

CITY OF  
GEARHART

**Staff Report**

For City Council Meeting - 09/06/2017

***Subject - Old Business - Emergency Communications***

**Synopsis:** Councilor Jesse and Dana Gandy are requesting funds from the hazard mitigation fund. The request is to install communication infrastructure at the Gearhart reservoir site east of town.

- |                                       |               |
|---------------------------------------|---------------|
| ● Antenna pole installed -            | \$700         |
| ● Electrical connections -            | \$1500        |
| ● Communication equipment structure - | \$2200        |
| ● Misc -                              | <u>\$500</u>  |
| ● <b>Total estimate</b>               | <b>\$4900</b> |

**Recommendation:** City staff recommends this project as it will increase our communication resiliency in many different types of events and hazards.

**Legal Analysis:** Will be done within FCC rules and regulations.

**Financial Analysis:** Currently the hazard mitigation fund contains \$14,950.

Respectfully submitted,

A handwritten signature in black ink, consisting of a stylized, cursive 'C' followed by a few loops and a horizontal stroke.

Chad

# City of Gearhart Emergency Communications Resiliency Project

**A Proposal by the Sunset Empire Amateur Radio Club,  
(SEARC) a 501c3 Non-Profit community service  
organization that has been actively promoting the use of  
amateur radio to support Clatsop County and its coastal  
communities since 1933.**

Presented by Dana Gandy, President of SEARC

July 5, 2017

## Overview of the Proposal

Proposed is a collaboration between the City of Gearhart and SEARC that will provide a "hardened" emergency communication site serving the City of Gearhart, its Emergency Responders and its Citizens, by facilitating their ability to communicate reliably with Local, County, and Federal Emergency Management resources during and after a man-made or natural crisis.

## Who is SEARC?

The Sunset Empire Amateur Radio Club is a group of like-minded individuals from a wide variety of professions, primarily with backgrounds in technology, engineering, healthcare and the military. We are a civic minded group with a passion for community service. Many of us participate in other areas of our communities in addition to sharing our love of amateur radio with others.

Our charter and bylaws mandate that we provide and promote amateur radio education to our fellow citizens by providing licensing classes and that we build, maintain, and grow a network of radio repeaters to serve the coastal communities of Clatsop County *with an emphasis on Emergency Communications.*

(On a lighter note, the Radio Room on the Columbia Lightship is an example of one of our outreach programs.)

The network we provide is the foundation of amateur radio in Clatsop County and is used by the Emergency Operations Center at Camp Rilea as the primary method to collect and disseminate information during emergencies.

Current Radio Repeater sites belonging to SEARC that are part of this critical infrastructure are located on Megler Mountain in Washington, and in Oregon on Wikiup Mountain, Nicolai Mountain, and on Onion Peak above Arch Cape.

These sites are "linked" by an encoded system that allows them to be utilized as a network far up the coast past Aberdeen and inland as far as Olympia, Washington. Other proposed sites currently in consideration would extend coverage well into the Portland Metro area.

## **Considerations**

An opportunity currently exists to place a linked repeater system to serve the City of Gearhart. This location would provide for excellent coverage of the Northwest Corner of Clatsop County, extending as far south as Tillamook Head and parts of Cannon Beach / Arch Cape and as far north as Astoria and into parts of Washington. (Refer to the coverage maps included in this packet) This fills a "weak" area of coverage between those two cities and additionally provides an excellent opportunity for the City of Gearhart to substantially enhance its communications resiliency.

Additionally, in an emergency this repeater would be linked through our primary "hub" on Megler Mountain to a system of repeaters covering South West Washington as far north and east as Olympia.

To help the City of Gearhart further that goal, SEARC will provide on-site training to City Employees who want to become licensed radio operators. *Special emphasis is placed upon the training and support of CERT and other highly significant groups and individuals.*

## **Proposed Location**

The City of Gearhart has a Water Tank, located about 1/3 mile inland from the beach at an elevation of about 190' that is ideal for this purpose. The nearest road is Salminen Road which directly connects to the service road leading to the tank. The access road is blocked by a vehicle gate, but hikers and pedestrians can walk around the gate. The access road is improved gravel with some sections being paved. The tank is about ¼ mile from the gate and is surrounded by a high chain link fence. Access to the tank area is via a locked gate. There are no provisions for pedestrian access. The tank is surrounded by a paved asphalt parking area. The tank area is relatively clear of dense trees and brush and is set into the hillside. Power is available with an interconnection box directly next to the tank. The "amperage" or capacity of the service is not known at this time.

## **Equipment Location**

There are two basic options here: The city provides a shelter such as an insulated CONEX box in which the repeater and public safety equipment is mounted in, or a small hut can be installed to house the repeater. In any case the container or hut should be as close to the tank power source as possible. If a hut is used then only a 6'x6' unit is needed. This is to allow equipment to be installed and to be used as a personnel shelter during service periods. The antenna cables would drop directly down from the messenger cable that is attached to the water tank and enter the CONEX/hut via a water proof cable entrance boot. If the hut is used, but not heated, with free flow natural ventilation, then lead acid deep cycle batteries can be used for standby power. If the hut is sealed and insulated then AGM batteries must be used. Considerations must be made to keep the hut from being upset by winds i.e. bolt it down.

As this CONEX/Hut would likely serve multiple roles as a communication center, a CERT rally point and Cache, and alternate Public Service communication facility, size DOES matter.

## **Equipment Power**

A simple, fully grounded 15 amp 110 AC power circuit is needed. If possible a 20 circuit would be appreciated as this gives more flexibility for the future. If other equipment is going to be used in this facility these items should be on their own circuit. GFI is not to be used on the radio circuit. There should be a separate AC circuit with GFI protection to permit power tools and test equipment to be used. It is urged that a qualified electrical engineer and the city engineer consult on this project to ensure the appropriate codes are complied with.

A propane powered backup generator at the site would provide an ideal redundant power source. Another consideration would be a solar/battery option.

## **Antenna Location**

We would prefer NOT to locate our antennas on the water tank. In addition we strongly desire to keep all of our radio antennas away from any public service systems. Since we expect this location to have public service radios in the future, planning for this now can prevent a lot of problems later in the process. In that regard, we propose a power pole or similar post on the NW hillside above the asphalt area surrounding the tank. It is suggested the maximum height of the pole or post to be about 15' to 18'. This allows an extension ladder to be used to service the antennas.

The antenna transmission lines would be routed overhead to the water tank via messenger cable similar to overhead telephone and power wiring that enters a home. Considering the height of the hillside, the height of the antenna pole, and the height of the water tank the overhead wiring run should allow any utility service vehicle to easily access the area. The "messenger cable" will most likely be a standard utility company type of cable fully grounded to the antenna post and the water tank. Antenna transmission lines would be secured to the messenger cable via black UV resistant "ty-wraps". The antenna pole/post would be fully grounded in accordance with the NEC.

## **Security**

This radio system will become an integral part of the critical communications infrastructure for Clatsop County, as well as an important part of the emergency response structure for the City of Gearhart and must be properly secured.

Additionally, as the valuation of the equipment belonging to SEARC will be in excess of \$15000, we believe it is in everyone's best interest to ensure a secure housing at this site and that access to the box/hut be recorded. SEARC can make recommendations in this respect, if requested. We prefer that the City of Gearhart control access and when maintenance periods occur we will "check-out" the keys from a designated individual or department.

## **In Closing**

This proposal covers the basic installation, operation, and some of the benefits of placing a repeater system in the City of Gearhart. In no way does it begin to encompass all the benefits to the City and its residents that a system of this nature can provide.

We encourage discussion and an open dialogue between the City of Gearhart and SEARC to "flesh out" the full potential of this installation and the services that this system provides now, and what it can provide in the future.

For example, once the basic system is in place it is possible to add telemetry from the Water Tank to the Water Treatment plant, real time video from cameras, a redundant phone system that doesn't rely on the current infrastructure, and several other valuable features.

Finally, by choice and by law, SEARC does not request or require any type of compensation for its time or equipment. We are registered as a Private Foundation under our 501c3 non-profit status. What we do is funded by our members through donations and dues.

We look forward to a long and rewarding relationship with the City of Gearhart. Personally, I am available at any time to meet and discuss this proposal or any type of service we can provide to the City of Gearhart.

Thank you

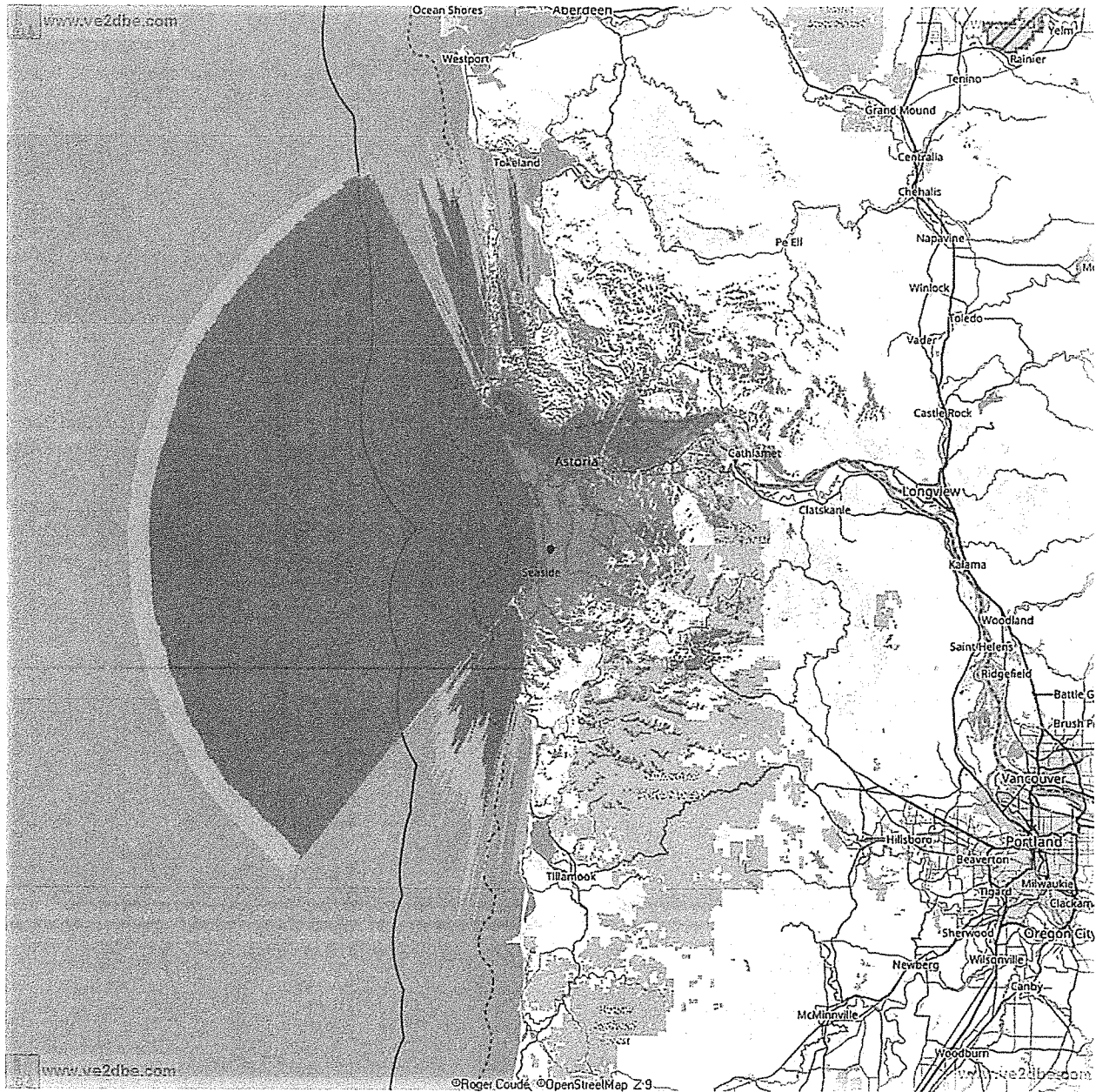
## **Radio Equipment Specifications**

(Provided and Installed by SEARC)

- The repeater will be a commercial Kenwood TKR-750 VHF or equivalent operating on or about 146.200 Megahertz.
  - This repeater has an output of approximately 45 Watts
  - Full Duplex operation
  - High Reliability
  - Low Power Consumption
  
- The link radio will be a Kenwood TK-8180 UHF transceiver or equivalent operating on a discreet frequency.
  - Transceiver will be configured for an output of 10 Watts
  - Operates on the 433/70 Centimeter band
  - Simple Duplex Operation for linking with the Megler repeater
  
- The VHF Antenna will be a Diamond X50 series or equivalent
  - Low wind load
  - High reliability
  - Good omnidirectional coverage with high gain
  
- The UHF linking antenna will be a COMTELCO Yagi or equivalent aimed directly at the Megler repeater
  
- Antenna transmission lines will be Andrew Heliax, LMR-400 or equivalent.
  
- The system will be controlled by an ARCOM RC-210 Repeater Controller
  
- Backup Power will be provided by either lead acid or AGM batteries depending on the structure the equipment is housed in.



# Anticipated Coverage Area of the Gearhart Repeater System



Coverage Chart "A"

