**VOC Systems Executive Summary**

VOC Systems is a team dedicated to creating a system that gives small communities a means to fight against large corporations involved in volatile organic compound (VOC) leaks. VOC’s are categories as carbon compounds that are hazardous to human health. VOC System’s monitors records VOC levels in a community and stores them for use as evidence in legal proceedings.

**Purpose**

The Environmental Protection Agency (EPA) estimates that over 80 million pounds of undetected VOCs are released by oil refineries every year. In August of 2012, Chevron was successfully sued by the Richmond, California community for an oil fire. In Mayflower, Arkansas the state governor successfully sued Exxon Mobil for a massive oil leak. In the Standard Heights community of Baton Rouge, Louisiana residents suffered from a Napthalene leak caused by a nearby Exxon Mobil plant.

Napthalene is a chemical that turns to toxic vapor as it touches the atmosphere. It is a byproduct of fossil fuel combustion. Napthalene breaks apart red blood cells causing severe vomiting and tissue damage. Exxon Mobil initially claimed that the leak wasn’t large enough to affect the community. Months later, Mobil would admit that the leak was larger than estimated. Standard Heights has received no apology or compensation.

VOC Systems is needed because no one wants to sue a corporal giant with no more evidence than similar symptoms among the residents of a community. The VOC levels that the VOC System’s monitor records acts as a fire, as an oil leak. It is the tangible evidence these communities need to stand up for themselves.

**System Overview**

The VOC Monitoring System comes in two sizes. The small system includes three monitors; the large system includes five monitors. These monitors are positioned around a community. Each monitor includes a sensor that detects a VOC as chosen by a community’s specific need.

Every hour the monitors will record the VOC level. Once a week these VOC readings will be downloaded onto a mobile computer. From there, the data is stored and sent to a web application. This web application is available to anyone with an internet connection.

The web application includes access to VOC level files for a specified period of time. For comparison, the application includes a VOC (parts per million) vs. time (hour) graph for a specific monitor. Lastly, a map is available to locate monitors and see what VOC each monitoring system detects.

**Financial Plan**

A key factor for the VOC Monitoring System is that is must be affordable. The markets this product is targeted towards are City Councils and First Responders such as community fire departments. This plan does not consider the possibility of buying items in bulk. The cost analysis is therefore not a best case scenario representation.

The hardware for each VOC monitor will cost approximately $107.79 dollars.

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| Hardware | Price |
| Arduino Kit | 33.99 |
| Sensor\* | 7.25 |
| SD Shield | 10.00 |
| Solar Power Shield | 35.00 |
| Potentiometer | 0.60 |
| XBEE | 20.95 |

Table 1: Hardware cost breakdown for a single VOC monitor

\* Sensor cost varies depending upon VOC

The system will be ready for deployment in three months. The one time, man hour cost, for VOC System is $4,704. Web application will be maintained by the VOC Systems team for an estimated at 2 hours a week for a total monthly cost of $157. The installation and customer training will take four hours for a total cost of $78 dollars per system.

In order to reduce the cost of the overall system, the VOC Monitoring system will come in packages that have include a deposit and monthly fee.

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| --- | --- | --- |
| Package Type | Deposit | Monthly Fee |
| Small System | 100 | 75 |
| Large System | 200 | 100 |

Table 1: Monthly cost breakdown for system sizes

For the start-up system, there will be five large systems and five small systems deployed. The total onetime cost of the VOC monitors and installation will be $5,214. The yearly upkeep and sole expense of these systems will be $1,884. The one time profit from this example is $1,500. The yearly income from monthly payments is $10,500. The profit from the first year of deployment is $4,902. The profit from the following year will be $8,616.

VOC Systems is requesting $12,000 dollars man-hour costs, creating for five large systems and five small systems, and a year’s worth of maintenance fees.