Exhibit C1 - Scope of Work

Section 3: Scope of Work

The Blue Lake Rancheria Native American tribe will partner with Sonoma Technology, Inc. to establish a network of high quality and low-cost PM sensors in the Blue Lake Rancheria community. An extensive training and capacity building program will accompany the monitoring network and will focus on education about air quality, personal exposure, mitigation strategies, data analysis, smoke impacts on air quality, and how to share information within the Blue Lake Rancheria community. The monitoring and education program under this grant will span two years after which point, Blue Lake Rancheria will seek longer term funding to operate and maintain the regulatory-grade PM instrument. Our overall project timeline is three years to allow time for hiring staff, purchasing and installing equipment, and reporting after 24 months of monitoring.

There are five main tasks in this project:

1. Develop a project and monitoring work plan.

2. Conduct monitoring of PM throughout the community by deploying one regulatory-grade PM instrument and a network of low-cost $PM_{2.5}$ sensors to monitor air quality from local sources and smoke from wildland fires.

3. Engage the community and increase the spatial density of $PM_{2.5}$ measurements by establishing a dense network of low-cost air quality sensors (PurpleAir) at private residences, schools, and community locations; train teachers to use low-cost air quality sensors in schools; and share information with the community on the levels of local air pollution.

4. Train one or more Blue Lake Rancheria staff to operate, maintain, and monitor the data collected by the regulatory-grade instrument over the course of the project period and into the future.

5. Develop reports, presentations, maps, and a StoryMap of the data and information collected to inform community members of the work conducted, results, and available resources.

This project seeks to continue our work on air quality community engagement in priority population schools, an activity we have received interest and support on from ten area schools to date- as well as involve interested community members in the monitoring plan and activities. We believe the community engagement and reporting components will reach a broad audience in our region, and the workforce development will build capacity at Blue Lake Rancheria and for the community at large. We are partnering with

Blue Lake Rancheria's Tribal Education Agency and Sonoma Technology, Inc. to maximize impacts. The project contact will be Michelle Fuller, Blue Lake Rancheria's Environmental Programs Director (mfuller@bluelakerancheria-nsn.gov).

Each project task is described below.

Task 1: Develop Project Work Plan

The team will develop a project work plan and monitoring plan that contains detailed information about the network design and rationale, deployment plan, and community education and support plan. The project work plan will contain details of the elements described in the following sections as well as a project schedule and communication plan. The objective of the project work plan and monitoring plan is to clearly define the tasks, monitoring details, and schedule for the overall project. As part of the development of the project work plan and monitoring plan, we will assemble a project stakeholder team comprised of community leaders and residents. The project stakeholder team will help to coordinate community meetings and will serve as an advisory group to the project. During the development of the project work plan and monitoring plan, we will conduct a project kick-off meeting to present the plan and gather input and feedback from the stakeholder team.

Deliverables: Project work plan and air monitoring plan (draft and final); identified project stakeholder team; project kick-off meeting with the project stakeholder team. We will report on activities under this task in our interim grant reports with specific activities and expenditures.

Task 2: Monitoring

The objective of this task is to collect air quality data that meet regulatory requirements using a Federal Equivalent Method (FEM) instrument and low-cost sensor data with precision and accuracy of sufficient quality to assess spatial variations in $PM_{2.5}$.

During the past several years, Blue Lake Rancheria and Sonoma Technology have been working together under a previous AB617 grant to provide air quality education to the Blue Lake Rancheria community members, teachers, and students. Our team worked together to successfully deploy KMS, an air quality educational program, to eight schools in the region. KMS teaches students in grades 6-12 about monitoring and improving air quality in their communities. In this program, students learn about particle pollution, its sources, its health effects, and actions that can be taken to reduce air emissions. In-class lecture and discussion are followed by a hands-on lesson using handheld, low-cost air sensors paired with a smartphone app. Students measure air quality around schools and their local community and develop an understanding about particle pollution sources and affected areas. In addition, the KMS program helps

students understand how their daily routines and actions can impact emissions and air quality at a time when they are developing life-long habits.

To complement the standard KMS program, Sonoma Technology in collaboration with Blue Lake Rancheria educators, developed and delivered a learning module titled "The history of unequal air pollution distribution and Assembly Bill 617: investigating your community" to educators for use in classrooms. Additionally, we developed a reusable "Build a sensor Maker kit", allowing students to build their own indoor air sensor, which employs aspects of engineering, electronics, and coding. The Blue Lake Rancheria – Sonoma Technology partnership has been successful and has helped build capacity for air quality education in local schools.

The purpose of the proposed monitoring program is to build upon the air quality education work from the previous AB617 grant to improve the Blue Lake Rancheria community's understanding of the spatial and temporal variations in $PM_{2.5}$ and to broaden the community's understanding of air quality issues. To accomplish this, we propose to deploy one high quality, FEM instrument that will provide defensible information to identify emissions source impacts on the community. We also propose to deploy a network of low-cost PM sensors distributed throughout the community.

The objectives of the air monitoring program proposed are to 1) obtain regulatory grade $PM_{2.5}$ data to more accurately characterize local air quality conditions compared to existing monitoring sites located far from Blue Lake Rancheria; 2) deploy a low-cost PM sensor network; and 3) develop training, education, and outreach materials to support the overall monitoring program and capacity building. The focus of the air monitoring program will be on $PM_{2.5}$ which is particulate matter with size ranges of less than 2.5 microns in aerodynamic diameter. $PM_{2.5}$ contains particles and droplets that are so small that they can be inhaled and get deep into the lungs and bloodstream. Of these, particles less than 2.5 microns in diameter, pose the greatest risk to health (https://www.epa.gov/pm-pollution/particulate-matter-pm-basics).

The Teledyne T640 is a FEM for $PM_{2.5}$ [EQPM-0516-238] measurements. This instrument does not need a climate-controlled shelter, is relatively easy to use, has a standard operating procedure (SOP), and training materials that already exist. Sonoma Technology has extensive experience deploying, operating, and training on the T640 instrument. In addition, Sonoma Technology wrote the T640 SOP for the US Environmental Protection Agency (EPA). Data collected by the T640 are reported with user-selected intervals including 1-minute, 5-minute, and 1-hour. Sonoma Technology will prepare materials and provide training to Blue Lake Rancheria staff and/or community member(s) to act as local field technicians to perform routine instrument maintenance (described in more detail below). The T640, with proper maintenance, should have a lifetime of approximately ten years or more (Figure 3).

Figure 3. Photograph of the T640 instrument.

Sonoma Technology has extensive experience in setting up monitoring shelters and data systems for communities which will ensure both high quality data and a high data capture rate. Data will be sent to Sonoma Technology's central data repository in real-time via cellular communications and will be reviewed by an analyst daily to ensure proper instrument operation, with a focus on the T640. Data will be automatically quality controlled via routine checks such as stuck values (indicating a possible instrument problem) with an automated system that will alert Sonoma Technology analysts when there are issues in the data stream.

The low-cost sensors to be deployed are the PurpleAir PA-II (PA-II). This sensor is widely deployed across the world, is easy to install and use, and requires no maintenance. Extensive training material is also available for the PA-II sensor.[2] The PA-II can be deployed indoors or outdoors. For quality purposes, prior to deploying the PA-II sensors in the community, we will collocate all the PA-II sensors with the T640 FEM instrument for a few weeks and permanently collocate at least one PA-II with the FEM for the duration of the project. Collocation is vital and provides an indication of the performance of the PA-II sensors compared to the T640 FEM instrument. While the PA-II sensor has performed well in the South Coast Air Quality Management District (SCAQMD) AQ-SPEC evaluation, and thousands of these sensors are currently deployed, sensor-to-sensor variability may still be high. Collocated data will be assessed for individual and overall sensor precision, drift, and accuracy compared to

[2] Reference SCAQMD community guidebook just posted on AQMD website. Our installation video: https://www.youtube.com/watch?v=ho6Gew_0600

the T640. We will use best practices in working with communities using the sensors. It is anticipated that the PA-II sensors have a lifetime between three and five years.

The PA-II sensors will be deployed at locations throughout the community including schools and community centers. There are eight schools in the Blue Lake Rancheria area that currently participate in the Kids Making Sense air quality program. Ideally, the PA-II sensors would be located at the same schools to allow students additional opportunities to understand air quality in their region and how concentrations change over time at their school. Schools are often central in communities, and thus locating air sensors at schools also allows the community to benefit from the data. For some locations, it would be useful to have sensors both indoors and outdoors. Schools are where youth spend most of their day, thus underlining the importance of understanding both indoor and outdoor air quality in these locations. Conceptually, we would place the T640 FEM instrument at a secure central location for the community and the low-cost sensors would be distributed throughout the community in locations determined based on community demand and participation, the location of existing PA-II sensors already in the community, and local meteorology. A plan for deploying both the T640 FEM instrument and the PA-II sensors will be developed and documented in the project work plan and monitoring plan. Figure 4 shows the PurpleAir data website map for the area around Blue Lake Rancheria. There are currently only two PurpleAir sensors located in and around the Blue Lake Community.

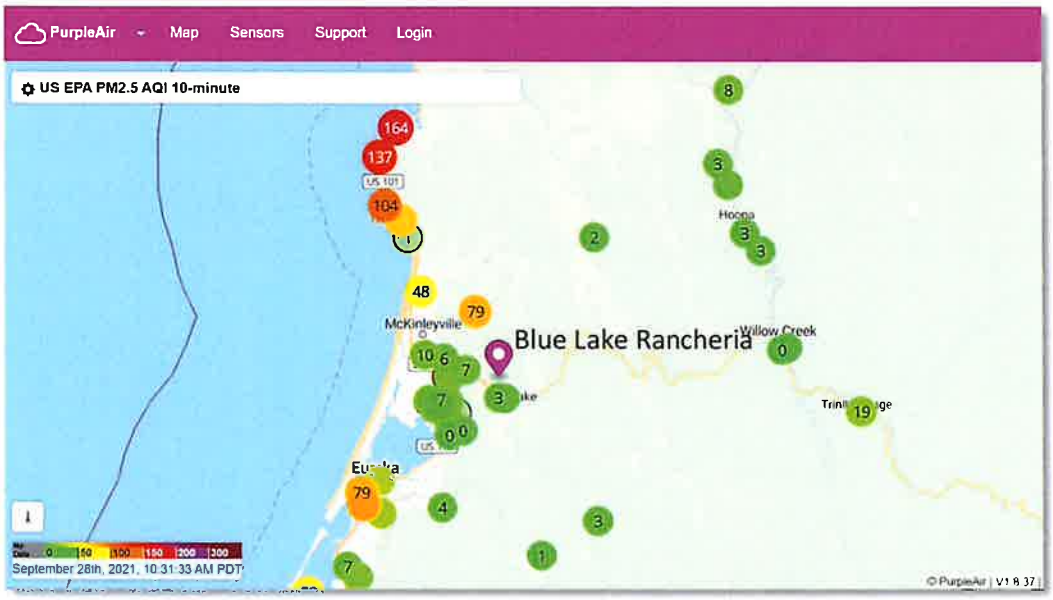


Figure 4. Screenshot of the PurpleAir data mapping website showing two PurpleAir sensors in the Blue Lake Rancheria community (www.purpleair.com; September 28, 2021).

Data from the PA-II sensors will be available on the PurpleAir website (Figure 4) in real-time so that students and community members can take action to protect their health. Data from outdoor PA-II sensors set to "public" mode will also be available on the AirNow Fire and Smoke Map website (https://fire.airnow.gov/). This website autocorrects the PA-II sensor that allows for closer comparison to regulatory air monitored data. Additionally, the T640 data will be displayed on the AirNow website and the Fire and Smoke website.

A meteorological monitoring station will be collocated with the T640 instrument to collect wind speed, direction, temperature, and relative humidity data. Meteorological measurements will also be collocated with the PA-II sensors deployed at schools, using the Tempest Smart Weather Station (Tempest). The Tempest data will be used for educational purposes to teach students and teachers how weather influences air quality. These wind, temperature, and relative humidity measurements are vital for data interpretation.

In addition to the data collected during the monitoring program, various other sources of data and information will be used to support data analysis, education, and capacity building. The data collected by the T640, and PA-II sensors will be made available to the public in real time. In addition, we will analyze the data to assess if there are locations in the community with consistently higher concentrations than other locations, on average. We will analyze the data based on meteorology, local emissions sources, and air quality events including smoke impacts from wildland fires.

We will explore the data to identify periods when high $PM_{2.5}$ concentrations occur and identify the frequency with which all or most sites have high concentrations at the same time, or if only one or a few sites have high concentrations. If all sites have high concentrations at the same time, this suggests a more regional, rather than local, source impacting the community. If results point to a specific local source, we will identify potential mitigation measures the community could engage to address the source and/or exposure to the source. This approach will help identify previously unknown emission sources and confirm or rule out the impact of suspected sources. Data will be utilized in an educational capacity but can also be used by the community to determine local air quality conditions. A summary of the data to be collected is provided in Table 1. Other sources of data to be used for educational purposes include the PurpleAir data viewing website (www.purpleair.com), the AirNow website that displays regulatory data (www.airnow.gov), and the AirNow Fire and Smoke Map website (https://fire.airnow.gov/).

Table 1. Summary of the data to be collected and/or used for educational purposes.

Measurement	Instrument	Frequency	Data for community	For student education
FEM $PM_{2.5}$	Teledyne T640	1-minute	■	
Wind speed/direction, temperature, RH	Collocated Meteorological Station	1-minute	■	
Low-cost PM sensor	Purple Air PA-II	~1-minute	■	■
Wind speed/direction, temperature, RH, rainfall	WeatherFlow Tempest	3-seconds		■

The following summarizes the scope of actions associated with the monitoring program.

- Provide actionable data by using a regulatory-grade FEM instrument to measure $PM_{2.5}$.
- Provide $PM_{2.5}$ air quality data to enable community members to take action to reduce their exposure to $PM_{2.5}$, both indoors and outdoors.
- Provide air quality data and publicly available information resources data to support education and training.
- Provide capacity building opportunities for community members and students to learn how to maintain the FEM instrument, use and deploy low-cost sensors, analyze data, and share findings with other community members online.

Task 2 Deliverables: T640 FEM instrument acquisition and deployment, meteorological instrument acquisition and deployment, field technician training, PA-II sensors and deployment in the community, training materials for the T640 and the PA-II sensors. We will report on activities under this task in our interim grant reports including specific data collection achieved, any issues and plan for their resolution, and expenditures tracked.

Task 3: Community Engagement

In the project described here, Sonoma Technology will work with Blue Lake Rancheria educators to build upon previous efforts to bring focused air quality education to local schools. This will include development of new learning modules to complement the

KMS air quality educational program already in place at schools within Blue Lake Rancheria. The goal of the learning modules is to educate teachers and students about how to use the PurpleAir sensors, the differences that exist between air sensors and regulatory grade monitors, and how to reconcile those differences when interpreting data. Additionally, three topic-specific learning modules will be developed (described below). All educational materials will be aligned to Next Generation Science Standards and Common Core Standards. The end-product of the community and education learning modules will be a GIS-based StoryMap which will highlight the air quality programs and information that have been in progress with teachers, students, and the community.

Air Sensor Learning Module

This module will educate teachers and students on how to site air sensors including considerations for obtaining data from online and private mode sensors, and how to interpret the data to build overall capacity around sensor usage. The materials will be developed in collaboration with Blue Lake Rancheria with the intention of building capacity within the community. Schools, teachers, and students will be able to use the information to site additional sensors and expand their local network into the future and to enable students, teachers, and community members to be able to interpret future data.

Portions of the material will be used to create a slide deck that can be shared with the general community to aid them in setting up their own air sensors.

Air Sensor Data Interpretation Learning Module

The next module will focus on how to obtain data from the air sensors, and how to interpret it. A step-by-step guide for how to use online tools to view local and regional-scale air sensor and regulatory monitor data, including AirNow and the PurpleAir website, will also be included. Additionally, a discussion surrounding correction factors and their role in interpreting air sensor data will be highlighted.

Indoor Versus Outdoor Air Quality Learning Module

The first topic-specific module will focus on understanding indoor versus outdoor air quality, and how they are related. Discussions around infiltration of outdoor pollutants into buildings, classrooms, and homes will be included. Common sources of indoor particulate matter will also be discussed. Activities in the module will utilize handheld air sensors and stationary Purple Air sensors located at the schools. Activities will include exercises to find the most effective way to reduce indoor PM levels (building different filter assemblies to test), exercises to explore data from Purple Air monitors located both indoors and outdoors at schools, and materials that integrates hand-held air sensors.

Topic Module: Fire and Smoke

Sonoma Technology, in collaboration with Blue Lake Rancheria educators, will develop educational materials for teachers and students regarding air quality during fire and smoke events. This will include explanations of online tools, such as the AirNow Fire and Smoke Map, and considerations that should be used when referencing these tools. It will also include explanations as to the difference between regulatory monitors and air sensors. Developed material will include investigations that can be performed by students using the air sensors included in Kids Making Sense Air Quality Classroom kits, already in use by Blue Lake Rancheria educators. The developed materials will include mitigation strategies students and teachers can employ to protect themselves from smoke exposure during smoke events.

As part of these efforts, a Tempest Weather station will be sited at least five schools. This will allow for discussions of the impact of meteorology on air quality in the curriculum and will allow for teachers and students to understand the role of meteorology as it relates to smoke transport.

Local Emission Sources

Sonoma Technology will work with Blue Lake Rancheria to identify primary outdoor emissions sources in the region that are of concern to community members. Based on these sources, Sonoma Technology will develop learning materials to highlight emission sources and supplement the KMS standard curriculum already in use at schools. The module will help participants identify sources in their area, will outline activities to measure personal exposure (e.g., upwind/downwind, time of day measurements, etc.), and suggest strategies that can be used to help mitigate personal exposure to these sources.

Educator and Community Leader Training

Sonoma Technology will host a 1-day in-person or virtual training session for up to 15 teachers, para-educators, and community leaders. Training will ensure teachers are comfortable with materials developed in new modules and will support their efforts to implement material in their classrooms. In this "train the trainer" format, Sonoma Technology will equip those who intend to deliver the material to the community members and students for years to come, with the information and training they need to be successful. This ensures training and education using these materials will continue.

Deliverables: Air sensor curriculum module, Air sensor data module, indoor vs outdoor air quality module, fire and smoke module, local emissions module, educator and community leader training on modules. We will report on activities under this task in our interim grant reports with details on community members reached and expenditures.

Task 4: Workforce Development

Included in the budget estimate is two years of funding for one or two (depending on availability and to redundancy of skills) local field technicians. Sonoma Technology will prepare training materials and fully train the individual(s) to perform routine maintenance on the T640 instrument. This will ensure the instrument remains in compliance and that data produced is of good quality throughout the course of its monitoring at the site (beyond the duration of this project). This technician will also be offered training through the Institute for Tribal Environmental Professionals' (ITEP) Tribal Air Monitoring Support Center for air quality training specific to tribal communities.

Technicians will also be trained on best practices to site PA-II sensors and performing future co-locations of PA-II sensors with the T640. This will ensure the PA-II sensors can be periodically tested and remain in working order, especially following high $PM_{2.5}$ air quality events, such as prolonged wildfire episodes.

Local technicians will be provided thorough training including state of the science on siting sensors, technical documentation, and best practice guides on maintaining the T640 and PA-II sensors. Local technicians will be supported with detailed information to reference following the end of the project and will have access to technical support.

GIS expert

Included in the budget will be funding for training an experienced GIS user/administrator from the Blue Lake Rancheria community to assist and support teachers with both the development of and future updates to the StoryMap. Sonoma Technology will work with this individual to ensure they are prepared with the necessary details and specifics of the StoryMap framework developed by Sonoma Technology (with community input) and will provide supplementary training needed to ensure they can assist teachers with future updates to the StoryMap.

Deliverables: Training for local field technicians, training session for the GIS user/administrator. We will report on trainings in our interim grant reports with details on staff trained, details of training, any problems and proposed solutions, and expenditures.

Task 5: Reporting

Throughout the duration of the project, the data collected by the T640 will be quality assured and analyzed. The data collected by both the T640 and the PurpleAir sensors will be made available to the community and training will be provided on how to interpret the data. Presentations will be provided summarizing the data in general and special presentations will be developed when the community is impacted by smoke from wildland fire(s). Interim grant reports will share work completed under all tasks, any issues or delays and their proposed solutions or new timelines, and grant expenditures. Upon completion of the project, a final report will be delivered that summarizes the monitoring campaign, the data analysis results, and future recommendations.

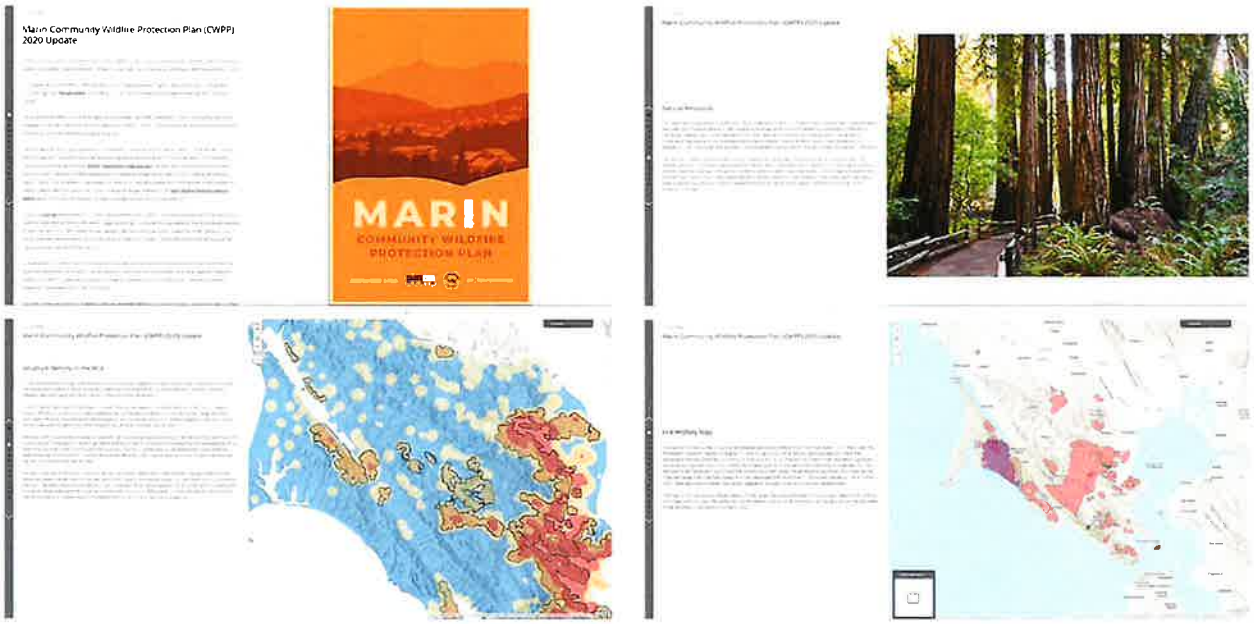
Community Data Communication and Reporting

StoryMaps are an engaging, interactive way to tell stories by combining text, maps, and other content into an online public platform. StoryMaps can be created for any topic and naturally facilitates data explanations through storytelling to the public who might not be engaged by a scientific report. As people scroll through the text on the screen, the associated graphics update to show the most relevant graphic for the text the viewer is reading. The graphics can be photos, tables, or interactive maps where users can click around to find out more information. These interactive platforms can be created and updated over time to reflect changing data and content.

To support community and student engagement, a StoryMap will be developed and populated by students to showcase the work they have done in the community related to emissions, air quality, and the environment. Using the StoryMap platform as a tool to repot data will allow the results to be easily accessible to the entire community. The historical and cultural context of topics, for example fire and smoke activities, can also be built into the StoryMap to bridge Indigenous knowledge with measurement data. Reporting data in this way allows the project and its data to be dynamic, easily adaptable, and updatable based on the most current data collected. Students will be able to directly contribute to pages set up to highlight their own air monitoring projects. When student projects are shared through this medium, it showcases student's work to improve their understanding of their environment to their local community members, the local air district, and beyond.

Students and teachers will be trained on how to update and maintain the StoryMap to empower them to continue to serve the community for years to come beyond this project.

An example of a Story Map developed by Sonoma Technology can be found here https://www.arcgis.com/apps/MapJournal/index.html?appid=6b55c55b3f7d41fe980ef5e65ae881a6, and screenshots of various pages are shown below.



Topics that could be developed in the StoryMap when first established include:

- A description of the area and the history of the land.
- Background information on air pollution and the health and environmental risks associated with exposure.
- Information on pollution sources in the area. The locations of known emissions can be presented in an interactive map format that would allow users to find out more information by hovering over a map marker.
- Background on wildfires and smoke exposure as well as information on burning activities that take place in the area. This may include a map that shows information on recent past fires in the area and the locations of those/burn areas.
- Information concerning how to protect yourself during a wildfire event.
- If groups of students have used the hand-held air sensors from the Kids Making Sense kits, they can develop a page with information on their own monitoring sessions, the question they set out to explore, their approach, and the results they discovered.
- Interactive map of the Purple Air sensor and regulatory monitor locations in the area and links to the live data feed on the Purple Air website or AirNow Fire and Smoke map for each sensor.

Section 4: Budget Narrative

Task 1: Develop Project Work Plan

The team will develop a project work plan and monitoring plan that contains detailed information about the network design and rationale, deployment plan, and community education and support plan.