



May 7, 2021

To:
Town of Erie
645 Holbrook Street
Erie, CO 80516

Attn: Malcolm Fleming

Cost Proposal for Air Quality Monitoring in the Town of Erie, Colorado

Dear Mr. Fleming,

Please find attached our proposal, including a number of monitoring choices, for air quality monitoring in the Town of Erie.

The proposal includes options for one anchor site and 1-3 satellite sites.

Some of the costs for each site are fixed, such as the trailer, meteorology, communication. Measurements at each site can be chosen from the list as desired.

The costs for each measurement are identical or very similar to the rates charged to Longmont and Broomfield.

We have quoted the monitoring of ozone and Particulate Matter following 'regulatory-like' protocols. This entails following the instrument configuration, calibration, and maintenance protocols as mandated by the EPA, and also followed by the Colorado Department of Public Health and Environment (CDPHE). An alternative option would be to conduct this monitoring according to the instrument manufacturer recommendations at an approximately 20% lower cost.

The monitoring of volatile organic compounds (VOCs) is quoted for operation of a gas chromatography-flame ionization instrument. This will provide sensitive and VOC-specific monitoring of a series of the primary oil and natural gas hydrocarbons. The most prominent VOCs observed in ambient air, with a minimum of twenty individual species, will be reported. The system will be similar to the ones currently in operation at the Longmont Union Reservoir, Broomfield Livingston, and the Boulder Reservoir. As an alternative option, a mass spectrometry instrument could be chosen, such as the one currently in operation at the Broomfield Soaring Eagle Park monitoring station. The mass spectrometer has a higher sensitivity and will allow identification and quantification of additional and unknown volatile gases that may be in the atmosphere, such as halogenated and oxygenated compounds. The acquisition and data processing of a mass spectrometry system adds approximately 65% to the VOCs monitoring costs. We would be happy to discuss this option as an alternative.

Quantification of VOCs will follow the protocol and be based on the calibration scale the World Meteorological Organization Global Atmospheric Watch program with calibration standards to be obtained from the U.K. National Physics Laboratory.

The satellite trailer cost estimate is an add-on to the anchor site. Ten and twenty percent discounts are applied in the case that Erie chooses more than one satellite monitoring station. This discount would be applied to the total of the satellite station expense.

This bid includes the automated processing and reporting of the data to a new, dedicated web portal for the Town of Erie. In addition, data from the Erie monitoring stations will be included in the already operational AirLive Combined Northern Colorado Front Range website (<https://www.bouldair.com/NoCoFrontRange.htm>).

All monitoring and services to be provided to the Town of Erie will mirror our current services within contracts to Broomfield, Longmont, and Boulder County. We would be happy to discuss any further needs and reporting that Erie may be interested in.

The listed quotes include the reporting and interpretation of the data by expert scientists to the Erie Town Board and Erie citizens.

We are also providing a bid for analyses of canister samples. The per-sample cost can only be guaranteed for a contract with a total of 250 samples.

Costs for a second year of monitoring in the case of a contract renewal are estimated at approximately 60% of the year one expense.

We agree to relocate each of the satellite trailers up to two times during each contract year at no extra cost. Any additional relocations would be charged at \$5,000.

The quoted cost are for the implementation of the monitoring stations, and one full year of operation and reporting from the date when measurements at the respective site, including the reporting of the data to a public web portal, are at least 80% completed.

Site access and electrical power will be provided by the Town of Erie at no cost to Boulder A.I.R.

We request payment of 50% of the quoted costs per monitoring site at onset of the contract.

We commit to installing and making operational, including the reporting of the data to the web portal, no later than six weeks from the date of the availability of electrical power at the sites and/or these time windows from the date of receipt of the first payment:

One monitoring station: Four months for a project start during May – June 2021. Three months for a project start after August 1, 2021.

Two monitoring stations: Same as above for the first station. Six months for the second station.

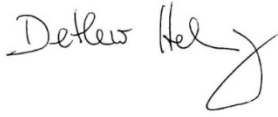
Three to four monitoring stations: Same as above for the first and second of the stations. Seven months for the third and fourth station.

Invoicing Schedule:

- 50% at start of contract
- 25% four months after onset of air monitoring data reporting
- 25% eight months after onset of air monitoring data reporting

We appreciate this opportunity to provide air quality monitoring for the Town of Erie.

Thank you,

A handwritten signature in black ink, appearing to read "Detlev Helmig". The signature is fluid and cursive, with a large, stylized loop at the end.

Detlev Helmig, PhD
Boulder A.I.R. LLC

Town of Erie Anchor Site Air Quality Monitoring Proposal by Boulder A.I.R.								
Year 1 (1.25 years)							Year 2	Year 3
							(~60% of first year plus inflation)	
Item	Variable	Rate	Measurement		Total	Total Cost	US\$	
		US\$	per hour	per day	# samples per year	US\$		
1	Ozone, TEI_49, regulatory-like	0.25	12	288	105192	26,298	16,410	17,066
2	Volatile Organic Compounds (including ethane, ethene, acetylene, propane, propene, i-butane, n-butane, i-pentane, n-pentane, isoprene, n-hexane, benzene, toluene, o-xylene, ethylbenzene, o-xylene, m-xylene, p-xylene); custom-gas chromatograph; WMO-grade by <u>gas chromatography - flame ionization detection</u>	24.00	0.75	18	6575	157,788	98,460	102,398
3	Methane, PICARRO G2301, WMO-grade	0.50	12	288	105192	52,596	32,820	34,133
4	PM_2.5, PM_10, GRIMM EDM180, regulatory-like	0.42	12	288	105192	44,181	27,569	28,671
5	Meteorological variables (wind speed, wind direction, temperature, relative humidity, radiation), research-grade; 10 m-meteorological tower	0.07	12	288	105192	7,363	4,595	4,779
6	Webcam for public website images	0.18	2	48	17532	3,156	1,969	2,048
7	Communication					4,000	2,496	2,596
8	Security system with multiple webcams					3,000	1,872	1,947
9	Insulated and temperature-controlled instrument trailer, 7 x 14, meteorological tower					20,000		
10	Website development, data reporting, data management					40,000	24,960	25,958
Total Anchor site:						358,382	211,150	219,596
Calendar Year Expenses								
Assumptions: Contract start June 1, 2021; Monitoring at anchor site to start September 1, 2021								
Cost per month year 1						29,865		
Cost June 1 - December 31, 2021 (7 months charged)						209,056		
Cost January 1 - August 31, 2022 (five months charged; three months at no cost)						149,326		
Approximate cost September 1 - December 31, 2022						74,543		
Approximate cost January 1 - December 31, 2022						223,869		
Approximate cost January 1 - December 31, 2023						219,596		

Town of Erie Satellite Site Air Quality Monitoring Proposal by Boulder A.I.R.									
		Year 1 (1.25 years)					Year 2	Year 3	
							(~60% of first year plus inflation)		
Item	Variable	Rate	Measurement Frequency		Total	Total Cost			
		US\$	per hour	per day	# samples per year	US\$	US\$		
1	Volatile Organic Compounds (including ethane, ethene, acetylene, propane, propene, i-butane, n-butane, i-pentane, n-pentane, isoprene, n-hexane, benzene, toluene, o-xylene, ethylbenzene, o-xylene, m-xylene, p-xylene); custom-gas chromatograph; WMO-grade by <u>gas chromatography - flame ionization detection</u>	24.00	0.75	18	6575	157,788	98,460	102,398	
2	Methane, PICARRO G2301, WMO-grade	0.50	12	288	105192	52,596	32,820	34,133	
3	PM_2.5, PM_10, GRIMM EDM180, regulatory-like	0.42	12	288	105192	44,181	27,569	28,671	
4	Meteorological variables (wind speed, wind direction, temperature, relative humidity), research-grade	0.07	12	288	105192	7,363	4,595	4,779	
5	Webcam for public website images	0.18	2	48	17532	3,156	1,969	2,048	
6	Communication					4,000	2,496	2,596	
7	Security system with multiple webcams					3,000	1,872	1,947	
8	Insulated and temperature-controlled instrument trailer, 6 x 12, meteorological tower					16,000			
9	Website development, data reporting, data management					20,000	12,480	12,979	
Total one satellite site:						308,084	182,260	189,551	
Calendar Year Expenses									
Assumptions: Contract start June 1, 2021; Monitoring at satellite site to start December 1, 2021									
Cost per month year 1						25,674			
Cost June 1 - December 31, 2021 (seven months charged)						179,716			
Cost January 1 - November 30, 2022 (five months charged; six months at no cost)						128,368			
Approximate cost December 31, 2022						15,188			
Approximate cost January 1 - December 31, 2022						143,557			
Approximate cost January 1 - December 31, 2023						189,551			
Total for two satellite sites (10% discount)									
Cost June 1 - December 31, 2021 (7 months charged)						323,488			
Approximate cost January 1 - December 31, 2022						258,402			
Approximate cost January 1 - December 31, 2023						341,191			
Total for three satellite sites (20% discount)									
Cost June 1 - December 31, 2021 (7 months charged)						431,317			
Approximate cost January 1 - December 31, 2022						344,536			
Approximate cost January 1 - December 31, 2023						454,922			

Town of Erie Monitoring Proposal by Boulder A.I.R.					
Summa Canisters (cans)					
Item	Description	Rate	Total		Total Cost
		US\$	# samples per year		US\$
1	Provide 6-L Restek Summa canisters, up to ten for parallel use. Pre-condition canisters for sampling deployment. Provide Restek passive sampling constant flow sample collection devices, up to five for parallel use. Provide training to Town staff and citizens on use of samplers. Deployment and collection of samples. Gas chromatography analysis for methane & VOCs by two-channel dual detection GC (flame ionization detection for methane and non-methane hydrocarbons, and mass spectrometry detection for more complex VOCs). Charges include tabulation of results, graphical analyses, and data interpretation.	400	250		100,000