Quality Assurance Project Plan for Puyallup Tribal Emissions Inventory for Non-Tribal Facilities

Prepared By: Puyallup Tribe of Indians

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Quality Assurance Project Plan for

Emissions Inventory for Non-Tribal Facilities

The Puyallup Tribe of Indians

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1.1 Approvals:

Celine Smith-Jolibois, Air Quality Program Manager: Date:

Celine Smith-Jolibois 11/12/2024

Char Naylor, Fisheries Assistant Director: Date:

Char Naylor 11/12/2024

Vanessa Marshall, USEPA Region 10 Grants Project Officer: Date:

VANESSA MARSHALL Digitally signed by VANESSA MARSHALL Date: 2024.11.12 11:01:18 -08'00'

Cindy Fields, USEPA Region 10 Quality Assurance Manager: Date:

Don Matheny Digitally signed by Don Matheny Date: 2024.11.12 14:29:49 -08'00'

1.2Table of Contents

1.3 Distribution List

This section presents the primary staff who will be working on the project. These staff will be identifying existing data resources for evaluation and potential use under the project or serving in project-specific roles for implementing the Quality Assurance Project Plan. The listing in Table 1.1 includes staff responsible for implementing independent internal quality management steps and staff serving in external oversight roles.

This QAPP and, as applicable, all major deliverables relying on existing data will be distributed to the staff presented in Table 1.1. Additionally, this QAPP will be provided to any unlisted staff who are assigned to perform work under this project. A secured copy of this QAPP will be maintained in the project files under the Puyallup Tribe of Indians Air Quality Program project files in the Puyallup Tribe of Indians server.

Name	Organization	Role
Vanessa Marshall	US EPA, Region 10	EPA Project Officer (PO) or PO Representative (POR)
Cindy Fields	UA EPA Region 10 q	EPA Quality Assurance Manager
Celine Smith-Jolibois	Puyallup Tribe of Indians	Grantee Task 1 Leader, Air Quality Program Manager (PM)
Char Naylor	Puyallup Tribe of Indians	Grantee Quality Assurance Manager (QAM)

1.4 Project /Task Organization

The primary personnel responsible for implementation of this project are the Puyallup Tribe of Indians Project Manager (PM) and Quality Assurance Manager (QAM). Their duties are outlined briefly in this section. The project QAM is independent of the unit generating the data.

Celine Smith-Jolibois is the Puyallup Tribe of Indians PM and will provide senior-level oversight. The PM is responsible for Puyallup Tribe of Indians technical and financial performance as well as maintaining communications with the EPA to ensure mutual understanding of grant requirements, EPA expectations, and conformity with EPA quality procedures; managing oversight and conduct of project activities including allocation of resources to specific tasks; ensuring that quality procedures are incorporated into all aspects of the project; developing, conducting, and/or overseeing QA plans as necessary; ensuring that any corrective actions are implemented; operating project activities within the documented and approved QAPP; and ensuring all products delivered to the EPA are of specified type, quantity, and quality.

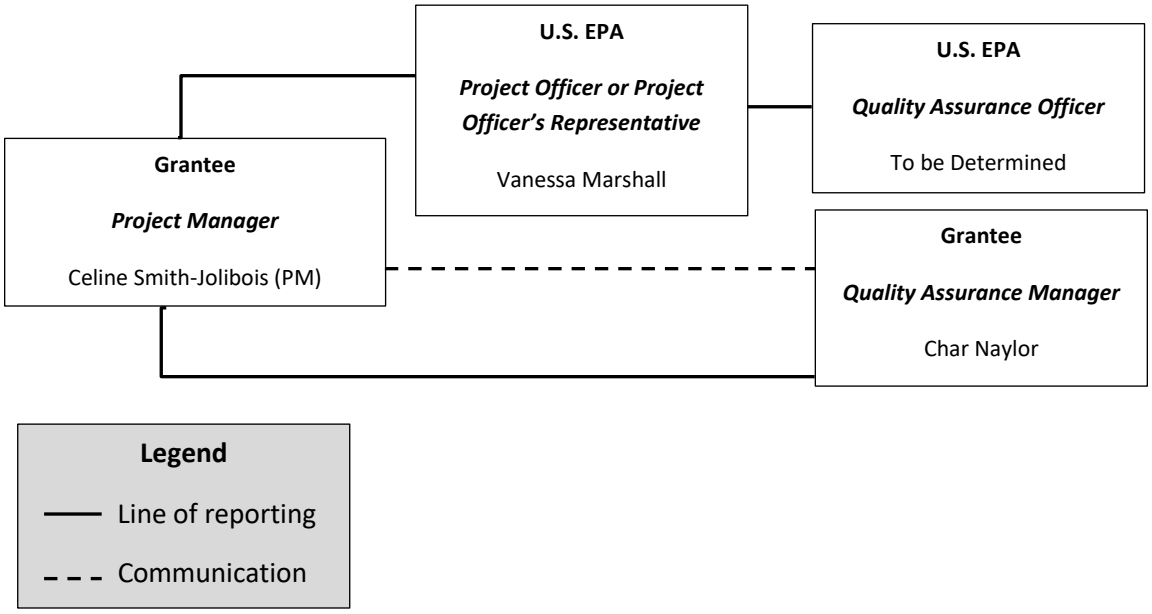
Task-level management system. For each task's major deliverables, the PM will review all QA-related plans and reports and is responsible for transmitting them to the QA Manager (or delegate) for

review and approval. The PM is responsible for ensuring quality procedures are implemented at the task level and for maintaining the official, approved, task-level QAPP content. The PM will discuss any concerns about quality or any proposed revisions to task-level QAPP content with the QAM, or delegate to identify, resolve, or preclude problems or to amend task-level plans, if necessary. In addition, the PM will work with the QAM to identify and implement quality improvements. The PM is responsible for ensuring the consistency of similar or related QA measures across tasks and ensuring that all required QA/QC procedures are being implemented.

Project-level management system. Tasks are expected to proceed concurrently, in parallel. The PM will maintain close communications with QAM and ensure any difficulties encountered or proposed changes at the task level are reviewed for implications on other similar or related tasks. The PM is also responsible for communicating progress or difficulties encountered (across all tasks) to the EPA PO or POR, who provides the EPA's primary oversight function for this project at EPA OAR/EPA Region 10 and is responsible for review and approval of this QAPP and any future revisions. The PM will be responsible for consulting with the EPA PO or POR, on planning, scheduling, and implementing the QA/QC for all project deliverables and obtaining required EPA approvals.

The QA Manager, Char Naylor, is responsible for overseeing QA activities on tasks, and generally helping the Puyallup Tribe of Indians PM understand and comply with EPA QA requirements. She will not be involved in data collection or analyses. At the request of the Puyallup Tribe of Indians PM, Ms. Naylor is responsible for conducting periodic reviews of this project's QA program. Ms. Naylor will keep written documentation of reviewed documents and activities.

Project Organization



1.5 Problem Definition/Background

The Puyallup Tribe was aboriginally located on the east side of the Puget Sound in the vicinity of what is now the City of Tacoma. In 1854, The Puyallup Indian Reservation was established under the terms of the Medicine Creek Treaty, and was expanded by the executive order of January 20th, 1857 to include within Reservation boundaries an area that encompasses what are now areas of Pierce County, the Port of Tacoma, the City of Tacoma, the City of Fife, and the City of Puyallup. Today, most of the Puyallup

Reservation has been developed by the cities of Tacoma, Fife, and Puyallup. The historic urban industirialization of reservation areas has created major pollution consequences.

The Puyallup Tribe of Indians Land Claims Settlement Act of 1989, (P.L. 101-41), (hereafter, Settlement Act of 1989) established criteria for the protection of the Tribe's fishery, as well as the health, safety, and welfare of the Tribe. The Settlement Act of 1989 envisions a permanent homeland for the Puyallup Tribe. Indian reservations are unique and for all practical purposes,they are not being made anymore. Damage to, and destruction of the reservation environment is a critical threat to the Tribe's health and welfare. Tribal members do not have the same flexibility in moving from their homeland as do many other U.S. citizens. Tribal members have cultural, as well as spiritual ties to the land, air and water that comprise their homeland.

The Puyallup Reservation is located within the Puget Sound air shed and is greatly influenced by four factors: urban development, the Pacific Ocean, the mountains and the weather. The Puyallup reservation which encompasses what are now areas of Pierce County, the Port of Tacoma, and cities of Tacoma, Fife, and Puyallup, has been heavily developed over the years creating major pollution consequences. Today, most of the Puyallup reservation has been industrialized by the cities of Tacoma, Fife, and Puyallup. This is especially true for the tideflats area which is part of the ancestral lands of the Puyallup Tribe of Indians. The tideflats area is a unique environment made up of over 5,000 acres of waterfront land that provides vital saltwater and estuarian habitat for salmon, shellfish, and other marine life which hold important spiritual and cultural significance to the Puyallup Tribe and its people, and is an economic center which includes industrial, manufacturing, and maritime activities. The Tideflats area is also designated as the Port of Tacoma Manufacturing Industrial Center, and is home to the highest concentration of industiral and manufacturing activities for Tacoma and Pierce County. Due to historic industrialization of the reservation the people of the Puyallup Reservation already experience poor air quality, which has both direct impacts and is part of the cumulative impacts affecting people's health. The Puyallup Tribe is greatly concerned with the cumulative impacts associated with all the industiral facilities on the Reservation and the impacts to the air that the membership and community members breathe.

In order to protect the health of Tribal and other community members who reside in or near the Puyallup Reservation, the tribe needs to understand air quality pollution sources. The Reservation is downwind from a major industrial area, an area of the Tideflats known as the Port of Tacoma. The Puyallup Tribe does not have a comprehensive understanding of the non-tribal emissions sources affecting the Reservation, namely industrial sources from the Tideflats. Under this project, the Puyallup Tribe will identify, evaluate, and utilize existing data resources to develop a tribal inventory of the major sources of greenhouse gas and other air pollutant emissions for non-tribal facilities operating in the Tacoma Tideflats on or adjacent to Puyallup Tribal lands.

1.5.1 Reason for Project

Due to the concerns about the cumulative impacts associated with all the industrial facilities on the Reservation and the impacts to the air that the membership and community members breathe the main objective of this project is to create an emissions inventory for non-tribal facilities operating in the Tideflats that is as comprehensive as possible. By compiling an emissions inventory that is as comprehensive as possible The Puyallup Tribal Air program will be able to present to tribal leadership and members of the community on the biggest sources of emissions and the health impacts expected from that pollution. By evaluating baseline emissions data published by the EPA, we also hope to not

only assess potential impacts to human health, but also work with agencies and facilities to mitigate these impacts and reduce air pollution on and adjacent to the reservation.

1.6 Project/ Task Description

Utilizing the EPA's National Emissions Inventory (NEI) data and data collected by Puget Sound Clean Air Agency (PSCAA), the Puyallup Tribe will develop a comprehensive emissions inventory for non-tribal facilities operating on or adjacent to the Puyallup reservation. The work to be performed under this project involves preparing a tribal inventory of the major sources of greenhouse gas and other air pollutant emissions from non-tribal facilities operating in the Tacoma Tideflats. Using existing data resources, the Puyallup Tribe will develop a comprehensive emissions inventory that covers the various sources for emissions such as mobile combustion, stationary combustion, agriculture and land management, waste generation, solid waste etc. It is anticipated that the tribal emissions inventory for non-tribal facilities developed under this project will be completed by March 31st 2025.

1.7 Quality Objectives/ Criteria

The primary objective for this project is to utilize existing data resources to develop a reliable and comprehensive Tribal emissions inventory for non-tribal facilities operating in the Tideflats area. To achieve this goal emission inventory data must be reasonably close to reality in order for the Puyallup Tribe to understand the main sources and pollutants.

1.7.1 Data Quality, Management, and Analyses

For this project, PTOI will use a variety of QC techniques and criteria to ensure the quality of data. The data quality objectives and criteria for this project are accuracy, precision, bias, representativeness, and comparability. Accuracy is a measure of the overall agreement of a measurement to a known value. It includes a combination of random error and systematic error. It includes a combination of random error and systematic error. Precision is a measure of how reproducible a measurement is or how close a calculated estimate is to the actual value. Bias is a systematic error in the method of measurement or calculation. If the calculated value is consistently high or consistently low, the value is said to be biased. Our goal is to ensure that the information and data utilized are as accurate, precise, and unbiased as possible within project constraints. It is not anticipated that this project will include primary data collection. Generally, existing data and tools provided by the EPA and other qualified sources will be used for project tasks. A subject matter specialist familiar with technical reporting standards (such as a permit writer or compliance engineer with knowledge of the tribe's facilities operating in the sector) will be used to QA all data utilized for developing the PTOI tribal emissions inventory. The Puyallup Tribe of Indians will verify the accuracy of all data by checking for logical consistency among datasets. All existing environmental data shall meet the applicable criteria defined in CFR and associated guidance, such as the validation templates provided in the EPA QA Handbook Volume II.

Uncertainty can be evaluated using a few different approaches. The most useful uncertainty analysis is quantitative and is based on statistical characteristics of the data such as the variance and bias of estimates. In a sensitivity analysis, the effect of a single variable on the resulting emissions estimate generated by a model (or calculation) is evaluated by varying its value while holding all other variables constant. Sensitivity analyses will help focus on the data that have the

greatest impact on the output data. Additional statistical tests may be utilized depending on the need for more or less rigorous tools and on the specific project activity being evaluated.

When available, data originally gathered using published methods whose applicability, sensitivity, accuracy, and precision have been fully assessed, will be preferred and considered to be of acceptable quality. Project decisions may be adversely impacted if, for example, existing data were used in a manner inconsistent with the originator's purpose. Metadata can be described as the amount and quality of information known about one or more facets of the data or a dataset. It can be used to summarize basic information about the data (e.g., how, why, and when the existing data were collected), which can make working with specific data or datasets easier and provides the user with more confidence. Metadata are valuable when evaluating existing data, as well as when planning for collection primary data that may be required in the future.

Representativeness is a qualitative term that expresses the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition. The Puyallup Tribe will use the most complete and accurate information available to compile representative data for the Puyallup tribes' inventory of non-tribal facilities GHG and other air pollutant emitting activities. Data *comparability* is a qualitative term that expresses the measure of confidence that one dataset can be compared to another and can be combined for the decision(s) to be made. The Puyallup Tribe of Indians will be utilizing published data (specifically the EPA National Emissions Inventory) to compile a tribal inventory of emissions from non-tribal facilities operating on or adjacent to the reservation.

1.7.2 Document Preparation

All documents produced under this project will undergo internal QC review, as well as technical review and an editorial review, prior to submission to the EPA project officer. QC, technical and editorial reviews will be performed by the project manager and quality assurance manager prior to submission to the EPA project officer. Technical review will involve reviewing document for accuracy, integrity of technical methodologies, analyses, and conclusions. Editorial review will involve verification of clarity, spelling and grammatical correctness, and ensure documents are free of typographical errors. Editorial review will also involve verification that references are correctly cited. The QC documentation form (Appendix A) will be used to track the approval process. The form must be completed and signed for all document deliverables. The signatures required include those of the Project Manager and Quality Assurance Manager. Completion of this form certifies that technical review, editorial review, and all required QC procedures have been completed to the satisfaction of the PM and QA Manager. Copies of these forms will be maintained in the project files.

1.8 Documentation and Records

The Puyallup Tribe of Indians will document in electronic form QC activities for this project. The PM is responsible for ensuring that copies of all completed QC forms, along with other QA records (including this QAPP), will be maintained in project files. Project files will be retained by

the Puyallup Tribe of Indians for 7 years. The types of documentation that will be prepared for this project include:

- Planning documentation (e.g., QAPP)
- Implementation documentation (i.e., Review/Approval Forms and QC records)

Detailed documentation of QC activities for this project will be maintained using the QC Documentation Form Shown in Appendix A. This form will be used to document the completions of the QC techniques planned for use on this project. One or more completed versions of these forms, as necessary, will be maintained in the project files. The types of documents and activities for which QC will be conducted and documented may include raw data, data from other sources such as data bases or literature, and comparisons or primary estimates with QC estimates.

2.0 Existing Data Acquisition and Management Protocols (Group B)

2.1 Sampling Process Design

2.1.1 Need and Intended Use of Data Used

A wide range of data for a diverse set of greenhouse gas and other air pollutant emitting activities is necessary to prepare a comprehensive tribal inventory. Existing data resources may include source-specific or facility-specific Greenhouse gas and other air pollutant emissions estimates, emissions factors, or activity data for use with emissions factors. The experimental design for this inventory project relies on the EPA's National Emissions Inventory and emissions data collected by the Puget Sound Clean Air Agency. Data from these resources will be utilized by the Puyallup Tribe of Indians to compile a comprehensive emissions inventory for non-tribal facilities operating on or adjacent to the Puyallup Reservation.

2.2 Quality Control

All data operations conducted for this project will involve existing, non-direct measurement data. All data received will be reviewed by a senior technical staff member to assess data quality and completeness before their use. To assess data quality the Puyallup Tribe of Indians will compare emissions data for the same sources across different inventories, and will verify the reasonableness of especially large emissions to ensure that outliers are not due to user error. In addition to reviewing and assessing the data collected, all data entered into spreadsheet will be reviewed by a senior technical QC reviewer. The QC reviewer will evaluate the approach to ensure the methods are appropriate and have been applied correctly to the analysis. The QC reviewer will also confirm all data were entered correctly.

2.3 Non-Direct Measurements

To compile an emissions inventory for non-tribal facilities operating on or adjacent to the reservation that is as comprehensive as possible, The Puyallup Tribe of Indians will utilize EPA published data (NEI) which according to **Table 3.1** is of the highest quality.

Table 3.1 Existing Data Quality Ranking Hierarchy

Quality Rank	Source Type
Highest	Federal, state, and local government agencies

Quality Rank	Source Type
Second	Consultant reports for state and local government agencies
Third	NGO studies; peer-reviewed journal articles; trade journal articles; conference proceedings
Fourth	Conference proceedings and other trade literature: non-peer-reviewed
Fifth	Individual estimates (e.g., via personal communication with vendors)

PTOI will work with EPA to ensure that all data used for the project are appropriate for their intended use. The main criteria that will be used in the selection of the data are the vintage and quality of the data (based on peer review). The quality of the data will consider the credibility of the source, and the QA documentation provided by the data source. Senior technical staff will also evaluate the availability of alternative datasets, suitability of the selected data for the intended purpose, and agreement with estimates from the Tribal greenhouse gas inventory tool.

PTOI will use the Data Quality Ranking Hierarchy when identifying and reviewing available sources of data and information. The source types in **Table 3.1** appear in the order in which they are likely to meet the data quality criteria. For example, federal government data are more likely to be from a credible source, thoroughly reviewed, suitable, available, and representative, and any exceptions to these data criteria are likely to be noted in the government data, providing transparency. Data from individuals are expected to be less reliable, not peer reviewed, and may not be suitable or representative of tribal activities. The Puyallup Tribe of Indians intends to utilize the EPA National Emissions Inventory data (which is the highest quality ranking) as an informational tool to better understand threats to human health and work to mitigate or ameliorate effects.

2.3.1 Criteria for Accepting Existing Data for Intended Use

The criteria for determining whether the data are acceptable for use in developing the tribal inventory will be based on the reasonableness of the data. In order to develop a tribal emissions inventory that is as comprehensive as possible, and will help the Puyallup Tribe understand the main sources and pollutants in the Tideflats emissions inventory data must be reasonably close to reality.

2.4 Data Management

Data management procedures include file storage and file transfer. All project and data files will be stored on PTOI project servers. Files will be organized and maintained by the Project manager in folders by project, task, and function, including a system of file labeling to ensure version control. Any files containing confidential business information will be stored on secure computers. The TL will make sure that staff are trained and adhere to the project file organization and version control labeling to ensure that files are placed in consistent locations. All files will be backed up each night to avoid loss of data. Data are stored in various formats that correspond to the software being used. As necessary, data will be transferred using various techniques, including email, File Transfer Protocol, or shared drives. Typically, records will be archived once the project is completed. Record retention times will be based on contractual and statutory requirements or will follow PTOI practices for storing materials of up to 7 years after the end of the period of performance (POP). Multiple project staff are granted access rights

to the archived file system for each project. Records may be retrieved from archived file system by the TL, PM, or other project staff with access during the records retention period. As soon as allowed by applicable regulations or the grant agreement, records will be destroyed according to PTOI policies and procedures. For any sensitive information that is gathered under the project, PTOI's policy is consistent with EPA–recommended methods of destruction, which include degaussing, reformatting, or secure deletion of electronic records; physical destruction of electronic media; recycling; shredding; incineration; and pulping. Should the grant specify some other manner of disposition (e.g., transfer to the client), PTOI will comply with that directive. As noted above, PTOI has developed a file naming convention/nomenclature for electronic file tracking and record keeping. Foremost, all files must be given a short but descriptive name. For those records and files gathered or provided to PTOI, the filename may include the identification of "original" in its filename.

Similarly, files that have undergone a review by an independent, qualified person will include, at the end of the filename, the initials of the reviewer or the suffix "rev" (in lieu of initials) if more than one reviewer reviewed the file, along with the date reviewed and version number, as a way to track which staff person(s) reviewed the file and when. Filenames of draft versions will follow an incremental, decimal numbering system. More specifically, each successive draft of a document is numbered sequentially from version 0.1, 0.2, 0.3… until a final version is complete. Final versions will be indicated by whole numbers (e.g., version 1.0). Final versions of documents that undergo revisions will be labeled version X.1 for the first set of revisions. While the document is under review, subsequent draft versions will increase incrementally (e.g., 1.2, 1.3, 1.4) until a revised final version is complete (e.g., version 2.0).

In the event data retrieval is requested and to prevent loss of data, all draft and final file versions will be retained electronically—that is, superseded versions will not be deleted.

Note that changes made to deliverables will be documented using the software's *track changes* feature, which allows a user to track and view all changes that are made to the document version. All deliverable reviews will be documented in a QC Documentation Form (see **Appendix A**) for the project. This form will be maintained in the project files.

For this project, it is not anticipated that any special hardware or software will be used. General software available through the Microsoft Suite including Excel, PowerPoint, Access, and Word will be sufficient to perform the work.

3.0 Assessment and Oversight (Group C)

3.1 Assessments and Response Actions

The QA program includes periodic review of data files and draft deliverables. The essential steps in the QA program are as follows:

1. Identify and define the problem
2. Assign responsibility for investigating the problem
3. Investigate and determine the cause of the problem
4. Assign and accept responsibility for implementing appropriate corrective actions
5. Establish the effectiveness of and implement the corrective action

6. Verify that the corrective action has eliminated the problem.

The TL will provide day-to-day oversight of the quality system. Periodic project file reviews will be carried out by the QA Manager, at least once per year to verify that required records, documentation, and technical review information are maintained in the files. The QAM will ensure that problems found during the review are brought to the attention of the TL and are corrected immediately. All nonconforming data will be noted, and corrective measures to bring nonconforming data into conformance will be recorded.

The TLs and QA Manager are responsible for determining whether the quality system established for the project is appropriate and functioning in a manner that ensures the integrity of all work products. All technical staff have roles and will participate in the corrective action process. Corrective actions for errors found during QC checks will be determined by the PM and, if necessary, with direction from the QA Manager as appropriate. The originator of the work will make the corrections and will note on the QC form that the errors were corrected. The PM and QA Manager will review the corrections to ensure the errors were corrected. Any problems noted during audits will be reviewed and corrected by the QA Manager and discussed with the PM as needed. Depending on the severity of the deficiency, the PM may consult the QA Manager and stop work until the cited deficiency is resolved. Deficiencies identified and their resolution will be documented in monthly project reports, as applicable. The QA Manager and PM will comply and respond to all internal and EPA audits on the project, as needed. The QA Manager will produce a report outlining any corrective actions taken

3.2 Reports to Management

The periodic progress reports (to the EPA PO) required in the grant agreement will be reviewed by the PM and the QAPM to ensure the project is meeting milestones and that the resources committed to the project are sufficient to meet project objectives. These periodic progress reports will describe the status of the project, accomplishments during the reporting period, activities planned for the next period, and any special problems or events including any QA/QC issues. Reports to the EPA will be drafted by the TL or other project staff familiar with project activities during the reporting period.

Any QC issues impacting the quality of a deliverable, the project budget, or schedule will be identified and promptly discussed with the assigned TL and the PM or QAM as appropriate. All significant findings will be included in monthly reports with the methods used to resolve the specific QC issue or the recommendations for resolution for consideration by the EPA's PO or designee.

Based on the technical work completed during the reporting period, progress reports will be reviewed internally by an independent, qualified technical person (equivalent or senior to the TL), prior to submitting to the PM. The PM will conduct a final review of the report before transmitting the progress report to the EPA PO, and the PM's manager will be cc'd on all progress reports.

4. Data Validation and Usability (Group D)

4.1 Data Review, Verification, Validation

All work conducted under this project will be subject to technical and editorial review. When existing data for the same GHG/ air pollutant emitting activity are available from multiple sources, the background information documents will be reviewed for all sources to determine the dataset that is the most representative of tribal operations. Additionally, the inventory report will include the vintage of

the existing data resource and preference will be given to the most recent dataset that is representative of similar GHG/air pollutant emitting non-tribal activities. Reviews will be conducted by an independent, qualified person—or a person not directly involved in the production of the deliverable. The term "validation" refers to whether the data meet the QAPP-defined user requirements while the term "verification" refers to whether conclusions can be correctly drawn from the data. The quality of data used and generated for the project will be reviewed and verified at multiple levels by the project team. This review will be conducted by the PTOI PM or a senior technical reviewer with specific, applicable expertise. All original and modified data files will be reviewed for input, handling, and calculation errors. Additionally, all units of measure will be checked for consistency. Any potential issues identified through this review process will be evaluated and, if necessary, data will be corrected, and analysis will be revised as necessary, using corrected data. These corrections will be documented in project records. These measures of data quality will be used to judge whether the data are acceptable for their intended use. In cases where available data do not or may not meet data quality acceptance criteria, the TL will document these findings in the inventory along with corrective actions or use of alternative data sources.

4.2 Verification and Validation Methods

As a standard operating procedure, all data (retrieved and generated) will be verified and validated through a review of data files by an independent, qualified technical staff member (i.e., someone other than the document originator), and ultimately, the PTOI PM. Forms for documenting QC activities and review of deliverables are included in **Appendix A.** Documentation of calculations will be included in spreadsheet work products and in supporting memoranda, as appropriate.

The PM is responsible for day-to-day technical activities of tasks, including planning, data gathering, documentation, reporting, and controlling technical and financial resources. The PM is the primary person responsible for quality of work on tasks under this project and will approve all-related plans and reports. These reports will be transmitted by the PM to the QAM for final review and approval.

Source data will be verified and validated through a review of data files by the technical staff, and ultimately the PM. Reviews of analyses will include a thorough evaluation of content and calculated values. All original and modified data files will be reviewed for input, handling, and calculation errors. Additionally, all measurement units will be checked for consistency. Any potential issues identified through this review process will be evaluated, errors corrected, and analysis repeated using the corrected data. All corrections will be documented in project records.

Source data will be verified and validated through a review of data files by the technical staff, and ultimately the PM. Typical data verification reviews can include checks of the following:

- Data sources are clearly documented,
- Calculations are appropriately documented,
- All relevant assumptions are clearly documented,
- Conclusions are relevant and supported by results, and
- Text is well-written and easy to understand.

The documented review process will be stored with deliverables for the project. For the narrative describing the methodologies used for the inventory, all comments on drafts will be clearly and concisely summarized including a description of how substantive issues raised by commenters were resolved.

As discussed in Section 1.7, QC objectives include verification that data in database tables are stored and transferred correctly, algorithms call data correctly, units are internally consistent, and reports pull the required data. These data management issues will be addressed as part of the QC checks of data acquisition and document preparation.

For this project, it is not anticipated that any special data validation software will be required. However, where calculations are required to assess the data/datasets, calculations will be performed using computer spreadsheets (like Excel spreadsheets with predefined functions, or formulas) and calculators to reduce typographical or translation errors. General software available through the Microsoft Suite including Excel, PowerPoint, Access, and Word will be sufficient to perform the work as described in Section 1.6 for this project.

4.3 Reconciliation with User Requirements

All data (retrieved and generated) and deliverables in this project will be analyzed and reconciled with project data quality requirements. To ensure deliverables meet user requirements, the TL or senior technical lead will review all data and deliverables throughout the project to ensure that the data, methodologies, and tools used meet data quality objectives, are clearly conveyed, and represent sound and established science.

PTOI will review each project with the EPA at the planning stage to ensure the approach is fundamentally sound and will meet the project objectives. The TL or senior technical lead will evaluate data continuously during the life term of the project to ensure they are of sufficient quality and quantity to meet the project goals. Prior to submission of draft and final products, the TL or senior technical lead will make a final assessment to determine whether the objectives have been fulfilled in a technically sound manner. Assumptions made in preparing project analyses will be clearly specified in the inventory.

As discussed in Section 1.7.1, uncertainty can be evaluated using a few different approaches. The most useful uncertainty analysis is quantitative and is based on statistical characteristics of the data such as the variance and bias of estimates. In a sensitivity analysis, the effect of a single variable on the resulting emissions estimate generated by a model (or calculation) is evaluated by varying its value while holding all other variables constant. Sensitivity analyses will help focus on the data that have the greatest impact on the output data. Additional statistical tests may be utilized depending on the need for more or less rigorous tools and on the specific inventory activity being evaluated.

References

EPA, EPA-454/B-17-001, *Quality Assurance Handbook for Air Pollution Measurement Systems, Ambient Air Quality Monitoring Program, Volume II*. Available at https://www3.epa.gov/ttnamti1/files/ambient/pm25/qa/Final%20Handbook%20Document%201_17.pdf. Accessed on 8/5/2024.

EPA, Environmental Protection Agency, awsedap.epa.gov/public/single/?appid=20230c40-026d-494e-903f-3f112761a208&sheet=5d3fdda7-14bc-4284-a9bb-cfd856b9348d&opt=ctxmenu%2Ccurrsel. Accessed 16 Aug. 2024.

"Tideflats Subarea Plan." *Home - City of Tacoma*, www.cityoftacoma.org/cms/one.aspx?pageId=132602. Accessed 23 Sept. 2024.

Appendix A

<Grantee Org.>

Documentation of QA Review and Approval of Electronic Deliverables

Approvals on this form verify that all technical and editorial reviews have been completed and the deliverable meets the criteria for scientific defensibility, technical, and editorial accuracy, and presentation clarity as outlined in the Quality Assurance (QA) Project Plan, QA Narrative, Quality Management Plan, and/or according to direction from the EPA PO.

Client:	EPA Region <X>
Grant Number:	<enter grant number>
EPA Project Officer:	<enter EPA PO>
Project Number:	<enter internal Project ID>
Project Name:	<enter internal project name>
Grantee Org. Project Manager	<enter grantee's project manager>

QA Form Details

Item Number	File Name (Copy the name of the File Reviewed)	Deliverable Description	Date Sent to Client:	Deliverable (Draft)	Deliverable (Final)	Document Originator	QA Review information (Review Type)	(Reviewer Name)	(Date Review was Performed)	(Brief Summary of Review Findings and Other Notes)	(Have all Findings Been Resolved)	(Originator Signature)	(Reviewer Signature)	(File Location) *Copy Long Folder Path Name*
01				☐	☐		*Technical*				☐ Yes			
							Technical				☐ Yes			
02				☐	☐		*Technical*				☐ Yes			
							Technical				☐ Yes			
03				☐	☐		*Technical*				☐ Yes			
							Technical				☐ Yes			
04				☐	☐		*Technical*				☐ Yes			
							Technical				☐ Yes			