



Quality Assurance Vegetation Management System Transmission Audit Procedure

SUMMARY

This utility procedure specifies how Quality Assurance Vegetation Management (QAVM) under Electric Operations (EO) Quality Management (QM) performs audits of Vegetation Management (VM) activities along electric transmission facilities. Following this procedure ensures compliance with the following documents and regulatory requirements:

- [Utility Procedure TD-7103S, "Transmission Vegetation Management Standard \(TVMS\)"](#)
- [Utility Procedure TD-7103P-01, "Transmission Non-Orchard Routine Patrol Procedure \(TNORPP\)"](#)
- [Utility Procedure TD-7103P-02, "Transmission Orchard Patrol Procedure \(TOPP\)"](#)
- [California Public Utilities Commission \(CPUC\) General Order \(G.O.\) 95, Rule 35](#)
- [Public Resources Codes \(PRCs\) 4293–4296](#)

This audit procedure implements Utility Standard [RISK-6301S "Quality Management Audit Standard"](#) and incorporates elements of ISO 19011 Guidelines for Auditing Management Systems.

Level of Use: Informational Use

TARGET AUDIENCE

All Compliance and Risk Consultants (CRC) and Audit Lead who perform VM system transmission audits.

SAFETY

Safety must always be considered. Determine necessary personal protective equipment (PPE) and potential safety issues prior to field work. Obtain as much information as practical concerning safety where work is to be performed. This information should be discussed with local VM Operations as needed for clarification.

When working in remote areas, notify a VM or Quality Assurance (QA) representative of the work location, carry a personal locator beacon or similar device (e.g., GARMIN), and always perform a 360-degree vehicle walk around inspection before entering the vehicle and driving.

If a situation is potentially unsafe, discuss with the QAVM Supervisor for options and alternatives.

BEFORE YOU START

- Review Appendix A, Audit Procedure – Preparation
- Review Appendix B, Audit Procedure – Authorization and Communication



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- Verify the line mileage population query is updated.
- Notify the Compliance Data Analyst of audit initiation. They will create the audit folder in the current QAVM method of storage.

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PROCEDURE STEPS

1 Audit Scope

1.1 Audit Lead DEFINE and FINALIZE audit scope while considering the following:

- QAVM annual authorized work plan
- Geographic areas
- LiDAR data
- Contractor make-up
- Contractor performance

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1.1 (continued)

- Desired sample size

NOTE

Sustained prior years' audit results may be factored into sampling parameters to either reduce or increase sample size.

2 Sample Equation and Plan

2.1 PERFORM the following steps to DETERMINE the sample size:

NOTE

Geographic Information Services (GIS) information is updated once each year for the entire transmission system. This update should occur before the first transmission audit as determined by the approved QAVM annual plan.

1. DETERMINE the number of System Transmission or System Orchard line miles in target audit area by referring to the GIS line mileage annual query stored in the QAVM SharePoint site.
 2. Using the values provided by the QAVM Supervisor, CALCULATE a statistically valid audit sample size in accordance with Form [RISK-6301P-07-F01, "QAVM Transmission Audit Sample Equations and Worksheets"](#).
- 2.2 CREATE an audit plan using attachment [RISK-6301P-07-Att01 "QAVM Transmission Audit Plan"](#).
- 2.3 SUBMIT the Transmission Audit Plan and Transmission Audit Sample Equation to the QAVM Supervisor for review and approval.
- 2.4 SAVE a PDF file of the approved audit plan and approval email in the audit folder.

3 Sample Preparation

- 3.1 ADJUST the percentage of audited sample miles based on voltage (SEE Table 1, "Voltage Selection").
- IF an audit area does not contain a voltage level,

THEN the sample mileage for that voltage will be equally spread over other voltage levels and should be proportionate to the total number of voltage miles.



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3.1 (continued)

Table 1. Voltage Selection

Sample Line Selection Criteria	
Voltage Level	% of total sample population
500kV	20%
230kV	40%
115kV	25%
60-70kV	15%
	100%

NOTE

Any deviation from Table 1 is at the discretion of the QAVM Supervisor.

3.2 PERFORM the steps in attachment [RISK-6301P-07-Att02 "QAVM Transmission Structure and Pole List Generation"](#).

1. CREATE audit maps in color.
 - a. INCLUDE the following information for each:
 - Audit name and sample number
 - Transmission Line Name, voltage, and sample structure or pole
 - b. INCLUDE the following layers for each:
 - Fire Responsibility Areas
 - High Fire Threat District Areas
 - c. INCLUDE map of LiDAR data
 - IF no LiDAR data was received for the spans in either direction of the reference point,

THEN INCLUDE a note on the first page of the map.

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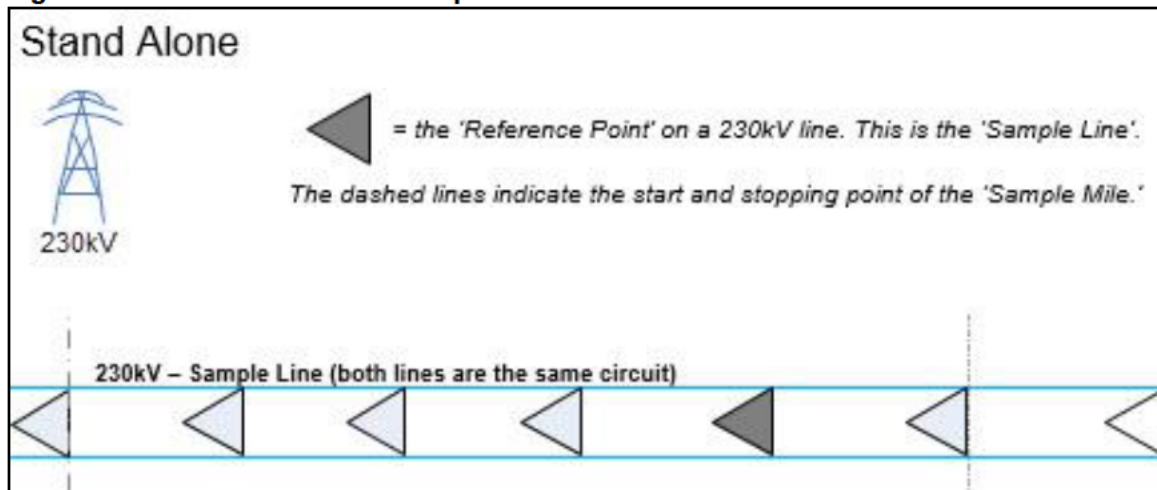
3.2 (continued)

NOTE

Use resources available (e.g., Google Earth, Vegetation Management Database (VMD), Maps+) to research pertinent information regarding safety concerns, access notes/requirements, and customer information.

2. IDENTIFY each sample line section by selecting the reference point from the randomized and sorted Structure and Pole List as described in Section 3.2.
 - a. Each sample line section is a minimum one continuous mile in length and must include the reference point.
 - IF the entire T-line is less than one mile long,
THEN AUDIT the maximum amount of mileage available.
 - b. The reference point can be anywhere within the audited line section (SEE Figure 1, "Reference Point and Sample Line").

Figure 1. Reference Point and Sample Line



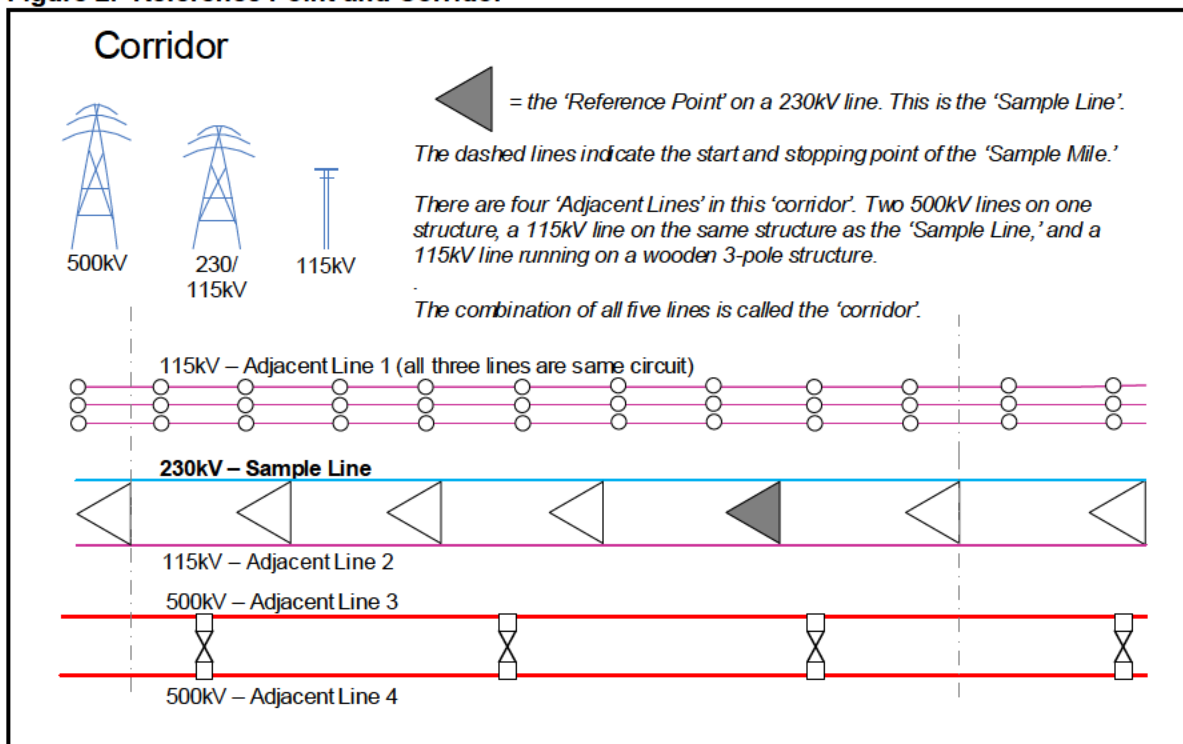
- c. The auditor should choose the direction to audit based on tree density or geographical barriers.
- d. All sample spans must be audited in their entirety, even if audit sample exceeds one mile.
 - IF the chosen sample line section overlaps an area that appears on a previously selected sample line section,
THEN AUDIT in the opposite direction to avoid overlap.

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3.2 (continued)

- IF overlap cannot be avoided to obtain one mile of audited sample line, THEN DISCARD the reference point and select the next reference point from the Structure and Pole List.
- AUDIT in a corridor: AUDIT each adjacent transmission line in addition to the sample line when in a transmission corridor (SEE Figure 2, "Reference Point and Corridor").

Figure 2. Reference Point and Corridor



3.3 DETERMINE methodology for auditing LiDAR data accuracy.

4 Entrance Meeting

4.1 DEVELOP an Entrance Meeting presentation using the most recently approved template

4.2 SCHEDULE the Entrance Meeting with the Audit Client

1. NOTIFY the Audit Client of the option of inviting other stakeholders as needed (e.g., PG&E personnel, contractors)

4.3 CONDUCT the Entrance Meeting

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- 4.4 STORE final presentation in the current QAVM method of storage
- 4.5 SEND PDF of Entrance Meeting Presentation and Audit Plan to the Audit Client via email

5 Data Collection

NOTE

Refer to Appendix C, "Transmission Audit Procedure – Data Collection" for a flow chart of next steps.

- 5.1 CONDUCT Field Review
- 5.2 AUDIT sample line.
 - 1. Audit Team CONDUCTS applicable audit activities based on guidance documents, procedures, and standards.
 - 2. RECORD findings within a corridor as "sample line" or "adjacent line."
 - 3. AUDIT each usable reference point until the minimum number of miles by voltage is met.
 - IF auditing in a corridor where the structures on adjacent lines are offset from the sample structure (SEE Figure 2, "Reference Point and Corridor", page 6),

THEN CHECK with QAVM Supervisor to confirm stopping point of audit on adjacent lines
 - 4. INCLUDE field data on maps. At minimum, completed maps should include:
 - Total tree population (if applicable, broken down by HFTD areas)
 - Audit Date
 - Total number of each type of findings
 - LAN ID and signature
 - Additional information as deemed pertinent by Audit Lead
 - 5. RECORD and DISCUSS deviations and safety concerns with QAVM Supervisor to seek options and alternatives. Note any deviations from the original sample selection in the report.
- 5.3 DOCUMENT findings and observations using current QAVM data collection methods.
 - 1. FLAG findings as discussed in the entrance meeting.

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5.3 (continued)

2. PHOTOGRAPH findings from different perspectives as described below:
 - a. Best practice: INCLUDE a close-up, a mid-distance photo to provide height and distance perspectives, and another photo to identify the immediate surroundings.
 - b. RECORD video when appropriate (e.g., wind blowing limbs or branches intermittently into compliance zone).
3. COMMUNICATE audit findings as outlined in the Entrance Meeting.

6 Data Analysis

- 6.1 ANALYZE the data using applicable systems of records
- 6.2 ASSIGN primary and, if applicable, associated supplemental causes to each non-compliance finding using attachment [RISK-6301P-07-Att03, "QAVM Cause Analysis Definitions"](#).
- 6.3 ENTER each tree line contact and non-compliant tree into the Corrective Action Program (CAP) system following current CAP requirements and processes.
- 6.4 UPDATE the [ATTORNEY WORK PRODUCT - QAVM Compliance Information 2012-Ongoing MASTER spreadsheet](#).
- 6.5 REVIEW the prior audit's published report and CAP entry AND COMPARE corrective/preventive actions with current causal analysis.

7 Exit Meeting

NOTE

It is recommended a rough draft of the audit report be created before the Exit Meeting.

- 7.1 SCHEDULE an Exit Meeting with the Audit Client to be held within one week of completing the field audit.
- 7.2 DEVELOP the Exit Meeting presentation using the most recently approved template.
- 7.3 CONDUCT an Exit Meeting.
 1. PROVIDE opportunity for the Audit Client to review all the audit materials. Any issues or comments must be provided to the Audit Lead within seven days.
- 7.4 NOTIFY the Audit Client of any open non-compliance CAP issues.



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8 Audit Report

- 8.1 COMPOSE an Audit Report using the most recently approved template.
- 8.2 SUBMIT the audit report to QAVM personnel for peer review.
- 8.3 UPDATE the audit report as necessary.
- 8.4 NOTIFY the Audit Client of any significant changes made to the report since the Exit Meeting.
- 8.5 QAVM Supervisor and Audit Lead work together to DETERMINE if any preventive and/or corrective actions are necessary to include in audit report.
- 8.6 Upon approving the audit report, the QAVM Supervisor must perform the following tasks:
 1. FILL OUT the signature page.
 2. SUBMIT the audit report to the QAVM Manager for review and approval for publishing.
- 8.7 Upon final approval of the audit report, QAVM Supervisor INSTRUCTS Audit Lead to INITIATE a Post-Report CAP issue to document the completion of the audit and preventive and/or corrective actions using current CAP requirements and processes.
- 8.8 PROVIDE the CAP issue number to the QAVM Supervisor.
 1. QAVM Supervisor PUBLISH the audit report package by emailing a link to where the report is stored to the Audit Client.

9 Post Report Meeting

- 9.1 ASK the Audit Client whether a post report meeting is needed.
- 9.2 IF a post report meeting is needed,
THEN PERFORM the tasks below:
 1. SCHEDULE AND CONDUCT the post report meeting with the Audit Client within two weeks of the report being published.
 2. ENCOURAGE the Audit Client to INVITE the inspection and tree contractors to the post report meeting to ENSURE that all relevant information is shared.
 3. PRESENT a summary of findings.
 4. DISCUSS trends, significant findings, and primary cause issues.
 5. DISCUSS CAP implementation and follow up by QAVM.



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10 Audit Closure

- 10.1 ENSURE all CAP items are closed and all required audit documentation is completed.
- 10.2 PERFORM the following steps to PREPARE AND FILE the audit documents.
 - 1. COMPLETE attachment [RISK-6301P-07-Att04, "QAVM Audit Records Checklist"](#).
 - 2. RETAIN all audit documents per PG&E standards.

END of Instructions

DEFINITIONS

Adjacent Line: Electric Transmission line or lines different than sample line that follow the same path in the field as the sample line.

Audit Client: The audit requester and the related organization, group, or person being audited.

Audit Lead: A person qualified, to organize and direct an audit, to report audit findings, and to evaluate corrective actions.

Auditor (Quality): A person who has the qualifications to perform quality audits.

Compliance: Fulfilling the requirements stated in laws and regulations (e.g., GO 95 Rule 35, PRC 4293, and FAC-003-3).

Conformance: Abiding by internal PG&E standards and procedures. A product or service has met the requirements of the relevant specifications, contract, regulation or standard.

Corridor: The presence of one or more transmission lines located within separate and contiguous easements, or within close proximity of each other. If Audit Lead cannot decide whether to include a line in a corridor, discuss with QAVM Supervisor.

Easement or Right of Way (ROW): A geographically described strip of land, upon which PG&E's electric transmission facilities are constructed, operated and maintained.

Issue Tracking System (ITS): Centralized database where issues relating to Vegetation Management activities are tracked.

Line Mile: Determined by the distance between point A and point B. Example: between structure 1/001 and 1/006 is a physical distance of one mile.

Compliance and Risk Consultant (CRC): An auditor who is a PG&E employee.



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Reference Point: The sample structure and/or pole. Determined by random sampling during the preparation phase and must be included in the sample line mile.

Cause Analysis: A structured investigation that aims to identify the true cause of a problem, and the actions necessary to reduce or eliminate recurrence.

Sample Line: The line segment to be audited. Must include the reference point from the randomized structure list developed during the preparation phase of the audit. This may include lines on the same structure and/or pole.

Transmission Vegetation Corrective / Preventive Action: Provides direction to PG&E employees and contractors of corrective actions to be taken when Vegetation Management (VM) work on NERC-critical electric transmission lines is constrained, and where such constraint may lead to a vegetation encroachment into the Minimum Vegetation Clearance Distance (MVCD) prior to the implementation of the next annual work plan.

IMPLEMENTATION RESPONSIBILITIES

It is the responsibility of the QAVM Supervisor to ensure all QAVM personnel have read and understand the content of this procedure.

GOVERNING DOCUMENT

[RISK-6301S, "Quality Management Audit Standard"](#)

COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

- California Public Utility Commission General Order (GO) 95, Rule 35
- California Public Resource Code (PRC) 4293
- Title 14 - California Code of Regulations Article 4 sections 1250-1258

Records and Information Management:

Information or records generated by this procedure must be managed in accordance with the Enterprise Records and Information (ERIM) program Policy, Standards and Enterprise Records Retention Schedule (ERRS). REFER [GOV-7101S, "Enterprise Records and Information Management Standard"](#) and related standards. Management of records includes, but is not limited to:

- Integrity
- Storage
- Retention and Disposition
- Classification and Protection



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REFERENCE DOCUMENTS

Developmental References:

NA

Supplemental References:

[ASQ/ANSI/ISO 19011:2018: Guidelines for Auditing Management Systems](#)

[Transmission Maintenance Agreements \(CAISO\)](#)

[California Public Utility Commission General Order \(GO\) 95, Rule 35](#)

[California Public Resource Code \(PRC\) 4293](#)

[North American Electric Reliability Corporation \(NERC\) Standards for Vegetation Management FAC-003-4](#)

[Title 14 - California Code of Regulations Article 4 sections 1250-1258](#)

[Transmission Vegetation Management Standard](#)

[Transmission Routine Non-Orchard Patrol Procedure \(TRPP\)](#)

[Transmission Orchard Patrol Procedure](#)

[Transmission Right of Way Maintenance Procedure](#)

[Transmission Vegetation Corrective Action Procedure](#)

[Vegetation Management Hazard Notification Procedure](#)

[Transmission Vegetation Imminent Threat Procedure](#)

[Vegetation Management Priority Tag Procedure](#)

[Vegetation Management Transmission LiDAR Bulletin](#)

Tree Contractor and Pre-Inspection Contracts

APPENDICES

[Appendix A, Audit Procedure – Preparation](#)

[Appendix B, Audit Procedure – Authorization and Communication](#)

[Appendix C, Audit Procedure – Data Collection](#)



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[Appendix D. Audit Procedure – Reporting](#)

ATTACHMENTS

[Attachment 1, "QAVM Transmission Audit Plan"](#)

[Attachment 2, "QAVM Transmission Structure and Pole List Generation"](#)

[Attachment 3, "QAVM Cause Analysis Definitions"](#)

[Attachment 4, "QAVM Audit Records Checklist"](#)

[RISK-6301P-07-F01, "QAVM Transmission Audit Sample Equations and Worksheets"](#)

DOCUMENT REVISION

TD-7104P-02, "Quality Assurance Vegetation Management System Transmission Audit Procedure"

DOCUMENT APPROVER

██████████, Manager, Electric Operations Quality Assurance

DOCUMENT OWNER

██████████, Manager, Electric Operations Quality Management Support

DOCUMENT CONTACT

██████████, Quality Assurance Supervisor, Quality Assurance

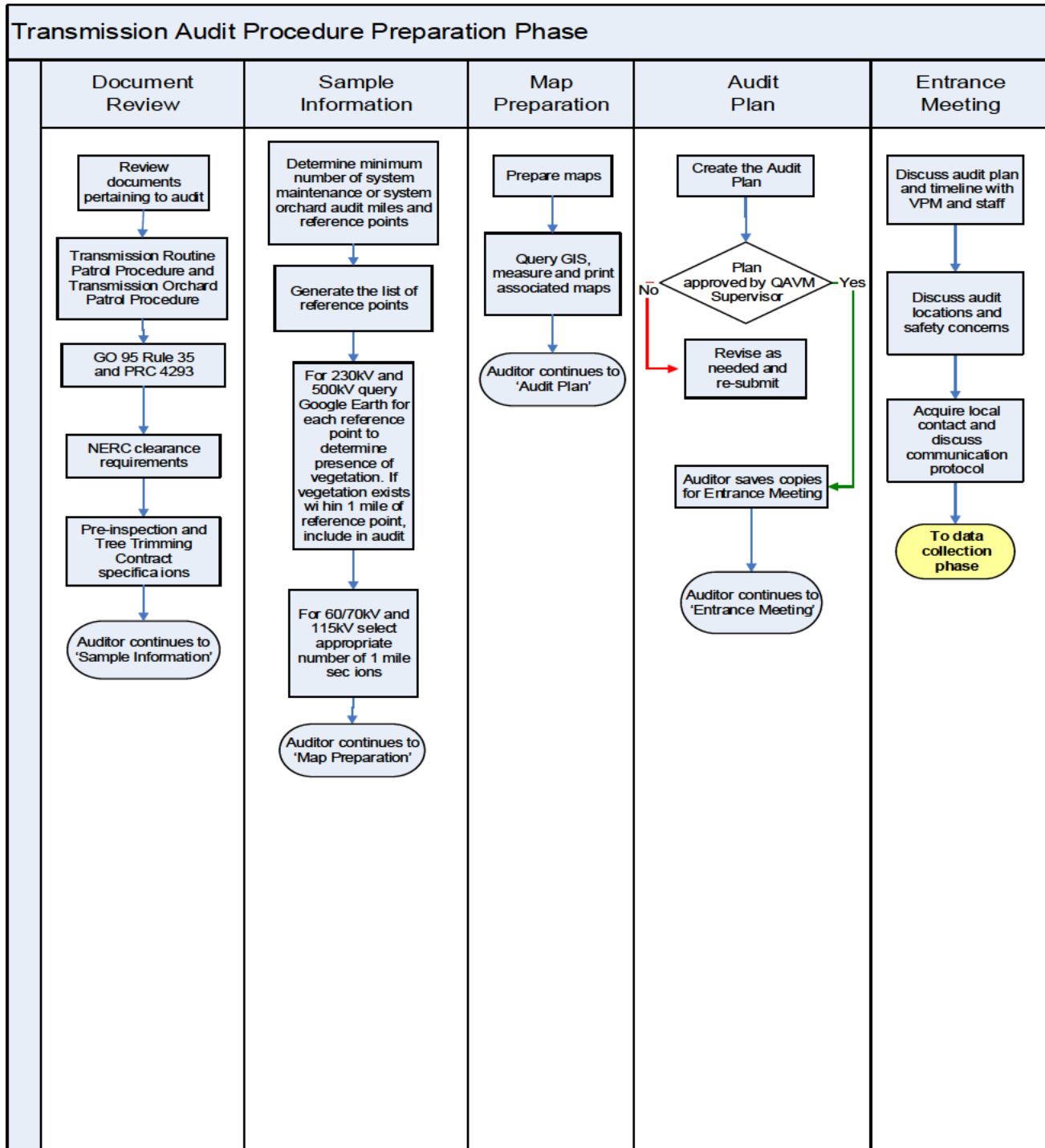
REVISION NOTES

Where?	What Changed?	Who?	When?
NA	New Procedure – Supersedes TD-7104P-02	██████████	11/29/2021

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Appendix A, Audit Procedure – Preparation

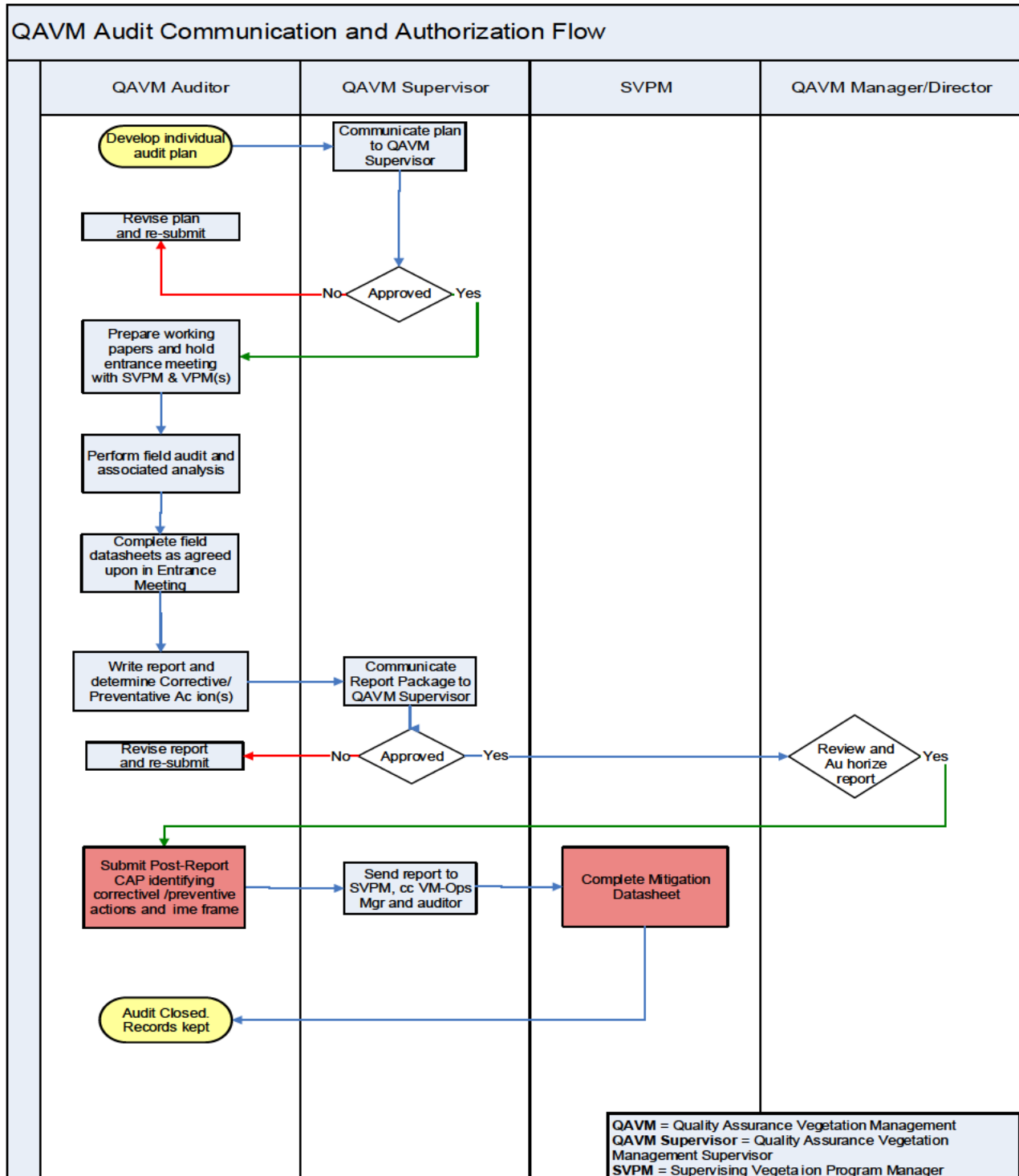
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Appendix B, Audit Procedure – Authorization and Communication

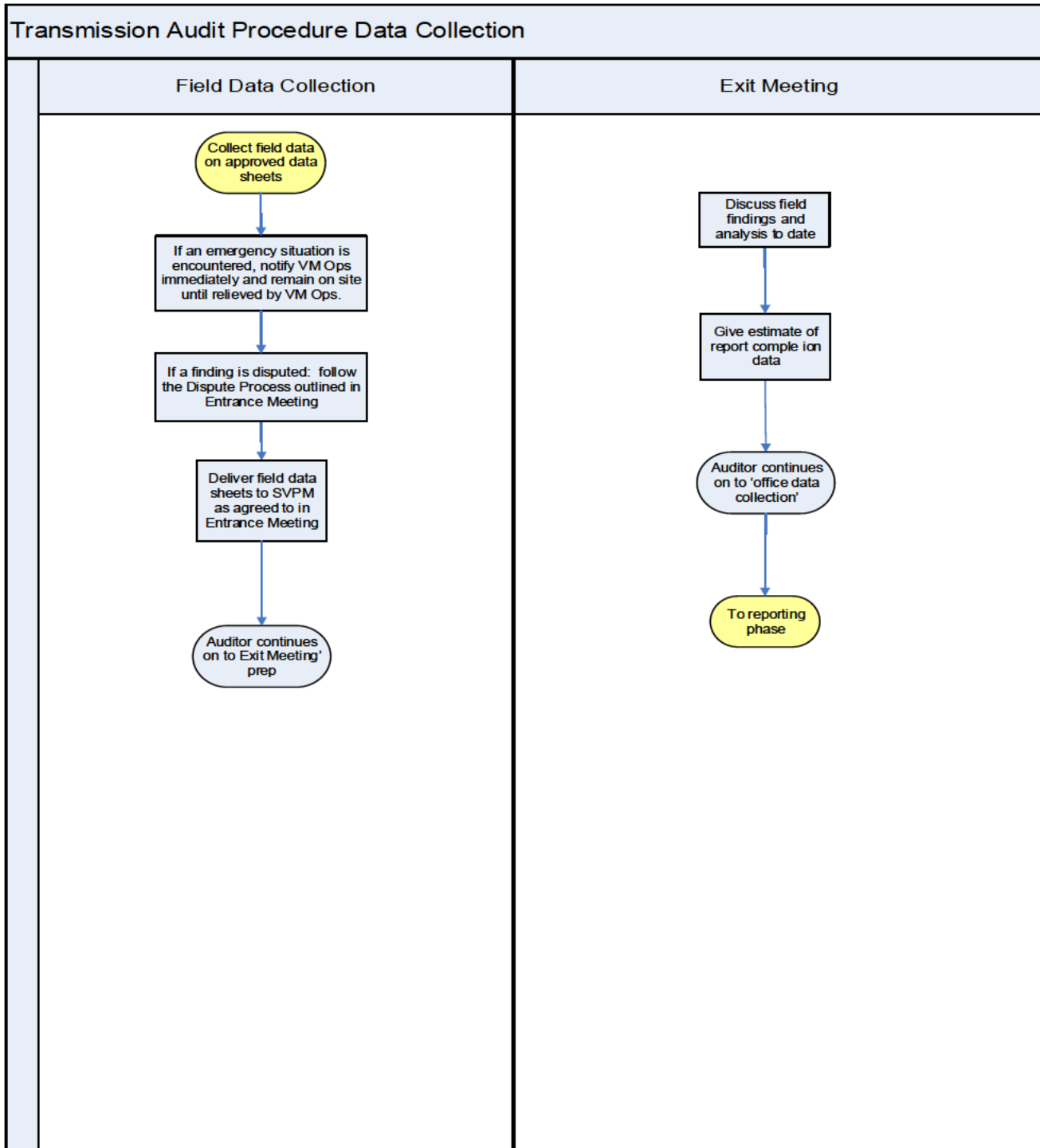
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Appendix C, Audit Procedure – Data Collection

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Appendix D, Audit Procedure – Reporting

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