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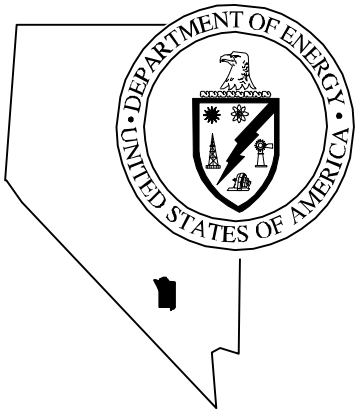
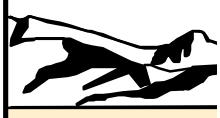
DOE/NV--526



Amchitka Island, Alaska

Potential U.S. Department of Energy Site Responsibilities

December 1998



Environmental Restoration
Division

U.S. Department of Energy
Nevada Operations Office

DOE/NV--526

AMCHITKA ISLAND, ALASKA

POTENTIAL U.S. DEPARTMENT OF ENERGY SITE RESPONSIBILITIES

DOE Nevada Operations Office
Las Vegas, Nevada

December 1998

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AMCHITKA ISLAND, ALASKA

POTENTIAL U.S. DEPARTMENT OF ENERGY SITE RESPONSIBILITIES

Approved by: Signature Approved Date: 1/22/99

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Approved by: Signature Approved Date: 1/22/99

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Environmental Restoration Division

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List of Acronyms and Abbreviations

AEC	Atomic Energy Commission
BSF&W	U.S. Bureau of Sport Fisheries and Wildlife
COE	U.S. Army Corps of Engineers
CP	Control Point
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE/NV	U.S. Department of Energy, Nevada Operations Office
ft	Foot (feet)
km	Kilometer(s)
LTHMP	Long Term Hydrologic Monitoring Program
m	Meter(s)
mi	Mile(s)
PCBs	Polychlorinated biphenyls
POL	Petroleum, oil, lubricants
RADSAFE	Radiological Safety
RI	Remedial Investigation
ROTHR	Relocatable Over The Horizon Radar
SGZ	Surface ground zero
SI	Site inspection
TX	Transmitter site
USFWS	U.S. Fish and Wildlife Service
WWII	World War II

1.0 Introduction

This report was prepared to satisfy a request by the U.S. Department of Energy, Nevada Operations Office (DOE/NV), to perform an historical records review concerning activities of the U.S. Atomic Energy Commission (AEC), the predecessor agency to the U.S. Department of Energy (DOE), at Amchitka Island, Alaska. The review focused on AEC activities that resulted in known or suspected contamination of the island environment by nonradiological hazardous or toxic materials. This review is intended to identify all of the potentially contaminated sites for which the DOE may be responsible, either wholly or in part. Additionally, this historical review is intended to identify potential data gaps that the DOE will need to fill to support the ecological and human health risk assessments currently being performed. Some of these data gaps may be filled during the August 1998, summer sampling event.

1.1 Key Information Sources

The historical information reviewed during preparation of this letter report include documents currently in the IT Corporation Las Vegas library, documents obtained from the Coordination and Information Center operated by Bechtel Nevada for DOE/NV, and Holmes and Narver, Inc. records obtained from the Federal Records Center in Laguna Niguel, California, and currently in the control of the DOE/NV Records Manager. Only a small subset of the records reviewed contain enough substantive information that allowed the conclusions presented in this report to be made. The following documents represent the primary information sources used in preparation of this letter report:

- *Summary of Site Contamination on Amchitka Island, Alaska* (USFWS, 1993)

This document identifies and describes the sites on the island that the U.S. Fish and Wildlife Service (USFWS) considers to be potentially contaminated. These sites have been the focal point of discussions regarding site responsibilities between the federal agencies that have used the island since the beginning of World War II (WWII). This document is referenced as the USFWS database in the letter report.

- *Amchitka Army Air Base Phase I Remedial Investigation, Amchitka Island, Alaska Management Plan* (Shannon and Wilson, 1996)

This document is the Work Plan for the remedial investigation (RI) that the U.S. Army Corps of Engineers (COE) is currently implementing for the USFWS sites of concern for which the COE

has been assigned primary responsibility. This document is referenced as the COE's RI Work Plan in the letter report.

- *Site Inspection Report, Amchitka Island, Alaska* (USFWS, 1996)

This document describes the results of a site inspection (SI) that Foster Wheeler Environmental Corporation conducted on behalf of the USFWS for sites of primary concern to the USFWS. This document is referenced as the USFWS SI in the letter report.

- *Planning Directive, Demobilization, Restoration, and Monitoring Activities, Amchitka Island Test Area* (AEC, 1972)

This document identifies 120 sites used by the AEC that required cleanup and restoration before the AEC demobilized from the island. The document also describes the cleanup and restoration procedures to be used for each site. This document is referenced as the *Planning Directive* in the letter report.

- *The Environment of Amchitka Island, Alaska* (Merritt and Fuller, 1977)

This document is a compendium of scientific articles that describe the history, physical environment, and biology of Amchitka Island. The articles are based on the results of extensive studies of the island's environment sponsored by the AEC. These articles are the primary sources of information on the impacts of AEC activities on the environment of the island.

- *Deactivation Report, ROTHR Support Facilities, Amchitka Island, Alaska* (Cannon, undated)

This document describes the U.S. Navy's activities during operation of their Relocatable Over-the-Horizon Radar (ROTHR) system on the island. The document provides summaries of the island infrastructure, including electrical power, sanitary sewer, and solid waste operations. The document also describes the condition of the ROTHR facilities at the time of the Navy's departure from the island.

- *AEC-DOD Memorandum of Agreement - Project Long Shot* (DOE/NV, 1965)

This document describes the roles and responsibilities of the U.S. Department of Defense (DoD) and the AEC for the Long Shot project.

- Holmes and Narver Records (DOE/NV, 1965-1971)

The Holmes and Narver records obtained from the Federal Records Center primarily consist of specifications, vendor submittals and shop drawings, progress reports, communications memoranda, and other detailed information regarding AEC's activities on the island. Although review of these records has not led to the identification of any sites of potential concern that were not identified in the other key information sources, the records do provide details on material use, especially drilling mud, that have been very valuable in establishing DOE's potential responsibility for many of the sites identified in the USFWS database and in the *Planning Directive*.

1.2 Summary of Site Usage

The following is a brief summary of the Amchitka Island occupation and use that may have led to the potential presence of chemical contamination on the island.

1942 - 1950

In support of WWII activities, the island of Amchitka served as a forward air base for the United States armed forces. The island was abandoned by the U.S. Army in August of 1950. The army left behind hundreds of deserted buildings (primarily Quonset huts); several miles of runway, taxiways, and hard stands for parking aircraft; and a number of tank farms and drum caches.

1951

The DoD investigated Amchitka Island to determine its suitability for Project Windstorm, which was a project to determine the cratering potential of nuclear explosions. The DoD drilled approximately 34 test holes northwest of the Cannikin surface ground zero (SGZ) area and made a determination that the island was not suitable for the project.

1952 - 1953

At least two salvage operations were conducted on the island. The first operation apparently only included removal of easily transported, high-value items (i.e., trucks, generators, etc.). The second salvage operation focused mainly on metals such as copper and lead. This salvage operation apparently included cutting down power poles in the base camp area and stripping the wire.

1959 - 1961

Western Electric Company operated a White Alice Radar Site on the island on behalf of the U.S. Air Force. This site apparently was a temporary radar installation to bridge the gap between Adak and Shemya before those installations received upgraded radar equipment which could bridge the gap themselves. The White Alice Radar Site was located approximately 1 kilometer (km) (0.62 miles [mi]) northwest of the Cannikin SGZ.

1964 - 1966

The DoD occupied the island to conduct the Long Shot underground nuclear test. Rehabilitation and operation of island facilities were performed by the DoD.

The AEC's responsibilities only included drilling the Long Shot emplacement hole, instrumenting exploratory holes (which were drilled by the COE) and providing the device and scientific support for the operation.

1967 - 1973

The AEC occupied the island during the period of 1967 through 1973 for the purpose of conducting the project Milrow and Cannikin underground nuclear tests. The AEC demobilized from the island in 1973; however, scientists representing AEC and its successor agencies have periodically returned to the island for monitoring purposes.

1976 - 1984

In 1976 the USFWS established a goose propagation and rearing facility on Amchitka in hopes of reestablishing the Aleutian Canada goose and endangered subspecies.

1986

The COE conducted a removal action on many of the WWII-era drum dumps and other facilities. The removal action apparently resulted in consolidation of WWII debris and various disposal sites on the island.

1987 - 1993

The U.S. Navy constructed and operated a ROTHR system. During this construction and operation period, the Navy apparently rehabilitated and used many of the facilities left by the AEC and other previous tenants.

1.3 AEC Occupancy

The AEC occupancy of the island included use of the Base Camp area around Baker Runway; development of the Milrow and Cannikin test sites and drill sites D, E, and F; and installation of a small construction camp at the northwest end of the island which also was used as the Control Point (CP) for the Milrow and Cannikin tests. With the exception of the test sites and drill sites, facilities constructed by the AEC were located in areas disturbed by previous occupants of the island, primarily areas disturbed during WWII and areas occupied by DoD during the Long Shot project. In addition, the AEC rehabilitated and used structures built during WWII and for the Long Shot project. Subsequent occupants of the island (particularly the Navy) also used many of the facilities constructed and/or used by the AEC. Because of this, it would be difficult to determine whether the AEC caused any contamination that is found to be associated with previously disturbed areas (prior to AEC occupancy) and areas used by subsequent occupants.

The currently available DOE records regarding AEC activities on the island focus primarily on the three test areas and three drill sites. Little information has been found on day-to-day operations in the Base Camp area or at the CP. Specific records on the use or storage of potentially hazardous or toxic materials other than drilling mud additives have not been found. However, personnel from the U.S. Bureau of Sport Fisheries and Wildlife (BSF&W), the predecessor to the USFWS, were present on the island continuously during the AEC's occupancy, and intensive studies of the island's ecologic systems were being conducted throughout the AEC's stay on the island. No records from these entities have been found regarding the release of any toxic materials into the island environment other than drilling mud spills into various streams and lakes.

The USFWS has recently expressed concern about the potential use of electrical equipment containing polychlorinated biphenyls (PCBs) by the AEC. No documentation has been found in any available DOE records indicating that the AEC brought PCB electrical equipment to the island. Review of specifications, vendor submittals, Construction Bills of Material, plan drawings, and other information from the Holmes and Narver, Inc., records retrieved from the Federal Records Center indicate that the transformers brought to the island by the AEC and AEC's contractors were either dry-types or were filled with non-PCB oil. Many of the transformers apparently were the pole-mounted type, which generally are not associated with PCB transformer oil. One vendor submittal found in the Holmes and Narver, Inc. records includes specifications and installation instructions for Westinghouse pole-mounted distribution transformers for use in the Base Camp area power distribution system (see Appendix A). The transformer oil identified in this submittal was called "Wemco C1," which is not the trade-name

used by Westinghouse for PCB transformer oil (Inerteen). However, the electric power distribution system used by the AEC in the Base Camp area was originally built during WWII, and was modified by the DoD for the Long Shot project. The AEC added to this system as necessary to support their power needs. It is possible that pre-AEC transformers included in the system contained PCBs.

The AEC's requirements for island demobilization and restoration specifically identified transformers as salvable equipment that was to be removed from the island. No documentation has been found in any available DOE records indicating that AEC transformers were disposed of on the island.

1.4 AEC Demobilization and Restoration

The AEC implemented an extensive restoration program prior to demobilizing from the island. The primary goals of the restoration program included restoration of areas disturbed by AEC operations to the condition they were in before AEC use and the prevention of future environmental damage from areas and facilities used by the AEC. The AEC identified 120 sites that required restoration based on discussions with the BSF&W. Following completion of the restoration activities, the BSF&W signed off on all 120 sites. No documentation has been found in any available DOE records indicating that the BSF&W did not approve the restoration activities at any of the 120 sites, nor has documentation been found indicating that there were any sites of potential concern other than the 120 identified by the AEC.

2.0 U.S. Fish and Wildlife Service Sites of Potential Concern

In 1993, the USFWS prepared a database of sites that they considered to be potentially contaminated based on the historical information available to them at that time. This database has been the focal point of all subsequent discussions between the federal agencies that have used the island since the beginning of WWII and for all site investigations of chemical contamination, including a SI conducted by Foster Wheeler Corporation on behalf of the USFWS and the RI currently being conducted by Shannon and Wilson, Inc. on behalf of the COE.

The locations of the sites included in the USFWS database have been compared to the locations of the 120 sites specifically referenced as requiring cleanup in the AEC's *Planning Directive* to identify the USFWS sites of potential concern that the DOE may be responsible for, either wholly or in part. This comparison has been performed independently from any previous assignments of site responsibilities. The USFWS sites of potential concern are presented on the island maps included as Plates 1 and 2. The sites have been color-coded on the maps to indicate the potentially responsible parties. The results of the comparison of the USFWS sites with currently available DOE records are presented in Table 2-1.

The following sections provide brief descriptions of the USFWS sites of potential concern that the DOE may be responsible for, either wholly or in part, based on the currently available DOE records.

2.1 Base Camp Area

BACA-001 - Landfill/Asbestos Disposal Cell:
The BACA-001 location consists of the Navy's landfill and surrounding areas that showed evidence of solid waste disposal activities, including asbestos. This location appears to correspond with a WWII dump site that the AEC used for burning scrap and burying the residue. No documentation has been found in any available DOE records indicating that the AEC used this area for anything other than burning scrap.

The asbestos disposal cell most likely was created after the AEC left the island, as requirements for segregating asbestos in landfills generally were not promulgated until the 1980s well after

Table 2-1
Amchitka Island, Alaska
Summary of U.S. Fish and Wildlife Service Sites of Concern
(Page 1 of 4)

USFWS[1] 10/93 Database Site Number	USFWS 10/93 Database Site Name	USFWS Responsible Agency/ies	AEC[2]/DOE[3] Documentation Responsibility	Comments
Base Camp				
AMCH-BACA-001	Landfill/Asbestos Disposal Cell	USN[4]	USN, COE[5], DOE	Area is old WWII[6] landfill used by AEC for burning of debris and by COE in 1986 for asbestos disposal. USN landfill also in vicinity.
AMCH-BACA-002	Drum Dump	COE	None	USFWS unable to locate site in June 1993.
AMCH-BACA-003	Napalm Pits	COE	COE	No documentation of AEC activities in area.
AMCH-BACA-004	Kirilof Dock Area (tank farm/associated structures and dock as one site).	USN, COE, DOE, USFWS	USN, COE, DOE, USFWS	Kirilof POL[7] built by AEC but used by all. No documentation that system was leaking when AEC demobilized from island. It is possible that system began leaking under USN control.
AMCH-BACA-005	South Bight Quarry	COE	COE	Ordnance site. AEC only used as borrow source.
AMCH-BACA-006	Fuel Tanks/Fill Stand	USN, COE, DOE	USN, COE, DOE	POL used by COE, AEC, and possibly USN
AMCH-BACA-007	St. Makarius Landfill	COE	COE	AEC used beach for a sand borrow source and sand wash area; however, no documentation of AEC use as a disposal site.
AMCH-BACA-008	Omega Point Dump	COE	COE	No documentation of AEC activities in area.
AMCH-BACA-009	East Cape Dump	COE	COE	No documentation of AEC activities in area.
AMCH-BACA-010	Landfill, Infantry Road	COE	COE,DOE?	Possibly Clevenger Pit used by an AEC contractor as a dump.
AMCH-BACA-011	Aircraft Graveyard, Drum Dump	COE	COE	AEC documentation indicates that Kirilof Peninsula was only used for borrow (outside of the Kirilof POL).
AMCH-BACA-012	Kirilof Peninsula, Ordnance	COE	COE	Ordnance site. No documentation of AEC activities in area.
AMCH-BACA-013	Hazardous Waste Storage Warehouse	USN	USN	Hazardous Material Storage Facility used by USN. No documentation of similar AEC use. Possibly AEC dry storage building.
AMCH-BACA-014	Ammunition Disposal Site	COE	COE	Ammunition Dump.
AMCH-BACA-015	Former Tank Settings	COE	COE	No AEC tanks in vicinity.
AMCH-BACA-016	Small Tank Site	COE	COE	No AEC tanks in vicinity.

Table 2-1
Amchitka Island, Alaska
Summary of U.S. Fish and Wildlife Service Sites of Concern
(Page 2 of 4)

USFWS[1] 10/93 Database Site Number	USFWS 10/93 Database Site Name	USFWS Responsible Agency/ies	AEC[2]/DOE[3] Documentation Responsibility	Comments
Base Camp (continued)				
AMCH-BACA-017	Maintenance Complex	COE	COE	No AEC fuel distribution system in area. Also no documentation of AEC use of underground storage tanks on the island.
AMCH-BACA-018	Power Plant	COE	COE	Power distribution system built by Army.
AMCH-BACA-019	Asbestos Disposal Area	COE	COE	COE used site for asbestos disposal during their 1986 cleanup.
AMCH-BACA-020	Kirilof Point Seeps	Undetermined	COE	AECs POL system located on Constantine Harbor side of Kirilof Point.
AMCH-BACA-021	South Hangar	USN	COE, USN, DOE, USFWS	Transformers in South Hanger removed by USN probably USN equipment.
AMCH-BACA-022	North Hangar	USN	USN	No documentation of AEC use of PCB[8] transformers on the island. North hanger burned down under USN care.
AMCH-BACA-023	Clevenger Lake	COE	COE, DOE	AEC used area for borrow. Constantine Springs used by all agencies.
AMCH-BACA-024	Tar Barrels	COE	COE	No documentation of AEC storage of tar barrels in area.
AMCH-BACA-025	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-026	Contractor's Camp	USFWS	USFWS	USFWS transformers.
AMCH-BACA-027	Fox Runway Oil Spill	USN	USN	USN contractor spilled fuel.
AMCH-BACA-028	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-029	Sewage Lagoon	USN	USN, COE, DOE, USFWS	Sewage lagoon built by AEC but used by all; however, no documentation of when lagoons started leaking. USN had only permitted discharge.
AMCH-BACA-030	Oil Spill (PCBs)	USN	USN, COE?	PCB transformer spills deleted from the October 1993 USFWS database. No documentation of AEC use of PCB transformers so transformers likely USN or COE.
AMCH-BACA-031	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-032	Drums (Site Unlocatable)	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-033	Dump Pit	COE	COE, DOE?, USN?	WWII landfill. Location possibly same as AECs metals landfill. Also possibly same location as USN illegal (non-permitted) landfill.
AMCH-BACA-034	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-035	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-036	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.

Table 2-1
Amchitka Island, Alaska
Summary of U.S. Fish and Wildlife Service Sites of Concern
(Page 3 of 4)

USFWS[1] 10/93 Database Site Number	USFWS 10/93 Database Site Name	USFWS Responsible Agency/ies	AEC[2]/DOE[3] Documentation Responsibility	Comments
Base Camp (continued)				
AMCH-BACA-037	Tanks	COE	COE	AECs POL tanks were much bigger. No documentation of other tanks used by AEC on Kirilof Point.
AMCH-BACA-038	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-039	Drum Dump	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-040	Drums, Loading Dock	COE	COE	No documentation of AEC activities in area.
AMCH-BACA-041	Tank Pits	COE	COE	WWII tank farm. AECs POL system was on Kirilof Point.
AMCH-BACA-042	Former Tank Farm	COE	COE	WWII tank farm. AECs POL system was on Kirilof Point.
AMCH-BACA-043	Drums; Site Unlocatable	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-044	Drums; Site Unlocatable	COE	COE	No documentation of AEC drum storage/disposal in area.
AMCH-BACA-045	Tanks, Masonic Lodge	COE	COE	No documentation of AEC tanks in area. AECs POL system was on Kirilof Point.
AMCH-BACA-046	Tank; Site Unlocatable	COE	COE	No documentation of AEC fuel tank/drum use in area.
AMCH-BACA-047	Oil Spill, Baker Runway	USN	USN	USN spill of waste oil in illegal landfill created by them.
AMCH-BACA-048	Generator, Batteries	USFWS	USFWS	USFWS generator and batteries. Generator possibly inherited from AEC.
BIRD CAPE				
AMCH-BICA-001	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP[11]. USN also used the same location as TX [9]site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-002	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-003	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-004	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-005	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.

Table 2-1
Amchitka Island, Alaska
Summary of U.S. Fish and Wildlife Service Sites of Concern
(Page 4 of 4)

USFWS[1] 10/93 Database Site Number	USFWS 10/93 Database Site Name	USFWS Responsible Agency/ies	AEC[2]/DOE[3] Documentation Responsibility	Comments
BIRD CAPE (continued)				
AMCH-BICA-006	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-007	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-008	Drum Dump	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-009	Debris Pile	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
AMCH-BICA-010	Background Sample	COE	COE	AEC used southern portion of northwest tip of island for CP. USN also used the same location as TX site. No documentation of AEC use of northern portion of that end of island.
Infantry Road				
AMCH-INRO-001	Long Shot Nuclear	DOE	DOE, COE	Long Shot was Department of Defense Vela Uniform test. According to the MOA[10] between AEC and Department of Defense, AEC only drilled the emplacement hole and provided the device and scientific support. DoD ran the camp and installed all the exploratory holes.
AMCH-INRO-002	Milrow Nuclear	DOE	DOE	Milrow
AMCH-INRO-003	Cannikin Nuclear	DOE	DOE	Cannikin
AMCH-INRO-004	Bridge Creek Oil Spill	USN	USN	USN bulldozer spilled fuel into Bridge Creek.
AMCH-INRO-005	Former White Alice Site	COE	COE	No documentation of AEC use of area for anything other than borrow.
AMCH-INRO-006	Drums; Top Camp	COE	COE	Although AEC apparently used Top Camp they also apparently cleaned up after themselves prior to island demobilization. No documentation found as to how AEC used the site. However, leaving drums scattered around the site is inconsistent with the AEC site restoration activities. It is likely that the drums are remnants from a WWII fuel dump.

[1]USFWS = U.S. Fish and Wildlife Service
[2]AEC = U.S. Atomic Energy Commission
[3]DOE = U.S. Department of Energy
[4]USN = U.S. Navy
[5]COE = U.S. Army Corps of Engineers
[6]WWII = World War II
[7]POL = Petroleum, oil, and lubricants
[8]PCB = Polychlorinated biphenyl(s)
[9]TX = Transmitter site
[10]MOA = Memorandum of Agreement

Shaded Area Potential DOE site

[11]CP = Control Point

References: AEC, 1972; Shannon and Wilson, 1996; USFWS, 1993; USFWS, 1996; Merritt and Fuller, 1977; Ecology and Environment, 1992

the AEC had left the island. The BACA-001 location was not included in the COE's RI, nor was it included in the USFWS SI. The Navy currently is periodically monitoring groundwater downgradient from the landfill.

BACA-004 - Kirilof Petroleum, Oil, Lubricants (POL) Tank System:
The Kirilof POL system was constructed by the AEC. The system was left intact for future use when AEC left the island. No documentation has been found in any available DOE records indicating that the system was leaking or had leaked at the time AEC left the island. It is possible that the petroleum-contaminated soils observed by the USFWS were the result of leaks that occurred after AEC left the island.

The results of the USFWS SI indicate that petroleum contamination is present in the vicinity of the Kirilof tanks. The COE is currently only addressing one of the four individual sites that comprise the BACA-004 location under their RI. The other three individual sites that comprise the location were not included in the RI.

BACA-006 - Constantine POL:
The BACA-006 location corresponds with the Constantine POL described in AEC's *Planning Directive*. The Constantine POL was built by the DoD for the Long Shot project, and added to by the AEC. The Constantine POL is being addressed under the COE's RI.

BACA-010 - WWII Landfill:
The BACA-010 location is described as a WWII-era landfill in the USFWS database. The location appears to correspond with Clevenger Pit, which was used by an AEC contractor as a dump site. The AEC's *Planning Directive* required that the Clevenger Pit be cleaned up. No documentation has been found in any available DOE records indicating that the site was not cleaned up as required. The BACA-010 location is being addressed under the COE's RI.

BACA-021 - South Hangar:
South Hangar is a WWII structure that was rehabilitated by the AEC for use as office space and an equipment repair area. A self-service gas station, utilizing above-ground storage tanks, was located on the paved area immediately west of the hangar. The USFWS database indicates that the primary contaminants of concern at the South Hangar were PCBs; however, the results of the Foster Wheeler SI suggest that other contaminants, including polycyclic aromatic hydrocarbons, volatile organic compounds, and metals are also of concern at the site.

The AEC specifications for the South Hangar rehabilitation work called for installation of a dry-type transformer (see Appendix A). No documentation has been found in any available DOE records indicating that the transformer installed by the AEC at the South Hangar was not a dry-type. Because of this, any PCBs present at the South Hangar are likely the result of activities by an occupant other than AEC. However, because of the presence of the AEC gas station at the hangar and the use of it as an equipment maintenance facility, it is possible that the DOE may be responsible, at least in part, for some of the non-PCB contamination reported in the SI. Since the DoD used the hangar before AEC's occupancy of the island and the Navy and the USFWS used it after the AEC left, the DOE likely is not responsible for all of the reported contamination. The South Hangar was not included in the COE's RI.

BACA-023 - Constantine Springs and Clevenger Lake:

Constantine Springs was developed as the Base Camp water supply during WWII, and has been used as the water supply by all tenants since that time. The AEC built a vehicle wash rack in the vicinity of the springs; however, no documentation has been found in any available DOE records indicating that the vehicles were washed with anything but soap and water. In addition, no documentation has been found in any available DOE records indicating that the Clevenger Lake area was used by AEC for anything other than as a source of soil. The USFWS database indicates that no further action is required at either Constantine Springs or Clevenger Lake.

BACA-029 - Sewage Lagoon:

The sewage lagoon was built by the AEC to serve the Main Camp, which was located south of the west end of Baker Runway. The original lagoon consisted of a single cell, which the Navy modified to be double-cell during their occupancy of the island. No documentation has been found in any available DOE records indicating that the sewage lagoon was leaking at the time that the AEC left the island. It is possible that the lagoon began leaking after the AEC had left.

The primary contaminants of concern for the sewage lagoon identified by the USFWS are PCBs and metals. However, no documentation has been found in any available DOE records indicating that the AEC brought PCB electrical equipment to the island (see Section 1.2 for a discussion of the potential for PCBs to be associated with AEC activities). The Navy currently is responsible for addressing the sewage lagoon.

BACA-033 - Dump Pit

There appears to be some controversy about the location of BACA-033. The Global Positioning System coordinates for the location included in the USFWS database place it approximately 1.2 km (0.75 mi) south of the center of Baker Runway. However, the narrative description of the location in the USFWS database and information included in the COE's RI Work Plan indicate that the location may actually be approximately 0.8 km (0.5 mi) south of the east end of the runway. This latter location also appears to correspond with the AEC's Metals Dump, which was used for disposal of scrap metals and tires during island demobilization. No documentation has been found in any available DOE records indicating that the AEC used the Metals Dump for disposal of anything other than scrap metal and tires. The COE is addressing the dump site south of the east end of Baker Runway under their RI.

2.2 Infantry Road

INRO-001 - Long Shot:

No documentation has been found in any available DOE records that describes specific facilities constructed at the Long Shot site that could have resulted in the release of contaminants, with the exception of the drilling mud pits currently present adjacent to the SGZ area. Because the DoD was responsible for most of the activities conducted during Long Shot, DoD records, if they exist, may provide more information on the potential presence of chemical contaminants at the Long Shot site other than those associated with drilling mud.

The AEC's *Planning Directive* indicates that three streams in the vicinity of Long Shot were impacted by drilling mud spills. Based on the locations identified in the *Planning Directive*, these streams appear to be Bridge Creek, which drains the western and southern portions of the site, an unnamed stream located to the east of the site (biota and sediment samples were collected from this stream during the summer 1997 DOE sampling event), and a small intermittent stream that drains the SGZ mud pits.

Bridge Creek, the unnamed stream east of the site, and the SGZ mud pits will be sampled during the 1998 summer sampling event.

INRO-002 - Milrow:

No documentation has been found in any available DOE records that describes specific facilities or activities at the Milrow site that could have resulted in the release of contaminants, with the exception of the drilling mud pits. During the Milrow emplacement hole drilling operation,

significant quantities of drilling mud were spilled into the Clevenger Creek drainage system on several occasions. These spills apparently resulted in the elimination of fish and most invertebrates from the affected areas of the creek. The drilling mud eventually was routed to Heart Lake, which is adjacent to the Milrow SGZ area, to prevent further damage to the creek. Studies of the Clevenger Creek watershed subsequent to the Milrow test indicated that the fish and invertebrates slowly repopulated the affected portions of the creek once the discharge of drilling mud had been stopped. Nine Dolly Varden fry were found in a moss sample collected from Clevenger Creek below the Milrow SGZ during the 1997 DOE sampling event, which indicates that fish are spawning in the affected portions of the creek.

Clevenger Creek and Heart Lake will be sampled during the 1998 summer sampling event.

INRO-003 - Cannikin:

No documentation has been found in any available DOE records that describes specific facilities or activities at the Cannikin site that could have resulted in the release of contaminants, with the exception of the drilling mud pits. Like Milrow, the Cannikin drilling operations resulted in discharges of significant quantities of drilling mud into the White Alice Creek drainage system, with the consequent elimination of fish and invertebrates from the affected portions of the creek. Although post-Cannikin studies of the White Alice Creek watershed were not as comprehensive as those conducted for the Clevenger Creek watershed, the studies did indicate that Cannikin Lake, which was formed in a depression caused by the Cannikin test, was slowly being populated by Dolly Varden, which likely was the result of recruitment from unaffected portions of the White Alice Creek drainage system.

The USFWS database entry for the Cannikin site indicates that USFWS personnel observed an apparent landfill area located on the southwest of Cannikin Lake. No documentation has been found in any available DOE records that indicates that the AEC created a landfill in the Cannikin vicinity. It is possible that the landfill observed by USFWS personnel is actually the HTH-3 wellhead, which is located to the southwest of the southern end of Cannikin Lake.

Cannikin was the only test where a post-shot reentry hole was drilled. The post-shot wellhead is located to the southeast of the Cannikin SGZ area, on the east side of the south fork of White Alice Creek. The currently available DOE records indicate that drilling mud used for the post-shot drilling was mixed at Drill Site D and then pumped through a pipeline from Site D to the post-shot location. Because of this, there may not have been mud pits at the post-shot location. No documentation has been found in any available DOE records that indicates the potential

presence of other contaminants at the post-shot site, or that indicates that drilling mud was spilled during the operation.

One potential mud pit was observed adjacent to the Cannikin SGZ area during DOE's 1997 sampling event. This potential mud pit and White Alice Creek will be sampled during the 1998 sampling event.

2.3 Bird Cape

The ten sites of potential concern included in the USFWS database are all located in the vicinity of Bird Cape, which is on the north side of the northwestern tip of the island (Plate 1). The AEC's Northwest Camp and CP were located on the south side of this part of the island (CP Bluff on Plate 1). Because of this, it is unlikely that the DOE is responsible for any of the Bird Cape sites. The Bird Cape sites are being addressed under the COE's RI.

3.0 Additional Sites of Potential DOE Concern

The currently available DOE records have been reviewed for information on the potential for chemical contamination at any of the sites identified as requiring restoration in AEC's *Planning Directive* and not included in the USFWS database. The majority of the sites identified in the *Planning Directive* were areas that had been physically disturbed, such as borrow pits and spoil piles, or facilities that had been constructed or modified by the AEC, such as buildings and recording trailer parks. Other than the descriptions of these sites in the *Planning Directive,* very little documentation has been found in the currently available DOE records regarding the potential for chemical contaminants to be present at these sites, except for the sites involving use of drilling mud. The following sections provide brief descriptions of AEC sites not included in the USFWS database where sufficient information was found in the currently available DOE records to indicate the possible presence of chemical contamination.

3.1 Base Camp Area

Construction Area:

The AECs *Planning Directive* identified a site north of Charlie Runway that was used for material storage during the resurfacing of Baker Runway (AEC's Location 4 in the *Planning Directive*). This site apparently was originally disturbed by the Army during WWII. Restoration of this site by AEC included removal of drums of tar and limited recontouring and revegetation. No documentation has been found in any available DOE records indicating that the site was not cleaned up as required.

The COE's RI Work Plan indicates that a WWII-era asphalt hot-mix plant was located in the vicinity of the AEC Construction Area site. According to the COE's RI Work Plan, two buried railroad tank cars apparently containing hydrocarbons were discovered in the vicinity of the hot-mix plant during a site visit in 1995. The COE RI Work Plan indicates that these tanks are likely the responsibility of the AEC or the Navy. However, no documentation has been found in any available DOE records indicating that the AEC installed underground storage tanks at this location.

Fuel Drum Disposal Area:
The AECs *Planning Directive* identified a site in the vicinity of Fox Runway that was used as a disposal area for empty fuel drums (AEC's Location 16 in the *Planning Directive*). The *Planning Directive* indicates that this disposal area was not used extensively, as most empty drums were taken to the Metals Dump for disposal. The *Planning Directive* required that the drums present at the site either be hauled to the Metals Dump for disposal or be buried at the location. No documentation has been found in any available DOE records indicating that the site was not cleaned up as required, or that drums containing product were disposed of there.

Hus-Key Camp Sewage Lagoon:
The Hus-Key Camp sewage lagoon (AEC's Location 17 in the *Planning Directive*) was originally constructed by the DoD for Project Long Shot, and was used by the AEC for sewage generated at the Hus-Key Camp. The Hus-Key Camp sewage lagoon may be the pond located on the south side of Fox Runway. No documentation has been found in any available DOE records indicating the types of wastes that may have been discharged into the lagoon other than domestic wastewater from the camp.

South Hangar Septic System:
Wastewater from the South Hangar and the airport terminal building was disposed of in a septic system that terminated in a leachfield located somewhere to the south of the South Hangar.

Radiological Safety (RADSAFE) Decontamination Facility:
A RADSAFE decontamination facility building was constructed during AEC activities. The facility was located off of the southwest end of Charlie runway. However, according to *The Radiation Contamination Clearance Report* (DOE/NV, 1977) the facility was apparently never used.

3.2 Infantry Road

Rifle Range Road Mud Sumps:
There were three mud sumps constructed by the AEC during the Milrow operations. These sumps were located where Infantry Road and Rifle Range Road intersect. Two mud sumps were built on Rifle Range Road just south of the intersection. These sumps apparently were used for temporary storage of drilling mud after the Milrow emplacement hole had been completed. The third sump was built on the north side of Infantry Road, and apparently was used to contain

drilling mud that leaked from the other two sumps. All three sumps were emptied and the mud transported to Drill Site E for disposal before the Milrow test was conducted.

The *Planning Directive* indicates that the Silver Salmon Lake drainage system was impacted by siltation from gravel pits and by leaks from the Rifle Range Road sumps. However, reports on the studies of the fresh water ecosystems on the island indicate that the primary impacts to the Silver Salmon Lake drainage system from AEC operations were caused by siltation from the roads and gravel pits. Significant drilling mud spills into watersheds tended to be reported by the scientists studying the freshwater ecosystems of the island. Because of the dramatic effects of such spills on stream biota. No reports have been found in DOE records concerning drilling mud spills into the Silver Salmon Lake watershed. Because of this, it is likely that leaks from the sumps into the watershed, if they did occur, did not result in significant damage to the watershed.

Milepost 13 Lake and Milepost 14 Lake:

The AEC built a pipeline along Infantry Road from Cannikin to Drill Site D to facilitate transfer of drilling mud from one site to another. Two lakes along infantry road, one at Milepost 13 and one at Milepost 14 (the milepost designations used at the time of AEC occupancy of the island), were apparently used as temporary drilling mud storage facilities in conjunction with the pipeline. Weekly reports of AEC activities on the island during site restoration and demobilization indicate that the drilling mud was removed from both of these lakes before the AEC left the island. These lakes will be sampled during the 1998 sampling event.

Drill Site D:

Drill Site D was developed by the AEC as an underground test site, but was never used. The AEC drilled a 1,387-meter (m) (4,550-foot [ft]) deep, 3-m (10-ft) diameter emplacement hole and two 2,134-m (7,000-ft) deep exploratory holes at the site. The emplacement hole and one of the exploratory holes were filled with drilling mud before they were sealed and abandoned by the AEC. The second exploratory hole was left open for the Long Term Hydrological Monitoring Program (LTHMP). The two holes full of drilling mud were sealed with 3-m (10-ft) cement plugs and welded steel caps prior to abandonment.

Three large mud pits were constructed in the vicinity of the emplacement hole at Drill Site D. These mud pits were used for the Drill Site D drilling operations. In addition, DOE records indicate that drilling mud was mixed a Drill Site D and piped to other drill sites for use. These drilling mud pits failed at least several times, discharging significant quantities of drilling mud into the stream draining the site (Falls Creek). Weekly reports of AEC activities on the island

during site restoration and demobilization indicate that the drilling mud was removed from the mud pits before the AEC left the island; however, the mud pits were left open with the concurrence of the BSF&W. No documentation has been found in any available DOE records that describes specific facilities or activities at Drill Site D that could have resulted in the release of contaminants, with the exception of the drilling mud pits.

The *Planning Directive* indicates that fish and invertebrates in a small lake on the north side of Infantry Road opposite Drill Site D were killed by an oil spill. The currently available DOE records indicate that this oil spill was likely from a generator used to power a mud pump on the pipeline, and was a one-time event. The *Planning Directive* indicates that fish and invertebrates returned to the lake following the spill.

The drilling mud pits and Falls Creek will be sampled during the 1998 sampling event.

Drill Site F:

Drill Site F was developed by the AEC as an underground test site, but was never used. The AEC drilled a 162-m (531-ft) deep, 2.3-m (7.5-ft) diameter emplacement hole and a 2,137-m (7,012-ft) deep exploratory hole at the site. Both holes were filled with drilling mud before they were sealed and abandoned by the AEC. The two holes were sealed with 3-m (10-ft) cement plugs and welded steel caps prior to abandonment.

The drilling mud pits at Drill Site F failed at least once, discharging drilling mud into the stream draining the site (Limpet Creek). No documentation has been found in any available DOE records that describes specific facilities or activities at Drill Site F that could have resulted in the release of contaminants, with the exception of the drilling mud pits.

One small mud pit is currently present at the site south of the emplacement hole. This mud pit and Limpet Creek will be sampled during the 1998 sampling event.

Drill Site E:

Drill Site E was developed by the AEC as an underground test site, but was never used. The AEC started an emplacement hole, but abandoned the operation after drilling 3-m (10-ft). There was one 2,284-m (7,495-ft) deep exploratory hole drilled at the site, which was left open by the AEC for use in the LTHMP.

The drilling mud pits at Drill Site E failed catastrophically, discharging the entire contents of the mud pits into the stream draining the site. No documentation has been found in any available (to date) DOE records that describes specific facilities or activities at Drill Site E that could have resulted in the release of contaminants, with the exception of the drilling mud pits.

The stream draining Drill Site E will be sampled during the 1998 sampling event.

3.3 Northwest Camp/CP

No documentation has been found in any available DOE records that describes specific facilities or activities at the Northwest Camp/CP that could have resulted in the release of contaminants. All of the AEC's facilities at the Northwest Camp/CP were removed during site restoration except for an underground bunker. The Navy's transmitter site (including support facilities) for the ROTHR was located in the same area.

4.0 Summary and Conclusions

Review of the currently available historical information regarding the AEC's activities on Amchitka Island indicates that the DOE may be wholly or partially responsible for 11 sites identified in the USFWS database of sites of potential concern. In addition, 10 sites for which the DOE may be wholly or partially responsible have been identified that are not included in the USFWS database of sites of potential concern. The following is a summary of the records review.

4.1 Base Camp Area

The DOE shares responsibility with other agencies for eight USFWS sites of concern in the base camp area. No USFWS sites of concern have been identified in the Base Camp area that are solely DOE's responsibility. The COE is addressing four of the joint-responsibility sites in their entirety under their RI. The COE also is addressing a portion of another joint-responsibility site (Kirilof POL) under their RI. The three USFWS joint-responsibility sites of concern that are not being addressed under the COE's RI are the Navy Landfill (BACA-001), South Hangar (BACA-021) and the Sewage Lagoon (BACA-029).

The DOE also may be wholly or partially responsible for five sites in the Base Camp area that are not included in the USFWS database. Of these five sites, the DOE is wholly responsible for two: the Fuel Drum Disposal Area and the RADSAFE Decontamination Facility. One of the three joint-responsibility non-USFWS sites (the Construction Area) is being addressed under the COE RI, although the COE appears to be assigning responsibility for two underground storage tanks found at the site to either the DOE or the Navy. None of the other non-USFWS sites in the Base Camp area are currently being addressed by any agency.

4.2 Infantry Road

The DOE is responsible for three USFWS sites of concern along Infantry Road: Long Shot (INRO-001), Milrow (INRO-002), and Cannikin (INRO-003). Based on the available historical information, the DOE is solely responsible for Milrow and Cannikin, and shares responsibility for Long Shot with the DoD, which was the lead agency for the Long Shot project. All three of these sites are being addressed under DOE's 1998 sampling event.

The DOE also is responsible for five sites along Infantry Road that are not included in the USFWS database of sites of concern. All of these sites involved the discharge of drilling mud into the environment as a result of AEC activities. Four of the five sites are being addressed under

DOE's 1998 sampling event. The fifth site, Rifle Range Road Mud Sumps, is not being addressed under the DOE's 1998 sampling event because the available documentation indicates that leaks from these mud sumps did not cause significant damage to the environment.

4.3 Bird Cape/Northwest Camp/CP

No documentation has been found in any available DOE records that describes specific facilities or activities in the Bird Cape/Northwest Camp/CP area that could have resulted in the release of contaminants.

5.0 References

AEC, see U.S. Atomic Energy Commission.

Cannon, J. M. Undated. *Deactivation Report, ROTHR Support Facilities, Amchitka Island, Alaska.* Chesapeake, VA: U.S. Navy, Fleet Surveillance Support Command.

DOE/NV, see U.S. Department of Energy, Nevada Operations Office.

Ecology and Environment, Inc. 1992. *Contamination Assessment Report, Amchitka Island, Aleutian Islands, Alaska*, KO-7030 D087(A). Report prepared for the U.S. Army Corps of Engineers. Anchorage, AK.

Merritt, M. L. and R. G. Fuller, eds. 1977. *The Environment of Amchitka Island, Alaska*, TID-26712. Springfield, VA: Technical Information Center, Energy Research and Development Administration.

Shannon and Wilson, Inc. 1996. *Final Report, Amchitka Army Air Base Phase I Remedial Investigation Amchitka Island, Alaska, Contract No. DACA85-94-D-0009, Site Characterization Report, Volume I.* Prepared for the Department of the Army, Alaska District, Corps of Engineers. Anchorage, AK.

USFWS, see U.S. Fish and Wildlife Service.

U.S. Atomic Energy Commission, Nevada Operations Office. 1972. *Planning Directive, Demobilization, Restoration and Monitoring, Amchitka Island Test Area*, NVO-107. Las Vegas, NV.

U.S. Department of Energy, Nevada Operations Office. 1965 - 1971. Holmes and Narver, Inc. files pertaining to Projects Long Shot, Milrow, and Cannikin on Amchitka Island, Alaska. Las Vegas, NV: Federal Records Center.

U.S. Department of Energy, Nevada Operations Office. 1965. AEC-DOD Memorandum of Agreement: Project Longshot. Las Vegas, NV: Archive Record Center.

U.S. Department of Energy, Nevada Operations Office. 1977. *Radiation Contamination Clearance Report, Amchitka Island, Alaska*, NVO-294-8. Las Vegas, NV.

U.S. Fish and Wildlife Service. 1993. *Summary of Site Contamination on Amchitka Island, Alaska*, U.S. Fish and Wildlife 1993 database, ITLV Library Number 4015. Anchorage, AK.

U.S. Fish and Wildlife Service. 1996. *Site Inspection Report Volume 1-Text, Amchitka Island, Alaska*. Prepared by Foster Wheeler Environmental Corporation, SEA Consultants Inc., Industrial Economics Inc. Seattle, WA.

Appendix A
AEC Transformer Information

Box 71

SPECIFICATIONS

AND

PROPOSAL DOCUMENTS

FOR

REHABILITATION

OF

NORTH AND SOUTH HANGARS

AMCHITKA ISLAND, ALASKA

MARCH 1968

42

HOLMES & NARVER, INC.
ON-CONTINENT TEST DIVISION
P. O. BOX 14340
Las Vegas, Nevada 89114

11. SERVICE EQUIPMENT.

11.1 North Hangar: Service-disconnecting means shall be of the enclosed circuit breaker type with external handle for manual operation. Enclosures shall be sheet metal with hinged cover for surface mounting unless otherwise indicated. Multipole circuit breakers shall be of the common-trip type having a single operating handle and for sizes of 50 amperes or less may consist of single-pole circuit breakers permanently assembled at the factory into a multipole unit.

11.2 South Hangar: Service for the South Hangar shall be a load center unit substation and shall conform to applicable standards of NEMA, ASA, and IEEE. The unit substation shall consist of an incoming high-voltage section, a transformer section, and two outgoing low-voltage sections.

11.2.1 The incoming line section shall be equipped with a 3-pole unfused air insulated 4160 volt load break switch with stored energy mechanism; 600 ampere continuous current, 2-position, open, close with terminal lugs to terminate the 4160 volt, 3-phase cable feeder.

11.2.2 The transformer section shall contain one dry type transformer. The transformer shall be insulated with class "H" materials and shall carry full rated load continuously without exceeding 150 degrees C. rise above an ambient temperature of 30 degrees C. when cooled by natrual air circulation. The unit shall be rated at 300 KVA with a 4.16 KV delta primary and a 208/120 volt wye secondary. High voltage windings shall be furnished with two 2½% taps above and two 2½% taps below normal. Core and coil assemblies to be factory tested in accordance with NEMA and ASA standards.

11.2.3 The outgoing sections shall contain fusible switches of the type, size, and poles as shown on the one-line-diagram on the drawings. Switches shall be horsepower rated and shall have quick-make, quick-break mechanism, rotary handle and visible blades. Each switch shall be individually housed in a steel enclosure with a hinged cover that will be interlocked closed when the switch is in the "On" position but can be released for inspection by authorized personnel. The switch handles shall have provision for locking in the "Off" position.

12. LOAD-CENTER PANELBOARDS shall be circuit-breaker equipped. Multipole circuit breakers shall be of the common-trip type having a single operating handle and for sizes of 50 amperes or less may consist of single-pole circuit breakers permanently assembled at the factory into a multipole unit. Plug-in type units are not acceptable.

FORM 2101-1
REV. (7-65)

HOLMES & NARVER, INC.
ENGINEERS - CONSTRUCTORS
ON-CONTINENT TEST DIVISION

File 2a.

TO: Chief of Procurement
FROM: Engineering Manager

JOB: POWER DISTRIBUTION SYSTEM - AMCHITKA ISLAND - ID 1935A
RE:

In reply refer to:
ENG-68-435

DATE: September 13, 1968

Reference: P.O. D-0867-A

On September 11, 1968, Westinghouse drawings and instruction manuals on transformers were submitted to us for information only. In reviewing them we have found that they do not comply with the requirements set forth in AIF 26-E, dated March 21, 1968. A copy of each submittal is attached.

AIF 26-E, Item No. 4 - 1 each, transformer as described in Item No. 1, except it shall have a 480 volt secondary.

The submittal shows a 208 Y/120 volt secondary.

Westinghouse submittals stamped July 15, 1968, show a "CTP" type transformer and these submittals are for a "CP" type and/or an "S" type. We have been assured verbally by the local representative that these are basically the same type of transformers, however, the "S" has no protection, and the "CP" has a low voltage circuit breaker. There is no indication that the current limiting fuses will be furnished with the transformers as specified.

The 30 KVA and 45 KVA do not show the drilling on the secondary terminals as requested.

It is requested that these items be clarified before the equipment is shipped to Amchitka and found not meeting specifications.

Enclosures: Westinghouse Submittal Nos. ABR4479, ABR4480, ABR4486, and ABR4487 and Instruction Manuals.

EPG:JPN:kkf

cc: Engineering Manager/Assistant Engineering Manager (w/o encl)
Assistant General Manager, STS (w/o encl)
Chief Project Engineer, STS (w/o encl)
Production Engineer (w/o encl)
Chief Electrical Design Section (w/encl)
File ID 1935A (w/o encl)
Resident Manager/Resident Engineer, Amchitka (w/encl)

FORM 1327-5V (7/67)

DRAWING TRANSMITTAL & ACKNOWLEDGEMENT

HOLMES & NARVER, INC.
ENGINEERS - CONSTRUCTORS
ON-CONTINENT TEST DIVISION

Date 9-11-68

To: Manager, Engineering

P.O. No. D-0867-A

From: CONTRACTS & SUPPLY, OCTD

Req. No. D-0867 and Rev. 1

Vendor Osborne Electric Supply Co., Inc.

SUBMITTED FOR YOUR REVIEW AND COMMENTS ARE: I N F O R M A T I O N O N L Y

4 EACH, PRINTS _____ EACH, REPRODUCIBLE COPIES

OF DRAWINGS AS LISTED BELOW, SUBMITTED BY Vendor

PLEASE RETURN 1 PRINTS OF EACH DRAWING AND ONE COPY OF THIS FORM TO US FOR DISTRIBUTION.

VENDOR'S DWG. NO.			
587B290			
778C343			
Instruction Manuals			

* INDICATES RE-SUBMISSION.

W. F. Martin

W. F. Martin - Expediting

To: CONTRACT & SUPPLY, O.C.T.D.

From: _____

THE LISTED DRAWINGS ARE RETURNED FOR FURTHER ACTION. OUR REVIEW INDICATES THE FOLLOWING:

☐ APPROVED ☐ APPROVED AS NOTED ☐ APPROVED SUBJECT TO SUBCONTRACT ☐ NOT APPROVED; HAVE VENDOR RE-SUBMIT

COMMENTS:

DRAWINGS CHECKED BY: _____ SECTION: _____

cc: PROJECT ENGINEER (Orig. & Copy)
☐ EXPEDITING, ☐ LOSA – ☐ O.C.T.D.
☐ INSPECTION, ☐ LOSA – ☐ O.C.T.D.
PURCHASING FILE

Instructions for Oil-Immersed Distribution Transformers 5 to 500 KVA, 34,500 Volts and Below Single and Multi-Phase

Westinghouse Electric Corporation

Distribution Transformer Division, Sharon, Pa.

I. B. 46-060-1. Effective October, 1964. Supersedes I. B. 46-100-1A, May, 1954

Table Of Contents

List of Illustrations

SCOPE

This instruction book has been prepared to assist the purchaser in properly installing, operating and maintaining Oil-Immersed Distribution Transformers supplied by Westinghouse. It does not, however, cover all details or variations in the product nor provide for every possible contingency met in connection with installation, operation, and maintenance. Should further instructions be desired, or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the Westinghouse Electric Corporation.

SPECIAL INQUIRIES

When communicating with Westinghouse regarding the product covered by this Instruction Book, include the serial number, style number and sub letter, type, and rating as given on the product nameplate.* Also, to facilitate replies when particular information is required, be sure to state fully and clearly the problem and attendant conditions.

Address all communications to the nearest Westinghouse representative as listed in the back of this book.

* For a permanent record, it is suggested that all nameplate data be duplicated and retained in a convenient location.

NOTE: This Instruction Book includes design changes not covered by Instruction Cards 116, 2339, 2447, 2448, 2462, 2652, and Instruction Books 5379, 5922, 5922-1, 46-100-1, and 46-100-1A.

It is suggested that operators keep the older instructions on file for older transformers in service.

Part One: Description

APPLICATION

Oil-immersed distribution transformers are normally used for stepping public utility "distribution voltages" (ranging from 2400 to 34,500 volts) down to lower utilization voltages. Although some are used for stepping down to industrial voltages of 240/480, 2400 and 4800, most are used for stepping down to the household voltage of 120/240. These same transformers are also used for small substations and miscellaneous applications. As with any transformer, they can also serve to step-up voltages.

COMPONENT PARTS

Oil-immersed distribution transformers consist essentially of: (1) a closed-loop magnetic steel core upon which is wound two or more separate coils; (2) a tank for containing the insulating and cooling oil in which the core-coil assembly is immersed; (3) the necessary bushings for bringing incoming and outgoing leads through the tank or cover; (4) integrally-mounted transformer protective devices such as lightning arresters, protective links and low voltage circuit breakers when ordered by the purchaser.

TRANSFORMER TYPE BY INSTALLATION

Oil-immersed distribution transformers are designed for pole-mounting to serve overhead power distribution systems; concrete pad or surface-mounting to serve partial or entire underground systems; and mounting in underground vaults (subway) for underground systems.

TRANSFORMER TYPE BY PROTECTIVE DEVICES

Completely Self-Protecting "CSP" Transformers have integrally-mounted lightning arresters, and in addition have internally-mounted circuit breakers connected in series with the low-voltage winding, and protective links connected in series with the high-voltage winding. Therefore, no other auxiliary protective devices are required when operating these transformers.

Current-Protecting "CP" Transformers are equipped with the internally-mounted low-voltage circuit breaker and high-voltage protective links, but omit the lightning arresters. These transformers are used in locations where lightning is not a problem, so it follows that again no other auxiliary protective devices are required.

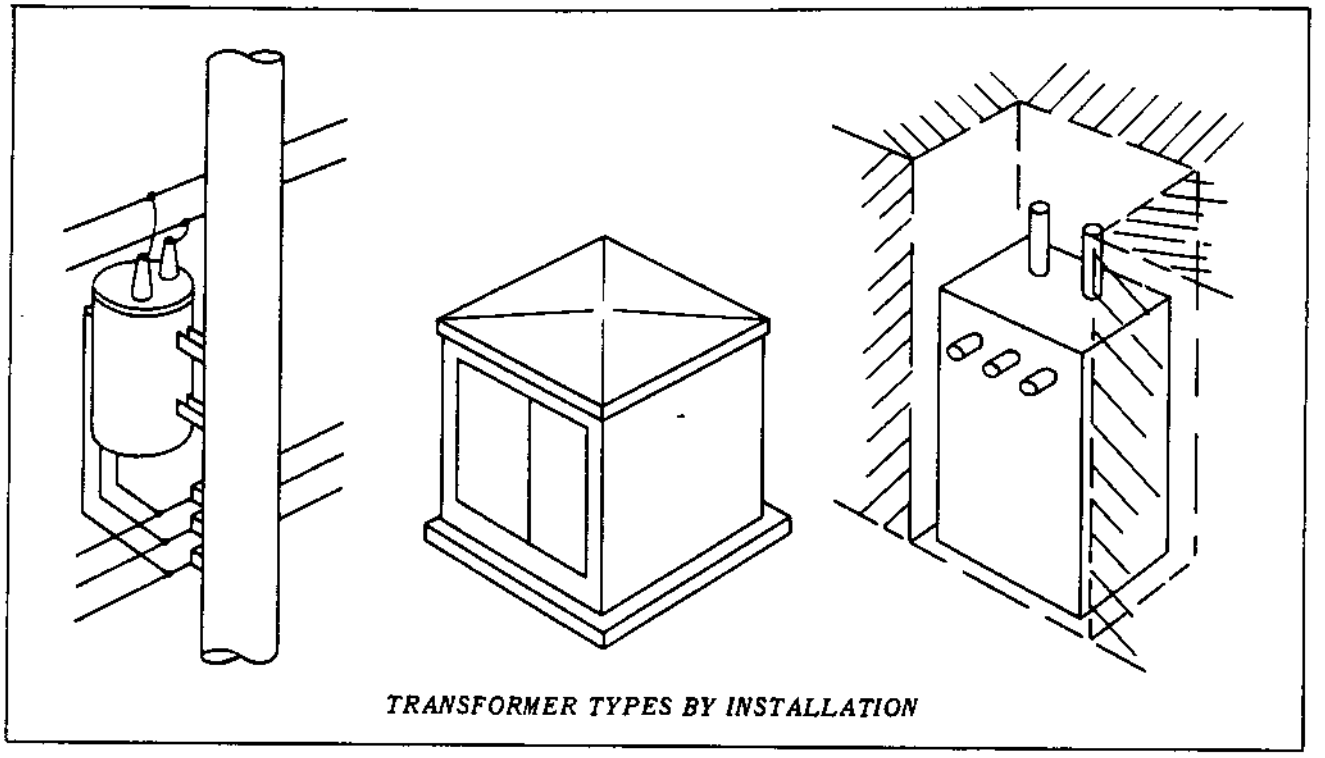
Surge-Protecting "SP" Transformers include integrally-mounted lightning arresters and internally-mounted high-voltage protective links, but omit the internally-mounted low-voltage circuit breaker. These transformers are used in locations where lightning is a problem. However, the protective links simply protect the system from outage due to internal transformer failure, so that if overload protection is desirable, it must be provided by external fuses.

Conventional "S" Transformers contain no protective equipment. Therefore lightning and over-current protection for these transformers must be provided by purchaser installed auxiliary protective devices.

TRANSFORMER CONSTRUCTION

Unless specifically ordered otherwise, oil-immersed distribution transformers are constructed in conformance with current ASA, I.E.E.E., N.E.M.A., and E.E.I.-N.E.M.A. standards.

Single-Phase Transformers consists of a single core - coil assembly housed in either a round or rectangular tank.



TRANSFORMER TYPES BY INSTALLATION

Fig. 1
POLE-MOUNTED

Fig. 2
PAD-MOUNTED

Fig. 3
SUBWAY

Three-Phase Transformers are generally of the T-T or "Scott" connected construction, employing the use of two single-phase core - coil assemblies mounted in either a round or rectangular tank. Based on design and the purchaser's requirements, the core - coil assemblies can be mounted side-by-side or one above the other. Triplex three-phase transformers made from three single-phase core - coil assemblies, and other multi-phase transformers in duplex or single common core construction are manufactured to the purchaser's requirements.

TRANSFORMER BY CLASS

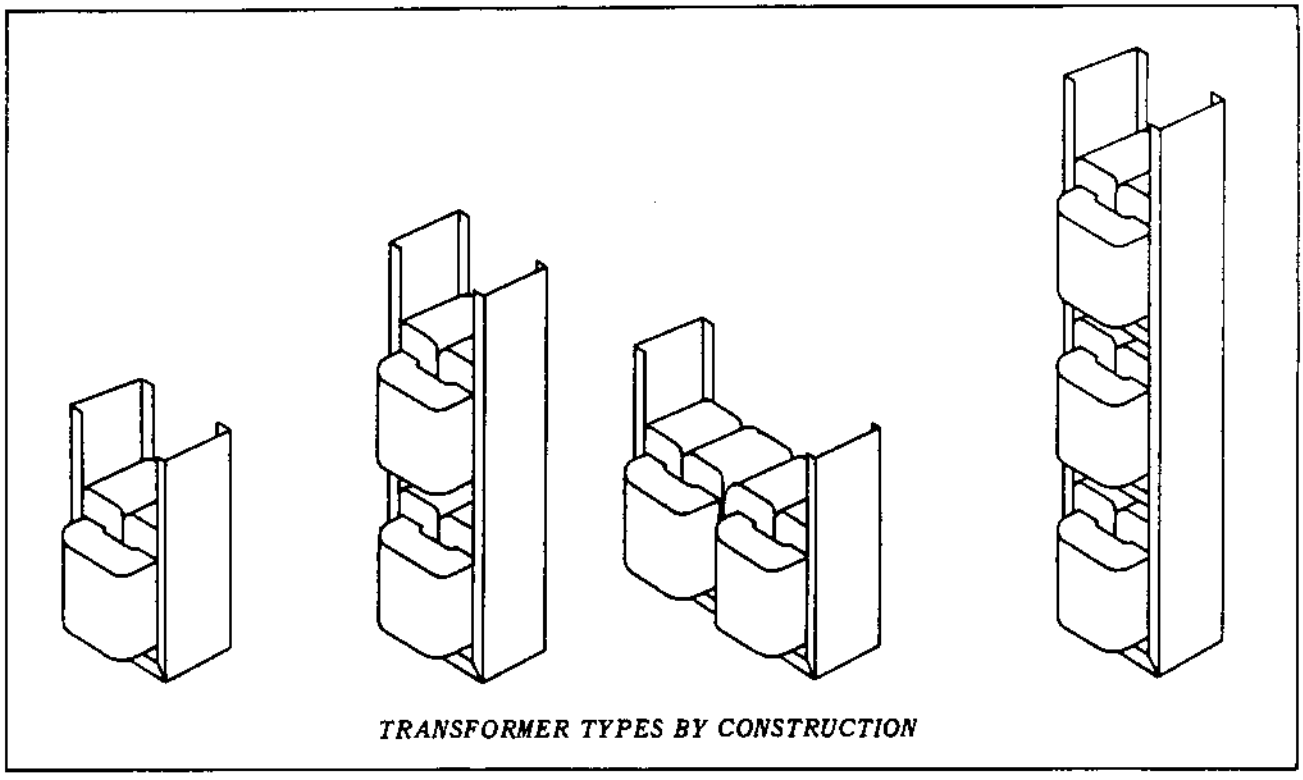
Class A are single-phase transformers with two fully-insulated high-voltage bushings.

Class B-1 are single-phase transformers with one fully-insulated high-voltage bushing and one neutral or partially-insulated high-voltage bushing. This type transformer is generally supplied so as to permit the purchaser to use either high-voltage bushing as the neutral bushing. (The arrester on a CSP transformer is also transferable.)

Class B-2 and B-3 are single-phase transformers with one fully-insulated high-voltage bushing, the other end of the high-voltage winding being grounded internally to the tank. The low-voltage winding is also grounded to the tank externally.

TRANSFORMER PROTECTIVE DEVICES

The major transformer protective devices are the internally-mounted circuit breaker,



TRANSFORMER TYPES BY CONSTRUCTION

Fig. 4
SINGLE-PHASE
CORE & COIL

Fig. 5
THREE-PHASE
T-T DUPLEX

Fig. 6
THREE-PHASE
TRIPLEX

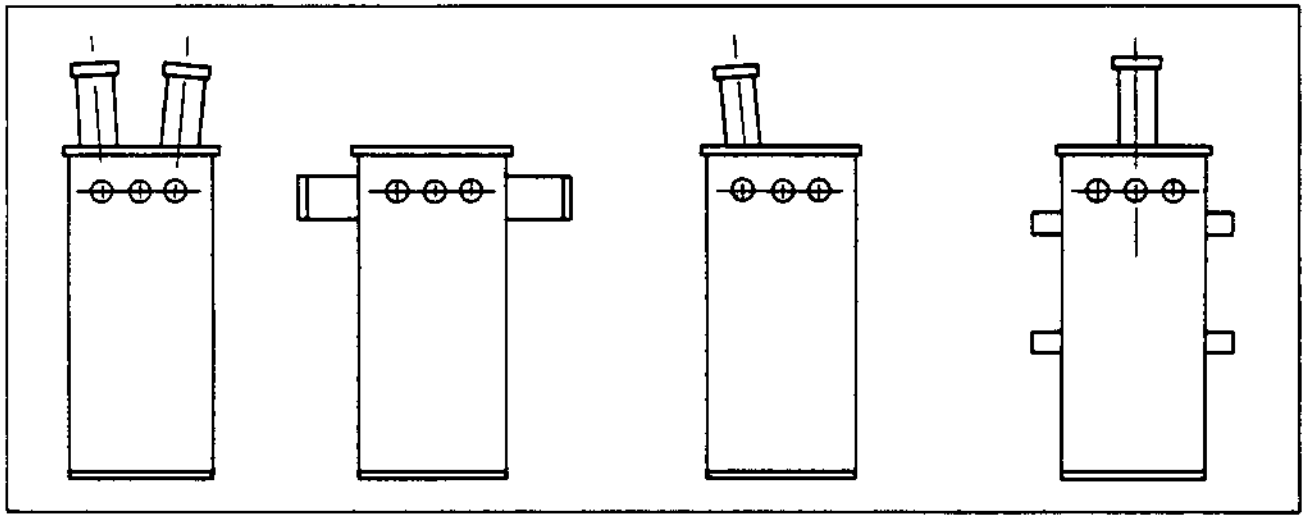
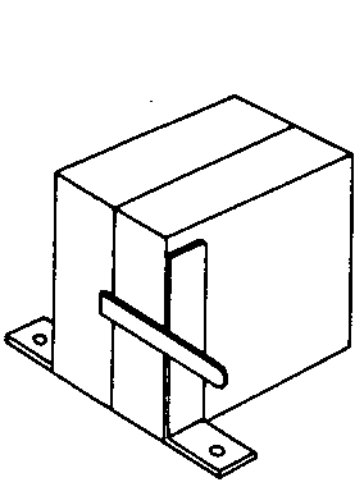
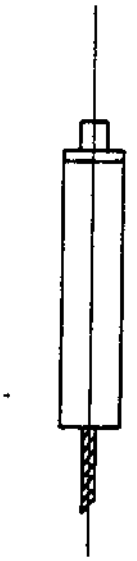


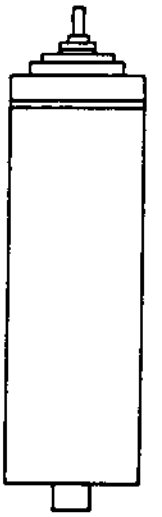
Fig. 7
CLASS A

Fig. 8
CLASS B2

Fig. 9
CLASS B3







TRANSFORMER PROTECTIVE DEVICES

Fig. 10
CIRCUIT BREAKER

Fig. 11
PROTECTIVE LINK

Fig. 12
LIGHTNING ARRESTER

the protective link, and the integrally-mounted lightning arrester.

The circuit breaker protects the transformer against secondary short circuits and abnormal overloads.

The protective link is designed to isolate the transformer from the system in case of transformer fault and prevent system lockout.

The lightning arrester protects the transformer against dangerous over-voltages of all kinds whether they originate from lightning, switching surges or other transients.

Part Two: Installation

RECEIVING, INSPECTION, HANDLING AND STORING

Oil-immersed distribution transformers are normally shipped completely assembled. (If ordered, pole hangers are shipped separately.) All transformers should be carefully inspected upon receipt and the transportation company notified of any damage.

The majority of the transformers are now shipped on a simple pallet, the transformer being securely attached to the pallet by means of metal straps banded over the transformer's lifting lugs. The palletized transformer may be moved readily, by lift truck, crane or cart. (NEVER LIFT OR DRAG ANY TRANSFORMER BY THE BUSHINGS OR ARRESTERS.)

No unusual precautions for storing need be taken because distribution transformers are normally built for outdoor service. Care must be exercised to prevent their being submerged in water (except "Subway" transformers).

Although Westinghouse takes every precaution to assure purchaser the transformers arrive at their destination in first-class condition, the purchaser should examine the exterior carefully for damage to porcelain insulators and arresters.

PREPARATION FOR INSTALLATION

The purchaser should perform a final inspection of oil-immersed distribution transformers prior to installation.

FINISH

The transformer is supplied with a high quality finish to withstand long outdoor exposure service. However, in transformer shipping and handling, the finish may be scratched or abraded. The scratches and abrasions should be touched up with approved outdoor materials recommended by Westinghouse Electric Corporation.

WEMCO CI OIL

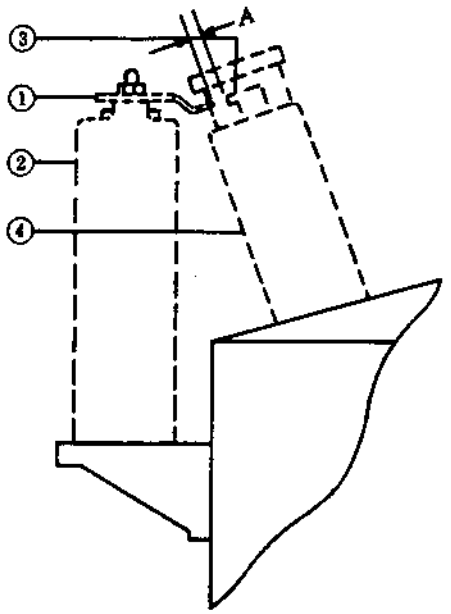
The transformers are normally filled with dry de-gassed inhibited oil at the factory, after vacuum treatment of the core - coil assemblies in their own tanks. It is only by such a treatment that a high initial dielectric strength, comparable to that attained after long periods in service, can be obtained. Transformers must never be operated with the oil level more than 1/4" below the cold oil level mark. Should transformer oil have to be replenished, care must be taken that no moisture gets inside the transformer. Oil of normal dryness will test 22 Kv or higher in the standard test cap.

MOISTURE

Transformer insulation's greatest enemy is moisture. Keep the transformer sealed at all times (except minimum inspection or adjustment periods) to avoid transferal of moisture from the atmosphere to the transformer oil and from the oil to the transformer insulation. Care must be used in replacing the cover. If the gasket is not properly in place, and the cover not securely bolted, moisture in the form of rain or snow will be sucked into the tank.

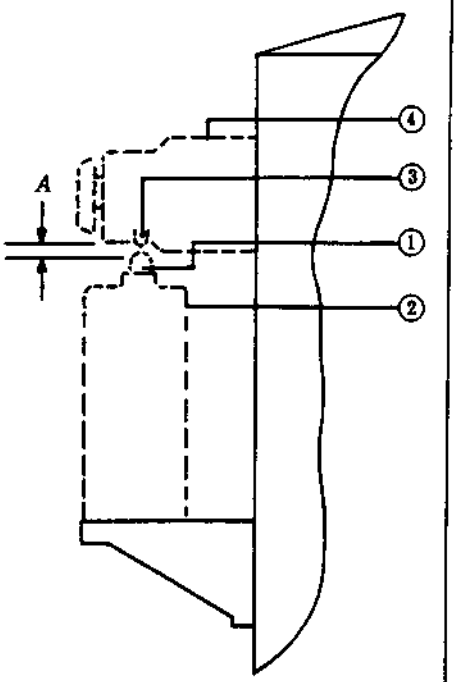
OPERATOR'S DATA

The purchaser's or operator's data may be attached to the transformer by using the space provided on the nameplate or on the



ARRESTER ISOLATING GAP	
KV ①	"A" Gap Setting
3/4	1/4, - 1/32 + 1/8
3	1/4, - 1/32 + 1/8
6	3/8, - 1/32 + 3/16
9	1/2, - 1/16 + 1/4
10	1/2, - 1/16 + 1/4
15	3/4, - 1/16 + 3/8
18	3/4, - 1/16 + 3/8

① Kv Rating of Arrester



COVER MOUNTED BUSHING AND ARRESTER *WALL MOUNTED BUSHING AND ARRESTER*

1 Movable Electrode* 2 Arrester 3 Fixed Electrode 4 H.V. Bushing

*Obtained by adjusting mounting position on wall

Fig. 13 LIGHTNING ARRESTERS AND GAP ADJUSTMENTS

pad below the nameplate. Holes in the pad may be tapped for #6-32 machine screws, or #4 self-tapping screws may be used. Screws shall be 5/16 ± 1/16 inch long.

LIGHTNING ARRESTER GAP SETTINGS

For proper operation the external air gaps of lightning arresters should have spacings as shown in Fig. 13. The settings are made at the factory and normally require no adjustment, unless they may have been changed adversely due to tampering or damage in handling and shipping.

NAMEPLATE

If the transformer has multiple high-voltage or low-voltage ratings, refer to the diagram nameplate and connect the transformer or adjust the tap changer for the desired voltage prior to installation. THE TRANSFORMER MUST BE DE-ENERGIZED WHEN MAKING ADJUSTMENTS AND CHANGING CONNECTIONS.

PROTECTIVE LINK COORDINATION

"SP" and "CSP" transformers are provided with internally-mounted protective

links intended to fuse should a fault develop within the winding of the transformer. In order to limit the outage to a single transformer, it is important that any external fuses, circuit reclosers, or circuit breakers at branch lines or substations through which the transformer is fed be coordinated with the protective links. A more detailed discussion of the coordination of over-current devices is given in Westinghouse Transformer Technical Data Booklet No. 46-162. Current-time fusing characteristics of transformer protective links and system type T, K, and TU fuses is given in booklet No. 46-162A.

WINDING CONNECTIONS

Unless otherwise requested by the purchaser --

High-voltage windings having taps are connected when shipped for the rated voltage.

High-voltage windings of single-phase transformers designed for series-multiple operation (without external switch provision) are connected for the series voltage.

Transformers for series-multiple operation on the high-voltage side having externally-operated switches, are shipped connected for the lowest voltage, because it is assumed that this is the voltage at which they will be operated initially.

Low-voltage windings of single-phase transformers designed for both series-multiple and three-wire operation, where connections are made inside the tank, are connected for series or three-wire operation.

Three-phase transformers with low-voltage windings rated 240x480 volts shall be connected for 480 volts operation.

Three-phase transformers designed for both delta and wye operation on the high voltage side are normally shipped connected for the wye voltage.

Depending on individual circumstances, it may be desirable to change the connections or taps before mounting the transformer on the pole. For three-phase installations, it is important the connections (and taps) be alike on all three phases.

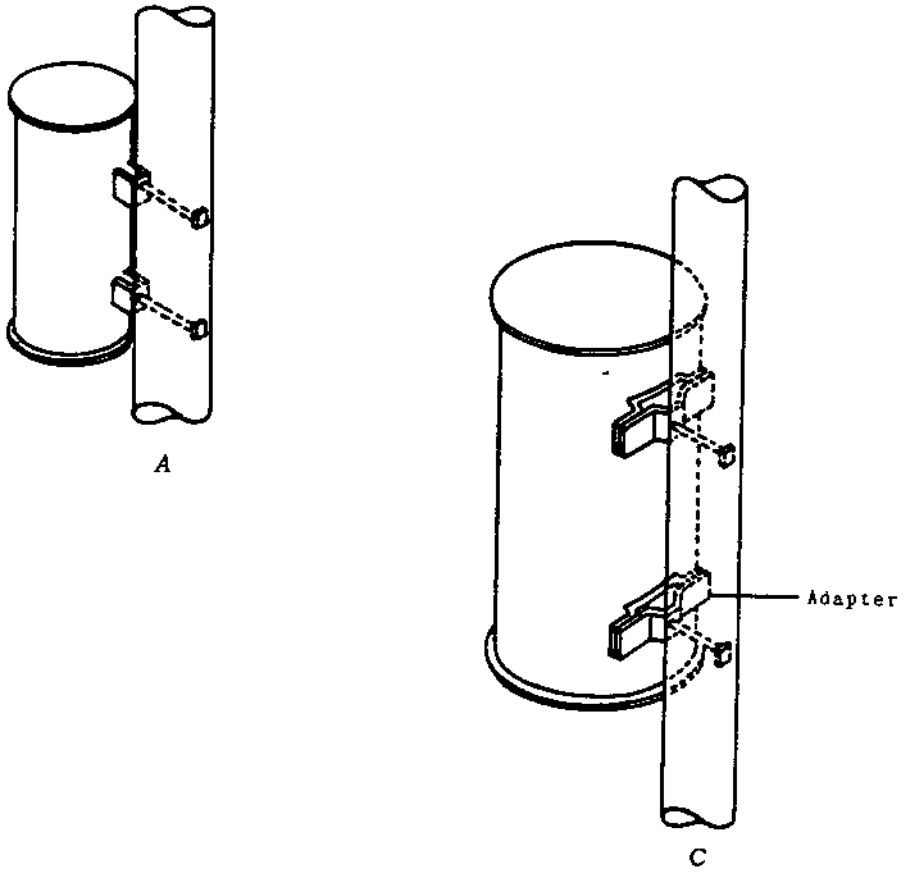
PARALLEL OPERATION

When transformers are banked in multiple along a line on different poles, the line drop will usually compensate for difference in impedance. However, transformers on the same pole are not usually operated in parallel, except in emergency, because the losses in the units will exceed the losses of a larger unit having a rating equal to their total. If transformers are so operated, the transformer having the lowest impedance will take more than its share of the load. Transformers are considered satisfactory for paralleling if their impedances are within 7.5 percent of the larger value for two-winding transformers or 10 percent for auto-transformers, providing, of course, their ratios are the same.

MOUNTING

Single-phase and three-phase pole-type transformers are provided with hanger lugs and may be mounted on poles, platforms, or pads, as desired. When platform or pad mounted, the hanger lugs may be used for bracing.

The simplest and most economical method of mounting, particularly for "CSP" transformers where no auxiliary equipment on the pole is necessary, is to bolt the transformer directly to the pole as shown in Fig. 14. Transformers above 100 Kva



DIRECT POLE MOUNTING OF DISTRIBUTION TRANSFORMERS
A - With Type "A" Support Lugs
B - With Type "B" Support Lugs
C - With Type "C" Support Plates

Fig. 14

require an adapter for direct pole mounting. No crossarms on the pole are required unless needed for other purposes.

Where two crossarms are used for mounting the transformers on a pole, "T crossarm hangers" for ratings through 100 Kva and type "C crossarm hangers" for the larger ratings are available from Westinghouse. In these cases, the lower portion of the crossarm hangers rest against the lower crossarm. If desired, lag screws may be inserted through holes in the bottom of the hangers into the lower crossarms.

Where "T crossarm hangers" are used, if desired, the lower crossarm maybe omitted and replaced by a "kicker" bracket available from Westinghouse. The "kicker"

rests directly against the pole. A lag screw or through bolt is needed to secure it to the pole.

Regardless of the type of mounting used, oil-immersed distribution transformers must always be mounted vertically to assure proper oil immersion of terminal blocks, circuit breakers, protective links, bushings, and other transformer parts designed to operate under oil for insulating and cooling purposes.

HIGH VOLTAGE CONNECTIONS

Refer to the diagram nameplate on the transformer for proper connection of the transformer to the system. When installing a transformer, the amount of protective apparatus required depends upon the type of transformer. The completely self-protecting "CSP" transformer requires neither lightning arresters nor fuse cutouts; however, conventional type "S" transformers should be provided with both lightning arresters and fuse cutouts. Hot-line clamps may be advantageously used (particularly with "CSP" transformers) for connecting the transformer to the high voltage lines.

Westinghouse Instruction Book 46-100-3 shows the more common external circuit connection diagrams for single-, two-, three- and six-phase connections.

LOW-VOLTAGE CONNECTIONS

Refer to the diagram nameplate on the transformer for proper connection of the transformer to the system.

If a parallel connection of two sections of a low-voltage winding is made outside the transformer tank, the connection must be as short and as close to the low-voltage bushings as possible to insure equal division of current between the winding sections.

Where single-phase, three-wire service is supplied from a single-phase transformer, the neutral is usually grounded. When two-wire service is supplied, one of the leads is usually grounded if conditions permit. See National Electric Code for specific instructions. If the internal leads are reconnected at the low-voltage bushings to secure two-wire service, maintain at least one-inch clearance between live parts and between live parts and ground.

TANK GROUNDING CONNECTIONS

All transformers are provided with tank grounding provisions. Most public utilities follow a practice of grounding distribution transformer tanks - however, many operate with ungrounded tanks. Westinghouse transformers (except those with one high-voltage lead solidly connected to the tank) may be operated either way.

On transformers with lightning arresters, the arresters discharge lightning surges to the tank. When tanks are to be operated ungrounded, a tank discharge gap must be used. The gap, normally insulated from ground, sparks over to form a discharge path for dissipating the lightning surge to ground during the time of a lightning stroke.

Transformers are not normally supplied with a tank discharge gap. If desired, the gap must be ordered as a separate item.

BUSHING CONNECTORS

High- and low-voltage bushing connectors are compatible with either copper or aluminum conductors used in distribution systems.

Part Three: Operation And Maintenance

OPERATING LIMITS

Generally very little operating attention is required for oil-immersed distribution transformers, because there are no moving parts in the transformer proper. However, care should be used that the following major operating limits are not exceeded, or if exceeded, that sufficient compensation is provided elsewhere:

1. Frequency should not be appreciably lower than or greatly in excess of rating.

2. Voltage should not exceed rating by more than 5 percent while delivering continuous output or by more than 10% at no load.

3. Elevation at installation should not exceed 3300 feet (1000 meters) above sea level (unless the transformer was designed for this service).

4. Ambient temperature should not exceed 40 degrees C and the average temperature for any 24 hour period should not exceed 30 degrees C (unless the transformer is specifically designed for this service).

5. Continuous Kva load should not exceed rating (except for "CSP" transformers, in which case the circuit breaker will automatically allow loading up to full thermal capacity of the transformer, according to existing ambient temperature).

6. Continuous Kva load on reduced capacity taps should not exceed reduced capacity rating (except "CSP" transformers). Taps at voltages less than 90 percent of maximum voltage are usually rated at reduced Kva.

7. For transformers which do not have built-in lightning protection, suitable external protection should be provided since bushing flashover is not considered adequate protection against all forms of lightning.

TAPS

CAUTION: To avoid danger to life and damage to property, connections must not be changed by either tap changers or terminal boards while the transformer is energized. These devices are not designed to change connections while carrying current. On three-phase installations, the voltage ratings of connections used should be the same for all three phases.

When the secondary voltage is too low, it may be raised by moving the tap changer on the primary side to a position having a lower rated voltage. The operating handle is above the oil level, and an indicator plate (with numerals corresponding to the position numbers on the diagram nameplate) is located just below the handle.

The positive snap action of the tap changer into position also guides the operator and insures a positive contact and a stop is provided to identify the highest and the lowest tap positions. Where a terminal board is furnished in lieu of a tap changer, similar results can be obtained by reconnecting in accordance with the connection diagram specified on the nameplate.

CIRCUIT BREAKER MANUAL OPERATION

On all "CSP" or "CP" transformers, the circuit breaker may be opened to drop the secondary load or to disconnect the low-voltage windings of the transformer from the low-voltage bushings. This opening

is accomplished by moving the circuit breaker external operating handle located at the top of the tank wall from C toward R to its extreme position. Reclosing the breaker is accomplished by moving the handle back to its original C or closed position.

The circuit breaker external operating handle rotates in a quadrant or boss through the tank wall of the transformer. The mechanism is marked with letters C - L - O - R, indicating the direction of travel and the sequence of manual operations of the handle; that is, Close - Light reset - Open - Reset latches.

SIGNAL LIGHTS

On all "CSP" or "CP" transformers (except some 5 Kva ratings), the signal light furnishes a valuable service by indicating growing transformer overloads which could eventually cause breaker tripping. The signal light also indicates that point in the transformer loading at which it becomes more economical to install the next larger Kva rating transformer, than to further overload the existing transformer.

Whenever a signal light is observed, it is common practice to reset the light at least once to determine whether its operation was caused by an isolated load condition or whether it was caused by a repetitive condition. The signal light may be reset without disconnecting the secondary load by moving the external operating handle to the L (light reset) position and moving it back to the C or close position. If the light is immediately relighted, the overload is either still continuing or has occurred so recently that the transformer has not yet cooled down. If the light is relighted within a few days, this is an indication of a recurrent overload.

CIRCUIT BREAKER TRIPPING

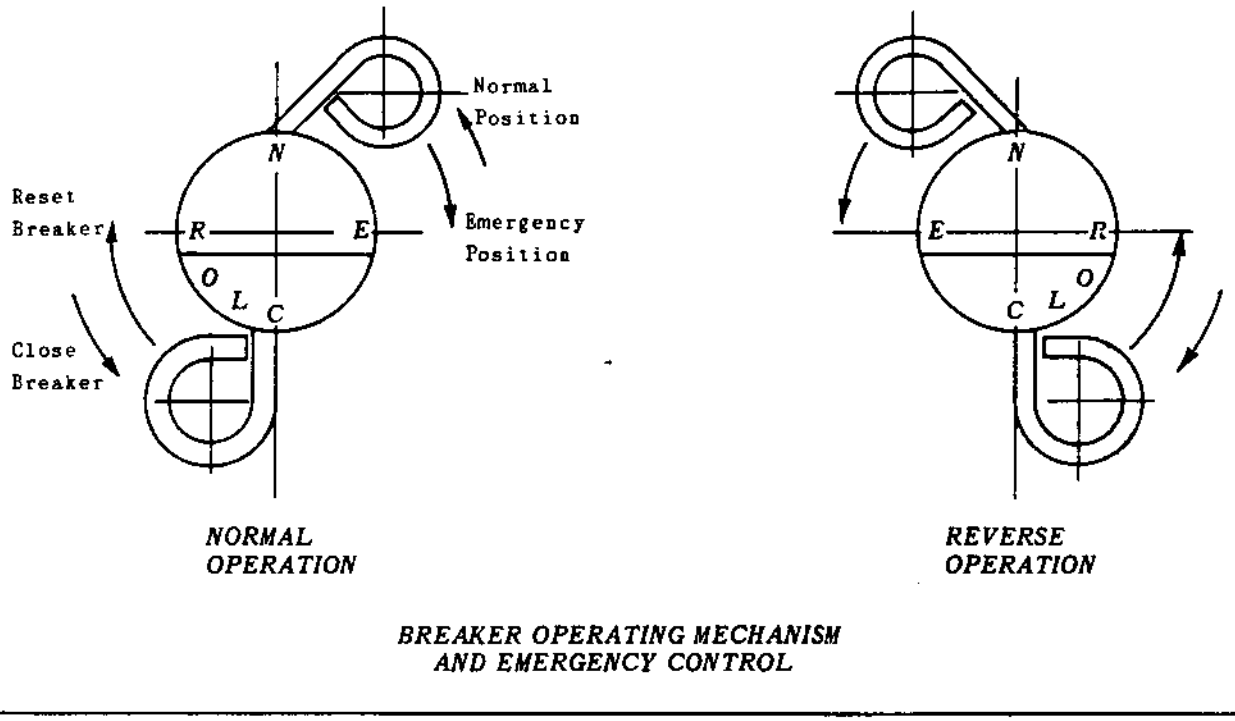
In most cases, if the signal light warning is not heeded, or if the overload is extreme, the circuit breaker may trip open to prevent the winding from burning out. Since this will disconnect the load entirely, the transformer will usually have cooled sufficiently by the time the trouble-man arrives that the breaker can be reclosed to restore service at least temporarily. If the oil temperature is still high, the signal light may continue to burn after the breaker has been reset. If the load is still excessive, the circuit breaker may again trip open to protect the winding against burnout.

IMPORTANT: On transformers which have two circuit breakers, both breakers must be closed to secure full transformer capacity.

CIRCUIT BREAKER EMERGENCY CONTROL

Following a circuit breaker tripout due to a long, sustained overload condition, the transformer oil may not have had time to cool sufficiently to allow the breaker latch to be reset immediately, therefore making it impossible to reclose the breaker.

On all "CSP" and "CP" transformers (except some 5 Kva and ratings 167 Kva and above), an Emergency Control Lever, located above the breaker operating handle, is provided to recalibrate the breaker to a higher trip temperature and thus allow immediate breaker reclosing. The Emergency Control Lever, held in its normal or N position by a meter seal, acts to increase the breaker trip temperature when it is pulled downward to the emergency or E position by hand or by a hookstick. The meter seal is designed to slip upon the application of a downward force to the



BREAKER OPERATING MECHANISM AND EMERGENCY CONTROL

Fig. 15

Emergency Control Lever, so it need not be removed completely.

In general, it is desirable to return the Emergency Control Lever to its upward or "Normal" position within a day or two after its use. Extended use of the Emergency Trip Setting of the breaker will result in higher winding temperatures before the breaker trips with subsequent reduction in transformer life.

PRECAUTIONS

1. When a transformer is disconnected from the line, make certain the lines from the transformer to the open disconnects or open breaker are grounded. Make certain there can be no backfeed, the transformer is de-energized and cannot be re-energized while you are working on it.

2. If it is necessary to remove the cover when working on a transformer, great care should be taken to prevent loose articles from falling into the tank, since these materials if allowed to remain may cause a breakdown.

3. Treat all wires and testing equipment as energized and capable of severe shock.

4. Work safely. All safety rules of the purchaser should be followed.

5. Use only approved fire extinguishers such as CO_2 and Pyrene for electrical equipment fires.

6. Never operate or change positions on tap changers, terminal blocks and switches (designed for changes during de-energized periods) while the transformer is energized.

7. Never operate or apply voltage to transformers with oil below the proper level.

8. Transformers should be protected from excessive overloads and faults due to lightning surges, and short circuits with approved protective devices. ("CSP" transformers are totally protected and therefore require no additional protective devices.)

9. Make sure lightning arresters have the proper external gap settings prior to energizing the transformers.

10. Carefully check the nameplate for the rating and proper designated connection of the transformer to the system.

11. Never lift or drag any transformer by the bushings or arresters.

12. Don't expose the inside of a transformer to the atmosphere over an extended period of time. Keep it sealed tight, except when inspecting, changing connections or making minor repairs. This should be done as quickly as possible.

OTHER INFORMATION

Complete instructions covering detailed description of construction, application, operation and maintenance of oil-immersed distribution transformers and all accessories can be obtained through your nearest Westinghouse representative.

MAINTENANCE

Because of the comparatively small investment involved at each location and because of the generally high level of reliability, very little inspection or maintenance is economically justified for the great majority of distribution transformers. A visual inspection of the external parts of the transformer is desirable at perhaps two to five-year intervals based on local operating conditions and experience. At such times the general condition of the following should be noted:

1. High-voltage bushings and leads.

2. Low-voltage bushings and leads.

3. Lightning arresters and porcelains.

4. Finish on tank.

5. Transformer gasket seals.

Where parts have become broken or where the tank shows evidence of excessive rusting, the transformer should be repaired.

When transformers are returned to a service shop for any reason, it is common practice to make a thorough inspection of all parts, and make any additional repairs which may be indicated, including the repainting of at least the exterior surfaces of the tank. Gasket seals of the transformer should also be checked at this time. If there is any evidence of moisture having entered the unit, the oil should be drained, the core and coil assembly thoroughly dried, and the unit then refilled with new inhibited "Wemco CI" oil. Vacuum treat the transformer after refilling to insure maximum electrical strength. Whether or not the oil is replaced, the level should be brought to the proper height, as indicated by the oil gauge (if any) or by the oil level mark on the inside of the tank.

CAUTION: If the transformer is tested either before or after the repair operations, the test voltage used should not exceed 65 percent of the factory test values. See N.E.M.A. Transformer Standard 48-132.

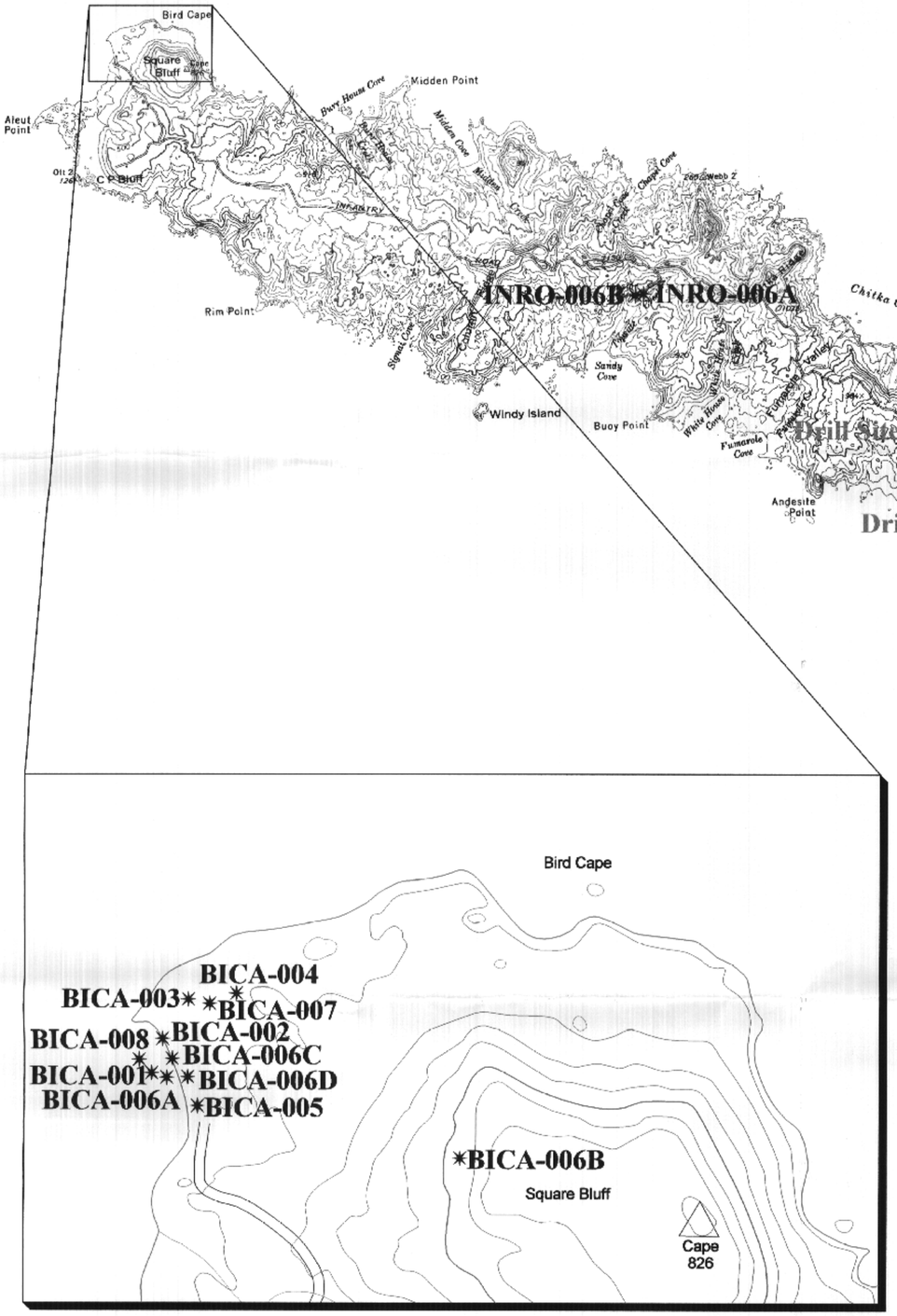
RENEWAL PARTS

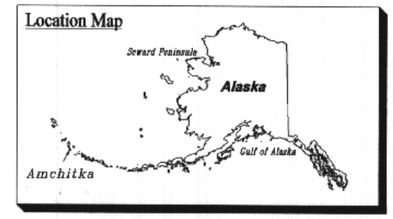
Maintenance and repair work on distribution transformers is usually done in a shop after a replacement unit has been installed to continue service. It is, therefore, not usually necessary that spare parts be carried to meet emergency conditions, but only from a repair shop "convenience" standpoint. Stocking practice varies widely with different operators. It sometimes depends on how many units are in service with like parts. Most operators limit their renewal parts stock to bushings, terminal boards, tap changers and in some case (for "SP" and "CSP" transformers) lightning arresters. Some operators carry practically no renewal parts but order them when required for a specific case.

Renewal parts information for Westinghouse transformers is available upon request.

Memorandum

Plates





Potential Responsible Parties

- DOE
- COE/DOD

Note

See Table 2-1 for Site Identification.

Scale
0 1 2 Miles
0 2 4 Kilometers

Bird Cape
Aleut Point
Square Bluff
Cape Alaska
Midden Point
Port House Cove
Midden Cove
Middle Creek
Chapel Cove
Rim Point
Stone Cove
Sandy Cove
Windy Island
Buoy Point
Andesite Point
Fumarole Valley
Fumarole Cove
White House Cove
Chitka Cove
Chitka
Low Bluff
Peregrine Point
Landslide Cove
Drill Site E
Drill Site E
Drill Site E
Fossil Lake
Sea Otter Point
Lisnyi Creek
Drill Site D
Milepost 14 Lake
Petrel Point
Milepost 12 Lake
Emerald Lake
Mex Island
INRO-005
INRO-003
Crown Reefer Point
BACA-014
See Plate 2 for Base Camp Area
Bat Island
Kirilof Point
Ivakin Point
Constantine Harbor
Constantine Point
Whale Cove
Clam Point
Rifle Range Point
Pratfall Lake
Gallon Pit
Tin Lake
Stone Beach Cove
Makarius Bay
Mason Lake
Engineer Lake
Cyril Cove
Long Shot
Quonset Lake
Twin Lakes
Heart Lake
Big Lake
North Bight
Gravel Pit
East Cape
BACA-009
BACA-008
St Makarius Point
Pillow Point
Omega Point
Grampus Point
Pacific Ocean
Bering Sea

Source: Melvin L. Merritt and R. Glen Fuller,1977
U.S. Atomic Energy Commission, Nevada Operations Office, 1972
U.S. Fish and Wildlife Service, 1993

PLATE 1
Potentially Contaminated Sites
Amchitka Island, Alaska

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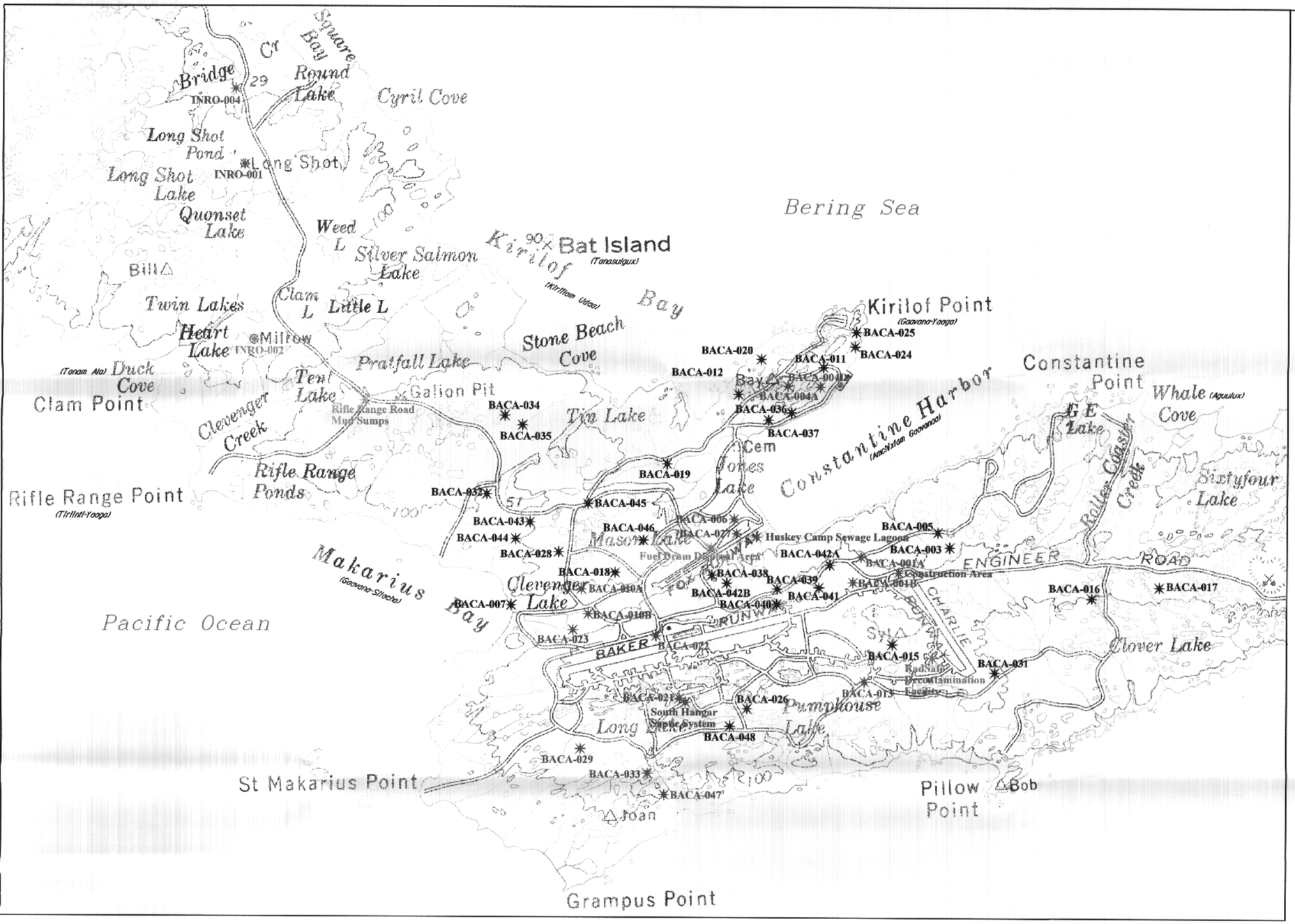
10-DEC-1998



Potential Responsible Parties

- DOE
- COE/DOD
- Navy
- USFWS
- Multiple Responsible Parties

Note

See Table 2-1 for Site Identification.

Scale

0 3,000 6,000 Feet

0 1 2 Kilometers

Source: Melvin L. Merritt and R. Glen Fuller,1977
U.S. Atomic Energy Commission, Nevada Operations Office, 1972
U.S. Fish and Wildlife Service, 1993

PLATE 2
Potentially Contaminated Sites
Base Camp Area and Infantry Road
Amchitka Island, Alaska

Distribution List

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