# APPENDIX B

## PAMS Monitoring Network Plan
## Monitoring Organizations Required to Operate at NCore Sites

South Coast AQMD operates two Photochemical Assessment Monitoring Stations (PAMS) sites in the current air monitoring network. PAMS sites are located at the Los Angeles (Main St.) and the Rubidoux sites.

### Network Locations

The NCore and NATTS sites are located at Los Angeles (Main St.) and Rubidoux and are collocated with the PAMS monitoring sites. These locations will measure the parameters outlined in Table 1. An inventory of equipment used at each site is provided in Attachment 1.

### Auto GC

Volatile Organic Compounds (VOCs) – A complete list of the targeted compounds are found in Table 1. South Coast AQMD will measure hourly speciated VOC measurements with an auto-gas chromatograph (GC) using an Agilent/Markes model 7890A/Unity Air Server 2.

### Meteorology Measurements

South Coast AQMD will measure wind direction, wind speed, temperature, humidity, atmospheric pressure, solar radiation, ultraviolet radiation and mixing height. South Coast AQMD has elected to use the following instrumentation to measure the parameters described above: RM Young 5305VP anemometer, Rotronic HC2-S3 ambient temperature/humidity, Vaisala PTB 110 barometer, Kipp and Zonen CMP6 Pyranometer, Eppley TUVR Total Ultraviolet Radiometer and Vaisala CL51 Ceilometers.

South Coast AQMD requests waivers to allow precipitation and mixing height measurements to be obtained/measured from nearby sites. Rationale for this request is provided in the waiver Attachment 2.

### Other Measurements

Carbonyls – South Coast AQMD will monitor Carbonyls at a frequency of three 8-hour samples on a one in-three day basis during the months of June, July, August and September (~120 samples per PAMS sampling season) using ATEC model 8000 Automated Sampler. A complete list of the target carbonyl compounds may be found in Table 1. The TO-11A test method, as used in the National Air Toxics Trends (NATTS) program will be used.

Nitrogen Oxides – South Coast AQMD will monitor for NO and NOy (total oxides of nitrogen) in addition to true NO2. The true NO2 is measured with a direct reading NO2 analyzer, cavity attenuated phase shift (CAPS) spectroscopy. South Coast AQMD has elected to use Teledyne CAPS T500U for the true NO2 measurement. NO and NOy will be measured using a Teledyne T200 U Ultra- Sensitive Trace-Chemiluminescence.

## Table 1 PAMS Target Compound List[a]

| Priority Compounds | | | | Optional Compounds | | | |
|---|---|---|---|---|---|---|---|
| 1 | 1,2,3-trimethylbenzene[a] | 19 | n-hexane [b] | 1 | 1,3,5-trimethylbenzene | 19 | m-diethlybenzene |
| 2 | 1,2,4-trimethylbenzene[a] | 20 | n-pentane | 2 | 1-pentene | 20 | methylcyclohexane |
| 3 | 1-butene | 21 | o-ethyltoluene [a] | 3 | 2,2-dimethylbutane | 21 | methylcyclopentane |
| 4 | 2,2,4-trimethylpentane[b] | 22 | o-xylene [a,b] | 4 | 2,3,4-trimethylpentane | 22 | n-decane |
| 5 | Acetaldehyde[b,c] | 23 | p-ethyltoluene [a] | 5 | 2,3-dimethylbutane | 23 | n-heptane |
| 6 | acetone [c,d] | 24 | Propane | 6 | 2,3-dimethylpentane | 24 | n-nonane |
| 7 | benzene [a,b] | 25 | propylene | 7 | 2,4-dimethylpentane | 25 | n-octane |
| 8 | c-2-butene | 26 | styrene [a,b] | 8 | 2-methylheptane | 26 | n-propylbenzene [a] |
| 9 | ethane [d] | 27 | toluene [a,b] | 9 | 2-methylhexane | 27 | n-undecane |
| 10 | ethylbenzene [a,b] | 28 | t-2-butene | 10 | 2-methylpentane | 28 | p-diethylbenzene |
| 11 | Ethylene | | | 11 | 3-methylheptane | 29 | t-2-pentene |
| 12 | formaldehyde [b,c] | | | 12 | 3-methylhexane | 30 | α/β-pinene |
| 13 | Isobutane | | | 13 | 3-methylpentane | 31 | 1,3 butadiene [b] |
| 14 | Isopentane | | | 14 | Acetylene | 32 | benzaldehyde [c] |
| 15 | Isoprene | | | 15 | c-2-pentene | 33 | carbon tetrachloride [b] |
| 16 | m&p-xylenes [a,b] | | | 16 | cyclohexane | 34 | Ethanol |
| 17 | m-ethyltoluene [a] | | | 17 | cyclopentane | 35 | Tetrachloroethylene [b] |
| 18 | n-butane | | | 18 | isopropylbenzene [b] | | |

Source: Revisions to the Photochemical Assessment Monitoring Stations Compound Target List.U.S. EPA, November 20, 2013

[a] Important SOAP (Secondary Organic Aerosols Precursor) Compounds

[b] HAP (Hazardous Air Pollutant) Compounds

[c] Carbonyl compounds

[d] Non-reactive compounds, not considered to be VOC for regulatory purposes

# Attachment 1
# Equipment Inventory

| | |
|---|---|
| **Region** | 9 |
| **State** | California |
| **AQS ID** | 06-037-1103, Los Angeles (Main St.) |
| **CBSA** | 31080 – Los Angeles-Long Beach-Anaheim |

| Parameter | Category | Detail |
|---|---|---|
| Site | Is the AQS site ID listed above the expected PAMS Core site location? | Yes |
| | What is the status of the decision for the expected PAMS Core site location (not started, draft, or final)? | Final |
| | Is there an alternate PAMS Core site location selected? | No |
| | Identify type of alternative site (existing PAMS, NATTS, etc.) | None |
| | Alternate site AQS ID (if known) | None |
| Mixing Height | Is there an existing functional ceilometer or other similar instrument available for use? | Yes |
| | Current location (at future PAMS Core site, at other site, not applicable) | Waiver previously approved for alternate location at North Hollywood AMS. |
| | Instrument type (ceilometer, radar profiler, etc.) | Ceilometer, radar wind profiler |
| | Manufacturer | Vaisala |
| | Model | CL51 |
| | Date purchased | 4/2016 |
| | Comments | North Hollywood site ceilometer includes mixing height algorithm. |
| Auto GC | Is there an existing Auto GC available for use? | Yes |
| | Current location (at future PAMS Core site, at other site, not applicable) | At PAMS Core site – Los Angeles (Main St.) |
| | Manufacturer | Agilent/Markes |
| | Model | 7890A/Unity Air Server 2 |
| | Date purchased | 07/2015 |
| | Does it have a service contract? | GC under warranty – establishing service contract. |
| | Comments | |
| True NO2 | Is there an existing true NO2 instrument available for use? | Yes |
| | Current location (at future PAMS Core site, at other site, not applicable) | At PAMS Core site – Los Angeles (Main St.) |
| | Instrument type (photolytic conversion, cavity ring down, CAPS, etc.) | CAPS |
| | Manufacturer | Teledyne |
| | Model | T500U |
| | Date purchased | 06/2019 |
| | Comments | |
| Carbonyls Sampling | Is there an existing sequential carbonyls sampling unit or similar instrument available for use? | Yes |
| | Current location (at future PAMS Core site, at other site, not applicable) | At Core PAMS site |
| | Manufacturer | ATEC |
| | Model | 8000 |
| | Date purchased | 2017 |
| | Comments | |
| Carbonyls Analysis | Does the site currently have a support laboratory for carbonyls or plans to use a support laboratory? | Samples to be analyzed at South Coast AQMD |
| | laboratory name | N/A |
| | comments | |

| | | |
|---|---|---|
| Barometric Pressure | Instrument type (aneroid barometer, etc.) | Barometer, Electronic |
| | Manufacturer | Vaisala |
| | Model | PTB110 |
| | Date purchased | 9/27/13 |
| | Comments | Equivalent sensor also at LAX Upper Air Station |
| UV Radiation | Instrument type (UV radiometer, etc.) | Total Ultraviolet Radiation |
| | Manufacturer | Eppley |
| | Model | TUVR |
| | Date purchased | 3/6/08 |
| | Comments | Equivalent sensor also at LAX Upper Air Station |
| Solar Radiation | Instrument type (Pyranometer, etc.) | Pyranometer |
| | Manufacturer | Kipp and Zonen |
| | Model | CMP6 |
| | Date purchased | 3/6/08 |
| | Comments | |
| Precipitation | Instrument type (tipping bucket, weighing, etc.) | Electronic Gauge - Weighing |
| | Manufacturer | |
| | Model | |
| | Date purchased | |
| | Comments | NWS/FAA precipitation nearby at Downtown LA (USC) |

| | |
|---|---|
| **Region** | 9 |
| **State** | California |
| **AQS ID** | 06-065-8001, Rubidoux |
| **CBSA** | 40140 - Riverside-San Bernardino-Ontario |

| Parameter | Category | Detail |
|---|---|---|
| Site | Is the AQS site ID listed above the expected PAMS Core site location? | Yes |
| | What is the status of the decision for the expected PAMS Core site location (not started, draft, or final)? | Final |
| | Is there an alternate PAMS Core site location selected? | No |
| | Identify type of alternative site (existing PAMS, NATTS, etc.) | None |
| | Alternate site AQS ID (if known) | None |
| Mixing Height | Is there an existing functional ceilometer or other similar instrument available for use? | Yes. |
| | Current location (at future PAMS Core site, at other site, not applicable) | At PAMS Core site - Rubidoux AMS. |
| | Instrument type (ceilometer, radar profiler, etc.) | Ceilometer, Radar Wind Profiler. |
| | Manufacturer | Vaisala |
| | Model | CL51 |
| | Date purchased | 1/2018 |
| | Comments | Ceilometer includes mixing height algorithm. |
| Auto GC | Is there an existing Auto GC available for use? | Yes |
| | Current location (at future PAMS Core site, at other site, not applicable) | At PAMS Core site - Rubidoux AMS. |
| | Manufacturer | Agilent/Markes |
| | Model | 7890A/Unity Air Server 2 |
| | Date purchased | 04/2016 |
| | Does it have a service contract? | GC under warranty – establishing service contract. |
| | Comments | |
| True NO2 | Is there an existing true NO2 instrument available for use? | Yes |
| | Current location (at future PAMS Core site, at other site, not applicable) | At PAMS Core site - Rubidoux AMS. |
| | Instrument type (photolytic conversion, cavity ring down, CAPS, etc.) | CAPS |
| | Manufacturer | Teledyne |
| | Model | T500U |
| | Date purchased | 06/2019 |
| | Comments | |
| Carbonyls Sampling | Is there an existing sequential carbonyls sampling unit or similar instrument available for use? | Yes |
| | Current location (at future PAMS Core site, at other site, not applicable) | At Core PAMS site |
| | Manufacturer | ATEC |
| | Model | 8000 |
| | Date purchased | 2017 |
| | Comments | |
| Carbonyls Analysis | Does the site currently have a support laboratory for carbonyls or plans to use a support laboratory? | Samples to be analyzed at South Coast AQMD |
| | Laboratory name | N/A |
| | Comments | |

| | | |
|---|---|---|
| Barometric Pressure | Instrument type (aneroid barometer, etc.) | Barometer, Electronic |
| | Manufacturer | Vaisala |
| | Model | PTB110 |
| | Date purchased | 9/27/13 |
| | Comments | |
| UV Radiation | Instrument type (UV radiometer, etc.) | Total Ultraviolet Radiation |
| | Manufacturer | Eppley |
| | Model | TUVR |
| | Date purchased | 3/6/08 |
| | Comments | |
| Solar Radiation | Instrument type (Pyranometer, etc.) | Pyranometer |
| | Manufacturer | Kipp and Zonen |
| | Model | CMP6 |
| | Date purchased | 3/6/08 |
| | Comments | |
| Precipitation | Instrument type (tipping bucket, weighing, etc.) | Electronic Gauge - Weighing |
| | Manufacturer | |
| | Model | |
| | Date purchased | |
| | Comments | NWS/FAA precipitation nearby at Ontario airport site |

# Attachment 2
# Waiver Requests and Rationale

**Meteorological Waiver Request**

South Coast AQMD requests an extension of two previously submitted waiver requests:

1. Upper Air Measurements (Mixing Height) – Los Angeles (Main St.):
   An extension of the waiver approved in the 2024 Annual Network Plan to continue obtaining mixing height measurements for the Los Angeles (Main St.) site from the North Hollywood air monitoring station.

2. Precipitation Measurements – Los Angeles (Main St.) and Rubidoux:
   An extension of the waiver initially submitted in the 2019 Enhanced PAMS Plan to obtain precipitation data for the Los Angeles (Main St.) site from Downtown Los Angeles (USC) and for the Rubidoux site from Ontario International Airport.

**Rationale for Waiver**

**Mixing Height – Los Angeles (Main St.)**
The Los Angeles (Main St.) site is not suitable for direct upper air meteorological measurements due to physical obstructions and urban infrastructure limitations. The North Hollywood air monitoring station provides appropriate siting conditions, including unobstructed sky views, and is located within a reasonable distance to serve as a representative surrogate. The use of ceilometer-based mixing height data from North Hollywood was approved in the 2024 Annual Network Plan, and South Coast AQMD requests that this waiver be extended.

**Precipitation – Los Angeles (Main St.) and Rubidoux**
Neither the Los Angeles (Main St.) nor the Rubidoux monitoring sites have the space or conditions necessary to support accurate on-site precipitation measurements. To address this, South Coast AQMD requests to continue using nearby, high-quality precipitation data from trusted networks maintained by the National Weather Service (NWS) and Federal Aviation Administration (FAA). Specifically:

- USC (Downtown Los Angeles) will be used for precipitation data representative of the Los Angeles (Main St.) site, and

- Ontario International Airport will be used for precipitation data representative of the Rubidoux site.

This approach, consistent with the 2019 Enhanced PAMS Plan, ensures reliable and representative precipitation data are available while avoiding the logistical and siting limitations at the monitoring locations.

These waivers continue to support the integrity of the air monitoring network while utilizing existing infrastructure in a cost-effective and scientifically valid manner.