APPENDIX G: Tsunami Warning Dissemination

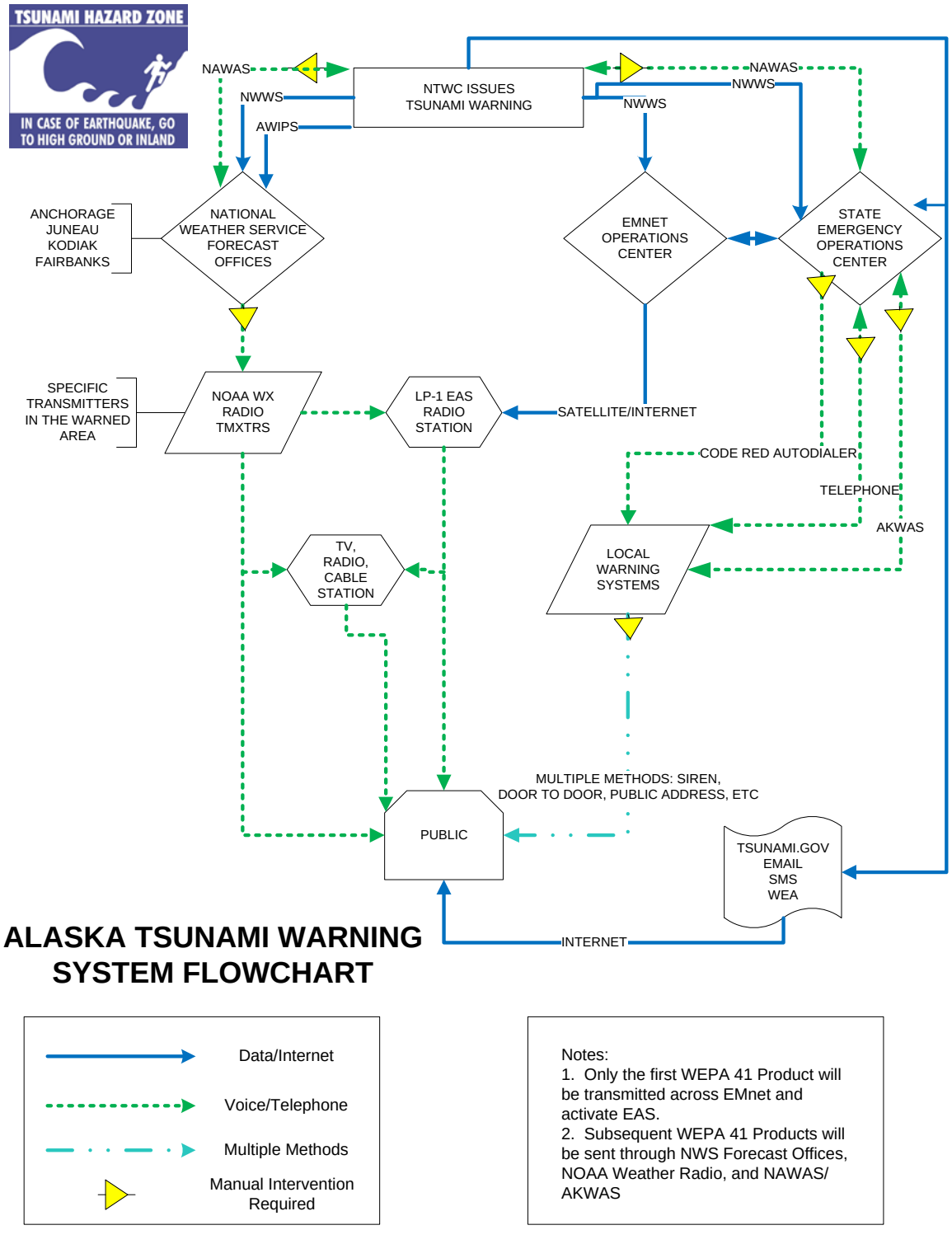

Figure G1: Tsunami Warning Dissemination

I. Tsunami Warning System Description

The tsunami warning system in Alaska is comprised of a number of elements designed to alert the public and governmental organizations of the threat posed by significant coastal inundation, flooding, or wave action caused by a tsunamigenic event.

> *Large earthquakes have the potential to generate local tsunamis. In the event of a locally-generated tsunami, the earthquake is your warning.* ***If you feel the ground shake for 20 seconds or more, and you find it difficult to stand, move inland or to higher ground as soon as possible.***

II. Tsunami Warning Dissemination Systems

A. *National Tsunami Warning Center (NTWC)*

The NTWC's mission is to provide accurate and timely tsunami bulletins to its area of responsibility (which includes Alaska). The center detects, locates, sizes, and analyzes earthquakes throughout the world. Earthquakes that activate the center's alarm system initiate an earthquake and tsunami investigation, including: sea level data analysis and tsunami forecasting; and information is disseminated to the appropriate emergency management officials. ***For purposes of this appendix to the State Emergency Alert System (EAS) Plan, only Tsunami Warning products are disseminated through the EAS***. *Tsunami Watches*, *Tsunami Advisories*, and *Tsunami Information Statements* are not transmitted through EAS. Upon identification of an event that meets the criteria for a Tsunami Warning, the NTWC broadcasts Tsunami Warning product utilizing the World Meteorological Organization (WMO) header of WEPA41 PAAQ and NWS Advanced Weather Information Processing System (AWIPS) ID of TSUWCA. These products are simultaneously transmitted across the NOAA Weather Wire System (NWWS) and AWIPS. In addition, the NTWC communicates with the Alaska State Emergency Operations Center (SEOC) and NWS Forecast Offices in Anchorage, Juneau, and Fairbanks through the National Warning System (NAWAS). For more information visit;

http://ntwc.arh.noaa.gov/operations/opsmanual.pdf

B. *EMnet*

EMnet is a satellite and internet-based warning dissemination system. EMnet monitors the NWWS feed, and upon receipt of an initial WEPA41 PAAQ message automatically converts the product into an EAS-formatted message and broadcasts an EAS Tsunami Warning (TSW) product to each State Relay Network (SRN) station and Local Primary - 1 (LP-1) station located within the warned area. LP-1 stations that serve primarily coastal southern Alaska receive the TSW from an EMnet satellite receiver and terminal, and forward that information to an EAS encoder/decoder at the station. Each EMnet terminal in Alaska is configured to automatically activate that stations' encoder, with no delay. **Only the initial WEPA41 PAAQ message will be transmitted via EMnet. Subsequent updates to the original warning product will be transmitted across**

NOAA All Hazards Weather Radio, NAWAS/AKWAS, internet, RSS, email, text, and other systems.

C. *NOAA Weather Radio All Hazards (NWR)*

NWR is a nationwide network of radio stations broadcasting continuous weather information direct from a nearby NWS Office. Refer to Appendix F for a map and table of NWR transmitter locations in Alaska. Upon receipt of the WEPA41 PAAQ/TSUWCA from AWIPS, the appropriate forecast office creates a SAME-formatted tsunami product in the NWS Console Replacement System (CRS), selects the appropriate transmitters in the warned area, and broadcasts the warning. (The only exception is for NWR transmitters controlled by the Kodiak NWS Service Office. In Kodiak, the AWIPS product is manually converted and recorded in a legacy NWR system). In addition to specific NWR transmitters, the TSW is also broadcast on U.S. Coast Guard VHF high-sites in the warned area. Agencies and individuals who have purchased commercial NWR receivers and have configured them for TSWs will be alerted automatically through this system. Separate from the NWR and USCG High Sites the US Coast Guard rebroadcasts the warning information on VHF Marine Channel 16.

D. *Emergency Alert System (EAS)*

The Emergency Alert System (EAS) is comprised of participating broadcast radio and television stations, cable system operators, and certain wireline video providers. EAS is a "daisy-chain" system, in which downstream stations receive warnings that are retransmitted from other broadcast TV, radio, and cable systems. In Alaska, TSWs are received by the State Primary (SP), SRN stations, and LP-1s through EMnet and/or NWR. The rest of Alaska's EAS participants receive the TSW from the SP, SRN station, LP-1, or NWR transmitter in their area. Participating stations in coastal areas therefore have redundant methods of receiving the initial WEPA41 PAAQ. Subsequent updates to the initial WEPA41 PAAQ/TSW will be transmitted to EAS stations via NWR. In the event that the WEPA41 PAAQ/TSW message cannot be transmitted or received through NWWS/EMnet or AWIPS/NWR, the remaining State Origination Points (State EOC, AST Fairbanks Dispatch Center, or City of Wasilla Police Department MatCom dispatch center) can activate EAS through either EMnet or through legacy EAS equipment and a telephone or UHF radio link to the SP station; refer to Appendix E, Alaska State Relay Network, for a visual depiction of the legacy EAS architecture.

E. *National Warning System (NAWAS) / Alaska Warning System (AKWAS)*

NAWAS is a four-wire, terrestrial ring down voice telephone system used to convey warnings from the federal government to state and federal warning points. During tsunami warning events, NTWC contacts the FEMA Alternate Operations Center, who in turn connects NTWC directly with all state and federal warning points along the West Coast of the United States, including Alaska, and the Province of British Columbia, Canada. This "party line" is used to verbally relay the information contained in the NTWC WEPA41 PAAQ product. In turn, AKWAS is the State of Alaska system, which connects the state warning point (Alaska State EOC during business hours or MatCom after hours) to 26 local warning points throughout Alaska. For tsunami warnings, the WEPA41 PAAQ message is verbally relayed to local warning points along the coast.

F. *Internet, RSS, Email, Text, and Other Systems*

There are numerous government and commercial internet-based services that provide for tsunami warning products to be received directly by the general public. This includes the NOAA Tsunami Warning System website at http://tsunami.gov, RSS and ATOM feeds from http://alerts.weather.gov, email list servers, and cell phone Short Message Service (SMS) text messaging. While these systems provide a robust means to transmit warnings directly to the public, it should be noted that the officially recognized methods for tsunami products to be received are through NAWAS/AKWAS, NWWS, NWR, and the NOAA Tsunami Warning System website.

G. State EOC CodeRED Emergency Communications Network

The State EOC utilizes the CodeRED system to provide telephone, email, and SMS text notifications to all locally-designated tsunami warning points of contact. The system must be initiated manually either by the SEOC warning point staff or on-call duty officer. Once initiated, the system simultaneously contacts all registered points of contact via any or all of the methods listed above, and provides the State EOC with dynamic reports about successful contacts. This system is initiated upon receipt of the tsunami warning from the NTWC, and is always followed up by direct person-to-person telephonic contact with communities in the warned area.

H. *Local Warning Systems*

Local warning systems vary greatly throughout coastal Alaska. Methods for local warning include siren systems (tone and voice-capable), public address systems, reverse-911 or auto-dialer systems, local radio and television broadcasts, and in some cases door-to-door notifications. Local warning methods are key to an effective tsunami warning system in Alaska; it is through local warning systems that residents and visitors are directed to shelter in place or evacuate, and where "all-clear" or "safe to return" messages are transmitted. **Mandatory or precautionary evacuations are only directed locally.** Some communities in Alaska (i.e. Kenai Peninsula Borough) have configured their audible and voice siren systems to activate automatically upon receipt of a Specific Area Message Encoded (SAME) formatted message broadcast over local NWR transmitters.

III. Tsunami Warning System Tests

A. *Daily NWWS Test (NTXX98)*

NTWC issues an electronic test message utilizing the WMO header NTXX98 multiple times each day. The purpose of this test is to ensure that messages are being transmitted correctly through the NTWC NWWS and NWS Telecommunications Gateway infrastructure. This message can be monitored by all users who have a direct NWWS downlink.

B. *EAS and NWR Required Weekly Tests*

State Origination Points, all Participating National EAS stations and systems, and the NWS NWR system are required to transmit a Required Weekly Test (RWT) product from their EAS equipment or NWR. The purpose of this test is to ensure that all

participants in EAS are able to successfully receive an EAS product from the sources they monitor. Please see section VII. Required Emergency Alert Systems tests for more information. RWTs are logged only by receiving participants, and not rebroadcast over the air.

C. Monthly

1. A Required Monthly Test (RMT) is transmitted on the Wednesday of the first full week of each month. The RMT is transmitted by one of the State Origination Points (on a rotating basis), and is required to be rebroadcast by all EAS participants within 60 minutes of reception. This test is carried on the air, and is heard and seen by the general public.
2. The NTWC conducts a monthly dissemination exercise for the west coast of the United States and Canada. The exercises transmits the WEPA41, WEAK51, and TSUWCA products across all NTWC systems, including NADIN/DAWN Service B, AWIPS, NWWS, VHF Radio, NAWAS, and telephone call-out. This exercise ensures that all warning points in the west coast system are able to receive and acknowledge receipt of the WEPA41/WEAK51/TSUWCA products.

D. Annual "Live Code" TSW Exercise

Once a year the tsunami warning system exercises the use of a "live code," end to end test; the primary objective of the exercise is to ensure that the WEPA41 PAAQ product can be successfully converted to an EAS TSW event code, and rebroadcast successfully by the Alaska State Relay Network. This includes ensuring all systems and devices throughout the system, from NTWC to the legacy EAS encoder/decoder or intermediary device at the station/cable system level is properly configured to automatically rebroadcast the TSW event. The test is conducted to coincide with Alaska Tsunami Preparedness week and is regularly scheduled the week of March 26 each calendar year. The secondary objectives during the test include activating all Statewide dissemination systems. Additionally, many local jurisdictions take the opportunity to test local warning systems, conduct earthquake and tsunami preparedness events, and to exercise local tsunami evacuation plans.