



# Wahkiakum County Sheriff's Office

## Sheriff Mark C. Howie

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P. O. Box 65/64 Main Street, Cathlamet, WA 98612

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Undersheriff Gary Howell

Chief Civil Deputy Joannie Kuhlmeier

January 16, 2024

### **Request For Proposal (RFP) for the Wahkiakum County Emergency Radio Repeater and Infrastructure Project Upgrades.**

Wahkiakum County is pleased to announce the opportunity to submit Sealed Proposals for the attached project to upgrade the Wahkiakum County Emergency Responder Radio System.

Who:

- 1) Any qualified individual/business/firm is welcome to make a response to this solicitation.

What:

This project will:

- 1) Link our current sites/locations \*(see below for details)
- 2) The current Radio repeaters \*(see below for details)
- 3) Radio Dispatch console equipment \*(see below for details)
- 4) County-wide replacement of end-user equipment. \*(see below for details)

Where:

Numerous locations throughout Wahkiakum County, Washington, and surrounding counties in Oregon and Washington

When:

- 1) Solicitation approved to be published by Wahkiakum BOCC: 1/16/2024.
- 2) Solicitation posted on Wahkiakum County webpage 1/16/2024.
- 3) Intent for RFP printed in Wahkiakum County Eagle: 1/18/2024
- 4) Responses due: 2/6/2024 10AM
- 5) Public response opening: 2/6/2024 10 AM
- 6) Anticipated selection by BOCC: 2/13/2024

- 7) Anticipated contract signing: 2/20/2024.
- 8) Absolute performance period ends: 12/31/2024

Wahkiakum County Primary contact and Project Manager:

Beau Renfro, Emergency Technology Coordinator, 64 Main Street, Cathlamet, WA 98612. Phone: 360-795-3242 Option 0. Email: [renfrob@co.wahkiakum.wa.us](mailto:renfrob@co.wahkiakum.wa.us)

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**I. Description of community served.**

The Wahkiakum County Sheriff's Office (WCSO) Dispatch is the only Public Safety Answering Point (PSAP) for Wahkiakum County and serves a resident population of approximately 4,700. WCSO provides emergency call-taking and dispatch services to the Wahkiakum County Sheriff's Office, four fire districts, and one municipal fire department. With the exception of law enforcement, Wahkiakum County is served by a fully volunteer fire and EMS system.

**II. Summary of the Work.**

A. Wahkiakum County is requesting sealed proposals to overhaul its obsolete radio system. This will be a four-segment process considering several factors, including price, equipment availability, and installation time. Wahkiakum County received a congressional funding appropriation to aid in the completion of this overhaul. This funding performance period for this project is the 2024 calendar year. This means we MUST have this project completed and accepted no later than 12/31/2024. We are breaking this project into four prioritized project segments. Respondents must respond to segments one through three to be eligible to respond to segment 4.

B. This summary is a basic description of the project and is not meant to replace the technical specification described later in this document.

**III. Project Segments:**

A. Segment one: Provides a communications transport system by linking all six locations (five repeater locations and the Wahkiakum County PSAP, See Diagram A1) This will require a mix of fiber and microwave technology.

B. Segment two: Total replacement of the five current stand-alone VHF repeater systems with a system that allows seamless roaming between sites without user interaction and optionally employs technology allowing the tracking of subscriber units to simplify users' access to radio system coverage and increase responder

safety. The new system should use the four existing licensed VHF channel pairs and optionally adds a fifth repeated channel pair from existing mobile licenses unless vendor determines the proposed system needs additional licensing (See Table 1 – Current FCC Licensing).

C. Segment three: Total replacement of our current two obsolete radio dispatch consoles with three new current generation consoles and backend radio infrastructure.

D. Segment four: Replacement of all end-users' portable, mobile and base stations. (See Table 2 - End user equipment information)

**IV. Respondent's responsibilities:**

A. The Respondent will be required to design and present a proposal for equipment upgrade, installation, and management of a system for each of the four segments. Respondents that cannot provide segments one through three will not be accepted for successive segments. This proposal shall: provide coverage improved quality audio that equals or exceeds current system coverage; Provide equipment, including but not limited to site repeaters, antennas, cabling and subscriber units, that are capable of complying with Project 25 digital protocol (P25) and MDC1200 or equivalent PTT ID signaling on all channels for minimal cost; Provide new battery power system capable of powering all equipment for a minimum of 12 hours to ensure continued operation (as described in further detail).

## V. RFP Timeline

For a proposal to be considered responsive it must comply with the following:

- A. Sealed proposals must be received by: 2/6/2024 at 10 AM PST.
- B. Mailing address (USPS only) Wahkiakum County Sheriff's Office, ATTN: Beau Renfro, PO BOX 65., Cathlamet, WA 98612
- C. Shipping Address (FedEx and UPS etc.) Wahkiakum County Sheriff's Office, ATTN: Beau Renfro, 64 Main Street, Cathlamet, WA 98612
- D. Sealed proposals must be marked "Emergency Responder Radio System Upgrades Project."
- E. All submissions must be in hardcopy and also must include one electronic copy of all submitted items/materials on electronic media within the same envelope. No writing and/or marks on the outside of the sealed envelope, except for the printed name of the project, will be considered as part of the proposal or as an amendment to the contents inside the envelope.
- F. Sealed proposals must include a proposal which addresses the scope of work and attached specifications. The sealed proposal must also include the following information:
  - 1: A cover letter by respondent that contains, at minimum, the respondent's name and address.
  - 2: Executive Summary: Provide a brief statement of the respondent's history, structure, and why the respondent or firm is the best choice for Wahkiakum County. Provide information on respondent's philosophy of service, volume of work, financial stability, and experience in similar projects.
  - 3: Project Approach: Describe respondent's approach to providing the services outlined in the scope of work and specifications. Discuss how respondent would provide leadership to facilitate teamwork and communication. Describe the scheduling techniques to be used, and the software employed to produce an effective schedule. Describe how the respondent will identify activities and their duration and how the respondent proposes to ensure employees and/or contractors mobilize, perform, and complete their work according to the schedule.

4: Project Team: Provide related and current licensure information for the respondent and current resumes for the personnel to whom responsibility for Wahkiakum County's projects will be assigned. Provide the title, roles, and responsibilities for each of the team members and their experience in performing these responsibilities. Provide an organizational chart illustrating proposed staffing and their fields of expertise.

5: Relevant Experience: Present specific projects the respondent has worked on that are similar in scope to this project.

6: References: Provide at least 2 references from clients for whom the respondent completed projects of similar size or scope.

7: Budget: Provide a proposed total cost for the project which addresses the scope of work for this project, including specification requirements, equipment, and installation; and which includes a schedule and estimated budget for completion of services.

8: Timeline: Describe how the respondent will ensure we meet the 12/31/2024 total project completion deadline. This is critical for Wahkiakum County to ensure payment on the project. Wahkiakum County may deem the project in default if the Respondent is unable to meet the 12/31/2024 deadline for total system completion.

9: The respondent is encouraged to submit a good, better, and best option for each of the four segments.

10: No Proposal may be withdrawn for a period of thirty (30) days after the time scheduled for receipt of Proposals.

11: Data contained in the proposal and all documentation provided therein becomes the property of the County and the data becomes public information. If the Respondent wishes to have any confidential or proprietary information withheld from the public, such information must fall within the definition of "trade secret" contained within Washington State statutes. All "trade secret" information the Respondent wishes the County to withhold must be submitted separately from the remainder of the proposal. The separate package must be clearly marked "Trade Secret" on the outside of the package. Each page inside the package must also be clearly marked as "Trade Secret." Should

Wahkiakum County be challenged in court by a third party for a decision to

withhold or redact information so identified by respondent, respondent agrees to indemnify, defend, and hold harmless Wahkiakum County for any judgments, attorney fees, and/or court costs associated with asserting the documents contain "trade secret" information. The respondent agrees and acknowledges that the respondent proposal is a disclosable public record. Wahkiakum County reserves the right to make an independent discretionary decision whether the documents marked as "Trade Secret" qualify as such pursuant to the Public Records Act. All documents not marked as "Trade Secret" are subject to release in compliance with the Public Records Act.

**VI. Taxes**

The respondent shall include in the proposal all taxes, if any, levied by federal, state, and municipal Governments upon labor and for material or equipment entering into the work; including materials purchased by owner, if any, and the respondent shall pay all such taxes and show evidence of payment as described in the project contract.

**VII. Bond**

A Bond will be required for this project and will be part of the successful Respondents contract deliverables.

**VIII. Intent to Pay the Prevailing Wage.**

The respondent must provide an intent to pay prevailing wage affidavit and ensure compliance with Washington State Department of Labor and Industries prevailing wage requirements.

**IX. Right to Reject Proposals**

Wahkiakum County reserves the right to reject any or all proposals or to accept the proposal judged by Wahkiakum County as most satisfactory for its requirements is. Wahkiakum County reserves the right to waive any informality in any proposal.

**X. Objections to Specifications.**

Written objections to specifications or proposal procedures must be received by

Wahkiakum County at least three (3) business days before the due date and time for proposal submission.

**XI. Requirements for Signing Proposals.**

The following requirements must be observed in the signing of Proposals:

1. Proposals that are not signed by individuals making them shall have attached thereto a power of attorney evidencing authority to sign the proposal in the name of the person or firm for whom it is signed. Proposals that are signed for a Partnership shall be signed by all of the General Partners or by an attorney-in-fact. If signed by an attorney-in-fact, there shall be attached to the proposal a power of attorney evidencing authority to sign the proposal, executed by the General Partners.
2. Proposals that are signed for a corporation shall have the correct corporate name thereof and the signature of the president or other authorized officer of the corporation, manually written below the corporate name following the word "By (insert the officer's name)". If an official other than the president of the corporation manually signs such a proposal, a document evidencing the authority of such official to sign the proposal shall be attached to it. All corporate proposals shall also bear the attesting signature of the secretary of the corporation.
3. Proposals that are signed for a limited liability company shall have the correct company name thereof and the signature of the Manager(s), Member(s), or other authorized official manually below the company name following the word "By (insert the official's name)", If such a proposal is manually signed by someone other than the Manager(s) or Member(s), as listed on the Washington Secretary of State's website, a document evidencing the authority of such person to sign the Proposal shall be attached to it.

**XII. Explanation to Respondent and Addenda.**

- A. Neither Wahkiakum County, Wahkiakum County's representatives, nor the

Engineer will give verbal answers to any inquiries regarding the meaning of drawings and specifications or provide verbal instructions prior to the award of the project contract. Any verbal statement regarding the same by any person, prior to the award, is unauthorized and shall not be relied upon.

B. Any explanation desired by Respondents must be submitted via email to [renfrob@co.wahkiakum.wa.us](mailto:renfrob@co.wahkiakum.wa.us), and received no later than February 1, 2024, at Noon (PST). If explanation is necessary, a reply will be made and posted on the project information web page ( <https://www.co.wahkiakum.wa.us/580/Wahkiakum-County-Emergency-Responder-Rad> )

C. Examination and Selection of Proposals. The sealed proposals shall be opened at 10 AM (PST) on February 6<sup>th</sup>, 2023. Proposals will then be referred to the evaluation committee, as described below, for review, scoring, and recommendation to the Board of County Commissioners.

### **XIII. RFP Scoring**

A. Wahkiakum County will use the below criteria to select the successful respondent based on qualification and response:

1. First, respondent proposal must comply with the minimum RFP technical specifications, instructions, and requirements in this document; and
2. Second, respondent must supply information regarding the below areas of qualifications, which will be evaluated as follows:

- a) Qualifications and experience of respondent, respondent's team, and subcontractors, references, and experience in carrying out similar projects 20 points.
- b) Overall project approach, innovativeness of the plan offered, and uniqueness of the project features 20 points.
- c) Ability to meet product specifications, quality of products proposed, and warranty options 20 points.
- d) Demonstrated ability to meet the timeline for completion of Segment one. 50 points.
- e) Demonstrated ability to meet the timeline for completion of Segment two. 50 points.
- f) Demonstrated ability to meet the timeline for completion of Segment three 50 points.
- g) Demonstrated ability to meet the timeline for completion of Segment four. 50 points.
- h) Overall Cost proposal for project 25 points.

**B. Evaluation Committee:**

1. A County Evaluation Committee (CEC) will evaluate and score responsive proposals. The CEC will be composed of County staff and other parties that may have relevant expertise or experience. The CEC will score and recommend proposals in accordance with the evaluation criteria set forth in this document. Evaluation of the recommendation of the CEC shall be within the sole judgment and discretion of the Wahkiakum Board of County Commissioners.

**C. Award of Proposal.**

1. The proposal shall be deemed as having been awarded when the proposal has been accepted by formal motion made by the Board of Wahkiakum County Commissioners. Commencement of the project shall be contingent on the execution by the parties of a mutually agreeable contract.

**XIV. Schedule of Payments and Time for Completion.**

A. Unless otherwise negotiated between Wahkiakum County and the successful Respondent, the payment schedule for the project will be as follows:

1. **Thirty percent (30%) at the time of contract signing.**
2. **Twenty percent (20%) upon completion of detailed design review.**
3. **Thirty percent (30%) at completion of installation.**
4. **Twenty percent (20%) upon acceptance of the final system.**

**XV. Time for completion of the Project**

The timing for completion of the project is not negotiable and must be completed and accepted no later than 12/31/2024.

**XVI. Response Checklist.**

The below checklist is provided for ease of the Respondent in responding to this RFP:

- Cover Letter
- Executive Summary
- Project Approach and Management Plan
- Proposal for Segment One
- Proposal for Segment Two
- Proposal for Segment Three
- Proposal for Segment Four
- Proposal which addresses the Scope of Work and Specifications in Appendix A.
- Qualifications and Experience of Respondent/Firm
- Staffing Plan

Work Plan and Schedule, including ability of Respondent to meet future service requirements.

Cost/Budget Proposal

References

Trade Secret submissions (optional and separate attachment)

## **XVII. Project Specifications by Segments:**

- **Segment One:**

Provides a transport link system by linking all six locations (five repeater locations and the Wahkiakum County PSAP; see Diagram A1) This will require the engineering of a mix of fiber and microwave technology. Note: Commercial fiber is being constructed by a third party between the KM, Wahkiakum County PSAP and Wahkiakum School sites with expected completion Q2 2024. The usage of this fiber network is acceptable; however, terminations will be within the scope of the proposal.

### A. Scope

Respondent will deliver a data transport network capable of supporting a four channel VHF digital P25 and/or analog LMR system with a continual Network Monitoring System.

### B. General

Wahkiakum County desires to obtain a new Transport Network (TN) to support the LMR system at existing sites located throughout Wahkiakum County and the surrounding area. The new TN will consist of microwave and/or fiberoptic links between the existing sites depicted in the TN Description (Diagram 1) and a Network Management System (NMS)/site alarm system. Wahkiakum County is a heavily forested and mountainous area. Microwave path engineering must account for future tree growth.

### C. Licensing & Engineering

Path licensing, path analysis, engineering, and coordination are the responsibility of the Respondent and must be included in the proposal. The respondent may either perform these requirements in-house, acting as Wahkiakum County's agent, or subcontract the process out to a third-party vendor. Wahkiakum County will review the completed package with the respondent or the subcontractor.

### D. Availability

The solution shall be the respondent's sole responsibility to ensure and guarantee for each new path the 99.999% two- way availability of each path, error-free, at a minimum data rate of 100 Mbps (or a respondent-proposed rate).

### E. Network Management System (NMS).

This solution shall include a Network Management System.

F. Capacity

Minimum 100 Mbps (or respondent-proposed rate) capacity across the primary transport system.

G. Scalability

Transport network equipment must allow for additional future sites.

H. Topography

Respondent will design a TN based on loop/ring topography. Microwave network sites will comprise one microwave radio and one dish per side, with two radios and two dishes per site for any microwave links. A network that employs fiberoptic links will comprise one physical connection per optic cable installation per side, with two geographically distinct fiberoptic cable system connection points per site.

I. Equipment

All proposed site equipment will be capable of operating on 48VDC and be powered by the proposed battery backup system in segment two. Connectivity to and from the respondent's equipment is to be via standard RJ-45 Cat 5/6, TCP/IP connection operating at a speed of 100Mbps to 1Gbps. Connection to the network management system must be available from any equipment at any location within the network.

J. Installation

The respondent shall be responsible for all costs of shipping, storage, and other transportation required for all equipment to be installed. New racks must be provided and installed by the respondent. Mounting space will be near, but not necessarily adjacent to, any current mounting locations of pre-existing microwave equipment. The respondent will make every effort to provide adjacent mounting space wherever possible.

All electronic equipment, transmission lines, equipment racks, antennas, and other tower and building attachments shall be grounded in accordance with industry standards and local building codes. All electrical work shall be performed by licensed electricians and completed per standards adopted by the 2023 National Electrical Code.

All antennas and tower attachments must be installed in accordance with the latest adopted version of ANSI/TIA-222 for material, structural, wind, and ice loading in the geographical zone in which the tower or other attachment structure is located.

All pressurized lines and waveguides must be evaluated to manufacturer's specifications.

All antenna mounts for dishes with diameters between three feet and six feet will have three (3) points of attachment with stiff arms or other equally rigid configurations to prevent movement of the antenna from its set path azimuth and elevation. Dishes with diameters of eight feet or more will have four (4) points of attachment with two stiff arms attached to the tower - one stiff arm on either side of the dish.

The respondent installation provider must have experience with Pacific Northwest tower installations.

All installation-related cabling will be accomplished in a neat, organized and logical fashion.

#### K. Acceptance

Ownership of equipment will pass to Wahkiakum County upon completion of installation at Wahkiakum County's facilities. Respondent equipment must pass acceptance testing before project completion.

#### L. Warranty & Support

The warranty for equipment will commence upon project completion.

Respondent may not make any exceptions to the standard warranty as part of the purchase. Conditions noted by the Respondent that will affect the terms of the Respondent's warranty must be corrected by the Respondent and included as part of the total cost of the submitted RFP.

The respondent must provide a life cycle plan for the microwave radio being proposed and for all ancillary electronic equipment provided as part of the proposal. Please note that the life cycle of the proposed equipment is a strong consideration for the selection of the successful proposal.

The respondent shall provide two (2) complete sets of equipment service manuals for each type of equipment provided. At a minimum, service manuals must include all information required to troubleshoot and repair each system component down to the lowest field replaceable component level.

All radio modules and circuit cards must be "hot swappable."

The respondent shall provide one (1) complete set of replaceable modules, circuit boards, and, if appropriate, replaceable baseband/bandpass/multiplier filters for each utilized frequency.

Only field repairable systems will be considered for selection.

#### M. Sites and Tower Heights

A map with a table containing site names and tower information can be found in Diagram 1.

There is a microwave link in place between the School Site and Wickiup sites. This link is not owned by WCSO, and if it is to be used in the new solution, permission and an MOU would need to be executed.

#### N. Implementation of equipment

Implementation of equipment to include project management, engineering, and equipment installation services.

- **Segment two**

- a) Scope

- O. Total replacement of the five current standalone VHF repeater systems with a system that allows seamless roaming between sites without user interaction and employs technology allowing the tracking of subscriber units to simplify users' access to radio system coverage and increase responder safety. The new system should use the four existing licensed VHF frequency pairs and optionally add a fifth repeated channel pair from existing mobile licenses unless the vendor determines the proposed system needs additional licensing (See Table 1 – Current FCC Licensing). The overall goal is five repeated channels that allow users to travel the county with seamless coverage on each channel without direct interaction.

- b) General

- Existing repeaters and base station equipment consist of Motorola MTR2000's, MTR3000's and Quantars, Motorola MCC 5500 Dispatch Consoles.

- c) Backup battery power solution

- Replace the existing Absolyte and standard (Car type) battery backup power systems with a current generation long life cycle with little-to-no maintenance battery system that will provide a minimum of 12 hours of run time for all proposed essential equipment. This system should include a redundant and hot swappable charging system.

- d) Decommission and disposal.

- Decommission and dispose of the existing LMR system and power systems. Wahkiakum County reserves the right to retain some equipment at its sole discretion.

- e) Implementation of equipment

- Implementation of equipment to include project management, engineering, and equipment installation services.

- f) VHF Voting / Simulcast System

The vendor will design and implement an analog, digital or a combination of both, VHF LMR system that will provide seamless site roaming and provide coverage to a high percentage of the area inside of Wahkiakum County. The desired system will provide a minimum of 5 county wide voice paths with subscriber unit identification and optionally, data paths including subscriber unit location. The desired system will allow for group alerting via quick call or similar data methods employed on the subscriber unit for fire personnel. The third purpose is interoperability with neighboring agencies. The LMR system will use VHF frequencies that are already licensed for use with the FCC by Wahkiakum County and the Wahkiakum School District. The system will consist of four/five channels that allow users of each channel to roam throughout the county and maintain communication without user interaction by means of voted simulcast, automatic roaming or other similar method. The Respondent will be responsible for interfacing the VHF LMR system with the new dispatch consoles also being upgraded throughout this process and integration to the existing Equature logging recorders.

g) Frequency coordination and planning

Any and all frequency coordination and planning are the responsibility of the respondent and should be included.

- **Segment three:** Total replacement of our current two obsolete MCC 5500 consoles with three new current generation consoles and backend radio infrastructure. See Table 3 for a list of current resources and Radio Interfaces.

a) Scope

WCSO Dispatch operates two Motorola MCC 5500 dispatch consoles that are connected to their hardware located in the basement phone room. The dispatch consoles are connected to the base stations located at the school repeater site by way of an aging and failing overhead 50-pair copper cable (NOT TO BE USED IN THE NEW SOLUTION).

Radios and phones are integrated into one headset at each dispatch console. Currently there are two dispatch consoles, and the Respondent will be installing a 3<sup>rd</sup> console in an adjacent office. The Respondent will be responsible for pulling all new connections to all 3 consoles. Note: Commercial fiber is currently being constructed between WCSO Dispatch and the school repeater site and the WCSO Dispatch and KM repeater site with expected completion Q2 2024. This will provide a layer 2 network connecting these three sites.

b) Logging Recorder interface

The Courthouse Server room houses a fully redundant (hot/hot) pair of Equature logging recorders connected to the Radio system with copper analog inputs recording on VOX.

This Equature logging recorder is capable of digital recording as well.

c) Respondent will include voice call integration.

d) Respondent to include subscriber unit location options.

e) Automatic Station Identification

The system must be equipped to identify the system with a solid state automatic International Morse Code identification system and must operate in the following manner:

The unit must operate in the semiautomatic mode transmitting the ID only when the repeat interval timer has elapsed, and the channel is not in use. The unit must not interfere with the channel in use.

f) Implementation of Equipment

Implementation of equipment to include project management, engineering, and equipment installation services.

g) Turnkey installation

This shall be a turnkey installation to include all wiring, PC, headset jacks, foot pedals, desk mics, programing, user training, monitors, and if not compatible with current monitor mounting array, then any adaptations needed should be included, and any other peripherals needed for a complete installation.

- **Segment four:** Replacement of all end user portable, mobile and base stations. (See Table 2 - End user equipment information)

a) Scope

There are currently approximately 400 end user units including portable and mobile stations. See Table 2 for current End-user equipment information.

b) General

Wahkiakum County would like to replace all end subscriber units. Provide a Good, Better, Best recommendation based on the unit counts in Table 2.

- i) Portable radios shall include 1 radio, 1 battery with minimum 12-hour battery life, 1 110VA charger, programming of County provided template, 1 antenna, 1 lapel microphone, and 1 belt clip. With the exception of chargers, radios, antennas, batteries and accessories that all shall meet or exceed IP68 standards.
- ii) Mobile radio shall include 1 mobile radio, programming of county-provided template, 1 antenna, and all associated power and antenna wiring. Cost shall include a flat rate per radio on-site swap-out price for the radio and antenna upgrade. In some cases, units may require interfacing with PAs or fire apparatus headsets. Department personnel will be responsible for providing interfacing instructions or specialized adapters.
- iii) Include a per-device vehicular repeater option for vehicle-based radios including interfacing and installation.
- iv) Base stations shall include 1 radio, 110V power supply, programming of county template, a flat rate per radio on site swap out price. Optionally include a price per desk set (MCD5000 or similar)



## XVIII. Common Technical Requirements

This section describes the technical requirements of all equipment supplied as part of this system. **If your solution cannot comply with one of the Common Technical Requirements then the Respondent must note the exception it in their response.**

### 1) Equipment to be Provided:

Complete, Installed, and Ready. The ideal Respondent will provide a complete radio system solution, a complete transport system solution, any new site backup battery power solutions, and decommissioning and disposal of the current LMR system.

Unless specifically excepted by the terms of these specifications, any parts or accessories ordinarily furnished or required to make a complete operating unit or system must be furnished by the Respondent, whether directly mentioned or not mentioned in the specifications.

The equipment must be complete, installed, and ready for operation at Wahkiakum County's dispatch center location and at any of the remote sites.

### 2) Unit Identification.

Base stations, repeaters, dispatch consoles, and subscriber units shall be capable of transmitting and receiving unit identifiers and emergency signaling. In the case of analog equipment, all equipment shall be capable of MDC-1200 signaling or similar multi-vendor signaling standards. The P25 protocol includes acceptable unit identification and emergency signaling standards. However, all equipment should operate in P25 mode if this method of signaling is proposed. A bid on only segments 1, 2, and 3 will not be expected to update disparate existing subscriber unit equipment to comply with this provision.

### 3) Component Ratings

Every component part of the equipment must be operated within the manufacturer's continuous commercial duty rating under any combination of operating conditions specified.

#### 4) Overload Protection

Adequate fuses and/or circuit breakers must be included to protect the equipment from internal and external faults. In the event these fusing devices are employed in circuits exhibiting switching surges, a suitable time delay element must be incorporated in the fuse device to preclude false operation and yet protect the equipment from a sustained overload.

#### 5) Electrostatic Protection

None of the equipment provided by Respondent may be affected by an electrostatic discharge of 15,000 V from a 125 pF capacitor with a 500 ohm series resistor. This discharge simulates the typical electrostatic discharge from the human body. This discharge may be applied to any exterior surface of the common control unit, cabling, radio sets, and any associated items.

#### 6) Electromagnetic Susceptibility

The radio components and dispatch equipment of the radio system may be operated in an equipment room with up to 110-watt VHF, UHF, and microwave transmitters. The system must not adversely impact or be impacted by any of these other existing radio systems.

#### 7) Existing Equipment Interfaces

Wahkiakum County and the Respondent must coordinate all interconnections to all County-supplied equipment. Actual interconnections to working systems will be done by the Respondent.

#### 8) Equipment Placement

All equipment must be arranged and installed so its intended function will not be impaired because of weather, temperature, adjacent equipment, or any other factors. Sufficient installation space and clearance must be provided so service and maintenance can be readily performed within the restriction of the current shelters and rack locations, including current and future Amateur Radio equipment. The relative arrangement of operating equipment must be consistent with good human engineering practices resulting in maximum operator efficiency. Plans showing the placement of all equipment must be submitted to Wahkiakum County's Project Manager for approval a minimum of 10 days prior to actual placement since Wahkiakum County's installation requirements and standards must be preserved. The Respondent will ensure room for placement of all equipment purchased under this RFP.

#### 9) Equipment Mounting

Respondent must install equipment in open frame 19-inch EIA racks. Cabinets may also be proposed. Most sites support typical 7-foot rack heights.

Respondent must describe its plans for racks at all sites (i.e., ship equipment in racks and replace racks at the site or ship equipment in racks and transfer equipment to existing racks). Installations must be carefully planned and organized to provide easy maintenance access and best space utilization. All cabinets and racks must include space for wire management between them.

#### 10) Cabinet Requirements

If cabinets are used, they must include standard EIA 19-inch rack mounting facilities for mounting the equipment. All sections of the cabinet must be constructed to prevent warping, twisting, or sagging of any component or assembly. The cabinet must be supplied with removable front and rear doors and adequate ventilation to provide cooling for the contained equipment.

Access doors must be equipped with locks to prevent access to the equipment from unauthorized personnel. All front and back cabinet doors must be easily removed for equipment maintenance. These doors or panels must have dimensions to permit free, unobstructed access to all equipment mounted in the cabinet. The cabinet must be manufactured with durable, quality materials. All materials prone to rust and/or corrosion must be finished and painted. Swing out or slide out chassis/circuit card assemblies must be provided to facilitate assembly and maintenance. Wiring and cabling must be formed with sufficient slack to allow unrestricted chassis movement. Intra-rack cable management must support the auto retro action or otherwise automatic stowage of any cables connected to equipment mounted on slide-out rack rails. All hinges, slides, rollers, fasteners, etc. must be of high-quality construction to provide long life and endure Public Safety use.

All parts requiring periodic servicing or maintenance must be easily accessible and must not require the removal of other parts or exposure to voltages above 60 VDC or VAC to gain this access.

#### 11) Cable System Installation Practices

Equipment requiring specific DTE and/or DCE connections must be clearly marked at each port. Cabling between such equipment must be clearly and permanently labeled as to which end is DTE and which is DCE.

All network connections must be terminated in modular jacks at both ends.

Cable tie devices must not be used at any time; only hook-and-loop (a.k.a. Velcro®) style straps are permitted. Straps used in the MDF and IDFs must be spaced no more than 3 feet apart for the entirety of the run.

All pull ropes and like devices used during installation must be replaced in all pathways for future use.

The respondent must follow the manufacturer's specifications regarding cable length, bend radius, environmental restrictions, and mounting.

The cable must not be pulled through L-bend devices without prior approval of the County's Project Manager.

Cable with any sign of kinks bends, twists, or other damage or deformity must be considered faulty and replaced with good quality cable.

Cabling must never be attached to power cables or devices, lighting systems, or be located in any pathway with power cabling.

The cable tray must not surpass more than 50 percent of its rated capacity.

Innerduct must not be filled to more than 50 percent of its rated capacity.

All fiberoptic cabling must be contained in orange or yellow raceway/ENT to distinguish it from other cabling.

All cabling must be cut to fit, include a service loop where appropriate, and be labeled on both ends.

The following color codes must be used:

Red - alarm cabling

White - analog telephony station cabling and patch cables.

Blue - Ethernet generic data cables

Yellow- Cat 6/6A patch cables

Green - radio system Ethernet data cables

## 12) Equipment Surge Protection

All communications equipment must be furnished with power line and control line transient and surge protection devices. As a minimum, each surge protector must be a silicon avalanche trigger type device.

The type of device proposed must be specified by Respondent on the equipment drawings furnished and approved by the County's Project Manager before installation.

### 13)Power Supplies

Dual power supplies operating redundantly must be supplied if it is a standard equipment option. Each power supply must be capable of supplying the entire load.

Power supplies must incorporate an electronic "crowbar" circuit to protect external equipment from excessive voltage in the event of a malfunction. A short-circuit protection current-limiting circuit must also be incorporated to protect the supply from accidental shorts or excessive current drains. The power supplies must have capacities to support the growth of the system within the system tier level.

If required to maintain any system or console programming, including any operator selectable programming, the power supplies must support any battery required to maintain programming memory. The battery supply must maintain power to the memory for a minimum of 30 minutes.

Power supplies must not be operated at more than 75 percent of their rated load.

If multiple units are powered by a single power supply, each unit must be separately fused. A short at one unit must not cause the power supply fuse or circuit breaker to open resulting in the loss of power to all the other units.

### 14)Non-LAN Cable

All general-purpose interconnecting cables, except power, LAN, and equipment ground, used in the system must consist of standard telephone company type 25-pair cable with tinned-copper conductors, telephone standard color-coded

insulation, with vinyl jackets, terminated with an Amphenol SO terminal male connector on one end and a female connector on the other end. The number of installed cables must meet the system requirements plus specified future growth requirements.

Special-purpose cables designed as part of the Respondent's system are exempted from the requirement above.

#### 15) Connector Blocks

All cabling in the system for non-LAN connections must be run below the computer flooring, in an overhead cable tray, or in county-supplied cableway and terminate in Respondent-supplied Leviton 40066-MR, or equal. 25-pair connector blocks will have a standoff bracket and a prewired Amphenol female connector mating with the specified cable connector for general non-patch cable type interconnects. These "66 blocks" must be located on the plywood backboard mounted on the wall of the equipment room. The exact locations of the connector blocks must be identified in drawings and coordinated with the Owner.

Should any conductor require a different gauge of wire than specified by the "66 block" manufacturer, or require shielding, the conductor must be supplied in addition to and terminate in the same locations with appropriate connectors at each end.

The number of blocks supplied must be the number required to accommodate all the circuits and functions, including the future growth requirements. At least one block must be supplied for each functional group of interconnections as listed. The blocks must be laid out in a logical manner to minimize the length of the interconnecting jumpers. Connections must be made by jumpers as required from these blocks to the appropriate termination blocks. Blocks must not contain direct originating and terminating connections on the same block.

No series connecting (daisy chaining) of cabling must be used. All blocks and connectors used on the blocks must be identified with a marked identification strip.

The blocks may be mounted directly to the wall-mounted plywood backboard provided they are mounted in an orderly manner with jumper rings or cable distribution posts attached to the backboard. Sufficient rings or posts must be installed and located to accept the vertical jumpers from between the blocks to facilitate jumper runs in either direction or allow the jumpers to drop directly to their terminating positions. Rings or posts must also be installed located across the top to provide horizontal jumper runs positioned to allow the jumpers to access the vertical runs in either direction.

Patch panels may be used to transition from a single 8P8C (RJ45-type) cable and connector to a cross-connect block or multi-conductor cable supporting multiple connections.

#### 16) Quality and Workmanship Requirements

The respondent must advise the County's Project Manager of any equipment failing during installation and testing or arriving damaged, the cause of the failure or damage, and the respondent's plan to remedy the problem. Failed equipment may not be repaired unless the entire module or assembly is replaced with a new unused spare assembly that has been factory-tested and aligned.

All equipment must contain the latest current production hardware, firmware, and software at the time of the start of system acceptance testing unless otherwise agreed to in writing by the Owner's Project Manager. Such agreement must include a list of all the equipment, firmware, and software not at current production levels, as well as the current version of the equipment, firmware, and software, plus an explanation as to why it was not upgraded to the current release and a description of any difference between the installed version and the current production version.

All field service bulletins, software patches, and similar service and repair notices must be installed before the start of system acceptance testing. The county's Project Manager must be provided with all such field service notices, documents,

patches, release notes, etc., applying to the system being installed before the start of acceptance.

All work done and material supplied by Respondent must comply with defined industry standards such as:

- Motorola R56 latest version
- MDC1200 or similar PTT-ID/ANI standard
- Harris Standard known as AE/LZT 123 4618/1, latest revision.
- EIA/TIA 568C- Commercial Building Telecommunications Wiring Standard
- EIA/TIA 569C-Commercial Building Standard for Telecommunications Pathways and Spaces
- EIA/TIA 6078 -Commercial Building Grounding and Bonding Requirements for Telecommunications
- Institute of Electrical and Electronic Engineers (IEEE) Publication: 142-2007 Recommended Practice for Grounding of Industrial and Commercial Power Systems
- National Fire Protection Association (NFPA) Publication: 70, 2011 Edition National Electrical Code (NEC)
- Underwriters Laboratories, Inc. (U.L.) Publication 83-2008 Thermoplastic Insulated Wires
- Underwriters Laboratories, Inc. (U.L.) Publication 467-2007 (R86) Grounding and Bonding
- Underwriters Laboratories, Inc. (U.L.) Publication UL 96A-2007 - Installation Requirements for Lightning Protection System
- Underwriters Laboratories, Inc. (U.L.) Publication UL 96-2005 - Lightning Protection Components
- Underwriters Laboratories, Inc. (U.L.) Publication UL 1581-2001- Reference Standards for Electrical Wire, Cable, and Flexible Cores
- Institute of Electrical and Electronic Engineers (IEEE) Publication: IEEE C62-1991- Lightning Protection
- International Building Code
- International Fire Code

- Local codes as applicable

In the event of a conflict or different ways of accomplishing the same result, the more stringent code or specification requirement must be used. Respondents must request additional clarification from the County's Project Manager. Failure to request clarification may result in the Respondent having to re-install equipment or rework an installation at the Respondent's own expense.

Upon completion of installation, all material must be free from defects, corrosion, scratches, or other such conditions as to present an other-than-new appearance. All the equipment and materials must be of recent manufacture and design, new and unused.

All finished work must be straight, level, true and plumb where applicable, and installed exactly per the manufacturer's instructions, recommendations, and drawings. Only qualified mechanics skilled in this kind of work must be used. All workmanship must be first class in all respects. All mounting locations must be approved by the County's Project Manager before installation; failure to do this may result in the repair, removal, and re-installation of the equipment at the Respondent's expense.

Equipment racks must be securely anchored and electrically isolated from the floor.

The respondent must restore any floor panels, ceiling tiles, raceway covers, power panel covers, junction box covers, equipment cabinet panels, and similar covers or protective devices removed during installation. Should Respondent find missing covers, panels, etc. the missing items must be brought to the attention of the County's Project Manager as soon as possible for remedy.

Respondent must use only technicians trained in the installation of this equipment. Respondent must identify and provide resume information including training history of any technician proposed to perform work on the system. County's Project Manager must have the right to reject personnel from the proposed project team for, in the County's Project Manager's opinion, lack of training or prior unsatisfactory performance.

All work must be performed, according to local conditions, in a manner best calculated to promote timeliness and accuracy, to secure the safety of life, person, and property, to assure safe and continuous operation of the County's equipment and mission, and to reduce to a minimum any interference with the public and with other contractors in or about the property.

Respondent is responsible for damage to the County's any property caused by its installation of the equipment specified in this Contract.

Respondents must take all appropriate actions to ensure the work areas are kept clean and safe. All waste materials generated by Respondent must be removed daily.

All wiring and cabling must be laced, clamped or supported by appropriate means. All wiring must be done in a neat and workmanlike manner. Wiring and cabling must use County-provided cable tray, raceway, conduit, or underfloor wiring systems where provided. Ty-wraps must not be used to support or bundle LAN cables rated at CAT 6 or higher. Hook and loop style (e.g., Velcro) straps and cable ties or similar methods must be used for all LAN cables rated at CAT 6 or higher. No method of compressing or deforming the LAN cable must be used.

#### 17) AC Wiring

Wiring practice, material and cabling must be in accordance with requirements of the 2023 National Electrical Code, OSHA, Underwriters Laboratories, and applicable local codes and standards. All wiring must be laced clamped or supported by appropriate means.

If installed by the Respondent, AC wiring from the building circuit-breaker or fuse switch panels must be a minimum of 12 AWG.

#### 18) Implementation Requirements

These standards and other standards are the requirements for the installation of the system(s) and equipment.

Respondent must carefully coordinate all phases of the work with the County's Project Manager.

The following requirements are provided for installation of equipment including, but not limited to, antennas and antenna systems, consoles, base/control/repeater equipment, data networking equipment, and other miscellaneous equipment and devices required or used. Any variation in these guidelines requires the approval of the County's Project Manager.

Respondent must furnish all personnel to perform the initial installation, placement and assembling at the County's locations or elsewhere as required, of the individual equipment and the components into an operating system. This requirement includes the performance of any test to determine the satisfactory operating condition of the equipment before it is formally accepted by Wahkiakum County.

Respondent is responsible for the installation of all equipment furnished under this Contract. Respondent must provide sufficient competent engineers and technicians to perform the installation, as well as a full-time, factory-trained, technically competent project manager to supervise all phases of the system installation. The project manager must be assigned to this project through the installation and all testing phases. Respondent must also make connections between the County's provided equipment and Respondent-provided equipment (e.g., microwave equipment, routers, Ethernet switches, logging recorder, etc.) as may be required.

#### 19) Equipment Installations

The equipment installations required by this specification include the following described items as well as all other attachments, hardware, software, and procedures as may be provided to ensure a completed installation in accordance with the standards of good engineering practices, all building codes and ordinances

(including earthquake protection) in effect at the sites specified in this specification and requires the approval of Wahkiakum County's Project Manager.

The installation must follow the latest versions of Motorola R56, Harris AE/U.T 123 4618/1, or other recognized guidelines and standards. Respondent's proposal must identify the installation standard for all installations.

All special tools, testing devices, extenders, and other equipment required to properly maintain the complete network, and any associated components must be supplied with the network in accordance with the maintenance and testing requirements. A list of all such devices, extenders, tools, or equipment must be enclosed with the Proposal.

Wiring of 120 VAC to the nearest distribution panel ~~if needed~~ will be provided by Respondent as part of the project. A review of existing circuit drops and available breaker positions must be conducted by the Respondent. All new circuit breakers in panels must be supplied by Respondent. Wiring from this distribution panel to any new equipment is the responsibility of the Respondent. Respondents must identify in their proposal the number and type of AC circuits required.

All site work permits and licenses, as required to improve or develop any of the sites, must be provided by the Respondent as part of their work. Respondents will be required to obtain electrical and building permits as may be applicable. Each Point of Destination will require separate permits from the agency having jurisdiction.

Respondent must provide all services associated with the implementation of the radio system except those specifically identified in these specifications as provided by Wahkiakum County.

Proposed prices must include all installation hardware, brackets, braces, fasteners of all kinds, wiring, conduit, ancillary devices, procedures, and services required to install and/or interface equipment and components to provide a complete operating system fulfilling the requirements of the specification.

Respondent must adhere to FCC rules and all state and local government codes and ordinances in all matters pertaining to the work.

The proposed installation work must be authorized by the County's Project Manager before the commencement of any phase of work at each Point of Destination. The respondent must provide descriptions and layout drawings showing the proposed installations at each site at least 10 days prior to beginning any work.

Access to all Points of Destination will require prior coordination with County's Project Manager.

Fixed equipment and cable installations must be accomplished in compliance with earthquake protection practices. This requirement includes but is not limited to, providing flexible entry cables, surge loops, special battery racks, and special equipment rack design and mounting practices.

Rack mounting may be accomplished by either of two methods: special floors only mounting, or a combination of floor and top mounting. The respondent must recommend a particular method and provide an option for another method. Counties will select its preferred method before execution of the Agreement. All mounting arrangements must comply with the current edition of the Washington State Building Code and local building requirements.

It is the Respondent's responsibility to be aware of the facilities for delivering, storing, placing, handling, and disposing of materials. All aspects of the installation must be planned and executed in a professional manner as approved by the County's Project Manager. The respondent must make provisions to have all trash properly disposed of daily.

(1) Respondent must supply all the necessary installation items required to make the equipment a complete operating system including Wahkiakum County-supplied equipment. This requirement must include, but is not limited to, clamps, wiring, cable, hardware, tie-wraps, anchors, etc.

The respondent must make all the tests, adjustments, level settings, etc. to the equipment required to control and operate the consoles, recorders, base stations, and associated equipment in a normal manner.

The Respondent must provide any necessary cutouts in the computer floor sections as required. The County's Project Manager must approve the location of any cutouts required.

#### 20) Installation Plan

Respondent must develop and submit a final installation plan to the County's Project Manager for approval at least 10 days before the start of installation. No equipment is to be installed until the plan has been approved by the County's Project Manager. The plan must detail the location of equipment, cabling, mounting, hardware, existing equipment not included in this project, and installation procedures. Diagrams must be used to indicate equipment locations.

The existing system including consoles, remote desktop units, mobiles and portables, etc. must remain operational during the system transition. No more than one console or repeater pair can be taken offline at any time. Any down time will be communicated to the county to allow for all public safety users to be notified of alternate communications unless coordinated with the county's project manager. Respondent must develop an installation plan identifying all processes for effecting the transition between the old system and the new system including fallback plans and any common operation required.

Special attention must be paid to the planned reuse of existing system frequencies and the difficulties this may cause with the transition process.

#### 21) Equipment Warehousing

Respondent will be responsible for local warehousing of all delivered equipment prior to installation.

## 22) Equipment Recordkeeping

Before the installation of equipment, Respondent must establish a record system for each unit or equipment to be furnished under this contract. The system must be computerized and must keep current the correlation between equipment serial numbers and model numbers. This system may be in a database or spreadsheet format. The system must allow the County's technical staff to keep the information up to date over the life of the system. As a minimum, the record must contain the following but not be limited to:

- Type of equipment
- Manufacturer
- Model number
- Serial number
- Date of installation
- Accessory operational checklist
- Maintenance list
- Parts replaced.
- Name of the technician who performed the work.

Before the installation of equipment, Respondent must establish a system maintenance log and a failure reporting system to assist in recordkeeping and management of the maintenance program. This system may be the same system outlined in the previous paragraph but with the additional capacity to add maintenance and repair notes and information.

The record system, the failure reporting system and the system maintenance log are subject to approval by the County's Project Manager. The record system and the system maintenance log must be maintained locally under the County's technical staff control.

## 23) Grounding

All equipment must be grounded (bonded). Grounded Equipment must include, but not be limited to, all metal conduit, trays, racks, chassis, shelves, antennas, and transmission lines in accordance with these specifications.

The grounding system configuration for the equipment must be a single-point grounding system installed by Respondent. Respondent must document any existing grounding systems and document for the County's Project Manager that the existing grounding systems meet all manufacturer's specifications for the new equipment being installed. If deficiencies are noted, the Respondent must provide a written report detailing all deficiencies on a Point of Destination basis. The respondent will be responsible for correcting the deficiencies.

The respondent must furnish and install all grounding and bonding conductors and make all necessary connections to the grounding system. The conductors must be a minimum size of 6 AWG stranded copper wire unless a smaller wire size must be used to equipment size limitations. Any deviation from the 6 AWG grounding wire must be approved by the County's Project Manager. Bonding conductors must be used to bond the various pieces of equipment, conduit, trays, etc. together.

Ground conductors must be run as straight as possible with a minimum number of bends. No 90-degree bends will be permitted.

The respondent must supply all the necessary installation items required to make the equipment a complete operating system, including any County-supplied equipment. This requirement includes but is not limited to, clamps, wiring, cable, hardware, ty- wraps, anchors, etc.

The respondent must provide any necessary cutouts in the computer floor sections as required. The county's Project Manager must approve the location of any cutouts required.

#### 24) Failure to Meet Requirements of Specifications

Should any of the inspections, tests, or operation of the equipment under service conditions show the system or equipment does not meet the requirements of the specifications, the County's Project Manager may reject the equipment and direct the Respondent to immediately furnish new equipment or parts as needed to bring it up to the requirements of the specifications.

#### 25) Antennas and Mounts

All communications antennas, regardless of specific installation location, must be erected plumb, level, and square unless specifically noted in the design (e.g., mechanical down tilt antennas). Respondent must supply antenna mounts and all attachment hardware required to install Respondent-supplied antennas. If fabrication is necessary, antenna mounting hardware must be hot-dipped galvanized after fabrication. Antenna mounting hardware must be made of hot-dipped galvanized or stainless-steel material. Heavy wall conduit (already galvanized) may be used when mounting antennas to buildings, wooden poles, or other non-tower structures. Exterior utilization of electro galvanized or plated material for mounting antennas is not permissible.

If the galvanizing on any antenna support is heavily scratched, saw cut, drilled, or otherwise damaged, the damaged area must be repaired using the cold galvanizing compound.

Antenna mounting hardware must provide a good bond between antenna and antenna mount.

#### 26) Antenna Feed Line

All antennas must have a jumper constructed of Commscope LDF4-S0A or equal (not to exceed 50 inches) when using Commscope AVAS-50 or equal or larger as the primary length of the feed line. If Commscope LDF4-S0A or equal is used as the primary length of the feed line, it must be connected directly to the antenna. A "drip loop" must be formed as this jumper or feed line is installed. The manufacturer

recommended bending radius specifications must not be exceeded. No connectors must fall within, or be obscured by, any antenna support pipe or conduit run when making antenna feed line installations inside of support pipes or conduit runs.

At tower sites, the following items must be employed:

Where feed line support systems have not been provided, cable ladder or angle mount clamps must be installed to support the feedline using waveguide cushions or a similar mounting approach.

At locations where galvanized pipes or electrical conduit are used for mounting antennas; the external feed line runs may be secured by the utilization of snap-in hangers.

No ty-wraps of any sort, twisted wire, electrical tape, duct tape, string, rope, or any non-workmanlike approach must be used to support antenna feedlines.

When installing antenna feed line runs, the antenna feed line must not be attached to any individual antenna feed line run already installed. Attachment methods must encompass all antenna feed line runs and antenna feed line support at this point. Attachment intervals must follow requirements contained within this RFP or manufacturer recommendations.

The use of cable trays or messenger cables for antenna feed line support must be considered on an "as needed" basis. All antenna feed line runs must be secured to the messenger or cable tray by the utilization of stainless-steel wraplock or stainless-steel ties.

All antenna feed line runs inside buildings (where cable trays are provided) may be secured by utilization of black nylon cable ties. Where cable trays are not provided, the use of jiffy clips, one-hole pipe straps, rigid conduit straps, Unistrut and Unistrut dampers, or black nylon cable ties are permitted to secure antenna feed line runs. Utilization of electrogalvanized or plated material inside of buildings is permitted.

All antenna feed lines must have cable identification tags denoting the corresponding antenna. Each antenna and transmission line must be identified with colored tape bands and brass tags supplied and installed by Respondent as follows:

- Red - Receive.
- Yellow - Transmit.
- Brass Tag - Antenna/feedline names chosen during design.

Place colored tape bands on the antenna, near the ends of each cable and jumper, and on cables on both sides of the building entrance panel and on both sides of the cable on the inside of the building.

The number of bands denotes the antenna number.

The color tape must be 3M 7 mil Scotch 35 Vinyl Electrical Color-Coding Tape (red and yellow).

Place 1.5" diameter round blank brass tags (Brady Catalog #23211) near ends of each cable. Each brass tag must be customized to clearly identify each run of cable utilized.

Use ¼" steel stamps for letter and number sets (Brady Catalog #23240 and #23241).

Continuous, ¼-inch-wide, Type 316 stainless-steel strapping (Brady Catalog #42331) and stainless-steel banding heads (Brady Catalog #90910) utilizing a proper banding tool (Brady Catalog #42322) must be used to secure the brass tag at the connector ends of each run of cable.

All antenna feed line entryways into buildings must be sealed. All entryways must be filled to near capacity prior to starting a new opening. Microwave waveguide installations may dictate special consideration.

All antennas supported by wooden poles or electrical conduit, or pipe-mounted to building sides or through the roof, must use some type of grounding system. Where

possible, this type of support should have an AWG #2 wire running to an adequate grounding system or grounding rod.

After ground strap installation, the work must be wrapped with overlapping layers of black outdoor electrical tape and protected with Scotchkote or equivalent outdoor coating to preclude corrosion. A minimum of three layers of protection must be applied.

#### 27) Equipment - General

The proposed equipment will be quality, durable public-safety-grade equipment. Equipment shall meet or exceed current standards of the Electronic Industries Alliance (EIA) and the Telecommunications Industry Association, and the rules and regulations of the Federal Communications Commission (FCC), in addition to these specifications. All equipment will be installed in accordance with industry-standard methods and practices, and quality material and workmanship used in all system installations.

#### 28) Base Stations

Base stations may operate in either Analog or Digital (P25) mode or a combination of both modes.

Base stations shall meet or exceed the performance requirements of a Class A transceiver as defined in the following standards:

ANSI/TIA-603-D, Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

ANSI/TIA-102.CAAB-C, Project 25 Land Mobile Radio Transceiver Recommendations, C4FM/CQPSK Modulation

#### 29) Encryption

The system equipment must come supplied with the necessary hardware and software to support P25 standard encryption.

### 30) Voting Comparator

When voting comparators are used they shall be capable of voting both voice and data transmissions. Voting comparators shall select the best-received signal based on either the Received Signal Strength Index (RSSI) or Bit Error Rate (BER). The voter shall be capable of the best signal selection on a constant basis.

### 31) Antenna Systems General

The following minimum specifications, for each fixed antenna system proposed, shall be provided:

- Antenna mounting height and location on the tower.
- Antenna type and gain
- Transmission line type and loss
- Combining and multi-coupling network

### 32) Transmission Lines and Antenna System Accessories

Transmission lines shall be one continuous length with a copper conductor and weatherproof jacket. All RF connectors shall be installed in accordance with their manufacturer's installation requirements. All RF connectors shall be weathertight gold- or silver-plated contacts. All connectors shall be torqued to the manufacturer's specifications using a torque wrench. Manufacturer-approved wrapping and sealer shall be utilized on all outdoor transmission line in-line and grounding connections to prevent water intrusion. Outdoor installations shall include the proper minimum diameter drip loops in all cabling. Transmission lines shall be securely fastened to a cable tray or ladder attached to the tower using manufacturer-approved devices and methods. Mounting hardware, cable hangers, grounding kits and other miscellaneous items shall be supplied to ensure proper installation of the antenna and transmission line. All metal components

shall be intrinsically corrosion resistant. A hoisting grip shall be used at the top and at manufacturer recommended intervals to provide strain relief.

### 33) Site Receiver Multicoupler System

Sites with multiple receivers must have a receiver multicoupling system. At each site, one receiver antenna must be used as much as practical for all receivers at the site. If more than one antenna is required, on any site, for all receive operations, a detailed explanation of the proposed configuration along with complete justification must be included in the Proposal. The receiver multicoupling system must not be included in the transmitter combiner system.

The multicoupling system must be expandable to at least 6 channels and employ a high third-order intercept above +40 dBm to limit the generation of intermodulation products. The noise figure must not exceed 5.0 dB. Any port not used in the system must be terminated in a 50-ohm load.

The multicoupling system must be powered by a nominal industry-standard -48 VDC power connection.

### 34) Simulcast System

Where simulcast operation is proposed, the Respondent must provide full technical details about all aspects of the proposed simulcast equipment including but not limited to:

Methods used to maintain required frequency stability and specifications for frequency stability.

Methods used to maintain proper audio phasing and time of arrival requirements.

Respondent will supply the site interconnection transport facilities consisting of ISO Layer 2 connections using microwave, fiber, telco circuits, or other transport facilities. If the Respondent requires quality of service, other traffic prioritization, or

other traffic shaping (i.e., MPLS services, or ISO Layer 3 routing services, the Respondent must supply the required system(s).

The respondent must detail the bandwidth required to implement the system. The Respondent must supply any networking equipment required to connect the sites to the County's supplied transport network. Respondents must detail their limits on transport performance to maintain simulcast phasing in all configurations of transport operation.

### 35) Precision Frequency Source

A precision frequency source must be provided at each simulcast transmitter site to control all frequency synthesizers in the repeater stations to stabilize all transmitter frequencies.

The precision frequency source must be an "atomic" type frequency standard such as rubidium, or some other source of equal accuracy. Any other source offered by Respondent must be technically justified as an adequate source to meet the simulcast system requirements of frequency stability throughout the system.

### 36) Phase Delay Equalization

Phase delay equalization must be provided to minimize simulcast overlap distortion. Equalization equipment must be provided for each transmit channel and will have sufficient delay adjustment to provide "over" and "under" adjustment of at least 25 percent or as required by the overlap distance requirements, whichever is greater. The equipment configuration must support adjustments in the simulcast delay or "launch time" adjustments from the controller location or other defined single location without making a trip to the remote site.

The simulcast timing/phase delay equipment must automatically compensate for changes in network routing. This compensation must allow for an infinite number of

network configurations. Respondent must specify the maximum County network/transport time delay that can be accommodated with Respondent's equipment.

### 37) Receiver Voting Systems

Receiver voting systems must be employed as part of any area-wide simulcast radio system. The voting equipment must be capable of continuous-duty operation. Each of the VHF simulcast channels must be supplied with a receiver voting system. The respondent must supply detailed information on the voting system including primary and secondary voters for each simulcast channel and the working of the voting system for the initial voting and ongoing voting for each transmission.

The equipment supplied must be capable of the following operational criteria when an on-channel, properly coded signal appears in the system.

The remote receiver voting system must be designed and interconnected to constantly select the highest quality signal being received and automatically rejecting the weaker and/or noisier (e.g., higher bit error rate) signals. The process must be continuously selective and provide for automatic switchover without interruption of speech or data. The best quality audio signals during a transmission as changes of condition or location occur must be selected. The voting comparator must monitor the integrity of the incoming receive data circuits and reject any lines not meeting the required bit error rate/RSSL.

The system must be "failsafe," so any receiver or data transport circuit failure will not cause the rest of the system to malfunction or result in an interruption of communications.

Controls must be provided allowing for individual selection and disabling of each receiver input.

### 38) Coverage

Respondent will provide radio coverage predictions in various service areas as described below:

39) Mobile service coverage map

The mobile service coverage map will show existing sites. The respondent will provide predicted coverage of the proposed radio system for mobile radios in Wahkiakum County.

40) Portable service coverage maps.

The portable service coverage map will show existing sites. The respondent will provide predicted coverage of the proposed radio system for portable radios outdoors in Wahkiakum County. In addition, Respondent will provide predicted residential in-building coverage service areas for portable radios on the proposed radio system assuming a bi-directional building loss of 6 dB.

Coverage design, implementation, and testing for the proposed system will adhere to latest revision of Telecommunications Industry Association (TIA)

Telecommunications System Bulletin 88.3-E

The Respondent's design will minimize the effects of RF interference with all users at existing facilities.

The respondent will provide computer-generated propagation plots clearly illustrating predicted talk-in and talk-out coverage areas of their proposed systems for all areas showing 97 percent reliability. Plots will be provided for both mobile and worn portable coverage.

Mobile coverage will be for a 50-watt mobile using a unity gain antenna mounted on the roof of a mid-size SUV with 15 feet of the type of coaxial cable recommended by Respondent for mobile installations.

Portable coverage will be for a 5-watt portable radio mounted with a unity gain radio- unit-mounted antenna and use of a remote-speaker mic assuming the user does not remove the radio when transmitting.

If portable plots assume worn-on-the-hip assumption, Respondent will explain and potentially adjust portable plots for Law Enforcement users that use chest carrying positions and for Fire Service users, who will tend to use leather shoulder slings/cases or pocket-carrying methods.

Coverage plots will be provided showing the coverage from proposed sites. Simulcast cell coverage plots will account for both signal strength and simulcast overlap delay distortion in defining acceptable coverage. The respondent will include:

Composite coverage of system for mobiles and portables - talk-in and talk-out

Simulcast cell coverage for mobiles and portables - talk-in and talk-out.

Single-site, simulcast cell, and, as applicable, composite-site coverage plots will be provided, showing the total coverage from the proposed site or sites.

A description of the method used to calculate coverage will be included in the proposal. All criteria and assumptions will be stated on each map. In addition, the method used to create propagation models will be explained.

The following information will be clearly defined for each map and each site:

- Base/repeater site location, including latitude and longitude using NAD83
- Base/repeater RF transmitter output power (per channel)
- Base/repeater RF power at the input of the antenna (per channel)
- Base/repeater antenna model, gain, directivity, and azimuth and mechanical down tilt as applicable
- Base/repeater transmit effective radiated power (ERP) (per channel)
- Base/repeater receiver sensitivity
- Base/repeater transmit and receive antenna height(s) above ground.
- Base/repeater antenna height(s) above average terrain (HAAT)

- Base/repeater site elevation above mean sea level (AMSL)
- Subscriber RF transmitter output power
- Assumed fixed-site RF noise floor or degradation.
- Assumed mobile and portable RF noise floor or degradation.
- Simulcast launch delay specifications.

#### 41) Network Management System

The Network Management System (NMS) shall provide a single platform for personnel to monitor the connectivity network and to provide adequate alarm information for first level response to system degradation and outages. The NMS shall be a GUI-based, multi-protocol network management tool. The NMS shall provide remote access via VPN with SSL web access control security. The NMS shall be capable of e-mail and paging notifications of threshold events that require immediate response and deployment.

Network management consists of the following functions:

- Equipment configuration management and provisioning
- Performance management
- Security management
- Alarm management

#### 42) Configuration Management

The NMS shall provide the interface for the configuration of the connectivity network. Connectivity configuration includes items such as the following:

- Provisioning of the transport network equipment
- Provisioning of the VHF radio system
- Administrative functions

The NMS shall provide a database for all network elements and configuration parameters. The NMS shall allow the system administrator to perform multiple simultaneous database operations.

#### 43) Performance Management

The NMS shall display and store system status, alarm indications, administrative functions, and NMS system access. The NMS shall store performance data on electronic media. Real-time storage capacity shall be enough to store system activity records for one full month.

The NMS shall display system performance information on an NMS workstation.

Data displayed and stored shall include the following items at a minimum:

- System failures (static and intermittent)
- Historical Report
- Activity Details
- Activity Summaries
- Alarm Control, Display, and Logging
- Equipment Statistics
- Site Statistics
- Event Logs
- On-Screen Reports
- Receive signal level (RSL)
- IP packet statistics such as collisions, jabbers, packet sizing, and fragments
- Data stored and reported, and thresholds for upper and lower limits shall be customizable.

#### 44) Security Management

Access to the NMS and other system elements shall be password-protected. There shall be at least two levels of password access. Access to status, activity, alarms,

and other system information shall be available to three authorized users. Control and diagnostic operations shall be accessible to a limited number of administrator-level users, authorized to control these operations.

The servers shall have the ability to be remotely supported via VPN. The database administrator shall have the capability to monitor all VPN access and activity while being performed by the remote entity.

Web browser access shall be provided with support monitoring and control functions and administratively restrictive database modifications. Multiple locations and users should be able to access the monitoring screens concurrently.

#### 45) Fault Management

The NMS shall monitor the connectivity network for critical and non-critical failures and status changes. The system shall be continuously and automatically monitored for failure of any key component. The failure of any key component shall be automatically indicated at the NMS workstations.

#### 46) Self-Diagnostic Capabilities

The system will have the following diagnostic capabilities to facilitate and enhance the troubleshooting ability of the NMS system and associated hardware.

- Monitor primary and backup server hardware components (disk drives, fans, temperature)
- Gather statistics on the quality of polling per address.
- Gather statistics on the quality of polling per polling port.
- Ability to view polling activity in text as well as protocol (byte) level.
- Monitor internal operational alarms, which shall appear as other system event alarms.

#### 47) Alarm Points

The NMS shall monitor and alarm for major and minor failures, abnormal conditions of operation, and status changes of the radio system and connectivity network. Alarms monitored shall include equipment failures or link failures of or to the following equipment or systems:

- Network management system
- Database management systems
- Microwave radios
- VHF system radios
- -48VDC power systems
- Network switches

The above list is a minimum requirement. The NMS shall allow any failure or abnormal operating conditions to be traced to the shelf sub-system level.

The connectivity NMS shall provide summary alarm outputs connected to inputs of the radio system NMS.

#### 48) Alarm Point Inputs

The alarm system shall accommodate the following types of status inputs, at a minimum:

- Ethernet (SNMP)
- Form C relay (either N/O or N/C)
- TTL
- RS-232

#### 49) Alarm Indication

The NMS GUI screen display shall display the complete monitored network and associated programmed alarms, controls, and status. The GUI layer display progression shall be as follows:

- Global View: This shall be a mapped representation of all sites. If an alarm

condition exists at a site, a single-colored icon shall illuminate red for critical/major, yellow for minor, and green for normal.

- Site Level View: The site level views shall illustrate the equipment at each individual site. Each equipment sub-system shall be represented by an illuminated colored icon.
- Equipment View: The equipment view shall expand the equipment subsystem in the Site Level View and display the individual racks, shelves, and modules generating the alarm. Each displayed rack, shelf, and module shall have a colored icon illuminated.

When a major or minor failure or status change occurs, an indication shall be displayed on the alarm system terminal within 30 seconds of the alarm occurrence.

When an alarm is generated, the icon shall blink the appropriate color and continue to do so until acknowledged. Once an alarm point is acknowledged, the icon shall cease to blink and maintain the color associated with the priority level until the alarm status is normal.

The alarm system terminal shall display a report for each alarm containing, at a minimum, the following information:

- Date and time (stamped by either the master or RTU)
- Station name
- Point name
- Point status description
- Optional instruction line

The user shall have the capability to customize the system's alarm display field's format as to which fields are to be displayed, in what order, and in what colors.

Clear or normal alarms and/or conditions shall have the capability to be displayed in various colors independent of the coloration of the failed alarms.

The system workstations shall have the capability of displaying text and GUI representation of all current system-monitored alarm statuses.

All event state changes that have not been acknowledged by the user shall be displayed in a separate list of event state changes.

#### 50) Alarm Point Attributes

The primary alarm description text field shall provide a minimum of 40 characters for each alarm status. A secondary alarm description field shall assign the change of state severity: Critical, Major, Minor & and Status. The third field shall provide condition indicators for fail and clear, Door Open, Door Closed, etc.

The system shall be capable of classifying alarms into selectable groups such as Critical, Power Alarm Group, Generator, etc.

#### 51) Alarm Notification Media

The NMS shall provide remote access via VPN with SSL web access control security. The NMS shall provide automatic e-mail and paging notifications of threshold events that require immediate response and deployment, utilizing existing Internet connections and/or any new connections provisioned for purposes of contracted network monitoring services.

#### 52) Historical Data

The alarm system shall store historical alarm data. Historical alarm reports shall be capable of querying, allowing the operator to produce alarm reports based on date and time, site or subsystem, alarm classification, equipment, or equipment type. Historical data shall be exportable to other software for analysis. The system shall store historical alarm data for a period of at least 30 days.

#### 53) Protocols

The NMS platform shall have the ability to support concurrently polled protocols on multiple ports. It shall be capable of alarm mediation, such as receiving collected

alarms from another monitoring platform or element manager using one or more of the following protocols: SNMPv1, SNMPv2, SNMPv2c, SNMPv3, MODBUS, and TII. The NMS shall have a MoM SNMPv2c (minimum) port that will report all alarm information to a higher-order MoM.

#### 54) Seismic Requirements

Securing equipment to meet seismic requirements is the responsibility of the Respondent.

#### 55) Space Requirements

Space and power are limitations at most of the County's sites. Depending on the Respondent's space requirements, very few sites may need to have existing equipment relocated to a nearby rack or the existing may need to be slid to a temporary location near its original location. Relocation of the equipment is the responsibility of the Respondent. Under all circumstances, Respondent must ensure operation of the existing equipment, regardless of its installed location, is not interrupted without prior approval of the County's Project Manager.

Respondent is encouraged to minimize the floor and rack space required at each location.

The respondent must specify the following for each location of proposed fixed infrastructure equipment so the County's Project Manager can determine the effects of the proposed equipment on the site requirements:

- Equipment space requirements, including:
  - Number of rack spaces required.
  - Rack dimensions, including, width, depth, and height, with all equipment installed.
  - Any interior non-rack space required.
- Equipment heat and power loads including:
  - Number of AC circuits required and what current and voltage ratings.
  - Number of DC circuits required and what current and voltage ratings.

- Antenna requirements, including:
- Number and types of antennas required, including all transmit, receive, GPS, and any other necessary antennas.
- Necessary installation space for each antenna
- Mechanical/wind loads for each antenna.

#### 56) Antenna mounting requirements.

Respondent shall develop applications, apply for, attend public hearings, and provide responses to questions, for all permits, FAA clearance and review, tribal notifications, and any other environmental, tower, antenna, land use, historical, or related permits and/or approvals required for this project.

Respondent shall develop and apply for all permits required for the project. In connection with Respondent's duties applying for permits, Respondent shall attend required public hearings, provide responses to questions from the public and permitting agencies, make required notifications to tribes, and make and publish any notices as necessary for permitting approval.

The respondent must provide a calendar timeline for obtaining permits and site construction in their project schedule.

#### 57) Seismic

Respondent-supplied equipment systems and seismic bracing must be capable of withstanding the effects of earthquake motions as defined in seismic design parameters of the currently adopted edition of the Uniform Building Code.

#### 58) Shelter and Equipment Grounding

The respondent must make all connections to the existing grounding system for all equipment provided by the Respondent following established industry best practices.

For new locations, the Respondent must provide a grounding system and make all necessary grounding connections.

Respondent is responsible for cable entry panels, surge protectors, grounding hardware, and any other associated hardware for any new sites.

An internal perimeter ground bus is provided at the existing site using #2 green-jacketed copper-stranded wire or ¼-inch copper bus bar.

For new sites, the Respondent must install the interior ground bus following industry practices, manufacturer-approved methods, or following the direction of the County's Project Manager.

The Respondent must install grounding conductors along the cable tray or other suitable support medium. One end of the conductor must be bonded to the rack, equipment support apparatus, or other metal equipment. The other end of the conductor must be bonded to the ground bus or internal perimeter ground bus conductor. All ground conductors must be bonded to the ground bus conductor using suitable, approved methods.

The equipment grounding conductor must be a #6 AWG, or larger, green-jacketed, stranded-copper conductor. Braided conductor must not be used.

Grounding and bonding conductors must be installed in a direct path with bends no less than an 8-inch radius. All grounding conductors must be cut to the proper length to ensure the conductors do not create an electrical choke or unintended path for lightning strikes.

#### 59) Materials

As applicable, materials must conform to the following specifications.

Structural-Steel Shapes: ASTM A 36/A 36M or ASTM A 529/A 529M

Steel Plate, Bar, or Strip: ASTM A 529/A 529M, ASTM A 570/A 570M, or ASTM A 572/A 572M; 50,000-psi minimum yield strength

Zinc-coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, structural quality, Grade 50, with G60 coating designation; mill phosphatized.

Metallic-Coated Steel Sheet Pre-painted with Coil Coating: Steel sheet metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A755/A755M and the following requirements:

Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality

Non-High-Strength Bolts, Nuts, and Washers: ASTM A 307, Grade A; carbon- steel, hex-head bolts; carbon-steel nuts; and flat, unhardened steel washers

Finish: Hot-dip zinc coating, ASTM A 153, Class C

High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy hex steel structural bolts, heavy hex carbon-steel nuts, and hardened carbon-steel washers

Finish: Hot-dip zinc coating, ASTM A 153, Class C

Anchor Rods, Bolts, Nuts, and Washers: As follows:

Headless Bolts: ASTM A 687, high strength

Headed Bolts: ASTM A 490, Type 1, heavy hex steel structural bolts and heavy hex carbon steel nuts.

Washers: ASTM A 36/A 36M

Primers: As selected by the manufacturer for resistance to normal atmospheric corrosion, compatibility with finish paint systems, capability to provide a sound foundation for field-applied topcoats despite prolonged exposure, and as follows:

Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer; complying with performance requirements of FS TT-P-664

Metallic-Coated Steel Sheet Pre-painted with Coil Coating: Steel sheet metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A755/A755M and the following requirements:

Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 coating designation; structural quality

#### 60) Antenna Mounts

Tower-attached antenna mounts must be furnished and installed by the Respondent. Wahkiakum County and Respondent must agree on antenna mounting hardware, elevation, azimuth, and other technical parameters prior to installation.

Respondents must supply all antenna mounting hardware required to fasten or install the antenna.

#### 61) Transmission Line Supports

Transmission line supports must be furnished and installed by the Respondent as needed.

Transmission lines must be installed and supported following cable manufacturer instructions, not to exceed more than 36 inches between supports.

The transmission lines must be routed to an in-ground cable trench or an overhead ice bridge depending on the site conditions.

#### 62) DC Power Requirements

For all existing remote sites, WCSO Dispatch Center, simulcast voting location(s) and any other fixed-equipment locations, Respondent will provide all necessary -48 VDC power, including rectifiers, chargers, batteries, and primary circuit breakers. For any new sites, Respondent will furnish and install all necessary -48 VDC power, including rectifiers, chargers, batteries, and primary circuit breakers, cables, conduit, and connectors as necessary.

Industry-standard power at the top of the DC power rack as defined by:

Voltage range: -43.0 VDC to -56.4 VDC (-48 VDC nominal)

Ripple and Noise: 30 millivolts

Low voltage cut off at -42 VDC and reconnect when power is reapplied to the charger at -49 VDC.

DC power circuits must use a black-colored wire for ground connections regardless of polarity.

DC power circuits must use red for -48 VDC. If other voltages are used such as +12 VDC, the equipment supplied by Respondent must use a different color than red or the wires must be marked continuously as to their voltage.

Installation of DC power circuits must comply with the National Electrical Code. NEC Article 336 requires TC or TC-ER rated cables in cable trays. Alternatively, DC conductors in cable trays may be run in an Electrical Non-metallic Tube (ENT) commonly called a 'smurf tube'.

Unless otherwise approved by the County, the Respondent must furnish and install an appropriately sized circuit breaker panel at the top of each equipment rack, including appropriately sized circuit breakers, to allow each piece of equipment installed in each rack to be individually powered on and off.

The respondent must furnish and install appropriately sized wiring between each rack's circuit breaker panel and the site's primary DC plant.

All RF-site equipment must operate on industry-standard -48 VDC power. This requirement includes base stations, routers, switches, controllers, etc.

The respondent must furnish and install any necessary DC-to-DC converters required to support voltages other than -48 VDC. If any such converters are used, circuit breakers must also be used on the output to control each piece of equipment powered by the converter(s).

To ensure adequate -48 VDC power is made available, the Respondent must specify the current load for each piece of equipment proposed to be installed at each site, plus the total 48 VDC current load for all proposed equipment at each site.

Respondent must detail the DC power plant design requirements in their Proposal including design calculations and assumptions, operating parameters, and system technical information to fully describe the DC power equipment and system requirements.

### 63) Power Distribution

Any 12 VDC distribution planned for load rack locations must have its own load power distribution panel.

DC Power Distribution in the load racks must be provided as required by the system design. DC distribution must be designed to reduce the amount of equipment losing power when a circuit breaker is turned off. At the very minimum, equipment should be connected so the loss of a single power circuit does not affect the redundancy of the equipment design.

The distribution panels must incorporate circuit breakers providing a connection to each circuit breaker to indicate when it has tripped because of an overload condition and an alarm relay providing a Form C dry contact closure when any of the circuit breakers are tripped.

All wiring to the loads must be done by the Respondent. All wiring must comply with NEC wiring standards.

Any equipment (load) rack with a circuit breaker distribution installed as part of this work must have its own power and ground buses of suitable size for the equipment loads and be electrically isolated from the rack itself.

### 64) DC-to-DC Converter Specifications

Any 48V DC to 12V DC converter supplied must supply its rated output voltage  $\pm 2\%$  at the load with an input range of -41 to -60 VDC.

The output noise must not exceed 10mV RMS (10 kHz to 10 MHz), 150 mV peak to peak (10 kHz to 100 MHz), and 26 dBnC measured at the DC output terminals for all ranges of load values.

The converters must have Form C alarm contacts to indicate a converter failure.

The voltage regulation from no load to full load must be 1 percent or better.

The converters must have the following indicators as a minimum: Input DC, Output DC, Failure.

The converters must be equipped with the following meters: DC output voltage, DC output current. The meters must have an accuracy of 2 percent or greater.

The converters must automatically restart when the cause of a shutdown has been removed.

Converters must operate at full output capability over a temperature range of -20°C to 50°C, relative humidity 5 percent to 95 percent.

The converters must have an adjustable over-voltage protection limiting the maximum output voltage to no more than the rated voltage +10 percent.

The converters are all planned for installation at load racks. The respondent must furnish and install all equipment and hardware required to mount the specified equipment in 19-inch racks.

#### 65) Inverters

Any inverters must provide filtered 120V AC output with an AC ripple component of less than 0.03 volts RMS (30 millivolts). Random electrical noise levels must be 32 dBrnC or less measured at the output terminals for all load currents.

The input voltage range must be -42 to -60 VDC minimum.

The output waveform must be sinusoidal with a THD <2 percent for linear loads and <3 percent for non-linear loads from 0 to 100 percent load.

All inverters must be capable of supplying 120 VAC at 1 kW load continuously at +25°C temperature.

The inverter AC grounding and neutral connection must be installed in compliance with the NEC. The inverter must be defined as a separately derived system for code requirements.

#### 66) Backup Dispatch Radio

- a) A new high-power mobile radio and power supply shall be installed in dispatch to replace the current standalone backup radio.

#### 67) Documentation Requirements

Respondents must deliver the following documentation in electronic format.

Documentation must be delivered on removable media (USB drive) following final acceptance of the system. Documentation shall be delivered in a format that allows word searches within each document.

Portable Document Format© (PDF) is acceptable except as specifically noted.

"Secured" PDF means a PDF document with password security. Documents noted as "Native" must be provided to County's Project Manager in a format to be edited and maintained with current versions of Microsoft Word, Excel, Access, PowerPoint, or Visio. Document formats noted as "Native/..." must be provided in the most recent version of the designated format. All photographs must be provided in JPEG (.jpg) format. Hardcopy refers to paper documents.

All design documents in "Native" and PDF formats must be provided in black in white due to color blindness and the limitations of some printers and photocopiers especially devices supporting large paper formats, The use of color in Microsoft Word and Excel documents should be limited especially in Tables and Figures. Color PowerPoint presentations and color photos are encouraged. Color in these documents may be acceptable if the black and white versions clearly communicate the information provided using colors.

## XIX. Desing and system documentation

### A. Document: System Detailed Design

The System Detailed Design document includes a clear description of design goals and assumptions, propagation predictions and accompanying data, equipment lists, installation diagrams, interconnect diagrams, transport diagrams, annotated diagrams showing audio, RF, and signaling paths, electrical design including grounding and TVSS devices, list of channels, detailed list of required CTCSS/DTMF/other tone signaling, and other engineering detail sufficient to procure, install, configure, operate and maintain the subsystems comprising the Respondent's response to the project scope.

Format: PDF (Word Searchable).

### B. Document: System Access Information

The respondent must supply a complete list of all usernames, account names, passwords, reset instructions, and other information required to satisfy system security requirements. These requirements explicitly require the Respondent to supply all information for all levels of access.

Respondent must provide a statement attesting no hidden accounts, "backdoors," or other points of unauthorized access exist in the systems.

Format: Secure PDF.

### C. Document: Programming Documentation

Where provided by the manufacturer, the Respondent must supply all programming, configuration, and troubleshooting documentation for all components to Wahkiakum County. The respondent must further supply to the County's Project Manager comprehensive written documentation of all programming and configuration settings implemented on all components of the system.

Format: PDF (Word Searchable) and hardcopy.

### D. Document: Licenses and Registrations

The respondent must furnish all hardware, software, and firmware licenses and warranties for all components being provided. Respondent must supply proof of registration in the County's name for all software, firmware, and hardware where such registration is required for installation, configuration, or other purpose.

Respondent must further provide a complete list of software, firmware, and hardware not registered in the County's name, said list to include all information necessary for the County's Project Manager to complete registration (i.e., product identification codes, CD keys, serial numbers, etc.).

Format: PDF(Word Searchable) and hardcopy.

**E. Document: Component Warranty Materials**

Respondent shall provide all certifications and documentation activating, relating to, and governing equipment warranties from component manufacturers, properly completed and authorized by Respondent.

Format: PDF(Word Searchable) and hardcopy

**Project Management**

**F. Document: Work Breakdown Structure (WBS)**

Respondent and the County's Project Manager must jointly produce a work breakdown structure identifying the elements of work required to fulfill the project's goals and objectives. The WBS must be at a level of detail deemed by the County's Project Manager in the Project Manager's reasonable discretion to be sufficient for effective project management. Each entry in the WBS must include, at a minimum, a unique identification number, the task name, the anticipated duration, and all dependencies. WBS in chart form is preferred.

Format: Native.

**G. Document: Schedule**

Respondent must furnish a project schedule for review, modification, and acceptance by the County's Project Manager. The schedule must show each set of tasks to be completed, the expected duration, start and end time for each subsystem, and the responsible person for each task at a level of detail determined by the County's Project Manager to be sufficient for project management.

Format: PDF(Word Searchable) and Native/MS Project (or similar).

**H. Document: Contact List**

Respondent and Counties Project Manager must generate a common contact list identifying all key participants in the project including, at minimum, project owners; project executives/sponsors; Executive leadership responsible for the project for Respondent and County; project managers; engineering leads; technical leads; salespersons; sales manager; technicians; and supervisory personnel for County, Respondent, and all subcontractors. Contact information must include, at a minimum, each person's name, company, project role, email address, office telephone number, mobile/24-hour telephone number, and mailing address.

Format: Native and PDF (Word Searchable).

I. Document: Security/Background Information

This project requires entry to one or more secure public safety facilities.

Respondent personnel, including subcontractors, must successfully complete a criminal background security check to be allowed access to these facilities. The respondent must supply fully completed Background Check Authorization Forms as supplied by the County's Project Manager for each Respondent or subcontractor employee who will be on-premises. Said forms must be supplied no later than five working days before the expected date of facility access.

Format: Hardcopy.

J. Document: Communication Plan

Respondent and the County's Project Manager must jointly produce a communications plan identifying project and agency stakeholders, their level of information required, the frequency of needed communication, the method of communication, and the creator of each communication.

Format: Native and PDF (Word Searchable).

K. Document: Site Readiness Plan

Where applicable, the Respondent must provide reports on the readiness of each Point of Destination and facility to accept the provided systems in accordance with industry standards and codes. Site readiness reports must include specific instances of standard or code shortfalls, including drawings, pictures, and text explanations, along with reference to the specific code, standard, or practice being

applied. This document is intended to be used as the basis for the County's improvements at the sites and must be prepared by Respondent to best suit this use.

Format: PDF (Word Searchable) and native.

**L. Document: System Implementation Plan**

The respondent must furnish documentation detailing the plan for changes in the system. This plan must be focused on subsystem-level activity and illustrate the sequencing, interface, and dependencies of each subsystem.

Format: PDF (Word Searchable) and native.

**M. Document: Transition Plan for Each Subsystem**

The respondent and the County's Project Manager must jointly create a transition plan for each subsystem. The transition plan identifies the specific steps and changes required to move Wahkiakum County from the existing system to the new/upgraded system, including all interim or temporary states through which the process must move before achieving the end state. For example, if system users must temporarily move to a backup location while the primary location is being implemented, this condition must be noted in the transition plan.

Format: PDF (Word Searchable) and hardcopy.

**N. Document: System Planning Documentation**

System Planning documentation includes the following, all of which are to be presented by Respondent to the County's Project Manager for review, input, and approval before equipment ordering:

- Programming Template.
- Channel/frequency plan.
- Field radio replacement or reprogramming plan.
- Radio programming development plan.
- Logging recorder channel plan.
- Transport design.

- Network management design identifying the type and number of devices, alarms, monitors, presentation program, and other elements required by the system.

Format: PDF (Word Searchable) and hardcopy.

O. Document: Staging Acceptance Plan

The respondent must provide a comprehensive test plan for all system components and their interactions in a staged configuration to the County's Project Manager for review and approval. The respondent must provide written (hardcopy) certification of the plan's successful completion signed by the Respondent and the County's Project Manager.

Format: Native and hardcopy.

P. Document: System Acceptance Plan

Following installation and configuration, the Respondent and the County's Project Manager must inspect and test the system before implementation. Respondent must supply the initial System Acceptance Plan (SAP) to the County's Project Manager for review and approval before implementation. Respondent and County must complete the testing as identified in the SAP and both must sign the document as satisfactorily completed prior to implementation beginning.

Format: Native and hardcopy.

Q. Document: Certificate of System Acceptance

Respondent must furnish a Certificate of System Acceptance to Owner's Project Manager for review and signature. The Certificate must be signed by the Owner's Project Manager upon successful completion of the project including any post-installation system run time requirements.

Format: Hardcopy.

R. Document: System Overview

A written description of the system including components used, transport methods employed, installation locations, configuration parameters, features and functionality of the installed system.

Format: PDF (Word Searchable) and native.

**S. Document: Component Operation, Installation and Maintenance Manuals**

The manufacturer supplied operation, installation, and maintenance manuals for all radios, antennas, TVSS devices, combiners, multiplexers, power distribution units, inverters, timing sources, simulcast equipment, and other components of the radio system.

Format: PDF (Word Searchable).

**T. Document: As-Built**

The set of drawings, equipment specification sheets, engineer's instructions, and other documentation detailing how the systems addressed by the project scope were implemented. The make, model, serial number, and installed location of each major component must be noted and supplied in Native format (MS Excel preferred). Where applicable, a complete inventory of circuit board/card used in each equipment chassis, along with their location in the chassis, must be provided in Native format (MS Excel preferred). As built documents must include photographs of components' completed installation. This information will be used by County's Project Manager to maintain and operate the system and will form the basis for ongoing documentation throughout the lifetime of the system.

Format: PDF (Word Searchable) and native.

**U. Federal Communications Commission (FCC) Licenses**

(a) All applications are made on behalf of Wahkiakum County

(b) All documentation received from the FCC or sent to the FCC on behalf of the County regarding the licenses.

(c) All licenses received from the applications made on behalf of the County.

Format: PDF (Word Searchable).

#### V. Document: As-Built

Antenna system as-built drawings must include manufacturer make, model, and serial number for each installed antenna along with the site location, the antenna support structure (tower), location on the structure (leg/face, height, and azimuth), connection media, and down tilt. Additional components such as tower-top amplifiers, waveguide splitters, circulators, and others must be noted with make, model, serial number, mounting location, and connection type. Photographs of the connection media's entry point into the equipment facility must be supplied and the proper connection media clearly identified. Photographs and identifying notations of antennas as mounted, grounding, inline TVSS, and cable paths must also be included.

Format: Native.

#### W. Document: Transport Design

All network designs and engineering documentation including MPLS, WAN, and LAN systems. Documentation must include:

- System diagrams for all data networks and interconnections
- Radio Network with interconnections to other networks
- Network Management Systems
- MPLS Network
- IP Addressing (Multicast and Unicast) - IP Address, Subnet Mask, and Default Gateway
- Port assignments for every data network device including unused ports indicating interface type (i.e., copper, SFP, etc.)
- VLAN diagrams (simply adding VLAN number to IP addressing tables will not

suffice to meet this requirement)

- IP Multicast networks and protocols
- MPLS Network Diagrams:
- LSPs
- Individual diagrams for each MPLS service instance (i.e., each epipe, VPLS, VPRN, IES, etc.

Format: Native.

#### X. Document: As-Built

Where the Respondent furnishes transport elements, the Respondent must supply diagrams and explanatory text identifying each component and connection comprising the system transport (i.e., Ethernet, microwave, telco) as actually built. The characteristics of each connection (i.e., speed/bandwidth, protocol) must be identified for each link in the transport. Each component of the system transport must be identified by make, model, device type, and serial number along with its installation location.

Format: PDF (Word Searchable) and Native.

#### Y. Document: Maintenance and Operation

Respondent must supply all manufacturer's provided documentation regarding the maintenance and operation of each component of the transport systems being furnished by Respondent.

#### Z. Document: System Design

All final design and engineering documentation pertaining to the network management system must be supplied by Respondent to the Owner's Project Manager for review and approval prior to implementation. The System Design must include diagrams, explanatory text, and other material detailing all network health, monitoring, configuration, routing, alert, alarm, and notification systems,

devices, and mechanisms used in the system. These systems include site alarms, environmental monitoring and reports, equipment alarms, data networks, databases, servers, backhaul, and other subsystems.

**AA. Document: As-Built**

The respondent must supply drawings, specifications, diagrams, photographs, test data, and explanatory text identifying all network management elements described herein as they were built and configured. As built must include addressing schemes used, equipment makes, models, serial numbers, and firmware/software revision as applicable.

**BB. Document: Maintenance and Operation**

Manufacturer-supplied operations and maintenance manuals must be supplied for each portion of the network management system and the related subsystems (i.e., alerting, environmental, site alarms, etc.).

**CC. Document: Component Operation, Installation and Maintenance Manuals**

The Respondent shall provide the manufacturer-supplied operation, installation, and maintenance manuals for all parts of the data network hardware and software.

Format: PDF (Word Searchable).

**DD. Document: As-Built**

The respondent shall provide a set of drawings, equipment specification sheets, engineer's instructions, and other documentation detailing how the systems addressed by the project scope were implemented. The make, model, serial number, and installed location of each major component must be noted and supplied in Native format (MS Excel preferred). As built documents must include photographs of the components' completed installation. This information will be

used by the Owner's technical staff to maintain and operate the system and will form the basis for ongoing documentation throughout the lifetime of the system.

Format: PDF (Word Searchable) and Native.

**EE. Document: Network Design**

The respondent shall provide all network design and engineering documentation including addressing scheme, protocols used, bandwidth requirements, interfaces to other networks and to components, and component configuration (including port assignment, VLAN assignment, etc.). Design must identify each portion of the data network being used.

Format: PDF (Word Searchable).

**FF. Document: Component Operation, Installation and Maintenance Manuals**

The respondent shall provide the manufacturer-supplied operation, installation and maintenance manuals for all parts of the data network hardware and software.

Format: PDF (Word Searchable).

**GG. Document: As-Built**

The respondent shall provide a set of drawings, equipment specification sheets, the engineer's instructions, and other documentation detailing how the systems addressed by the project scope were implemented. The make, model, serial number, and installed location of each major component must be noted and supplied in Native format (MS Excel preferred). Where applicable, a complete inventory of circuit board/card used in each equipment chassis, along with their location in the chassis, must be provided in Native format (MS Excel preferred). As built documents must include photographs of the components' completed installation. This information will be used by the County's technical staff to maintain

and operate the system and will form the basis for ongoing documentation throughout the lifetime of the system.

Format: PDF (Word Searchable) and Native.

HH. Document: Detailed System Interface Design  
Respondent must provide a detailed system design to the County's Project Manager for review and approval prior to implementation. Detailed System Design must include, at a minimum: wiring diagrams and explanations identifying how and where the logging recorder will be interfaced to the relevant radio channels; explanations including diagrams and drawings describing the system's interface with consoles, headsets, channel assignments, and names, including the source of each channel's audio and data.

II. Document: Component Operation, Installation and Maintenance Manuals  
The respondent shall provide the manufacturer-supplied operation, installation, and maintenance manuals for all parts of the logging recorder interface. Full documentation of the functions, features, and operation of all software components must be included.

Format: PDF (Word Searchable).

JJ. Document: As-Built  
The respondent shall provide a set of drawings, equipment specification sheets, engineer's instructions, and other documentation detailing how the systems addressed by the project scope were implemented. As-built documents must include photographs of the components' completed installation. This information will be used by the County's technical staff to maintain and operate the system and will form the basis for ongoing documentation throughout the lifetime of the system.

Format: PDF (Word Searchable) and native

#### KK. System Staging

The system minus the antennas and antenna feed lines, including the transmitter combiners, receiver multicouplers, and tower-top amplifiers must be assembled and tested. This testing may be done at the factory or other location chosen by the manufacturer. This process is referred to as "System Staging" in this Document as defined below.

LL. The equipment must be installed in the same racks and configuration as it will be installed at Points of Destination to the greatest degree practical. This includes:

- Same equipment mounting locations.
- Same adjacent rack mounting arrangement where racks are mounted adjacent to each other.
- All inter- and intra-rack cabling must be cut to the correct length for the installation at the Owner's location. This requirement includes the factory attachment of all cable connectors.
- All power connections both AC and DC

If a dispatch console is available for staging, a position may be set on a table or rack mounted to facilitate testing without installation in console furniture.

Any doors, access panels, and equipment covers must be installed for the final Staging Acceptance Test.

Any exceptions to the staging layout, different from the final installation at Points of Destination, must be defined and identified in the staging documentation.

#### MM. Acceptance Testing Requirements

The acceptance testing process includes the following:

- Local Staging Acceptance Testing
- System Acceptance Testing
- Performance Acceptance Testing
- Interface Acceptance Testing
- Coverage Acceptance Testing

- Assembly Staging Testing
- The entire system must be assembled and tested at the equipment supplier's local location as described.
- The complete system must pass the Staging Acceptance Test Plan (SATP) prior to final installation. The SATP must include the following as a minimum:
  - Certification for each piece of equipment meeting its manufacturer's published specifications.
  - Test results showing receive sensitivity, transmitter power output, and modulation for each piece of base station equipment showing the test results matched to the serial number of the specific equipment.
  - Test results showing the testing of each alarm point provided for all alarms.
  - Test results for the receiver multicoupler and tower-top amplifier.
  - Test demonstration showing the basic capabilities of the system to make, and process calls at each site in the system.
  - Test demonstration of the ability of the system to continue full system functionality during the sudden failure of any single component in the system where system redundancy is provided.
  - Test demonstration of the ability for backup systems to take over operation or provide service.
  - Inspection of equipment and installations, including cable dressing, cable construction, grounding, equipment condition, etc.
  - Spot verification of the previous information provided in the test results discussed above for the RF performance, alarm performance, and any other items for which an actual demonstration is not provided on up to five pieces of equipment and or subsystems.

#### NN. System Acceptance Process

Respondent must submit a final performance test plan or test procedure (Acceptance Test Plan (ATP)) for County's Project Manager's approval at least 30 days before the tests. The test plan must set forth the test equipment to be used

and the procedures to be followed for evaluating the system performance to ensure conformance with these specifications. This test plan must be agreed to by both parties.

The system acceptance process commences upon notification of the County's Project Manager that the Respondent is ready for the process to begin.

The respondent must supply to the County the acceptance documentation outlined in the Performance Test Section below. The County's Project Manager will review and approve the documentation and may request additional documentation or clarification.

The county and Respondent must agree on a schedule for the site visits to inspect the quality of the work, verify the equipment has been installed, and perform any spot checks or other tests. The county's Project Manager will perform these tests with the Respondent's assistance. The county's Project Manager will then accept each site, generate a punch list of items to be fixed or completed, or reject the site.

The county and Respondent will then perform the system operational tests as described below and in the ATP.

The Respondent, with the County's Project Manager's supervision, will then perform the Coverage Acceptance Test Plan (CATP) as described below. The respondent must generate a report showing the area tested, the tested locations, the number of locations and the pass-fail criteria. This information will be supplied to the County's Project Manager. Should the CATP not pass, the Respondent must verify system operation and re-run the tests. If on the second CATP, the system still does not pass, County's Project Manager may stop the acceptance process.

After a successful CATP, the general operational testing as described below and in the CATP will commence.

After successful general operational testing, the system must run for 30 days without the following:

- Any failure causing the complete loss of one or more channels or a site.

- Any transport network failure or conditions causing a change of network routing state or direction.
- Any voting system failure
- Any failure of the alarm reporting system resulting in the loss of alarms

If any of the failures described above occur, Respondent must replace the failed equipment and the 30-day acceptance period will start again. If the 30-day acceptance period is restarted twice, the Respondent and Owner's Project Manager may stop the acceptance process.

#### OO. Performance Tests and County's Acceptance

All tests must be performed after the equipment has been fully installed in its final location.

Certification for each piece of equipment meeting its manufacturer's published specifications

Performance tests must include but are not limited to the following tests.

- Tests for receive sensitivity, transmitter power output, and modulation for each piece of base station equipment showing the test results matched to the serial number of the specific equipment.
- Tests for each alarm.
- Test of the receiver multicoupler
- Test of the transmit combiner.
- Test of site effective receiver sensitivity
- Test of antenna, feedline, and RF interconnection Passive Intermodulation (PIM) levels. Systems must not exceed PIM levels of 140 dBc or approximately -107 dBm
- Test demonstration showing the basic capabilities of the system to make, and process calls at each site in the system.
- Demonstration of all the primary functions associated with the transport

system network management, system alarms, site alarms, and associated functions.

- Demonstrate the ability of the system to continue full system functionality during the sudden failure of any single processor or controller in the system where system redundancy is provided.
- Demonstrate the ability for backup systems to take over operations or provide service.
- Inspection of equipment and installations including cable dressing, cable construction, grounding, equipment condition, etc.
- Spot verification of previous information provided in the test results discussed above for the RF performance, alarm performance, and any other items for which an actual demonstration is not provided on up to five pieces of equipment and or subsystems.
- Inspection of all installations, workmanship and material supplied.
- Test of audio levels
- Test of hum and noise levels.
- Test of distortion levels
- Test of proper operation of the interface to the new dispatch consoles
- Test of proper operation of the interface to the Eventide logging recorder
- Test of proper operation of the interface to the radio network
- Test of proper operation of the interface to all other existing VHF conventional radio systems and backup radio
- Test of conformance with these specifications
- Test of interface to Other Equipment

PP. Testing must be conducted by the Respondent in accordance with the approved plan.

All testing must be under the direction and supervision of and witnessed by the County's Project Manager or the Project Manager's designated representative. The respondent must supply all test equipment required for each test.

The County's Project Manager will accept the system when it has operated continuously for a 30-day period without a failure after the successful completion of the performance test.

The acceptance of equipment or parts thereof will in no way relieve Respondent of the responsibility for furnishing equipment that meets the requirements of these specifications.

#### QQ. Coverage Acceptance Testing

Respondent must guarantee coverage to meet or exceed the coverage indicated on Respondent's computer-predicted coverage plots. The guaranteed mobile coverage must be based on a passing DAQ threshold of 3.4.

Coverage acceptance testing must adhere to the latest revision of TIA TSB-88 and must conclusively demonstrate the radio coverage is being achieved in accordance with the specifications required by this RFP. The number and size of test tiles must be determined in accordance with TIA TSB-88; however, the tile size must not exceed 1/2 square mile within the blue, red, and yellow bounded areas. Consistent with TSB88, a confidence level of not less than 99 percent must be used.

Both talk-out and talk-in coverage performance tests must be performed. In lieu of performing talk-in tests, Respondent may provide a talk-out versus talk-in signal level analysis, including field verification, proving the system is talk-out limited or the talk- in and talk-out ranges are balanced.

All radio equipment used for coverage testing must be configured with the most current firmware and software available at the time of testing.

Coverage testing must be performed by the Respondent. Respondent shall give the County at least seven days' notice of coverage testing. At its discretion, the County's Project Manager may attend or have representatives present for any or all coverage testing.

All equipment necessary to perform the coverage testing, including radios, power supplies, vehicles, and any other ancillary equipment, must be provided by Respondent.

The respondent must verify and certify the proper calibration of all equipment used during the coverage testing.

All coverage test data and relevant records must be provided to the County's Project Manager in both paper and electronic text-searchable format readable with standard software (Word, Excel, Adobe Acrobat, or other County-approved software).

Before performing coverage tests, the Respondent must submit proposed test grid maps to the County's Project Manager for approval.

Respondent must submit a detailed Coverage Acceptance Test Plan (CATP) for approval by the County's Project Manager.

Remedies for coverage failure must address the entire problem area(s) and not be limited to correcting a portion of the failed area. Remedies may not degrade areas of coverage previously accepted. A retest of coverage must be conducted in any area (previously failed or not) potentially affected by the remedy to verify the composite coverage is maintained.

After completion of the coverage test, the Respondent shall provide the raw data collected in a file and an interactive map with the test results for each data point collection.

## **RR. Current System Decommissioning and Disposal Requirements**

Site Decommissioning - Following the County's acceptance of the new VHF radio system, Respondent will decommission the previously existing VHF radio system equipment at all sites, including the Wahkiakum County Courthouse/WCSO Dispatch site.

In-building equipment decommissioning will include:

All VHF repeater base stations and peripheral equipment

All antenna equipment such as duplexing cavities and antenna feedlines

All cabling and wiring to the shelter's main electrical panel.

All bonding and grounding cabling that was attached to the decommissioned equipment and antenna feedlines.

Tower equipment decommissioning will include:

All previously utilized VHF antenna systems including the actual antennas and antenna feedlines.

All unused antenna mounting hardware; and any materials previously installed to attach the decommissioned feedline to the tower, where applicable

All bonding and grounding cabling that was previously installed in association with the tower-mounted antenna systems.

All previously utilized antenna feedline shelter access points will be closed, capped, or sealed in the manner designed by the manufacturer of the feedline entry port or equipment shelter. No unused feedline access points will be left open to the exterior environment.

Decommission Equipment Transport - Respondent will transport all decommissioned site materials to a designated collection area to be identified by County.

The respondent will ensure that all repeater, base station, peripheral, and RF filtering/duplexing equipment arrives at the collection site undamaged and in the same condition it was in prior to the beginning of the decommissioning process.

#### SS. Decommissioned Equipment Disposal

The respondent will dispose of all decommissioned materials in accordance with all laws, rules, and regulations, and in accordance with Wahkiakum County policies.

Wahkiakum County may retain any decommissioned equipment at its sole discretion.

#### TT. Warranty and Maintenance Requirements

Respondent must repair or replace without charge to County, any equipment or part thereof, which fails in operation during normal use within 12 months after system acceptance. Repairs or replacement do not apply to failures caused by acts of God or extraordinary circumstances beyond the control of Respondent.

Respondent must perform all maintenance, servicing, removal, and replacement of defective parts, and adjustments and measurements to maintain the equipment supplied under this contract, to the manufacturer's specifications and requirements of the FCC for a period of 1 year from the date of County's acceptance of the system. These actions must be at no additional cost to the County for those services requested for malfunctions reported during a normal working day. A normal working day is Monday through Friday, 0800 to 1700 hours, except holidays.

The Respondent must provide the County with written documentation after each service call describing the service performed, the cause of the outage or repair, and post-repair testing, programming, or other actions taken to verify proper operation. If County's spares were used in the repair, the item number or model number and serial number of the spare used, and the defective unit replaced must also be documented. Respondent must return the defective unit to the County's specified location.

The respondent must have a trained and competent technician to maintain the supplied equipment in a timely manner on 24-hour calls at all times. Counties must

be given the phone numbers and addresses of the people to contact in an emergency. The designated technician on call must be located within a 60-minute normal driving range of the County's dispatch center.

When a malfunction is reported and service is requested, the Respondent's technician must be en route to the equipment location to effect emergency repairs within 60 minutes after the Respondent was notified by the County of the request for service.

Respondent must provide the names of the people acting as the primary contact point for service, complaints, and general inquiries. Their names, addresses, and telephone numbers must be given to the County. The respondent must supply the escalation process and personnel in the event the normal trouble alerting, and service request process does not work.

The county may at its discretion elect to have its technical staff on site during the warranty, repair, and maintenance actions. The onsite staffing will be to witness, learn, and possibly assist in the equipment repair or upgrade process as desired.

The respondent must provide the after-warranty services for board and module-level return and repair services for the following:

- Five-day turnaround from receipt of the defective unit to return shipment.
- Advance Replacement if a replacement unit is sent for the County's use before removal of service of the defective unit and the County returns the replacement unit to the repair depot after receiving the County's repaired unit back.

All warranty and repair work must be done to restore the original operation of the system to the more stringent of these specifications or the manufacturer's original specifications. All replacement parts must be of new manufacture, appearance, and performance. Any replacement parts or modules with a shelf life must have the original shelf life starting from the time of receipt by the County as when the unit was manufactured.

## Maintenance and Test Equipment

Each Respondent must include with the Proposal a list of recommended spare parts deemed necessary by the manufacturer to minimize downtime, and a list of test and maintenance equipment required to maintain the equipment to the card level.

The respondent must provide quotes as an option for the following:

- Complete system maintenance on a 24/7 basis, not including mobile and portable units, quoted for on an annual basis for a 5-year term. Provide after-hours callout hourly rates as well.
- Services and equipment to keep the hardware and software up to date for a period of 10 years. The exact services included must be detailed along with any additional required services not included in the cost. This requirement includes work required of the County as well.

### UU. Future Equipment and Parts Availability

The manufacturer must certify all parts, components, software, firmware, and major subassemblies used in this equipment will be available for at least 10 years after the award of the contract. This requirement ensures additional equipment required in the future can be assembled and supplied and replacement parts, software, and firmware will be available to maintain the supplied equipment.

### VV. Project Closeout Requirements

The county's Project Manager will conduct a product completion review. All project objectives, goals and deliverables must be met at the quality and quantity identified in the project plan, specifications, and contract. This determination will be made at the discretion of the County's Project Manager in accordance with the contract, specifications, and plans relevant to this Project.

Accomplishment of goals and objectives will be signified by the County's Project Manager's signature on a Final Acceptance document.

WW. Contract Terms - Every contract requirement and term, including requirements contained change orders, contract amendments, and other formally incorporated documents, must be fulfilled to the County's Project Manager's satisfaction before the acceptance of the proposed system as complete.

XX. Financial Review and Final Invoice

The final invoice may be submitted following the completion of a financial review and reconciliation of the Project conducted by the County's Project Manager with the Respondent.

YY. Lessons Learned

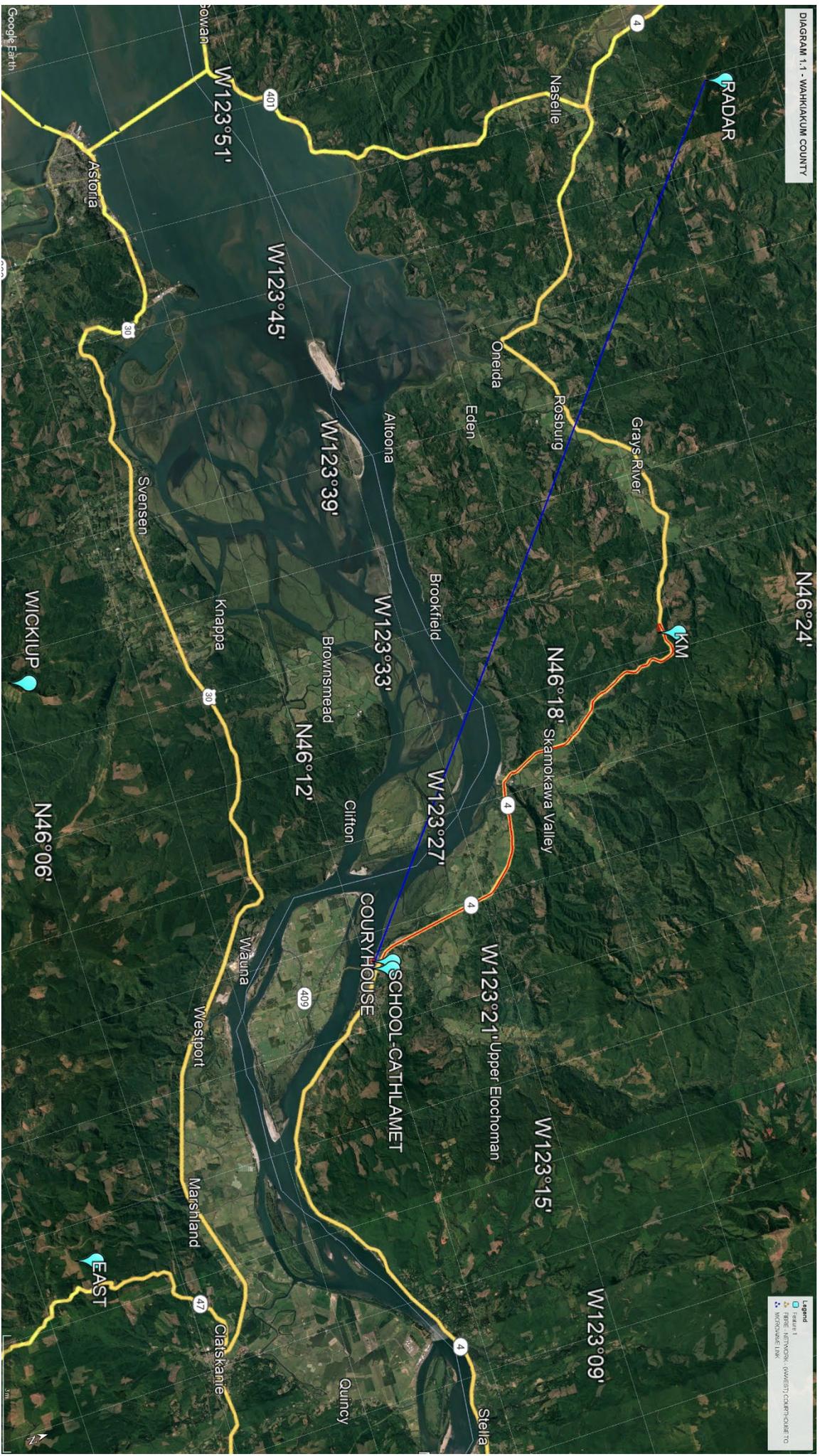
At County's Project Manager's discretion, the Respondent may be required to participate in a project review and the development of a "lessons learned" document as part of the project closure activities.

ZZ. Project Closure Certification

Upon satisfactory completion of these requirements, the County's Project Manager and Respondent must certify the Project as complete by signing a Project Closure document.



DIAGRAM 1.1 - WAHIAKUKUM COUNTY



• Diagram 1.1





- Diagram 1.2

Legend

- Feature 1
- FIBER NETWORK (WEST-CORCORAN TO WASHINGTON TWP)



- Table 1 – License information

Frequency		License	Emission Used	Repeater Locations
155.07	158.94	WPPC748	11K0F3E	Radar, KM, Wickiup, Clatskanie Hill
154.8	158.85	WPPC748	11K0F3E	Radar, KM, Wickiup, Clatskanie Hill
155.985	155.115	WRG734	11K0F3E	Radar, KM, School
152.285	157.545	WQVH328	7K60FXE	KM
153.9275	153.9275	WQOP660	11K0F3E	Mobile Only
155.4225	155.4225	WQOP660	11K0F3E	Mobile Only
156.18	156.18	WQKS800	11K0F3E	Mobile Only
158.34	158.34	WQVH328	7K60FXE	Mobile Only
159.66	159.66	WQVH328	7K60FXE	Mobile Only
159.81	159.81	WQVH328	7K60FXE	Mobile Only
159.93	159.93	WQVH328	7K60FXE	Mobile Only
160.17	160.17	WQVH328	7K60FXE	Mobile Only



- Table 2 for current End-user equipment information.

<b>Wahkiakum Fire Protection District 1 (Puget Island Fire)</b>	<b>3</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>Main Station: 475 SR409, Cathlamet, WA 98612</b>
<b>Wahkiakum Fire Protection District 2 (Skamokawa Fire/EMS)</b>	<b>8</b>	<b>16</b>	<b>0</b>	<b>1</b>	<b>Main Station: 33 E Valley Rd Skamokawa, WA 98647</b>
<b>Wahkiakum Fire Protection District 3 (Grase River Fire/EMS)</b>	<b>11</b>	<b>30</b>	<b>0</b>	<b>2</b>	<b>1- Main Station: 4631 SR 4 Rosburg, WA 98643 2- 8 Hull Creek Rd, Grays River, WA 98643</b>
<b>Wahkiakum Fire Protection District 4 (East County Fire)</b>	<b>9</b>	<b>34</b>	<b>0</b>	<b>2</b>	<b>1- Main Station: 13 Boege Rd Cathlamet, WA 98612 2- 714 Elochoman Valley Rd Cathlamet, WA 98612</b>
<b>Town of Cathlamet (Cathlamet Fire/EMS)</b>	<b>10</b>	<b>36</b>	<b>0</b>	<b>1</b>	<b>Main Station: 255 2nd Street Cathlamet, WA 98612</b>
<b>Wahkiakum County Sheriff's Office (Law Enforcement, Dispatch, EM, SAR)</b>	<b>11</b>	<b>22</b>	<b>0</b>	<b>0</b>	<b>Dispatch: 64 Main Street Cathlamet, WA 98612</b>
<b>Wahkiakum County Public Works</b>	<b>19</b>	<b>3</b>	<b>0</b>	<b>3</b>	<b>1- (CH) 64, Main Street Cathlamet, WA 98612 2-Sh 1)73 Elochoman Vally rd Cathlamet, WA 98612 3-(Shop 3) 4288 W. SR4 Rosburg, WA 98643</b>
<b>Wahkiakum County PUD #1</b>	<b>13</b>	<b>6</b>		<b>1</b>	<b>45 River Street Cathlamet, WA 98612</b>
<b>Wahkiakum County School District</b>	<b>11</b>	<b>15</b>		<b>3</b>	<b>(Bus Garage) 40 S 3rd St Cathlamet, WA 98612 (E.S.)265 S. 3rd Street Cathlamet, WA 98612 (G.S.)265 S. 3rd Street Cathlamet, WA 98612</b>
<b>Wahkiakum Coutny Health and Human Services</b>	<b>7</b>	<b>6</b>		<b>1</b>	<b>(Building 3) 42 Elochoman Vally Rd Cathlamet, WA 98612</b>
<b>Town of Cathlamet (Public Works)</b>					
<b>Spaire parts (Local)</b>	<b>2</b>	<b>12</b>	<b>1</b>	<b>0</b>	<b>Spare Parts Locker</b>
<b>TOTALS</b>	<b>104</b>	<b>194</b>	<b>1</b>	<b>15</b>	

