
- Performing additional anomaly verification digs and assessments to confirm the ILI tool is capable of accurately characterizing metal loss anomalies of different sizes and geometry.
- Performing magnetic particle inspections of exposed anomalies in order to detect cracking.
- Sharing of anomaly data with the ILI vendor so they can continue to refine their analysis of ILI-collected data.
- Developing a coating repair procedure for any remediated corrosion anomalies that will not foster corrosion under insulation (CUI).
- Performing two (2) weekly pipeline right of way inspections/patrols, by foot or vehicle.

- **PHMSA Selected Alternative**

The accident investigation that PHMSA conducted following the January 2018 release and the April 2018 ILI assessment data conducted by HECO’s ILI vendor, which became available after the publication of the draft special permit and DEA, confirms the advance of ongoing and significant external corrosion of the insulated Waiau pipeline. The external corrosion is occurring despite the application of a corrosion control system or CP system that meets the Federal pipeline standards for a well coated, non-insulated pipeline. HECO is unable to comply with the Federal pipeline regulations because the pipeline insulation and the field-applied shrink wrap sleeves at the girth welds are shielding the flow of CP current to areas of the pipe with disbonded coating, rendering conventional CP application and monitoring ineffective.

The corrosion appears to be located primarily under the field-applied sleeves near the girth welds. However, some areas of corrosion are located in the body of the pipe and below the factory applied insulation. The most recent ILI survey conducted on April 17, 2018, and subsequent field investigations (i.e. calibration digs) of those survey results, indicate that eight of the ILI metal loss indications are over 40% of the original pipe wall thickness (w.t.). There were another 157 anomalies that were noted to have metal loss depth between 20% and 39% and 463

anomalies between 10% and 19% w.t. These external corrosion features are distributed throughout the entire route of the pipeline, however some areas account for a higher frequency of metal loss anomalies. These areas of concentrated metal loss anomalies indicate there may be other factors such as CP interference or aggressive soil/water conditions could have contributed to the high number of anomalies. This situation is allowing corrosion to advance at a rapid rate. Careful and frequent monitoring and remediation is necessary for the safe operation of the Waiau Pipeline.

Based on the accident investigation and especially the recently-released ILI tool data, PHMSA's Selected Alternative is a combination of the proposed conditions presented in Alternative 2 and Alternative 3. PHMSA rejected the 4-year ILI tool survey interval proposed in Alternative 2. Given the number and extent of the external corrosion anomalies detected, PHMSA selected the more conservative ILI assessment interval proposed in Alternative 3 which proposed yearly ILI surveys. The special permit will require that HECO alternate between axial or circumferential MFL and UT ILI tools each year. Other than the differing ILI assessment intervals, Alternative 3 simply built upon the requirements in Alternative 2. For this reason, PHMSA will adopt each of the proposed conditions in both Alternative 2 and Alternative 3. The only requirement that PHMSA is altering from the proposed alternatives is that PHMSA will require that HECO perform pipeline right of way inspections/patrols by foot or vehicle once weekly rather than the proposed twice weekly. Part 195 regulations require a pipeline right of way patrol once every two weeks.¹ PHMSA finds that prior to remediation HECO must perform more frequent, i.e. weekly patrols, than required by the regulations. However, given the stringent inspection requirements for the pipeline, more conservative repair criteria for detected anomalies, existing leak detection capabilities, and remotely controlled functionality of current mainline valves, PHMSA may allow a patrol interval in accordance with the two-week regulatory standard, if warranted based on HECO's written request. That request must include supporting ILI and repair documentation that the threat of a small leak that is below the threshold of the existing leak detection system has been ameliorated.

PHMSA will include the following special permit conditions in the special permit issued to HECO to address the significant external corrosion currently affecting the pipeline. A full and complete list of the special permit conditions can be found in the Docket (PHMSA-2017-0155), which is available at www.regulations.gov.

- Conduct yearly ILI surveys (instead of every 4 years) utilizing alternating technologies axial or circumferential MFL and UT technologies. ILI surveys must be run at more frequent intervals if the remaining Failure Pressure Ratio (FPR) will be less than 1.25 prior to the next ILI survey, based upon anomaly growth estimates and pressure cycling.
- Use analytical criteria that requires the ILI vendor to utilize methods suitable for both pitting and general corrosion.
- Perform at least three (3) anomaly verification digs and assessments to confirm the ILI tool is capable of accurately characterizing metal loss anomalies of different sizes and geometry.
- Examine anomalies of greater than 40% wall loss within 180 days.

¹ See 49 C.F.R. 195.412(a).

- The following anomalies must be remediated within 60 days
 - All metal loss anomalies that exceed 40% of the nominal wall thickness or have a FPR below 1.39, and
 - All cracking exceeding 30% of the pipe wall thickness or with a FPR below 1.39.
- Perform magnetic particle inspections of all exposed anomalies in order to detect cracking.
- Share anomaly data, including verification dig data/field findings and unity plots with the ILI vendor so they can continue to refine their analysis of ILI- collected data.
- Analyze corrosion growth rate of pipeline anomalies after each ILI inspection.
- Utilize a NACE-certified expert to evaluate whether any AC or DC interference or shorting is occurring that could contribute to external corrosion. If needed, propose methods to mitigate those sources of potential corrosion.
 - Prepare this evaluation report every two (2) years except that the first analysis must be prepared and submitted to PHMSA within six (6) months of the issuance of the special permit.
- Complete interference/shorting remediation within six (6) months after HECO receives the report from the NACE-certified expert.
- Develop a coating repair procedure for any remediated corrosion anomalies that will not foster corrosion under insulation (CUI).
- Perform weekly pipeline right of way inspections/patrols by foot or vehicle until all ILI assessment and remediation of anomalies is complete. After completion of these actions, HECO may propose a patrol interval in accordance with 49 CFR 195.412(a) in concert with use of pressure sensors on each side of the six (6) supervisory control and data acquisition (SCADA)-connected, remote controlled mainline valves.
- Maintain and operate existing cathodic protection system to regulatory and industry standards to the greatest extent possible.

V. Affected Resources and Environmental Consequences

1. Aesthetics:

For the “No Action” alternative, the aesthetics of the affected environment would be altered if the applicant undertakes design changes in order to fully comply with 49 CFR §§ 195.571 and 195.573. The Selected Alternative will likely result in increased excavations for ILI verification digs and pipeline repair. These activities could result in temporary impacts to the aesthetic environments with heavy equipment and soil disturbance.

2. Agricultural Resources:

The “No Action” alternative will not impact agricultural resources unless the applicant undertakes design changes in order to fully comply with 49 CFR §§ 195.571 and 195.573. Increased movement of fuel by truck would not impact agricultural resources.

The special permit will not change the location of the pipeline. The pipeline traverses the outer perimeter of agricultural lands. With the increase in frequency of inspections, more validation digs and/or remediation will be required on agricultural lands, resulting in short-term disruptions on perimeter roadways of the agricultural lands.

3. Air Quality:

The “No Action” alternative would likely adversely affect air quality due to the possible need for fuel hauling via truck from the Barbers Point Tank Farm to the Waiiau Power Plant. Additional fugitive vapor emissions are related to loading fuels onto tanker trucks and increased vehicle operations between the facilities. This alternative could also result in emissions from a pipeline design change in order to fully comply with 49 CFR Part 195.

The Selected Alternative is not expected to change air quality, except for the potential for minimal increases in emissions due to increased monitoring and excavations. The pipeline will not be altered and therefore will have no change to the air quality in the pipelines inspection area. The Selected Alternative is expected to result in less impact on air quality than the No Action Alternative.

4. Biological Resources:

Since 2004, a 1900-foot section of the pipeline has operated adjacent to a marsh that is used by the protected Hawaiian Stilt during nesting season without apparent adverse effect. Any release could adversely impact terrestrial, fresh water, and/or marine habitats.

The “No Action” alternative is not expected to affect biological resources, unless the applicant needs to undertake pipeline design changes. These activities could result in temporary impacts. The use of highway transportation of hazardous liquid has greater potential to result in traffic incidents that could result in human or biological impacts.

The Selected Alternative is not expected to affect biological resources. The Selected Alternative is expected to provide increased protections against a release in comparison to the No Action alternative, Proposed Alternative 2, or Proposed Alternative 3. A release could impact wetland habitats.

5. Climate Change:

The “No Action” alternative would insignificantly contribute to global climate change due to the potential need for fuel hauling from the Barbers Point Tank Farm to the Waiiau Power Plant. Additional fugitive (methane) gas emissions may result from loading fuels onto tanker trucks and increased vehicle emissions due to operations between the facilities.

The Selected Alternative does not impose operational changes beyond increased maintenance and integrity activities, which are not anticipated to impact to global climate change. While increased maintenance may result in a minor increase in emissions, these are expected to be less than would be caused directly and indirectly from a shift to highway transportation or by a release of hazardous liquid from the pipeline.

6. Cultural Resources:

For the “No Action” alternative, any construction is expected to take place along the existing, already disturbed right of way, and therefore there will be no impact to any

culturally sensitive areas. A shift to highway transportation would not impacts cultural resources.

For the Selected Alternative, there will be an increase in ILI tool runs, which will lead to increased confirmation digs and pipeline repairs. There excavations will occur along the already disturbed right of way and are not expected to impact any culturally sensitive areas.

7. Environmental Justice:

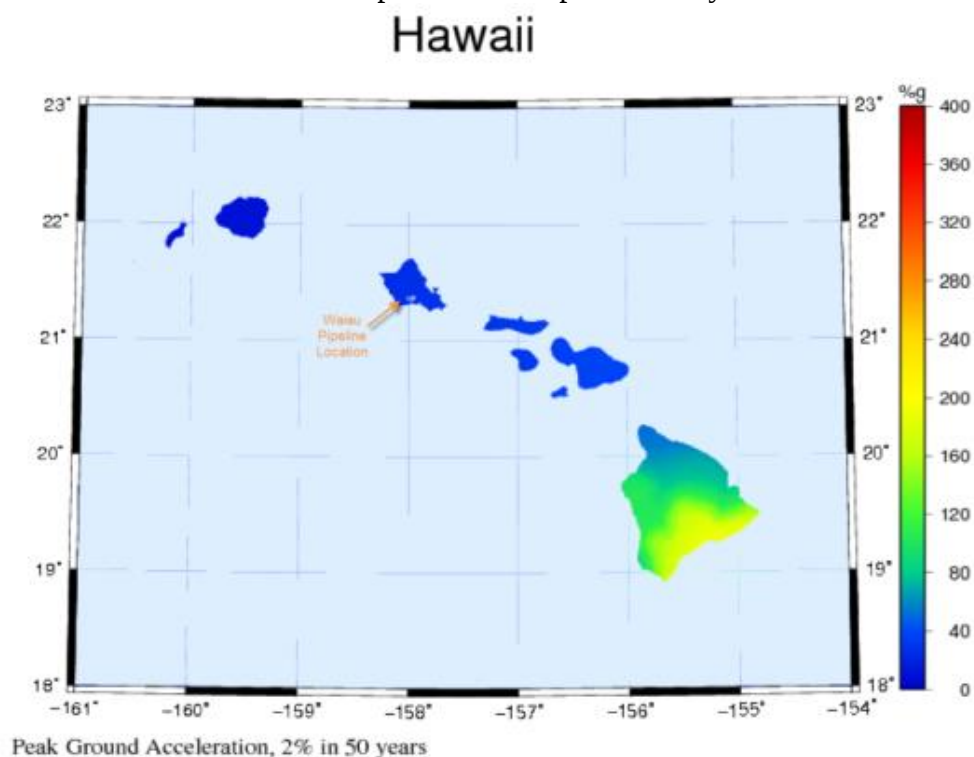
For the “No Action” alternatives, there are no identified environmental justice impacts. However, increased highway transportation could increase congestion, air pollution, and risk of traffic incidents.

The Selected Alternative will not require the installation of additional segment lengths or movement of the pipeline from its current location. While the special permit will result in increased excavation activities, the impact of the excavation activities is offset by the benefit to pipeline safety that the activities provide.

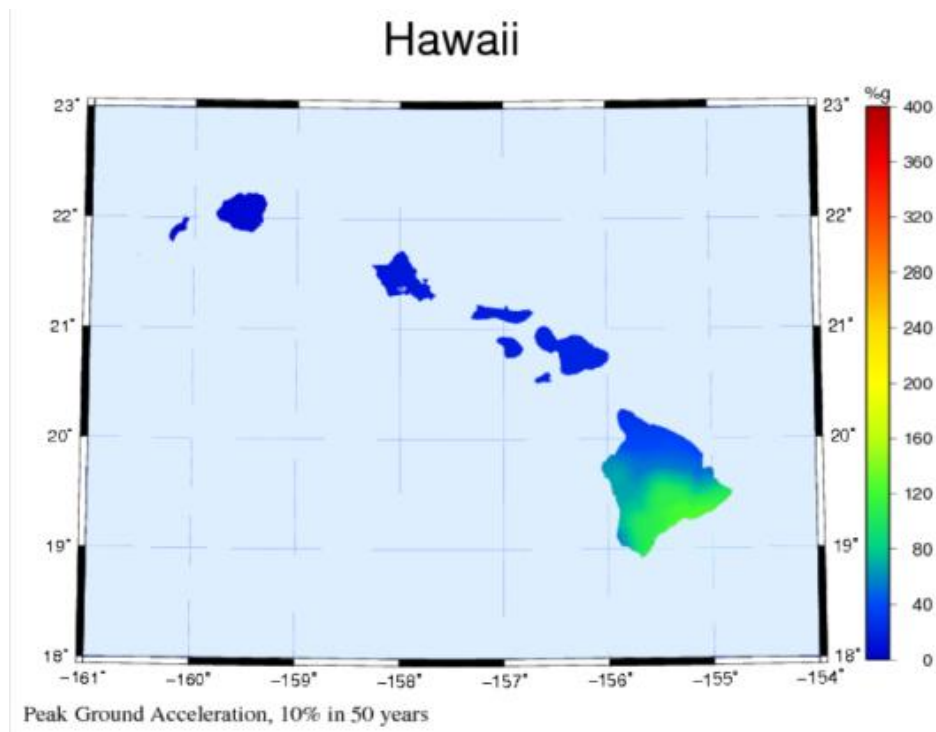
8. Geology, Soils, and Mineral Resources:

It is not expected that any of the alternatives will result in any effect on the geology, soils, and mineral resources.

The United States Geological Survey (USGS) has no changes to the ground acceleration maps for Hawaii since 1998. The areas in which the Waiau Pipeline was installed in 2004 have not changed nor will the pipeline location be altered by this special permit. The below are the acceleration maps for Hawaii published by the USGS.



Reference: <https://earthquake.usgs.gov/hazards/hazmaps/hi/1998/maps.php>



Reference: <https://earthquake.usgs.gov/hazards/hazmaps/hi/1998/maps.php>

9. Indian Trust Assets:

None of the alternatives would result in any effect on the any federally recognized Tribal Reservation or Indian Trust Assets.

10. Land Use:

None of the alternatives would impact land use or planning. The pipeline currently exists in a designated energy corridor. The location of the Waiau Pipeline will not change or be altered by the no action alternative or this special permit.

11. Noise:

Under the “No Action” alternative, noise levels may be increase along the transportation corridor between Barbers Point and the Waiau Power Plant due to potential increased tanker truck traffic (hauling fuel to the power plant). Under the no action alternative, the Waiau Pipeline might need to undergo a design change, which could involve increased noise levels during construction.

For the Selected Alternative, noise levels along the entire length of the pipeline will not be affected except to the extent that excavation and remediation activities increase and the use of equipment is necessary. The operating conditions of the Waiau Pipeline will not change in a way that increases noise as a result of this special permit.

12. Recreation:

None of the alternatives will permanently impact recreational resources along the existing pipeline route. The “No Action Alternative” could result in more-lengthy impacts if a design change is needed to ensure compliance with 49 CFR Part 195. The Selected Alternative could result in more frequent excavations for verification digs and remediation. This special permit will not add to or alter the pipelines current location. PHMSA finds that the Selected Alternative will be most effective in protecting recreational resources due to enhanced monitoring and maintenance requirements.

13. Safety:

The no-action alternative would require full compliance with cathodic protection assessments, which would require design changes to the pipeline. Alternatively, if the special permit were not issued, HECO might opt to cease pipeline operations and transport fuels via truck. Over the road transportation could result in increased safety risks due to loading, unloading, and the risks inherent to the transportation of hazardous materials via highway.

The Selected Alternatives and issuance of a special permit will result in increased inspection frequency using internal inspection tools that provide higher detection confidence, resolution and definition of corrosion on the pipeline compared to cathodic protection potential measurement alone. The subsequent risk of rupture or failure will be reduced due to these improved inspection methods. In comparison to Alternatives 2 and 3, the Selected Alternative would provide the greatest protections to pipeline integrity. The special permit will require that HECO adhere to all special permit requirements, including required ILI assessment intervals.

As the Waiau Pipeline location and operating conditions will not be altered as a result of this special permit, should a failure occur, the consequences and/or potential release volumes will have no change. The special permit conditions are intended to decrease the likelihood of pipeline failure, especially due to corrosion.

If the no action alternative were selected, significant changes to the pipeline could be required to ensure full compliance with cathodic protection requirements. Non-compliance issues may persist. It is possible that costs required to address challenges to ensure adequate and reliable cathodic protection could cause the applicant to remove the pipeline from service.

Increased in line inspections with UT and MFL ILI tools are intended to detect corrosion and other anomalies in need of remediation. These inspection and remediation activities are intended to increase the longevity of the pipeline by maintaining integrity.

14. Socioeconomics:

Under the “No Action” alternative, customers served by HECO, including those along the pipeline affected environment, may experience higher electricity costs due to the additional costs of hauling Power Plant fuel by truck.

For the Selected Alternative, current operations continue, and costs of additional inspections are assumed have minimal impact on electrical generation rates. There are also no proposed or associated projects that disproportionately impact low income populations in the affected area.

15. Topography:

None of the alternatives will affect the topography of the area.

16. Transportation:

Under the “No Action” alternative, increased traffic along the Barbers Point to Waiau corridor could result; no new road construction is anticipated.

For the Selected Alternative, the requested permit will not require the installation of additional segment lengths or movement of the pipeline from its current location. The access road requirements will not change. Slight and temporary increases in traffic could result from the increased integrity and remediation activity.

17. Water Resources:

None of the alternatives are expected directly impact surface waters, wetlands, or drinking water aquifers in the special permit inspection area. The requested permit will not require the installation of additional segment lengths or movement of the pipeline from its current location. Increased inspection frequency and instrument detection capability, under the Selected Alternative, to a greater extent than the proposed Alternatives 2 and 3, is expected to reduce the overall risk of rupture and spill.

VI. Further and Information and Analysis Regarding Corrosion under Insulation and the Waiau Pipeline Failure

PHMSA has preliminary accident data as reported in HECO's 30-day accident report (PHMSA F 7000.1) submitted to PHMSA on February 12, 2018. The Waiau Pipeline leaked for over an estimated six (6) hours after issuance of the NOPSO. The spill was discovered at 5:40 pm and reported by HECO to the NRC at 7:02 pm local time. The initial spill estimate was 500 gallons but increased to 74 barrels (3,108 US gallons) of low sulfur fuel oil in the PHMSA 30-day report. The preliminary cause of the leak appears to be un-monitorable external corrosion near the girth weld due to ineffective cathodic protection under a field applied insulation joint, as described in the NOPSO. Furthermore, the spill was not detected by HECO's leak detection system and was discovered by a landowner. The investigation is ongoing and may take a few months to complete.

PHMSA believes that close monitoring, conservative data analysis, and remediation requirements will greatly reduce the risk of failure caused by corrosion or cracking. Close monitoring of the pipeline is required under the special permit to ensure that any areas of corrosion can be detected before they result in a pipeline failure. Conservative remediation requirements for wall loss greater than 40% and cracking greater than 30% will require that areas of corrosion are addressed more quickly than required by Part 195 due to the speed with which corrosion anomalies can grow in the absence of cathodic protection.

VII. Consultation and Coordination

- Persons involved in the preparation of this document:
Derek Sato, Director Fuels Infrastructure, Hawaiian Electric Company, Inc.
Amelia Samaras, Attorney, PHMSA
Chris Hoidal, Senior Engineer, PHMSA

VIII. Public Comment

PHMSA accepted public comment on the draft special permit and DEA, including the proposed safety conditions. PHMSA received one public comment that opposed the special permit. The commenter said that the applicant should be required to comply with the Pipeline Safety Regulations. PHMSA understands this viewpoint. As described above, it is not clear how the pipeline could comply with the regulations, given the need for the pipeline insulation given the fuel type and the shielding effect of the insulation. PHMSA also had to consider the critical electric generation services that HECO provides to the Island of Oahu. Furthermore, HECO is required to perform more frequent safety inspections and repair activities under the special permit than would be required under the Pipeline Safety Regulations.

IX. Finding of No Significant Impact

PHMSA finds that the issuance of a special permit that imposes monitoring and maintenance activities in lieu of cathodic protection and cathodic protection monitoring in 49 CFR 195.571 and 195.573 would not result in a significant impact to the human environment. PHMSA finds

that the issuance of the special permit as described in the “Selected Alternative” would result in increased safety and environmental protection in comparison to the “no action alternative,” which could result in highway transport of the hazardous liquid, further attempts at compliance, or a potential redesign of the pipeline.

X. Bibliography

United States Geological Services Reference:

<https://earthquake.usgs.gov/hazards/hazmaps/hi/1998/maps.php>

National Pipeline Mapping System Reference:

<https://www.npms.phmsa.dot.gov/>

Electronic Code of Federal Regulations Reference:

https://www.ecfr.gov/cgi-bin/text-idx?SID=7ff1e43005a818e8b7aa27582804ce5b&mc=true&node=se49.3.195_1571&rgn=div8

Completed by PHMSA in Washington DC on: October 2, 2018