



October 3, 2018

Courtney Barker  
City Manager  
City of Satellite Beach  
565 Cassia Boulevard  
Satellite Beach, FL 32937

**Scope of Work and Fees for the Groundwater Testing Program for the City of Satellite Beach**

Dear Courtney,

Thank you for providing Applied Ecology, Inc. (AEI) the opportunity to assist the City of Satellite Beach with the above referenced services. This scope of work focuses on the sampling and reporting of results for PFAS (perfluoro compounds) and several potential pollutants of concern in 9 irrigation/groundwater samples (plus one blank).

Please refer to Appendix A for a detailed description of level of effort and costs by subtask.

**Task 1 – Field Sampling**

Field sampling will include the appropriate coordination with the lab to obtain necessary sampling kits, chain of custody forms and the sampling for the following number and types of samples:

Type of Sample	# Samples	Proposed Locations
Irrigation Wells/Public shower	6	110 Sherwood Ave, 420 Harwood Ave, 499 Desoto parkway, 750 Jamaica Blvd, Grant Ave. Beach access; Satellite Beach High School
Groundwater Wells	3	Satellite Beach Citywide shallow wells
Blanks	1	Trip field blank
Total	1	

For all proposed sample types and locations, the EPA 537 modified method, which provided the PFAS Full List of DoD 24 Analytes will be analyzed at a NELAC and DOD certified lab.

Strict SOPs will be followed for the sampling of PFAS to reduce potential sources of contamination. However, cross-contamination from other sources of PFAS can be difficult to control when using private individual lawns and wells, with previously installed wells not controlled during construction for perfluoro compounds (i.e. use of O-rings), use of lawn chemical treatments, and others.

In addition, the three groundwater samples will be tested for a suite of EPA priority pollutants, herbicides, perchlorate, as well as a suite of radionuclides. The specific analytes and respective EPA methods included in this scope of work are as follows:

- PPL Volatile Organics - SW846 8260B
- PPL Semivolatiles - SW846 8270D
- PPL Pesticides - SW846 8081B
- PCBs - SW846 8082A
- Priority Pollutant Metals - SW846 6010/7000
- Herbicides, Full List – SW846 8151A
- Perchlorate by LC/MS/MS - SW846 685
- Cyanide, Total - EPA 335.4/SW 9012B
- Gross Alpha, radionuclides - EPA 900.0
- Gross Beta - EPA 900.0
- Radium 226 - EPA 903.1
- Radium 228 - EPA Ra-05
- Strontium-90 - EPA 905.0

This task includes limited coordination with the homeowners for the irrigation samples and the City. No recruitment of homeowners for irrigation sampling is included under this task. Irrigation wells might represent shallow, intermediate or Floridan aquifer system, which would likely respond differently to sources of contamination.

Level IV laboratory report results are included in the laboratory cost.

Task 1 total labor costs are \$1,595 and expenses (laboratory costs, field supplies, equipment, mileage) \$7,153. *Total Task 1 Cost: \$8,748*

## **Task 2 – Reporting and Meeting Support**

Task 2 includes the data entry and summary reporting of the field samples collected under Task 1. In addition, it includes on in-person meeting and budget to address minor comments received by the City in the form of a Final Memo report.

Total Task 2 Cost: \$3,300 (all labor)

**Project Deliverables:**

- Draft Summary memo report which includes approximate sampling locations (private locations might not be able to be disclosed), the laboratory results, field quality assurance, and calibration logs, and summary discussion of results for all 9 samples.
- Attendance at one in-person/conference call meeting with the City
- Final Summary memo report which addresses comments received by the City

The scheduled sampling event will take place by November 2<sup>nd</sup> and results should be available within 3 weeks after sampling is complete (if no laboratory equipment failures occur). The Summary Memo will be delivered within one week after laboratory results are made available to Applied Ecology.

The total cost for the task effort (Tasks 1 and 2) is \$12,048 which includes field supplies, laboratory costs, and labor. Laboratory costs per analyte or analyte group, including 10% surcharge for Level IV reporting are included in the table below.

Parameter	Method	Sample Cost	Sample #	Total Cost	Level IV Total Cost
PFAS Full List DoD 24 Analytes	E537 Mod	\$245.00	10	\$2,450.00	\$2,695.00
PPL Volatile Organics	SW846 8260B	\$75.00	3	\$225.00	\$247.50
PPL Semivolatiles	SW846 8270D	\$130.00	3	\$390.00	\$429.00
PPL Pesticides	SW846 8081B	\$80.00	3	\$240.00	\$264.00
PCBs	SW846 8082A	\$45.00	3	\$135.00	\$148.50
Priority Pollutant Metals	SW846 6010/7000	\$110.00	3	\$330.00	\$363.00
Herbicides, Full List	SW846 8151A	\$105.00	3	\$315.00	\$346.50
Perchlorate by LC/MS/MS	SW846 685	\$100.00	3	\$300.00	\$330.00
Cyanide, Total	EPA 335.4/SW 9012B	\$30.00	3	\$90.00	\$99.00
Gross Alpha, radionuclides	EPA 900.0	\$30.00	3	\$90.00	\$99.00
Gross Beta	EPA 900.0	\$30.00	3	\$90.00	\$99.00
Radium 226	EPA 903.1	\$78.00	3	\$234.00	\$257.40
Radium 228	EPA Ra-05	\$78.00	3	\$234.00	\$257.40
Strontium-90	EPA 905.0	\$270.00	3	\$810.00	\$891.00
<b>TOTAL LAB COSTS</b>				<b>\$5,933.00</b>	<b>\$6,526.30</b>

I look forward to working with you for these services. If you have any questions, please do not hesitate to contact me at 321.848.1272 or [clistopad@appliedecologyinc.com](mailto:clistopad@appliedecologyinc.com).

Sincerely,



Claudia M. Listopad, Ph.D., GISP  
Principal Scientist  
Applied Ecology, Inc.



Appendix A. Tasks and subtasks with associated effort and cost for the Groundwater Testing Program for the City of Satellite Beach.

Task	Subtask	Description	Principal Scientist	Senior Scientist	Env. Scientist I	Junior Tech	Total Hrs	Total Cost
			\$135.00	\$90.00	\$50.00	\$35.00		
Field Sampling	1	Lab coordination, homeowner coordination (no recruitment)	4	0	4	0	8	\$740
	2	Irrigation wells: 4 irrigation + 1 public shower beach access (plu	0	0	6	0	6	\$300
	3	Well Sampling (3 shallow wells in Satellite Beach)	0	0	5	8	13	\$530
<b>FIELD SAMPLING TASK TOTAL</b>			<b>4</b>	<b>0</b>	<b>15</b>	<b>8</b>	<b>27</b>	<b>\$1,570</b>
Report	1	Data entry, draft summary memo report with results	12	0	12	0	24	\$2,220
	2	Meeting (1) and final memo report addressing comments	8	0	0	0	8	\$1,080
<b>REPORTING TASK TOTAL</b>			<b>20</b>		<b>12</b>	<b>0</b>	<b>32</b>	<b>\$3,300</b>
<b>Project Subtotal (Labor Only)</b>								<b>\$4,870</b>
<b>Expenses (Lab Costs, Field Equipment and Disposables, Travel Mileage)</b>								<b>\$9,550</b>
<b>Project Total with Expenses</b>								<b>\$14,420</b>

## Priority Pollutant List

**Priority Pollutants** are a set of chemical pollutants we regulate, and for which we have developed analytical test methods. The current list of 126 Priority Pollutants, shown below, can also be found at [40 CFR Part 423, Appendix A](#).

These are not the only pollutants regulated in Clean Water Act programs. The list is an important starting point for EPA to consider, for example, in developing national discharge standards (such as Effluent Guidelines) or in national permitting programs (such as NPDES).

1. Acenaphthene
2. Acrolein
3. Acrylonitrile
4. Benzene
5. Benzidine
6. Carbon tetrachloride
7. Chlorobenzene
8. 1,2,4-trichlorobenzene
9. Hexachlorobenzene
10. 1,2-dichloroethane
11. 1,1,1-trichloroethane
12. Hexachloroethane
13. 1,1-dichloroethane
14. 1,1,2-trichloroethane
15. 1,1,2,2-tetrachloroethane
16. Chloroethane
17. (Removed)
18. Bis(2-chloroethyl) ether
19. 2-chloroethyl vinyl ethers
20. 2-chloronaphthalene
21. 2,4,6-trichlorophenol
22. Parachlorometa cresol
23. Chloroform
24. 2-chlorophenol
25. 1,2-dichlorobenzene
26. 1,3-dichlorobenzene
27. 1,4-dichlorobenzene
28. 3,3-dichlorobenzidine
29. 1,1-dichloroethylene
30. 1,2-trans-dichloroethylene
31. 2,4-dichlorophenol
32. 1,2-dichloropropane
33. 1,3-dichloropropylene
34. 2,4-dimethylphenol
35. 2,4-dinitrotoluene
36. 2,6-dinitrotoluene
37. 1,2-diphenylhydrazine
38. Ethylbenzene
39. Fluoranthene
40. 4-chlorophenyl phenyl ether
41. 4-bromophenyl phenyl ether
42. Bis(2-chloroisopropyl) ether
43. Bis(2-chloroethoxy) methane
44. Methylene chloride
45. Methyl chloride
46. Methyl bromide
47. Bromoform
48. Dichlorobromomethane
49. (Removed)
50. (Removed)
51. Chlorodibromomethane
52. Hexachlorobutadiene
53. Hexachlorocyclopentadiene
54. Isophorone
55. Naphthalene
56. Nitrobenzene
57. 2-nitrophenol
58. 4-nitrophenol
59. 2,4-dinitrophenol
60. 4,6-dinitro-o-cresol
61. N-nitrosodimethylamine
62. N-nitrosodiphenylamine
63. N-nitrosodi-n-propylamine
64. Pentachlorophenol
65. Phenol
66. Bis(2-ethylhexyl) phthalate
67. Butyl benzyl phthalate
68. Di-N-Butyl Phthalate

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|------------------------------|-------------------------------|
| 69. Di-n-octyl phthalate     | 100. Heptachlor               |
| 70. Diethyl Phthalate        | 101. Heptachlor epoxide       |
| 71. Dimethyl phthalate       | 102. Alpha-BHC                |
| 72. Benzo(a) anthracene      | 103. Beta-BHC                 |
| 73. Benzo(a) pyrene          | 104. Gamma-BHC                |
| 74. Benzo(b) fluoranthene    | 105. Delta-BHC                |
| 75. Benzo(k) fluoranthene    | 106. PCB-1242 (Arochlor 1242) |
| 76. Chrysene                 | 107. PCB-1254 (Arochlor 1254) |
| 77. Acenaphthylene           | 108. PCB-1221 (Arochlor 1221) |
| 78. Anthracene               | 109. PCB-1232 (Arochlor 1232) |
| 79. Benzo(ghi) perylene      | 110. PCB-1248 (Arochlor 1248) |
| 80. Fluorene                 | 111. PCB-1260 (Arochlor 1260) |
| 81. Phenanthrene             | 112. PCB-1016 (Arochlor 1016) |
| 82. Dibenzo(h) anthracene    | 113. Toxaphene                |
| 83. Indeno (1,2,3-cd) pyrene | 114. Antimony                 |
| 84. Pyrene                   | 115. Arsenic                  |
| 85. Tetrachloroethylene      | 116. Asbestos                 |
| 86. Toluene                  | 117. Beryllium                |
| 87. Trichloroethylene        | 118. Cadmium                  |
| 88. Vinyl chloride           | 119. Chromium                 |
| 89. Aldrin                   | 120. Copper                   |
| 90. Dieldrin                 | 121. Cyanide, Total           |
| 91. Chlordane                | 122. Lead                     |
| 92. 4,4-DDT                  | 123. Mercury                  |
| 93. 4,4-DDE                  | 124. Nickel                   |
| 94. 4,4-DDD                  | 125. Selenium                 |
| 95. Alpha-endosulfan         | 126. Silver                   |
| 96. Beta-endosulfan          | 127. Thallium                 |
| 97. Endosulfan sulfate       | 128. Zinc                     |
| 98. Endrin                   | 129. 2,3,7,8-TCDD             |
| 99. Endrin aldehyde          |                               |

**Additional Information**

- [Toxic and Priority Pollutants Under the Clean Water Act](#)