GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

HEARING BOARD MEETING INFORMATION

Meeting Date & Time
Wednesday, November 2, 2022, 9:00 a.m.

Meeting Location
Great Basin Unified APCD Conference Room
157 Short Street
Bishop, CA 93514

District Board
Peter Pumphrey, Mono County, Chairman

Phillip L. Kiddoo, Air Pollution Control Officer
157 Short Street, Bishop, California 93514
(760) 872-8211 E-mail: pkiddoo@gbuapcd.org

Phillip L. Kiddoo
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street, Bishop, California 93514-3537
760-872-8211 Fax: 760-872-6109

AGENDA

MEETING OF THE HEARING BOARD

WEDNESDAY, NOVEMBER 2, 2022, 9:00 AM
GBUAPCD Conference Room
157 Short Street
Bishop, California 93514

Assistance for those with disabilities: If you have a disability and need accommodation to participate in the meeting, please call Tori DeHaven, Board Clerk, at (760) 872-8211 for assistance so the necessary arrangements can be made.

1. Call meeting to order and Pledge of Allegiance
2. Public Comment on Matters not on the Agenda (No-action)

Hearing Procedures for the interim hearing below. The Chairman will open the hearing and then:
Swearing in of witnesses by Hearing Board Clerk.
Statement and presentation by District staff.
Statement and presentation by Petitioner.
Questions from the Hearing Board.
Call for general testimony.
Rebuttal to previous testimony by Petitioner.
The Hearing Board will deliberate and arrive at a decision.

3. VARIANCE HEARING (Action): Consideration of the granting of an interim variance (docket number GB22-01) to the City of Los Angeles Department of Water and Power (LADWP) in anticipation of violation of the following Board Order and regulations: District's Board Order #160413-01, District Rule 433, and Notice to Comply No. 2002. The areas requested for a variance are located on the Owens Lake Dust Mitigation Project in Inyo County, California. The facility address is 111 Sulfate Road, Keeler, California 93530
4. Adjournment

GB22-01 - Interim Variance LADWP Petition

October 14, 2022

Phillip L. Kiddoo
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT
157 Short Street, Bishop, California 93514-3537
Tel: 760-872-8211 Fax: 760-872-6109

Petition for Hearing Before: THE GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT HEARING BOARD

PETITIONER: Los Angeles Department of Water and Power DATE October 14, 2022

CONTACT: Paul Liu, Manager of Owens Lake Dust Mitigation Program TELEPHONE: 213-367-1138

INDIVIDUAL______ CO-PARTNERSHIP:______ CORPORATION:______ OTHER: X

If other, please explain. Government agency

ADDRESS: 111 North Hope Street, Room 1468 CITY: Los Angeles

LOCATION AND TYPE OF BUSINESS ACTIVITY INVOLVED:

Owens Lake Dust Mitigation Program: 111 Sulfate Road, Keeler, CA 93530

TYPE OF VARIANCE REQUESTED (PLEASE SELECT):

☒ REGULAR ☒ INTERIM ☐ EMERGENCY

GIVE A BRIEF STATEMENT DESCRIBING THE REASONS FOR WHICH THE PETITION IS FILED, TO INCLUDE THE FOLLOWING:

1. **Identify the particular Section of the California Health & Safety Code, or the Great Basin Unified Air Pollution Control District's Book of Rules & Regulations Involved**:

   The Los Angeles Department of Water and Power (LADWP) requests an interim and regular variance from enforcement of Great Basin Unified Air Pollution Control District (GBUAPCD) Board Order 160413-01, GBUAPCD Rule 433, and Notice to Comply No. 2002 for T13-1. This Board Order and Rule require LADWP to implement a Best Available Control Measure (BACM) and achieve dust control performance criteria in designated Dust Control Areas (DCAs) during the dust season. Portions of four DCAs will be in violation of the performance criteria and performance requirements for BACM Shallow Flooding and Dynamic Water Management at the start of the dust season.

Portions of DCAs T13-1, T13-1 Addition, T17-1, T17-2 North and T17-2 South are included in this variance (Variance Areas). Dust control areas T13-1 and T13-1 Addition are operated as one unit and hereafter referred to as T13-1. The Variance Areas comprise approximately 2.25% of the total dust control area (698.5 acres or 1.09 square miles) (Exhibit 1). The start of the dust season for T13-1 and T17-2 North is October 16, 2022. The start of the dust season for T17-1 and T17-2 South is January 16, 2023. However, T17-1 and T17-2 South have Dynamic Water Management requirements that go into effect on October 16, 2022, that will not likely be met. In regards to Notice to Comply No. 2002, LADWP was in the process of implementing the specified corrective actions when the flash flood event occurred.

2. Facts or explanation to justify action being requested by the Petitioner:

Between August 5, 2022, and September 13, 2022, three extraordinary, high intensity, rainfall events occurred in the upper Centennial Wash watershed. Known as Tropical Storm Kay, these events caused the Governor of California to declare an emergency along with the counties of Inyo, Los Angeles, Imperial, Riverside, and San Bernardino (see press release here and Exhibit 2). This natural disaster shut down California Highway 190 and required multiple public agencies to provide mutual aid in an effort to protect the public (see article here and Exhibit 2). These natural disasters resulted in extreme flash flooding that impacted the eastern portion of Centennial Wash Alluvial fan as well as the Owens Lakebed, including the Variance Areas. The events include the following:

A. **Event 1 on August 5, 2022:** This rain event resulted in the closure of Highway 190 between Dirty Socks and the Junction of 136. This event included significant flooding, natural sediment deposition, and erosion occurring in T13-1, T17-1, and T17-2.

B. **Event 2 on September 9-10, 2022:** This rain event was associated with the remnants of Hurricane Kay. This event brought widespread rain to the Owens Valley and the lakebed, causing the closure of Highway 136 and 190, due to flash flooding and natural sediment deposition on the highway from the alluvial fans.

C. **Event 3 on September 13, 2022:** This final event was the most powerful and was classified as a 100-year event (1% chance of occurring in any given year). This event brought convective thunderstorm activity and high intensity rainfall, impacting the southern portion of Owens Lake (near Olancha) as well as the Upper Centennial Flat Watershed that flows into the southeastern portion of Owens Lake. Specifically, this event brought more than 1.5 inches of rain in a two-hour timespan in the upper Centennial Flat Watershed, resulting in unprecedented flash flooding, erosion, and natural sediment deposition. Significant natural sediment and debris transported from the Upper Centennial Flat Watershed was deposited within and damaged the Variance Areas. Traffic advisories are still in effect for Highway 190 from Dirty Socks to Darwin. Additional information on the magnitude of this storm event, as well as the associated damage to the DCAs, is provided in Exhibit 2.

Additional information regarding LADWP's tremendous efforts to investigate, catalogue, and create a repair plan to address the damage is documented in Exhibit 3.

3. The final date when petitioner will be in full compliance with the California Health & Safety Code Section or Rule cited in item 1 above:

LADWP anticipates completing initial repairs as follows:

- For Variance Areas in T13-1, LADWP anticipates completing initial repairs to the irrigation infrastructure by February 28, 2023. Please note, due to permitting requirements, long-term repairs including partition berms/and or grading will not be complete until October 15, 2023.
- For Variance Areas in T17-1, LADWP anticipates completing initial repairs by January 16, 2023. Please note, due to permitting requirements, long-term repairs including partition berms and/or grading will not be complete until October 15, 2023.
- For Variance Areas in T17-2 (North and South), LADWP anticipates completing initial repairs by December 31, 2022. Please note, due to permitting requirements, long-term repairs including partition berms/grading will not be complete until October 15, 2023.

These estimated dates reflect the best available assumptions for completion of initial repairs. Challenges potentially affecting the repair schedules include future precipitation events, access and trafficability due to soil conditions, permitting complications, and procurement of materials due to disruptions to the global supply chain due to the COVID-19 pandemic, as well as the Russia-Ukraine war.

Upon completion of the initial repairs, the infrastructure will be operated to maximize wetness to the extent possible. Long-term repairs will be complete and compliance is anticipated to be met for all Variance Areas prior to the start of the 2023/2024 dust season (October 16, 2023). A summary of the repair plans and compliance schedules are provided in Exhibit 3.

4. Discuss the hardship the petitioner will encounter should variance relief not be granted. Would this action result in the practical closing and elimination of a lawful business, or result in the arbitrary or unreasonable taking of property?

While the Owens Lake Dust Mitigation Program is not a profit-making business, LADWP is nevertheless in the business of dust control. Without this variance, LADWP cannot conduct this important business and will be non-compliant until Summer 2023 as the result of a 100-year storm that was a natural disaster outside the control of LADWP. LADWP is expending huge amounts of labor and effort towards these unanticipated repairs, and the variance will allow for efficient running of this business.

With or without the variance, the scope of work and schedule needed to address impacts from this natural disaster does not change. However, if the variance is not granted, then LADWP could be subject to penalties for noncompliance. Given the extraordinary flooding conditions that were beyond the reasonable control of LADWP, such penalties would be unfair and an unreasonable burden on City of Los Angeles rate payers. Furthermore, LADWP is seeking to be in compliance with the law as quickly as possible. LADWP is committed to expeditious repair of the facilities, many of which have already begun and which would not be further accelerated through penalties (see additional details in Exhibit 3 describing the expeditious actions completed to date by LADWP).

5. Is this petition also to be considered as an Interim Variance Petition, allowing above operations to continue, pending a Hearing Board decision or 90 days, whichever comes first?

Yes X No

6. If the compliance schedule extends beyond an applicable Federal attainment date for an ambient air quality standard, the petitioner must submit adequate documentation with substantiating calculations, which demonstrate the variance will not interfere with the attainment and maintenance of an ambient air quality standard.

The variance will not interfere with the attainment and maintenance of any ambient air quality standard. However, the 100-year storm event resulted in a natural disaster and deposition of significant non-anthropogenic, flood-related sediment and debris that may impact the air quality monitors in the future. Additional information is provided in Exhibit 4.

7. Discuss the advantages and disadvantages to the residents of the district resulting from requiring compliance or resulting from granting a variance:

The entire area experienced a once in a 100-year flood event, creating a natural disaster. LADWP is trying to mitigate the impacts to this community as quickly as possible. By performing these repairs cooperatively with the GBUAPCD through this variance, LADWP will be able to provide transparency to all residents of the District about its repair process in the four Variance Areas. LADWP believes that by working cooperatively with GBUAPCD through the variance process, LADWP will be able to provide residents with up-to-date information together with GBUAPCD.

LADWP is permanently committed to meeting BACM compliance in the four Variance Areas. Because air quality is at issue in this variance, it is possible that the residents of the District will become misinformed regarding LADWP's obligations to the GBUAPCD if the variance is denied. LADWP believes that granting of a timely request for a variance from the catastrophic damage resulting from an extraordinary flood event is a reasonable exercise of discretion within GBUAPCD's jurisdiction. Granting this variance will demonstrate to the residents of the District that LADWP and GBUAPD are working in conjunction to adhere to all applicable rules and regulations during the time period of the repairs.

8. During the period the variance is in effect to what extent is the Petitioner able to reduce excess emissions:

LADWP is committed to meeting BACM compliance criteria in the four Variance Areas as quickly as possible. During the period the variance is in effect, LADWP will control excess emissions to the maximum extent feasible. This includes minimizing the size of the areas requested in the variance, maintaining operations (where feasible), restoring operations as quickly as possible, and maintaining existing vegetation cover. LADWP also evaluated the installation of temporary dust control measures to reduce excess emissions. However, temporary measures (e.g. sand fence and tillage) require significant time for permitting, lease agreements, and evaluation for impacts to habitat and cultural resources. Therefore, given the repair and compliance timeline, these measures were not considered feasible for this variance petition. Additional information is provided in Exhibit 5.

The following exhibits and figures are enclosed:

Exhibit 1. Portions of Four Dust Control Areas Requested in this Variance

Figure 1. Portions of Four Dust Control Areas Requested in this Variance
This exhibit provides a summary map of the Dust Control Areas (DCAs) and their compliance period for which this variance is requested.

Exhibit 2. Summary of Storm Event and Damage to Dust Control Areas

Figure 2. Centennial Flat Watershed Location
The 103 square mile Centennial Flat Watershed drains into the southeastern side of Owens Lake, including into T17-1, T17-2 (North and South), and T13-1.

Figure 3. NOAA Radar Precipitation Estimates
Hourly Multi-Radar / Multi-Sensor precipitation estimates downloaded from NOAA, showing peak rainfall intensity of 1.9 inch/hour with an average of 1.52 inches falling over 44.6 square miles of the 103 square mile watershed.

Figure 4. NOAA Atlas 14, 2 Hour Precipitation Frequency Table / Graphs
The NOAA Atlas 14, 2-hour estimated recurrence interval for this storm was estimated to be greater than a 50-year, but less than a 100-year event.

Figure 5. Centennial Wash Culvert at Highway 190 Crossing
Pictures and video of the Centennial Wash Culvert at the Highway 190 Crossing. Severe overtopping is apparent, with significant damage and scouring to the road, embankment and areas around the highway / wash crossing.

Figure 6. NCAR, WRF-Hydro Storm Hydrograph Results
The NCAR, WRF-Hydro model storm hydrograph and timeseries stream segment /flow analysis estimated a flow of over 6,800 CFS.

Figure 7. Historical Alluvial Fan Morphology and Extent
Estimated alluvial fan extent delineated photo-interpretation using 1944, 1968, 1977, 1996, 2012, 2022 (before and after the event) demonstrate the dramatic expansion of the alluvial fan from the September 13th 2022 Flash Flood. This suggests that an event of this magnitude has not occurred in the 78-year period of available imagery.

Figure 8. Estimated Sediment Deposition and Erosion
High density LiDAR collected August 17th (pre-event) and September 27th (post-event) was used to determine the depth and volume of sediment deposited within and near the DCAs. Over 156,000 cubic yards was deposited with T13-1 and T17-2.

Figure 9. Summary of T13-1 Damage Due to Flash Flood

Damage to T13-1 included impacts to Laterals 2, 4, 6, and 9. Whiplines were displaced and tangled, new erosional channels created, and significant sediment deposition into the upper portion of T13-1 Addition area.

Figure 10. Summary of T17-2 (North and South) Damage Due to Flash Flood

Impacts of the flash flood occurred in laterals 1,2,3, and 4. Approximately 63 risers were buried, many whiplines displaced, and new channels are evident. Impacts due to the flash flood rendered the irrigation system inoperable and completely changed the soil and grade / slope within the DCA, potentially impacting the ability to spread water to meet compliance.

Exhibit 3. Repair Plans and Compliance Schedules

Figure 11. Timeline of Activities to Facilitate Repair due to Flash Flood

LADWP's response and planning for assessment and repair of the Shallow Flood facilitates has been swift, significant, and comprehensive. The timeline lays out the activities LADWP has completed to-date.

Figure 12. Anticipated Compliance and Repair Schedule

Exhibit 4. Supporting Information Regarding No Interference with Ambient Air Quality Standard

Figure 13. Plan to Reduce Emissions During the Variance Period

LADWP plans to reduce excess emissions during the duration of the variance by maintaining / operation of the existing pond, maintaining existing vegetation, sequentially operating shallow flood laterals as they are repairs, and minimizing disturbance during repair work.

Exhibit 5. Emissions Monitoring and Minimization

The undersigned, under penalty of perjury, states the above Petition and the items therein set forth are true and correct.

Executed on October 14, 2022, at Los Angeles, California

Paul Liu	Paul Liu
Signature	**Print Name**

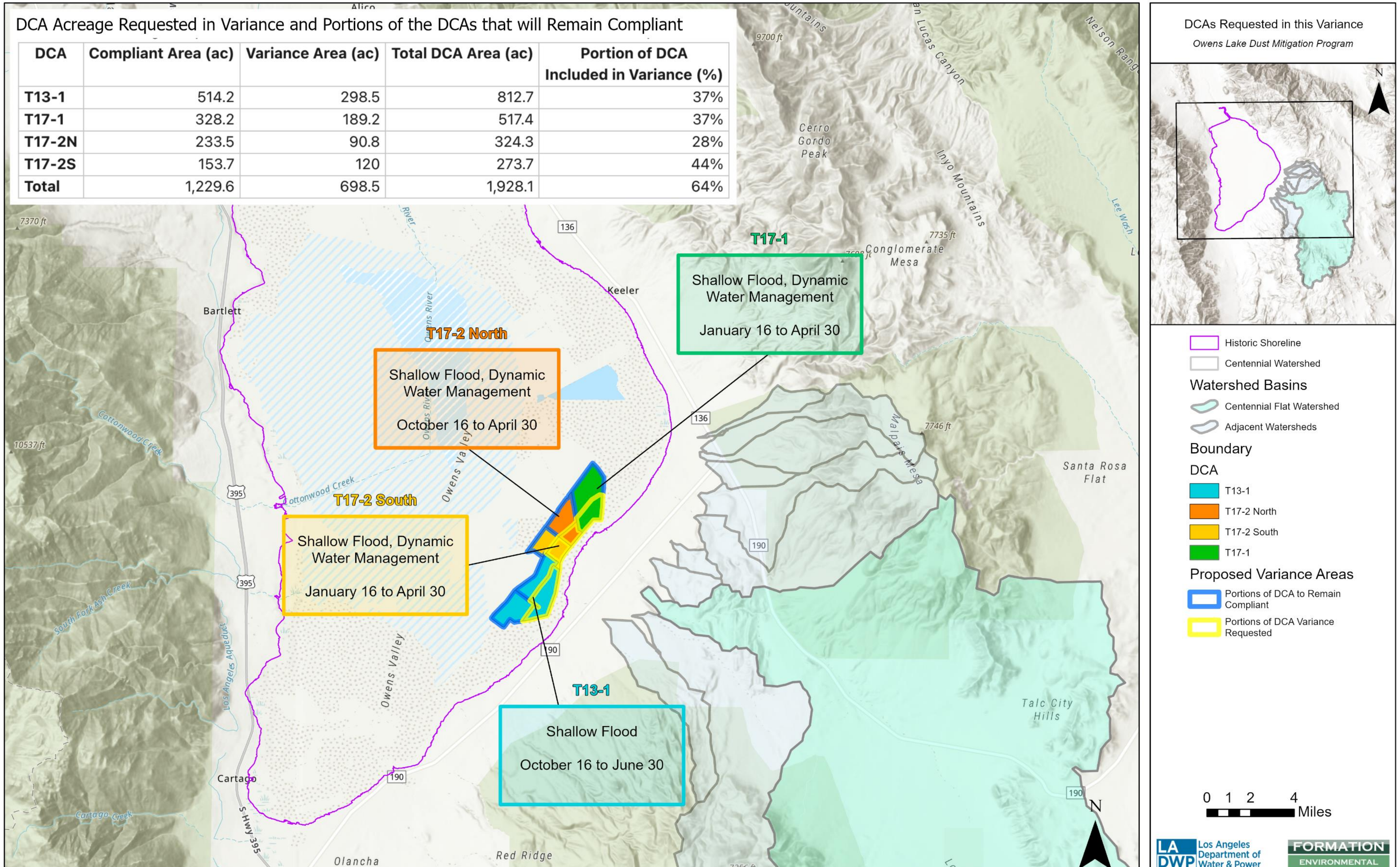
Manager of Owens Lake Dust Mitigation Program

Title

EXHIBIT 1. PORTIONS OF FOUR DUST CONTROL AREAS REQUESTED IN THIS VARIANCE

Figure 1. Portions of Four Dust Control Areas (DCAs) Requested in this Variance

This figure provides a summary map of the Variance Areas and their compliance period for which this variance is requested.



DCA Acreage Requested in Variance and Portions of the DCAs that will Remain Compliant

DCA	Compliant Area (ac)	Variance Area (ac)	Total DCA Area (ac)	Portion of DCA Included in Variance (%)
T13-1	514.2	298.5	812.7	37%
T17-1	328.2	189.2	517.4	37%
T17-2N	233.5	90.8	324.3	28%
T17-2S	153.7	120	273.7	44%
Total	1,229.6	698.5	1,928.1	64%

EXHIBIT 2. SUMMARY OF STORM EVENT AND DAMAGE TO DUST CONTROL AREAS

SUMMARY OF STORM EVENT MAGNITUDE

The location of the Centennial Flat Watershed is displayed in Figure 2. The magnitude of the September 13, 2022, storm event was evaluated using multiple approaches, including:

- **Precipitation Frequency Classification/Storm Analysis**: Multi-Radar/Multi-Sensor (MRMS) operational precipitation products from the National Oceanic and Atmospheric Administration (NOAA) National Severe Storms Laboratory (NSSL) were used to estimate precipitation for this event (Zhang et al., 2016). Data from the MRMS demonstrate that high-intensity precipitation occurred from approximately 1pm to 3pm on September 13th (Figure 3). The maximum rainfall intensity for this two-hour period was estimated at 1.9 inches/hour. The average precipitation was estimated at 1.52 inches, falling over 44.6 square miles of the 103 square mile Centennial Flat Watershed (Figure 4). These precipitation estimates were then compared to the National Weather Service (NWS) and NOAA authoritative precipitation frequency analysis products (NOAA Atlas 14 data tables) for this watershed to estimate the recurrence interval for the storm. Using the 2-hour duration precipitation event tables for this watershed, the September 13th event is estimated to be a 100-year recurrence interval storm. In other words, this magnitude of a precipitation event has only a 1% chance of occurring in any given year.

- **Caltrans Centennial Wash Culvert Design Criteria**: The Centennial Flat Watershed drains to a crossing of State Route 190 at Post Mile 20.85. There are three (3) side-by-side, 10 feet wide by 5 feet high, rectangular box culverts under the highway at this location. The box culverts were originally designed and installed by Caltrans in 1998 to accept a 50-year flood and an estimated 1,680 cubic feet per second (cfs) design flow without overtopping the highway (Erlwein, 1998). The flash flood flows created by the September 13th event caused significant overtopping and damage to State Route 190 at the location of the box culverts (Figure 5). This indicates that the flows associated with the flash flood were significantly larger than the Caltrans 50-year design flow.

- **Peak Storm Flow Analysis**: All of the alluvial fan washes that drain into Owens Lake are ungaged. This means that no actual records exist of the flow magnitude and duration exist. Therefore, the Weather Research and Forecasting hydrological model (WRF-Hydro), an open-source community supported model developed by the National Center for Atmospheric Research (NCAR) was used to estimate the peak flow based on the MRMS precipitation data. WRF-Hydro is used for a wide range of applications, including flash flood prediction, regional hydroclimate impacts assessment, seasonal forecasting of water resources, and land-atmosphere coupling studies (NCAR, 2022). WRF-HYDRO was adopted by the NWS in 2016 as the operational NOAA National Water Model (NWM) which continuously forecasts hydrologic risks across the Continental United States (NOAA, 2022).

  Results from the WRF-HYDRO modeling are presented in Figures 6-1 through 6-5. Results indicate that the peak flow near the Highway 190 culvert crossing was over 6,800 cfs. These flows are nearly 5-fold the 50-year design criteria for the box culvert design and represent a very significant magnitude flood event.

- **Historical Alluvial Fan Morphology and Extent**: Downstream of the Centennial Wash crossing of State Route 190, flows discharge across an alluvial fan and ultimately onto the Owens Lake playa. Delineation of the alluvial fan extent onto the Owens Lake Playa was completed using historic aerial images dating back to 1944, 1968, 1977, 1996, 2012, and 2022 prior to the storm event. Results demonstrate that the alluvial fan extension onto the playa had been relatively unchanged over the past 78 years (Figure 7). Following the September 13th event, the terminus of the alluvial fan onto the playa significantly expanded, extending over 3,500 feet farther onto the playa (Figure 7). This indicates that an event of this magnitude has not occurred or altered the alluvial fan to this extent in the 78-year period of available imagery.

All analyses for this storm clearly demonstrate the unprecedented nature and magnitude of the September 13th flash flood event. The magnitude of this event is well beyond the reasonable control of the LADWP.

DAMAGE TO DUST CONTROL FACILITIES

The flood event resulted in severe impacts to the Shallow Flood infrastructure in the subject DCAs. Specifically, the flash flood deposited an estimated 400,000 cubic yards of sediment below State Route 190. Approximately 156,000 cubic yards of sediment (Figure 8) buried and damaged Shallow Flood infrastructure such that it is inoperable until the repairs are completed. Specific damage to the subject DCAs includes:

- **Variance Areas in DCA T13-1:** In T13-1, laterals 2, 4, 6, and 9 were damaged by the flood flows and sediment deposition (Figure 9). Specifically, lateral 2 was completely sheared off at the above ground connection and is now located over 650 feet down gradient. Laterals 4 and 6 were moved roughly 60 to 80 feet down gradient. Lateral 9 was pushed 200 feet down gradient and is currently located below lateral 6. In addition, whiplines connected to risers on each lateral are tangled and displaced across the entire DCA. In addition to the damage of physical infrastructure, new erosional channels were created and several feet of sediment and debris were deposited across the T13-1 Addition area. These channels and sediment altered the slope/grade and impact the ability to evenly spread water for Shallow Flood compliance.

- **Variance Areas in DCAs T17-1 and T17-2 (North and South).** In T17-2 North and South, impacts occurred to the service areas of laterals 1, 2, 3, and 4. Several feet of sediment were deposited, burying approximately 63 risers and displacing many whiplines (Figure 10). The deposition is estimated to include over 123,000 cubic yards of sediment (Figure 8). Two risers were excavated along lateral 1 to determine the extent of deposition and burial (Figure 10). In this example, the total depth of sediment deposition exceeded 24 inches above the previous ground surface, including approximately 8 to 10 inches of sediment above the riser. In addition, significant new channels (upwards of 4 feet deep) are now evident (Figure 10) in both T17-1 and T17-2. These channels, combined with the sediment deposition, have profoundly impacted the slope/grade of the DCAs, impacting the ability to spread water evenly.

The damage to the DCAs from this 100-year storm event and resulting flood flows was not reasonably preventable and there is no practical method to achieve compliance until the necessary repairs are completed.

OTHER PUBLIC AGENCY RESPONSE TO THE STORM EVENT

This natural disaster also shut down California Highway 190 and required multiple public agencies to provide mutual aid in an effort to protect the public health. As a part of the September 13th event, the Town of Olancha and surrounding area experienced a severe thunderstorm event. The heavy rains triggered flash floods, mud slides and the closure of Highways 395 and 190. At approximately 4:30pm on the 13th, LADWP was contacted by Caltrans seeking mutual aid assistance to reopen Highway 395 at the Braley Creek crossing. The Highway was closed due to a flash flood in the Braley Creek Drainage that carried heavy mud and debris across Highway 395 clogging the culvert and inundating the roadway.

LADWP staff from the Independence yard who were working in the area were dispatched to assist Caltrans crews to clear and reopen the highway. The following is a brief recap of their response.

- Independence C&M Joe Bowling was contacted at approximately 4:45pm and asked to assist Caltrans with reopening Highway 395.
- Independence construction workers responded to the incident with 2 supervisors and 10 field staff operating a loader, a grader, an excavator, and a water truck.
- Crews worked in coordination with Caltrans to clear the roadway of debris and unplug the culvert to re-establish creek flows.
- An excavator cleaned sand traps on both ends of the culvert and flushed it with water to clear all debris.
- A loader and grader were used to remove mud and debris from the roadway.
- All work was completed and Highway 395 was fully opened by 8:30pm.

All LADWP staff returned safely to the Independence Yard by 9:00pm.

Additional coverage of the event includes the following (Attachment 1):

- The Governor of California declared an emergency along with the counties of Inyo, Los Angeles, Imperial, Riverside, and San Bernardino. The event was declared a disaster by Governor Newsom.
- High level summaries of the response were posted in LADWP’s Owens Valley community newsletter for October, as well as the LADWP contact newsletter.
- The National Park Service published a press release describing the damage throughout Death Valley National Park and the surrounding highways.

Figure 2. Centennial Flat Watershed Location

The 103 square mile Centennial Flat Watershed drains into the southeastern side of Owens Lake, including T17-1, T17-2 (North and South), and T13-1.

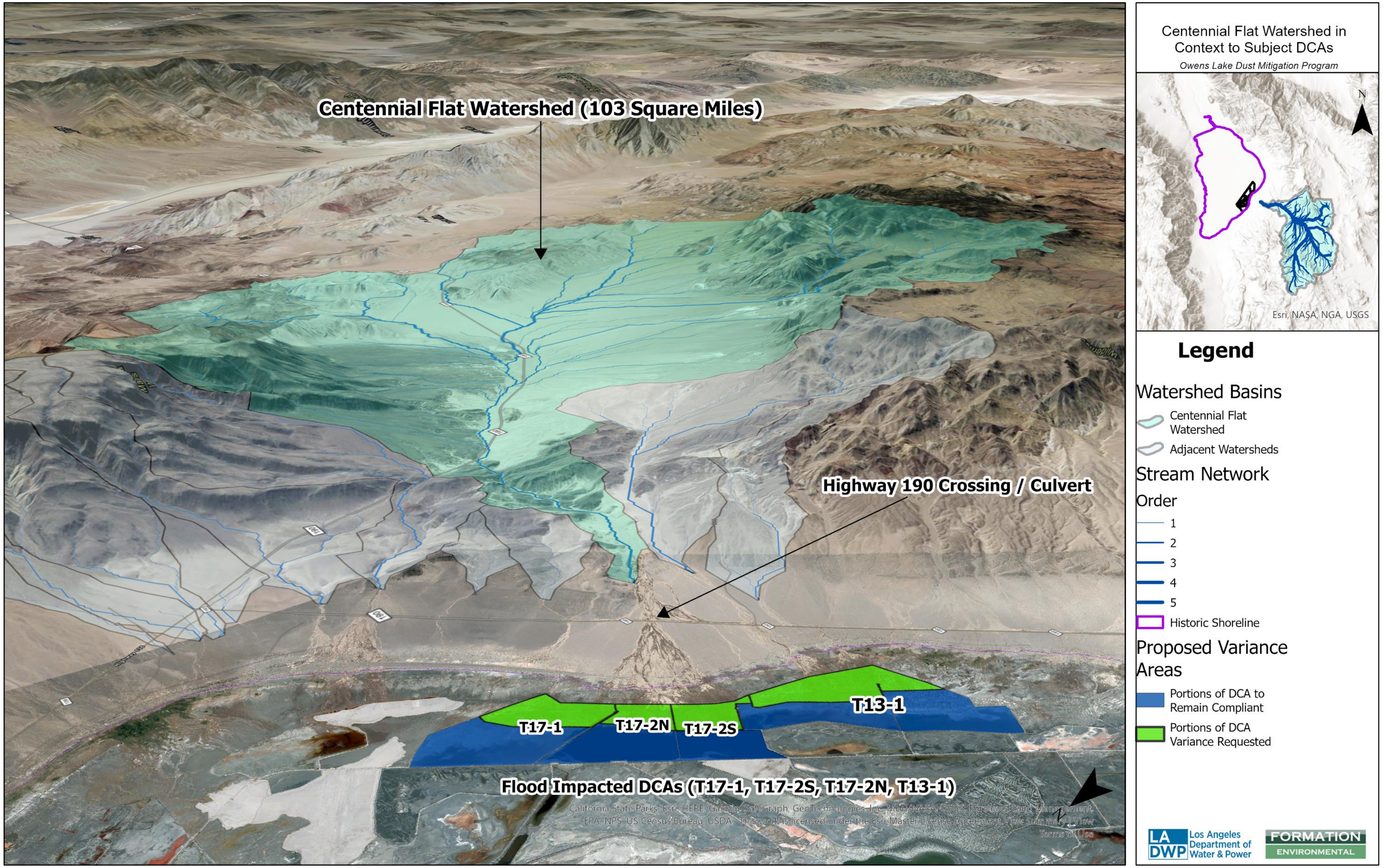


Figure 3. NOAA Radar Precipitation Estimates

Hourly Multi-Radar / Multi-Sensor precipitation estimates downloaded from NOAA, showing peak rainfall intensity of 1.9 inch/hour with an average of 1.52 inches falling over 44.6 square miles of the 103 square mile watershed.

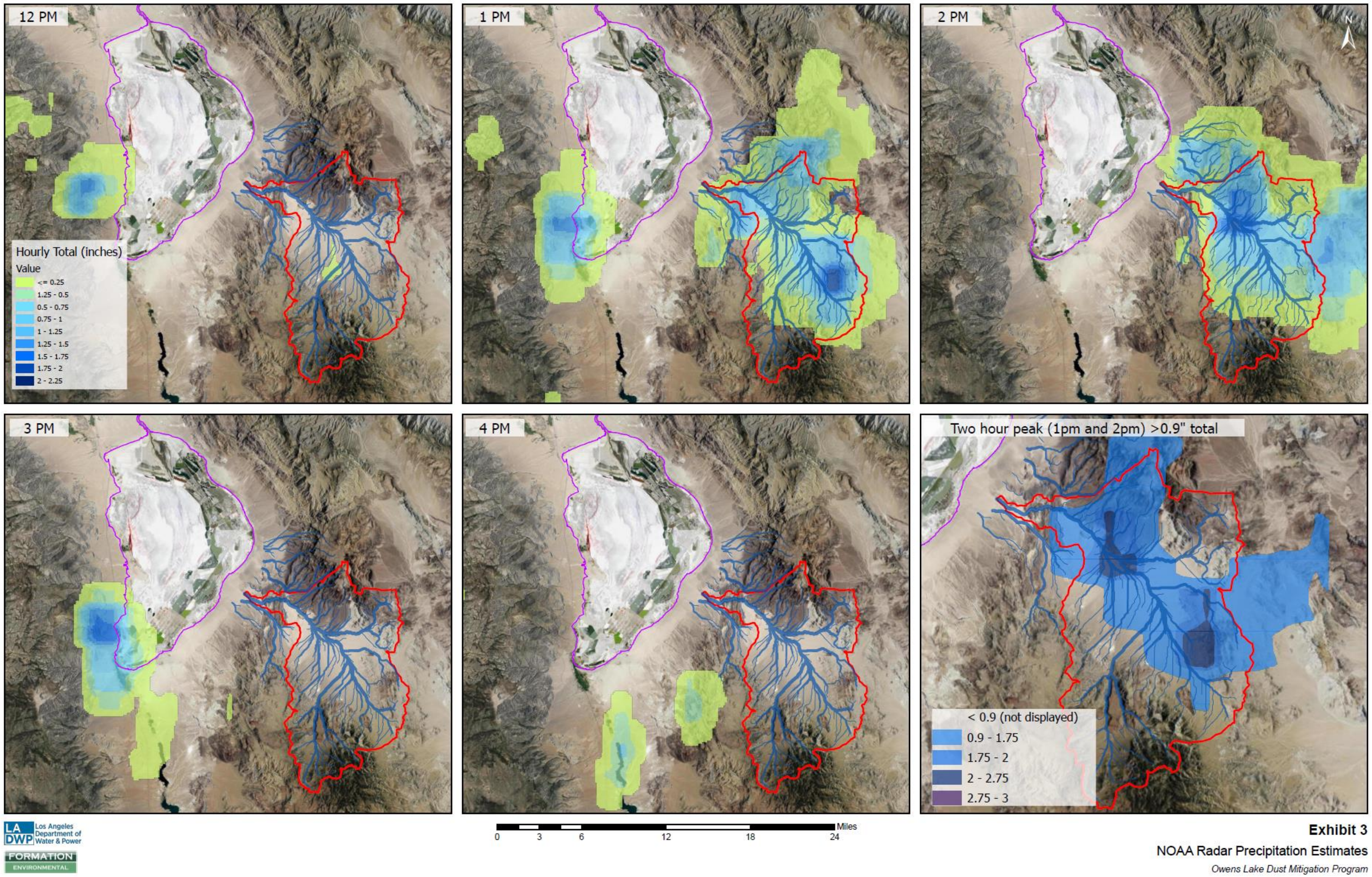


Figure 4. NOAA Atlas 14, 2 Hour Precipitation Frequency Table / Graphs

The NOAA Atlas 14, 2-hour estimated recurrence interval for this storm was estimated to be greater than a 50-year, but less than a 100-year event.

NOAA Atlas 14, Volume 6, Version 2
Location name: Lone Pine, California, USA*
Latitude: 36.2904°, Longitude: -117.7306°
Elevation: 4961.03 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF tabular | PF graphical | Maps & aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.082 (0.066-0.103)	0.113 (0.091-0.142)	0.158 (0.127-0.199)	0.198 (0.158-0.251)	0.258 (0.200-0.336)	0.307 (0.234-0.408)	0.363 (0.270-0.492)	0.424 (0.308-0.590)	0.516 (0.361-0.746)	0.596 (0.404-0.887)
10-min	0.117 (0.095-0.147)	0.163 (0.131-0.204)	0.227 (0.183-0.286)	0.284 (0.227-0.360)	0.369 (0.286-0.481)	0.441 (0.335-0.585)	0.520 (0.387-0.705)	0.608 (0.441-0.846)	0.740 (0.518-1.07)	0.854 (0.579-1.27)
15-min	0.142 (0.114-0.178)	0.197 (0.158-0.247)	0.275 (0.221-0.345)	0.344 (0.274-0.435)	0.446 (0.346-0.582)	0.533 (0.405-0.708)	0.628 (0.468-0.853)	0.735 (0.534-1.02)	0.895 (0.626-1.29)	1.03 (0.700-1.54)
30-min	0.193 (0.156-0.242)	0.268 (0.216-0.336)	0.374 (0.300-0.470)	0.468 (0.373-0.592)	0.608 (0.471-0.792)	0.726 (0.552-0.964)	0.856 (0.637-1.16)	1.00 (0.727-1.39)	1.22 (0.853-1.76)	1.41 (0.953-2.09)
60-min	0.260 (0.210-0.326)	0.360 (0.290-0.452)	0.503 (0.404-0.633)	0.630 (0.502-0.797)	0.818 (0.634-1.07)	0.977 (0.743-1.30)	1.15 (0.857-1.56)	1.35 (0.978-1.88)	1.64 (1.15-2.37)	1.89 (1.28-2.82)
2-hr	0.371 (0.299-0.465)	0.505 (0.407-0.634)	0.694 (0.558-0.873)	0.859 (0.686-1.09)	1.10 (0.853-1.44)	1.30 (0.990-1.73)	1.52 (1.13-2.06)	1.76 (1.28-2.45)	2.11 (1.48-3.05)	2.41 (1.64-3.59)
3-hr	0.450 (0.363-0.564)	0.610 (0.492-0.765)	0.835 (0.671-1.05)	1.03 (0.822-1.30)	1.31 (1.02-1.71)	1.55 (1.18-2.06)	1.80 (1.34-2.45)	2.08 (1.51-2.90)	2.49 (1.74-3.60)	2.84 (1.92-4.22)
6-hr	0.608 (0.491-0.762)	0.827 (0.666-1.04)	1.13 (0.910-1.42)	1.40 (1.12-1.77)	1.78 (1.38-2.33)	2.10 (1.60-2.79)	2.45 (1.82-3.33)	2.83 (2.06-3.94)	3.39 (2.37-4.89)	3.86 (2.62-5.75)
12-hr	0.778 (0.627-0.975)	1.08 (0.868-1.35)	1.50 (1.21-1.89)	1.87 (1.50-2.37)	2.43 (1.88-3.16)	2.89 (2.20-3.84)	3.40 (2.53-4.62)	3.98 (2.89-5.53)	4.83 (3.38-6.98)	5.58 (3.78-8.30)
24-hr	0.999 (0.886-1.15)	1.42 (1.26-1.64)	2.02 (1.78-2.33)	2.56 (2.24-2.98)	3.36 (2.85-4.05)	4.05 (3.37-4.98)	4.83 (3.92-6.08)	5.72 (4.51-7.40)	7.09 (5.37-9.56)	8.31 (6.08-11.6)
2-day	1.19 (1.05-1.37)	1.72 (1.52-1.98)	2.48 (2.19-2.86)	3.15 (2.76-3.67)	4.17 (3.54-5.02)	5.06 (4.20-6.21)	6.05 (4.90-7.61)	7.19 (5.67-9.30)	8.95 (6.78-12.1)	10.5 (7.70-14.7)
3-day	1.29 (1.14-1.48)	1.87 (1.65-2.15)	2.71 (2.39-3.13)	3.46 (3.03-4.02)	4.59 (3.89-5.53)	5.57 (4.63-6.85)	6.68 (5.42-8.40)	7.95 (6.27-10.3)	9.92 (7.51-13.4)	11.7 (8.55-16.3)
4-day	1.36 (1.21-1.57)	1.98 (1.76-2.29)	2.88 (2.54-3.32)	3.68 (3.22-4.28)	4.90 (4.15-5.89)	5.95 (4.94-7.31)	7.14 (5.79-8.99)	8.52 (6.72-11.0)	10.7 (8.07-14.4)	12.6 (9.20-17.5)
7-day	1.55 (1.37-1.78)	2.22 (1.97-2.56)	3.21 (2.84-3.71)	4.11 (3.60-4.78)	5.48 (4.65-6.60)	6.69 (5.55-8.21)	8.06 (6.54-10.1)	9.66 (7.62-12.5)	12.2 (9.21-16.4)	14.4 (10.6-20.1)
10-day	1.64 (1.46-1.89)	2.34 (2.08-2.70)	3.37 (2.97-3.89)	4.30 (3.77-5.01)	5.75 (4.87-6.91)	7.02 (5.83-8.62)	8.48 (6.87-10.7)	10.2 (8.03-13.2)	12.9 (9.75-17.3)	15.3 (11.2-21.4)
20-day	1.94 (1.72-2.24)	2.75 (2.44-3.17)	3.92 (3.47-4.53)	4.99 (4.38-5.82)	6.65 (5.64-8.00)	8.11 (6.73-9.96)	9.79 (7.94-12.3)	11.8 (9.28-15.2)	14.9 (11.3-20.1)	17.7 (13.0-24.7)
30-day	2.28 (2.02-2.62)	3.22 (2.86-3.72)	4.59 (4.05-5.30)	5.82 (5.10-6.78)	7.71 (6.54-9.28)	9.38 (7.79-11.5)	11.3 (9.16-14.2)	13.5 (10.7-17.5)	17.1 (12.9-23.0)	20.3 (14.9-28.3)
45-day	2.71 (2.40-3.12)	3.83 (3.39-4.41)	5.42 (4.79-6.26)	6.84 (5.99-7.97)	8.99 (7.63-10.8)	10.9 (9.03-13.3)	13.0 (10.6-16.4)	15.5 (12.3-20.1)	19.5 (14.8-26.3)	23.1 (16.9-32.2)
60-day	3.15 (2.79-3.62)	4.43 (3.93-5.11)	6.24 (5.51-7.21)	7.84 (6.87-9.13)	10.2 (8.68-12.3)	12.3 (10.2-15.1)	14.7 (11.9-18.5)	17.4 (13.7-22.5)	21.7 (16.4-29.3)	25.6 (18.7-35.7)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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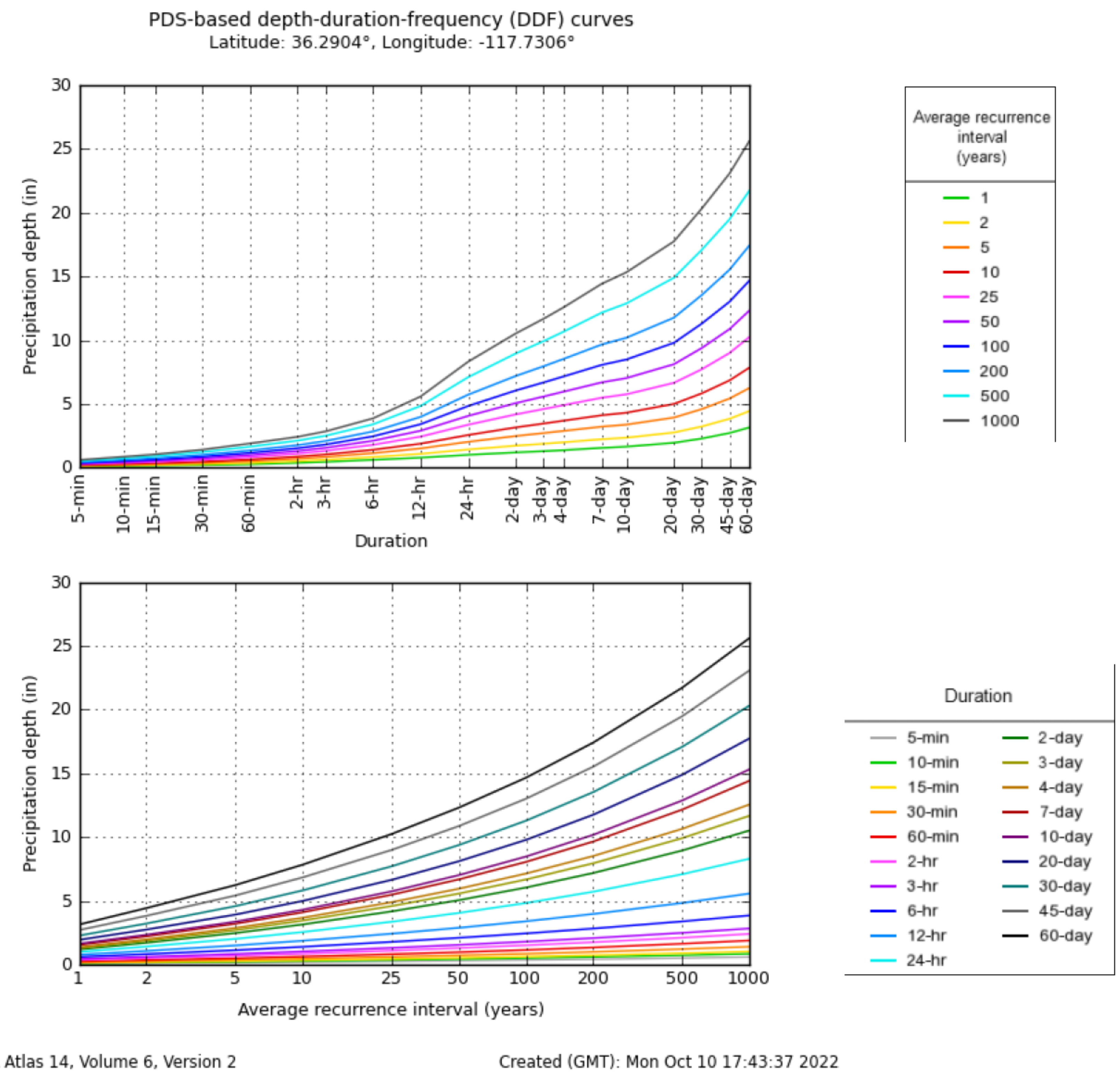
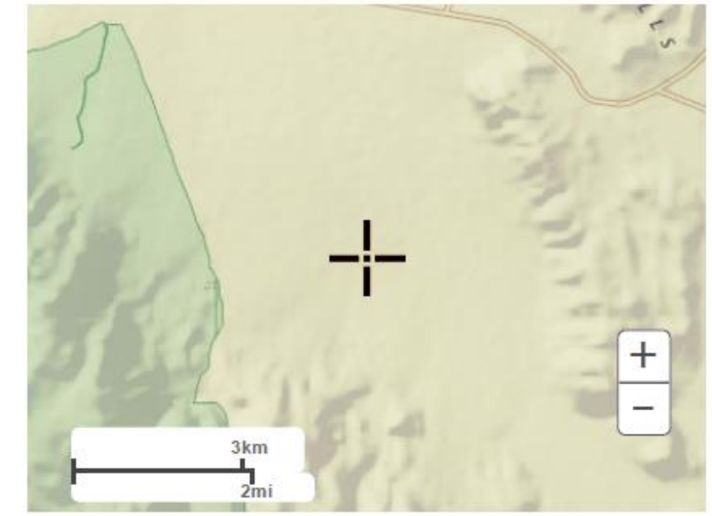
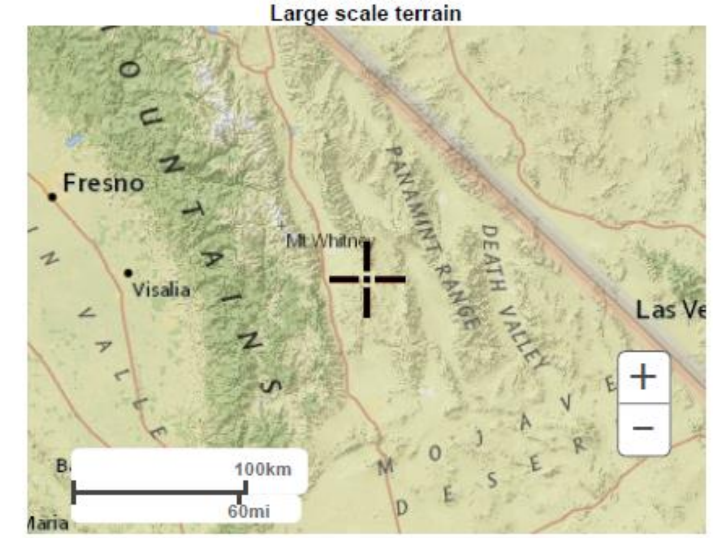
Figure 4 (continued). NOAA Atlas 14, 2 Hour Precipitation Frequency Table / Graphs



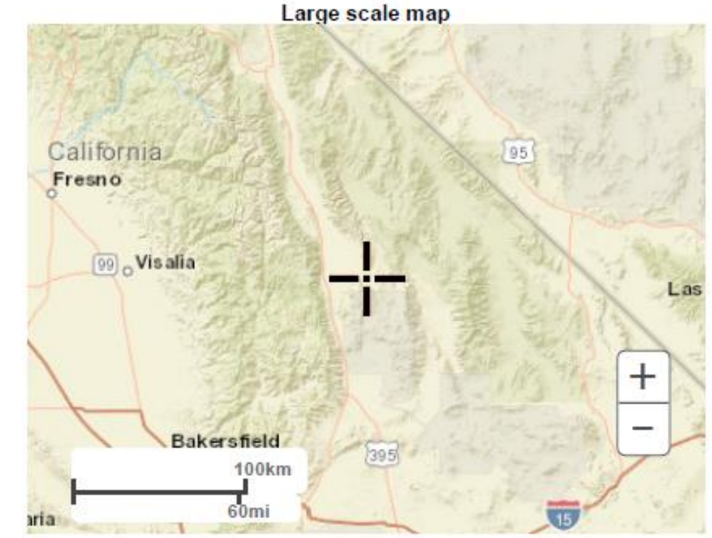
Precipitation Frequency Data Server



Large scale terrain



Large scale map



Large scale aerial

Figure 5. Centennial Wash Culvert at Highway 190 Crossing

Pictures and video of the Centennial Wash Culvert at the Highway 190 Crossing. Severe overtopping is apparent, with significant damage and scouring to the road, embankment and areas around the highway / wash crossing.

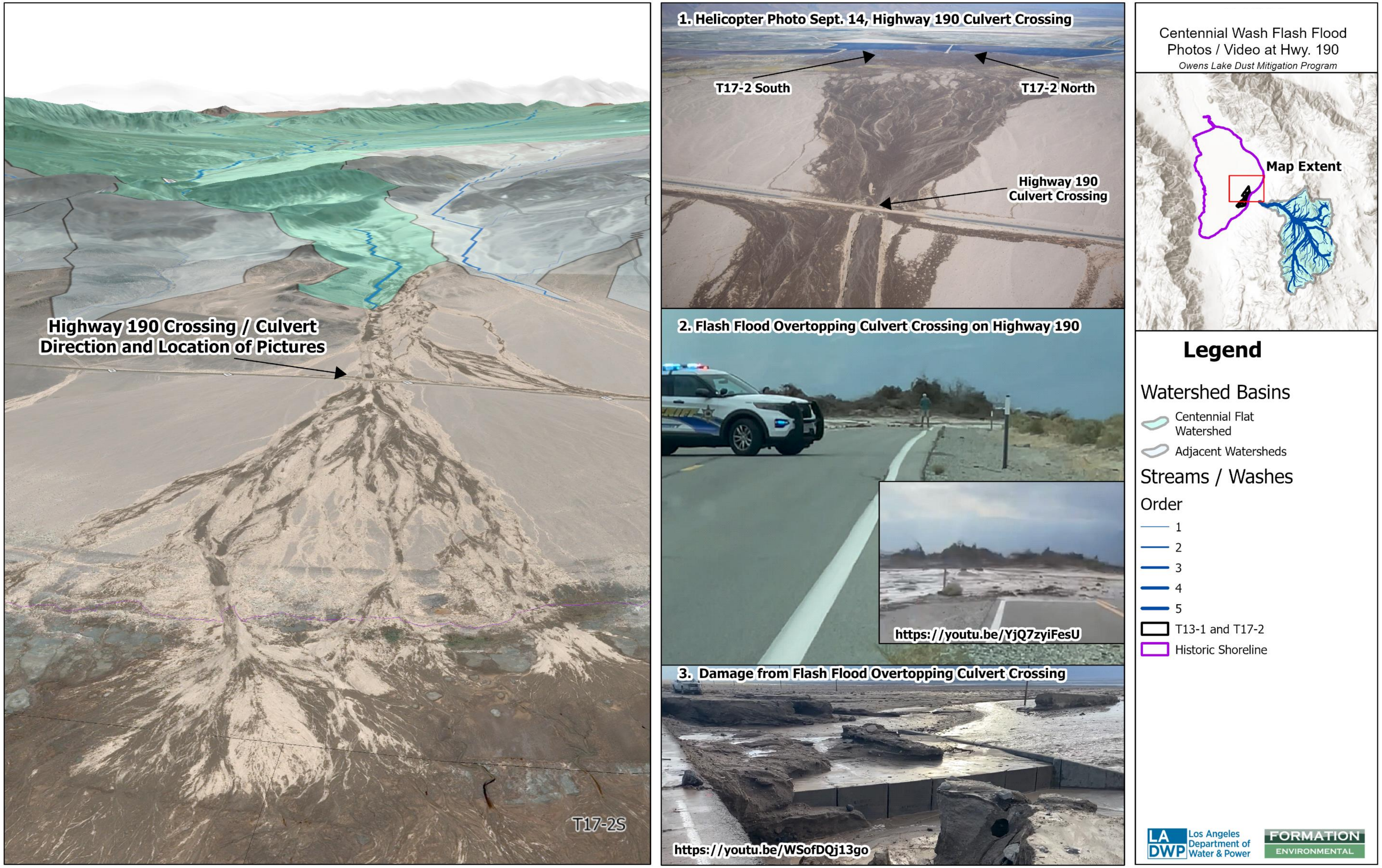


Figure 6-1 NCAR, WRF-Hydro Storm Hydrograph Results (1PM)

The NCAR, WRF-Hydro model storm hydrograph and timeseries stream segment /flow analysis estimated a flow of over 6,800 CFS.

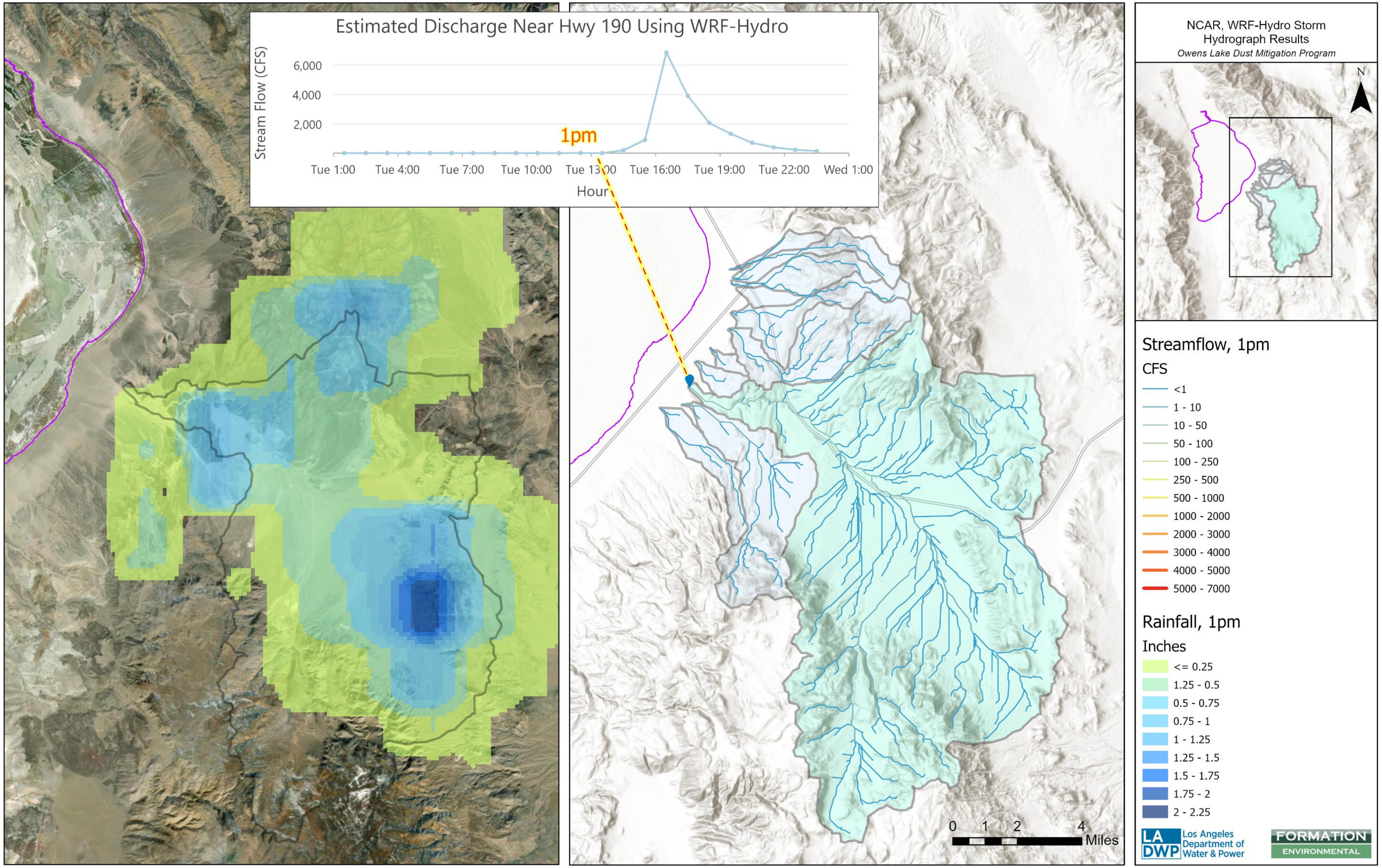


Figure 6-2 NCAR, WRF-Hydro Storm Hydrograph Results (2PM)

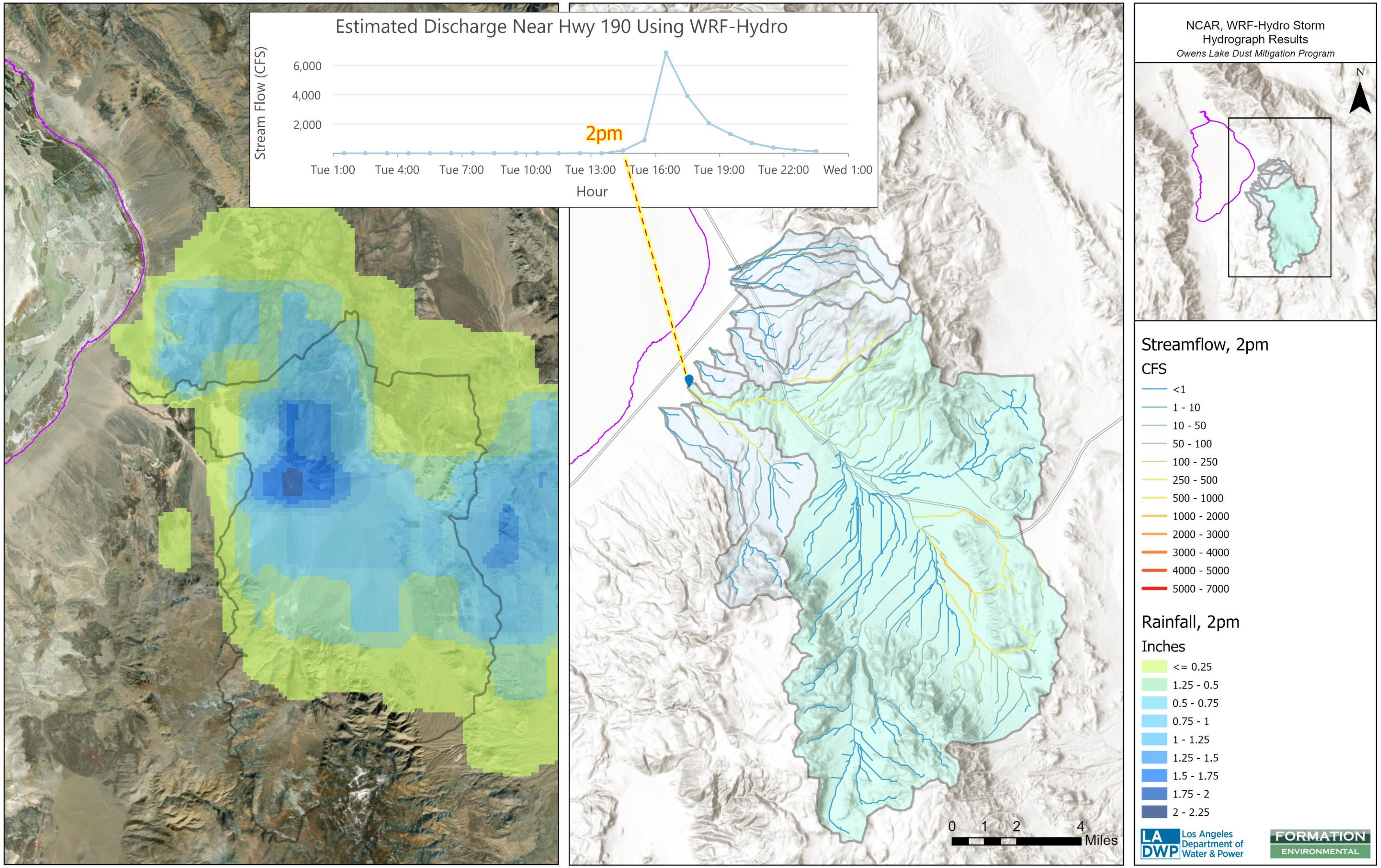


Figure 6-3 NCAR, WRF-Hydro Storm Hydrograph Results (3PM)

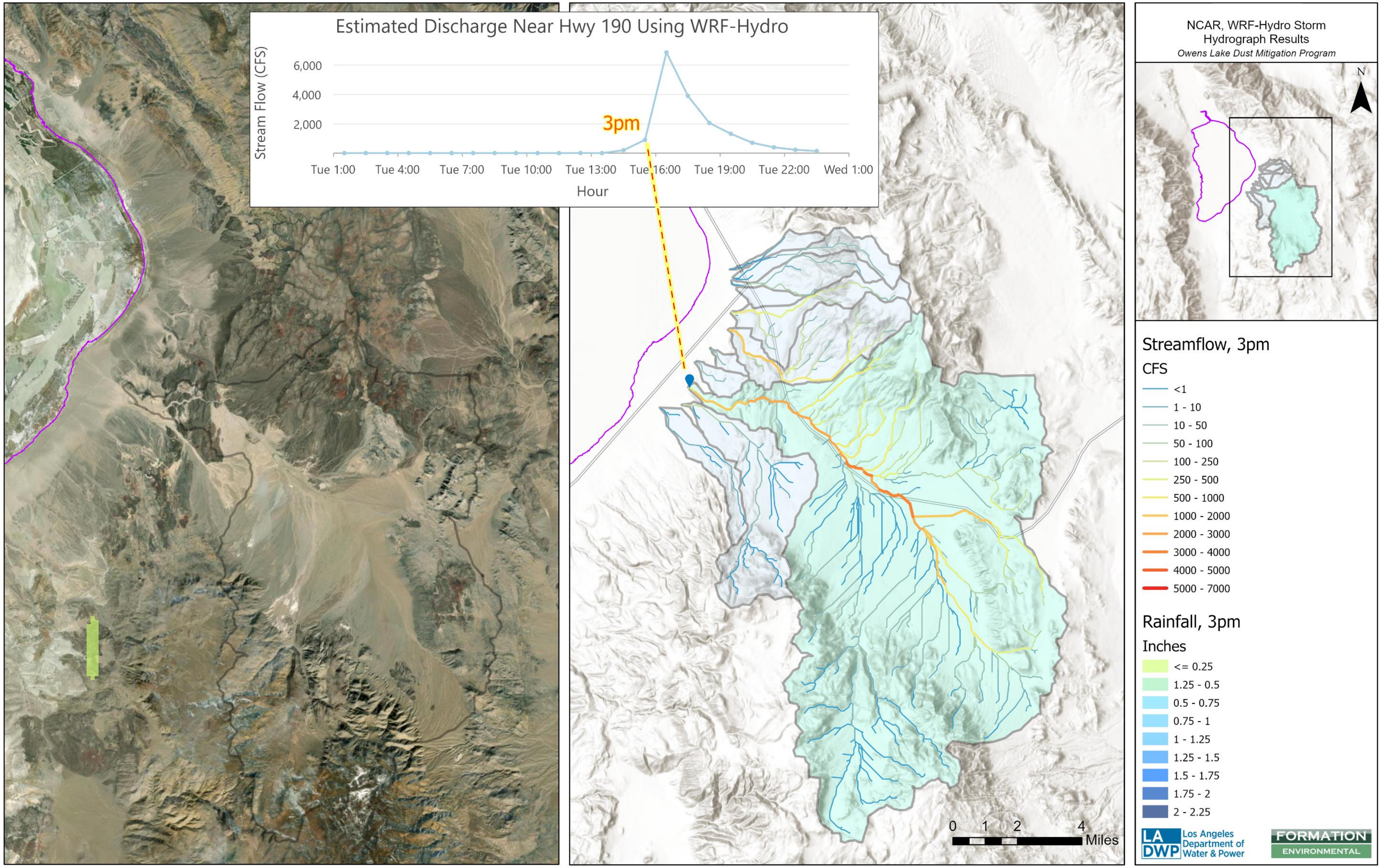


Figure 6-4 NCAR, WRF-Hydro Storm Hydrograph Results (4PM)

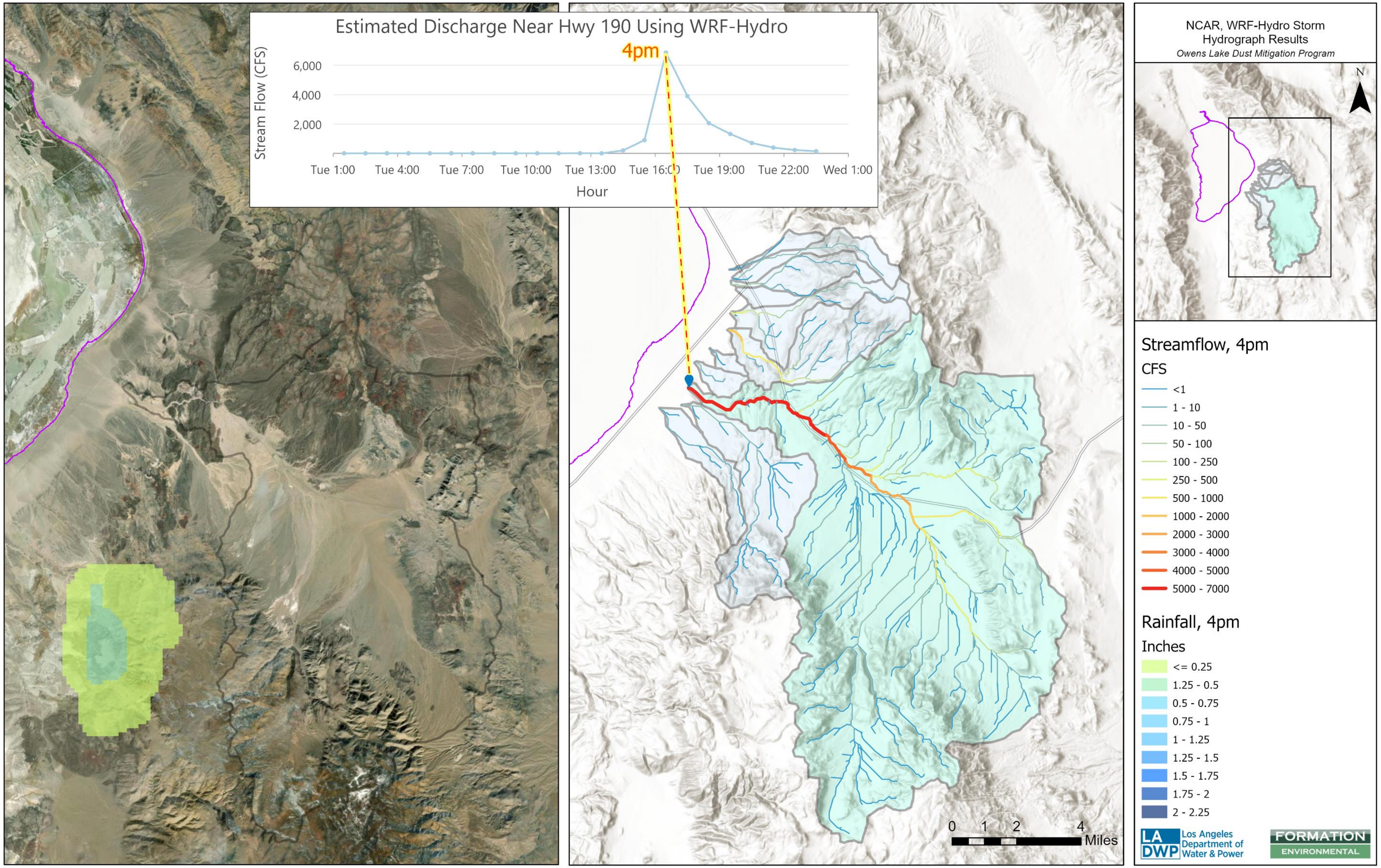


Figure 6-5 NCAR, WRF-Hydro Storm Hydrograph Results (5PM)

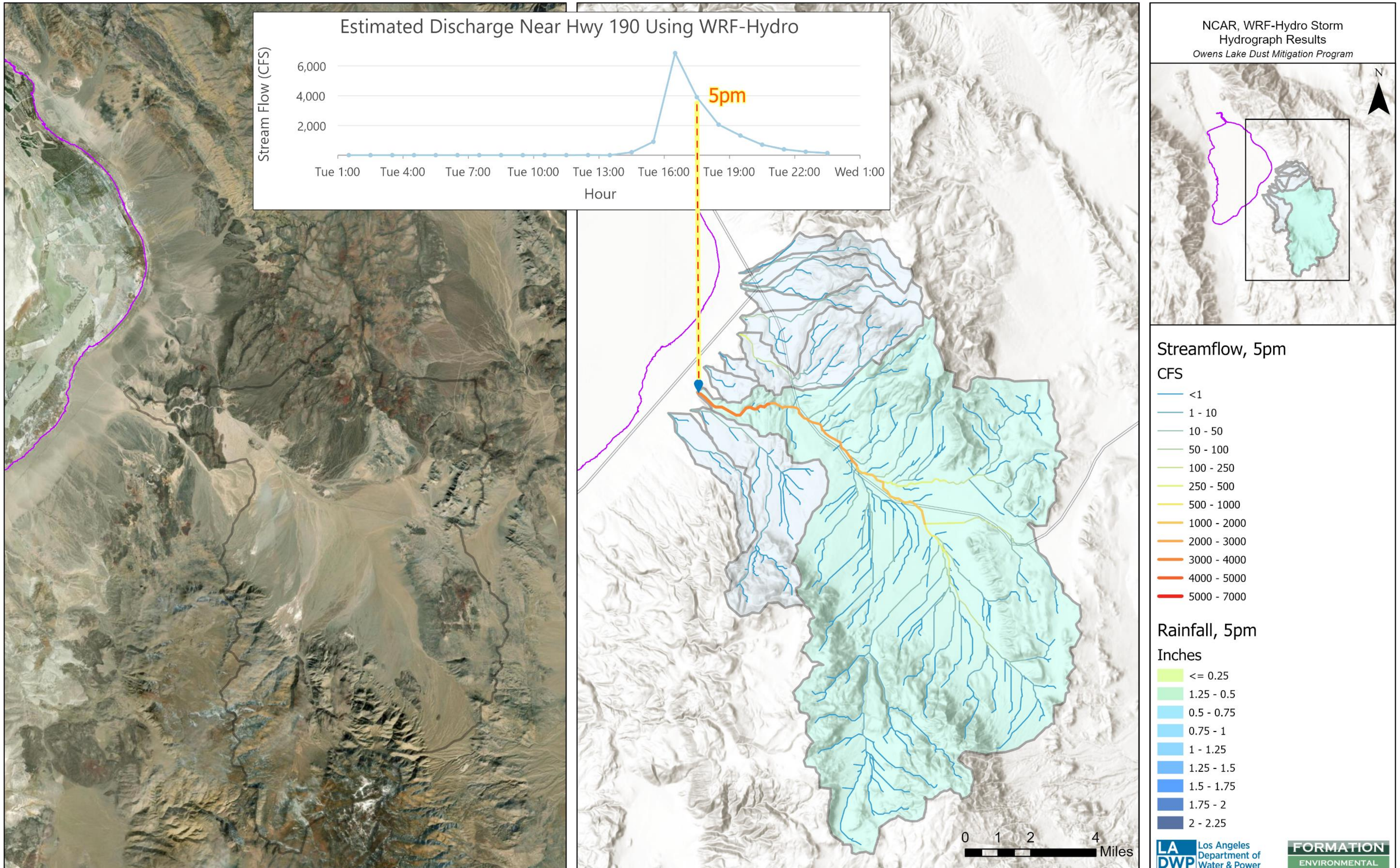


Figure 7. Historical Alluvial Fan Morphology and Extent

Estimated alluvial fan extent delineated photo-interpretation using 1944, 1968, 1977, 1996, 2012, 2022 (before and after the event) demonstrate the dramatic expansion of the alluvial fan from the September 13th, 2022, Flash Flood. This suggests that an event of this magnitude has not occurred in the 78 year period of available imagery.

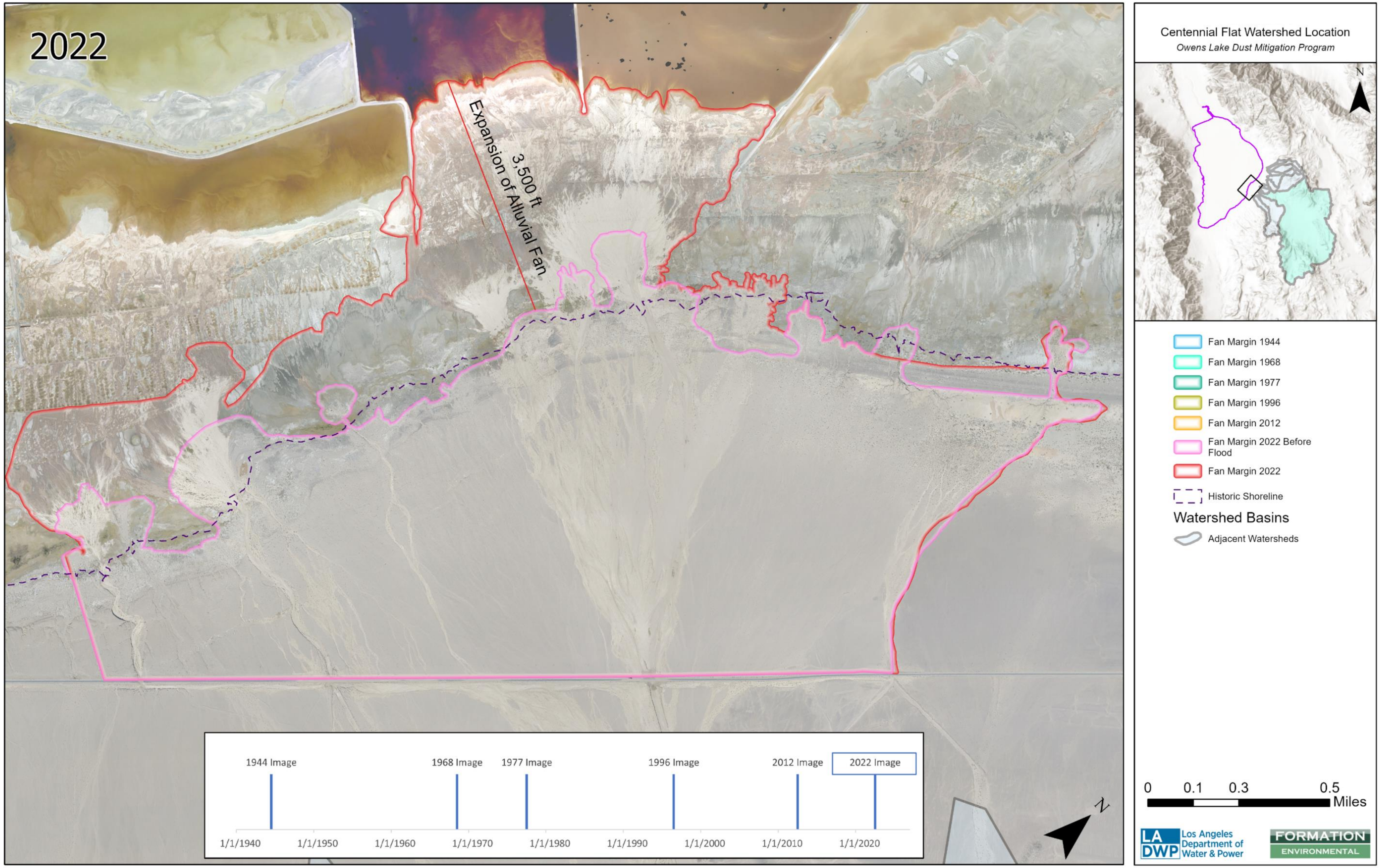


Figure 7-1 Historical Alluvial Fan Morphology and Extent: 1944

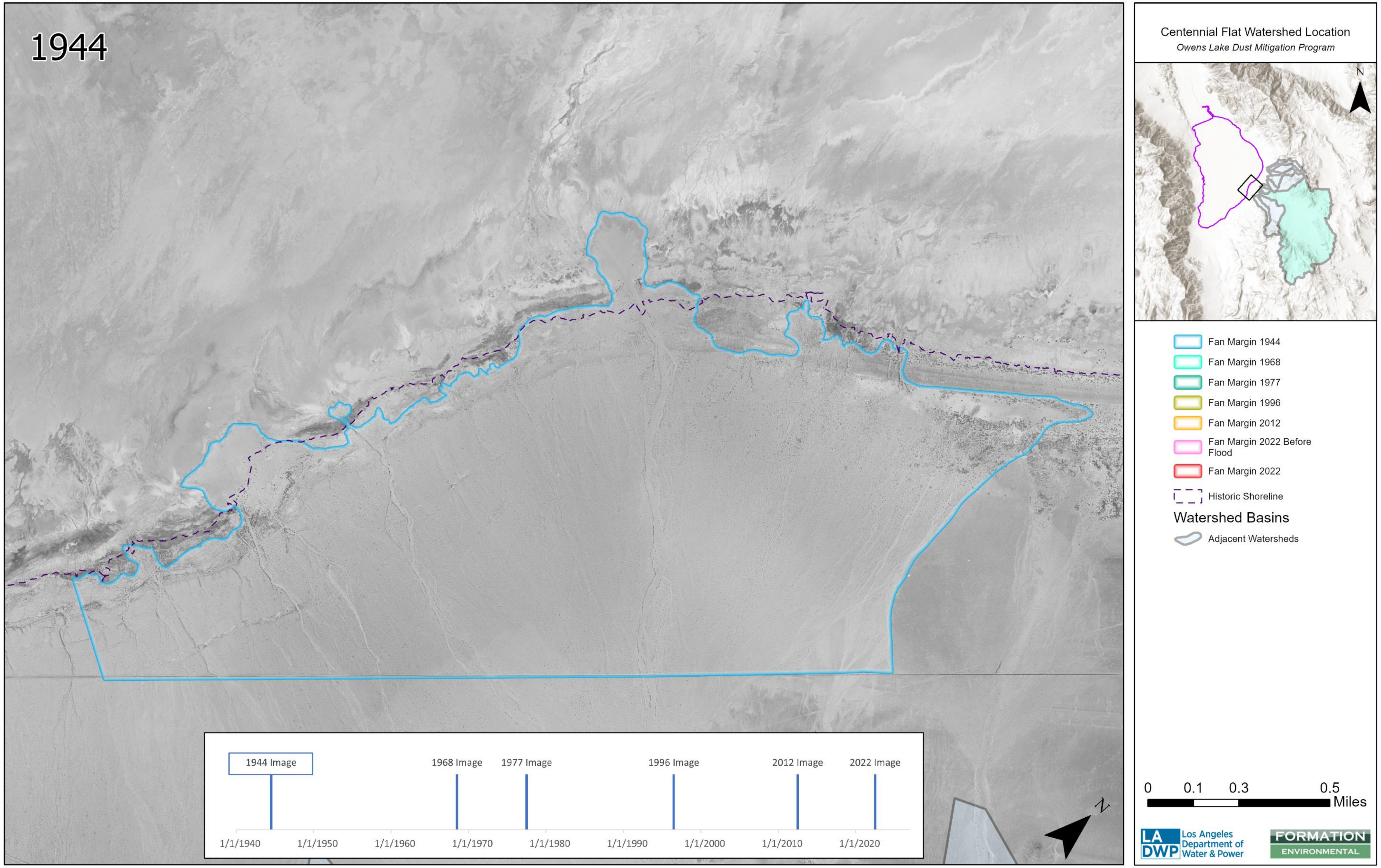


Figure 7-2 Historical Alluvial Fan Morphology and Extent: 1968

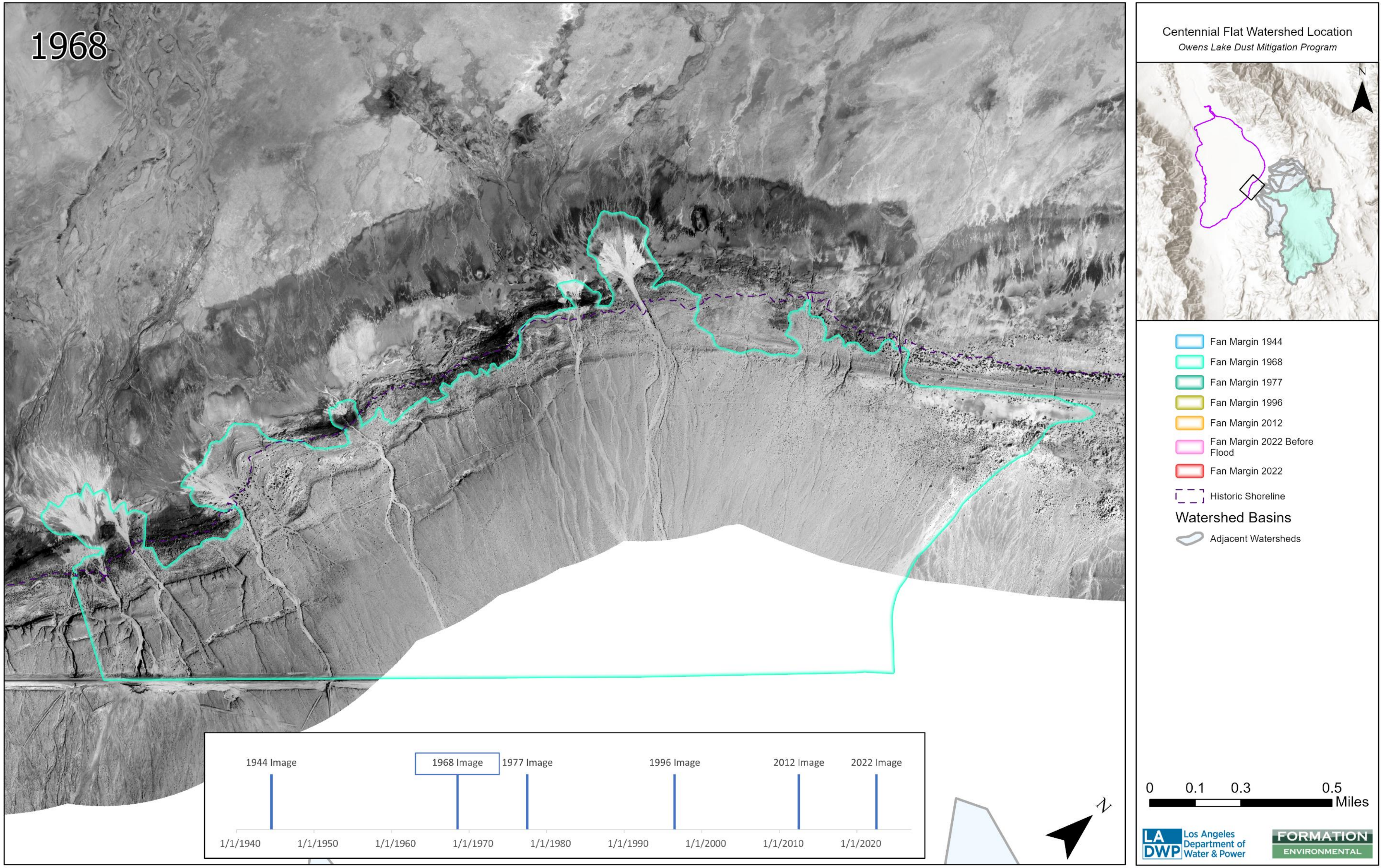


Figure 7-3 Historical Alluvial Fan Morphology and Extent: 1977

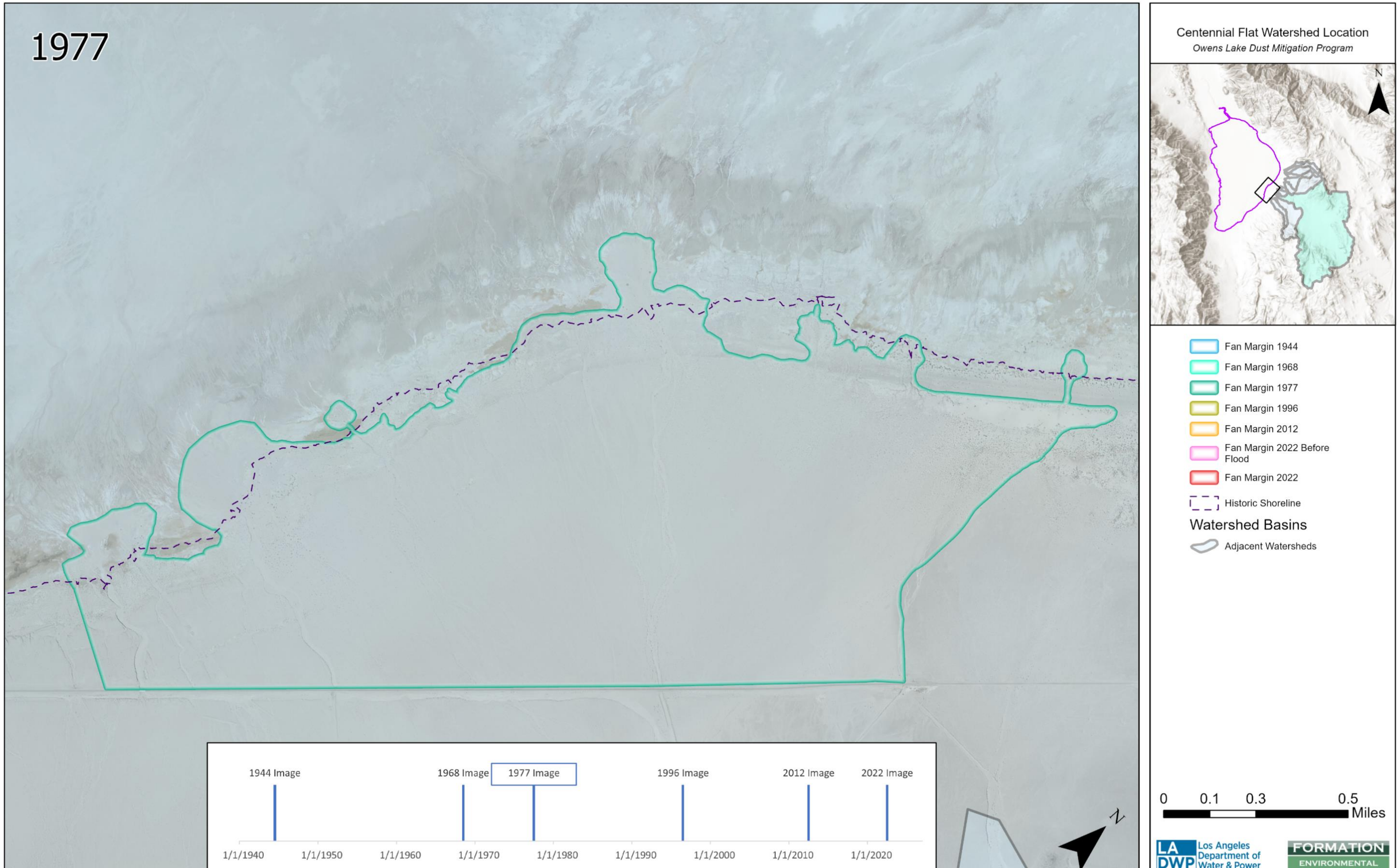


Figure 7-4 Historical Alluvial Fan Morphology and Extent: 1996

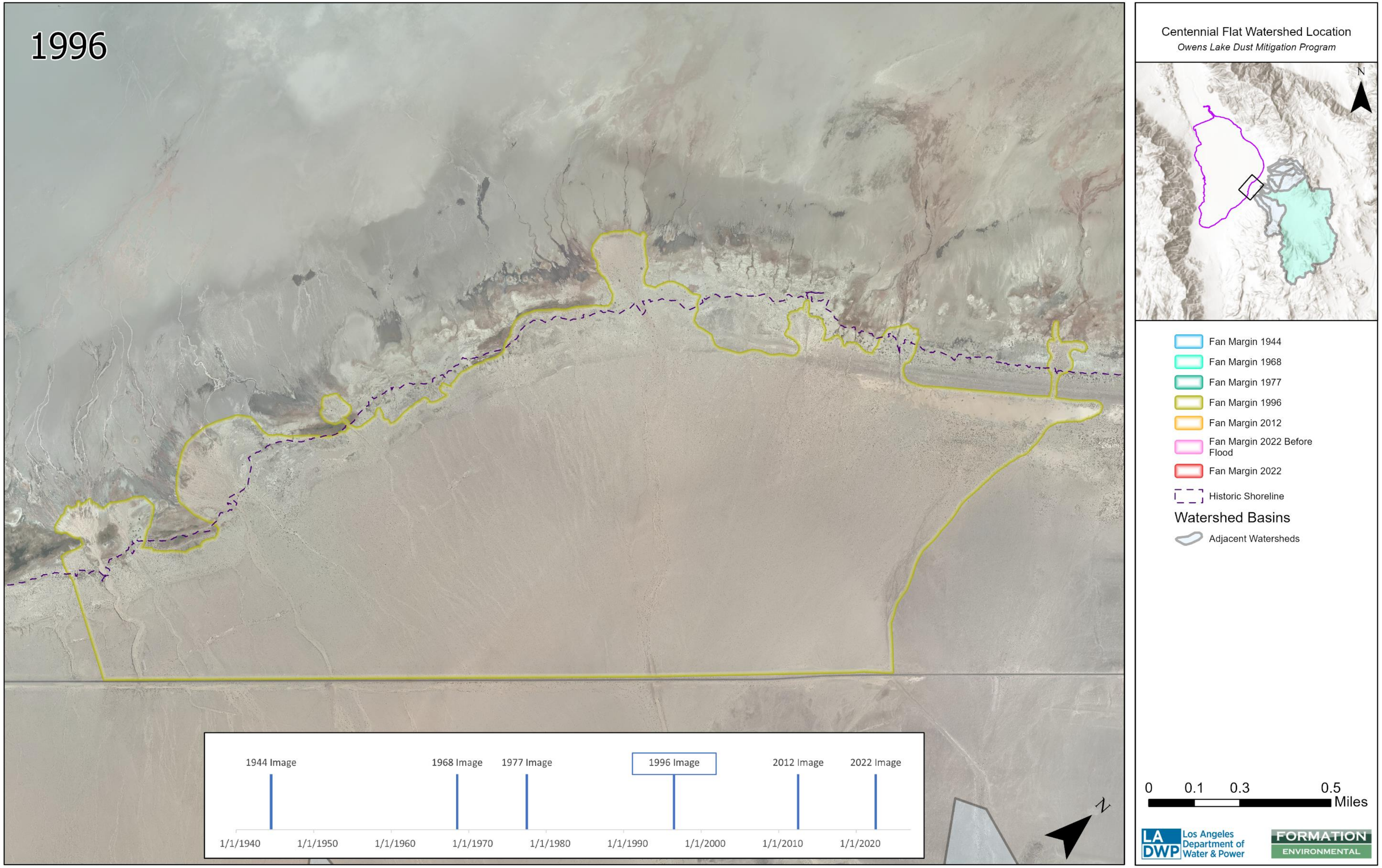


Figure 7-5 Historical Alluvial Fan Morphology and Extent: 2012

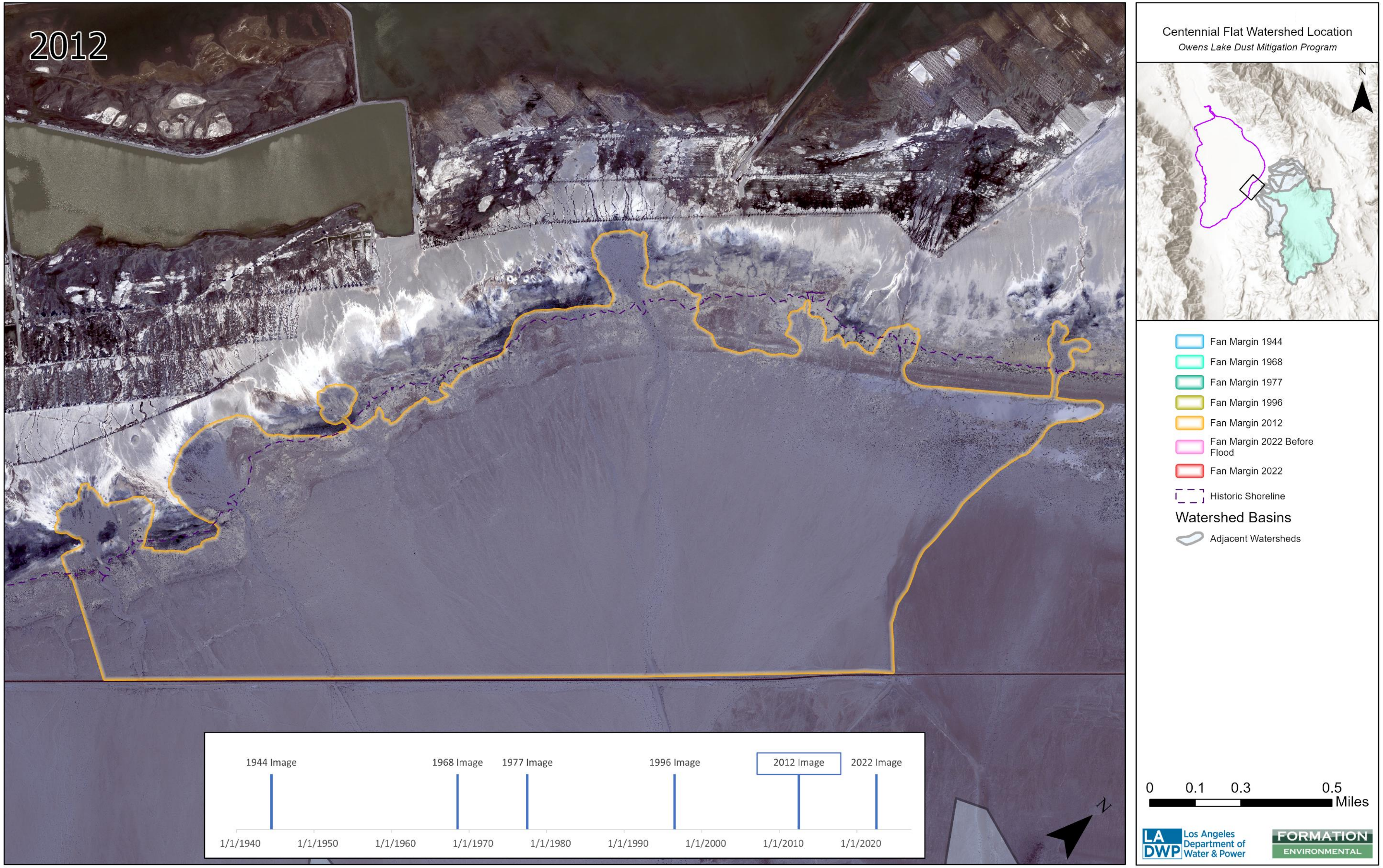


Figure 7-6 Historical Alluvial Fan Morphology and Extent: 2022 (Before Flood)

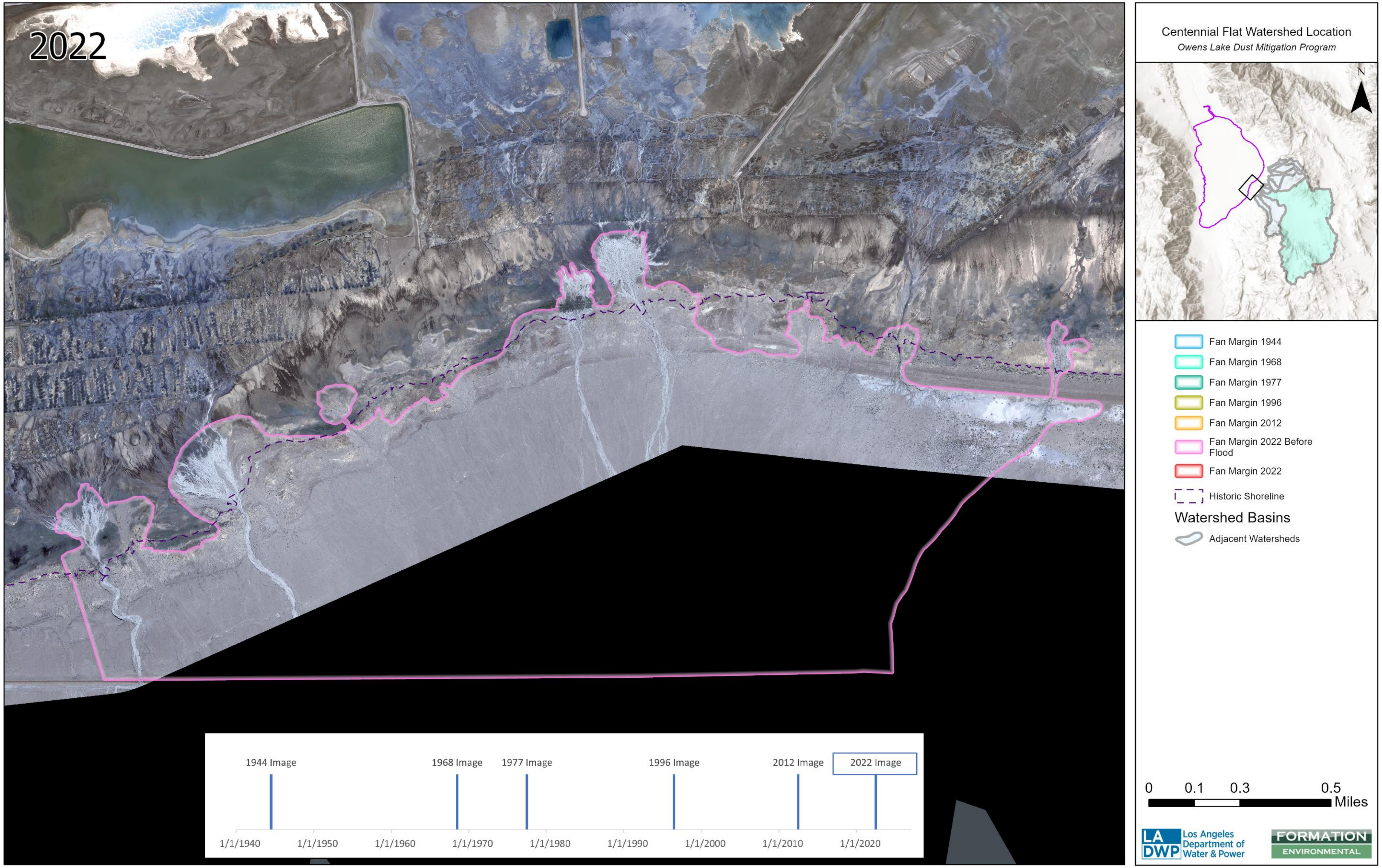


Figure 7-7 Historical Alluvial Fan Morphology and Extent: 2022 (After Flood)

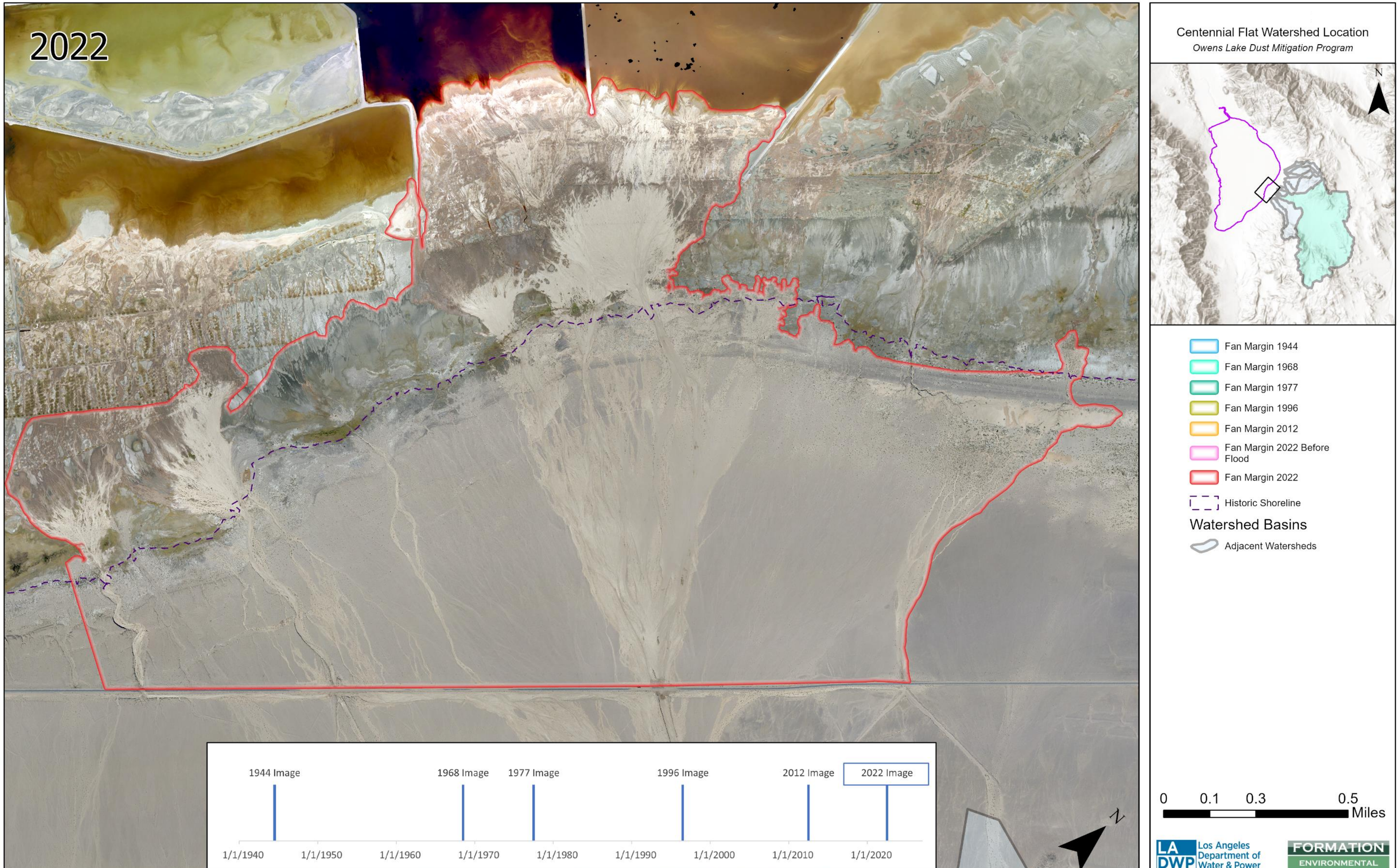


Figure 8. Estimated Sediment Deposition and Erosion

High density LiDAR collected September 2020 and September 27th (post-event) was used to determine the depth and volume of sediment deposited within and near the DCAs. Over 156,000 cubic yards was deposited with T13-1 and T17-2.

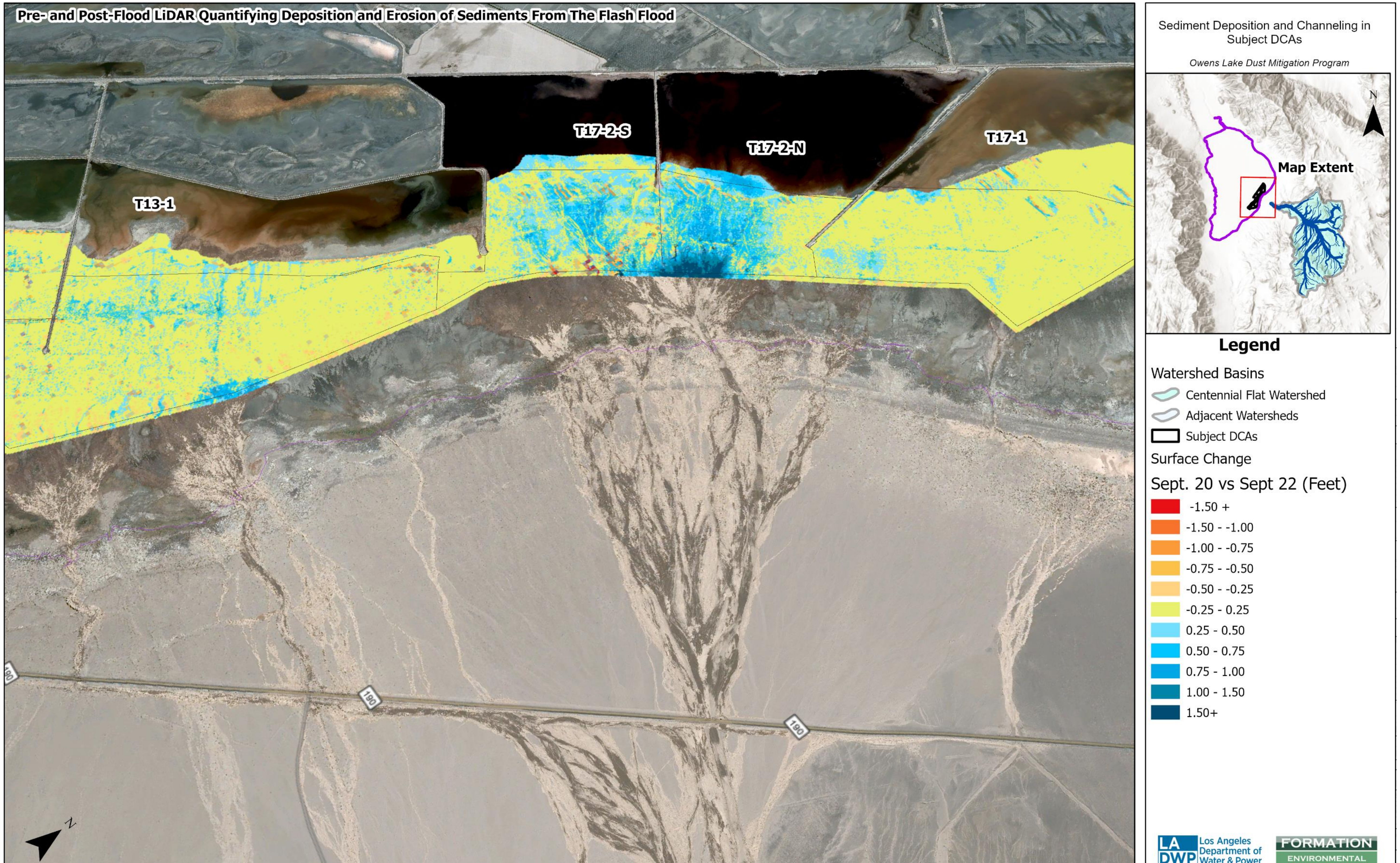


Figure 9. Summary of T13-1 Damage Due to Flash Flood

Damage to T13-1 included impacts to Laterals 2, 4, 6, and 9. Whiplines were displaced and tangled, new erosional channels created, and significant sediment deposition into the upper portion of T13-1 Addition area.

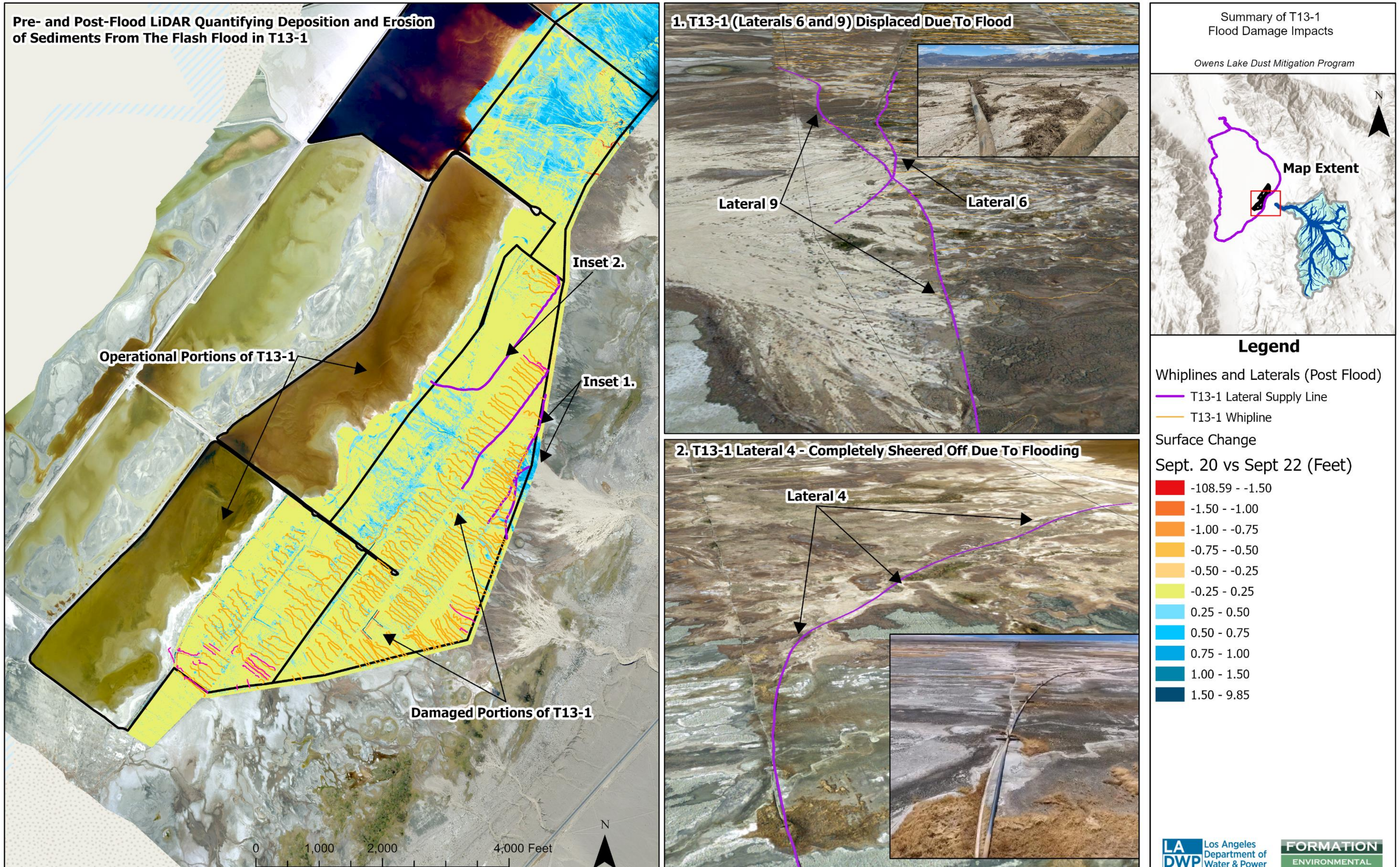


Figure 10. Summary of T17-2 (North and South) Damage Due to Flash Flood

Impacts of the flash flood occurred in laterals 1,2,3, and 4. Approximately 63 risers were buried, many whiplines displaced, and new channels are evident. Impacts due to the flash flood rendered the irrigation system inoperable and completely changed the soil and grade / slope within the DCA, potentially impacting the ability to spread water to meet compliance.

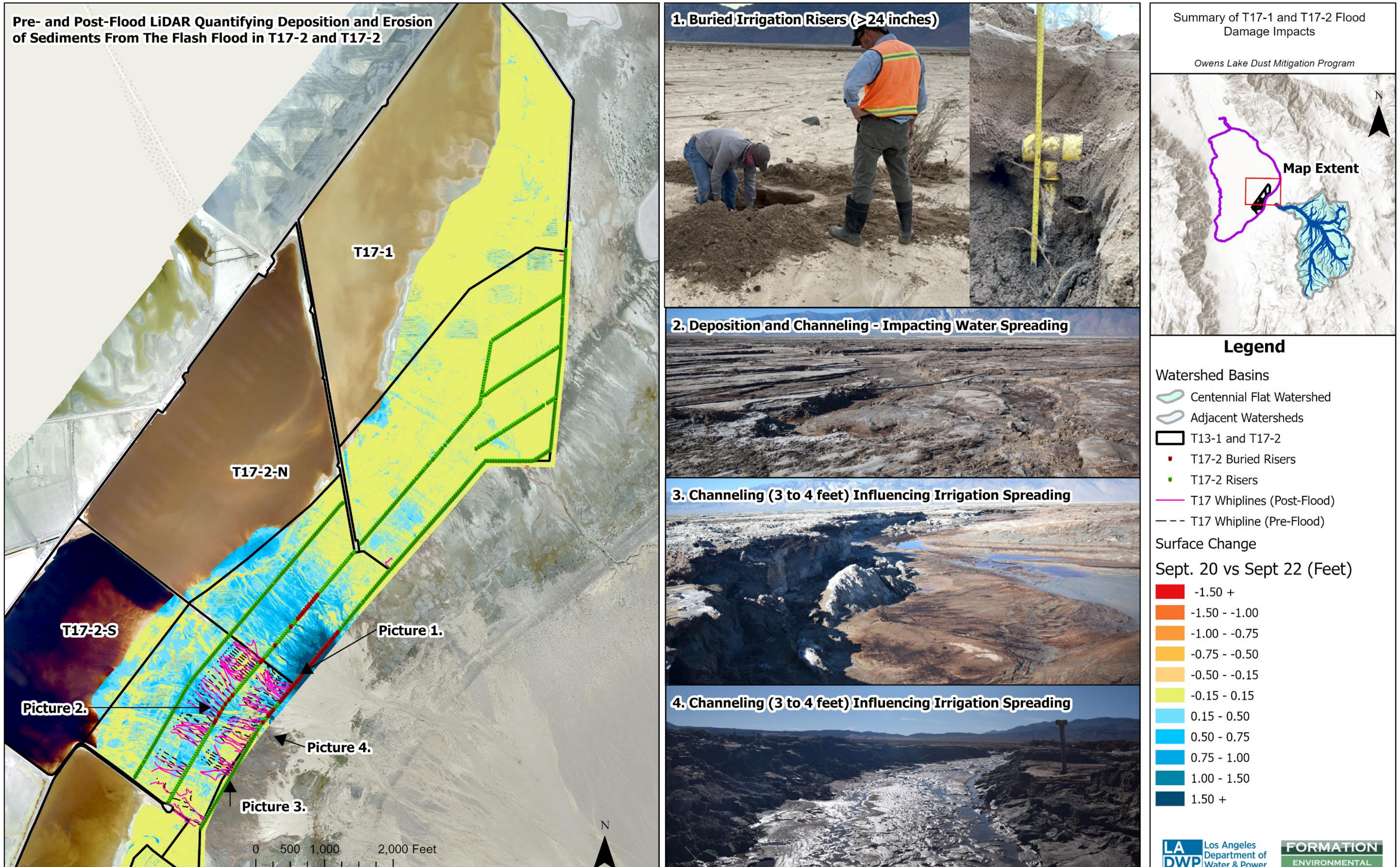


EXHIBIT 3. REPAIR PLANS AND COMPLIANCE SCHEDULES

ACTIVITIES COMPLETED TO DATE TO INITIATE REPAIRS

LADWP's response and planning for assessment and repair of the Shallow Flood facilitates has been swift, significant, and comprehensive. Beginning on September 14, 2022, the day after the final storm, LADWP conducted numerous field assessments, data collection efforts, and field reconnaissance events in order to develop a repair plan. An overall summary of the actions LADWP has taken to-date is provided in Figure 11 and bulleted below. A more detailed summary follows in Table 1.

- September 14th: LADWP begins patrol and investigation of the damage. This included helicopter flights to view and document the damage and extent of potential impacts. Low level flights were completed to capture high resolution pictures and to view specific Shallow Flood infrastructure components.

- September 15th: The pictures and images collected on September 14th were analyzed by LADWP staff, operations, and consultants. Initial analysis results were discussed during the September 15th dust control workshop with GBUAPCD. A presentation was made to GBUAPCD staff and provided as a link after the meeting. Potential issues were previewed, and it was discussed that this event had profound impacts on the Shallow Flood infrastructure, likely impacting LADWP's ability to meet compliance in specific DCAs during the upcoming dust season.

- September 16th through September 26th: During this timeframe, both LADWP and their consultants completed multiple reconnaissance efforts to investigate the flood damage. Although many of the areas impacted by the flooding were initially inaccessible due to moist/saturated soil conditions, LADWP operations staff investigated accessible portions of the DCAs on foot multiple times. On September 23rd, more areas were accessible, and a comprehensive investigation was completed by LADWP operations staff across both T13-1 and T17-2 (North and South). During this investigation, it was discovered that large portions of T17-2 (North and South) were completely buried and laterals within T13-1 were damaged and in-operable.

- September 27th: LADWP collected aerial imagery and Light Detection and Ranging (LIDAR) topographic data to quantify impacts to Shallow Flood infrastructure and support evaluation of design options for repair. In addition, LIDAR was used to determine the new grade/topography, sediment depth, and extent of erosional channeling caused by the flood. Low level drone videos were collected of each lateral to facilitate evaluation of inaccessible areas. This video was immediately processed and used the following day in a workshop with LADWP staff and operations.

- September 28th: LADWP staff, operations, and engineering consultants completed a field reconnaissance and workshop to discuss potential options for expeditious repair of the Shallow Flood infrastructure. During this workshop, both T13-1 and T17-2 (North and South) were visited, drone video was evaluated, and options for repair were identified. At this point, it was determined that T13-1 and T17-2 (North and South) were inoperable and would require significant repair.

- September 29th: LADWP staff further communicated with GBUAPCD staff regarding the extent of damage and the inability to meet Shallow Flood compliance in the subject DCAs. LADWP also requested a workshop/meeting with GBUAPCD staff for October 5th. Ultimately, this meeting was rescheduled to October 12th to accommodate GBUAPCD staff's availability.

- September 29th: Drone video and high-resolution imagery collected on August 17th and September 27th were used to identify each buried riser in T17-2 (North and South). This imagery was also used to determine the extent of channeling and digitize the damaged laterals, risers, and whiplines in T13-1.

- September 30th: Using the estimated riser locations from the drone survey and high-resolution aerial imagery, LADWP survey staff completed a GPS survey to identify each buried riser location and flag/stake each location for excavation.

- October 4th: LADWP consultants developed a technical memorandum documenting storm and flash flood damage.

- October 6th: LADWP staff consulted with tribal representatives to discuss the flash flood event and needed repairs. A tribal monitor was identified and scheduled to evaluate the impacted areas in T17-1 (North and South) and monitor the excavation of each buried riser.

- October 7th: LADWP operations and construction staff began repairs, including excavation of buried risers in T17-2 (North and South). A tribal representative was (and will continue to be) present during excavation/earth disturbing activities.

- October 8th: LADWP operations and construction staff planned and scheduled an equipment test to determine the options for equipment to repair T13-1.

- October 11th: LADWP operations and construction staff began planning for an equipment test in T13-1. The equipment test is needed given the very challenging soil conditions in T13-1. In T17-2 North while working on doing repairs, un-burying the risers, the excavator became stuck into a small sinkhole-like area of soil.

- October 12th: LADWP and GBUAPCD staff met to discuss the storm magnitude, damage, and repair plan. In addition, the variance request was discussed and GBUAPCD staff support was requested. In T17-2 North, crews were working to recover the excavator which got buried on October 11, 2022.

By October 12, 2022, LADWP determined that repairs to the damaged DCAs could not be completed by October 16, 2022. The flood waters deposited over an estimated 156,000 cubic yards of sediment into the DCAs, which completely buried and damaged the risers and whipline infrastructure in over two feet of sediment. Although LADWP's response and planning for assessment and repair of the Shallow Flood facilitates has been swift, significant, and comprehensive, it is beyond LADWP's reasonable control to complete all necessary repairs prior to the start of the dust season.

REPAIR PLANS AND COMPLIANCE SCHEDULE

The repair plan for the DCAs will require pulling the above-ground lateral segments back into the correct alignments; using excavators on mats due to the extremely soft soil conditions; repairing damaged segments of lateral piping; reconnecting and/or repairing the whiplines (where damaged); redeploying the whiplines to the correct alignments; and flushing the laterals and whiplines to remove debris. Repair of the facilities will be completed and LADWP will be in compliance with Rule 433, as described below and in Figure 12. It should be noted that the repair and compliance dates may change based on events outside of LADWP's control, including (but not limited to): heavy precipitation events impacting soil conditions, natural disasters, supply chain issues due to COVID 19, or other natural/unforeseen events outside of LADWP's control.

Variance Areas in DCA T13-1:

- Repair Plan: The repair plan for T13-1 includes pulling the above-ground lateral segments back into the correct alignments, repairing damaged segments of lateral piping, reconnecting and/or repairing the whiplines (where damaged), redeploying the whiplines to the correct alignments, and flushing the laterals and whiplines to remove debris. LADWP will also seek approval to complete long-term repairs, including construction of new partitions and/or grading where channeling and/or deposition have altered the slope and therefore the ability to meet the desired wetness. In addition, LADWP will try again to seek approval to construct a perimeter berm/road and/or rock wall to protect infrastructure into the future. It is anticipated that permitting will be challenging given cultural resource concerns in the area.

- Repair and Compliance Schedule: Soil conditions are very challenging for construction and repair within the portions of T13-1 with extremely soft soils of low bearing capacity. It is assumed that excavators on matts will be required for all activities, which could slow the pace at which repairs can be completed. It is estimated that infrastructure repairs will be completed by 2/28/2023. Upon completion of repairs, the laterals will be operated while the permitting and approvals for partition berms are finalized. Given the very challenging soil conditions in this DCA, it is estimated that partitions will be constructed outside of the dust season to allow for drying and construction. These long-term repairs will be complete by October 15, 2023, and the DCA will be compliant with Rule 433 by October 16, 2023 (Figure 12).

Variance Areas in DCAs T17-2 North and South:

- Repair Plan: The repair plan for T17-2 includes excavating each buried irrigation riser (approximately 63 risers), extending the riser above ground, and installing whiplines to improve distribution of water across the newly deposited sediment. Whiplines are specified in areas of significant new channeling and deposition (based on newly acquired LiDAR and imagery). A feasibility assessment is being completed to determine if Shallow Flood partition berms will improve compliance given the channeling that occurred during the flood. LADWP will again seek approval and permits to construct a perimeter rock wall and/or berm/road. It is anticipated that permitting will be challenging given cultural resource concerns in the area.

- Repair and Compliance Schedule: It is estimated the initial repairs and installation of new whiplines will be completed by 12/31/2022. Upon completion of the infrastructure repairs, the laterals will be operated to determine any additional improvements required to achieve compliance. Additional improvements may be needed given the change in grade/slope caused by the sedimentation. As described above, this could include partition berms or other features. These long-term repairs will be complete by October 15, 2023, and the DCA will be compliant with Rule 433 by October 16, 2023 (Figure 12).

Variance Areas in DCA T17-1:

- Repair Plan: The repair plan for T17-1 includes initial repairs to operate the facility and long-term improvements to address channeling within portions of the DCA area. This could include partition berms and other improvements to improve shallow flood wetness.

- Repair and Compliance Schedule: It is estimated the initial repairs to operate the SF area will be complete by 1/16/2023. Once the initial repairs are complete, the DCA will be operated to generate the maximum wetness feasible. However, it is anticipated that additional repairs and partition berms may be required to bring the entire DCA into full compliance with Rule 433. To minimize disturbance, grading, and berm work during the dust season, these long-term repairs are anticipated to be complete during the non-dust season summer timeframe. These long-term repairs will be complete by October 15, 2023, and the DCA will be compliant with Rule 433 by October 16, 2023 (Figure 12).

Figure 11. Timeline of Activities to Facilitate Repair due to Flash Flood

LADWP's response and planning for assessment and repair of the Shallow Flood facilitates has been swift, significant, and comprehensive. The timeline lays out the activities LADWP has completed to-date.

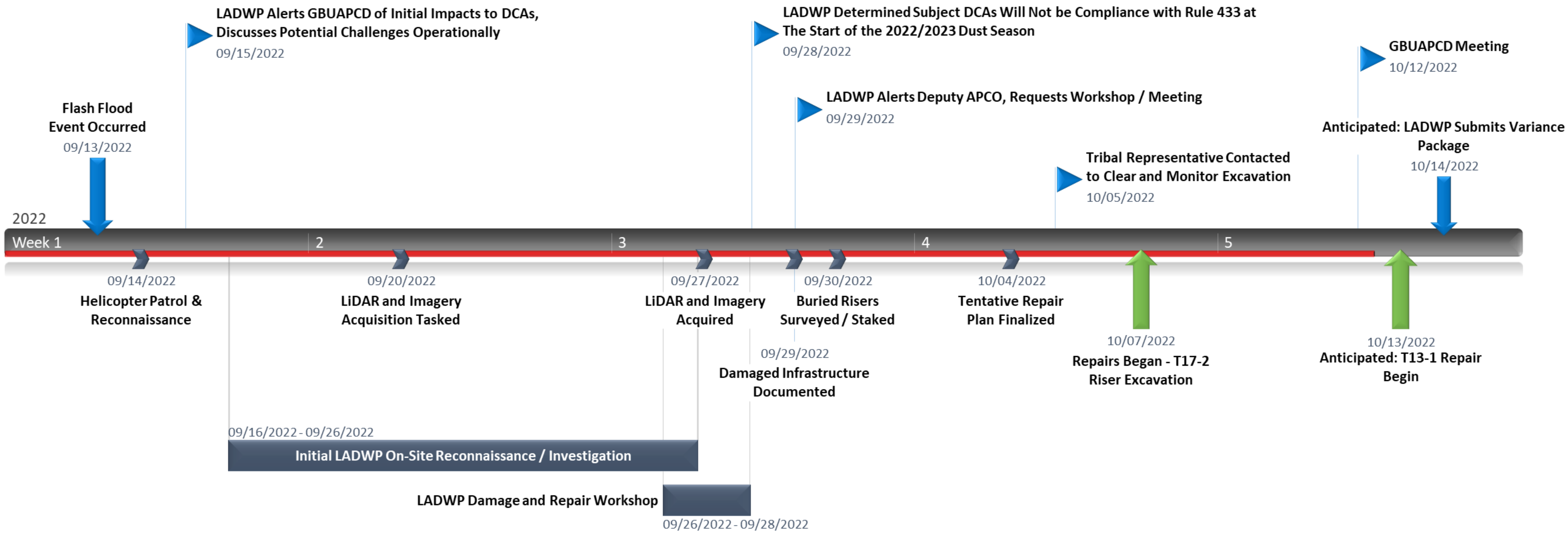


Figure 12. Anticipated Compliance and Repair Schedule

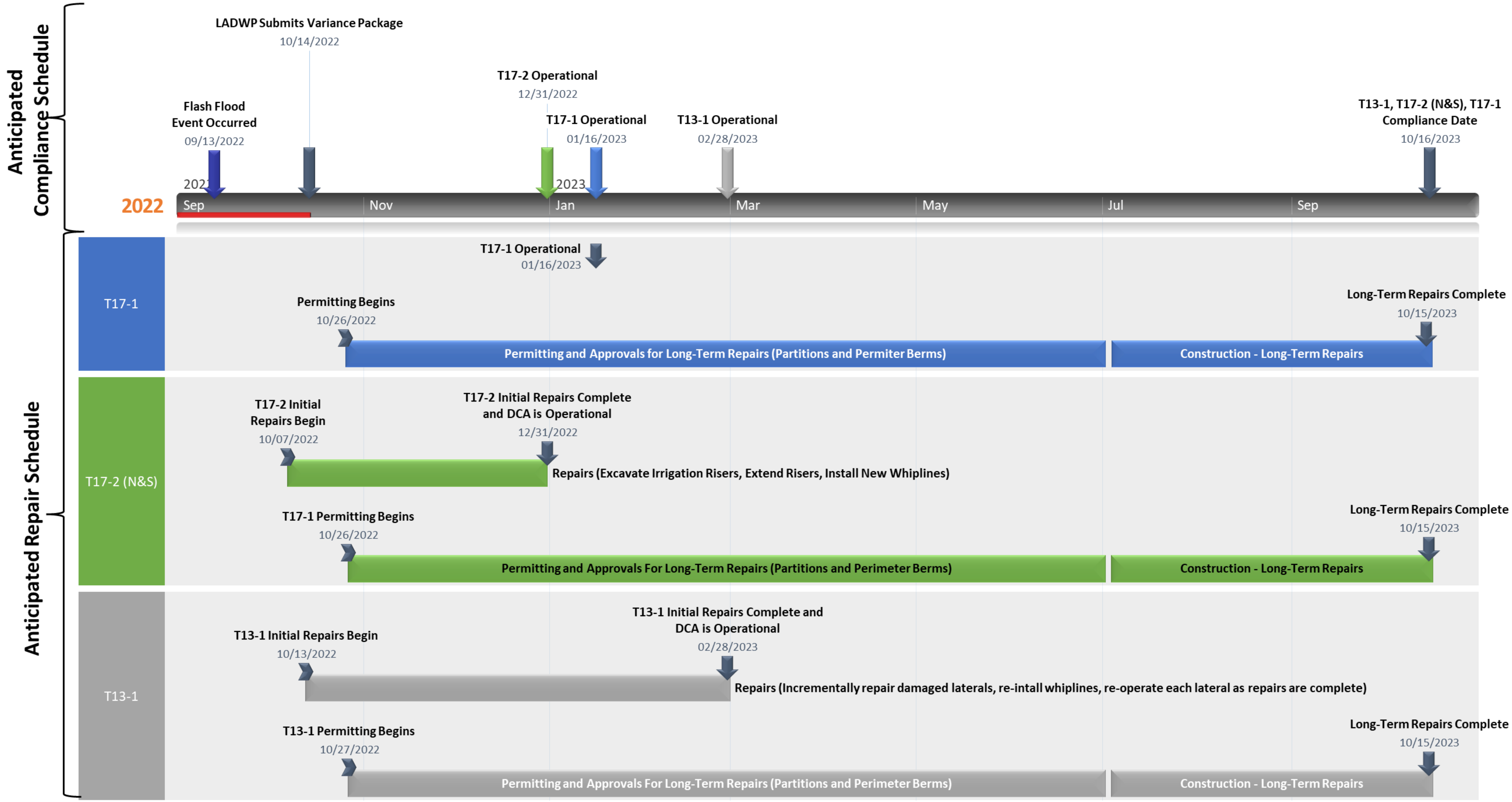


EXHIBIT 4. SUPPORTING INFORMATION REGARDING NO INTERFERENCE WITH AMBIENT AIR QUALITY STANDARD

SUPPORTING INFORMATION REGARDING NO INTERFERENCE WITH AMBIENT AIR QUALITY STANDARD

The applicable Federal attainment date in the 2016 State Implementation Plan (SIP) for the National Ambient Air Quality Standard (NAAQS) for particulate matter 10 microns in aerodynamic diameter or smaller, commonly referred to as PM_{10} was the end of calendar year 2017. GBUAPCD submitted a Reasonable Further Progress report in 2018, documenting progress toward attainment. Currently, GBUAPCD states that the Owens Valley Planning Area is not in attainment of the NAAQS for PM10. Although, the compliance schedule requested in the variance extends beyond the December 31, 2017 attainment date, LADWP believes that granting of the variance will not interfere with future attainment of the PM_{10} NAAQS for the following reasons:

- Variance Areas in T13-1: Over 63% of the DCA area (514.2 acres) will remain compliant and continue to be operated as Shallow Flood BACM (Table 1, Figure 13). In addition, approximately 96 acres of evenly distributed vegetation will be maintained during the repair period, preventing excess emissions (Figure 13). Importantly, to minimize dust emissions during the variance period, repairs to the laterals will be done sequentially, with the lower laterals being repaired first and then operated to incrementally increase wetness. Simultaneously, design will be completed to determine where partition berms may be required to improve wetness given the change in grade/slope as well as new channeling. Once the initial repairs are complete, the DCA will be operated to generate the maximum wetness feasible. However, partition berms will be required to bring the entire DCA into full compliance with Rule 433. To minimize disturbance and berm work during the dust season, repairs and construction of the partition berms is anticipated to be complete during the non-dust season summer timeframe.

- Variance Areas in T17-2 (North and South): Over 72% of the T17-2N DCA area (233.5 acres) and 56% (153.7 acres) of the T17-2S DCA will remain compliant and continue to be operated as Shallow Flood BACM (Table 1, Figure 13). Within the damaged Shallow Flood lateral areas, significant vegetation debris and non-erodible elements (rocks/boulders) were transported by the flood waters. These conditions cover approximately and act as a protective mat with significant roughness, reducing potential emissions during the repair period (Figure 13). As each riser is extended and repaired, installation of whiplines will be completed in portions of the DCA impacted by the flash flood to increase the uniformity of wetness given the change in grade and soil composition in the DCA. Simultaneous to these repairs, LADWP is evaluating the LiDAR topographic data to determine if berms/partitions are feasible or grading is required. It is anticipated that permitting, approvals, and a lease amendment will be needed for any berm partition work, grading, as well as the perimeter rock wall and/or berm. Once the initial repairs are complete, the DCA will be operated to generate the maximum wetness feasible. However, it is anticipated that additional repairs, grading, and partition berms may be required to bring the entire DCA into full compliance with Rule 433. To minimize disturbance and berm work during the dust season, repairs and construction of the partition berms is anticipated to be complete during the non-dust season summer timeframe.

- Variance Areas in T17-1. Over 63% of the T17-1 DCA area (328.2 acres) will remain compliant and continue to be operated as Shallow Flood BACM (Table 1, Figure 13). Once the initial repairs are complete, the DCA will be operated to generate the maximum wetness feasible. However, it is anticipated that additional repairs and partition berms may be required to bring the entire DCA into full compliance with Rule 433. To minimize disturbance and berm work during the dust season, repairs and construction of the partition berms and any grading is anticipated to be complete during the non-dust season summer timeframe.

Furthermore, if potential future violations occur due to the natural deposition of sediment from flood flows associated with this event, GBUAPCD could evaluate and potentially excluded those events under the Exceptional Events Rule (Code of Federal Regulations 50.14(c)(3)(iv)). This rule allows GBUAPCD to exclude data from high wind event days where natural, non-anthropogenic flood-deposited materials impact the air quality monitors. The concentrations measured on these high wind event days would not be considered when determining if the OVPA is in attainment of the PM10 NAAQS. GBUAPCD has successfully used this approach for the Coso Junction PM10 Planning Area, specifically excluding natural events due to deposition and subsequent emissions from flash flood deposited silts/sediment over several events spanning ~4 years.

Table 1. DCA Acreage Requested in Variance and Portions of the DCAs that will Remain Compliant.

DCA	Compliant Area (ac)	Variance Area (ac)	Total DCA Area (ac)	Portion of DCA Included in Variance (%)
T13-1	514.2	298.5	812.7	37%
T17-1	328.2	189.2	517.4	37%
T17-2N	233.5	90.8	324.3	28%
T17-2S	153.7	120	273.7	44%
Total	1,229.6	698.5	1,928.1	64%

Figure 13. Plan to Reduce Emissions During the Variance Period

LADWP plans to reduce excess emissions during the duration of the variance by maintaining/operation of the existing pond, maintaining existing vegetation, sequentially operating shallow flood laterals as they are repairs, and minimizing disturbance during repair work.

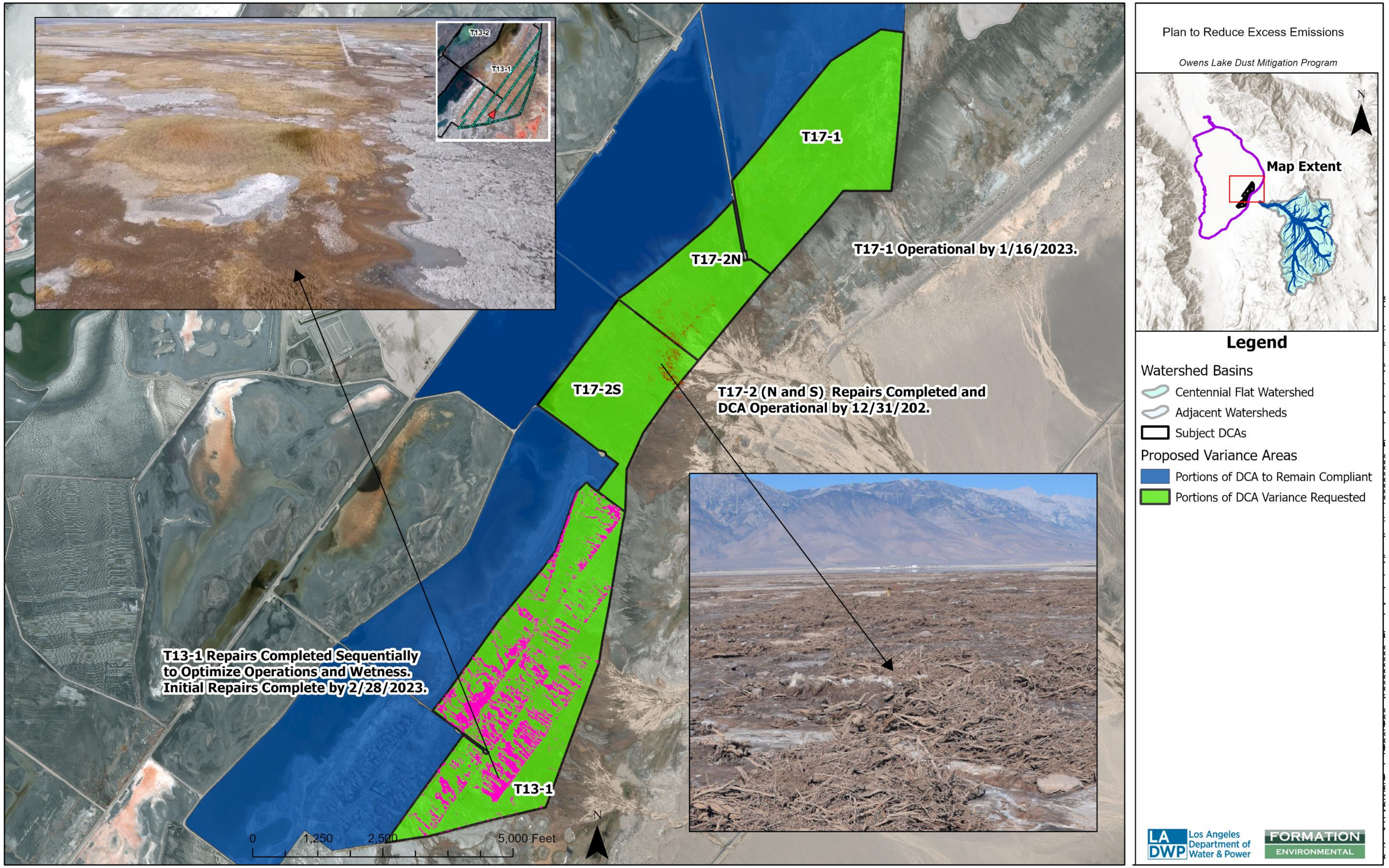


EXHIBIT 5. EMISSIONS MONITORING AND MINIMIZATION

Excess Emissions Minimization

LADWP is committed to meeting BACM compliance criteria in the Variance Areas as quickly as possible. During the period the variance is in effect, LADWP will control excess emissions to the maximum extent feasible. Measures include the following for each affected DCA:

- **Variance Areas in T13-1:** Excess emissions will be minimized by maintaining operations of the Shallow Flood pond and portions of the laterals within T13-1 (Table 1), representing 63% percent (514.2 acres) of the DCA. This means that only 37% (298.5 acres) of the DCA (Table 1) is requested in this variance petition. Within the area requested for variance, existing vegetation will be maintained and provide temporary control for portions of the DCA that require significant repairs. The area vegetated represents approximately 96 acres evenly distributed within the 289.5 acres requested in the variance (Figure 13). Importantly, repairs will be completed by the end of February 2023 and all laterals will be operated to increase surface wetness after repair. Specifically, shallow flood laterals will be repaired sequentially, with the lower laterals being repaired first and then operated to incrementally increase wetness and bring the DCA into compliance. LADWP believes that the plan will minimize excess emissions to the extent feasible for T13-1.

- **Variance Areas in T17-2 (North and South):** Excess emissions will be minimized by maintaining operations of the Shallow Flood pond portions of these DCAs. Specifically, compliance will be maintained within 233.5 acres of the 324.3-acre T17-2N DCA (representing 72% of the DCA area) and 153.7 acres of the 273.7 acres T17-2S DCA (representing 56% of the DCA area). LADWP will maintain the existing vegetation debris cover that was deposited in portions of the DCA during the flood event (Figure 13). The cover / debris acts as a mulch layer that is firmly embedded into the soil surface to protect portions of the DCA from excess emissions. Importantly, as risers are excavated and whiplines installation is complete for each lateral service area, the laterals will be sequentially operated to increase wetness. Repairs will be completed and the DCA will be operational by December 31, 2022, providing increased wetness to the portions of the DCA requested in this variance while the long-term repairs are permitted and completed. LADWP believes that the plan described here will minimize excess emissions to the extent feasible for T17-2 (North and South).

- **Variance Areas in T17-**1: Excess emissions will be minimized by maintaining operations of the Shallow Flood pond portion and lateral within T17-1 (Table 1), representing 63% percent (328.2 acres) of the DCA. This means that only 37% (189.2 acres) of the DCA (Table 1) is requested in this variance petition. DCA laterals within this portion of the DCA will be operated beginning 1/16/2022 to reduce excess emissions by increasing the soil wetness while permitting and repairs are completed on the damaged portion of the DCA.

- **Minimize disturbance during repairs.** Excess emissions will also be avoided by minimizing disturbance (to the extent feasible) during repairs. Specifically, LADWP will traverse the DCAs on marked pathways and not disturb more surface than necessary to implement the needed repairs. Areas will be accessed from the nearest existing roadway where it is safe to travel. Bucket drop heights will be minimized when digging to uncover buried laterals. Material will be carefully placed as horizontally as possible to minimize the height of potential stockpiles and ultimately backfilled into the excavation and compacted to minimize erodible material/spoil piles on the surface. Non-erodible elements placed by the flood will not be covered with excavated material unless necessary.

It should be noted that LADWP also evaluated the installation of temporary dust control measures to reduce excess emissions. However, temporary measures (e.g. sand fence and tillage) require significant time for permitting, lease agreements, and evaluation for impacts to habitat and cultural resources. Given the timeline, these measures were not considered feasible temporary measures for this variance petition.

TEMPORARY EMISSIONS MONITORING

LADWP plans to monitor the natural flash flood sediment deposits in the T17-1, T17-2 and T13-1 areas. Temporary monitoring may include the following techniques:

- Sand flux monitoring (SFM)
- Meteorological monitoring
- Visual monitoring

The SFM will be accomplished according to EPA Other Test Method 30. The number of SFM temporary locations will be determined per DCA based on the total acreage requested in this variance petition. Meteorological monitoring will be established at one location to provide hyperlocal information about the wind speed and wind direction that is affecting the exposed natural flash flood sediment deposits. Monitoring equipment will be removed and decommissioned when compliance is met.

References

Erlwein, T. 1998. Caltrans Hydrology Report on State Highway 190 in Inyo County From KP25.6 to KP37.0. South Owens Lake Drainage Improvements, 3/25/1998

Great Basin Unified Air Pollution Control District, Hearing Board. 2009. Findings and Order Granting Regular Variance From Requirements Set Forth in Governing Board Order: 080128-01. Variance Order – Docket No. GB09-06; Hearing Date September 25, 2009.

National Center for Atmospheric Research (NCAR). 2022. Developing an Improved Flood Prediction System. WRF-Hydro System. https://ral.ucar.edu/solutions/benefits/developing-an-improved-flood-prediction-system. Accessed October 12, 2022.

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Zhang, Jian, Kenneth Howard, Carrie Langston, Brian Kaney, Youcun Qi, Lin Tang, Heather Grams et al. "Multi-Radar Multi-Sensor (MRMS) quantitative precipitation estimation: Initial operating capabilities." Bulletin of the American Meteorological Society 97, no. 4 (2016): 621-638.

ATTACHMENT 1. EMERGENCY DECLARATION AND OTHER MEDIA COVERAGE

Governor Newsom Takes Action to Support Communities Recovering from Extreme Weather Events Across California

Published: Sep 16, 2022

SACRAMENTO – As communities across the state contend with the impacts of climate-driven extreme weather events this summer, Governor Gavin Newsom today signed emergency measures to support response and recovery efforts underway following Tropical Storm Kay, a severe June storm and several wildfires. The action comes on the heels of sweeping new measures the Governor signed into law today to tackle the climate crisis and protect communities.

Governor Newsom proclaimed a state of emergency for the counties of Imperial, Inyo, Los Angeles, Riverside and San Bernardino due to Kay, which brought heavy rain and winds to Southern California last week, causing debris flows, damaging homes and critical infrastructure and resulting in a fatality and widespread evacuations. The proclamation enables the counties to access resources under the California Disaster Assistance Act, directs Caltrans to formally request immediate assistance through the Federal Highway Administration's Emergency Relief Program, and supports impacted residents by easing access to unemployment benefits and waiving fees to replace documents such as driver's licenses and birth certificates.

The Governor also proclaimed a state of emergency for Plumas and Tehama counties following a June storm that caused flooding and debris flows, damaging roads and other infrastructure. The order directs Caltrans to formally request immediate assistance through the Federal Highway Administration's Emergency Relief Program.

Supporting ongoing recovery efforts in Mariposa County due to the Oak Fire and Siskiyou County due to the McKinney, Mill and other fires, the Governor signed two executive orders to expedite debris removal and cleanup of hazardous waste resulting from the fires.

The text of today's emergency proclamations and executive orders can be found below:

Tropical Storm Kay State of Emergency proclamation
Plumas and Tehama State of Emergency proclamation
Oak Fire cleanup executive order
McKinney and Mill fires cleanup executive order

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Important Information for the one-time Middle Class Tax Refund payment is now available. See the Middle Class Tax Refund page. ×

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STATE OF CALIFORNIA Franchise Tax Board File Pay Refund Forms

home / file / business / disaster codes

List of California disasters

Disaster Loss

Disaster loss deductions

List of disasters

Detailed list

Disaster Code	Incident Period	Disaster	County	Governor Declared	President Declared
136	September 2022	Fork, Barnes, & Mountain Fires	Madera, Modoc, Siskiyou	Yes	No
135	September 2022	Tropical Storm Kay	Imperial, Inyo, Los Angeles, Riverside, San Bernardino	Yes	No

Northern District Crews Fight Fires and Floods to Protect Aqueduct Infrastructure

On July 8, staff from the LADWP Bishop Construction yard responded to a mutual aid request from the California Department of Forestry and Fire Protection (CalFire) to help fight a fire that broke out in a small housing community and quickly moved towards LADWP property.

In total, LADWP sent six water tenders, a D6 bulldozer, a six-inch water pump and brought a light plant to aid Southern California Edison lineworkers in re-establishing power to the area. Once the fire was contained, our Bishop Construction crews continued to provide support to Cal Fire, the U.S. Forest Service and multiple local Fire Departments.

The following month, the Eastern Sierra experienced another natural disaster. Flash flooding caused by excessive rainfall hit hard the Eastern Sierra slopes and Owens Valley, causing road closures and potential damage to LADWP aqueduct infrastructure. Our Aqueduct and Reservoir Keepers and Construction crews from both the Bishop and Independence yards worked around the clock clearing debris and repairing access roads that were washed out or covered by mudslides.

Thank you to our employees who respond at all hours of the night during unexpected events. We honor your commitment to maintain our operations and safely deliver water and power to our customers.

Group photo by Chris Corsmeier

National Park Service

Death Valley

National Park
CA, NV

ALERTS IN EFFECT

DISMISS

PARK CLOSURES

No Park Access over Towne Pass (CA-190) from the West or Beatty/NV-374/Daylight Pass

Many roads are closed due to major flood damage. To enter the park, use CA-190 via Death Valley Junction from the east. Click 'more' for a map and detailed information.

more

+ 1 more non-emergency alert notifications...

Dismiss **View all alerts**

NPS.gov / Park Home / Learn About the Park / News / News Releases

NEWS RELEASE

Remnants of Hurricane Kay cause road closures

CA-190 and Badwater Road temporarily closed

On Saturday, Sept. 10, a park ranger took this photo of waterfalls in normally-dry Death Valley National Park. Badwater Road, south of Natural Bridge.
NPS

News Release Date: September 11, 2022

Subscribe | **What is RSS**

Contact: Abby Wines, 760-786-3221

DEATH VALLEY, Calif. – Storms fueled by the remnants of Hurricane Kay caused localized, heavy damage in Death Valley National Park on Saturday afternoon, September 10. California highway 190 (CA-190) is closed from CA-136 junction to Stovepipe Wells Village. Badwater Road is fully closed. Many other park roads are still closed from floods five weeks ago.

The flooding across Badwater Road was concentrated from Natural Bridge to Badwater Basin, mileposts 10-16. Park rangers received warnings about the storm's path about an hour in advance from the National Weather Service. Rangers warned people to leave the area. One RV was unable to leave until the National Park Service (NPS) road crew cleared a single administrative lane Sunday morning.

Also on Saturday afternoon, about 40 vehicles were blocked by active flooding CA-190 west of Towne Pass. At the same time, a tour bus got wheels stuck in soft sand while trying to turn around. The bus blocked both lanes of CA-190 for about an hour, east of Stovepipe Wells. Most vehicles were able to get around the bus on the shoulder, but a semi truck and an RV had to wait.

CA-190 has at least once section of missing pavement across both lanes on the west side of Towne Pass. Caltrans has not provided an estimate for when the road segment will reopen.

For the status of CA-190, check **quickmap.dot.ca.gov**. For overall information on all roads in Death Valley National Park, go to **nps.gov/deva/planyourvisit/conditions.htm**.

Tags: hurricane kay | flash flood | flash flooding | deva deluge 2022

0:00 / 0:14

Open Transcript

DURATION: 14.414 seconds

Waterfalls south of Natural Bridge on Badwater Road 2022-09-10 from recent rains.

Flash flooding on September 10, 2022 caused extensive pavement damage on CA-190.
CA-190 between Panamint Valley Road and Towne Pass
NPS

Left image

Waterfalls south of Natural Bridge on Badwater Road.

Credit: NPS/ M.Gallegos

Right image

After the rain.

Credit: NPS/ A. Wines

Last updated: September 13, 2022

An official form of the United States government. Provided by **Touchpoints**

GB22-01 - Interim Variance
Staff Report

BEFORE THE HEARING BOARD

OF THE

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

VARIANCE REQUEST Petitioner: City of Los Angeles Department of Water & Power 111 North Hope Street, Room 1050 Los Angeles, California 90012 Request Received: October 14, 2022 Facility Location: Owens Lake Dust Mitigation Program 111 Sulfate Road, Keeler, CA 93530	Docket Number: GB22-01 **SUMMARY REPORT AND STAFF RECOMMENDATION FOR INTERIM VARIANCE PETITION FOR OWENS LAKE** Hearing Date: November 2, 2022

SUMMARY

The City of Los Angeles Department of Water and Power (Petitioner) filed an interim and regular variance petition on October 14, 2022. The Petitioner's request is seeking relief from the requirements of Great Basin Unified Air Pollution Control District (District) Governing Board Order #160413-01, District Rule 433, and District Notice to Comply 2002 for portions of the T13-1, T13-1 Addition, T17-1, T17-2 North and T17-2 South Dust Control Areas of the Owens Lake Dust Mitigation Project. These areas were subject to flash flooding due to rainfall events that occurred in August and September 2022. The resulting flooding, sediment deposition, and erosion damaged infrastructure such that the Petitioner has indicated the areas are, or may be, noncompliant with requirements for Shallow Flooding Best Available Control Measure or Dynamic Water Management provisions as required under District Board Order #160413-01 and District Rule 433 until the Petitioner can complete repairs in the areas. The District supports the Petitioner's request for an interim variance. If granted, the interim variance being considered by the Hearing Board will relieve the Petitioner from specified compliance requirements until the hearing for the regular variance, which is currently scheduled for November 16, 2022.

FACTS

As background, the Petitioner is required by law to control emissions of particulate matter from the Owens Lake bed caused by its diversion of water from the Owens River and other tributaries to the Los Angeles Aqueduct. District Board Order #160413-01 and District Rule 433 require the Petitioner to implement approved Best Available Control Measures (BACM) as the primary control strategy to reduce dust emissions on Owens Lake in areas where the District has ordered controls. Shallow Flooding is one of the approved BACM and has specific wetness requirements that must be met and maintained from October 16 to through June 30 of each year. To meet the wetness requirements for Shallow Flooding BACM, the Petitioner utilizes several different methods to apply and evenly distribute water across a dust control area. Some dust control areas utilize large ponds that are filled from pipelines, other areas utilize long arrays of perforated whip lines and other areas use sprinklers. An area may utilize more than one method of water application to meet the requirements.

Dynamic Water Management is an operational modification to BACM Shallow Flooding that allows delayed start dates and/or earlier end dates required for shallow flooding in specific areas that have historically had low PM10 emissions within the modified time periods. When an area utilizes the provisions of Dynamic Water Management, and has a delayed start or earlier end date, sand flux monitoring is required in that area. If the area becomes emissive, the area may be required to be reflooded. Several of the Dust Control Areas included in the variance request are eligible Fall Dynamic Water Management Areas (see Exhibit 1).

Additionally, on April 28, 2022, the District issued Notice to Comply 2002 to the Petitioner regarding failure to meet BACM Shallow Flooding requirements in several dust control areas including T13-1, which is an area included in the variance request. On May 31, 2022, in response to the Notice to Comply, the Petitioner provided a plan for corrective action that included maintenance activities to resolve the noncompliance issues by October 16, 2022.

As detailed in the variance petition, rainfall events that occurred in August and September 2022, resulted in flooding, sediment deposition, and erosion that damaged infrastructure in portions of the T13-1, T13-1 Addition, T17-1, T17-2 North and T17-2 South Dust Control Areas of the Owens Lake Dust Mitigation Project (Exhibit 1) such that the Petitioner has indicated the areas are, or may be, noncompliant with requirements for Shallow Flooding Best Available Control Measure and/or Dynamic Water Management provisions as required under District Board Order #160413-01, District Rule 433 and corrective actions issued under Notice to Comply 2002 for T13-1 until the Petitioner can complete repairs in the areas.

<u>DISCUSSION</u>

California Health and Safety Code (CH&SC) § 42352, requires that no variance shall be granted unless the Petitioner has presented sufficient evidence that the hearing board can make the required findings. An abbreviated list of the required findings is provided below:

(1) That the petitioner for a variance is, or will be, in violation of any rule, regulation, or order of the District.

(2) Due to conditions beyond the reasonable control of the petitioner, requiring immediate compliance would impose an unreasonable burden upon an essential public service.

(3) That the closing would be without a corresponding benefit in reducing air contaminants.

(4) That the applicant for the variance has considered curtailing operations of the source in lieu of obtaining a variance.

(5) During the period the variance is in effect, that the applicant will reduce excess emissions to the maximum extent feasible.

(6) During the period the variance is in effect, that the applicant will monitor or otherwise quantify emission levels from the source, if requested to do so by the district, and report these emission levels to the district pursuant to a schedule established by the district.

Although flash flood events occur regularly in the area surrounding Owens Lake, the District recognizes that the recent events have resulted in damage to infrastructure that impacted the Petitioner's ability to meet compliance with existing District rules and orders. The deposition of material from these events has the potential to be emissive and these emissions, from both within and outside the ordered dust control areas, may impact public health as well as cause exceedances of federal and state air quality standards. The Owens Lake Dust Mitigation Program is not a typical facility, and the "facility" is not able to curtail operations. For these reasons, in addition to the Petitioner completing the repairs as expeditiously as possible, the District requests that the Petitioner take steps to reduce excess emissions to the maximum extent feasible and monitor emissions.

The District finds that the Petitioner has presented sufficient evidence to make the required findings to grant an interim variance. In the event the Petitioner is able to meet compliance due to ongoing repair efforts and does not need an interim variance for all the requested areas, the Petitioner may present updated information at the hearing.

STAFF RECOMMENDATION

District staff finds the Petitioner is eligible for an interim variance under California Health and Safety Code (CH&SC) § 42352. District staff recommends the following actions by the Hearing Board:

1. Determine the findings required by CH&SC Section 42352 to issue an interim variance for requested dust control areas. If the Petitioner wishes to modify the areas requested for the interim variance, based on updated information, the Petitioner may do so at the hearing.
2. Require as approval of the interim variance the following conditions:

a. The Petitioner shall reduce excess emission to the maximum extent feasible across the entire dust control area where the variance has been granted.

b. The Petitioner shall monitor emissions utilizing the approved sand flux monitoring protocol as provided in the 2016 SIP. The number of sand flux monitoring sites that should be installed within each variance area is provided below, with at least one of the sites located within the recent flash flood deposits and the remaining site(s) evenly distributed across the variance portion of each dust control areas. The Petitioner should install and begin full operation of the sand flux monitoring sites, including transmission of data to the District through the existing procedures, no later than Wednesday November 9, 2022. These sites should be operated and maintained through the variance period.

Variance Area Sand Flux Monitoring		
Dust Control Area	Variance Area (acres)	Number of Sand Flux Monitors to be installed
T17-1	189.2	2
T17-2 N	90.8	2
T17-2 S	120.0	2
T13-1 & T13-1 Addition	298.5	3

3. Proceed with the scheduled hearing to consider the Petitioner's request for a regular variance on November 16, 2022. Request that the Petitioner provide the following information to the Hearing Board and District Staff five business days prior the regular variance hearing:

a. A written update detailing completed maintenance activities, the status of infrastructure repairs, and any updates regarding the ability to meet compliance requirements for each dust control area.

b. A detailed schedule for each area that includes increments of progress and specific dates when initial repairs can be completed to meet compliance requirements.

c. A plan to reduce emissions in any area where a variance is granted. This may include, but is not limited to, keeping adjacent ponds full, working sequentially from low elevation to high elevation turning on the water as repairs proceed, and utilizing other resources to prevent emissions from the variance areas.

Prepared by: [signature] October 31, 2022
Ann Logan — Date
Deputy Air Pollution Control Officer

Approved by: [signature] 20221031
Phillip L. Kiddoo — Date
Air Pollution Control Officer

LIST OF DISTRICT EXHIBITS

EXHIBIT 1 – Map

EXHIBIT 2 – District Board Order #160413-01

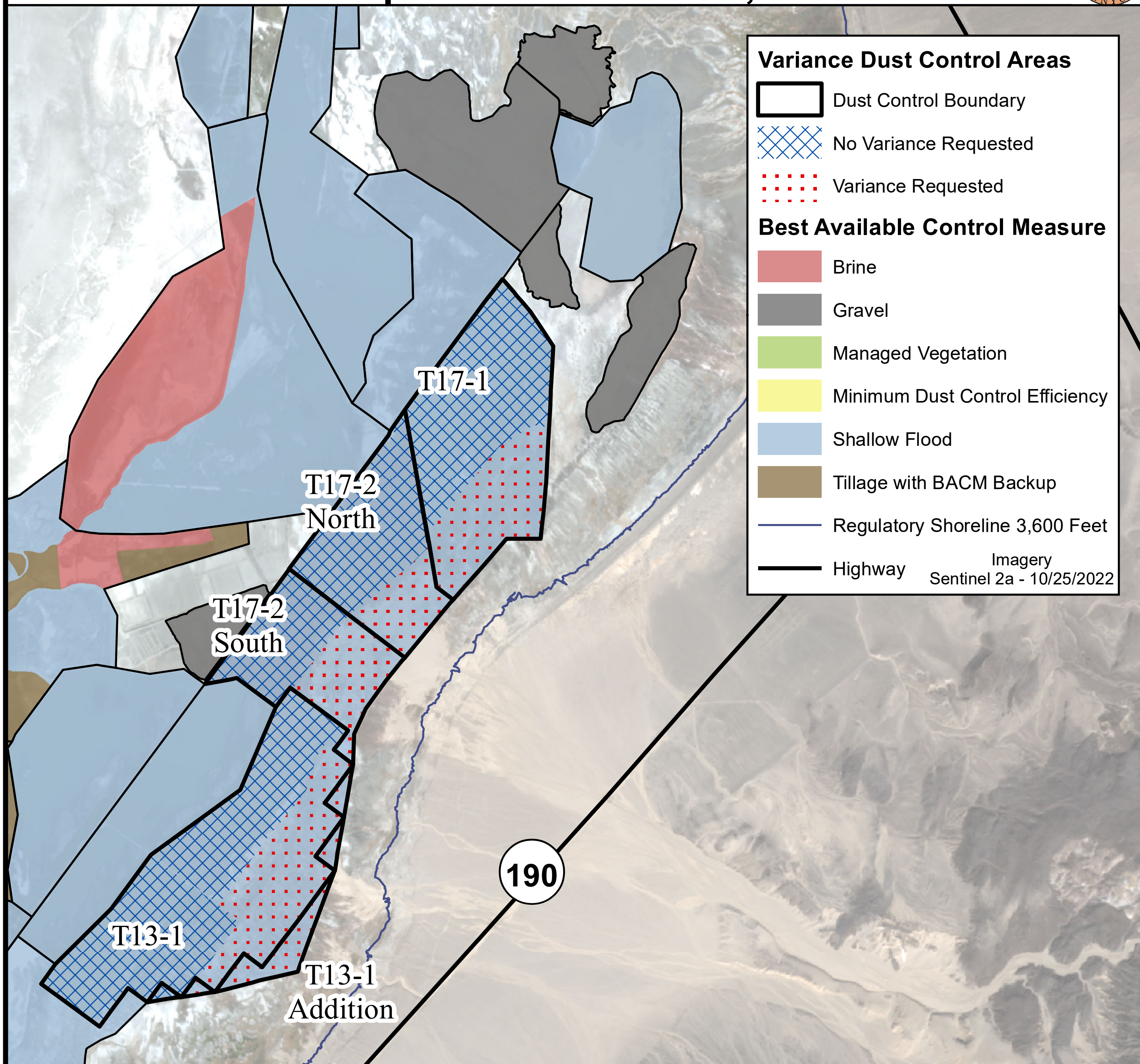
EXHIBIT 3 – District Rule 433

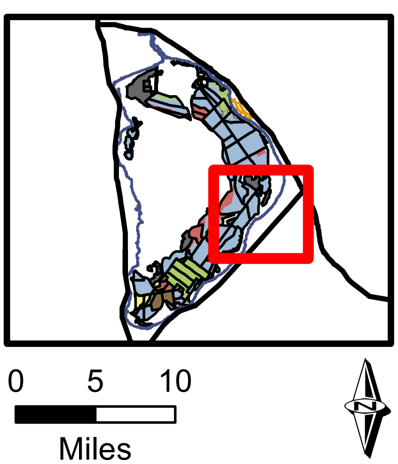
EXHIBIT 4 - Notice to Comply 2002

GB22-01 - Interim Variance Staff Report - Exhibit 1

Great Basin Unified Air Pollution Control District

Variance Areas Requested October 14, 2022





Dust Control Area	Eligible for Fall Dynamic Management Area	Acres Requested for Variance	Total Dust Control Acres	Percent of Dust Control Area Requested for Variance
T17-1	Yes - Starts Jan. 16	189.2	517.4	37%
T17-2 North	Not Eligible	90.8	324.3	28%
T17-2 South	Yes - Starts Jan. 16	120	273.7	44%
T13-1 & T13-1 Addition	Mixed - LADWP not operating under DWM Plan	298.5	812.7	37%
Total	-	*698.5*	*1928.1*	*36%*

GB22-01 - Interim Variance Staff Report - Exhibit 2

BOARD ORDER #160413-01
REQUIRING THE CITY OF LOS ANGELES TO UNDERTAKE MEASURES TO CONTROL PM_{10} EMISSIONS FROM THE DRIED BED OF OWENS LAKE

To comply with the federal Clean Air Act and state law for the control of particulate matter 10 microns in size or less (PM_{10}) emitted from the dried bed of Owens Lake, the Governing Board of the Great Basin Unified Air Pollution Control District (District) orders the City of Los Angeles (City) as follows:

PREAMBLE

A. WHEREAS the federal Clean Air Act, state law and orders duly adopted by the District, the 1998 Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (1998 SIP) dated November 16, 1998, the 2003 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (2003 SIP) dated November 13, 2003, the 2008 Revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (2008 SIP), 2013 Amendment to the Owens Valley PM10 SIP dated September 16, 2013 (2013 SIP Amendment) require the City to implement a series of measures and actions to reduce particulate emissions from the Owens Lake bed by a minimum of five percent per year such that the Owens Valley Planning Area (OVPA) will attain and maintain the federal 24-hour National Ambient Air Quality Standards (NAAQS) for PM_{10} by the statutory deadlines, and to achieve compliance with the California Ambient Air Quality Standard (CAAQS) for PM_{10};

B. WHEREAS, the District is required by law to maintain its discretion to protect the environment, public health and safety, this Order is intended to fulfill those duties without improperly constraining that lawful exercise of discretion;

C. WHEREAS, in 2008, the District adopted Governing Board Order (Board Order) #080128-01 and submitted the Board Order to the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA) as part of the 2008 SIP (2008 SIP Order); and CARB approved the 2008 SIP and Order and submitted them to the EPA for approval, which is pending before EPA; and in addition, the provisions of the 2008 SIP Order were approved by

EPA as part of the Coso Junction Maintenance Plan in 2010 (75 Fed. Reg. 54031 [September 3, 2010]);

D. WHEREAS, in 2013, the District amended the 2008 SIP Order by adopting Board Order #130916-01 (2013 SIP Amendment) to extend certain deadlines and incorporate provisions for the modification of PM_{10} control projects known as the "Phase 7 Project" and the "Keeler Dunes Project" as discussed in the 2016 OVPA SIP Chapter 6 that are necessary to meet the air quality standards, and submitted this amendment to CARB and EPA for approval, which is pending;

E. WHEREAS, through modeling and monitoring requirements set forth in adopted SIPs and SIP amendments, the District has determined that additional measures and actions will be required to continue to reduce PM_{10} emissions in the OVPA such that the OVPA will attain and maintain the federal 24-hour NAAQS for PM_{10} by the statutory deadlines, and to meet the CAAQS at residences within communities zoned for residential use in the Inyo County General Plan Use Diagrams in accordance with District Rule 401.D (State Standard);

F. WHEREAS, in 2011 a dispute arose between the District and the City regarding the District's requirements for the City to control dust from additional areas at Owens Lake beyond those areas identified in the 2008 SIP, followed by a series of appeals to the California Air Resources Board under Health & Safety Code Section 42316;

G. WHEREAS, those disputes were fully and finally resolved by a Stipulated Judgment entered in favor of the District on December 30, 2014 in the case entitled *City of Los Angeles, et al. v California Air Resources Board*, Sacramento Superior Court, Case No. 34-2013-80001451-CU-WM-GDS (Stipulated Judgment). Under the Stipulated Judgment, the City agreed in part to operate and maintain existing dust control measures, and implement additional dust control measures by December 31, 2017, and the District agreed, in part, to revise the 2008 SIP as provided in the Stipulated Judgment;

H. WHEREAS, the purpose and intention of this Board Order is to revise and supersede the 2008 SIP Order with the applicable provisions of Board Order #080128-01 and Board Order #130916-01 (2013 SIP Amendment). This Board Order (2016 SIP Order) will be enforceable upon adoption by the District as state law, and will be submitted to the CARB and EPA for their review and approval as a proposed revision to the Owens Valley PM_{10} Planning Area Demonstration of Attainment State Implementation Plan (2016 SIP);

I. WHEREAS, in consideration of the District's continuing duties under federal and state law, including but not limited to the Clean Air Act and California Health and Safety Code, to control PM_{10} emissions from the Owens Lake bed without interruption, the District intends, if this Order is stayed or disapproved, that Board Orders #080128-01 and #130916-01, and the Stipulated Judgment shall continue to be in effect, so that at all times there will be continuous control of these emissions;

J. WHEREAS, the District thereby intends that if this Order is stayed due to a legal challenge, including but not limited to a challenge to this Order under Health & Safety Code Section 42316, to the 2016 SIP, or to the Environmental Impact Report for this SIP, or if this Order is disapproved by CARB, the District will revert to enforce the terms of Board Orders #080128-01 and #130916-01, and the Stipulated Judgment which shall continue to be in effect and shall remain in full force for the duration of any stay or, in the case of disapproval, unless and until another Order is issued by this Board; and

K. WHEREAS, pursuant to Section 172(e) of the Clean Air Act, to prevent the deterioration of air quality due to dismantling or "backsliding" on control measures that have already been implemented before any such stay or disapproval, the District intends that the City shall continue to operate and maintain all control measures that are operational or implemented, or were in the process of transitioning to a different control measure at the time of any such stay or disapproval without interruption, unless and until a further Order of the District allows for such interruption;

THEREFORE, IT IS HEREBY ORDERED AS FOLLOWS:

ORDER

OWENS LAKE BED PM_{10} CONTROL MEASURE AREAS

1. Existing PM_{10} controls – At all times starting from January 1, 2016, the City shall continue to operate and maintain the 45.0 square miles of existing controls for PM_{10} as

described in this Paragraph in the areas on the Owens Lake bed within the Dust Control Areas (DCA) delineated in Exhibit 1:

A. On the 29.8 square miles ordered by Board Order #031113-01 (2003 SIP) within the 2003 DCA, the City shall continue to operate and maintain District-approved Best Available Control Measures (BACM) as described in Paragraphs 9 through 12.

B. On the 12.7 square miles ordered by Board Order #080128-01 (2008 SIP) within the 2006 DCA, the City shall continue to operate and maintain District-approved BACM as described in Paragraphs 9 through 12, except as follows:

i. On the T1A-1 area consisting of 0.39 square miles within the 12.7 mile 2006 DCA as shown in Exhibit 1, the City shall continue to operate and maintain sand fences in the natural occurring partially vegetated and seasonally wet T1A-1 area as required to comply with the minimum dust control efficiency (MDCE) performance standards set forth in the 2008 SIP Order and shown in Exhibit 2, and;

ii. For the "Phase 7a" area consisting of 3.1 square miles within the 12.7 mile 2006 DCA as shown in Exhibit 1, the City shall install and fully operate all BACM by December 31, 2015, except for any Managed Vegetation BACM within this area, for which the City shall install all infrastructure and plant materials by December 31, 2015, and achieve fully-compliant Managed Vegetation BACM as set forth in Paragraph 10 by December 31, 2017. This Paragraph is further subject to the exception for Phase 7b areas set forth in Paragraph 2.

C. On 0.5 square-miles on the south end of Owens Lake known as the "Channel Area," the City shall continue to operate and maintain dust controls using application of water to enhance existing vegetation coverage as required to comply with the MDCE performance standards set forth in the 2008 SIP Order and shown in Exhibit 2.

D. On the 2.0 square miles known as the Phase 8 area identified in Board Order #110317-01, the City shall continue to operate and maintain Gravel Blanket BACM as set forth in Paragraph 11.

2. <u>Phase 7b Cultural Resource Areas</u>

A. For the Phase 7a project area delineated in Exhibit 1, certain subareas contain cultural resources that qualify the subarea as an "Eligible Cultural Resource Areas" under the provision of the California Register of Historic Resources. These areas are designated as "Phase 7b" areas and were removed from the Phase 7a area for controls by Board Order #130916-01.

B. The District Board will decide at a later date whether PM_{10} controls are required in the Phase 7b areas in order to attain and maintain the NAAQS and State Standard after following the process described in Board Order #130916-01, and if necessary will issue a separate Board Order(s) for controls in those areas.

3. <u>Phase 9/10 Project to Implement 2011 and 2012 Supplemental Control Requirement Determinations</u>

A. In addition to the 45.0 square miles of controls set forth in Paragraph 1, by December 31, 2017, the City shall construct and permanently operate a PM_{10} control project by selecting and installing BACM on 3.62 square miles of lakebed areas identified in the 2011 Supplemental Control Requirements Determination (SCRD) and 2012 SCRD (collectively referred to as the "Phase 9/10" areas). With the exception of Eligible Cultural Resource Areas removed from the Phase 7a area under the provisions set forth in Paragraph 2, the Phase 9/10 areas shall bring the total area of the City's dust controls on the Owens Lake bed to 48.6 square miles. The construction deadline set forth in this paragraph is subject to the Force Majeure and Stipulated Penalties provisions set forth in Paragraphs 16 and 17.

B. The City may submit an application to the District's Air Pollution Control Officer (APCO) to approve modifications to the City's proposed Phase 9/10 project or measures on certain areas that are determined to contain significant cultural resources. The District shall consider and decide the City's application under the procedures contained in the 2013 Stipulated Abatement Order #130819-01.

C. The Phase 9/10 project will use dust control measures that are waterless or "water neutral" by offsetting any new or increased water use with water savings elsewhere on the lakebed.

4. Minor adjustments to PM_{10} control area boundaries – Upon written request by the City to the District and written approval by the District's APCO, minor adjustments may be made to the interior and exterior boundaries of the Phase 9/10 project area to avoid impacts to existing resources or features, or for constructability reasons, which approval shall not be unreasonably withheld. The City shall demonstrate by District-approved modeling that such adjustments do not have an impact on the ability of the Phase 9/10 area to meet the PM_{10} control performance requirements.

PM_{10} CONTROL MEASURES

5. The City shall implement BACM PM_{10} control measures as set forth in this Order and as described below in Paragraphs 9 through 11, or where allowed by the District, the MDCE BACM PM_{10} control measures described in Paragraph 12.

6. All PM_{10} control measures within the 12.7 square mile 2006 Supplemental DCA identified in Paragraph 1.B shall be designed, constructed, installed, operated and maintained by the City to achieve at least the initial target shown in Exhibit 2. MDCEs are the actual dust control measures control efficiencies required to meet the PM_{10} NAAQS, based on data collected during the four-year period between July 2002 and June 2006.

7. To complete implementation of a specified control measure by a date as required by this Order means that the control measure shall be constructed, installed, operated and maintained without interruption, so as to comply with the performance standards for the specified control measure no later than 5:00 p.m. on the required date.

CONTINGENCY PM_{10} CONTROL MEASURES

8. Additional BACM Contingency Measures to meet National Ambient Air Quality Standards (Clean Air Act Section 172(c)(9), 42 U.S.C. § 7502(c)(9).)

A. To provide the emission reductions necessary to meet the NAAQS and State Standard in the OVPA, the APCO may order the City on or any time after January 1, 2016 to implement BACM PM_{10} control measures on additional areas on the dried Owens Lake bed from those implemented under Paragraphs 1-3 of this order (BACM Contingency Measures). The City may be ordered to implement BACM Contingency Measures such that the total area where the City shall implement BACM PM_{10} controls is up to 53.4 square miles, and the City shall comply with those orders without appeal. These control areas need not be contiguous.

B. The District will not order the City to implement mitigation measures on additional areas on the lakebed beyond the total area of 53.4 square miles under Health & Safety Code Section 42316 or any other law, to control windblown dust emissions (including PM_{10}, $PM_{2.5}$ or any speciated components or products of PM). The provisions in this paragraph do not apply to fee orders issued to the City under Health & Safety Code Section 42316, or any orders for areas that are not on the dried Owens Lake bed.

C. At least once in every calendar year, the APCO will make a determination as to whether BACM Contingency Measures are to be ordered. Any BACM Contingency Measure orders shall be based on evidence presented to the APCO that the area considered for such order has caused or contributed to an exceedance of the NAAQS or State Standard, as described in Attachment B, the “2016 Owens Valley Planning Area Additional BACM Contingency Measures Determination Procedure.”

D. Source areas that cause or contribute to a monitored or modeled exceedance of the NAAQS or State Standard may be new source areas, or may be areas with existing dust controls. For emissions from areas with existing dust controls, the City will have the choice of increasing the controls in the existing dust control areas or controlling other contributing sources that will result in lowering the monitored impact below the NAAQS or State Standard, if such areas exist. If the City chooses to increase the controls in existing areas, it shall prepare and submit a written application to the APCO that contains District-approved modeling which demonstrates that the monitored impact can be reduced below the NAAQS by increasing the controls in existing dust control areas. The APCO has sole discretion whether to approve or disapprove the application.

E. The BACM Contingency Measures shall be limited to the Owens Lake bed below the Regulatory Shoreline elevation of 3,600.00 feet above mean sea level (amsl) and above the natural brine pool ordinary high water elevation of 3,553.55 feet amsl.

F. The BACM Contingency Measures areas will be controlled with waterless or water-neutral dust control measures by offsetting any new or increased water use with water savings elsewhere on the lakebed. The City is solely responsible for securing all permissions and authorizations necessary for those water savings. Failure or inability to secure such permissions and authorizations shall not relieve the City from its obligation to timely install and operate the ordered Contingency Measures. This paragraph is subject to the provisions of Paragraph 16 if they are applicable.

G. The implementation of BACM Contingency Measures will be considered contingency measures under Section 172(c)(9) of the federal Clean Air Act. Although the City may provide comment on a proposed BACM Contingency Measures order by the APCO, the City shall not appeal or contest the APCO's order for dust controls included in the combined 53.4 square miles now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

H. All BACM Contingency Measures shall be installed by the City and be operational within three years of the date that the APCO orders the City to implement them, except that if the City selects the use of BACM Managed Vegetation in Paragraph 10 for any of the areas ordered for BACM Contingency Measures, the City shall have all infrastructure and plants in place within three years, but will be allowed an additional two years to achieve full vegetation-cover compliance as set forth in Paragraph 10. The implementation deadline set forth in this paragraph is subject to the Force Majeure and Stipulated Penalties provisions set forth in Paragraphs 16 and 17. The City shall be solely responsible for all CEQA compliance, and to the extent joint documents are prepared under CEQA and NEPA, for CEQA/NEPA compliance, and other lease/permit requirements associated with any Contingency Measure projects.

I. Within 60 days of the date that the APCO orders the City to implement the BACM Contingency Measures, the City shall prepare and submit for the APCO's consideration and written approval, which approval shall not be unreasonably withheld, a Remedial Action Plan (RAP) that specifies the type and location of BACM to be installed and provides for the full and timely completion of those measures. The plan shall contain intermediate milestones specifying the completion dates for CEQA/NEPA compliance, construction bid award and control measure compliance.

J. Cultural and biological resource protection and mitigation shall be incorporated to the extent feasible as required by law into the design of Contingency Measure control areas.

PM_{10} CONTROL MEASURES

9. BACM Shallow Flooding

A. The "Shallow Flooding" PM_{10} control measure will apply water to the surface of those areas of the lake bed where Shallow Flooding is used as a PM_{10} control measure. Water shall be applied in amounts and by means sufficient to achieve the performance standards set forth in Paragraphs 9.B through 9.G below. The dates by which Shallow Flooding areas are to comply with these performance standards may be modified by the Dynamic Water Management provisions set forth in Paragraph 9.F.

B. For all Shallow Flooding areas except those within the 2006 DCA as referenced in Paragraph 1.B:

i. At least 75 percent of each square mile designated as BACM Shallow Flooding areas shall continuously consist of standing water or surface-saturated soil, substantially evenly distributed for the period commencing on October 16 of each year, and ending on May 15 of the next year. For these Shallow Flood dust control areas, 75 percent of each entire contiguous area shall consist of substantially evenly distributed standing water or surface-saturated soil.

ii. Beginning May 16 and through May 31 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 70 percent.

iii. Beginning June 1 and through June 15 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 65 percent.

iv. Beginning June 16 and through June 30 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 60 percent.

v. If for any Shallow Flooding area, the percent of areal wetness cover in the periods specified in Paragraphs 9.B.ii, iii, and iv, above, is below the minimum percentages specified for each BACM Shallow Flood area based on satellite imagery, and there were no monitored or modeled exceedances of the NAAQS at or above elevation 3,600 feet above mean sea level (Regulatory Shoreline), that area will be deemed to be in compliance, if the City demonstrates in writing and the APCO reasonably determines in writing that maximum water delivery flows were maintained throughout the applicable period.

C. For Shallow Flooding areas within the 12.7 square-mile 2006 DCA referenced in in Paragraph 1.B:

i. The percentage of each area that must have substantially evenly distributed standing water or surface-saturated soil shall be based on the Shallow

Flood Control Efficiency Curve (SFCE Curve) attached as Exhibit 3 to achieve the control efficiency levels in the MDCE Map (Exhibit 2).

ii. For only those Shallow Flooding areas with control efficiencies of 99 percent or more:

a. Beginning May 16 and through May 31 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 70 percent.

b. Beginning June 1 and through June 15 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 65 percent.

c. Beginning June 16 and through June 30 of every year, Shallow Flooding areal wetness cover may be reduced to a minimum of 60 percent.

d. If for any Shallow Flooding area, the percent of areal wetness cover in the periods specified in Paragraph 9.B.ii, iii and iv, above, is below the minimum percentages specified for each shallow flood area based on the air quality model for the analysis period, and there were no monitored or modeled exceedances of the NAAQS at or above the Regulatory Shoreline, that area will be deemed to be in compliance if the City demonstrates in writing and the APCO reasonably determines in writing that maximum water delivery flows were maintained throughout the applicable period.

D. Tillage With Shallow Flood BACM-Backup

i. The City may implement or transition BACM Shallow Flood areas to "Tillage with Shallow Flood BACM Back-up (TWB^2)," which shall consist of (1) soil tilling within all or portions of Shallow Flood BACM PM_{10} control areas (TWB^2 Areas), and (2) the installation of all necessary shallow flood infrastructure so that the TWB^2 Areas can be shallow-flooded if ordered by the APCO as provided in Paragraph 9.D.v below. The City shall at all times operate and maintain all TWB^2 areas so that they do not cause or contribute to exceedances of the NAAQS or State Standard.

ii. The City shall have the sole responsibility to obtain all required approvals and permits required by law for TWB^2. The District will support the City's efforts to obtain these approvals and permits in compliance with the law.

iii. The City's selection and implementation of TWB^2 shall comply with the procedures in Attachment A, Stipulated Judgment Attachment B, "Protocol for Operation and Maintenance of Owens Lake Tillage with BACM Backup" (TWB^2 Operations Protocol). The TWB^2 Operations Protocol shall address site selection, site dry-down, and measures to prevent untilled drying surfaces from becoming emissive during dry-down, tilling, maintenance and rewetting. The City shall have sole discretion to modify the TWB^2 Operations Protocol as necessary to ensure efficient operation of TWB^2.

iv. The District's monitoring and enforcement of TWB^2 Areas will comply with Attachment A, Stipulated Judgment Attachment C, the "Protocol for Monitoring and Enforcing Owens Lake Tillage with BACM Backup" (TWB^2 Monitoring Protocol). The TWB^2 Monitoring Protocol describes the data to be collected and methods of analysis to determine if TWB^2 areas on the Owens Lake bed need maintenance and/or reflooding in order to maintain or reestablish control efficiency for compliance with the NAAQS or State Standard. Based on data and after consulting with the City, the APCO shall have sole discretion to modify the TWB^2 Monitoring Protocol in writing as necessary to ensure air quality protection.

v. The APCO may order, and the City is required to reflood a TWB^2 area as provided in the TWB^2 Monitoring Protocol. Within 37 days of written order by the APCO that a TWB^2 area must be reflooded, the City shall complete reflooding of that area in accordance with approved Shallow Flooding BACM requirements.

vi. The City shall not appeal or contest the TWB^2 Protocol, any revisions to that protocol that comply with this Paragraph 9.D, or the APCO's order to reflood a TWB^2 area now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316, except the City may contest an APCO order to reflood a TWB^2 area on the sole basis that the APCO did not follow the TWB^2 Monitoring Protocol. Such a challenge shall be brought exclusively to Sacramento County Superior Court to enforce the 2014 Stipulated Judgment, and not by an appeal under Health & Safety Code Section 42316 or by any challenge in any other administrative or judicial forum. Any such appeal shall not relieve the City of the duty to reflood a TWB^2 area within 37 days of a written order from the APCO unless the City seeks and obtains an injunction from the Court before the expiration of the 37-day period to enjoin the reflooding.

vii. The District and City shall conduct periodic joint inspections of the TWB^2 Areas by the District and the City. The District will provide the City with at least 24-hour notification of the time and location of the District's TWB^2 field inspections and testing.

viii. The City may at its discretion file an application with the District to seek approval of tillage without shallow flooding backup as BACM by following the procedures in Paragraph 13.

E. <u>Brine BACM</u>. The City may use the "Brine BACM" as a Shallow Flooding BACM in areas that meet the definition for Brine BACM.

i. For an area to qualify for Brine BACM, it must satisfy all of the criteria in Attachment E, "2016 Brine BACM."

ii. The APCO will determine whether the criteria for Brine BACM at any location in a brine shallow flood area are satisfied and shall inform the City of the determination in writing.

iii. The APCO may order the City to shallow flood any Brine BACM area or any emissive portion thereof if any of the following criteria are met.

1) The APCO determines that emissive surface conditions exist in the area as determined by the Induced Particulate Erosion Test procedures in the TWB[2] Monitoring Protocol at Attachment A, SJ Attachment C; or

2) The APCO determines that sand flux greater than 5 g/cm2/day is measured in that area.

3) The APCO determines that the total surface cover of qualifying stable brine surfaces has been reduced to less than 60% of the areal extent of areas requiring 99% control or more than a 10% loss of control efficiency for areas requiring less than 99% control. The relationship between total surface cover and control efficiency shall be determined by the most current approved Shallow Flooding curve. In these cases of reduced surface coverage, there does not need to be emissive surface conditions as determined by the Induced Particulate Erosion Test or sand flux greater than 5 $g/cm^2/day$.

iv. If the APCO determines that Paragraph 9.E.iii.1, 9.E.iii.2 or 9.E.iii.3 are met, the APCO will give written notice to the City that the area must meet the Shallow Flood BACM requirements for that area within 37 days.

v. The City may comment upon the APCO's determination for Brine BACM areas or orders to shallow-flood an area, but shall not appeal or contest that determination in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

F. Dynamic Water Management. Dynamic Water Management (DWM) allows the APCO to delay the start dates and/or advance the end dates set forth in Paragraph 1.A and 1.B for shallow flooding on non-emissive years to save water if the modification can be shown to have no effect on performance standards or the dust control measure efficiencies required to meet the PM_{10} NAAQS.

i. For an area to qualify for DWM, it must satisfy all of the criteria in Attachment F, the "2016 Owens Lake Dynamic Water Management Plan."

ii. The APCO shall determine whether the criteria for DWM are satisfied and shall inform the City of the determination in writing. The City may comment upon the APCO's determination, but shall not appeal or contest that determination in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

iii. If an area is approved for DWM, the City shall comply with the following requirements:

1) Each year, the area must meet shallow flood wetness targets by or before the approved DWM start day, and may be shut off with no spring season ramping requirements after April 30.

2) Each year, areas irrigated with sprinklers must meet shallow flood wetness targets by or before two weeks before the approved DWM start day, and may be shut off with no spring ramping requirements after May 31.

3) The APCO may order and the City is required to implement BACM Shallow-Flooding on the DCM area or portion thereof if the APCO determines that emissive surface

conditions exist in that area as determined by the Induced Particulate Erosion Test procedures in the TWB[2] Monitoring Protocol. In this event, the APCO will give notice to the City that the area must meet the wetness target within 15 days if the area is less than or equal to 25 percent of the DWM area, 21 days if the area is greater than 25 percent of the DWM area. Sprinkler irrigated areas ordered by the APCO for BACM Shallow Flooding must meet the wetness target within 15 days regardless of the amount of area ordered.

4) The APCO may order and the City is required to implement BACM Shallow-Flooding on the DCM area or portion thereof if the APCO determines that sand flux greater than 5 g/cm2/day is measured in that area. In this event, the APCO will give notice to the City that the area must meet the wetness target within 15 days if the area is less than or equal to 25 percent of the DWM area, 21 days if the area is greater than 25 percent of the DWM area. Sprinkler irrigated areas ordered by the APCO for BACM Shallow Flooding must meet the wetness target within 15 days regardless of the amount of area ordered.

5) If any DWM area or portion thereof become emissive and is therefore issued a reflood order by the APCO more than once in a continuous six-year period, these areas will revert to the standard shallow flood period of October 16 through June 30 and will no longer be eligible for DWM.

6) If any DWM area or portion thereof becomes emissive and is therefore issued a reflood order by the APCO less than

once in a continuous six-year period, that reflood order shall only apply to the modified start or end period upon which the area was identified for re-flooding and not to the entire dust year.

G. If air quality modeling or monitoring data shows an exceedance or exceedances of the NAAQS or State Standard at or above the Regulatory Shoreline as a result of excessive dry areas within Shallow Flooding control areas during the dust control periods for each year and the APCO determines that existing PM_{10} control measures require a higher level of control efficiency, the City shall increase the control efficiency of those measures within one month of its receipt of a written determination by the APCO informing the City of this determination if more water application is needed to overcome evapotranspiration, or within 12 months of a written determination if land leveling or the installation of more laterals to the water delivery systems are needed, and maintain that higher control efficiency until the APCO determines that a reduced control efficiency is appropriate. The City may comment upon the APCO's determination, but shall not appeal or contest that determination in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

H. From July 1 through October 15 of each year, the District does not require the City to apply water to Shallow Flooding areas for dust control purposes. The City shall comply with all other permits, conditions and requirements.

I. Aerial photography, satellite imagery or other methods approved at the sole discretion of the APCO shall be used to confirm wetness coverage.

J. The following portions of the areas designated for control with Shallow Flooding are exempted from the requirement of dust control by means of a saturated surface:

i. Raised berms, roadways and their shoulders necessary to access, operate and maintain the control measure which are otherwise controlled and maintained to render them substantially non-emissive and

ii. Raised pads containing vaults, pumping equipment or control equipment necessary for the operation of Shallow Flooding infrastructure which are otherwise controlled and maintained to render them substantially non-emissive.

K. “Substantially non-emissive” shall mean that the surface is protected with gravel, durable pavement or other APCO-approved surface protections sufficient to meet the requirements of District Rules 400 and 401 (visible emissions and fugitive dust).

L. Excess surface water and shallow groundwater above the annual average water table that existed before site construction that reach the lower boundary of the DCM areas will be contained, collected and recirculated for reapplication to dust control areas or otherwise lawfully discharged. The DCM areas shall contain excess waters in the control areas and isolate the dust control measure areas from each other and from areas not controlled by the use of lateral boundary edge berms and/or drains or other equally effective measures. If drains are used, they shall be designed and constructed so that they may be regulated such that groundwater levels, surface water extent and wetlands in adjacent uncontrolled areas are not impacted. These requirements do not apply to Shallow Flood area T36-4 because of to its adjacency to the Lower Owens River Project (LORP) and the City’s intention to integrate the design and operation of T36-4 into the LORP.

M. The City shall remove all exotic pest plants, including salt cedar (Tamarix ramosissima), that invade any of the areas designated for control by Shallow Flooding.

N. As necessary to protect human health, the City shall prevent, avoid and/or abate mosquito, other pest vector and biting nuisance insect breeding and swarming within and in the vicinity of the PM_{10} control areas where water is applied for dust control purposes, including within communities less than three miles from those areas, by effective means that minimize adverse effects upon adjacent wildlife.

10. BACM Managed Vegetation

A. For all areas controlled with the Managed Vegetation BACM, the areas shall be operated and maintained in accordance with the Managed Vegetation Operation and Management Plan approved by the District in Board Order #110718-04. This Order provides for a mix of minimum vegetation covers that mimic the cover distribution of existing non-emissive Managed Vegetation controls on the lakebed. Areas controlled with Managed Vegetation BACM shall maintain a minimum overall average vegetation cover of 37 percent for each contiguous Managed Vegetation area. The cover at any point within that area can vary from the average as set forth in Paragraph 10.B.

B. Areas controlled with the Managed Vegetation BACM will be considered compliant when the vegetative cover requirements in Table 10.1 are maintained on the area. Vegetative cover compliance is to be determined based on a satellite image of the area taken between September 21 and December 21 of each year. The image shall be ground-truthed, calibrated, and validated by reference to measurements made by point frame or by equivalent methods approved by the APCO. Vegetative cover provided by any approved locally adapted native plant species will count toward compliance in any Managed Vegetation area. Vegetative cover must average 37 percent. However, it is recognized that over-control in some portions of a control area can offset under-control in other areas, as long as under-controlled areas are not large enough to become emissive. Table 10.1 provides for a range of allowable covers across multi-sized grids to ensure coverage distributions are sufficient to prevent PM_{10} emissions.

TABLE 10.1 Managed Vegetation BACM Vegetative Cover Criteria

Grid Scale	Average	>5% cover	>10% cover	>20 % cover

(acres)	(minimum % cover)	(minimum % of DCM area)		
0.1	37	92	83	65
1	37	94	87	68
10	37	95	89	74
100	37	95	90	77

C. The vegetation planted for dust control shall consist only of locally-adapted native species approved by both the APCO and the California State Lands Commission (CSLC). As of January 1, 2016, a plant list of 48 native species has been approved. Other appropriate species may be approved only upon written request of the City and written approval of the APCO.

D. Vegetation coverage shall be measured by the point-frame method, by ground-truth remote sensing or by other methods approved at the sole discretion of the APCO.

E. The following portions of the areas designated for control with Managed Vegetation are exempted from the requirements set forth in Paragraphs 10.A. above:

i. Portions consistently inundated with water, such as reservoirs, ponds and canals;

ii. Roadways and equipment pads necessary to access, operate and maintain the control measure which are otherwise controlled and maintained to render them substantially non-emissive; and

iii. Portions used as floodwater diversion channels or desiltation/retention basins.

F. "Substantially non-emissive" shall be defined to mean that the surface is protected with gravel, durable pavement or other APCO-approved surface protections sufficient to meet the requirements of District Rules 400 and 401 (visible emissions and fugitive dust).

G. Excess surface water and shallow groundwater above the root zone depths that reach the lower boundary of the dust control areas shall be collected and recirculated for reapplication to dust control areas or otherwise lawfully discharged. The DCM areas shall contain excess waters in the control areas and isolate the dust control measure areas from each other and from areas not controlled by the use of lateral boundary edge berms and/or drains or other equally effective measures. Drains shall be designed and constructed so that they may be regulated such that groundwater levels, surface water extent and wetlands in adjacent uncontrolled areas are not impacted.

H. To protect the Managed Vegetation control measure from flood damage and alluvial deposition, the City shall incorporate stormwater and siltation control facilities into and around Managed Vegetation areas adequate to maintain the dust mitigation function of Managed Vegetation. The Managed Vegetation protection facilities shall be designed to dissipate flood waters and capture the alluvial material carried by flood waters, so as to avoid greater than normal water flows and deposition of alluvial material into the Owens Lake brine pool.

I. The City shall remove all exotic pest plants, including salt cedar (Tamarix spp.), that invade any of the areas designated for control by Managed Vegetation.

J. As necessary to protect human health, the City shall prevent, avoid and/or abate mosquito, other pest vector and biting nuisance insect breeding and swarming within and in the vicinity of the PM_{10} control areas where water is applied for dust control purposes, including within communities less than three miles from those areas, by effective means that minimize adverse effects upon adjacent wildlife.

K. If air quality modeled or monitoring data shows an exceedance or exceedances of the PM_{10} NAAQS at or above the Regulatory Shoreline as a result of emissions from bare or vegetated areas and the APCO determines that existing PM_{10} control measures require a higher level of control efficiency, the City shall increase the control efficiency of those measures upon written determination by the APCO informing the City of this determination within 36 months by enhancing, restoring or establishing necessary vegetation coverage or within1 to 6 months to stabilize areas by other means. The City may comment upon the APCO's determination, but shall not appeal or contest that determination in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

11. BACM Gravel Blanket

A. In areas where Gravel Blanket is used as a PM_{10} control measure, the City shall meet one of the following two performance standards:

i. The entire control area shall be covered with a layer of gravel at least four inches thick. All gravel material placed must be screened to a size greater than one-half inch (½ inch) in diameter. Where it is necessary to support the gravel blanket, it shall be placed over a permanent permeable geotextile fabric; or

ii. The entire control area shall be covered with a layer of gravel at least two inches thick underlain with a permanent permeable geotextile fabric. All gravel material placed must be screened to a size greater than one-half inch (½ inch) in diameter.

B. All gravel shall be durable have resistance to leaching and erosion. It shall be as durable and no more toxic than the gravel from the Keeler fan site analyzed by the District in the Final Environmental Report prepared for the 1997 SIP and comply with all other permits, conditions and requirements.

C. All geotextile fabric used under Gravel Blanket BACM shall be Class I woven or nonwoven geotextile fabric meeting the minimum specifications set forth in the National Standard Materials Specification "Material Specification 592—

Geotextile" (National Engineering Handbook, Chapter 3, Part 642), or equivalent as approved by the APCO.

D. To protect the Gravel Blanket control measure from flooding, the City shall incorporate drains and channels into and around the control measure areas adequate to maintain the dust mitigation function of the Gravel Blanket, and outlet flood waters into the Owens Lake brine pool, Shallow Flooding areas, or reservoirs. The drains and channels shall be designed to incorporate features such as desiltation or retention basins that are adequate to capture the alluvial material carried by the flood waters and to avoid greater than normal deposition of this material into the Owens Lake brine pool.

E. The gravel placement design and implementation shall adequately protect the graveled areas from the deposition of wind- and water-borne soil, settling of gravel into lakebed sediments or infiltration of sediments from below. All graveled areas will be visually monitored by the City at least annually to ensure that the Gravel Blanket is not filled with sand, dust or salt and that it has not been inundated or washed out from flooding. If any of these conditions are observed over areas larger than one acre, additional gravel will be transported by the City to the playa and applied to the playa surface such that the original performance standard is re-established within four months per square mile of gravel cover, or within thirty-six months per square mile of gravel cover if replaced by different BACM (such as shallow flooding or managed vegetation), of written notice from the APCO. The City may comment upon the APCO's determination, but shall not appeal or contest that determination in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

F. The City shall apply BACM for fugitive dust sources (see WRAP Fugitive Dust Handbook, Western Governors' Association, 2006) and New Source Performance Standard (NSPS) emission limits to its gravel mining and transportation activities occurring within the District's geographic boundaries as required by the District in the City's District-issued Authority to Construct and Permit to Operate.

12. MDCE BACM Control Measures

A. As referenced in Paragraph 1, the T1A-1 sand fence (0.39 square miles) and Channel Area (0.5 square miles) PM_{10} control measures are currently dust control areas with MDCE BACM in operation. For these dust control areas only, MDCE BACM will continue to be operated to meet the required MDCE performance standards shown in Exhibit 2.

B. For areas of MDCE BACM that do not meet the MDCE performance standards or that cause or contribute to an exceedance of the federal 24-hour PM_{10} NAAQS or State Standard, as solely determined by the APCO using monitoring or an approved model, the City shall increase the control efficiency of those measures as directed by the APCO in writing to meet the performance standards of the approved BACM. The APCO's determination shall specify the increase in control efficiency required and the time allowed for such increase. The City may comment upon the APCO's determination, but shall not appeal or contest that determination in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

NEW BACM, ADJUSTMENTS TO EXISTING BACM, AND BACM TRANSITIONS.

13. Upon written request by the City, the District may approve new BACM, a modification or adjustment to the existing BACMs described in Paragraphs 9, 10, 11 and 12 of this Order, and/or the transition from one BACM to another provided that, at all times, the performance standards of one or the other BACM are continuously met during the transition to assure that the transition shall not prevent the OVPA from attaining or maintaining the NAAQS or State Standard for PM_{10}. The City's request shall contain a detailed description of the proposed alternative and a demonstration that the request satisfied all requirements of law and this Order.

A. The APCO shall have full discretion to consider any such application for a change in BACM, and to accept, reject or condition its approval of such application. Non-compliance with any such condition shall be enforceable as noncompliance with a District Order. Without limiting the District's discretion as provided herein, the procedures for transitions of implemented control measures or adjustments to BACM shall be those described in Attachment D, "2016 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area."

B. The District will review new or refined dust control measures proposed by the City, and will approve a measure as BACM if the District determines that the measure is consistent with the EPA's interpretation of the term Best Available Control Measure under the federal Clean Air Act and its implementation as required for the Owens Valley nonattainment area. In assessing whether a dust control measure (including a new measure or extension of a previously identified measure to a new area) is BACM, the District will consider the technological feasibility of the measure, as well as energy, environmental, and economic impacts and other costs.

C. If the City wishes to transition from one existing BACM to another BACM without meeting the performance standards of either BACM at all times, the Transition Area project size shall be limited to a maximum size of 3.0 square-miles at one time as provided for in Attachment D, "2016 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area." The 3.0 square mile Transition Area limit shall be in addition to the TWB[2] Areas implemented by the City.

D. The City shall control emissions during Transition Area project construction periods as provided in Attachment D, the "2016 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area" at Section 3.

E. The City shall only conduct construction of any Transition Area project between July 1 of year when on-site work on the project begins, through December 31 of the next year when all such work shall be completed and the new controls shall be fully installed and operational. The completion deadline set forth in this paragraph is subject to the Force Majeure and Stipulated Penalties provisions set forth in Paragraphs 16 and 17.

MONITORING

14. The District may locate PM_{10} air monitors on City-occupied or unoccupied property in communities located in the OVPA at the District's sole discretion. The City shall provide electric power to those monitors if such power source is under the City's control and shall not interfere with the operation of those monitors, cut off their power supply (except for planned or emergency system outages), or take any other action to evict or remove the monitors.

STORMWATER MANAGEMENT

15. The City shall design, install, continually operate and maintain flood and siltation control facilities to protect the all PM_{10} control measures installed on the lake bed at all times, and in a manner that groundwater levels, surface water extent, and wetlands in adjacent uncontrolled areas are not impacted by induced drainage.

A. Flood and siltation control facilities shall be integrated into the design and operation of the PM_{10} control measures. All flood and siltation control facilities and PM_{10} control measures damaged by stormwater runoff or flooding shall be promptly repaired and restored to their designed level of protection and effectiveness.

B. All flood and siltation control facilities shall be designed and operated in a manner to prevent any greater threat of alluvial material contamination to the existing trona mineral deposit lease area (State Lands Commission leases PRC 5464.1, PRC 3511 and PRC 2969.1) than would have occurred under natural conditions prior to the installation of PM_{10} control measures.

FORCE MAJEURE

16. Force Majeure

A. "*Force Majeure*" as used in the paragraphs above relating to the Phase 9/10 project (Paragraph 3.A), BACM Contingency Measure projects (Paragraph 8.H), and Transition Area projects (Paragraph 13.E), is defined as one of the following events that prevents the City's performance of the specified act by the deadline set forth in that Paragraph: (i) any act of God, war, fire, earthquake, windstorm, flood, severe drought that is declared as an official state of emergency by the Governor of the State of California, or natural catastrophe; (ii) unexpected and unintended accidents (excluding those caused by the City or the negligence of its agents or employees); civil disturbance, vandalism, sabotage or terrorism; (iii) restraint by court order or public authority or agency; (iv) action or non-action by, or inability to obtain the necessary authorizations or approvals from any governmental agency, provided that the City demonstrates it has made a timely and complete application to the agency and used its best efforts to obtain that approval, or (v) the inability to obtain private property owner access, provided that the City demonstrates it has made a timely and complete request to the owner, and used its best efforts to obtain that access. Force Majeure shall not include normal inclement weather, other asserted shortages of water, economic hardship or inability to pay.

B. The City's performance of its duties under Paragraph 16.A will be temporarily postponed only during the condition of Force Majeure, but not excused, and the City will continue to be responsible to recommence performance of its actions to comply with the deadlines at the end of the Force Majeure event. The deadlines for performance shall automatically be extended by the period of interruption caused by the Force Majeure event. The City shall exercise due diligence to resolve and remove any Force Majeure event. Nothing in this paragraph shall be interpreted to relieve the City of its obligations and duties under all applicable laws.

C. Any party seeking to rely upon this paragraph to excuse or postpone performance under Paragraph 16.A shall have the burden of establishing each of these elements to the Sacramento Superior Court with jurisdiction over the 2014 Stipulated Judgment in the case captioned *City of Los Angeles v. California Air Resources Board et al.*, Case No. 34-2013-80001451-CU-WM-GDS, and that it could not reasonably have been expected to avoid the event or circumstance, and which by exercise of due diligence has been unable to overcome the failure of performance.

17. <u>Stipulated Penalties</u>

A. The City shall be subject to notices of violation from the APCO and stipulated daily penalties for failure to meet dust control measure construction completion deadlines set forth in this Stipulated Judgment for the Phase 9/10 project (Paragraph 3.A), BACM Contingency Measure projects (Paragraph 8.H), and Transition Area projects (Paragraph 13.E), except as excused by a condition of Force Majeure as defined in Paragraph 16.A. The amount of the daily penalty shall be determined by the following formula:

Stipulated daily penalty ($/day) = $10,000 – $4500 ($A_C/A_R$),

where

A_C = Dust control area required by the APCO that is completed and compliant (square miles), and

A_R = Total dust control area required by the APCO (square miles).

B. The City shall pay any stipulated daily penalties within 90 days of any notice of violation from the APCO for failure to meet these deadlines. The City shall not challenge or oppose its duty to pay the stipulated daily penalty in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316(b).

C. This Paragraph 17 applies only to the failure to meet dust control measure completion deadlines as set forth in Paragraph 16.A and does not apply to any other notice of violation or enforcement of laws by the District or its APCO.

PERFORMANCE MONITORING PLAN

18. The City, in consultation with the District, shall develop and provide to the District in writing a Performance Monitoring Plan (PMP) to aid in its operation of the Owens Lake dust mitigation program on the Owens Lake bed.

A. The PMP shall describe the measurements and methods used to verify the performance of the constructed dust control measures. The PMP shall also describe the measurements and methods used to maximize information on dust emissions from any areas of special interest. The PMP shall require the City to make an annual report to the District regarding the measurements and methods used to verify the performance of the constructed dust control measures.

B. The City shall implement the PMP, and will use the results as a guide for making operational decisions about the type, location, timing, and level of dust control measures needed to comply with this Order.

C. The PMP report for each calendar year shall be submitted to the APCO by March 31 of the following calendar year.

ADDITIONAL REQUIREMENTS

19. The District Board orders the City of Los Angeles to satisfy the following requirements related to all control measures:

A. The City’s construction, operation and maintenance activities shall comply with all Mitigation Measures set forth in Final Environmental Impact Reports, EIR Addendums and Mitigated Negative Declarations associated with the areas on which dust controls are placed, and all subsequent environmental documents adopted by the District for implementation of the requirements of this SIP.

B. The City shall comply with any and all applicable requirements of the Mitigation Monitoring and Reporting Programs adopted by the District as a lead or responsible agency and associated with the Final Environmental Impact Reports and Final Environmental Impact Report Addendums for this project, and with all subsequent environmental documents adopted by the District for implementation of the requirements of this SIP. All mitigation measures required in certified environmental documents associated with the implementation, operation and maintenance of PM_{10} control measures required by this order are hereby incorporated as requirements of this order and may be enforced as such.

C. The City shall apply BACM to control air emissions from its construction/implementation activities occurring in the District's geographic boundaries. This provision applies to any activities that may emit air pollution and are associated with dust control projects at Owens Lake such as gravel mining, cement and asphalt plants, or construction activities. These operations could take place outside of the Owens Valley Planning Area, *e.g.* in the City of Bishop. BACMs appropriate for these activities have and will continue to be included as conditions on District-issued permits to operate.

<u>RETENTION OF LEGAL AUTHORITY</u>

20. If there is a change in federal or state law that requires controls in addition to those provided in this Order, then the District shall maintain its authority under Health & Safety Code Section 42316 to adopt a new order to require the City to comply with these new legal requirements. The District shall also maintain its authority under Health & Safety Code Section 42316 to order the City to control additional sources of air pollution and/or to undertake additional reasonable measures necessary to mitigate the air pollution caused in the District by the City's water-gathering activities for other areas, sources or activities that are not specifically addressed in Paragraphs 1 through 8 of this Order, or that are located outside of the Keeler, Olancha and Swansea dune areas as specified in Board Order #130916-01.

RELATIONSHIP TO BOARD ORDER 080128-01 AND STIPULATED JUDGMENT

21. This Board Order consists of the 2008 SIP Order as modified by the 2013 SIP Amendment and the Stipulated Judgment. The Stipulated Judgment is attached hereto as Attachment A, and its terms are incorporated into this Board Order as if fully set forth herein.

A. The City shall support and not challenge the adoption of this 2016 SIP Order by the District Governing Board, CARB and EPA, except that the City may challenge any new term that the City has not agreed to in advance, and that is not contained in the 2008 SIP order as modified by the 2013 Amendment and the Stipulated Judgment.

B. Except as provided in Paragraph 21.A, the City shall not appeal or contest this Board Order now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including CEQA or Health & Safety Code Section 42316, and has agreed that its terms are valid and reasonable under Health & Safety Code Section 42316.

22. The District hereby stays the force and effect of Board Order #080128-01 for all times that this Order is in full force and effect. In the event this Order, or any provision of this Order, is stayed due to a legal challenge, including but not limited to a challenge to this Order under Health & Safety Code Section 42316, or any other law, to the State Implementation Plan, or to the Environmental Impact Report for this Revised SIP, or in the event the Order is disapproved by the CARB, the following shall apply:

A. The City shall continue to construct, operate and maintain all control measures implemented under the Stipulated Judgment, including but not limited to those measures implemented or required for implementation on 48.6 square miles as specified in Paragraphs 1 through 5, and 9 of this Order, without interruption.

B. Board Order #080128-01 shall immediately be in effect and shall remain in full force for the duration of any stay or, in the case of disapproval, until another Order is issued by this Board. The Stipulated Judgment shall also remain in effect. The

City shall not challenge the provisions of this Board Order or the Stipulated Judgment now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Health & Safety Code Section 42316.

23. EFFECTIVE DATE

The effective date of this Board Order shall be April 13, 2016.

APPROVED, ADOPTED and ORDERED by Governing Board of the Great Basin Unified Air Pollution Control District this 13th day of April 2016 by the following vote:

Yes: Kingsley, Griffiths, Stump, Hames, Rawson

No: 0

Abstain: 0

Absent: Bacon, Johnston

Approved:

Matt Kingsley Chair of the Governing Board

Attest:

Tori DeHaven, Clerk of the Governing Board

/////

Exhibits

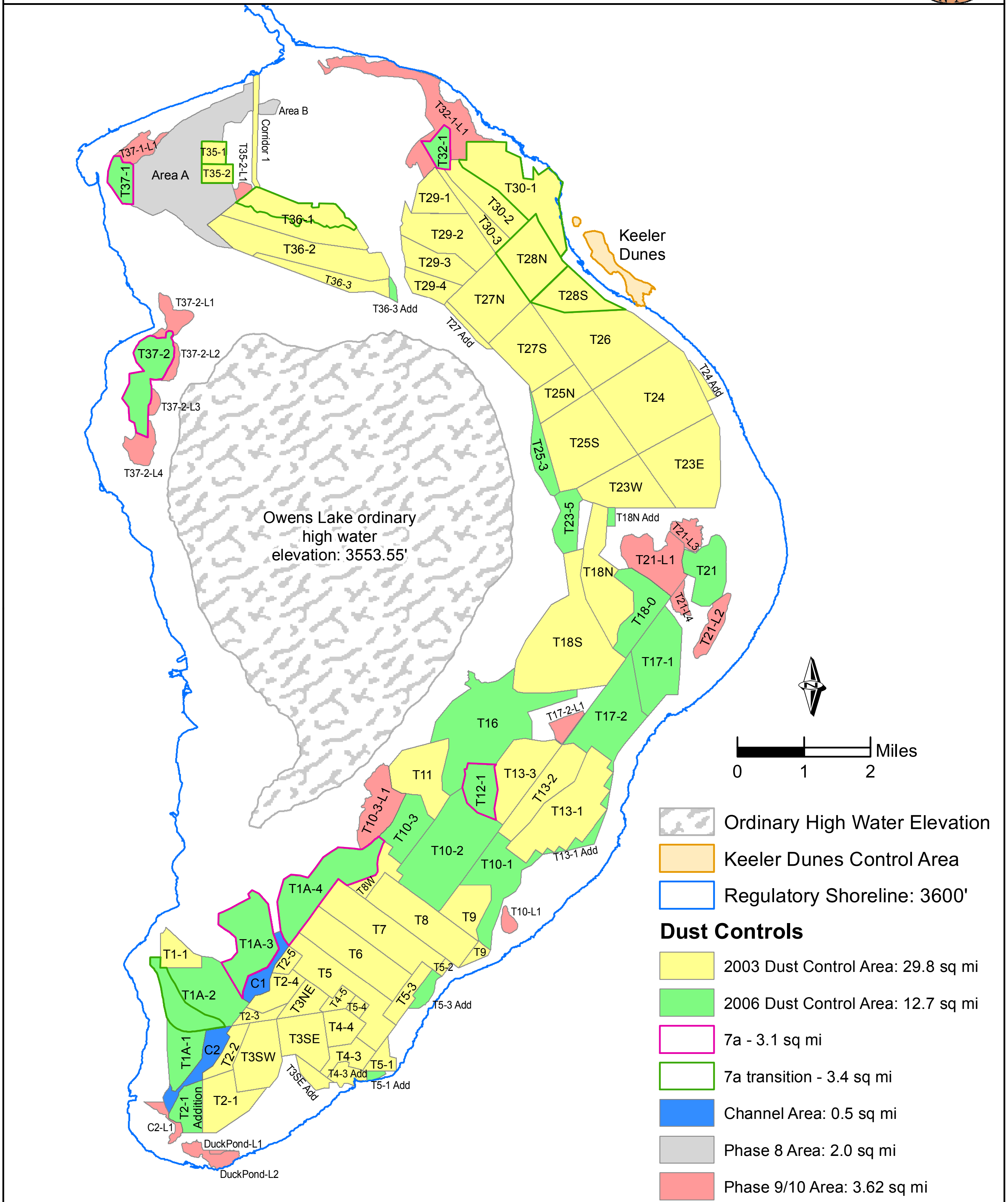
Exhibit 1	Map and Coordinates of PM_{10} Control Areas
Exhibit 2	Minimum Dust Control Efficiency Map
Exhibit 3	Shallow Flood Control Efficiency Curve
Exhibit 4	2016 Dynamic Water Management Areas

Attachments

Attachment A	Stipulated Judgment (SJ)
	SJ Attachment A – Court Final Ruling and Order
	SJ Attachment B – TwB2 Operations Protocol
	SJ Attachment C – TwB2 Monitoring Protocol.
Attachment B	2016 Owens Valley Planning Area Additional BACM Contingency Measures Determination Procedure
Attachment C	2016 Owens Lake Dust Source Identification Program Protocol
Attachment D	2016 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area
Attachment E	2016 Brine BACM
Attachment F	2016 Owens Lake Dynamic Water Management Plan

Great Basin Unified Air Pollution Control District

Exhibit 1 - PM10 Dust Control Areas



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SIP Revision 2016 Exhibit 1 Dust Control Map 20160204.mxd

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
Corridor 1	0.14	411375.0392	4043915.7480
		411368.8821	4043685.0145
		411326.8256	4042108.9708
		411411.9449	4041944.4412
		411404.1637	4041882.1942
		411328.7980	4041911.0091
		411307.5628	4041894.7186
		411206.9290	4042044.9075
		411237.3205	4043740.6607
		411250.0279	4044449.6939
		411252.3971	4044581.8872
		411297.8028	4044632.7570
		411393.9218	4044623.3657
		411375.0392	4043915.7480
T1-1	0.24	410001.3479	4023280.2990
		410002.3580	4023206.9595
		410005.2363	4022997.9711
		409150.1396	4022999.8884
		408999.6293	4023000.2258
		409002.0721	4023249.9209
		409002.6986	4023313.7804
		409007.7806	4023833.1024
		409051.0269	4023839.2045
		409110.9082	4023908.2518
		409130.6312	4023981.8092
		409555.1195	4023595.2654
		409806.6814	4023351.0115
		410001.3479	4023280.2990
T2-1	0.52	411579.3994	4020095.6486
		411149.7636	4019542.1549
		410360.7181	4019008.5005
		410025.1591	4019002.0354
		410021.5195	4020289.5251
		410764.8535	4020543.1808
		410856.3054	4019986.9090
		411246.3282	4020045.5553
		411579.3994	4020095.6486
T2-2	0.21	410764.8535	4020543.1808
		410021.5195	4020289.5251
		410015.7153	4020454.4270
		410264.9378	4020620.1863
		410488.7112	4020946.6551
		410592.4067	4021145.4323
		410686.3969	4021329.2488
		410604.9139	4021412.4751
		410723.1430	4021595.2150
		410775.1587	4021601.6591

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		411171.1912	4021661.1653
		410911.0799	4021031.0051
		410750.1808	4020640.9787
		410764.8535	4020543.1808
T2-3	0.12	411802.8532	4021756.0718
		411753.6515	4021748.6529
		411604.4684	4021726.2842
		411449.4651	4021702.9848
		411171.1912	4021661.1653
		410775.1587	4021601.6591
		410723.1430	4021595.2150
		410772.2220	4021661.6656
		410794.5608	4021690.3326
		411069.6619	4022043.1456
		411468.7821	4021898.4334
		412090.5723	4022145.4802
		412041.9403	4022079.6438
		411848.2994	4021817.5154
		411802.8532	4021756.0718
T2-4	0.28	412520.0138	4022726.6285
		412280.9151	4022403.1215
		412090.5723	4022145.4802
		411468.7821	4021898.4334
		411069.6619	4022043.1456
		411151.2016	4022147.9844
		411290.0657	4022321.4651
		411421.1708	4022347.8283
		411641.2736	4022435.1011
		411645.2720	4022735.1098
		411702.1375	4022877.2132
		412105.0647	4022841.9370
		412196.4642	4022965.6545
		412264.8371	4022915.1168
		412292.7693	4022894.4741
		412520.0138	4022726.6285
T2-5	0.10	412196.4642	4022965.6545
		412105.0647	4022841.9370
		411702.1375	4022877.2132
		411780.3515	4023076.2456
		411853.5786	4023178.4492
		411898.3534	4023239.0517
		412114.1288	4023531.1972
		412159.2499	4023493.2116
		412237.2383	4023435.6152
		412435.5486	4023289.1826
		412327.9694	4023143.6398
		412269.0657	4023063.9330

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		412196.4642	4022965.6545
T3NE	0.24	413088.6035	4022306.4585
		412849.6316	4021982.9620
		412928.1826	4021923.8598
		411802.8532	4021756.0718
		411848.2994	4021817.5154
		412041.9403	4022079.6438
		412090.5723	4022145.4802
		412280.9151	4022403.1215
		412520.0138	4022726.6285
		412843.4972	4022487.5883
		413088.6035	4022306.4585
T3SE	0.49	413055.0876	4021078.5086
		413074.9993	4020946.8083
		413096.9447	4020800.0171
		412857.9724	4020476.5179
		412534.5267	4020715.4819
		412270.9733	4020910.1986
		411937.4110	4020860.1271
		411802.8532	4021756.0718
		412928.1826	4021923.8598
		413012.4600	4021362.4643
		413055.0876	4021078.5086
T3SE Addition	0.12	412857.9724	4020476.5179
		412906.4567	4020440.6744
		413034.4897	4020346.0780
		413216.5995	4020220.4049
		413090.0414	4020217.8291
		413082.4137	4020077.9380
		412973.9179	4020085.6761
		412756.6975	4020031.3975
		412608.0432	4020197.5292
		412389.2662	4020442.0285
		412281.9783	4020866.6437
		412270.9733	4020910.1986
		412534.5267	4020715.4819
		412857.9724	4020476.5179
T3SW	0.61	411937.4110	4020860.1271
		411952.8142	4020757.8941
		411890.5687	4020548.9971
		411835.6901	4020364.6351
		411644.0866	4020105.5040
		411579.3994	4020095.6486
		411246.3282	4020045.5553
		410856.3054	4019986.9090
		410764.8535	4020543.1808
		410750.1808	4020640.9787

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
T4-3	0.24	410911.0799	4021031.0051
		411171.1912	4021661.1653
		411449.4651	4021702.9848
		411604.4684	4021726.2842
		411753.6515	4021748.6529
		411802.8532	4021756.0718
		411937.4110	4020860.1271
		414222.0726	4020969.0150
		414160.6092	4020885.8261
		413982.9758	4020645.4436
		413893.6355	4020524.5934
		413796.2475	4020548.7970
		413549.3839	4020610.1560
		413575.0389	4020713.6689
		413487.5647	4020735.4114
		413301.3640	4020707.4619
		413034.4897	4020346.0780
		412906.4567	4020440.6744
		412857.9724	4020476.5179
		413096.9447	4020800.0171
		413074.9993	4020946.8083
		413055.0876	4021078.5086
		413184.2856	4021094.6091
		413342.9646	4021118.4411
		413615.7688	4021163.4678
		413741.0231	4021324.3436
		413898.4688	4021208.0224
T4-3 Addition	0.14	414222.0726	4020969.0150
		413893.6355	4020524.5934
		413877.7052	4020502.9468
		414001.4695	4020502.4758
		414001.2533	4020257.4915
		413893.7745	4020264.7699
		413767.6592	4020273.3310
		413695.4389	4020332.7395
		413677.0551	4020225.3030
		413700.3399	4020128.3549
		413627.7543	4020158.1265
		413549.0822	4020190.3946
		413490.8659	4020190.3962
		413444.3883	4020190.3975
		413424.8082	4020157.2395
		413385.0218	4020104.3834
		413343.6338	4020101.2053
		413266.1224	4020221.4128
		413216.5995	4020220.4049
		413034.4897	4020346.0780

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		413301.3640	4020707.4619
		413487.5647	4020735.4114
		413575.0389	4020713.6689
		413549.3839	4020610.1560
		413796.2475	4020548.7970
		413893.6355	4020524.5934
T4-4	0.26	413814.0009	4021770.5574
		413975.7851	4021651.0243
		413741.0231	4021324.3436
		413615.7688	4021163.4678
		413342.9646	4021118.4411
		413184.2856	4021094.6091
		413055.0876	4021078.5086
		413012.4600	4021362.4643
		412928.1826	4021923.8598
		413490.4317	4022009.5808
		413652.2147	4021890.0650
		413814.0009	4021770.5574
T4-5	0.11	413729.5137	4022333.1288
		413490.4317	4022009.5808
		412928.1826	4021923.8598
		412849.6316	4021982.9620
		413088.6035	4022306.4585
		413166.9434	4022248.5872
		413406.0618	4022572.1831
		413729.5137	4022333.1288
T5	0.84	414615.6262	4022178.5720
		414426.4783	4021922.6108
		414376.5555	4021855.0570
		414700.1075	4021616.0524
		414505.9987	4021353.3100
		414461.0480	4021292.4897
		414222.0726	4020969.0150
		413898.4688	4021208.0224
		413741.0231	4021324.3436
		413975.7851	4021651.0243
		413814.0009	4021770.5574
		413865.8579	4021840.7154
		413931.8875	4021930.0605
		414053.0895	4022094.0927
		413729.5137	4022333.1288
		413406.0618	4022572.1831
		413166.9434	4022248.5872
		413088.6035	4022306.4585
		412843.4972	4022487.5883
		412520.0138	4022726.6285
		412292.7693	4022894.4741

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		412264.8371	4022915.1168
		412196.4642	4022965.6545
		412269.0657	4023063.9330
		412327.9694	4023143.6398
		412435.5486	4023289.1826
		412237.2383	4023435.6152
		412159.2499	4023493.2116
		412114.1288	4023531.1972
		412316.2796	4023804.5494
		412351.0895	4023851.6783
		412674.5366	4023612.7141
		412997.9834	4023373.7502
		413321.5800	4023134.6691
		413645.0264	4022895.7058
		413968.6226	4022656.6253
		414292.0677	4022417.6245
		414615.6262	4022178.5720
T5-1	0.14	414429.2165	4020500.8382
		414232.1268	4020501.5982
		414001.4695	4020502.4758
		413877.7052	4020502.9468
		413893.6355	4020524.5934
		413982.9758	4020645.4436
		414160.6092	4020885.8261
		414222.0726	4020969.0150
		414461.0480	4021292.4897
		414505.9987	4021353.3100
		414557.3614	4020853.0236
		414632.3454	4020832.6501
		414717.5371	4020809.5032
		414704.8599	4020499.7994
		414429.2165	4020500.8382
T5-2	0.03	416056.8587	4023113.9676
		415815.3044	4022792.4623
		415704.1714	4022874.5914
		415656.1628	4022910.0892
		415895.2471	4023233.5923
		416056.8587	4023113.9676
T5-3	0.22	415580.7123	4022964.7690
		415520.5385	4022883.3346
		415380.8866	4022694.3156
		415192.7623	4022439.6891
		415127.4250	4022351.2549
		415106.6480	4022323.0048
		415148.1754	4022285.3898
		415178.1078	4022263.0525
		415146.6854	4022220.5223

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414989.6965	4022007.9919
		414750.3341	4021684.0582
		414700.1075	4021616.0524
		414376.5555	4021855.0570
		414426.4783	4021922.6108
		414615.6262	4022178.5720
		414854.5912	4022502.0156
		415093.6715	4022825.5607
		415332.6768	4023149.0322
		415453.5288	4023059.7725
		415580.7123	4022964.7690
T5-4	0.06	413814.0009	4021770.5574
		413652.2147	4021890.0650
		413490.4317	4022009.5808
		413729.5137	4022333.1288
		414053.0895	4022094.0927
		413931.8875	4021930.0605
		413865.8579	4021840.7154
		413814.0009	4021770.5574
T6	0.87	415093.6715	4022825.5607
		414854.5912	4022502.0156
		414615.6262	4022178.5720
		414292.0677	4022417.6245
		413968.6226	4022656.6253
		413645.0264	4022895.7058
		413321.5800	4023134.6691
		412997.9834	4023373.7502
		412674.5366	4023612.7141
		412351.0895	4023851.6783
		412393.1732	4023908.6402
		412590.0541	4024175.1253
		412716.3209	4024345.9798
		412829.1735	4024498.6832
		413152.4691	4024259.7978
		413475.9145	4024020.7953
		413799.5105	4023781.7139
		414122.9555	4023542.7119
		414446.5511	4023303.6311
		414770.1473	4023064.5885
		415093.6715	4022825.5607
T7	0.94	413520.9060	4024987.7652
		413630.5473	4024906.7559
		413705.0932	4024851.6720
		413813.9702	4024771.2201
		413954.0157	4024667.7535
		414277.5935	4024428.7163
		414601.0379	4024189.7139

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414924.6337	4023950.6707
		415248.2293	4023711.6277
		415571.8247	4023472.5851
		415895.2471	4023233.5923
		415656.1628	4022910.0892
		415622.4090	4022934.9994
		415580.7123	4022964.7690
		415453.5288	4023059.7725
		415332.6768	4023149.0322
		415093.6715	4022825.5607
		414770.1473	4023064.5885
		414446.5511	4023303.6311
		414122.9555	4023542.7119
		413799.5105	4023781.7139
		413475.9145	4024020.7953
		413152.4691	4024259.7978
		412829.1735	4024498.6832
		413005.9543	4024737.9616
		413068.1384	4024822.1295
		413307.2567	4025145.6105
		413520.9060	4024987.7652
T8	0.87	414755.6684	4025075.7084
		414987.6679	4024904.2813
		415079.1212	4024836.7146
		415225.2485	4024728.7512
		415402.7156	4024597.6328
		415721.8772	4024363.7439
		416049.7522	4024119.5115
		416373.1960	4023880.5480
		416696.6388	4023641.5466
		416457.6759	4023318.1030
		416213.7556	4022998.2673
		416081.2099	4023096.2253
		416056.8587	4023113.9676
		415895.2471	4023233.5923
		415571.8247	4023472.5851
		415248.2293	4023711.6277
		414924.6337	4023950.6707
		414601.0379	4024189.7139
		414277.5935	4024428.7163
		413954.0157	4024667.7535
		414117.8568	4024889.3542
		414193.0965	4024991.1381
		414365.0268	4025223.8960
		414432.1019	4025314.6897
		414755.6684	4025075.7084
T8W	0.21	414516.2449	4026002.5719

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
T9	0.46	414628.9092	4025919.5013
		414592.2070	4025869.8256
		414509.4040	4025757.7501
		414573.9046	4025710.0958
		414832.3590	4025517.9893
		414714.1101	4025356.9862
		414875.1490	4025237.4744
		414828.4698	4025174.2710
		414755.6684	4025075.7084
		414432.1019	4025314.6897
		414365.0268	4025223.8960
		414193.0965	4024991.1381
		414117.8568	4024889.3542
		413954.0157	4024667.7535
		413813.9702	4024771.2201
		413705.0932	4024851.6720
		413630.5473	4024906.7559
		413520.9060	4024987.7652
		414210.4545	4025245.9289
		414234.5783	4025278.7465
		414265.6270	4025321.6698
		414260.7145	4025375.7117
		414249.7773	4025496.0299
		414253.5442	4025523.3931
		414275.2628	4025680.9863
		414383.8825	4025998.0971
		414433.1201	4026063.8621
		414516.2449	4026002.5719
		416987.0241	4023427.0505
		416933.0673	4023305.0811
		416213.7556	4022998.2673
		416457.6759	4023318.1030
		416696.6388	4023641.5466
		416373.1960	4023880.5480
		416049.7522	4024119.5115
		415721.8772	4024363.7439
		415752.1670	4024382.2273
		415795.7936	4024428.4142
		416222.2418	4025004.5422
		416423.1407	4025002.1395
		416999.8010	4024996.4655
		417001.1420	4024947.4364
		417009.4547	4024643.4367
		416773.5777	4024179.3380
		416740.4644	4024114.1911
		416644.2056	4023924.8115
		416681.7283	4023739.4429

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416700.3078	4023672.4212
		416724.9459	4023638.9524
		416791.8080	4023571.3270
		416987.0241	4023427.0505
T11	0.67	416016.5518	4027163.7735
		415892.7261	4026970.7408
		415850.0994	4026904.2901
		415790.4216	4026811.2579
		415677.0319	4026634.4934
		415640.1630	4026578.7438
		415466.7219	4026708.6625
		415342.4782	4027059.9901
		415340.1072	4027066.6946
		415303.7796	4027171.2685
		415233.1529	4027179.3891
		415156.5509	4027188.1773
		414946.8125	4027212.2390
		414946.0613	4027212.3252
		414829.7448	4027225.6694
		414704.5839	4027293.5349
		414666.3683	4027314.2564
		414603.3991	4027348.4000
		414525.4449	4027872.6930
		414845.5480	4028265.1622
		415530.3795	4028446.4469
		415969.6875	4028562.7110
		415987.3754	4028348.7866
		415812.0017	4027654.7770
		415815.0825	4027594.0878
		415819.5445	4027506.2313
		415821.2552	4027472.5544
		415829.9319	4027301.7160
		415955.5124	4027208.8937
		416016.5518	4027163.7735
T13-1	1.16	419964.9561	4027727.9417
		419815.0913	4027525.2967
		419726.2673	4027404.5246
		419887.7273	4027284.9795
		419648.9217	4026961.5818
		419810.2777	4026841.6888
		419748.5558	4026757.6663
		419525.0923	4026455.4515
		419499.4993	4026420.9158
		419206.2888	4026038.3123
		419051.1767	4026152.9153
		418944.5404	4026008.5914
		418812.4327	4025829.9087

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		418650.4050	4025948.9162
		418530.6017	4025787.6073
		418369.1355	4025906.6763
		418250.0503	4025745.2361
		418087.8706	4025864.4329
		417965.0399	4025698.1844
		417848.8505	4025540.9244
		417363.5983	4025899.4766
		417483.0867	4026061.2172
		417946.2974	4026526.0033
		418277.6506	4026974.4807
		419022.1895	4027514.9917
		419318.0047	4028206.2594
		419437.6778	4028367.7751
		419922.7917	4028009.4868
		419803.4484	4027847.6038
		419853.4559	4027810.6655
		419964.9561	4027727.9417
T13-2	0.61	419318.0047	4028206.2594
		419022.1895	4027514.9917
		418277.6506	4026974.4807
		417946.2974	4026526.0033
		417483.0867	4026061.2172
		417366.8592	4026147.0905
		417170.2116	4026293.6483
		417289.1233	4026454.5769
		418725.6089	4028396.0970
		418940.0949	4028435.3170
		418994.5143	4028445.2593
		419318.0047	4028206.2594
T13-3	0.68	417985.8357	4028530.6268
		418270.9212	4028479.7747
		418552.1861	4028522.0171
		418641.0131	4028456.3877
		418725.6089	4028396.0970
		417289.1233	4026454.5769
		417122.8974	4026577.3922
		417084.2094	4026850.3179
		417168.0579	4027307.0306
		417084.6434	4027863.9835
		417123.5860	4027916.7888
		417149.3087	4027977.2199
		417545.6899	4028513.6273
		417827.9025	4028557.0432
		417876.9859	4028548.4822
		417985.8357	4028530.6268
T18N	0.85	419496.3620	4034252.3887

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
T18S	1.82	419832.6228	4034141.1372
		419802.4606	4033687.7767
		419771.8711	4033218.0199
		419606.1581	4032994.4389
		419929.6632	4032755.4136
		420091.3942	4032635.9359
		419976.1285	4032480.3898
		420133.8016	4032354.8284
		420425.7541	4032122.7085
		420448.8685	4032104.3398
		420460.8875	4031607.1656
		420174.1314	4031339.0630
		420132.5084	4031300.4919
		420102.1497	4031215.3678
		420051.6551	4031073.7611
		420067.1527	4030907.7868
		419953.0593	4030737.6865
		419301.2890	4031913.5165
		419167.5391	4032516.0753
		419250.4837	4033085.9106
		419239.5306	4033150.5146
		419365.9142	4033768.8440
		419466.7915	4034261.8713
		419496.3620	4034252.3887
		419953.0593	4030737.6865
		420100.9126	4030629.4127
		420270.2682	4030504.5926
		420257.4813	4030470.7618
		419822.9960	4029884.0794
		419798.7906	4029851.3951
		419084.5984	4029747.7702
		418383.2186	4029647.0736
		418130.4116	4029646.0180
		417852.8347	4029647.5471
		417771.7107	4029657.7122
		417699.9538	4029667.9768
		417653.3789	4029674.6594
		417521.5049	4029776.4691
		417581.9086	4030267.7438
		417605.6678	4030460.9564
		417838.7772	4030929.0825
		418459.9718	4031788.9629
		418889.1261	4032024.0241
		418754.0253	4033026.4824
		419084.1419	4033110.8123
		419239.5306	4033150.5146
		419250.4837	4033085.9106

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		419167.5391	4032516.0753
		419301.2890	4031913.5165
		419953.0593	4030737.6865
T23E	1.16	422559.8892	4034701.7965
		422429.2563	4034127.0388
		421482.5827	4034132.2129
		420888.8631	4034972.0417
		420872.6936	4034994.9138
		420562.6228	4035433.5165
		422377.3155	4036418.9679
		422544.4991	4036065.0490
		422546.3765	4035898.7421
		422559.8892	4034701.7965
T23W	0.70	420888.8631	4034972.0417
		421482.5827	4034132.2129
		420004.5740	4034139.6849
		419832.6228	4034141.1372
		419496.3620	4034252.3887
		419466.7915	4034261.8713
		419223.1494	4034342.8214
		419188.9454	4034400.9790
		419064.9605	4034610.8362
		420562.6228	4035433.5165
		420872.6936	4034994.9138
		420888.8631	4034972.0417
T24	1.70	421775.5115	4037695.3945
		422237.3513	4036716.5520
		422377.3155	4036418.9679
		420562.6228	4035433.5165
		419459.5560	4036993.8362
		421317.9300	4038183.2674
		421672.5269	4037910.9745
		421775.5115	4037695.3945
T24 Addition	0.07	422237.3513	4036716.5520
		421775.5115	4037695.3945
		421815.4472	4037708.0812
		422114.0386	4037354.1188
		422305.0531	4037054.4245
		422453.6130	4036821.3405
		422237.3513	4036716.5520
T25N	0.40	419459.5560	4036993.8362
		418192.9713	4036174.1094
		417974.8683	4036933.5367
		419017.0594	4037619.7626
		419459.5560	4036993.8362
T25S	1.28	420562.6228	4035433.5165
		419064.9605	4034610.8362

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		418665.8457	4034527.9245
		418192.9713	4036174.1094
		419459.5560	4036993.8362
		420562.6228	4035433.5165
T26	1.33	420260.2740	4038939.6141
		420448.8516	4038850.6281
		421317.9300	4038183.2674
		419459.5560	4036993.8362
		419017.0594	4037619.7626
		417959.0480	4039116.3619
		418789.3715	4038860.6801
		420260.2740	4038939.6141
T27 Addition	0.08	416936.4016	4038118.4003
		417056.7418	4037995.5171
		416908.7138	4037982.5250
		416631.9746	4038195.4231
		416422.7260	4038451.3374
		416046.9016	4038858.3728
		415865.4763	4039054.8651
		415933.4067	4039143.8996
		416483.8237	4038580.2742
		416936.4016	4038118.4003
T27N	0.86	417959.0480	4039116.3619
		416936.4016	4038118.4003
		416483.8237	4038580.2742
		415933.4067	4039143.8996
		416323.1348	4039525.0305
		416658.3540	4039852.3712
		417121.6189	4040304.5343
		417255.4209	4040111.6752
		417959.0480	4039116.3619
T27S	0.85	419017.0594	4037619.7626
		417974.8683	4036933.5367
		417924.4340	4037108.4563
		417056.7418	4037995.5171
		416936.4016	4038118.4003
		417959.0480	4039116.3619
		419017.0594	4037619.7626
T28N	0.71	418687.1386	4040203.3591
		418733.7251	4040126.7522
		418872.7825	4039997.9387
		417959.0480	4039116.3619
		417255.4209	4040111.6752
		417121.6189	4040304.5343
		417473.8189	4040647.9564
		417921.3802	4041084.8832
		418093.9730	4041254.0466

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		418155.9146	4041076.4185
		418687.1386	4040203.3591
T28S	0.47	420260.2740	4038939.6141
		418789.3715	4038860.6801
		417959.0480	4039116.3619
		418872.7825	4039997.9387
		419760.8752	4039175.2705
		420260.2740	4038939.6141
T29-1	0.34	416435.5451	4041276.9560
		416401.4863	4041252.8896
		415073.9313	4041276.5425
		415237.3285	4041985.5193
		415381.2848	4042128.5039
		415526.1742	4042272.4160
		415526.4848	4042272.7244
		415581.2762	4042327.1461
		415630.5647	4042376.1020
		415630.5765	4042376.1058
		415636.0253	4042377.8375
		415652.9389	4042383.2128
		415653.6137	4042383.4273
		415655.4980	4042384.0262
		415655.6659	4042384.0795
		416435.5451	4041276.9560
T29-2	0.75	415073.9313	4041276.5425
		416401.4863	4041252.8896
		416435.5451	4041276.9560
		417121.6189	4040304.5343
		416658.3540	4039852.3712
		416144.0171	4040294.3138
		415700.1604	4040309.2538
		414814.5852	4040750.8719
		414797.1740	4040944.3347
		414835.3793	4040983.9777
		414873.5845	4041023.6206
		414850.9250	4041058.2850
		414828.2654	4041092.9493
		414928.6584	4041572.8182
		415073.9313	4041276.5425
T29-3	0.40	416658.3540	4039852.3712
		416323.1348	4039525.0305
		414927.2536	4039990.1326
		414931.2068	4040036.5085
		414921.7343	4040096.5239
		414906.2118	4040194.8691
		414894.9833	4040266.0091
		414848.0568	4040379.0156

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
T29-4	0.26	414814.5852	4040750.8719
		415700.1604	4040309.2538
		416144.0171	4040294.3138
		416658.3540	4039852.3712
		416323.1348	4039525.0305
		415933.4067	4039143.8996
		415865.4763	4039054.8651
		415536.0232	4039224.5107
		415102.2160	4039351.9435
		414905.7226	4039737.5501
		414921.1090	4039918.0500
		414927.2536	4039990.1326
T30-1	1.08	416323.1348	4039525.0305
		417130.3805	4042995.6745
		417384.3152	4042993.4517
		417370.6762	4042778.5344
		417719.8507	4042619.4658
		417792.5767	4042117.6796
		418026.3192	4042090.2555
		418032.4649	4042385.2584
		418154.9595	4042206.3723
		418410.5623	4042382.5975
		418608.9968	4042170.9490
		418642.6771	4042098.0531
		418743.9293	4042022.1567
		418637.1570	4041594.2678
		418746.9274	4040943.5424
		418839.1598	4040396.7884
		418687.1386	4040203.3591
		418155.9146	4041076.4185
		418093.9730	4041254.0466
		417921.3802	4041084.8832
		417171.9137	4041828.3044
		416322.8671	4042382.8026
		416237.8729	4042517.5607
		416238.8166	4042563.7458
		416407.4335	4042560.3903
		416409.8771	4042560.3417
		416410.0981	4042560.3373
		416410.1386	4042560.3365
		416413.8960	4042560.2618
		416413.9066	4042562.5781
		416413.9130	4042563.9624
		416413.9324	4042568.1752
		416413.9351	4042568.7621
		416414.7844	4042753.4996
		416415.9268	4043001.9282

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416475.6596	4043001.4053
		416511.9599	4043001.0876
		416737.3658	4042999.1146
		416745.5359	4042999.0431
		416748.7523	4042999.0149
		416748.7581	4042999.0149
		416757.0197	4042998.9425
		416778.2654	4042998.7566
		416779.0491	4042998.7497
		416779.3644	4042998.7470
		416782.0854	4042998.7231
		416785.1959	4042998.6959
		416802.5375	4042998.5441
		416828.7613	4042998.3146
		416834.3585	4042998.2656
		416844.5115	4042998.1767
		416853.3845	4042998.0990
		416872.3079	4042997.9334
		416874.3837	4042997.9152
		416874.7151	4042997.9123
		416874.9421	4042997.9104
		417130.3805	4042995.6745
T30-2	0.49	416238.8166	4042563.7458
		416237.8729	4042517.5607
		416322.8671	4042382.8026
		417171.9137	4041828.3044
		417921.3802	4041084.8832
		417473.8189	4040647.9564
		416056.9737	4042059.9711
		415869.3630	4042338.0433
		416015.9120	4042330.2460
		416018.9905	4042478.3471
		416020.1409	4042533.6930
		416020.5077	4042551.3401
		416020.8582	4042568.1991
		416238.8166	4042563.7458
T30-3	0.27	415665.8258	4042380.6277
		415692.3612	4042371.6124
		415869.3630	4042338.0433
		416056.9737	4042059.9711
		417473.8189	4040647.9564
		417121.6189	4040304.5343
		416435.5451	4041276.9560
		415655.6659	4042384.0795
		415655.9347	4042383.9882
		415665.8258	4042380.6277
T35-1	0.12	410493.9516	4043001.1922

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		410599.0285	4042999.1260
		410587.3545	4042696.5373
		410577.9311	4042452.2776
		410001.6954	4042464.1381
		410003.7039	4043010.8326
		410268.6279	4043005.6231
		410493.9516	4043001.1922
T35-2	0.13	410577.9311	4042452.2776
		410757.3767	4042448.5842
		410756.1353	4042245.4528
		410754.6508	4042002.5380
		410723.8358	4042002.5739
		410000.0033	4042003.4174
		410001.6954	4042464.1381
		410577.9311	4042452.2776
T36-1	1.01	412652.1923	4041436.0645
		412690.1314	4041406.0416
		412833.6710	4041412.9150
		412841.4082	4041505.7657
		413191.4978	4041500.2871
		413241.1228	4041488.5169
		413443.2128	4041269.5238
		413478.6456	4041158.2255
		413561.2523	4041141.5984
		413723.0869	4040965.9151
		413750.7680	4040919.5075
		414039.1683	4040436.0033
		414010.8260	4040412.9166
		413965.4168	4040383.7884
		412673.7969	4040565.9749
		410453.6629	4041239.6583
		410825.3880	4041524.8233
		410857.4942	4041549.4532
		410860.8313	4041552.0132
		410865.2368	4041555.3928
		410874.3719	4041562.4007
		410891.2200	4041575.3256
		410908.7982	4041588.8105
		410938.6899	4041611.7416
		410968.0051	4041634.2304
		410996.6969	4041656.2410
		411054.7057	4041700.7419
		411081.5448	4041721.3312
		411089.3727	4041727.3363
		411095.4672	4041732.0116
		411224.0888	4041830.6824
		411307.5628	4041894.7186

Exhibit 1 - PM10 Control Areas and Coordinates

2003 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
T36-2	1.04	411328.7980	4041911.0091
		411404.1637	4041882.1942
		412344.1688	4041513.1631
		412682.1021	4041508.1389
		412652.1923	4041436.0645
		414010.8260	4040412.9166
		414002.9668	4040378.3377
		414050.7092	4040298.5802
		414211.1526	4040321.9816
		414280.2236	4040319.3575
		414347.5813	4040337.7609
		414544.1961	4039918.4944
		414532.4404	4039758.0190
		414528.0492	4039697.5872
		414085.8937	4039631.6364
		411338.4485	4040324.4448
		411230.3923	4040243.9095
		410766.2080	4040418.8272
		410754.5323	4040429.4164
		410132.6677	4040993.4098
		410453.6629	4041239.6583
T36-3	0.35	412673.7969	4040565.9749
		413965.4168	4040383.7884
		414010.8260	4040412.9166
		414528.0492	4039697.5872
		414537.5701	4039498.0063
		414548.2365	4039274.9161
		414550.5526	4039224.6348
		414146.0294	4039386.3858
		413592.7832	4039353.6958
		412039.2079	4039939.1253
		411230.3923	4040243.9095
		411338.4485	4040324.4448
		414085.8937	4039631.6364
		414528.0492	4039697.5872

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
T1A-1	0.39	410110.0532	4021493.3823
		410038.4994	4021096.3389
		410027.5849	4021036.2856
		409998.0302	4020801.4793
		409724.2880	4020448.5196
		409487.6034	4020143.3409
		409409.2894	4020065.3131
		409362.4622	4020009.5035
		409276.4247	4020023.1050
		409280.4484	4020086.9084
		409223.1416	4020188.3568
		409215.0243	4020302.8876
		409166.5836	4020986.3494
		409149.2804	4021803.3442
		409163.9608	4021774.2357
		409179.6823	4021745.9744
		409194.6701	4021721.5470
		409209.7590	4021699.6128
		409225.4173	4021678.7661
		409252.5708	4021646.4477
		409273.6568	4021624.1573
		409294.6311	4021604.2271
		409323.3516	4021579.8075
		409359.8403	4021552.6623
		409394.2697	4021530.5798
		409430.4700	4021510.7705
		409469.1538	4021492.9143
		409509.3814	4021477.5621
		409541.7453	4021467.7021
		409587.0138	4021456.9762
		409628.6050	4021450.2633
		409667.1756	4021446.5232
		409702.2970	4021445.4495
		409734.0450	4021446.0422
		409774.5213	4021449.4157
		409835.6679	4021458.1413
		409886.0723	4021465.7122
		409975.4401	4021479.1355
		410079.1896	4021494.7189
		410110.0532	4021493.3823
T1A-2	1.09	410517.8291	4023045.8856
		410987.9078	4022252.4215
		411151.2016	4022147.9844
		411069.6619	4022043.1456
		410794.5608	4021690.3326
		410772.2220	4021661.6656
		410723.1430	4021595.2150

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		410566.9152	4021570.1680
		410350.3675	4021535.4504
		410110.0532	4021493.3823
		410079.1896	4021494.7189
		409975.4401	4021479.1355
		409886.0723	4021465.7122
		409835.6679	4021458.1413
		409774.5213	4021449.4157
		409734.0450	4021446.0422
		409702.2970	4021445.4495
		409667.1756	4021446.5232
		409628.6050	4021450.2633
		409587.0138	4021456.9762
		409541.7453	4021467.7021
		409509.3814	4021477.5621
		409469.1538	4021492.9143
		409430.4700	4021510.7705
		409394.2697	4021530.5798
		409359.8403	4021552.6623
		409323.3516	4021579.8075
		409294.6311	4021604.2271
		409273.6568	4021624.1573
		409252.5708	4021646.4477
		409225.4173	4021678.7661
		409209.7590	4021699.6128
		409194.6701	4021721.5470
		409179.6823	4021745.9744
		409163.9608	4021774.2357
		409149.2804	4021803.3442
		409108.8160	4021989.7821
		409094.0513	4022070.0886
		409085.6763	4022117.5963
		409078.4606	4022146.7713
		409062.7226	4022238.2376
		409046.0396	4022310.3637
		409031.2722	4022390.1936
		409011.1297	4022508.5332
		408992.2636	4022598.4083
		408976.2034	4022678.3443
		408957.5809	4022750.2154
		408947.0031	4022786.7507
		408929.8478	4022830.1862
		408906.8526	4022877.2718
		408890.4273	4022904.6472
		408861.2270	4022947.3527
		408845.1668	4022972.1731
		408798.0812	4023021.8137

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408749.6047	4023067.1420
		408752.0708	4023250.6832
		409002.0721	4023249.9209
		408999.6293	4023000.2258
		409150.1396	4022999.8884
		410005.2363	4022997.9711
		410002.3580	4023206.9595
		410001.3479	4023280.2990
		410254.3830	4023245.9717
		410472.0427	4023123.1702
		410517.8291	4023045.8856
T1A-3	0.79	411737.3086	4023824.9915
		411856.6603	4023492.7197
		411867.2652	4023463.2354
		411784.7187	4023306.3704
		411756.0765	4023263.9938
		411733.8386	4023231.0923
		411581.3611	4023006.5993
		411460.7988	4022950.7106
		411432.4438	4022937.5450
		411126.7256	4022795.5958
		411073.0277	4022641.9086
		410994.3205	4022416.6426
		410987.9078	4022252.4215
		410517.8291	4023045.8856
		410472.0427	4023123.1702
		410717.9845	4023206.8910
		410744.2155	4023238.1869
		410777.7814	4023278.2340
		410862.0902	4023378.8217
		410821.5600	4023731.0035
		410665.4241	4023862.7933
		410559.0790	4023934.9698
		410401.5722	4024041.8691
		410411.4127	4024308.5175
		410520.5786	4024349.2917
		410692.6404	4024438.4529
		410909.1814	4024550.6629
		411162.2767	4024681.8151
		411124.9240	4024778.6121
		411222.3255	4024873.8035
		411392.3945	4024792.1429
		411607.7455	4024539.2489
		411694.2835	4024061.5800
		411737.3086	4023824.9915
T1A-4	0.96	414433.1201	4026063.8621
		414383.8825	4025998.0971

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414275.2628	4025680.9863
		414253.5442	4025523.3931
		414249.7773	4025496.0299
		414260.7145	4025375.7117
		414265.6270	4025321.6698
		414234.5783	4025278.7465
		414210.4545	4025245.9289
		413520.9060	4024987.7652
		413307.2567	4025145.6105
		413068.1384	4024822.1295
		413005.9543	4024737.9616
		412829.1735	4024498.6832
		412716.3209	4024345.9798
		412590.0541	4024175.1253
		412393.1732	4023908.6402
		412351.0895	4023851.6783
		412316.2796	4023804.5494
		412114.1288	4023531.1972
		411987.3569	4023709.3450
		411915.0878	4023883.7727
		411828.1298	4024594.2291
		411987.9741	4025141.2709
		412161.8337	4025254.5966
		412387.4889	4025234.3186
		412577.2692	4025175.8075
		412752.8915	4025413.6926
		412942.5931	4025667.2112
		413140.6925	4025804.2789
		413273.7478	4025896.3417
		413298.0623	4025913.1653
		413700.6748	4025878.0963
		413843.4527	4025859.0182
		413892.4598	4025869.0491
		414047.8003	4025981.4887
		414054.0898	4025986.0412
		414058.1609	4025988.9880
		414103.3906	4026021.7264
		414202.5256	4026108.3980
		414237.0681	4026138.5977
		414280.6829	4026176.7292
		414433.1201	4026063.8621
T2-1 Addition	0.29	410025.1591	4019002.0354
		409535.8384	4018994.6572
		409535.7940	4019000.0000
		409535.7335	4019007.2814
		409535.4202	4019044.9991
		409535.2790	4019062.0029

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409535.2630	4019063.9333
		409534.8572	4019112.7819
		409500.0000	4019229.7137
		409493.9270	4019250.0862
		409428.6436	4019253.2063
		409374.7338	4019259.9508
		409302.2554	4019299.7625
		409272.1768	4019316.2843
		409240.1576	4019333.8721
		409219.4108	4019347.7120
		409207.4586	4019355.6851
		409207.5174	4019364.3380
		409208.2558	4019473.1115
		409435.8230	4019902.2959
		409445.4661	4019983.4003
		409576.6128	4020126.1299
		409630.4774	4020144.7287
		409689.8168	4020165.2179
		410021.5195	4020289.5251
		410025.1591	4019002.0354
T5-1 Addition	0.03	414429.2165	4020500.8382
		414464.0586	4020432.0182
		414293.7162	4020338.7319
		414135.9213	4020279.6763
		414001.2533	4020257.4915
		414001.4695	4020502.4758
		414232.1268	4020501.5982
		414429.2165	4020500.8382
T5-3 Addition	0.12	415656.1628	4022910.0892
		415704.1714	4022874.5914
		415815.3044	4022792.4623
		415748.1977	4022764.6488
		415699.5372	4022723.3612
		415670.0461	4022679.1244
		415672.9952	4022639.3114
		415650.8768	4022577.3799
		415643.2259	4022531.0919
		415621.3856	4022398.9584
		415574.1998	4022322.2813
		415529.9630	4022266.2481
		415496.0482	4022202.8421
		415434.1167	4022145.3343
		415404.6256	4022093.7248
		415361.8634	4022096.6739
		415302.8811	4022046.5389
		415242.8901	4022005.1797
		414989.6965	4022007.9919

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415146.6854	4022220.5223
		415178.1078	4022263.0525
		415148.1754	4022285.3898
		415106.6480	4022323.0048
		415127.4250	4022351.2549
		415192.7623	4022439.6891
		415380.8866	4022694.3156
		415520.5385	4022883.3346
		415580.7123	4022964.7690
		415622.4090	4022934.9994
		415656.1628	4022910.0892
T10-1	0.70	417483.0867	4026061.2172
		417363.5983	4025899.4766
		417848.8505	4025540.9244
		417965.0399	4025698.1844
		418087.8706	4025864.4329
		418250.0503	4025745.2361
		417981.0900	4025483.1796
		417862.3542	4025432.8305
		417742.6529	4025357.7897
		417731.0963	4025299.8718
		417711.4790	4025042.9035
		417596.8590	4024857.0344
		417427.9719	4024735.2047
		417308.1869	4024673.9089
		417192.2023	4024288.3952
		417038.6920	4023907.3688
		416987.0241	4023427.0505
		416791.8080	4023571.3270
		416724.9459	4023638.9524
		416700.3078	4023672.4212
		416681.7283	4023739.4429
		416644.2056	4023924.8115
		416740.4644	4024114.1911
		416773.5777	4024179.3380
		417009.4547	4024643.4367
		417001.1420	4024947.4364
		416999.8010	4024996.4655
		416423.1407	4025002.1395
		416222.2418	4025004.5422
		416940.2572	4025981.7598
		417170.2116	4026293.6483
		417366.8592	4026147.0905
		417483.0867	4026061.2172
T10-2	1.39	415752.1670	4024382.2273
		415721.8772	4024363.7439
		415402.7156	4024597.6328

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415225.2485	4024728.7512
		415079.1212	4024836.7146
		414987.6679	4024904.2813
		414755.6684	4025075.7084
		414828.4698	4025174.2710
		414875.1490	4025237.4744
		414714.1101	4025356.9862
		414832.3590	4025517.9893
		415640.1630	4026578.7438
		415677.0319	4026634.4934
		415790.4216	4026811.2579
		415850.0994	4026904.2901
		415892.7261	4026970.7408
		416016.5518	4027163.7735
		416307.8668	4027358.6501
		416425.8276	4026988.5600
		416674.9793	4026748.4247
		417122.8974	4026577.3922
		417289.1233	4026454.5769
		417170.2116	4026293.6483
		416940.2572	4025981.7598
		416222.2418	4025004.5422
		415795.7936	4024428.4142
		415752.1670	4024382.2273
T10-3	0.44	415640.1630	4026578.7438
		414832.3590	4025517.9893
		414573.9046	4025710.0958
		414509.4040	4025757.7501
		414592.2070	4025869.8256
		414628.9092	4025919.5013
		414516.2449	4026002.5719
		414433.1201	4026063.8621
		414280.6829	4026176.7292
		414294.0026	4026188.3743
		414361.5358	4026256.8825
		414364.4695	4026259.8586
		414468.2236	4026365.1107
		414474.4641	4026371.4413
		414521.1467	4026419.0833
		414574.5451	4026473.5792
		414575.1058	4026474.4055
		414580.1326	4026481.8134
		414581.3692	4026483.6358
		414626.7335	4026550.4892
		414628.2736	4026552.7589
		414777.6428	4026862.0020
		414809.4765	4026927.9082

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414946.7384	4027212.0856
		414946.8125	4027212.2390
		415156.5509	4027188.1773
		415233.1529	4027179.3891
		415303.7796	4027171.2685
		415340.1072	4027066.6946
		415342.4782	4027059.9901
		415466.7219	4026708.6625
		415640.1630	4026578.7438
T12-1	0.34	417123.5860	4027916.7888
		417084.6434	4027863.9835
		417168.0579	4027307.0306
		417084.2094	4026850.3179
		417122.8974	4026577.3922
		416674.9793	4026748.4247
		416425.8276	4026988.5600
		416307.8668	4027358.6501
		416380.4537	4027677.3045
		416356.7395	4027801.5013
		416412.4399	4027812.1367
		416445.8246	4027952.8636
		417123.5860	4027916.7888
T13-1 Addition	0.12	419964.9561	4027727.9417
		419949.6216	4027659.1454
		419887.7273	4027284.9795
		419880.3754	4027234.3219
		419832.8927	4026984.5659
		419810.2777	4026841.6888
		419499.9094	4025999.3318
		419182.9598	4025925.2840
		418812.4327	4025829.9087
		418720.4393	4025816.9724
		418530.6017	4025787.6073
		418422.7811	4025775.2222
		418250.0503	4025745.2361
		418369.1355	4025906.6763
		418530.6017	4025787.6073
		418650.4050	4025948.9162
		418812.4327	4025829.9087
		418944.5404	4026008.5914
		419051.1767	4026152.9153
		419206.2888	4026038.3123
		419499.4993	4026420.9158
		419525.0923	4026455.4515
		419748.5558	4026757.6663
		419810.2777	4026841.6888
		419648.9217	4026961.5818

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
T16	1.68	419887.7273	4027284.9795
		419726.2673	4027404.5246
		419815.0913	4027525.2967
		419964.9561	4027727.9417
		419084.5984	4029747.7702
		419093.6209	4029564.0366
		418540.1609	4029396.3602
		418492.0331	4029381.7793
		417887.8942	4029186.5402
		418000.2288	4028968.8521
		417985.8357	4028530.6268
		417876.9859	4028548.4822
		417827.9025	4028557.0432
		417545.6899	4028513.6273
		417149.3087	4027977.2199
		417123.5860	4027916.7888
		416445.8246	4027952.8636
		416412.4399	4027812.1367
		416356.7395	4027801.5013
		416380.4537	4027677.3045
		416307.8668	4027358.6501
		416016.5518	4027163.7735
		415955.5124	4027208.8937
		415829.9319	4027301.7160
		415821.2552	4027472.5544
		415819.5445	4027506.2313
		415815.0825	4027594.0878
		415812.0017	4027654.7770
		415987.3754	4028348.7866
		415969.6875	4028562.7110
		415530.3795	4028446.4469
		415660.2354	4028955.4660
		416062.8635	4029458.0553
		416338.7305	4029650.8434
		416414.3687	4029700.9180
		416477.5638	4029742.9928
		416497.9138	4029756.5417
		416520.7968	4029773.4766
		416520.8264	4029773.4985
		416501.9688	4029786.2637
		416489.6563	4029794.9004
		416430.1250	4029834.6543
		416415.3750	4029843.4570
		416400.7188	4029849.4766
		416387.3125	4029856.1563
		416372.5938	4029860.3106
		416368.5313	4029870.0703

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416375.7813	4029880.6270
		416384.4688	4029895.7617
		416385.5313	4029910.9023
		416395.3125	4029918.6621
		416406.0625	4029922.9727
		416419.9063	4029929.8086
		416435.1563	4029936.6543
		416449.2500	4029947.3340
		416459.1250	4029961.2246
		416462.9688	4029976.8418
		416471.5625	4029988.3965
		416481.0000	4029994.3359
		416483.2500	4030000.4590
		416476.4688	4030004.0684
		416464.6250	4030013.5332
		416452.1250	4030020.7266
		416447.3125	4030031.0762
		416454.8750	4030042.8809
		416467.7500	4030052.9766
		416466.0625	4030067.6035
		416454.5313	4030077.5586
		416440.6250	4030076.0938
		416437.6250	4030084.6914
		416445.8125	4030098.3496
		416459.0313	4030110.6875
		416465.9063	4030126.0488
		416467.1563	4030142.7871
		416461.5313	4030157.1523
		416450.1563	4030168.0938
		416439.0938	4030177.2402
		416443.8750	4030188.7227
		416458.4375	4030192.3809
		416470.3125	4030190.8789
		416479.0313	4030177.9727
		416493.8125	4030171.2637
		416510.6250	4030166.2656
		416527.2188	4030165.8828
		416541.7813	4030161.9238
		416568.0625	4030143.3945
		416585.0000	4030137.3281
		416601.6250	4030130.7734
		416608.7188	4030112.7188
		416614.8750	4030093.7324
		416614.1563	4030081.1367
		416606.9688	4030057.0176
		416610.2813	4030041.6328
		416621.0313	4030029.7910

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416626.8438	4030016.4492
		416634.6563	4030003.4863
		416639.6563	4029988.0273
		416642.2500	4029973.2676
		416656.7188	4029972.4727
		416688.3750	4029977.5293
		416704.9375	4029976.5762
		416715.9688	4029964.5742
		416723.1250	4029949.7949
		416734.4688	4029937.7109
		416747.7188	4029929.2070
		416759.0313	4029916.4004
		416768.4688	4029902.2207
		416781.8125	4029898.3633
		416790.3750	4029900.3945
		416827.0938	4029907.2129
		416838.2500	4029915.7813
		416845.7500	4029917.9492
		416852.5938	4029916.0938
		416867.9688	4029916.1543
		416880.3438	4029917.7637
		416895.6875	4029914.7402
		416933.2774	4029903.9416
		416933.3437	4029903.9482
		416960.6093	4029911.0537
		417119.3092	4029946.7131
		417187.5882	4029971.9062
		417307.5528	4030061.9091
		417404.8087	4030134.8752
		417581.9086	4030267.7438
		417521.5049	4029776.4691
		417653.3789	4029674.6594
		417699.9538	4029667.9768
		417771.7107	4029657.7122
		417852.8347	4029647.5471
		418130.4116	4029646.0180
		418383.2186	4029647.0736
		419084.5984	4029747.7702
T17-1	0.83	420796.0648	4029098.4398
		420658.2965	4029205.3010
		420395.6316	4030679.8608
		420485.2029	4030805.0886
		420995.8461	4031495.0315
		421054.3411	4031574.3940
		421209.7312	4031769.2300
		421298.8678	4031663.9944
		421331.5889	4031625.3209

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		421366.6346	4031583.9002
		421439.1082	4031498.2427
		421548.5165	4031333.2213
		421631.0272	4031208.7695
		421622.9727	4031054.6596
		421571.8926	4030077.3204
		421549.0082	4029833.7401
		421523.2951	4029607.1388
		421241.1573	4029607.9067
		421115.9541	4029457.7723
		420796.0648	4029098.4398
T17-2	0.93	420796.0648	4029098.4398
		420776.0445	4029075.9509
		420233.8289	4028421.8006
		420070.9764	4028193.2976
		419973.2496	4027978.3517
		419964.9561	4027727.9417
		419853.4559	4027810.6655
		419803.4484	4027847.6038
		419922.7917	4028009.4868
		419437.6778	4028367.7751
		419318.0047	4028206.2594
		418994.5143	4028445.2593
		418940.0949	4028435.3170
		418725.6089	4028396.0970
		418756.9252	4028433.4718
		419406.8125	4029323.4179
		419775.3475	4029819.8899
		419798.7906	4029851.3951
		419822.9960	4029884.0794
		420257.4813	4030470.7618
		420270.2682	4030504.5926
		420395.6316	4030679.8608
		420658.2965	4029205.3010
		420796.0648	4029098.4398
T18-0	0.53	420597.1630	4032558.7211
		420754.8980	4032462.5738
		420847.2185	4032406.3000
		421000.8019	4032283.7380
		421144.0336	4032169.4369
		421339.4293	4032013.5080
		421363.7119	4031994.1301
		421363.6591	4031994.0530
		421332.6602	4031948.7768
		421209.7312	4031769.2300
		421054.3411	4031574.3940
		420995.8461	4031495.0315

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		420485.2029	4030805.0886
		420395.6316	4030679.8608
		420270.2682	4030504.5926
		420100.9126	4030629.4127
		419953.0593	4030737.6865
		420067.1527	4030907.7868
		420051.6551	4031073.7611
		420102.1497	4031215.3678
		420132.5084	4031300.4919
		420174.1314	4031339.0630
		420460.8875	4031607.1656
		420448.8685	4032104.3398
		420425.7541	4032122.7085
		420133.8016	4032354.8284
		419976.1285	4032480.3898
		420091.3942	4032635.9359
		420399.6558	4032679.1114
		420597.1630	4032558.7211
T18N Addition	0.03	420004.5740	4034139.6849
		420012.6570	4033690.4716
		419802.4606	4033687.7767
		419832.6228	4034141.1372
		420004.5740	4034139.6849
T21	0.49	422592.2681	4031994.7888
		422592.1981	4031994.7332
		422355.2617	4031806.6465
		422299.6378	4031762.4906
		422105.2825	4031749.0183
		421855.0233	4031871.3901
		421952.1081	4032442.4394
		421827.2288	4032498.3566
		421765.7569	4032526.0855
		421758.8199	4032529.2147
		421672.6950	4032568.0642
		421669.5739	4032583.9514
		421642.8450	4032720.0067
		421615.4529	4032859.4383
		421680.5833	4033146.5036
		421959.4881	4033044.5656
		422031.2822	4033112.9606
		422103.3088	4033191.3140
		422274.9333	4033248.8166
		422331.3994	4033437.2447
		422451.8434	4033492.2605
		422530.2048	4033470.0379
		422579.0949	4033430.6750
		422659.7524	4033313.9588

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		422698.7244	4033173.2549
		422688.1222	4032830.0374
		422701.7643	4032367.5270
		422592.2681	4031994.7888
T23-5	0.31	419223.1494	4034342.8214
		419141.4448	4034271.8118
		419084.1419	4033110.8123
		418754.0253	4033026.4824
		418552.8969	4033287.6994
		418483.9471	4033621.1100
		418689.0409	4034066.4152
		418529.1039	4034424.5053
		418665.8457	4034527.9245
		419064.9605	4034610.8362
		419188.9454	4034400.9790
		419223.1494	4034342.8214
T25-3	0.26	417974.8683	4036933.5367
		418192.9713	4036174.1094
		418665.8457	4034527.9245
		418529.1039	4034424.5053
		418434.8263	4034452.0750
		418325.1939	4034653.5406
		418224.8453	4034845.3287
		418067.8080	4035047.7803
		417953.2284	4035467.5065
		417980.4697	4035865.3136
		418027.8561	4036319.6127
		417976.7952	4036709.7435
		417940.1967	4036989.3746
		417924.4340	4037108.4563
		417974.8683	4036933.5367
T32-1	0.18	416020.8582	4042568.1991
		416020.5077	4042551.3401
		416020.1409	4042533.6930
		416018.9905	4042478.3471
		416015.9120	4042330.2460
		415869.3630	4042338.0433
		415692.3612	4042371.6124
		415686.0509	4042382.4209
		415685.9013	4042382.6772
		415685.2178	4042383.8480
		415542.5045	4042628.2931
		415466.1135	4042759.1388
		415360.9503	4042939.2666
		415325.3619	4043000.2238
		415316.6838	4043015.0880
		415532.3824	4043014.2631

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415696.9669	4043207.9327
		415863.2633	4043403.6167
		415996.8507	4043320.6666
		416009.4278	4043312.8570
		416010.8609	4043237.9573
		416010.8619	4043237.9058
		416011.6310	4043197.7108
		416012.4067	4043157.1705
		416019.1461	4042804.9417
		416021.5536	4042625.6378
		416021.7492	4042611.0661
		416021.3865	4042593.6171
		416021.0826	4042578.9943
		416020.8582	4042568.1991
T36-3 Addition	0.03	414550.5526	4039224.6348
		414548.2365	4039274.9161
		414537.5701	4039498.0063
		414528.0492	4039697.5872
		414532.4404	4039758.0190
		414583.4212	4039699.2761
		414643.2559	4039605.6218
		414700.4892	4039498.9600
		414718.6997	4039441.7268
		414729.1056	4039314.2529
		414747.2438	4039109.5495
		414550.5526	4039224.6348
T37-1	0.21	408316.4774	4042459.9838
		408338.8360	4042445.5751
		408346.9908	4042440.3199
		408347.0668	4042402.6597
		408347.9558	4041961.9434
		408348.0616	4041909.5004
		408348.9029	4041492.4725
		408268.2287	4041492.7310
		408159.1942	4041493.0803
		408085.5117	4041493.3164
		407826.2600	4041871.2474
		407718.8959	4042027.7602
		407731.4988	4042299.4041
		407804.9242	4042524.2075
		407860.7976	4042630.3748
		407873.2855	4042654.1035
		407893.8312	4042653.2768
		407936.4269	4042651.5630
		407947.3069	4042651.1252
		407978.0503	4042649.8882
		407978.4997	4042649.8701

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		407979.3355	4042649.8365
		407980.4094	4042649.7933
		407985.9326	4042649.5710
		408021.5853	4042648.1365
		408022.4716	4042648.1008
		408032.2670	4042647.7067
		408032.2792	4042647.7062
		408037.2143	4042635.1454
		408046.7525	4042610.8691
		408053.9609	4042592.5224
		408067.3807	4042558.3666
		408073.8791	4042541.8273
		408077.5517	4042532.4798
		408078.1553	4042530.9437
		408080.2995	4042525.4862
		408086.5383	4042509.6074
		408088.7554	4042503.9647
		408089.5014	4042502.0659
		408089.5374	4042502.0637
		408089.5625	4042502.0622
		408090.7813	4042501.9891
		408095.0368	4042501.7350
		408162.3272	4042497.7099
		408184.0589	4042496.4101
		408184.9242	4042496.3584
		408201.5916	4042495.3615
		408219.8713	4042494.2681
		408226.3741	4042493.8791
		408267.6767	4042491.4087
		408267.7178	4042491.4062
		408294.6521	4042474.0488
		408315.3660	4042460.7000
		408316.4646	4042459.9920
		408316.4774	4042459.9838
T37-2	0.59	409286.9516	4038201.2212
		409308.0584	4038163.0196
		409308.0602	4038162.9814
		409308.0610	4038162.9628
		409310.1022	4038119.0518
		409311.1102	4038097.3658
		409312.4915	4038067.6499
		409312.7645	4038061.7760
		409325.1482	4038037.5861
		409335.6731	4038017.0272
		409335.6730	4038017.0063
		409334.9149	4037882.5867
		409334.4056	4037792.2852

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409260.6274	4037628.4629
		409184.9769	4037508.1215
		409105.2039	4037365.9140
		409044.0149	4037256.8354
		408950.7405	4037246.0033
		408947.8902	4037245.6722
		408910.3790	4037241.3160
		408869.9095	4037236.6162
		408755.7934	4037260.8691
		408761.5547	4037206.7214
		408764.0431	4037183.3347
		408766.5154	4037160.0993
		408768.3315	4037143.0313
		408784.9129	4037079.6832
		408785.6375	4037039.7694
		408785.6817	4037037.3381
		408787.0526	4036961.8229
		408789.6756	4036817.3542
		408751.3271	4036667.7207
		408706.6520	4036616.2502
		408702.8334	4036371.4813
		408700.9212	4036248.9110
		408700.7355	4036237.0064
		408700.7345	4036236.9420
		408700.2588	4036206.4511
		408694.4951	4035836.9988
		408465.9883	4035936.4920
		408417.2066	4035957.7318
		408415.8015	4035964.7875
		408386.2217	4036113.3207
		408376.9612	4036159.8220
		408370.5660	4036191.9354
		408325.9393	4036216.4188
		408313.2102	4036223.4024
		408249.5600	4036258.3226
		408231.7489	4036571.0454
		408075.5676	4036791.1801
		408254.3940	4037157.2867
		408249.8202	4037387.3633
		408305.3159	4037396.8798
		408538.1880	4037436.8131
		408606.5674	4037448.5389
		408414.0682	4037664.3519
		408348.7912	4037888.7233
		408388.2641	4037979.1214
		408394.2512	4037992.8327
		408415.8298	4038042.2505

Exhibit 1 - PM10 Control Areas and Coordinates

2006 Dust Control Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408457.2390	4038102.5799
		408493.9799	4038156.1081
		408687.9040	4038284.6646
		408762.6862	4038303.7721
		408796.6756	4038298.6942
		408853.1404	4038290.2585
		408856.6550	4038287.5971
		408883.0703	4038267.5946
		408888.3205	4038263.6190
		408908.9055	4038248.0314
		408911.3347	4038246.1919
		408915.2794	4038246.3720
		408969.2399	4038248.8355
		409028.9283	4038251.5605
		409068.1858	4038254.4649
		409124.1495	4038258.6052
		409126.1477	4038258.7530
		409129.0855	4038277.7607
		409130.9580	4038289.8759
		409134.0177	4038309.6731
		409144.5362	4038382.5555
		409166.2029	4038398.4562
		409188.6648	4038414.9404
		409194.4843	4038419.2111
		409201.0785	4038424.0504
		409201.1026	4038424.0681
		409201.2496	4038424.0469
		409201.6494	4038423.9892
		409267.1551	4038414.5416
		409267.1731	4038414.5390
		409276.8305	4038407.5517
		409299.1327	4038391.4158
		409299.1846	4038391.3782
		409300.1250	4038380.9426
		409304.3603	4038333.9409
		409304.7158	4038329.9955
		409304.7186	4038329.9623
		409264.9373	4038273.3966
		409254.9598	4038259.2095
		409254.9382	4038259.1787
		409254.9333	4038259.1717
		409266.6143	4038238.0301
		409286.9516	4038201.2212

Exhibit 1 - PM10 Control Areas and Coordinates

Channel Area

Area ID	Area (sq miles)	UTM X	UTM Y
C1	0.21	412114.1288	4023531.1972
		411898.3534	4023239.0517
		411853.5786	4023178.4492
		411780.3515	4023076.2456
		411702.1375	4022877.2132
		411645.2720	4022735.1098
		411641.2736	4022435.1011
		411421.1708	4022347.8283
		411290.0657	4022321.4651
		411151.2016	4022147.9844
		410987.9078	4022252.4215
		410994.3205	4022416.6426
		411073.0277	4022641.9086
		411126.7256	4022795.5958
		411432.4438	4022937.5450
		411460.7988	4022950.7106
		411581.3611	4023006.5993
		411733.8386	4023231.0923
		411756.0765	4023263.9938
		411784.7187	4023306.3704
		411867.2652	4023463.2354
		411856.6603	4023492.7197
		411737.3086	4023824.9915
		411915.0878	4023883.7727
		411987.3569	4023709.3450
		412114.1288	4023531.1972
C2	0.30	410021.5195	4020289.5251
		409689.8168	4020165.2179
		409630.4774	4020144.7287
		409576.6128	4020126.1299
		409445.4661	4019983.4003
		409435.8230	4019902.2959
		409208.2558	4019473.1115
		409164.6560	4019560.5346
		409160.4540	4019569.1396
		409135.7321	4019619.7659
		409133.7381	4019623.8493
		409132.8181	4019625.7333
		409119.1730	4019653.6761
		409087.7794	4019744.3676
		409076.9241	4019775.7268
		409064.5237	4019812.8632
		409052.3419	4019860.5319
		409109.9316	4019969.9738
		409201.9155	4020086.6047
		409223.1416	4020188.3568
		409280.4484	4020086.9084

Exhibit 1 - PM10 Control Areas and Coordinates

Channel Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409276.4247	4020023.1050
		409362.4622	4020009.5035
		409409.2894	4020065.3131
		409487.6034	4020143.3409
		409724.2880	4020448.5196
		409998.0302	4020801.4793
		410027.5849	4021036.2856
		410038.4994	4021096.3389
		410110.0532	4021493.3823
		410350.3675	4021535.4504
		410566.9152	4021570.1680
		410723.1430	4021595.2150
		410604.9139	4021412.4751
		410686.3969	4021329.2488
		410592.4067	4021145.4323
		410488.7112	4020946.6551
		410264.9378	4020620.1863
		410015.7153	4020454.4270
		410021.5195	4020289.5251

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 8 Area

Area ID	Area (sq miles)	UTM X	UTM Y
Area A	1.96	411237.3205	4043740.6607
		411207.6845	4043753.6791
		411179.2895	4043757.2091
		411151.6315	4043749.0266
		411123.9014	4043730.4160
		411089.3187	4043670.0089
		410953.8469	4043482.2177
		410935.7348	4043461.5191
		410823.5172	4043456.9972
		410787.0434	4043466.5180
		410727.7247	4043492.0010
		410704.5141	4043495.0568
		410597.5819	4043458.1315
		410565.5024	4043436.8383
		410543.3654	4043401.4241
		410537.6911	4043382.7183
		410536.8726	4043348.8423
		410542.2467	4043327.0034
		410533.5401	4043305.6995
		410526.6307	4043242.9925
		410511.3725	4043210.0862
		410493.9516	4043001.1922
		410268.6279	4043005.6231
		410003.7039	4043010.8326
		410001.6954	4042464.1381
		410000.0033	4042003.4174
		410723.8358	4042002.5739
		410768.3331	4041851.7219
		410776.8400	4041822.8824
		410840.2849	4041607.7952
		410843.9976	4041595.2088
		410857.4942	4041549.4532
		410825.3880	4041524.8233
		410453.6629	4041239.6583
		410132.6677	4040993.4098
		410754.5323	4040429.4164
		410536.3607	4040449.0193
		410369.0729	4040479.2024
		410233.7633	4040544.6348
		410176.5626	4040579.7134
		410104.1071	4040608.5803
		409907.2818	4040745.3987
		409879.5179	4040756.3952
		409750.2805	4040876.4342
		409701.3330	4040895.5954
		409678.6324	4040925.6786
		409642.8276	4040956.5193

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 8 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409600.4556	4040974.3943
		409571.2767	4041006.1819
		409557.0110	4041045.3963
		409545.6251	4041061.2854
		409454.5386	4041143.5883
		409411.7061	4041174.3745
		409399.9933	4041192.2740
		409373.0680	4041216.8668
		409144.3041	4041353.2179
		409121.3431	4041357.7851
		409098.3821	4041353.2179
		409025.7306	4041294.5927
		408819.0912	4041213.6030
		408655.7727	4041290.5176
		408426.6115	4041410.1279
		408344.8643	4041438.2143
		408298.9586	4041458.6586
		408268.2287	4041492.7310
		408348.9029	4041492.4725
		408348.0616	4041909.5004
		408347.9558	4041961.9434
		408347.0668	4042402.6597
		408346.9908	4042440.3199
		408338.8360	4042445.5751
		408316.4774	4042459.9838
		408316.4851	4042459.9851
		408316.5011	4042459.9880
		408316.6806	4042460.0196
		408339.4204	4042464.0330
		408343.1042	4042464.6831
		408343.1912	4042464.6985
		408352.7133	4042470.4798
		408352.9831	4042470.6436
		408358.4712	4042473.9756
		408358.9028	4042474.2377
		408361.9306	4042476.0760
		408389.6508	4042484.1169
		408405.7674	4042488.7920
		408428.3087	4042504.1697
		408441.1621	4042518.9802
		408445.2616	4042523.7039
		408455.9718	4042536.0449
		408462.6057	4042543.6889
		408466.8823	4042548.6166
		408471.3153	4042553.7246
		408477.8694	4042561.2767
		408479.8641	4042563.5751

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 8 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408482.5335	4042566.6510
		408486.5695	4042571.3015
		408500.6445	4042587.5196
		408505.8846	4042593.5576
		408506.2941	4042594.0294
		408511.8895	4042600.4769
		408520.5008	4042614.1347
		408525.9797	4042622.8245
		408526.1185	4042623.0446
		408526.3493	4042623.1913
		408527.1862	4042623.7230
		408531.5370	4042626.4874
		408533.4289	4042627.6895
		408538.3709	4042630.8295
		408543.1086	4042633.8398
		408543.1695	4042633.8785
		408548.7787	4042637.4425
		408563.7246	4042646.9389
		408566.5111	4042648.7094
		408568.1933	4042649.7782
		408569.7642	4042650.7764
		408569.7790	4042650.7858
		408570.3453	4042651.1456
		408571.7999	4042652.0698
		408574.7923	4042653.9712
		408574.9830	4042654.0923
		408576.1325	4042654.5279
		408578.9758	4042655.6054
		408590.3377	4042659.9109
		408604.3349	4042665.2152
		408611.9856	4042668.1144
		408619.1549	4042670.8313
		408629.8639	4042674.8894
		408651.6705	4042676.7814
		408652.7502	4042676.8751
		408658.4561	4042677.3701
		408665.3417	4042677.9675
		408674.8361	4042676.2663
		408688.6273	4042673.7951
		408696.6588	4042672.3560
		408707.2204	4042674.2302
		408713.6605	4042675.3731
		408745.3474	4042680.9963
		408748.7206	4042682.3273
		408758.3303	4042686.1190
		408766.3233	4042689.2729
		408785.3467	4042696.7791

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 8 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408792.4681	4042699.5891
		408803.5265	4042706.5849
		408820.8039	4042717.5152
		408825.1265	4042720.2498
		408840.3955	4042739.6846
		408844.1085	4042744.4106
		408851.2068	4042762.0701
		408857.0293	4042776.5556
		408858.9146	4042781.2460
		408859.2582	4042782.1007
		408863.2774	4042792.0999
		408858.8893	4042833.5669
		408857.4396	4042847.2662
		408856.8687	4042852.6613
		408856.6178	4042855.0319
		408856.0866	4042860.0523
		408859.4392	4042863.1236
		408863.1337	4042866.5080
		408863.5110	4042866.8537
		408867.9296	4042870.9015
		408890.4177	4042891.5024
		408894.7102	4042895.4348
		408900.2233	4042900.4852
		408907.6413	4042907.2807
		408910.5689	4042909.9627
		408913.3184	4042913.6459
		408918.1633	4042920.1363
		408921.8623	4042925.0916
		408929.5742	4042935.4224
		408932.4594	4042939.2875
		408932.7352	4042939.6570
		408936.0468	4042944.0932
		408937.4330	4042945.9503
		408937.7558	4042946.3827
		408940.4946	4042950.0516
		408946.5357	4042958.1444
		408953.7132	4042967.7595
		408959.3314	4042975.2857
		408971.6735	4042987.1501
		408976.9965	4042992.2671
		408993.9067	4043008.5228
		408994.3653	4043008.9637
		409008.4854	4043046.8150
		409011.3561	4043054.5105
		409021.0004	4043063.4047
		409021.8449	4043064.1835
		409029.3449	4043071.1002

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 8 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409029.4133	4043071.1632
		409035.9237	4043077.1673
		409041.4086	4043082.2255
		409049.1885	4043089.4003
		409057.0231	4043096.6256
		409060.9224	4043100.2216
		409064.2670	4043103.3061
		409064.8988	4043103.8887
		409081.3001	4043119.0144
		409083.5694	4043121.1072
		409092.7411	4043129.5655
		409103.0041	4043136.8856
		409119.9071	4043148.9417
		409123.5351	4043151.5294
		409125.0977	4043152.6440
		409131.4936	4043157.2058
		409146.6404	4043168.0094
		409156.9721	4043183.8188
		409157.5060	4043184.6357
		409158.1803	4043185.6676
		409169.1853	4043202.5072
		409169.4921	4043202.9767
		409169.6449	4043203.0818
		409194.5618	4043220.2162
		409200.9353	4043230.3216
		409208.7508	4043242.7132
		409208.7762	4043242.7534
		409230.6355	4043256.7461
		409238.0474	4043261.4907
		409246.0315	4043266.6016
		409331.5726	4043349.9087
		409344.7418	4043368.3637
		409498.2187	4043486.8379
		409513.1152	4043503.3271
		409564.1080	4043531.4515
		409606.3741	4043547.2951
		410002.9423	4043763.4240
		410192.6181	4043839.1058
		410212.5063	4043857.7331
		410224.8423	4043887.6674
		410263.2830	4043926.8198
		410428.1796	4043982.7461
		410597.2709	4044063.9791
		410780.5637	4044127.9989
		410797.1634	4044138.3212
		410822.1383	4044165.6309
		410976.4794	4044211.0969

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 8 Area

Area ID	Area (sq miles)	UTM X	UTM Y
Area B	0.06	410994.0806	4044226.5327
		411004.4350	4044247.5293
		411020.9354	4044383.2291
		411194.2518	4044437.7691
		411250.0279	4044449.6939
		411237.3205	4043740.6607
		411368.8821	4043685.0145
		411375.0392	4043915.7480
		411516.4385	4043938.4040
		411620.8424	4044005.2321
		411709.8854	4044038.2482
		411758.3361	4044037.2052
		411828.9394	4044025.2421
		411888.9563	4043991.2337
		411896.9565	4043946.2341
		411863.9022	4043894.9825
		411828.8353	4043806.6428
		411788.9031	4043686.1008
		411697.8689	4043662.0922
		411602.8327	4043660.0595
		411456.7364	4043657.0894
		411368.8821	4043685.0145

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
C2-L1	0.08	409087.7794	4019744.3676
		409119.1730	4019653.6761
		409132.8181	4019625.7333
		409133.7381	4019623.8493
		409135.7321	4019619.7659
		409160.4540	4019569.1396
		409164.6560	4019560.5346
		409208.2558	4019473.1115
		409207.5174	4019364.3380
		409207.4586	4019355.6851
		409219.4108	4019347.7120
		409240.1576	4019333.8721
		409272.1768	4019316.2843
		409302.2554	4019299.7625
		409374.7338	4019259.9508
		409428.6436	4019253.2063
		409493.9270	4019250.0862
		409500.0000	4019229.7137
		409534.8572	4019112.7819
		409535.2630	4019063.9333
		409535.2790	4019062.0029
		409535.4202	4019044.9991
		409535.7335	4019007.2814
		409535.7940	4019000.0000
		409535.8384	4018994.6572
		409524.1563	4018994.1348
		409505.6563	4018993.3340
		409501.8125	4018984.2520
		409501.9375	4018961.3789
		409502.3750	4018943.6641
		409479.4063	4018921.0293
		409469.4688	4018909.3457
		409459.9688	4018905.8438
		409411.3750	4018888.4805
		409384.1875	4018844.5391
		409375.1875	4018815.8887
		409371.6250	4018810.6992
		409355.9375	4018801.1973
		409350.1875	4018798.6875
		409344.2188	4018797.0176
		409333.7450	4018795.4162
		409302.8125	4018765.2930
		409250.5329	4018743.3376
		409250.3750	4018743.1016
		409244.9063	4018740.9746
		409221.4063	4018739.1406
		409204.0938	4018737.2305

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409198.1250	4018737.7090
		409195.0000	4018741.9863
		409192.9375	4018747.7637
		409191.4375	4018753.2520
		409190.0625	4018758.9082
		409190.4375	4018764.6133
		409191.8125	4018769.8379
		409195.1250	4018774.5059
		409198.6250	4018779.0742
		409200.9063	4018784.5996
		409201.9375	4018786.2715
		409204.2188	4018790.0527
		409207.3125	4018794.8496
		409211.6250	4018797.8184
		409216.2188	4018801.4961
		409219.6875	4018805.8887
		409223.0938	4018810.2930
		409226.1875	4018815.2168
		409229.7188	4018819.8027
		409232.1875	4018825.0371
		409234.5625	4018830.1231
		409235.3750	4018836.1895
		409234.5938	4018841.4199
		409233.1250	4018846.6074
		409230.8125	4018851.6250
		409228.1875	4018856.6602
		409224.5313	4018861.3262
		409220.7813	4018865.6563
		409218.8125	4018870.9414
		409217.8750	4018876.4922
		409215.3125	4018881.1738
		409213.3750	4018885.8184
		409212.1250	4018891.1270
		409209.7813	4018894.8106
		409209.5625	4018901.0000
		409210.7813	4018906.7266
		409212.3438	4018911.9688
		409215.1563	4018916.5918
		409218.9063	4018920.8926
		409222.8125	4018924.4766
		409226.2813	4018928.5117
		409229.3750	4018931.5137
		409231.4688	4018933.7598
		409235.1250	4018937.6543
		409239.8750	4018940.9121
		409243.5313	4018944.9590
		409246.7500	4018949.4375

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409248.4688	4018954.5586
		409247.7813	4018959.7637
		409248.8438	4018965.1680
		409253.0625	4018968.6270
		409257.7829	4018971.0797
		409291.3125	4018993.2539
		409309.4063	4018979.5859
		409335.4688	4018983.5879
		409353.6250	4019026.3809
		409356.5830	4019104.0949
		409356.0625	4019106.2852
		409356.7234	4019107.7831
		409357.0938	4019117.5137
		409365.3438	4019190.8477
		409342.5000	4019222.2031
		409306.1875	4019242.1289
		409285.8589	4019256.1706
		409284.1250	4019257.1387
		409280.9688	4019259.0879
		409280.8973	4019259.1698
		409280.7325	4019259.2676
		409280.6563	4019259.2891
		409280.2218	4019259.5708
		409276.9687	4019261.5019
		409262.6875	4019271.9140
		409247.6250	4019282.4531
		409233.2187	4019292.5313
		409197.8181	4019320.2782
		409195.7813	4019321.6465
		409192.2188	4019324.1133
		409192.2500	4019324.2578
		409192.3125	4019324.3594
		409192.2813	4019324.5391
		409186.7813	4019328.7168
		409186.2377	4019329.3549
		409186.0191	4019329.5262
		409185.9688	4019329.4863
		409183.0000	4019331.8926
		409153.7188	4019363.2930
		409134.1563	4019390.8242
		409134.1875	4019405.6758
		409140.5312	4019422.8145
		409144.9055	4019432.0277
		409137.4375	4019443.4883
		409120.9063	4019442.1953
		409074.3125	4019442.1231
		409059.8438	4019446.7422

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
DuckPond-L1	0.16	409046.5938	4019458.9746
		408978.2813	4019479.2481
		408943.9688	4019519.6250
		408908.4063	4019566.7305
		408862.1563	4019572.7344
		408843.8750	4019574.4863
		408828.3750	4019585.5293
		408759.6563	4019634.6895
		408629.0361	4019730.5739
		408624.1563	4019733.8164
		408601.4375	4019750.4258
		408590.7600	4019758.4994
		409087.7794	4019744.3676
		410031.0849	4018587.3936
		410032.3437	4018584.3964
		410061.7811	4018580.7016
		410064.1562	4018581.6230
		410075.5312	4018580.8203
		410084.2500	4018581.2128
		410090.4430	4018581.0267
		410099.0625	4018580.7675
		410114.6250	4018580.8418
		410131.4062	4018580.0039
		410147.9687	4018578.0117
		410161.5000	4018578.6796
		410173.5937	4018580.4902
		410181.7183	4018580.3297
		410182.4375	4018580.8613
		410182.6875	4018580.3104
		410184.2389	4018576.9366
		410187.4375	4018569.9804
		410188.2812	4018558.3593
		410190.5346	4018524.4617
		410200.8750	4018490.8964
		410231.3437	4018479.4785
		410354.2812	4018478.9472
		410451.4062	4018488.9179
		410466.6439	4018498.9629
		410532.6250	4018542.4589
		410589.2500	4018552.7656
		410707.4687	4018560.7851
		410798.9822	4018560.5659
		410804.9241	4018560.5518
		410812.2900	4018560.5342
		410820.8438	4018560.5137
		410834.3125	4018557.6856
		410844.6563	4018552.3574

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		410844.6639	4018552.3535
		410847.5625	4018550.8672
		410850.3125	4018547.8301
		410853.7188	4018547.5059
		410857.0313	4018549.7461
		410863.2193	4018554.0584
		410867.8750	4018557.3027
		410870.8097	4018559.3402
		410874.2187	4018561.7070
		410893.7187	4018561.6250
		410899.9687	4018542.9746
		410905.7187	4018522.6191
		410906.1241	4018520.4503
		410906.1250	4018520.4453
		410906.2813	4018519.7109
		410909.7812	4018501.6230
		410901.3437	4018483.3066
		410900.9063	4018471.0234
		410900.9039	4018470.9633
		410900.7187	4018466.3027
		410904.4062	4018461.4941
		410904.4110	4018461.4879
		410910.3315	4018453.7562
		410910.3437	4018453.7402
		410910.4375	4018453.6367
		410910.9683	4018443.1502
		410910.9688	4018443.1406
		410911.2187	4018437.8457
		410907.8125	4018417.8398
		410900.6250	4018398.5527
		410883.5312	4018390.5898
		410865.8750	4018390.1894
		410854.1875	4018378.3515
		410841.1875	4018369.8027
		410840.6562	4018369.0937
		410837.7813	4018365.1387
		410835.8266	4018363.0415
		410830.7265	4018357.5695
		410827.5625	4018357.0000
		410822.8911	4018358.9993
		410819.9687	4018360.2500
		410814.1562	4018352.5000
		410810.4739	4018348.5399
		410804.6250	4018342.2500
		410803.0625	4018339.5000
		410800.2813	4018335.2500
		410792.0000	4018328.5000

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		410790.9168	4018326.7118
		410788.0625	4018322.0000
		410777.7188	4018318.0000
		410768.7812	4018317.5000
		410761.8125	4018304.5000
		410757.7187	4018301.2500
		410764.5313	4018285.0000
		410761.9062	4018277.0000
		410757.6148	4018268.9799
		410754.2812	4018262.7500
		410749.3125	4018261.5000
		410742.1875	4018259.2500
		410749.3125	4018249.7500
		410750.3437	4018248.2500
		410750.5937	4018246.2500
		410749.3125	4018245.2500
		410748.8125	4018245.0000
		410740.6562	4018246.2500
		410739.9303	4018246.3706
		410730.1250	4018248.0000
		410709.7500	4018235.5000
		410702.3125	4018231.2500
		410700.0705	4018227.9247
		410696.7500	4018223.0000
		410688.3438	4018213.7500
		410668.5000	4018206.2500
		410627.3750	4018198.0000
		410621.3125	4018183.7500
		410624.2187	4018181.5000
		410620.0937	4018182.2500
		410594.5312	4018181.0000
		410589.2187	4018181.5000
		410566.4688	4018186.5000
		410535.8750	4018171.0000
		410532.9062	4018167.2500
		410529.1875	4018164.0000
		410500.9687	4018141.2500
		410494.2187	4018135.7500
		410488.1250	4018133.0000
		410485.5625	4018135.7500
		410474.4375	4018137.0000
		410468.3437	4018133.0000
		410464.6562	4018137.7500
		410446.7187	4018145.0000
		410440.1250	4018145.0000
		410428.8750	4018142.7500
		410421.5625	4018140.7500

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		410419.7140	4018140.1121
		410413.5937	4018138.0000
		410408.9063	4018137.0000
		410401.3750	4018129.7500
		410397.0937	4018126.5000
		410394.9062	4018122.7500
		410389.7188	4018111.2500
		410386.5000	4018107.2500
		410379.4221	4018100.9586
		410378.9063	4018100.5000
		410377.7500	4018099.5000
		410375.9688	4018099.0000
		410375.9280	4018099.0214
		410373.0937	4018100.5000
		410372.7087	4018101.6034
		410371.0000	4018106.5000
		410350.2500	4018116.2500
		410333.3667	4018121.4261
		410331.4062	4018124.1250
		410333.2500	4018140.2480
		410333.2506	4018140.2538
		410333.4062	4018141.7070
		410333.6875	4018155.2617
		410324.6250	4018165.8613
		410323.7802	4018166.2622
		410307.6562	4018173.8554
		410297.6875	4018189.5019
		410288.8437	4018192.3730
		410277.6250	4018191.7500
		410266.3125	4018184.4707
		410252.5625	4018175.0234
		410233.0937	4018172.1308
		410217.5000	4018183.3554
		410211.9375	4018201.1113
		410208.9375	4018208.8907
		410205.6875	4018217.3515
		410202.8435	4018219.5388
		410199.3125	4018222.2519
		410192.7500	4018221.7363
		410177.5318	4018231.4436
		410176.0625	4018232.3808
		410174.6592	4018240.8893
		410172.7500	4018252.4648
		410175.3437	4018253.2578
		410175.7187	4018262.0312
		410185.2187	4018276.3691
		410173.0000	4018290.9414

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		410154.6222	4018301.9333
		410154.4062	4018302.0625
		410136.2812	4018315.9316
		410122.0625	4018334.2773
		410104.0312	4018346.9629
		410103.7150	4018347.2933
		410102.3437	4018348.7265
		410101.5625	4018348.8203
		410101.1562	4018349.9668
		410089.0000	4018362.6172
		410074.5625	4018372.7851
		410055.0312	4018379.0000
		410036.4062	4018388.1269
		410036.2417	4018388.2575
		410018.7500	4018402.1328
		410014.5625	4018424.6855
		410017.2744	4018437.9767
		410018.8437	4018445.6679
		410019.5000	4018451.7129
		410019.5070	4018451.7791
		410021.0937	4018466.8027
		410019.7187	4018483.4375
		410013.0000	4018484.7089
		410003.4062	4018486.5175
		409987.0625	4018479.4375
		409970.6250	4018474.0664
		409970.1250	4018473.9004
		409968.0937	4018473.3925
		409955.5312	4018470.2812
		409950.9687	4018455.2617
		409952.2812	4018451.4765
		409956.8750	4018438.2812
		409943.2500	4018425.9902
		409939.5313	4018421.0313
		409931.5938	4018410.4102
		409913.3438	4018401.5430
		409893.1250	4018403.2188
		409880.5938	4018406.2031
		409817.6875	4018421.0469
		409784.9552	4018426.7287
		409782.2500	4018427.0957
		409762.8125	4018430.5723
		409744.7188	4018437.5410
		409687.8750	4018482.5137
		409632.0625	4018509.0020
		409597.8125	4018525.2168
		409566.8750	4018531.2968

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409563.5934	4018537.1404
		409557.5000	4018547.9902
		409554.3437	4018571.9843
		409542.9062	4018614.6425
		409521.1562	4018692.6875
		409518.0312	4018711.2324
		409517.3750	4018715.2363
		409522.0312	4018733.2187
		409527.5625	4018740.9648
		409564.9687	4018745.6347
		409578.4062	4018749.1738
		409593.3437	4018750.5722
		409607.9062	4018756.4629
		409617.5312	4018768.0390
		409625.2500	4018781.6093
		409637.8125	4018784.3828
		409637.7812	4018771.4902
		409643.2812	4018759.6464
		409658.0625	4018752.2910
		409673.4687	4018745.3359
		409687.9687	4018737.3886
		409703.0312	4018731.7773
		409718.5312	4018737.2461
		409734.6250	4018739.4726
		409748.8125	4018747.4531
		409755.9756	4018753.2742
		409761.6250	4018757.8652
		409769.0000	4018772.5293
		409782.4063	4018782.1055
		409797.4688	4018788.6426
		409812.5625	4018792.3906
		409826.0313	4018790.3164
		409840.4063	4018787.2441
		409853.3125	4018781.9316
		409862.6875	4018790.6914
		409860.2500	4018805.6211
		409861.2188	4018821.0000
		409871.9375	4018829.6211
		409885.2188	4018826.2676
		409889.6875	4018812.8047
		409893.7500	4018798.0879
		409898.1901	4018791.7561
		409902.7812	4018785.2089
		409913.0312	4018774.0722
		409922.2812	4018765.1035
		409933.7812	4018769.5039
		409945.6250	4018766.9316

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
DuckPond-L2	0.01	409956.1035	4018765.2943
		409959.8125	4018764.7148
		409966.9310	4018765.4660
		409973.2500	4018766.1328
		409980.1557	4018765.8153
		409986.8437	4018765.5078
		409995.0625	4018759.4550
		410003.5937	4018706.9765
		410004.5635	4018681.2253
		410004.5663	4018681.1495
		410005.1250	4018666.3145
		410005.7187	4018650.2050
		410009.2529	4018640.2979
		410011.4375	4018634.1738
		410029.4130	4018591.3744
		410031.0849	4018587.3936
		410798.9822	4018560.5659
		410707.4687	4018560.7851
		410589.2500	4018552.7656
		410532.6250	4018542.4589
		410466.6439	4018498.9629
		410451.4062	4018488.9179
		410354.2812	4018478.9472
		410231.3437	4018479.4785
		410200.8750	4018490.8964
		410190.5346	4018524.4617
		410188.2812	4018558.3593
		410187.4375	4018569.9804
		410184.2389	4018576.9366
		410182.6875	4018580.3104
		410182.4375	4018580.8613
		410181.7183	4018580.3297
		410173.5937	4018580.4902
		410161.5000	4018578.6796
		410147.9687	4018578.0117
		410131.4062	4018580.0039
		410114.6250	4018580.8418
		410099.0625	4018580.7675
		410090.4430	4018581.0267
		410084.2500	4018581.2128
		410075.5312	4018580.8203
		410064.1562	4018581.6230
		410061.7811	4018580.7016
		410032.3437	4018584.3964
		410031.0849	4018587.3936
		410610.8819	4018578.0027
		410611.9688	4018575.4198

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
T10-3-L1	0.49	410614.5938	4018563.3379
		410626.0313	4018566.1347
		410642.1875	4018572.1054
		410659.9375	4018574.7617
		410677.8438	4018575.7363
		410690.0938	4018573.8925
		410703.0313	4018572.6582
		410717.3437	4018571.8046
		410736.9688	4018572.6425
		410754.8750	4018573.5390
		410764.6562	4018574.2909
		410780.1250	4018575.4472
		410795.2813	4018572.1855
		410798.9822	4018560.5659
		414525.4449	4027872.6930
		414603.3991	4027348.4000
		414666.3683	4027314.2564
		414704.5839	4027293.5349
		414829.7448	4027225.6694
		414946.0613	4027212.3252
		414946.8125	4027212.2390
		414946.7384	4027212.0856
		414809.4765	4026927.9082
		414777.6428	4026862.0020
		414628.2736	4026552.7589
		414626.7335	4026550.4892
		414581.3692	4026483.6358
		414580.1326	4026481.8134
		414575.1058	4026474.4055
		414574.5451	4026473.5792
		414521.1467	4026419.0833
		414474.4641	4026371.4413
		414468.2236	4026365.1107
		414364.4695	4026259.8586
		414361.5358	4026256.8825
		414294.0026	4026188.3743
		414280.6829	4026176.7292
		414237.0681	4026138.5977
		414202.5256	4026108.3980
		414103.3906	4026021.7264
		414058.1609	4025988.9880
		414054.0898	4025986.0412
		414047.8003	4025981.4887
		413892.4598	4025869.0491
		413843.4527	4025859.0182
		413829.2680	4025901.0240
		413769.3260	4026077.6510

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		413766.8293	4026102.6406
		413774.2520	4026130.8220
		413773.2640	4026153.3100
		413768.6080	4026169.1760
		413769.9440	4026206.0330
		413764.4600	4026229.3150
		413761.1130	4026315.1330
		413762.1840	4026336.2360
		413793.8360	4026337.1470
		413799.1127	4026344.1542
		413795.9790	4026355.3210
		413798.2401	4026395.5489
		413810.6940	4026397.6650
		413814.6230	4026411.5210
		413816.3460	4026445.6330
		413813.8690	4026457.9570
		413813.8570	4026485.0170
		413822.1490	4026499.9920
		413823.9760	4026565.8770
		413826.1880	4026583.3080
		413822.6220	4026599.2050
		413823.7540	4026625.8900
		413823.6980	4026659.2300
		413831.9430	4026671.6870
		413842.7170	4026687.9070
		413849.7370	4026705.4350
		413858.0210	4026720.3030
		413864.8300	4026737.6330
		413900.5600	4026768.0750
		413894.8410	4026776.8640
		413897.2290	4026786.7260
		413911.2500	4026787.5200
		413928.8340	4026806.7060
		413942.1370	4026813.8660
		413954.7110	4026821.2980
		413954.6945	4026850.0205
		413949.8200	4026865.9560
		413932.9030	4026868.5760
		413922.8230	4026872.6790
		413869.4860	4026876.7850
		413859.9980	4026887.3760
		413856.9980	4026902.6120
		413868.5760	4026914.8210
		413880.3510	4026928.0390
		413900.4850	4026936.5090
		413919.7430	4026943.6490
		413930.3390	4026950.4550

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		413936.2790	4026967.1950
		413937.8340	4026983.6500
		413948.4310	4027009.1230
		413956.7560	4027025.5370
		413965.5510	4027032.4080
		413963.0570	4027060.0540
		413957.6050	4027084.4780
		413959.7010	4027096.0250
		413967.7620	4027104.8610
		413978.3090	4027109.4140
		413987.6000	4027103.8290
		414013.2630	4027104.3590
		414035.4440	4027111.8120
		414046.0470	4027119.5470
		414062.0140	4027127.3130
		414080.7920	4027132.4770
		414097.1890	4027138.9150
		414107.5030	4027143.0070
		414117.2610	4027147.5140
		414117.9868	4027150.2423
		414123.8820	4027172.4030
		414117.1900	4027185.9450
		414108.9260	4027190.1904
		414099.8110	4027194.8730
		414096.4400	4027215.2820
		414089.9220	4027235.2340
		414083.7370	4027243.7960
		414077.7010	4027260.6910
		414072.9140	4027271.6330
		414067.7740	4027280.1930
		414052.4860	4027287.2320
		414041.1880	4027289.2530
		414024.5660	4027291.9670
		414002.5650	4027309.4960
		413989.4380	4027321.2290
		413983.0380	4027339.5380
		413972.5920	4027356.7900
		413961.3010	4027372.3260
		413950.8350	4027392.4680
		413948.6340	4027404.9760
		413940.4080	4027414.5520
		413921.6940	4027428.1910
		413933.3400	4027448.7420
		413941.7030	4027462.0890
		413954.1560	4027484.8490
		413965.1680	4027492.3790
		413974.1510	4027529.3630

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		413981.8210	4027549.7810
		413994.7960	4027555.4150
		414009.3540	4027565.0360
		414026.2990	4027583.1480
		414051.7640	4027604.5520
		414072.4060	4027617.4380
		414087.2730	4027635.8180
		414094.1170	4027644.6930
		414099.7487	4027648.1666
		414103.2320	4027650.3150
		414103.0520	4027659.4080
		414111.1230	4027679.4510
		414131.1575	4027709.6455
		414137.5800	4027719.3250
		414146.7760	4027732.4730
		414151.9075	4027740.9051
		414159.1334	4027742.4894
		414167.6240	4027744.3510
		414176.2720	4027740.3740
		414187.0540	4027736.3470
		414198.4250	4027745.3200
		414200.6060	4027756.1820
		414207.5960	4027779.8570
		414216.6760	4027799.1990
		414224.2310	4027814.6090
		414235.0980	4027828.8040
		414275.1810	4027863.5300
		414286.5747	4027873.8534
		414297.5260	4027883.7760
		414297.8098	4027883.9169
		414315.6990	4027892.7980
		414330.5710	4027902.9550
		414370.1950	4027920.8980
		414381.9180	4027926.2160
		414394.0920	4027957.3720
		414406.4329	4027941.2416
		414428.1750	4027912.8230
		414499.9870	4027893.3960
		414513.9410	4027875.5850
		414525.4449	4027872.6930
T10-L1	0.06	417550.0640	4023881.8302
		417491.8761	4023844.6200
		417432.5938	4023823.1348
		417406.6889	4023841.7865
		417404.5313	4023842.9277
		417401.1064	4023845.8060
		417398.8438	4023845.8750

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		417387.4375	4023846.9883
		417377.4063	4023848.7207
		417373.9911	4023849.5536
		417367.8438	4023851.0000
		417363.5497	4023852.4464
		417358.9375	4023853.9434
		417350.9375	4023857.4238
		417347.9675	4023859.0146
		417343.0938	4023861.5000
		417335.2813	4023866.7500
		417334.1271	4023867.6364
		417330.9375	4023867.5996
		417322.1875	4023869.0977
		417323.3403	4023876.4640
		417319.6875	4023879.7500
		417310.5938	4023888.9688
		417301.9688	4023899.1680
		417298.6438	4023903.5500
		417293.6563	4023910.0000
		417286.2813	4023921.5000
		417285.7344	4023922.4546
		417281.1250	4023930.3848
		417276.9063	4023939.6543
		417273.1563	4023949.9414
		417271.6830	4023954.8214
		417269.7188	4023961.2500
		417266.5000	4023975.5000
		417263.6563	4023992.2500
		417261.2488	4024009.7315
		417257.5625	4024036.4043
		417256.6438	4024045.0105
		417255.7813	4024053.0000
		417254.3444	4024071.4844
		417254.3436	4024071.5000
		417253.3443	4024112.0000
		417253.3441	4024112.0410
		417253.6875	4024135.5000
		417255.3873	4024181.7966
		417255.3750	4024181.8125
		417250.0938	4024188.6699
		417245.7188	4024206.3731
		417256.9692	4024218.8867
		417258.1250	4024236.5586
		417263.7812	4024236.7032
		417268.0938	4024251.1309
		417269.0000	4024267.9277
		417277.5625	4024282.9609

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		417277.4688	4024300.6270
		417280.5938	4024358.7793
		417282.1250	4024375.4063
		417285.8125	4024392.4238
		417287.3438	4024410.4102
		417289.7500	4024428.7559
		417300.5625	4024444.2070
		417305.9375	4024459.5820
		417310.6563	4024474.8535
		417322.5000	4024483.1133
		417333.2813	4024492.4785
		417361.0938	4024493.2520
		417376.7188	4024486.8066
		417388.3125	4024474.5840
		417392.8438	4024457.3848
		417400.8438	4024441.6406
		417409.6250	4024426.0449
		417413.8750	4024408.6758
		417410.5625	4024391.0352
		417407.2188	4024373.8281
		417415.2188	4024358.4316
		417428.4688	4024345.1348
		417437.3125	4024327.9512
		417440.1563	4024309.4434
		417446.3750	4024292.7773
		417458.0313	4024278.2344
		417469.2813	4024264.1680
		417484.2500	4024254.3535
		417498.4688	4024242.7949
		417498.5437	4024242.7227
		417558.7235	4024192.5258
		417582.1322	4024165.5897
		417614.8309	4024120.6349
		417620.5572	4024112.7622
		417646.5625	4024066.9434
		417656.8125	4024054.6660
		417656.8125	4024053.9609
		417656.8128	4024053.9378
		417656.8135	4024053.8927
		417657.0938	4024034.7207
		417655.5938	4024017.8535
		417650.0938	4024000.1777
		417629.0625	4023935.6406
		417621.0000	4023926.7168
		417608.2188	4023918.3125
		417592.9375	4023910.2793
		417550.0640	4023881.8302

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
T17-2-L1	0.12	419265.6563	4029152.4160
		419053.1875	4028867.2344
		418728.2813	4028430.3242
		418722.1875	4028434.7051
		418703.3750	4028437.6113
		418680.8125	4028447.9473
		418676.5938	4028450.9375
		418674.2813	4028451.2168
		418664.3125	4028457.7617
		418660.2500	4028462.5137
		418660.2188	4028462.5254
		418638.8750	4028479.9082
		418638.1563	4028480.3301
		418634.0938	4028482.5215
		418621.2188	4028489.2559
		418609.7188	4028497.1602
		418601.2813	4028504.0840
		418601.6563	4028503.9395
		418601.5938	4028504.0488
		418601.3750	4028504.1934
		418598.5938	4028507.4434
		418596.1250	4028509.4160
		418584.2188	4028525.0977
		418580.7188	4028530.0801
		418580.1875	4028530.3770
		418578.4063	4028533.3984
		418570.1250	4028545.2070
		418569.4688	4028546.6484
		418565.5938	4028551.4981
		418565.3125	4028552.3945
		418559.5625	4028562.7246
		418551.6250	4028575.1992
		418539.2188	4028627.8965
		418524.0938	4028708.4375
		418520.7813	4028730.8281
		418502.0625	4028752.2461
		418496.8750	4028756.9395
		418496.8438	4028756.9844
		418496.5938	4028756.8008
		418494.7188	4028760.0723
		418494.0938	4028761.0039
		418493.0938	4028762.8887
		418487.2500	4028772.9844
		418475.8750	4028792.9961
		418471.0000	4028801.4629
		418469.1250	4028804.2422
		418466.1875	4028809.8301

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		418464.6250	4028811.8184
		418462.2500	4028816.1504
		418462.0625	4028816.4043
		418461.3125	4028817.9063
		418458.3750	4028823.2715
		418449.0313	4028841.5430
		418442.6563	4028852.5977
		418442.2500	4028853.2813
		418442.2188	4028853.3281
		418439.5000	4028858.0840
		418435.1563	4028865.5527
		418421.8750	4028887.7285
		418409.2813	4028909.4512
		418402.2813	4028918.5664
		418403.4688	4028924.1250
		418406.3125	4028924.7207
		418406.1250	4028926.3691
		418425.3438	4028932.8164
		418448.0313	4028940.3438
		418471.4688	4028948.4356
		418496.0625	4028956.0762
		418519.5938	4028965.4629
		418543.4688	4028974.0664
		418558.3125	4028978.1367
		418559.6563	4028978.6289
		418560.0938	4028978.6250
		418563.4688	4028979.5508
		418568.6250	4028979.1816
		418574.5625	4028981.1914
		418575.4375	4028982.5371
		418575.5313	4028982.4453
		418583.1563	4028989.5234
		418591.9688	4028996.3711
		418597.2813	4029000.5430
		418642.1875	4029024.3945
		418665.8438	4029033.3867
		418697.6875	4029043.9512
		418731.6250	4029055.7832
		418768.2500	4029068.1465
		418802.2813	4029079.1816
		418836.2813	4029091.3516
		418871.5938	4029102.8867
		418905.1250	4029114.3223
		418921.4688	4029120.4512
		418945.6250	4029128.2676
		418982.5313	4029140.7832
		419022.2188	4029154.0684

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		419059.9688	4029167.3906
		419099.0938	4029180.6953
		419140.2500	4029194.4121
		419180.0313	4029207.9473
		419215.6250	4029220.5000
		419236.5000	4029216.8945
		419238.6875	4029208.1816
		419243.2188	4029190.2520
		419251.0000	4029170.3809
		419266.3125	4029154.2773
		419265.6563	4029152.4160
T21-L1	0.58	421681.3538	4033175.4977
		421680.5833	4033146.5036
		421615.4529	4032859.4383
		421642.8450	4032720.0067
		421669.5739	4032583.9514
		421672.6950	4032568.0642
		421758.8199	4032529.2147
		421765.7569	4032526.0855
		421697.5464	4032435.8333
		421697.6948	4032435.3497
		421670.3086	4032396.8373
		421569.2500	4032259.9922
		421363.7119	4031994.1301
		421339.4293	4032013.5080
		421144.0336	4032169.4369
		421144.0312	4032169.4629
		421000.8019	4032283.7380
		420847.2185	4032406.3000
		420754.8980	4032462.5738
		420597.1630	4032558.7211
		420519.7444	4032605.9176
		420399.6563	4032679.1270
		420338.1250	4032670.5020
		420278.7230	4032824.8330
		420268.6708	4032850.9495
		420242.1858	4032883.6401
		420238.1250	4032888.6523
		420224.9228	4032905.2489
		420193.0625	4032945.3008
		420165.5938	4032977.7578
		420162.7669	4032996.9399
		420162.3109	4033000.0345
		420161.3125	4033002.9452
		420161.6104	4033004.7879
		420160.6230	4033011.4880
		420141.0313	4033144.4336

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		420140.7813	4033147.0859
		420141.1996	4033148.5249
		420143.4558	4033203.3550
		420143.5374	4033205.3387
		420144.0937	4033218.8593
		420144.4633	4033220.3903
		420147.4490	4033232.7596
		420153.7104	4033258.6996
		420173.6875	4033341.4609
		420174.9951	4033345.4837
		420175.2050	4033346.1296
		420177.5797	4033353.4352
		420186.9793	4033382.3528
		420196.2248	4033410.7966
		420200.5000	4033423.9492
		420208.1891	4033433.2144
		420223.8529	4033452.0889
		420231.9037	4033461.7901
		420385.1563	4033492.7617
		420395.0145	4033495.6276
		420401.9865	4033497.6543
		420413.6562	4033501.0468
		420427.3129	4033493.4316
		420447.8534	4033481.9780
		420449.1875	4033481.7383
		420460.4375	4033474.9609
		420487.7500	4033452.4140
		420517.0008	4033438.1465
		420539.4687	4033427.1875
		420600.0313	4033422.4414
		420657.7231	4033463.9297
		420657.7295	4033463.9343
		420665.7051	4033469.6699
		420678.7685	4033479.0642
		420680.8189	4033481.0229
		420681.5000	4033481.8359
		420682.0937	4033482.4921
		420685.4062	4033485.9570
		420685.5938	4033486.1601
		420686.4637	4033484.5982
		420693.9979	4033488.8795
		420717.0933	4033502.0036
		420717.4375	4033502.1992
		420727.9603	4033504.2983
		420758.9397	4033510.4780
		420771.4062	4033512.9648
		420785.9062	4033509.2656

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		420801.6305	4033494.5087
		420922.1111	4033381.4411
		420922.5938	4033381.6054
		420922.8279	4033380.7684
		420922.8832	4033380.5707
		420925.1180	4033372.5814
		420926.0313	4033369.3164
		420925.8380	4033369.1089
		420925.2390	4033368.4656
		420924.4903	4033367.6616
		420925.3378	4033360.9801
		420926.0065	4033355.7077
		420928.4060	4033336.7903
		420931.8125	4033309.9335
		420934.0937	4033294.3827
		420933.1563	4033286.8906
		420933.0079	4033286.3887
		420933.2906	4033280.8201
		420934.1039	4033264.8003
		420934.6255	4033254.5274
		420936.6875	4033213.9141
		420939.2159	4033185.1852
		420941.8338	4033155.4399
		420945.9610	4033108.5460
		420961.0398	4033090.9540
		421000.4203	4033087.0715
		421003.7903	4033086.7392
		421006.9062	4033088.8632
		421008.2187	4033088.2890
		421016.2812	4033085.5078
		421026.4497	4033089.4725
		421111.6444	4033122.6896
		421120.9062	4033126.3007
		421156.2164	4033165.7803
		421185.2500	4033198.2422
		421217.8062	4033213.5770
		421220.8437	4033215.0078
		421260.1030	4033214.0976
		421276.4384	4033232.9462
		421275.1818	4033266.8735
		421227.5312	4033321.5781
		421226.5937	4033325.8281
		421225.7812	4033326.3632
		421225.7583	4033327.2740
		421225.7500	4033327.6015
		421225.7053	4033327.6434
		421225.6250	4033327.7188

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
T21-L2	0.22	421224.3750	4033341.4766
		421225.4375	4033348.0078
		421262.4688	4033473.2813
		421296.7148	4033532.0450
		421296.8750	4033533.2305
		421298.0873	4033534.4719
		421298.1910	4033534.5781
		421298.5144	4033535.1329
		421299.1563	4033536.2344
		421325.6875	4033569.8984
		421667.0073	4033278.2092
		421683.3131	4033249.2211
		421681.3538	4033175.4977
		422355.2617	4031806.6465
		422592.1981	4031994.7332
		422592.2681	4031994.7888
		422706.9375	4032059.7129
		422723.9063	4032064.2676
		422743.0000	4032064.9160
		422750.9688	4032066.0098
		422762.7813	4032059.0234
		422780.2500	4032057.0488
		422785.9063	4032056.4102
		422787.2500	4032056.6426
		422789.2188	4032056.0371
		422798.4063	4032055.0020
		422803.7813	4032052.6738
		422819.4375	4032024.1758
		422782.8438	4031909.1758
		422762.3750	4031844.7949
		422760.7813	4031839.7871
		422737.0923	4031776.4887
		422736.6258	4031775.2422
		422736.2497	4031756.2669
		422736.0128	4031744.3181
		422735.8080	4031733.9876
		422735.4900	4031717.9484
		422735.0625	4031696.3828
		422680.8437	4031591.6054
		422683.1729	4031470.4752
		422651.0344	4031345.6709
		422556.9952	4031186.7779
		422547.0581	4031169.9878
		422537.2791	4031153.4648
		422423.6318	4030950.1465
		422374.4375	4030862.1364
		422306.7034	4030741.4598

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		422287.9036	4030707.9656
		422270.1646	4030676.3614
		422265.5625	4030668.1621
		422229.6875	4030618.2598
		422219.6875	4030598.5430
		422179.5625	4030586.6953
		422137.6875	4030584.5976
		422081.3437	4030558.1641
		422055.1563	4030549.5840
		422036.4875	4030526.8295
		422017.7812	4030504.0293
		422017.1875	4030502.8340
		422005.7500	4030495.0605
		422002.6562	4030493.6054
		421987.0313	4030490.0781
		421960.8438	4030498.2148
		421959.9691	4030498.8625
		421958.6250	4030499.7597
		421952.6250	4030504.3008
		421943.8125	4030514.3359
		421939.1563	4030535.4160
		421906.0625	4030624.2657
		421905.8750	4030681.7520
		421917.6875	4030743.1250
		421979.9063	4030822.8203
		422000.3125	4030866.1621
		422040.0000	4030920.2246
		422071.7188	4031037.7227
		422078.8437	4031057.9609
		422086.2500	4031077.9824
		422093.7188	4031097.2930
		422101.8125	4031116.7129
		422143.6875	4031189.1074
		422157.1250	4031224.5703
		422184.9688	4031280.4258
		422195.2188	4031296.0430
		422197.8268	4031297.8575
		422198.1250	4031298.2656
		422198.3906	4031298.2498
		422260.4688	4031341.4394
		422267.4120	4031351.3946
		422272.5625	4031358.7793
		422281.2812	4031378.1543
		422274.2177	4031400.4159
		422256.5625	4031456.0586
		422253.9062	4031458.9609
		422254.0295	4031459.5487

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
T21-L3	0.16	422254.0312	4031459.5566
		422253.2187	4031460.6660
		422253.9375	4031462.0683
		422253.5937	4031462.6191
		422254.8909	4031473.2921
		422251.7087	4031506.0989
		422249.0937	4031533.0586
		422247.8125	4031563.2207
		422252.7680	4031573.8470
		422253.3119	4031575.0133
		422263.3458	4031596.5297
		422274.8437	4031621.1855
		422325.9062	4031691.4257
		422377.0000	4031739.3144
		422377.0000	4031756.2384
		422377.0000	4031777.6270
		422375.1250	4031781.4063
		422355.2617	4031806.6465
		421681.3538	4033175.4977
		421683.3131	4033249.2211
		421667.0073	4033278.2092
		421325.6875	4033569.8984
		421337.3438	4033573.5957
		421348.0625	4033589.7070
		421353.7188	4033610.9844
		421350.7188	4033619.8516
		421340.8750	4033617.4961
		421342.6888	4033638.0295
		421342.2188	4033649.4024
		421344.9063	4033663.1328
		421353.7032	4033666.4219
		421356.5626	4033683.2246
		421357.2500	4033695.3516
		421357.0000	4033723.4629
		421355.2188	4033745.7265
		421367.1536	4033760.3685
		421373.3437	4033747.4922
		421386.5782	4033738.4356
		421398.3281	4033747.2285
		421389.1771	4033767.0417
		421388.6563	4033775.5293
		421388.0937	4033786.0586
		421388.3687	4033797.9895
		421388.3437	4033798.4101
		421388.4062	4033798.5000
		421388.5937	4033806.9375
		421391.7455	4033807.1188

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		421391.8203	4033807.3154
		421392.2089	4033807.3332
		421392.4687	4033807.9296
		421393.7352	4033807.4030
		421408.1563	4033808.0625
		421431.4375	4033804.7969
		421437.0421	4033805.5893
		421467.1079	4033814.9518
		421467.2566	4033814.9981
		421467.6250	4033815.1757
		421467.5937	4033815.2070
		421467.8125	4033815.2734
		421470.2500	4033816.4414
		421470.8437	4033816.1796
		421475.9193	4033817.6978
		421476.0937	4033817.7500
		421507.5496	4033802.0096
		421525.4375	4033793.0585
		421557.1950	4033790.3410
		421572.0868	4033789.0667
		421590.6250	4033787.4804
		421608.0077	4033783.9971
		421619.3570	4033786.1881
		421626.5402	4033787.3951
		421635.4925	4033787.2683
		421641.0366	4033785.6417
		421644.3490	4033795.2713
		421643.7696	4033804.2922
		421641.1584	4033816.0019
		421639.8440	4033826.3449
		421635.8801	4033836.7091
		421632.3219	4033843.9715
		421635.4373	4033850.0944
		421650.5821	4033872.2859
		421652.6197	4033875.2716
		421656.0434	4033883.0405
		421815.0124	4033817.5358
		421821.7338	4033823.3113
		421825.1344	4033833.6057
		421825.1586	4033844.0972
		421828.6209	4033853.7005
		421831.2069	4033865.4808
		421840.6401	4033868.5665
		421849.1875	4033864.5559
		421861.4905	4033869.2576
		421870.4155	4033865.4724
		421882.9527	4033862.8097

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		421897.4917	4033860.1399
		421904.5251	4033864.7053
		421916.7480	4033869.7255
		421927.9963	4033871.1454
		421938.0470	4033873.4798
		421950.8317	4033878.1297
		421960.2882	4033878.2885
		421971.6928	4033883.7259
		421981.6913	4033878.9210
		421996.3310	4033870.6050
		422009.1723	4033859.4988
		422011.5803	4033853.0010
		422012.8878	4033849.4728
		422017.2076	4033845.0204
		422017.2935	4033844.9319
		422020.5628	4033839.1590
		422024.5346	4033827.5918
		422026.1756	4033816.2211
		422020.7079	4033808.8057
		422011.3152	4033811.5365
		422002.4601	4033809.7484
		422001.1644	4033801.0568
		422001.1532	4033800.9817
		421992.5010	4033795.5881
		421984.0740	4033800.3783
		421983.9137	4033800.3841
		421972.9042	4033800.7808
		421975.3936	4033793.8987
		421979.1253	4033785.5857
		421981.5495	4033775.2535
		421980.7289	4033770.9823
		421980.4211	4033769.3799
		421973.7300	4033761.9837
		421973.2791	4033761.4853
		421972.1063	4033751.4194
		421973.3260	4033745.9242
		421974.0544	4033742.6426
		421979.1361	4033733.7866
		421980.7452	4033725.8332
		421979.5661	4033719.2661
		421973.4134	4033713.1999
		421967.8173	4033711.6574
		421964.1567	4033708.4748
		421961.1699	4033705.8780
		421960.1243	4033696.4667
		421966.8012	4033692.1762
		421970.0931	4033690.0608

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		421980.6143	4033688.9731
		421988.5415	4033688.4598
		421998.0473	4033686.6421
		422006.3557	4033686.3910
		422016.2491	4033687.9296
		422024.2668	4033691.2074
		422031.1895	4033696.5703
		422038.6330	4033699.2169
		422049.5891	4033701.1525
		422062.4299	4033700.5623
		422072.4037	4033700.1082
		422080.6334	4033700.4474
		422087.1016	4033700.2761
		422094.0021	4033699.9198
		422107.3423	4033700.3998
		422115.8217	4033696.7180
		422120.8667	4033686.1297
		422122.9285	4033677.6255
		422127.5932	4033670.6240
		422133.6283	4033666.1255
		422144.1333	4033662.2180
		422148.6320	4033658.7623
		422146.4703	4033651.7194
		422136.6773	4033649.1883
		422126.5214	4033654.3374
		422116.4330	4033655.3419
		422114.2782	4033648.5226
		422103.3853	4033645.5553
		422100.7640	4033635.3872
		422109.6710	4033624.9497
		422106.0714	4033610.4672
		422097.7836	4033612.8259
		422086.4797	4033617.3840
		422076.8310	4033612.0243
		422069.6830	4033608.2939
		422068.1048	4033600.2682
		422070.7961	4033594.6110
		422076.4092	4033589.0905
		422086.4236	4033582.5941
		422094.9721	4033577.4356
		422099.8992	4033567.4788
		422101.7457	4033560.6932
		422102.9795	4033554.2022
		422101.9369	4033543.0252
		422091.9876	4033540.6676
		422081.1628	4033547.1483
		422076.0186	4033537.1299

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		422077.3582	4033526.4853
		422089.0030	4033525.0805
		422098.9131	4033521.7941
		422108.1795	4033513.4364
		422115.9466	4033504.5129
		422120.8971	4033493.7021
		422118.1076	4033479.0611
		422113.7164	4033472.8288
		422110.6834	4033464.5756
		422107.2126	4033455.7725
		422101.3954	4033443.3430
		422108.9339	4033430.2451
		422115.2944	4033417.8423
		422118.1472	4033405.9709
		422129.9964	4033396.1217
		422139.8929	4033389.8593
		422145.9259	4033377.7909
		422132.4500	4033366.8283
		422123.6608	4033375.4093
		422115.2309	4033381.2009
		422106.1155	4033371.9270
		422099.8864	4033365.5106
		422099.3837	4033352.3751
		422100.9061	4033338.2579
		422103.0624	4033324.5643
		422104.3472	4033317.2360
		422102.8931	4033308.7865
		422106.4651	4033298.1806
		422107.4961	4033290.6624
		422111.2775	4033280.8407
		422111.8319	4033270.2617
		422107.5996	4033262.1347
		422102.5389	4033258.4160
		422098.4937	4033253.8542
		422093.3394	4033246.6213
		422087.6756	4033241.0610
		422087.9392	4033235.0746
		422087.7863	4033227.9793
		422090.4422	4033218.6231
		422091.1239	4033210.4872
		422083.2183	4033205.0622
		422077.2351	4033201.5231
		422071.5556	4033199.2851
		422064.5823	4033195.0741
		422056.0822	4033193.5265
		422047.8242	4033193.5299
		422025.7375	4033193.5185

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		422026.1892	4033178.9272
		422030.5186	4033150.3205
		422027.8469	4033132.4328
		422024.7620	4033130.1337
		422022.7511	4033128.6350
		422021.0685	4033127.4847
		422015.3894	4033123.6024
		422006.9767	4033117.8513
		422004.6276	4033115.4819
		421999.0594	4033109.5075
		421989.8693	4033099.8472
		421978.5849	4033089.2141
		421973.8440	4033084.4323
		421961.3093	4033071.1790
		421960.2017	4033070.6722
		421955.7590	4033068.6393
		421954.7815	4033068.6871
		421953.2106	4033067.2688
		421938.5345	4033069.6053
		421807.2800	4033119.4706
		421787.2775	4033131.6011
		421771.3335	4033149.0309
		421753.3823	4033154.6110
		421751.2529	4033155.7844
		421744.9561	4033156.4569
		421740.2787	4033161.8318
		421739.8847	4033162.0490
		421732.3732	4033170.4510
		421714.0618	4033172.7965
		421697.7144	4033177.8108
		421681.3538	4033175.4977
T21-L4	0.09	421332.6602	4031948.7768
		421363.6591	4031994.0530
		421363.7119	4031994.1301
		421569.2500	4032259.9922
		421670.3086	4032396.8373
		421682.4093	4032389.0803
		421694.5070	4032360.0904
		421694.7468	4032352.0833
		421693.9881	4032346.0625
		421692.2021	4032335.6053
		421689.7399	4032324.9168
		421689.3147	4032315.8803
		421691.6528	4032305.8870
		421692.6354	4032299.5731
		421693.5070	4032290.6651
		421694.3799	4032279.8754

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		421690.3575	4032274.6757
		421684.7524	4032237.8263
		421686.6249	4032229.2442
		421683.2492	4032216.6541
		421677.5625	4032207.8156
		421673.5102	4032201.5322
		421667.4350	4032192.7211
		421663.4474	4032179.2393
		421660.1193	4032167.1790
		421660.6172	4032155.9092
		421660.3095	4032146.3649
		421659.9347	4032137.0408
		421660.3858	4032126.9874
		421660.6580	4032119.4315
		421671.4127	4032064.3120
		421681.5899	4031992.0625
		421682.3623	4031986.5794
		421689.6883	4031962.7511
		421706.6607	4031938.6811
		421762.6978	4031837.3530
		421765.3662	4031823.7942
		421768.0140	4031802.6034
		421772.6023	4031788.8286
		421774.6640	4031769.5205
		421776.1675	4031757.8969
		421776.2667	4031757.1298
		421778.3781	4031737.6634
		421776.9124	4031716.3730
		421782.8388	4031696.8350
		421788.8514	4031677.6715
		421797.3525	4031656.8917
		421806.7336	4031643.0568
		421819.5804	4031629.6476
		421823.9717	4031625.8883
		421828.1038	4031614.3553
		421830.1140	4031598.4637
		421835.2463	4031584.1761
		421835.3749	4031583.7936
		421838.7364	4031573.7984
		421843.0984	4031564.1375
		421845.9583	4031549.5613
		421845.7263	4031539.8520
		421835.4569	4031528.6020
		421820.8268	4031520.4979
		421817.8060	4031521.0213
		421812.0341	4031522.0213
		421798.7070	4031526.3489

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		421792.3020	4031528.5219
		421781.6201	4031527.1440
		421770.4360	4031533.5609
		421762.6020	4031534.6338
		421751.5708	4031537.5581
		421745.8850	4031539.0977
		421735.3104	4031547.0779
		421722.5693	4031559.1294
		421718.4833	4031563.1533
		421712.8996	4031565.8937
		421706.6777	4031565.5124
		421700.1310	4031557.1728
		421691.8667	4031545.0022
		421679.6144	4031543.3809
		421667.9481	4031541.6010
		421653.5219	4031539.1528
		421652.3562	4031538.9597
		421633.6192	4031535.8565
		421622.9774	4031534.3864
		421614.2890	4031534.6916
		421607.0773	4031540.6380
		421601.3715	4031546.7178
		421602.6661	4031564.3030
		421602.2850	4031578.4099
		421600.4091	4031586.9260
		421593.0455	4031595.3515
		421583.6789	4031596.4376
		421573.8871	4031597.2021
		421563.2709	4031598.2955
		421551.0553	4031602.9082
		421540.4570	4031607.2844
		421526.5440	4031610.6698
		421519.5461	4031615.1546
		421512.1129	4031608.7235
		421504.6883	4031603.2008
		421494.5662	4031607.3591
		421481.4896	4031613.5299
		421467.7393	4031622.4144
		421461.8037	4031629.1372
		421458.2079	4031642.2363
		421459.6343	4031656.2858
		421456.8945	4031661.9327
		421445.4766	4031666.8714
		421427.4105	4031662.3658
		421416.0194	4031667.1383
		421414.5884	4031674.9406
		421418.9934	4031689.3452

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		421418.2065	4031697.7663
		421418.1949	4031697.7878
		421411.5422	4031710.1714
		421407.1827	4031717.5263
		421403.9331	4031726.3433
		421396.5242	4031737.6376
		421396.5336	4031748.8364
		421393.5339	4031757.9002
		421389.7467	4031768.3162
		421388.7680	4031781.8972
		421385.6242	4031792.0299
		421383.9764	4031799.7115
		421385.4441	4031807.0840
		421380.7557	4031823.9391
		421374.1852	4031838.6418
		421371.6079	4031844.0354
		421370.1681	4031851.4348
		421366.9893	4031860.1026
		421364.2461	4031866.2165
		421361.6452	4031872.0337
		421352.2877	4031881.9664
		421348.8181	4031889.9356
		421349.3702	4031897.8652
		421353.2973	4031907.6305
		421348.4242	4031920.6849
		421346.1745	4031929.6559
		421331.2509	4031937.3717
		421332.6602	4031948.7768
T32-1-L1	0.94	417130.3805	4042995.6745
		416874.9421	4042997.9104
		416874.7151	4042997.9123
		416874.3837	4042997.9152
		416872.3079	4042997.9334
		416853.3845	4042998.0990
		416844.5115	4042998.1767
		416834.3585	4042998.2656
		416828.7613	4042998.3146
		416802.5375	4042998.5441
		416785.1959	4042998.6959
		416782.0854	4042998.7231
		416779.3644	4042998.7470
		416779.0491	4042998.7497
		416778.2654	4042998.7566
		416757.0197	4042998.9425
		416748.7581	4042999.0149
		416748.7523	4042999.0149
		416745.5359	4042999.0431

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416737.3658	4042999.1146
		416511.9599	4043001.0876
		416475.6596	4043001.4053
		416415.9268	4043001.9282
		416414.7844	4042753.4996
		416413.9351	4042568.7621
		416413.9324	4042568.1752
		416413.9130	4042563.9624
		416413.9066	4042562.5781
		416413.8960	4042560.2618
		416410.1386	4042560.3365
		416410.0981	4042560.3373
		416409.8771	4042560.3417
		416407.4335	4042560.3903
		416238.8166	4042563.7458
		416020.8582	4042568.1991
		416021.0826	4042578.9943
		416021.3865	4042593.6171
		416021.7492	4042611.0661
		416021.5536	4042625.6378
		416019.1461	4042804.9417
		416012.4067	4043157.1705
		416011.6310	4043197.7108
		416010.8619	4043237.9058
		416010.8609	4043237.9573
		416009.4278	4043312.8570
		415996.8507	4043320.6666
		415863.2633	4043403.6167
		415696.9669	4043207.9327
		415532.3824	4043014.2631
		415316.6838	4043015.0880
		415325.3619	4043000.2238
		415360.9503	4042939.2666
		415466.1135	4042759.1388
		415542.5045	4042628.2931
		415685.2178	4042383.8480
		415685.9013	4042382.6772
		415686.0509	4042382.4209
		415679.5045	4042381.9393
		415669.5805	4042381.2091
		415665.8258	4042380.6277
		415655.9347	4042383.9882
		415655.6659	4042384.0795
		415655.4980	4042384.0262
		415653.6137	4042383.4273
		415652.9389	4042383.2128
		415636.0253	4042377.8375

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415630.5765	4042376.1058
		415630.5647	4042376.1020
		415581.2762	4042327.1461
		415526.4848	4042272.7244
		415526.1742	4042272.4160
		415381.2848	4042128.5039
		415381.2813	4042128.5117
		415380.3014	4042130.6674
		415207.4375	4042510.9688
		415198.6250	4042506.9961
		415194.4688	4042500.9492
		415188.8125	4042489.9883
		415189.5625	4042475.2461
		415187.3125	4042454.0820
		415176.7188	4042443.8750
		415160.0937	4042439.3398
		415137.4063	4042441.6094
		415116.6250	4042449.9219
		415105.2813	4042454.0820
		415100.3750	4042451.4336
		415100.7500	4042439.7188
		415107.1562	4042419.3086
		415107.1562	4042407.5898
		415095.8438	4042391.7188
		415080.7188	4042384.9141
		415062.9375	4042375.4648
		415051.2188	4042368.6602
		415039.5000	4042370.9297
		415025.1562	4042378.4883
		415011.1563	4042391.3398
		415005.5000	4042401.5430
		414994.1563	4042413.2617
		414983.9688	4042431.4023
		414974.5000	4042447.2773
		414962.7813	4042456.3477
		414950.6875	4042463.1523
		414941.6250	4042467.6875
		414940.8387	4042542.5520
		414979.1256	4042644.0956
		415021.5742	4042723.1665
		415096.4834	4042851.3445
		415198.0271	4042977.8579
		415262.4711	4043039.8008
		415267.4292	4043044.5665
		415293.5017	4043069.6271
		415303.2187	4043076.0821
		415322.8125	4043088.8867

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415342.1563	4043102.2773
		415361.1875	4043115.0156
		415370.8957	4043120.2930
		415372.0174	4043121.0065
		415377.3750	4043124.4141
		415401.0660	4043138.8041
		415409.0313	4043144.0860
		415427.3898	4043155.1458
		415446.5457	4043167.2021
		415448.0566	4043168.1932
		415483.6875	4043192.0586
		415491.5926	4043197.4737
		415519.0937	4043216.3125
		415541.2221	4043230.7747
		415564.1250	4043246.0703
		415566.8079	4043247.7982
		415588.9062	4043262.8437
		415597.1221	4043268.3788
		415604.2869	4043273.2057
		415640.3728	4043297.5169
		415581.9980	4043383.2661
		415581.8819	4043383.4366
		415499.7456	4043504.0903
		415410.7239	4043634.8580
		415406.6252	4043640.8788
		415405.2197	4043642.9433
		415432.6720	4043804.8033
		415436.6986	4043889.3616
		415440.8828	4043977.2311
		415416.7852	4044097.9308
		415410.2813	4044130.5077
		415383.9094	4044194.0515
		415308.0000	4044376.9570
		415302.5938	4044388.6406
		415293.1250	4044396.9335
		415254.2813	4044433.7304
		415196.6835	4044508.1803
		415125.3150	4044522.9378
		415089.1511	4044528.5689
		415036.4110	4044529.7884
		414966.2940	4044529.4835
		414963.7285	4044530.0457
		414952.7563	4044532.4504
		414901.1823	4044543.7532
		414877.4635	4044551.2350
		414853.8747	4044558.6757
		414841.8345	4044561.0587

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414772.5946	4044574.7624
		414740.0569	4044577.8320
		414637.9743	4044587.4625
		414499.1207	4044591.6958
		414427.3490	4044594.9786
		414378.8662	4044592.9092
		414322.6706	4044590.0980
		414288.5312	4044582.7890
		414276.8125	4044575.6367
		414179.7188	4044619.9257
		414159.0313	4044624.5038
		414155.0167	4044626.9932
		414120.4375	4044636.8867
		414100.8750	4044641.5077
		414062.3750	4044647.7929
		414060.9596	4044647.9407
		414006.1875	4044653.6602
		413985.5000	4044654.8242
		413963.7188	4044655.1914
		413942.8750	4044655.4609
		413927.0000	4044663.3633
		413903.6926	4044683.3942
		413894.4560	4044691.3325
		413851.0549	4044728.6326
		413835.1875	4044742.2695
		413737.0178	4044770.1565
		413736.1250	4044770.4101
		413718.5444	4044774.0088
		413659.5625	4044786.0820
		413580.1563	4044802.4375
		413383.0000	4044830.8046
		413320.1563	4044817.4180
		413301.5625	4044812.2851
		413262.4688	4044804.2656
		413207.5312	4044792.0234
		413172.6250	4044764.1484
		413151.1250	4044737.0781
		413142.0461	4044726.1974
		413141.5000	4044725.5430
		413105.0313	4044686.0703
		413088.8438	4044676.3438
		413043.8125	4044656.6133
		412977.2813	4044638.2344
		412971.8750	4044655.3125
		412975.2813	4044677.9492
		412966.1250	4044702.3750
		412952.9375	4044727.2227

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		412938.6562	4044751.1016
		412920.3125	4044773.7500
		412905.0625	4044797.0703
		412890.5938	4044820.3594
		412872.4062	4044841.6563
		412854.5938	4044865.6172
		412835.3750	4044887.9297
		412825.1563	4044907.0273
		412814.8750	4044926.4844
		412817.4375	4044949.8359
		412821.0937	4044973.8476
		412833.8750	4044984.1484
		412849.5000	4044967.3906
		412865.1250	4044948.5508
		412881.3125	4044929.0977
		412898.4375	4044907.7422
		412916.5625	4044886.6485
		412934.3125	4044865.6524
		412949.7500	4044845.4648
		412969.3750	4044830.5859
		412990.7188	4044816.5156
		413017.0625	4044806.8750
		413040.4688	4044796.8320
		413062.4375	4044789.0195
		413085.0625	4044786.7696
		413095.4635	4044802.3610
		413097.2812	4044805.0859
		413093.7092	4044816.2902
		413090.2969	4044826.9934
		413090.2500	4044827.1406
		413088.7234	4044828.4651
		413073.9063	4044841.3203
		413058.5312	4044853.3359
		413057.0049	4044856.3692
		413054.8607	4044860.6302
		413050.4507	4044869.3941
		413049.8932	4044870.5020
		413049.0313	4044872.2148
		413049.0161	4044872.7291
		413048.9673	4044874.3842
		413048.4418	4044892.2065
		413048.4062	4044893.4141
		413048.7500	4044913.7695
		413047.3185	4044918.3035
		413044.7613	4044926.4027
		413042.0000	4044935.1484
		413039.8215	4044941.9659

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		413038.5737	4044945.8710
		413036.7812	4044951.4805
		413023.3447	4044959.5826
		413022.9375	4044959.8281
		413014.6212	4044969.9870
		413011.1250	4044974.2578
		413003.5000	4044987.2227
		413010.9449	4044993.1086
		413019.4688	4044999.8476
		413034.9506	4045003.2954
		413038.7812	4045004.1484
		413053.3053	4045007.3910
		413058.5000	4045008.5508
		413073.2813	4045017.1016
		413091.9375	4045015.5664
		413111.7812	4045015.2734
		413130.2813	4045011.9883
		413148.3125	4045016.6758
		413165.4375	4045023.4844
		413168.2239	4045023.7454
		413181.4217	4045024.9820
		413182.9063	4045025.1211
		413184.2136	4045025.0429
		413189.0494	4045024.7537
		413189.4029	4045024.7326
		413202.4375	4045023.9531
		413203.5915	4045025.6581
		413209.3750	4045034.2032
		413195.8125	4045035.4062
		413177.8125	4045036.8008
		413187.4688	4045042.9063
		413206.1875	4045040.2695
		413222.8125	4045043.4570
		413241.0937	4045047.8281
		413256.7500	4045051.7148
		413276.3437	4045051.3555
		413296.3437	4045052.1562
		413310.8125	4045040.5937
		413320.4010	4045033.1821
		413326.6250	4045028.3711
		413339.4375	4045017.6914
		413359.2813	4045018.9414
		413376.8750	4045025.6133
		413391.3750	4045035.7891
		413409.2187	4045037.5664
		413400.5625	4045051.1055
		413406.4371	4045060.5758

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		413408.1250	4045063.2968
		413426.5312	4045064.4219
		413443.5938	4045062.9375
		413450.4040	4045062.7371
		413463.3750	4045062.3555
		413482.5938	4045067.3867
		413487.4246	4045067.6792
		413502.5938	4045068.5976
		413513.5982	4045067.5155
		413520.0313	4045066.8828
		413520.9528	4045066.8472
		413538.6935	4045066.1613
		413540.8438	4045066.0782
		413547.6784	4045067.8885
		413561.3125	4045071.5000
		413571.2790	4045068.4413
		413580.1250	4045065.7265
		413599.5312	4045065.5469
		413619.9063	4045068.5742
		413636.8438	4045078.2188
		413656.3437	4045077.6133
		413666.4113	4045075.3178
		413671.1644	4045074.2341
		413678.1875	4045072.6328
		413686.7636	4045072.1193
		413687.7673	4045072.0592
		413701.2813	4045071.2500
		413702.4004	4045071.8062
		413714.0230	4045077.5833
		413714.5312	4045077.8359
		413727.3489	4045087.0569
		413728.0625	4045087.5703
		413731.0785	4045087.0728
		413749.2813	4045084.0703
		413770.8125	4045087.8281
		413791.1875	4045086.2071
		413810.5938	4045080.6719
		413831.9687	4045078.7265
		413834.2120	4045078.4635
		413852.1875	4045076.3555
		413853.1677	4045075.8880
		413866.9063	4045069.3360
		413869.6487	4045067.4577
		413869.8125	4045067.4414
		413877.2714	4045062.9992
		413885.8205	4045058.1245
		413887.6432	4045058.1620

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		413891.5833	4045058.2433
		413903.6562	4045058.4922
		413904.4613	4045058.2431
		413907.0937	4045058.3711
		413920.1245	4045054.0324
		413927.9063	4045051.4414
		413929.4440	4045050.6288
		413936.9484	4045046.6632
		413940.8584	4045045.0355
		413941.1875	4045044.8984
		413941.8640	4045044.0793
		413941.8839	4045044.0552
		413941.8961	4045044.0487
		413947.6875	4045040.9883
		413948.7066	4045037.5727
		413949.5378	4045034.7866
		413950.3390	4045033.8164
		413952.5938	4045031.0860
		413952.2068	4045025.8405
		413952.9063	4045023.4961
		413954.1304	4045006.9314
		413956.3750	4044999.4219
		413958.8706	4044987.8796
		413963.9633	4044981.2161
		413968.7500	4044974.9531
		413977.2500	4044960.2656
		413983.4375	4044947.5000
		413986.1563	4044931.0312
		413996.9063	4044916.7852
		414016.1250	4044914.2656
		414033.6875	4044906.6172
		414052.8125	4044906.1289
		414072.3750	4044908.3789
		414083.4063	4044921.7031
		414100.8750	4044927.2539
		414120.6250	4044930.7031
		414121.6109	4044930.8922
		414122.0625	4044931.0156
		414123.7604	4044931.3681
		414128.9757	4044932.4506
		414139.0000	4044934.5313
		414155.0625	4044938.7969
		414157.8468	4044939.0266
		414161.4688	4044939.9805
		414182.9834	4044943.1052
		414183.2813	4044943.1484
		414204.6490	4044940.7685

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414205.9375	4044940.6250
		414228.0625	4044939.2071
		414249.1563	4044933.0117
		414271.4375	4044935.2110
		414280.2977	4044939.0012
		414291.3437	4044943.7265
		414308.3750	4044952.0938
		414308.5634	4044952.1951
		414314.1747	4044955.2120
		414315.3593	4044956.8200
		414316.1250	4044957.8594
		414317.0840	4044958.0836
		414321.3864	4044959.0895
		414327.8750	4044962.5781
		414332.8372	4044962.9602
		414347.1241	4044964.0604
		414352.7927	4044964.8795
		414367.8125	4044967.8867
		414383.5625	4044972.0625
		414398.1250	4044977.2929
		414413.6562	4044979.3125
		414431.3437	4044976.8359
		414437.7882	4044976.1305
		414452.7188	4044974.4961
		414467.1704	4044972.9714
		414471.7500	4044972.4883
		414481.0722	4044971.0124
		414483.3437	4044971.2929
		414496.4688	4044971.6797
		414504.4274	4044973.0845
		414505.2500	4044981.2695
		414505.3966	4044981.7496
		414508.0625	4044990.4844
		414511.0552	4044990.9591
		414515.2146	4044991.6189
		414515.5649	4044991.6744
		414519.3125	4044988.5000
		414525.8438	4044981.5000
		414530.6563	4044974.2500
		414535.5137	4044972.3411
		414539.9062	4044965.6055
		414544.5787	4044966.5259
		414550.2500	4044961.7500
		414556.3750	4044959.7500
		414565.5625	4044958.2500
		414569.1490	4044959.5662
		414570.6134	4044949.3240

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414571.1250	4044945.7461
		414587.0778	4044947.7554
		414587.4688	4044947.8047
		414592.8251	4044946.7488
		414606.7500	4044944.0039
		414612.6035	4044944.8317
		414615.9375	4044937.5000
		414625.2142	4044940.9941
		414632.5313	4044943.7500
		414639.4063	4044940.0000
		414647.6875	4044937.2500
		414654.0938	4044930.5000
		414666.7813	4044918.7500
		414677.2813	4044913.7500
		414680.1250	4044913.2500
		414685.1563	4044912.0000
		414695.9375	4044899.2500
		414699.7188	4044891.0000
		414702.5000	4044889.0000
		414703.6892	4044886.4129
		414706.0625	4044881.2500
		414709.1206	4044880.1380
		414709.5000	4044880.0000
		414710.1025	4044879.0036
		414716.0000	4044869.2500
		414720.0000	4044864.0000
		414724.7137	4044862.1231
		414726.9063	4044861.2500
		414731.1250	4044861.2500
		414734.8125	4044856.0000
		414733.7188	4044854.7500
		414734.1250	4044851.2500
		414738.1563	4044849.5000
		414743.5000	4044845.2500
		414748.4167	4044845.2500
		414756.6563	4044845.2500
		414759.3438	4044844.2500
		414766.3438	4044841.5000
		414777.0000	4044833.2500
		414786.6875	4044822.7500
		414800.3750	4044819.2500
		414802.0000	4044818.5000
		414802.2813	4044818.5000
		414820.9063	4044816.0000
		414845.7813	4044812.2500
		414846.5938	4044812.2500
		414868.0313	4044808.0000

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		414890.7500	4044802.2500
		414912.7188	4044797.0000
		414915.5758	4044796.7473
		414932.5000	4044795.2500
		414935.6250	4044795.0000
		414955.0938	4044789.7500
		414958.0938	4044788.2500
		414976.4688	4044783.2500
		414997.1875	4044778.5000
		415001.1563	4044777.7500
		415002.6147	4044777.6331
		415019.8750	4044776.2500
		415024.0313	4044777.2500
		415030.0000	4044771.7500
		415045.5938	4044768.7500
		415056.1250	4044765.7500
		415071.0000	4044763.5000
		415082.5625	4044763.5000
		415104.3183	4044760.1139
		415108.9766	4044753.6674
		415112.7812	4044748.4023
		415125.7500	4044744.2695
		415132.8050	4044742.7189
		415146.4375	4044739.7226
		415158.6875	4044736.7617
		415163.8375	4044735.9730
		415166.9601	4044735.4948
		415178.2500	4044733.7656
		415181.9335	4044731.4456
		415194.2814	4044723.6680
		415196.7188	4044722.1328
		415207.7422	4044718.2725
		415217.1875	4044714.9649
		415229.7510	4044709.3659
		415238.0313	4044705.6758
		415252.8589	4044702.2998
		415257.5520	4044701.2312
		415258.5638	4044701.0008
		415260.4375	4044700.5742
		415277.5679	4044694.8447
		415282.3125	4044693.2578
		415293.9813	4044691.2320
		415304.8125	4044689.3516
		415325.8025	4044679.4597
		415326.5625	4044679.1016
		415342.7265	4044678.3045
		415348.0313	4044678.0430

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415351.4548	4044677.0900
		415351.7725	4044677.0016
		415355.2108	4044676.0446
		415359.1007	4044674.9619
		415362.1877	4044674.1025
		415368.8438	4044672.2500
		415382.8099	4044669.7347
		415389.9687	4044668.4453
		415412.5312	4044662.2500
		415435.1250	4044655.8320
		415456.6562	4044649.4531
		415472.6192	4044643.2642
		415477.2500	4044641.4687
		415485.8804	4044638.7771
		415495.3832	4044635.8134
		415496.1250	4044635.5820
		415515.2813	4044627.1211
		415518.3608	4044626.1182
		415532.6250	4044621.4727
		415550.8750	4044616.3125
		415560.1900	4044612.8868
		415565.8057	4044610.8215
		415565.9310	4044610.7754
		415569.7812	4044609.3594
		415586.5938	4044598.0860
		415606.3437	4044590.3555
		415624.4375	4044581.3203
		415639.3963	4044574.7532
		415643.8438	4044572.8008
		415652.7329	4044568.6985
		415663.3302	4044563.8079
		415663.6250	4044563.6719
		415682.7812	4044554.1055
		415700.7500	4044543.3359
		415705.8118	4044540.3258
		415709.1792	4044538.3233
		415710.3502	4044537.6269
		415717.6250	4044533.3008
		415727.8060	4044529.5410
		415729.6922	4044528.8444
		415730.0099	4044528.7271
		415734.0625	4044527.2305
		415736.1696	4044525.8331
		415750.5312	4044516.3086
		415758.3804	4044509.3832
		415765.5000	4044503.1016
		415772.5636	4044500.0209

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415779.9360	4044496.8055
		415781.2813	4044496.2188
		415774.6562	4044483.5625
		415771.9687	4044465.8047
		415772.4688	4044451.0468
		415762.4063	4044438.1016
		415753.9445	4044431.7449
		415749.6562	4044428.5234
		415749.1821	4044424.3311
		415747.8750	4044412.7734
		415741.7812	4044396.8164
		415739.0625	4044380.0859
		415739.0625	4044363.0468
		415744.1811	4044350.0971
		415745.7188	4044346.2070
		415748.2138	4044340.7077
		415753.3645	4044329.3551
		415753.3750	4044329.3320
		415759.9687	4044312.6288
		415754.6250	4044296.0859
		415753.8167	4044291.2794
		415753.7812	4044290.6523
		415753.8125	4044289.9140
		415752.6875	4044281.3125
		415751.9199	4044279.9999
		415751.6250	4044278.2461
		415749.7831	4044273.5301
		415746.4112	4044264.8966
		415749.5000	4044258.1250
		415754.8437	4044257.8086
		415759.2813	4044253.5586
		415764.4688	4044247.0585
		415767.4062	4044242.7500
		415770.9687	4044235.2890
		415772.7500	4044230.8242
		415773.3750	4044227.5508
		415774.8125	4044218.9766
		415767.4688	4044213.5469
		415766.3437	4044212.2929
		415766.3125	4044211.2578
		415763.9375	4044206.2969
		415759.4688	4044200.3632
		415760.2813	4044197.7578
		415759.4375	4044194.6797
		415758.5625	4044191.7226
		415757.4062	4044189.6132
		415755.1563	4044183.4570

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415758.0937	4044181.3320
		415760.9062	4044179.3125
		415764.6250	4044175.0507
		415765.2500	4044174.3086
		415765.7188	4044173.0351
		415768.3437	4044168.6797
		415774.4688	4044161.6523
		415774.9062	4044161.1406
		415775.1563	4044160.9453
		415777.1875	4044158.3828
		415778.1875	4044157.0820
		415778.5625	4044156.6797
		415780.3240	4044152.1065
		415785.9687	4044142.9218
		415790.9244	4044136.1914
		415793.4062	4044135.2695
		415794.0937	4044134.2578
		415798.7812	4044127.0624
		415799.1202	4044125.8062
		415802.3125	4044121.9218
		415806.8125	4044111.0429
		415808.1994	4044107.8612
		415808.8125	4044107.1992
		415814.4375	4044102.9492
		415819.8125	4044096.1875
		415822.2500	4044091.7382
		415826.2187	4044086.9609
		415829.4375	4044082.6953
		415833.0625	4044080.5273
		415836.3125	4044080.1445
		415836.6875	4044071.4219
		415832.9687	4044063.7851
		415832.2538	4044057.9896
		415832.8468	4044056.9279
		415833.4398	4044055.8663
		415838.6562	4044050.4492
		415845.7858	4044041.9496
		415846.5312	4044041.2812
		415856.8750	4044031.8867
		415867.1875	4044020.2969
		415868.8457	4044018.4143
		415878.5312	4044007.4180
		415887.6562	4043995.8750
		415899.9062	4043987.3554
		415914.4375	4043982.9609
		415929.2187	4043981.8359
		415943.3750	4043976.2773

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		415955.1563	4043965.1992
		415967.7500	4043957.8984
		415982.4375	4043951.4492
		415996.0937	4043950.2734
		416012.3125	4043949.3242
		416027.4688	4043949.1250
		416033.2351	4043950.0655
		416041.7188	4043951.4492
		416052.2593	4043953.9567
		416058.9062	4043962.6054
		416064.3119	4043953.4465
		416065.9216	4043953.2681
		416067.5312	4043953.0898
		416079.9687	4043946.5976
		416094.4688	4043948.2070
		416107.2187	4043954.9883
		416119.7188	4043961.9531
		416121.4151	4043963.0681
		416130.5938	4043969.1015
		416138.3125	4043978.5077
		416150.2000	4043982.1564
		416153.6875	4043986.7617
		416160.5207	4043987.9831
		416160.9128	4043988.2668
		416161.3425	4043988.5777
		416166.6875	4044004.1250
		416171.2813	4044022.1445
		416185.9687	4044025.4219
		416202.2187	4044020.3593
		416216.5312	4044025.2890
		416229.1702	4044030.0451
		416233.5736	4044033.1394
		416237.2359	4044035.7128
		416240.0119	4044038.0385
		416245.2813	4044042.4531
		416245.9177	4044042.2086
		416246.5540	4044041.9642
		416247.3125	4044043.0703
		416249.4687	4044041.4648
		416253.0625	4044043.1367
		416254.5517	4044038.8919
		416259.3750	4044037.0390
		416259.8310	4044036.1638
		416260.8211	4044034.2637
		416261.6470	4044034.9506
		416262.4062	4044035.5820
		416266.2500	4044030.9492

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416267.8488	4044027.1585
		416269.1250	4044024.1328
		416268.6562	4044021.6894
		416267.8953	4044017.7229
		416267.9011	4044017.6287
		416267.9069	4044017.5346
		416270.2434	4044011.4929
		416270.4854	4044010.8671
		416271.0625	4044009.3749
		416274.6154	4044002.6324
		416276.3679	4043999.3064
		416276.7188	4043998.6406
		416278.0625	4043996.5077
		416279.4062	4043994.3749
		416281.2406	4043991.9859
		416283.0625	4043989.6132
		416283.2500	4043989.1269
		416283.4375	4043988.6406
		416285.8750	4043981.4804
		416284.9835	4043980.2698
		416284.0919	4043979.0591
		416286.1563	4043975.5586
		416286.9509	4043974.2400
		416287.0400	4043974.0922
		416287.0472	4043974.0802
		416287.9237	4043972.6259
		416288.0637	4043972.4208
		416293.1250	4043965.0078
		416294.2835	4043962.0731
		416294.4688	4043961.7656
		416294.5466	4043961.4066
		416295.5947	4043958.7515
		416298.5312	4043951.3125
		416297.6223	4043947.2118
		416297.9987	4043945.4750
		416298.3750	4043943.7382
		416303.8750	4043928.9062
		416311.9687	4043913.1914
		416317.7812	4043897.9531
		416318.3953	4043895.6550
		416319.0094	4043893.3568
		416323.1875	4043890.9140
		416335.5000	4043878.1757
		416345.7188	4043864.6132
		416357.5312	4043851.8945
		416358.1184	4043851.3074
		416361.7502	4043847.6756

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416362.9573	4043846.4684
		416369.6562	4043839.7695
		416383.0625	4043831.6797
		416390.8399	4043824.8053
		416393.6579	4043824.5288
		416394.4688	4043824.4492
		416397.6562	4043822.3554
		416402.3750	4043816.9844
		416407.3054	4043809.1908
		416407.8437	4043808.3398
		416408.2282	4043808.1439
		416416.0625	4043804.1523
		416421.7500	4043799.7187
		416431.0937	4043795.0976
		416436.9375	4043787.8476
		416436.9531	4043786.0019
		416436.9687	4043784.1562
		416439.7500	4043779.6601
		416441.2970	4043777.9694
		416441.6888	4043777.5412
		416441.8750	4043777.5429
		416444.5678	4043773.5112
		416450.2813	4043764.9570
		416456.9687	4043750.6953
		416461.3750	4043733.4297
		416459.9375	4043715.6523
		416459.5340	4043704.7745
		416459.7500	4043703.5547
		416459.4699	4043703.0478
		416459.2500	4043697.1211
		416460.1813	4043689.1233
		416460.9687	4043687.3632
		416467.8750	4043682.9453
		416473.0313	4043678.2656
		416477.6875	4043673.6171
		416478.3750	4043669.4609
		416478.6061	4043669.2486
		416484.7500	4043663.6054
		416484.1875	4043654.9648
		416484.0000	4043652.0937
		416488.3125	4043646.5586
		416493.2500	4043640.6953
		416496.8437	4043635.4180
		416502.0313	4043625.4921
		416505.1563	4043618.3086
		416509.0313	4043611.7148
		416513.1875	4043604.9961

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416516.7812	4043596.5937
		416519.5625	4043585.7968
		416516.8750	4043577.6328
		416515.2500	4043575.7929
		416514.2835	4043573.6851
		416512.0662	4043568.8494
		416511.7784	4043567.2830
		416516.9910	4043565.5015
		416517.7500	4043565.2421
		416525.5312	4043559.2617
		416526.9341	4043551.1581
		416527.7500	4043546.4453
		416527.9688	4043544.3415
		416528.1875	4043542.2382
		416527.1580	4043534.8354
		416527.1250	4043534.5976
		416526.5156	4043531.8808
		416526.0945	4043530.0036
		416525.9062	4043529.1640
		416526.4832	4043524.9591
		416526.8125	4043522.5586
		416528.7782	4043517.3200
		416530.0313	4043513.9805
		416530.4062	4043510.2617
		416530.3526	4043509.8563
		416529.6250	4043504.3593
		416529.6250	4043502.3828
		416530.5938	4043495.9140
		416534.0937	4043484.0859
		416534.1449	4043483.4661
		416534.9597	4043481.3282
		416535.0625	4043481.0585
		416535.2049	4043480.8010
		416541.8898	4043468.7127
		416548.2295	4043467.3879
		416549.5625	4043467.1093
		416552.7500	4043468.0937
		416559.0937	4043468.9531
		416563.1875	4043467.7422
		416563.5938	4043467.5508
		416568.8599	4043464.7798
		416570.1563	4043464.0976
		416570.5806	4043461.7927
		416571.1875	4043458.4960
		416571.3125	4043451.7265
		416571.3381	4043450.1999
		416573.1875	4043432.4219

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416581.3437	4043415.6484
		416589.6875	4043398.3515
		416597.6562	4043380.3203
		416598.2094	4043377.6772
		416602.3750	4043371.0546
		416601.2385	4043368.7970
		416600.4118	4043367.1548
		416601.3125	4043362.8516
		416599.3723	4043348.6223
		416600.7188	4043346.9609
		416602.9375	4043344.1601
		416607.8750	4043340.5742
		416611.0313	4043334.5742
		416611.7500	4043331.5898
		416612.1563	4043323.8906
		416613.0000	4043319.6171
		416613.0625	4043316.7265
		416612.9062	4043313.2304
		416612.7356	4043311.7313
		416620.6562	4043302.0937
		416632.3125	4043288.9883
		416636.2819	4043282.3737
		416640.3898	4043275.5284
		416641.4688	4043273.7304
		416640.8556	4043269.3181
		416639.0000	4043255.9648
		416636.5883	4043254.5016
		416625.3125	4043247.6601
		416627.5938	4043236.2109
		416635.5387	4043231.7528
		416641.8438	4043228.2148
		416648.7812	4043213.6641
		416658.2813	4043203.3242
		416670.3750	4043192.5391
		416680.9687	4043180.7070
		416685.5664	4043181.0048
		416696.0449	4043181.6835
		416697.3125	4043181.7656
		416710.0313	4043171.0156
		416722.8750	4043161.2969
		416740.0625	4043160.2773
		416756.6562	4043153.0976
		416772.5312	4043144.1093
		416787.4688	4043133.5508
		416798.2813	4043119.0390
		416804.5000	4043102.9804
		416817.6875	4043095.1211

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		416830.1195	4043088.9051
		416830.1379	4043088.9252
		416830.1563	4043088.9452
		416832.5872	4043088.5580
		416836.6491	4043087.9110
		416839.5540	4043088.1106
		416847.1563	4043088.6328
		416849.5905	4043086.8986
		416858.2813	4043080.7070
		416867.7570	4043081.5548
		416873.3437	4043082.0546
		416890.4063	4043081.1172
		416907.6562	4043081.3671
		416923.4375	4043075.1718
		416927.1865	4043069.7354
		416931.5938	4043071.9180
		416931.6875	4043071.9609
		416932.9688	4043071.8711
		416937.9688	4043071.5234
		416953.5313	4043070.4336
		416956.7188	4043069.2227
		416971.1204	4043063.7614
		416971.5625	4043063.5937
		416977.5324	4043065.1101
		416978.0000	4043065.2421
		416984.0313	4043067.9609
		416990.9062	4043069.2148
		416998.0000	4043067.8281
		416999.7188	4043068.7343
		417001.1248	4043069.4627
		417003.4063	4043070.6446
		417008.8125	4043072.5039
		417009.6562	4043072.3008
		417012.7812	4043070.2344
		417130.3805	4042995.6745
T35-2-L1	0.05	411224.0888	4041830.6824
		411095.4672	4041732.0116
		411089.3727	4041727.3363
		411081.5448	4041721.3312
		411054.7057	4041700.7419
		410996.6969	4041656.2410
		410968.0051	4041634.2304
		410938.6899	4041611.7416
		410908.7982	4041588.8105
		410891.2200	4041575.3256
		410882.7812	4041570.8945
		410874.3719	4041562.4007

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		410865.2368	4041555.3928
		410860.8313	4041552.0132
		410857.4942	4041549.4532
		410843.9976	4041595.2088
		410840.2849	4041607.7952
		410776.8400	4041822.8824
		410768.3331	4041851.7219
		410783.3125	4041852.0898
		410802.3437	4041854.1445
		410822.8438	4041852.0273
		410841.4375	4041851.6093
		410853.1563	4041864.0781
		410860.5000	4041879.9140
		410874.8438	4041890.4882
		410884.7812	4041906.0624
		410889.1250	4041924.3749
		410892.7188	4041944.9413
		410893.6250	4041966.4297
		410890.9375	4041986.3593
		410895.1563	4042005.6210
		410911.0625	4042016.1718
		410951.5526	4042020.9825
		410994.7500	4042021.4062
		411034.1563	4042020.8555
		411048.2187	4042015.8046
		411089.0911	4042005.7764
		411114.5444	4041993.0498
		411150.1875	4041979.1406
		411184.2060	4041970.2758
		411204.3007	4041943.4829
		411215.0179	4041889.8970
		411224.0888	4041830.6824
T37-1-L1	0.18	409238.0474	4043261.4907
		409230.6355	4043256.7461
		409208.7762	4043242.7534
		409208.7508	4043242.7132
		409200.9353	4043230.3216
		409194.5618	4043220.2162
		409169.6449	4043203.0818
		409169.4921	4043202.9767
		409169.1853	4043202.5072
		409158.1803	4043185.6676
		409157.5060	4043184.6357
		409156.9721	4043183.8188
		409146.6404	4043168.0094
		409131.4936	4043157.2058
		409125.0977	4043152.6440

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409123.5351	4043151.5294
		409119.9071	4043148.9417
		409103.0041	4043136.8856
		409092.7411	4043129.5655
		409083.5694	4043121.1072
		409081.3001	4043119.0144
		409064.8988	4043103.8887
		409064.2670	4043103.3061
		409060.9224	4043100.2216
		409057.0231	4043096.6256
		409049.1885	4043089.4003
		409041.4086	4043082.2255
		409035.9237	4043077.1673
		409029.4133	4043071.1632
		409029.3449	4043071.1002
		409021.8449	4043064.1835
		409021.0004	4043063.4047
		409011.3561	4043054.5105
		409008.4854	4043046.8150
		408994.3653	4043008.9637
		408993.9067	4043008.5228
		408976.9965	4042992.2671
		408971.6735	4042987.1501
		408959.3314	4042975.2857
		408953.7132	4042967.7595
		408946.5357	4042958.1444
		408940.4946	4042950.0516
		408937.7558	4042946.3827
		408937.4330	4042945.9503
		408936.0468	4042944.0932
		408932.7352	4042939.6570
		408932.4594	4042939.2875
		408929.5742	4042935.4224
		408921.8623	4042925.0916
		408918.1633	4042920.1363
		408913.3184	4042913.6459
		408910.5689	4042909.9627
		408907.6413	4042907.2807
		408900.2233	4042900.4852
		408894.7102	4042895.4348
		408890.4177	4042891.5024
		408867.9296	4042870.9015
		408863.5110	4042866.8537
		408863.1337	4042866.5080
		408859.4392	4042863.1236
		408856.0866	4042860.0523
		408856.6178	4042855.0319

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408856.8687	4042852.6613
		408857.4396	4042847.2662
		408858.8893	4042833.5669
		408863.2774	4042792.0999
		408859.2582	4042782.1007
		408858.9146	4042781.2460
		408857.0293	4042776.5556
		408851.2068	4042762.0701
		408844.1085	4042744.4106
		408840.3955	4042739.6846
		408825.1265	4042720.2498
		408820.8039	4042717.5152
		408803.5265	4042706.5849
		408792.4681	4042699.5891
		408785.3467	4042696.7791
		408766.3233	4042689.2729
		408758.3303	4042686.1190
		408748.7206	4042682.3273
		408745.3474	4042680.9963
		408713.6605	4042675.3731
		408707.2204	4042674.2302
		408696.6588	4042672.3560
		408688.6273	4042673.7951
		408674.8361	4042676.2663
		408665.3417	4042677.9675
		408658.4561	4042677.3701
		408652.7502	4042676.8751
		408651.6705	4042676.7814
		408629.8639	4042674.8894
		408619.1549	4042670.8313
		408611.9856	4042668.1144
		408604.3349	4042665.2152
		408590.3377	4042659.9109
		408578.9758	4042655.6054
		408576.1325	4042654.5279
		408574.9830	4042654.0923
		408574.7923	4042653.9712
		408571.7999	4042652.0698
		408570.3453	4042651.1456
		408569.7790	4042650.7858
		408569.7642	4042650.7764
		408568.1933	4042649.7782
		408566.5111	4042648.7094
		408563.7246	4042646.9389
		408548.7787	4042637.4425
		408543.1695	4042633.8785
		408543.1086	4042633.8398

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408538.3709	4042630.8295
		408533.4289	4042627.6895
		408531.5370	4042626.4874
		408527.1862	4042623.7230
		408526.3493	4042623.1913
		408526.1185	4042623.0446
		408525.9797	4042622.8245
		408520.5008	4042614.1347
		408511.8895	4042600.4769
		408506.2941	4042594.0294
		408505.8846	4042593.5576
		408500.6445	4042587.5196
		408486.5695	4042571.3015
		408482.5335	4042566.6510
		408479.8641	4042563.5751
		408477.8694	4042561.2767
		408471.3153	4042553.7246
		408466.8823	4042548.6166
		408462.6057	4042543.6889
		408455.9718	4042536.0449
		408445.2616	4042523.7039
		408441.1621	4042518.9802
		408428.3087	4042504.1697
		408405.7674	4042488.7920
		408389.6508	4042484.1169
		408361.9306	4042476.0760
		408358.9028	4042474.2377
		408358.4712	4042473.9756
		408352.9831	4042470.6436
		408352.7133	4042470.4798
		408343.1912	4042464.6985
		408343.1042	4042464.6831
		408339.4204	4042464.0330
		408316.6806	4042460.0196
		408316.5011	4042459.9880
		408316.4851	4042459.9851
		408316.4774	4042459.9838
		408316.4646	4042459.9920
		408315.3660	4042460.7000
		408294.6521	4042474.0488
		408267.7178	4042491.4062
		408267.6767	4042491.4087
		408226.3741	4042493.8791
		408219.8713	4042494.2681
		408201.5916	4042495.3615
		408184.9242	4042496.3584
		408184.0589	4042496.4101

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408162.3272	4042497.7099
		408095.0368	4042501.7350
		408090.7813	4042501.9891
		408089.5625	4042502.0622
		408089.5374	4042502.0637
		408089.5014	4042502.0659
		408088.7554	4042503.9647
		408086.5383	4042509.6074
		408080.2995	4042525.4862
		408078.1553	4042530.9437
		408077.5517	4042532.4798
		408073.8791	4042541.8273
		408067.3807	4042558.3666
		408053.9609	4042592.5224
		408046.7525	4042610.8691
		408037.2143	4042635.1454
		408032.2792	4042647.7062
		408032.2670	4042647.7067
		408022.4716	4042648.1008
		408021.5853	4042648.1365
		407985.9326	4042649.5710
		407980.4094	4042649.7933
		407979.3355	4042649.8365
		407978.4997	4042649.8701
		407978.0503	4042649.8882
		407947.3069	4042651.1252
		407936.4269	4042651.5630
		407893.8312	4042653.2768
		407873.2855	4042654.1035
		407870.3125	4042665.4414
		407896.3438	4042683.5195
		407922.8750	4042703.9179
		407947.9375	4042726.9179
		407973.3750	4042750.1133
		407996.6250	4042770.2265
		408018.2813	4042789.8633
		408040.1250	4042807.8789
		408062.2813	4042821.8437
		408085.0937	4042835.7617
		408089.1563	4042842.0820
		408092.5311	4042843.5702
		408095.9063	4042845.0585
		408103.6562	4042849.9570
		408117.4375	4042862.0039
		408133.1563	4042873.4141
		408149.8125	4042886.3672
		408166.7812	4042897.6328

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408181.5312	4042909.5586
		408195.5938	4042922.3984
		408206.4375	4042938.3320
		408219.5312	4042950.7265
		408235.3750	4042961.1796
		408250.8750	4042973.5586
		408267.7812	4042982.0312
		408276.0313	4042994.5039
		408276.8750	4043008.7578
		408278.2144	4043009.7267
		408278.6608	4043010.0496
		408279.5536	4043010.6956
		408292.5938	4043020.1289
		408306.8437	4043030.0742
		408322.1563	4043041.5703
		408337.2500	4043053.9766
		408351.0937	4043065.2695
		408362.8750	4043075.1875
		408375.4062	4043087.2187
		408390.5625	4043091.8672
		408405.5625	4043100.9140
		408421.1875	4043110.6328
		408437.1875	4043119.8359
		408453.5625	4043131.0468
		408462.4688	4043148.3672
		408476.1875	4043150.3554
		408492.7812	4043154.0195
		408489.3750	4043168.8437
		408476.0937	4043180.2461
		408463.7188	4043185.2500
		408474.0000	4043196.3672
		408489.4062	4043203.4531
		408504.3125	4043212.4921
		408520.1250	4043220.2617
		408536.8125	4043224.8633
		408550.2813	4043227.7812
		408560.2813	4043230.2539
		408570.9687	4043224.7148
		408581.0937	4043216.5391
		408595.1875	4043212.7890
		408611.6250	4043219.1211
		408627.1875	4043226.4062
		408643.4062	4043232.2500
		408657.7187	4043240.6680
		408659.5468	4043242.1263
		408661.3750	4043243.5849
		408702.3750	4043268.4531

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408719.0313	4043275.4804
		408734.3352	4043280.9297
		408745.7188	4043272.6289
		408765.5289	4043234.0403
		408758.0392	4043201.0853
		408755.1533	4043197.3114
		408738.5658	4043175.6201
		408686.1375	4043144.1631
		408685.5828	4043140.5577
		408681.3431	4043112.9996
		408680.1457	4043105.2164
		408681.7293	4043101.1695
		408693.6272	4043070.7635
		408723.9473	4043060.0623
		408744.5576	4043052.7881
		408832.9367	4043031.8168
		408833.2603	4043031.8977
		408856.9040	4043037.8086
		408870.1068	4043056.0894
		408876.3773	4043064.7717
		408890.1591	4043080.7191
		408981.2340	4043186.1058
		409002.8003	4043195.7418
		409051.6377	4043217.5628
		409068.8239	4043219.3770
		409116.9343	4043224.4555
		409118.4002	4043224.6103
		409154.2975	4043228.3996
		409156.7550	4043228.6590
		409157.8562	4043228.7753
		409157.8603	4043228.7757
		409159.6323	4043228.9628
		409170.1563	4043228.0156
		409181.7104	4043227.3755
		409189.9687	4043241.4180
		409210.7188	4043251.7539
		409232.2187	4043261.0195
		409238.0474	4043261.4907
T37-2-L1	0.18	409286.9516	4038201.2212
		409266.6143	4038238.0301
		409254.9333	4038259.1717
		409254.9382	4038259.1787
		409254.9598	4038259.2095
		409264.9373	4038273.3966
		409304.7186	4038329.9623
		409304.7158	4038329.9955
		409304.3603	4038333.9409

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409300.1250	4038380.9426
		409299.1846	4038391.3782
		409299.1327	4038391.4158
		409276.8305	4038407.5517
		409267.1731	4038414.5390
		409267.1551	4038414.5416
		409201.6494	4038423.9892
		409201.2496	4038424.0469
		409201.1026	4038424.0681
		409201.0785	4038424.0504
		409194.4843	4038419.2111
		409188.6648	4038414.9404
		409166.2029	4038398.4562
		409144.5362	4038382.5555
		409134.0177	4038309.6731
		409130.9580	4038289.8759
		409129.0855	4038277.7607
		409126.1477	4038258.7530
		409124.1495	4038258.6052
		409068.1858	4038254.4649
		409028.9283	4038251.5605
		408969.2399	4038248.8355
		408915.2794	4038246.3720
		408911.3347	4038246.1919
		408908.9055	4038248.0314
		408888.3205	4038263.6190
		408883.0703	4038267.5946
		408856.6550	4038287.5971
		408853.1404	4038290.2585
		408796.6756	4038298.6942
		408762.6862	4038303.7721
		408853.6562	4038362.2188
		408871.8125	4038370.6446
		408887.5312	4038382.1250
		408889.4379	4038383.7596
		408896.8438	4038391.3789
		408898.5012	4038391.5296
		408901.8750	4038394.4219
		408918.5000	4038406.1367
		408935.3125	4038417.6641
		408948.0625	4038431.7461
		408957.6562	4038446.8125
		408976.3125	4038455.0391
		408992.6250	4038467.4883
		409009.2187	4038479.3594
		409028.4062	4038485.9649
		409046.1875	4038482.4141

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409063.9687	4038478.6485
		409078.1875	4038468.6875
		409086.8125	4038456.3594
		409099.4688	4038449.0000
		409113.4062	4038450.3555
		409125.5312	4038455.2071
		409135.4688	4038464.4844
		409142.7812	4038475.7461
		409147.8750	4038489.3945
		409153.4375	4038504.4727
		409159.0625	4038520.6563
		409159.4696	4038523.6720
		409159.4688	4038523.8086
		409160.0389	4038546.9275
		409159.0625	4038553.9414
		409157.6875	4038570.2617
		409153.4688	4038584.7578
		409150.4375	4038600.5469
		409144.4375	4038615.7070
		409136.0937	4038629.5547
		409134.5935	4038631.0554
		409134.5313	4038631.0234
		409134.2729	4038631.3762
		409124.7188	4038640.9336
		409119.3680	4038651.1019
		409117.6152	4038662.4947
		409117.1771	4038683.5275
		409111.4807	4038705.4367
		409109.0694	4038711.5575
		409108.3125	4038712.5391
		409108.6051	4038712.7361
		409109.6129	4038713.4146
		409106.9687	4038718.4727
		409117.7188	4038729.5274
		409123.3125	4038745.1094
		409122.0625	4038760.8750
		409116.4062	4038776.2227
		409110.5938	4038791.9180
		409106.9687	4038808.4570
		409101.8125	4038825.7383
		409089.7305	4038837.6123
		409006.3051	4038926.0054
		408972.6702	4038988.9814
		408959.7888	4039112.0709
		408951.9168	4039210.8287
		408958.5938	4039291.7383
		408959.4063	4039303.7854

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408959.1250	4039309.5586
		408959.0857	4039312.3876
		408958.9688	4039313.1211
		408955.3750	4039329.7852
		408967.5113	4039340.2998
		408977.8706	4039344.4704
		408988.0000	4039348.1523
		408997.3259	4039348.7398
		409003.7729	4039349.1459
		409005.9585	4039349.2836
		409019.8673	4039337.2715
		409041.3628	4039313.2471
		409074.2382	4039296.8094
		409109.6425	4039281.6361
		409157.0590	4039282.9006
		409181.7155	4039273.4173
		409217.1198	4039244.9674
		409240.5119	4039210.8276
		409262.0074	4039145.7089
		409267.0652	4039102.7180
		409277.1354	4039075.6544
		409281.3701	4039066.7893
		409291.7217	4039045.1860
		409310.0561	4039014.2073
		409304.0686	4038996.2869
		409298.0313	4038972.5625
		409299.0937	4038963.9414
		409296.4486	4038947.1801
		409308.3019	4038932.7868
		409335.4124	4038931.3884
		409336.8125	4038932.1367
		409347.0313	4038930.7891
		409398.0488	4038923.4734
		409464.9356	4038920.0867
		409531.8224	4038927.7068
		409608.8692	4038926.8601
		409679.9893	4038920.9334
		409737.5628	4038900.6134
		409767.1962	4038870.1333
		409800.2162	4038834.5732
		409816.3029	4038771.9198
		409806.9896	4038754.9864
		409771.4295	4038706.7263
		409734.1761	4038665.2396
		409675.7560	4038616.9795
		409575.8491	4038550.0927
		409531.8224	4038517.9193

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409465.7822	4038432.4058
		409416.5659	4038358.2027
		409407.0313	4038350.7226
		409401.9375	4038346.3164
		409398.5312	4038343.5430
		409393.9687	4038338.2617
		409388.7500	4038333.7969
		409381.7500	4038329.5039
		409373.8750	4038325.3711
		409370.0625	4038324.4063
		409368.1250	4038323.7031
		409364.9375	4038323.3633
		409363.8437	4038323.1211
		409358.1250	4038321.8867
		409351.4375	4038321.9844
		409342.6562	4038321.9922
		409341.4062	4038321.7031
		409339.0625	4038320.0703
		409337.3750	4038318.4024
		409334.3750	4038314.7930
		409331.5625	4038312.0743
		409330.8437	4038311.4141
		409329.8125	4038310.5508
		409323.1875	4038306.6015
		409318.5000	4038301.6836
		409318.0937	4038298.4687
		409316.6562	4038296.4492
		409313.5938	4038291.4883
		409309.4688	4038285.2617
		409306.1563	4038282.4727
		409300.4062	4038276.9180
		409298.2187	4038273.2188
		409294.8437	4038266.7578
		409293.6875	4038261.0664
		409290.9687	4038253.3594
		409288.6250	4038248.0743
		409287.8125	4038242.8320
		409288.7812	4038232.8984
		409286.2187	4038223.9180
		409286.1250	4038217.5976
		409286.9516	4038201.2212
T37-2-L2	0.06	408869.9095	4037236.6162
		408910.3790	4037241.3160
		408947.8902	4037245.6722
		408950.7405	4037246.0033
		409044.0149	4037256.8354
		409105.2039	4037365.9140

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409184.9769	4037508.1215
		409260.6274	4037628.4629
		409334.4056	4037792.2852
		409334.9149	4037882.5867
		409335.6730	4038017.0063
		409335.6731	4038017.0272
		409325.1482	4038037.5861
		409312.7645	4038061.7760
		409312.4915	4038067.6499
		409311.1102	4038097.3658
		409310.1022	4038119.0518
		409308.0610	4038162.9628
		409308.0602	4038162.9814
		409308.0584	4038163.0196
		409307.8777	4038166.1114
		409347.6416	4038144.3188
		409375.6250	4038127.1055
		409383.2500	4038121.4687
		409387.9687	4038119.0391
		409393.1250	4038115.2773
		409396.2187	4038114.1601
		409406.5155	4038103.8984
		409446.3089	4038029.3916
		409441.2289	4037985.3649
		409441.2289	4037954.8848
		409467.4756	4037903.2380
		409477.6356	4037837.1979
		409460.7022	4037805.8712
		409453.0822	4037784.7045
		409458.1622	4037752.5311
		409455.6222	4037719.5110
		409451.3889	4037705.9643
		409457.3156	4037684.7976
		409456.4689	4037654.3175
		409448.0022	4037625.5308
		409439.5355	4037584.8907
		409420.0621	4037550.1773
		409405.6688	4037525.6240
		409405.6688	4037517.0038
		409405.6688	4037504.6109
		409405.6688	4037473.9772
		409395.5088	4037419.7904
		409386.1954	4037359.6770
		409359.9487	4037335.1236
		409340.4753	4037324.1169
		409332.8553	4037299.5635
		409322.8937	4037270.2646

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		409318.4619	4037257.2300
		409269.3552	4037252.1500
		409239.7218	4037236.0633
		409220.2484	4037215.7433
		409191.4617	4037210.6633
		409167.7550	4037210.6633
		409157.2756	4037211.5764
		408869.9095	4037236.6162
T37-2-L3	0.05	408702.8334	4036371.4813
		408706.6520	4036616.2502
		408751.3271	4036667.7207
		408789.6756	4036817.3542
		408787.0526	4036961.8229
		408785.6817	4037037.3381
		408785.6375	4037039.7694
		408794.4375	4037037.9062
		408806.1875	4037026.1640
		408822.2500	4037020.7461
		408835.3125	4037020.0195
		408840.4062	4037016.9688
		408918.0313	4036927.3555
		408927.0000	4036920.4453
		408935.6562	4036909.0938
		408945.7500	4036898.8125
		408955.1250	4036887.5235
		408961.2500	4036872.5196
		408967.0625	4036859.3594
		409002.5938	4036740.4531
		408992.6562	4036629.7070
		408958.3750	4036561.8867
		408944.7500	4036525.4102
		408915.6562	4036465.5898
		408903.9639	4036451.2250
		408863.1007	4036401.0218
		408798.7641	4036379.9278
		408768.6901	4036377.2799
		408723.8003	4036373.3274
		408702.8334	4036371.4813
T37-2-L4	0.19	408376.9612	4036159.8220
		408386.2217	4036113.3207
		408415.8015	4035964.7875
		408417.2066	4035957.7318
		408465.9883	4035936.4920
		408694.4951	4035836.9988
		408700.2588	4036206.4511
		408700.7345	4036236.9420
		408700.7355	4036237.0064

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408708.2813	4036241.5586
		408724.0625	4036246.0469
		408749.7813	4036241.7656
		408762.0000	4036235.3047
		408781.4375	4036182.1367
		408792.3125	4036136.7539
		408830.6875	4036062.8320
		408837.3750	4036051.0742
		408843.3750	4036038.2383
		408859.2500	4035986.2305
		408864.9063	4035973.7852
		408872.5625	4035948.5977
		408873.2500	4035943.3984
		408873.0906	4035940.5779
		408876.8438	4035883.5859
		408879.5000	4035815.1836
		408878.5000	4035789.0859
		408895.0000	4035711.7891
		408893.7500	4035698.2695
		408889.7188	4035685.5820
		408880.0313	4035676.4922
		408851.3125	4035629.3242
		408843.4063	4035619.1055
		408815.4375	4035538.7305
		408817.2813	4035522.3750
		408844.1875	4035466.7656
		408840.3125	4035452.2110
		408835.3750	4035436.3320
		408817.2500	4035393.7461
		408786.1250	4035323.3125
		408765.4688	4035287.1992
		408762.3875	4035264.5425
		408762.4688	4035263.8984
		408760.6563	4035251.8125
		408757.9688	4035237.5742
		408753.5938	4035225.4063
		408747.6563	4035211.9453
		408740.4063	4035199.5391
		408730.8438	4035187.8711
		408728.1888	4035185.3085
		408719.7188	4035177.1328
		408706.9063	4035167.7734
		408693.5938	4035160.7617
		408604.7254	4035159.7544
		408513.1563	4035190.4727
		408499.9375	4035192.5469
		408432.2494	4035196.6703

Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408366.8901	4035211.7998
		408341.8750	4035232.3789
		408334.0313	4035251.2656
		408321.6250	4035269.7930
		408305.1875	4035283.0312
		408288.6875	4035289.4570
		408273.6330	4035299.0781
		408258.5298	4035331.8132
		408256.1826	4035344.2198
		408238.4688	4035390.0430
		408220.2813	4035482.1211
		408214.2813	4035500.4219
		408168.9063	4035551.6289
		408124.9687	4035589.3789
		408113.2283	4035598.0053
		408113.0000	4035598.0703
		408112.9178	4035598.2335
		408108.5625	4035601.4336
		408099.7812	4035620.1562
		408097.9508	4035632.0474
		408097.6563	4035632.8203
		408097.0553	4035637.8653
		408096.5000	4035641.4726
		408096.5315	4035642.2625
		408095.2813	4035652.7578
		408095.8125	4035672.1563
		408096.4063	4035692.6602
		408130.6831	4035745.0568
		408132.1875	4035757.6367
		408135.0000	4035776.5781
		408135.7450	4035781.2150
		408132.6875	4035844.1211
		408137.9688	4035860.2188
		408150.6250	4035868.3906
		408158.6250	4035864.0625
		408159.2188	4035864.1250
		408159.9063	4035863.3750
		408167.1875	4035859.4375
		408172.0534	4035854.2357
		408196.3125	4035838.2109
		408266.8750	4035787.7461
		408295.9375	4035789.6328
		408332.2369	4035822.6743
		408338.7188	4035833.7969
		408342.2470	4035836.5598
		408342.9688	4035837.1250
		408342.9688	4035837.1406

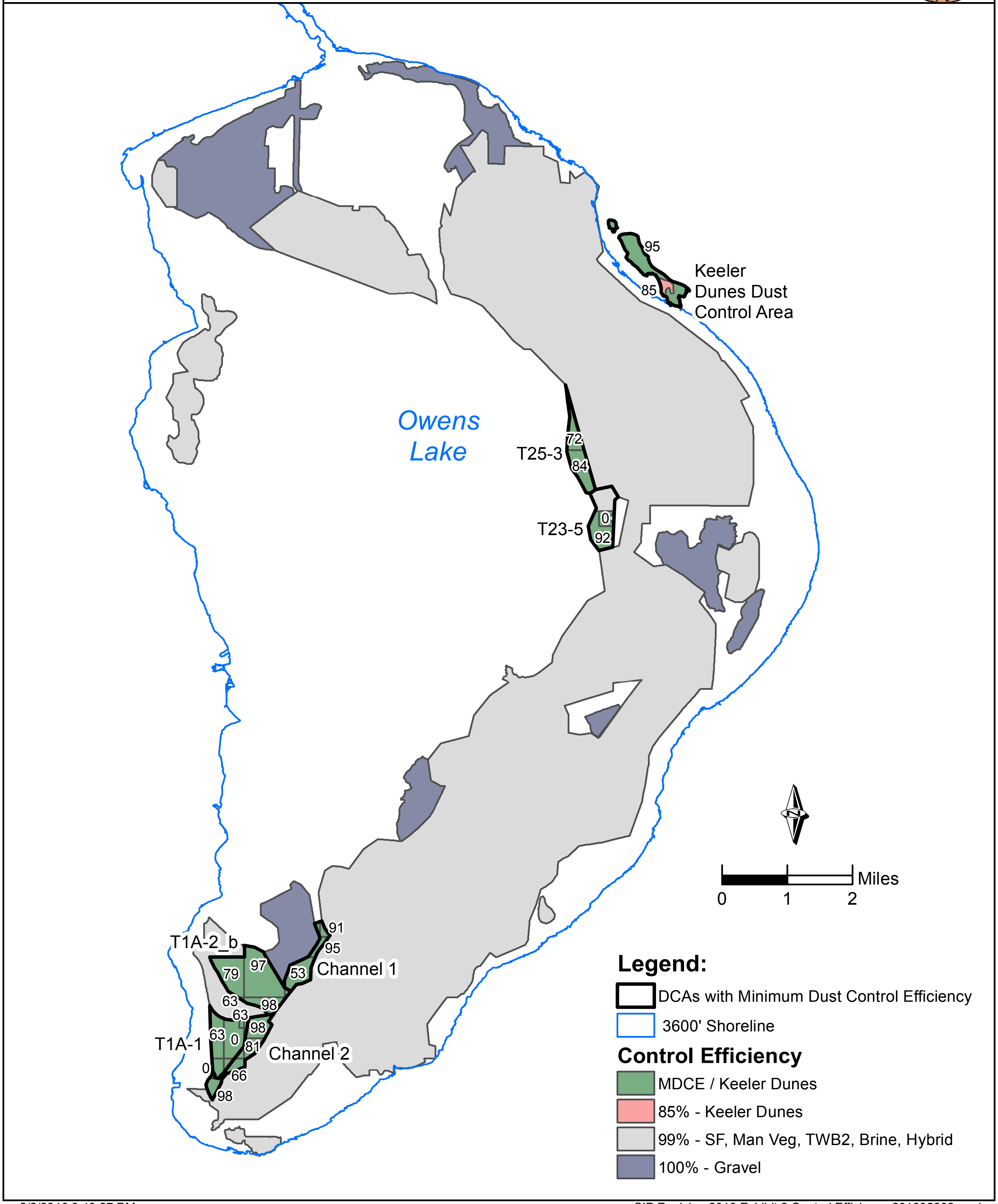
Exhibit 1 - PM10 Control Areas and Coordinates

Phase 9/10 Area

Area ID	Area (sq miles)	UTM X	UTM Y
		408343.0625	4035837.2109
		408347.9063	4035841.0117
		408354.9375	4035850.0313
		408356.5000	4035850.6875
		408361.0625	4035857.0039
		408365.0938	4035857.2539
		408367.7188	4035859.9414
		408378.3750	4035868.6875
		408384.4063	4035886.2578
		408387.1466	4035898.8420
		408389.2813	4035908.6445
		408392.2500	4035932.2969
		408391.5000	4035954.7578
		408393.2500	4035976.0977
		408393.7500	4035998.4492
		408391.9063	4036022.1992
		408388.5313	4036046.6602
		408383.6875	4036069.8164
		408382.4063	4036094.4531
		408381.9990	4036102.1378
		408381.7363	4036107.0950
		408381.1250	4036118.6289
		408374.8125	4036140.0391
		408375.0938	4036142.6250
		408373.2500	4036144.5430
		408376.3438	4036153.9297
		408376.8125	4036158.0781
		408376.9612	4036159.8220

Great Basin Unified Air Pollution Control District

Exhibit 2 - Dust Control Efficiency Map



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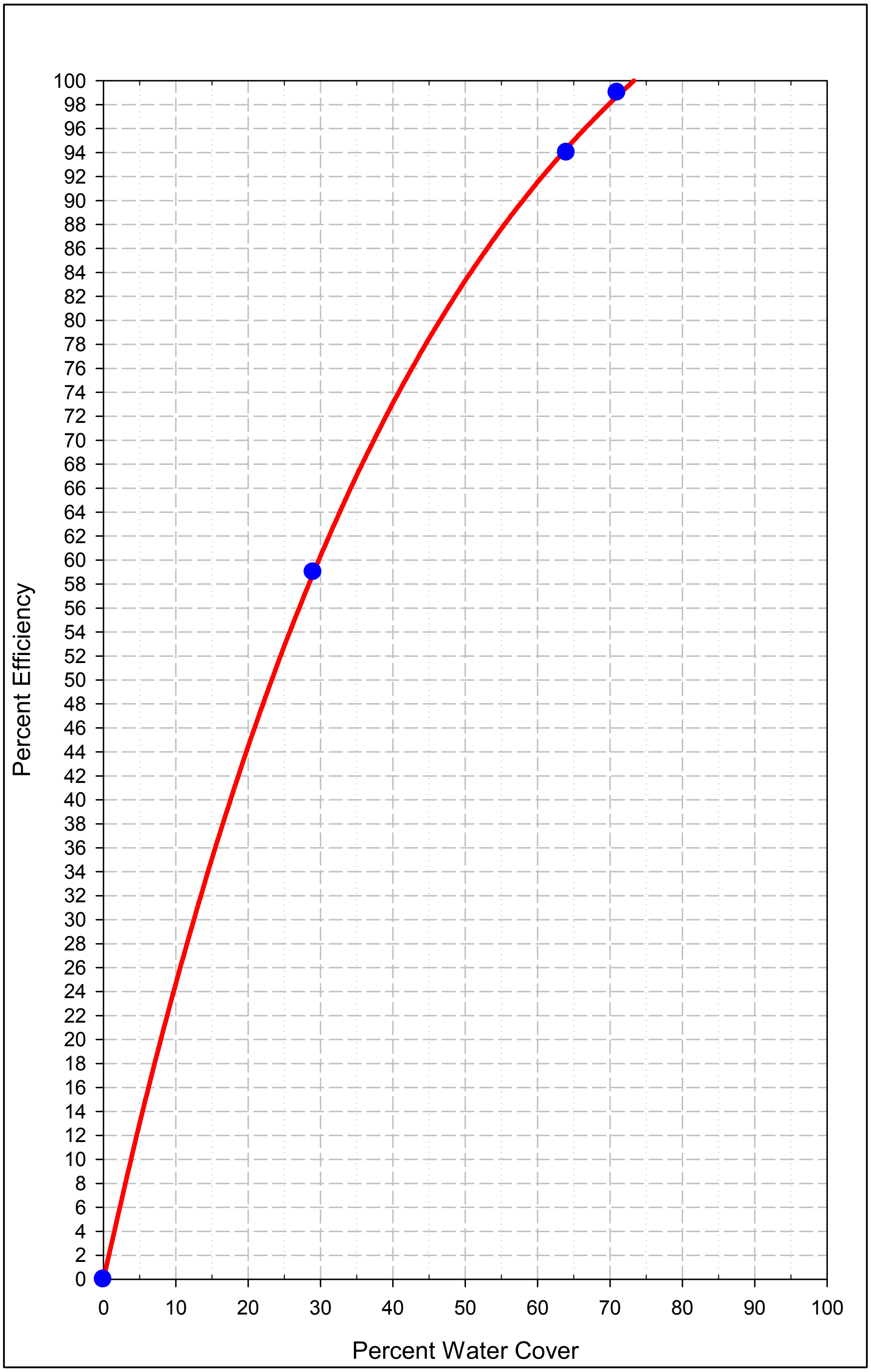
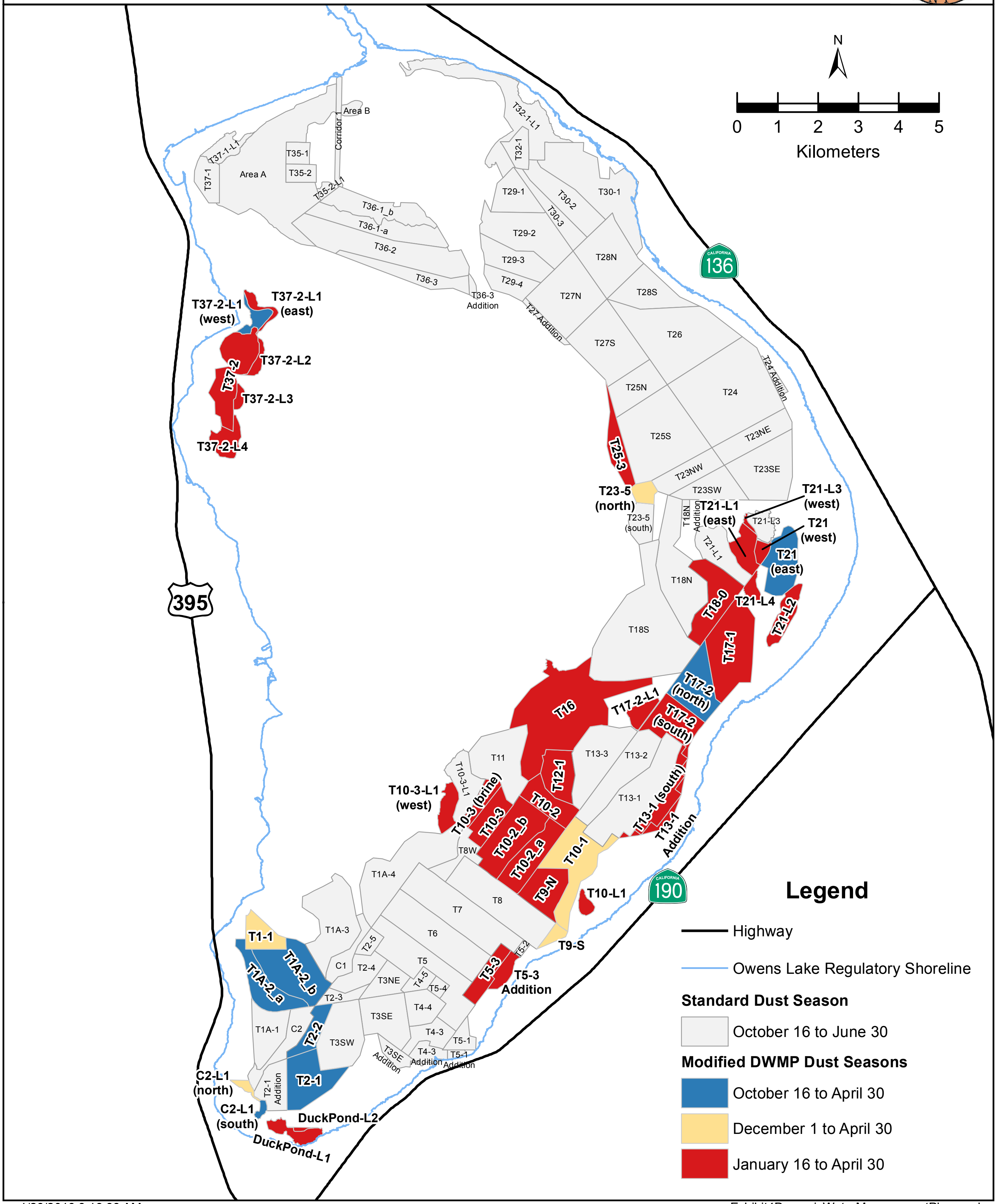
SIP Revision 2016 Exhibit 2 Control Efficiency 201602202.mxd

Exhibit 3 - Shallow Flood control efficiency curve



Great Basin Unified Air Pollution Control District

Exhibit 4 - Dynamic Water Management Dust Control Areas



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GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

Exempt from Filing Fees
Government Code § 6103

FILED / ENDORSED
DEC 30 2014
By E. Higginbotham, Deputy Clerk

SUPERIOR COURT OF THE STATE OF CALIFORNIA

COUNTY OF SACRAMENTO

CITY OF LOS ANGELES, a California Municipal Corporation, ACTING BY AND THROUGH ITS DEPARTMENT OF WATER AND POWER, Petitioner and Plaintiff, v. CALIFORNIA AIR RESOURCES BOARD; EXECUTIVE OFFICER OF THE CALIFORNIA AIR RESOURCES BOARD, in its official capacity; GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT; and DOES 1-100, Respondents and Defendants.	Case No. 34-2013-80001451-CU-WM-GDS [Assigned for All Purposes to the Honorable Shelleyanne W.L. Chang] STIPULATED JUDGMENT FOR RESPONDENT AND DEFENDANT GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT Department: 24 Date Action Filed: December 19, 2012
CALIFORNIA STATE LANDS COMMISSION; and DOES 101-500, Real Parties in Interest.	

la-1255083

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Attorneys for Petitioner and Plaintiff
CITY OF LOS ANGELES, a California Municipal Corporation,
ACTING BY AND THROUGH ITS DEPARTMENT
OF WATER AND POWER

Petitioner and Plaintiff CITY OF LOS ANGELES, a California Municipal Corporation, ACTING BY AND THROUGH ITS DEPARTMENT OF WATER AND POWER ("Petitioner" or "City") and Respondent and Defendant GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT ("District") (collectively "Parties"), having agreed and consented to the entry of this stipulated judgment for the Respondents and Defendants ("Stipulated Judgment") containing the terms specified below, and the Court having been presented with the Stipulated Judgment and reviewed its terms, the Court hereby approves the Stipulated Judgment and these terms, and issues the following orders:

RECITALS BY THE PARTIES

A. The District is a unified air pollution control district as provided by Division 26, Part 3, Chapter 3 of the California Health and Safety Code and consists of all of Inyo, Mono and Alpine counties.

B. The City is a charter city in the State of California, and its Department of Water and Power ("LADWP") is a proprietary department of the City. The LADWP is responsible for providing water and power to the residents of Los Angeles. Its duties include operating the Los Angeles Aqueduct, which transports water from the Eastern Sierra region to Southern California.

C. The dispute between the parties concerns the control of air pollution from Owens Lake. Owens Lake is located in Inyo County in eastern California, south of the town of Lone Pine and north of the town of Olancha.

D. Large portions of the Owens Lake bed are comprised primarily of dry saline soils and crusts. The City's water diversions from the Owens Valley, including by the use of the Los Angeles Aqueduct, has exposed lake bed areas.

E. The lake bed soils and crusts are a source of wind-borne dust during significant wind events, and contribute to elevated concentrations of particulate matter less than 10 microns in diameter ("PM_{10}").

F. PM_{10} is a criteria pollutant regulated by the federal Clean Air Act, 42 U.S.C. Section 7401 *et seq.*, as amended ("CAA").

G. Under the National Ambient Air Quality Standard ("NAAQS") adopted pursuant to the CAA, PM_{10} levels may not exceed an average concentration of 150 micrograms per cubic meter ("$\mu g/m^3$") during a 24-hour period more than one time per calendar year averaged over three years.

H. The CAA further requires the U.S. Environmental Protection Agency ("EPA") to divide each state into air quality control regions. Each region is characterized as either "attainment" or "non-attainment" for each identified air pollutant, depending on whether the monitored level of that air pollutant in that region is at or below (attainment) or above (non-attainment) the level mandated by the NAAQS.

I. Once the EPA establishes the NAAQS, the states have the primary responsibility to prepare a State Implementation Plan ("SIP") for achieving and maintaining the NAAQS within each air quality control region within the state. The SIP must establish "enforceable emission limitations and other control measures" designed to, among other things, achieve attainment in non-attainment regions within the state.

J. The California Legislature delegated responsibility and authority to meet the CAA's SIP requirements to Respondent CARB and authorized CARB to implement this requirement through the creation of thirty-five (35) air pollution control districts.

K. On August 7, 1987, the EPA designated the Owens Valley Planning Area ("OVPA") as one of the regions in California in violation of the PM_{10} NAAQS. The EPA designated the OVPA as a "serious nonattainment area" for PM_{10}.

L. In addition to the federal NAAQS, the State of California has adopted a PM_{10} standard ("State Standard"). The State Standard is violated when monitors record PM_{10} concentrations greater than 50 $\mu g/m^3$ averaged over a 24-hour period.

M. The District has regulatory authority over air quality issues in the OVPA where Owens Lake is situated.

N. Health and Safety Code Section 42316 ("Section 42316"), enacted by the California Legislature in 1983, provides in part that the District has authority to require the City to undertake reasonable measures at Owens Lake in order to address the impacts of its activities that cause or contribute to violations of federal and state air quality standards, including but not limited to the NAAQS and State Standard for PM_{10}.

O. In November 1998, the District submitted to EPA its 1998 SIP. In September 1999, the EPA approved the 1998 SIP. The District and the City agreed to the provisions in the 1998 SIP and requested EPA to extend the attainment deadline for the OVPA. In September 1999, the EPA approved the 1998 SIP and extended the attainment deadline by five years, from December 31, 2001 to December 31, 2006.

P. The 1998 SIP provides three allowable mitigation control measures that are approved as Best Available Control Measures ("BACM") that the City may select for use at the dried Owens Lake bed: (1) shallow flooding; (2) managed vegetation; or (3) gravel cover.

Q. Under the CAA at 42 U.S.C. § 7513(e), for areas receiving extensions of the original attainment date, the SIP shall provide for implementation of "the most stringent measures that are included in the implementation plan of any State or are achieved in practice in any State, and can feasibly be implemented in the [nonattainment] area."

R. In 2003, the District revised the 1998 SIP and submitted the 2003 SIP to EPA for approval. The 2003 SIP requires most stringent measures ("MSM") BACM controls. EPA has not taken action on the 2003 SIP.

S. In 2005, the City disputed orders issued by the District under Section 42316 for additional air pollution controls at the dried Owens Lake bed. To resolve this dispute, the City and the District entered into a settlement agreement. Pursuant to that agreement, the District agreed to submit revisions to the 2003 SIP. For this purpose, in 2008, the District adopted Board Order No. 080128-01 and submitted the order as the 2008 SIP ("2008 SIP Order"). CARB approved the 2008 SIP Order and submitted it to the EPA for approval, which is pending before EPA. The 2008 SIP also requires MSM BACM controls.

T. On or about August 1, 2011, the District issued the 2011 SCRD which ordered the City to install additional dust control measures on approximately 2.86 square miles of the dried Owens Lake bed to meet the NAAQS for PM_{10}. These are known as the Phase 9 dust control areas.

U. The City appealed the 2011 SCRD under Section 42316(b). On June 15, 2012, the Executive Officer of the CARB held a hearing on the City's appeal. On November 19, 2012, the CARB issued its written decision denying the City's appeal and affirming the 2011 SCRD ("CARB Decision").

V. On or about December 10, 2012, the City filed a Verified Petition for Writ of Mandate in this action entitled *City of Los Angeles, et al. v California Air Resources Board,* Los Angeles County Superior Court, Case No. BS140620 (the "Action"). This Action was transferred to the Sacramento County Superior Court and the City filed a First Amended Verified Petition for Writ of Mandate and Complaint for Declaratory Relief on or about August 30, 2013 ("Amended Petition'). The District filed its Answer to the Amended Petition on September 30, 2013. The Action in part appeals the CARB Decision pursuant to Sections 42316 and Civil Procedure Code Section 1094.5. On September 25, 2014, the Court issued a tentative ruling denying the City's petition for writ of mandate and ordering entry of judgment for Respondents and Defendants. A hearing was held on September 26, 2014 and after oral argument, the Court took the matter under submission pending the issuance of its final ruling and order.

W. On November 16, 2012, the District issued the 2012 SCRD which ordered the City to install additional 0.76 square miles of dust control measures on the dried Owens Lake bed to meet the NAAQS for PM_{10}. These are known as the Phase 10 dust control areas.

X. The City appealed the 2012 SCRD under Section 42316(b). On April 18, 2014, the Executive Officer of the CARB held a hearing on the City's appeal. A decision on this appeal is pending.

Y. On April 4, 2014, the District issued the 2013 SCRD which stated that no additional areas of the lake bed required controls at that time. On August 6, 2014, the District issued its preliminary 2014 SCRD which also stated that no additional areas of the lake bed required controls at that time.

Z. Based on data collected, the 2011, 2012, 2013 and 2014 SCRDs, modeling and experience by the District to date, the District estimates that the City's control of dust emissions by applying BACM to 48.6 square miles of the dried Owens Lake bed, and the District's control of dust emissions from the adjacent Keeler Dunes will reduce emissions in the OVPA such that it can attain the NAAQS. Further monitoring and data collection will be needed to confirm the estimates of attainment.

AA. The Parties acknowledge the need to control dust from the lakebed caused by the City's water production activities and for additional effective dust control measures that do not rely on water that can be substituted in areas currently under control or applied in areas ordered to be controlled.

BB. The Parties further acknowledge the need to balance the requirements to control dust emissions and conserve water with the requirements to minimize impacts to cultural and biological resources.

CC. Now, therefore, after extensive negotiations to resolve their disputes, the Parties have reached a settlement with the terms contained herein, and agree to entry of this Stipulated Judgment to resolve this action and their disputes including those stated in the Amended Petition and the District's Answer, and those regarding the 2011 SCRD, 2012 SCRD, 2013 SCRD and 2014 SCRD under Section 42316.

STIPULATED JUDGMENT

1. **Entry of Judgment**. The Court orders that final judgment on the Petition and Complaint in this action, including all terms contained herein, be entered for Respondent and Defendant District against Petitioner and Plaintiff on all causes of action in the pending First Amended Petition and Complaint ("Judgment"). The Judgment shall constitute final judgment resolving all claims and defenses alleged in the Amended Petition and the Answer filed by the District. The Parties agree not to appeal or further contest this Judgment. The Judgment shall consists of any final ruling and order by this Court on the City's writ of mandate as referenced in Preamble Paragraph V, which shall be attached as Attachment A to this Stipulated Judgment, and the additional terms contained herein, which the Parties stipulate are consistent with the Court's order.

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2. **Phase 9/10 Project to Implement 2011 and 2012 Supplemental Control Requirement Determinations**

A. By December 31, 2017, the City shall construct a dust control project to complete the Phase 9 and Phase 10 dust controls by selecting and installing BACM on 3.62 square miles of areas identified in the 2011 SCRD and 2012 SCRD (collectively referred to as the "Phase 9/10" project). The Phase 9/10 project shall bring the total area of the City's dust controls on the Owens Lake bed to 48.6 square miles. The construction deadline set forth in this paragraph is subject to the Force Majeure and Stipulated Penalties provisions set forth in Paragraphs 14 and 15 below.

B. The City may submit an application to the APCO to approve modifications to the City's proposed project or measures on certain areas that are determined to contain significant cultural resources. The District shall consider and decide the City's application under the procedures contained in the 2013 Stipulated Abatement Order No. 130819-01.

C. The Phase 9/10 project will use dust control measures that are waterless or "water neutral" by offsetting any new or increased water use with water savings elsewhere on the lakebed.

D. Within 60 days of the court's entry of this Stipulated Judgment, the City shall prepare and submit for the APCO's consideration and written approval, which approval shall not be unreasonably withheld, a Remedial Action Plan ("RAP") for the Phase 9/10 project that provides for project completion by December 31, 2017. The plan shall contain intermediate milestones specifying the completion dates for CEQA compliance (and to the extent joint documents are prepared under CEQA and NEPA, for CEQA/NEPA compliance), construction bid award and control measure compliance.

E. Upon completion of the Phase 9/10 project, and any additional BACM Contingency Measures as provided in Paragraph 3 below, the City shall permanently operate dust controls with approved BACM on those areas and all other existing areas where the City has installed and operates dust controls on the dried Owens Lake bed, except as provided by a SIP for BACM testing and development.

3. **Additional BACM Contingency Measures**

A. To provide the emission reductions necessary to meet the NAAQS in the OVPA, the District's Air Pollution Control Officer ("APCO") may order the City on or any time after January 1, 2016 to implement additional BACM contingency measure controls on up to 4.8 square miles (which need not be contiguous) of the dried Owens Lake bed ("BACM Contingency Measures"). If the City implements the entire 4.8 square miles of BACM Contingency Measure controls, there will be a total of 53.4 square miles of dust controls on the Owens Lake bed. Any BACM Contingency Measure orders shall be based on evidence presented to the APCO that the area considered for such order has caused or contributed to an exceedance of the NAAQS or State Standard. Areas that are deferred for controls under the procedures in Paragraph 2.B because of the presence of significant cultural resources, then re-ordered for controls per those procedures, shall not be counted as part of the 4.8 square miles allowed for BACM Contingency Measures. Although the City may provide comment on a proposed BACM Contingency Measures order by the APCO, the City shall not appeal or contest the APCO's order for dust controls included in the combined 53.4 square miles now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Section 42316.

B. Except for the 4.8 square mile BACM Contingency Measure area and any area re-ordered for control under Paragraph 2.B of this Judgment, the District shall not issue any further orders for mitigation measures to the City under Section 42316 or any other law, including but not limited to SCRDs, requiring the City to control windblown dust emissions (including PM 10, PM 2.5 or any speciated components or products of PM) from any areas on the dried Owens Lake bed beyond the combined 53.4 square miles. The provisions in this paragraph do not apply to fee orders issued to the City under Section 42316, or any orders for areas that are not on the dried Owens Lake bed.

C. The BACM Contingency Measures provided under this paragraph will be limited to the Owens Lake bed below elevation 3,600.00 feet above mean sea level ("amsl") and above the natural brine pool at elevation 3,553.55 feet amsl.

D. The BACM Contingency Measures areas will be controlled with waterless or water-neutral dust control measures by offsetting any new or increased water use with water savings elsewhere on the lakebed.

E. The BACM Contingency Measures shall be installed by the City and be operational within three years of the date that the APCO orders City to implement the BACM Contingency Measures, except that if the City selects the use of managed vegetation for its BACM for any of the areas ordered for BACM Contingency Measures, the City will be allowed an additional two years to achieve full vegetation-cover compliance for those areas. The implementation deadline set forth in this paragraph is subject to the Force Majeure and Stipulated Penalties provisions set forth in Paragraphs 14 and 15 below. The City shall be solely responsible for all CEQA compliance, and to the extent joint documents are prepared under CEQA and NEPA, for CEQA/NEPA compliance, and all lease and permit requirements associated with any Contingency Measures.

F. Within 60 days of the date that the APCO orders City to implement the BACM Contingency Measures, the City shall prepare and submit for the APCO's consideration and written approval, which approval shall not be unreasonably withheld, a RAP that provides for the completion of those measures by the time deadlines provided in Paragraph 3.E above. The plan shall contain intermediate milestones specifying the completion dates for CEQA/NEPA compliance, construction bid award and control measure compliance.

4. <u>Monitoring</u>

A. For PM_{10} monitoring, the City shall grant an irrevocable right in perpetuity to the District to site air monitors on City-occupied or unoccupied property in communities located in the OVPA at the District's sole discretion, shall provide electric power to those monitors if such power source is under the City's control, and shall not interfere with the operation of those monitors, cut off their power supply (except for planned or emergency system outages), or take any other action to evict or remove the monitors.

5. <u>Tillage with BACM Backup (TwB2)</u>

A. In addition to the approved BACM in the 2008 SIP Order, the City may select a variation on the Shallow Flood BACM called Tillage with BACM Backup ("TwB2").

TwB2 is a District-approved variation of the approved Shallow Flood BACM that wets and/or roughens emissive Owens Lake bed surfaces to prevent air emissions. TwB2 consists of soil tilling and/or wetting within all or portions of Shallow Flood BACM PM_{10} control areas (TwB2 Areas) where sufficient shallow flood infrastructure and available water supply exists. The City shall at all times maintain all TwB2 areas in compliance with all conditions and procedures contained in this Stipulated Judgment such that TwB2 areas do not cause or contribute to exceedances of the PM_{10} Standard. The City shall have the sole duty to obtain all required approvals and permits required by law for TwB2. The District will support the City's efforts to obtain these approvals and permits in compliance with the law.

B. The City's selection and implementation of TwB2 shall comply with the "Protocol for Operation and Maintenance of Owens Lake Tillage with BACM Backup" attached hereto and made part of this Stipulated Judgment as Attachment B ("TwB2 Operations Protocol"). The TwB2 Operations Protocol addresses site selection, site dry-down, measures to prevent untilled drying surfaces from becoming emissive during dry-down, tilling, maintenance and rewetting. The City shall have sole discretion to modify the Operations Protocol as necessary to ensure efficient operation of TwB2.

C. The District's monitoring and enforcement of TwB2 Areas shall comply with the "Protocol for Monitoring and Enforcing Owens Lake Tillage with BACM Backup" attached hereto and made part of this Stipulated Judgment as Attachment C ("TwB2 Monitoring Protocol"). This protocol describes the data to be collected and methods of analysis to determine if TwB2 areas on the Owens Lake bed need maintenance and/or reflooding in order to maintain or reestablish control efficiency for compliance with the PM_{10} NAAQS. Based on data and after consulting with the City, the APCO shall have sole discretion to modify the TwB2 Monitoring Protocol in writing as necessary to ensure air quality protection.

D. The APCO may order, and the City is required to reflood a TwB2 area as provided in the TwB2 Monitoring Protocol. Within 37 days of notification by the APCO that a TwB2 area must be reflooded, the City shall complete reflooding of that area in accordance with approved Shallow Flooding BACM requirements. The City shall not appeal or contest the TwB2

Protocol, any revisions to that protocol that comply with this Paragraph 5, or the APCO's order to reflood a TwB2 area now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Section 42316, except the City may contest an APCO order to reflood a TwB2 area on the sole basis that the APCO did not follow the TwB2 Monitoring Protocol. Such a challenge shall be brought exclusively to this Court to enforce this Stipulated Judgment, and not by an appeal under Section 42316 or by any challenge in any other administrative or judicial forum.

E. The Parties agree to periodic joint inspections of the TwB2 Areas by the District and the City. The Parties shall agree to a standing time for meetings at least every other week after the City commences tillage for TwB2 to discuss the status of the surface conditions, whether re-tilling or re-flooding should be ordered to avoid unlawful dust emissions, and to foster collaboration and cooperation at the staff level. The District will provide the City with at least 24-hour notification of the time and location of the District's TwB2 field inspections and testing. Although the presence of City staff is not required during these inspections and testing by the District, this prior notification will give the City the opportunity to observe any TwB2 monitoring that the APCO will use to determine if a TwB2 area should be flooded.

F. The City may at its discretion file an application with the District to seek approval of tillage without TwB2 as BACM. The Parties shall follow the process in the 2008 SIP Order for this application.

G. The City shall be solely responsible to obtain all required approvals and permits required to implement TwB2. The District will support the City's efforts to obtain such approvals in compliance with the law.

6. New and refined dust control measures

A. The District will review new or refined dust control measures proposed by the City, and will approve a measure as MSM BACM if the District determines that the measure is consistent with the federal EPA's interpretation of the term Best Available Control Measure under the federal Clean Air Act and implementation of MSM as required for the Owens Valley nonattainment area. In assessing whether a dust control measure (including a new measure or extension of a previously identified measure to a new area) is BACM, the District will consider the technological feasibility of the measure, as well as energy, environmental, and economic impacts and other costs.

B. The Parties will continue to collaborate on the expedited testing of Tillage, Engineered Roughness Elements, Lake Brine and Dust Palliative Chemicals as candidate BACMs. The Parties further agree to identify additional candidate BACMs, as appropriate. New dust control measures should be waterless, where feasible. Where not feasible, new dust control measures should be water neutral by offsetting any new or increased water use with water savings elsewhere on the lakebed.

C. The Parties commit to a minimum of quarterly meetings and field visits to discuss and review BACM testing.

7. <u>Lake-wide efforts to reduce water use</u>

A. The City and the District commit to work together to jointly develop and propose "Dynamic Water Management" actions for incorporation into the 2015 SIP revision referenced in Paragraph 11. These actions may include "early water ramp-down" in non-emissive years. TwB2 is not a Dynamic Water Management concept. The proposed actions shall set forth the conditions upon which the APCO can approve the City's application to undertake these dynamic water management actions.

8. <u>Revision to the 2008 SIP Transition Procedure</u>

A. The District shall amend the 2008 SIP Order to increase the Transition Area project size limitation from 0.5 square miles for Managed Vegetation BACM, or 1.5 square miles for other BACM, as provided in Attachment D, Section 3 to the 2008 SIP Order, to 3.0 square mile at one time. The 3.0 square mile Transition Area shall be in addition to the TwB2 Areas implemented by the City as provide in Paragraph 5 above.

B. The City shall control emissions during Transition Area project construction periods as provided in the 2008 SIP Order at Attachment D, Section 3, and the Stipulated Abatement Order No. 110317-01 at Paragraph 8, dated March 17, 2011.

C. The City shall only conduct construction of a Transition Area project between July 1 of year when on-site work on the project begins, through December 31 of the next year when all such work shall be completed and the new controls shall be fully installed and operational. The completion deadline set forth in this paragraph is subject to the Force Majeure and Stipulated Penalties provisions set forth in Paragraphs 14 and 15 below.

9. Cultural and Biological Resources

Cultural and biological resource protection and mitigation shall be incorporated to the extent feasible as required by law into the design of dust control areas.

10. Collaboration with Other Agencies

A. The Parties agree to collaborate in their efforts to secure support for the terms of this agreement, agreement implementation, and obtaining necessary permits, leases and approvals with the California Air Resources Board, California Department of Fish and Wildlife, California State Historic Preservation Office, California State Lands Commission, California Native American Heritage Commission, U.S. Army Corps of Engineers, U.S. Bureau of Land Management, U.S. Environmental Protection Agency and private parties owning land in the areas to be controlled in Phases 9 and 10. The Parties plan to continue to meet with these agencies to prepare them for favorable decisions on future dust control projects and revisions to the SIP.

B. The Parties are aware that all final approvals necessary for TwB2 may not be obtained before this Stipulated Judgment is executed and approved, and anticipate obtaining those approvals after the entry of this judgment.

11. 2015 SIP revision and CEQA/NEPA compliance

A. By July 1, 2015, the City shall prepare and consider for certification the environmental impact analysis documents required by the California Environmental Quality Act ("CEQA") and, if applicable, the National Environmental Policy Act ("NEPA") necessary to proceed with Phase 9/10 Project.

B. By December 31, 2015, the District shall prepare a SIP revision that consists of the 2008 SIP Order and the provisions of this Stipulated Judgment ("2015 SIP Order"). The City shall support and not challenge the adoption of the 2015 SIP Order by the District Governing Board, CARB and EPA, except that the City may challenge any new term that the City has not agreed to in advance, and that is not contained in the 2008 SIP Order as modified by this Stipulated Judgment.

C. The City shall not appeal or contest the 2015 SIP Order that contain the terms of this Stipulated Judgment now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including CEQA or Section 42316, and agrees that the terms of that 2015 SIP Order are valid and reasonable under Section 42316.

D. The District intends to act as a responsible agency and use the City's Phase 9/10 CEQA/NEPA documents to act on the SIP revision. If the City's CEQA/NEPA document is not adequate for the District's approval purposes, the District shall have until December 31, 2016 to act on the SIP revision.

E. The Parties have developed the terms of this Stipulated Judgment with the intention that its provisions will be incorporated into the 2015 SIP Order and are consistent with applicable provisions of federal, state and local law, including Section 42316, including all applicable provisions of federal law regarding attainment of the NAAQS and exceptional events.

12. <u>Owens Lake Scientific Advisory Panel</u>

A. The Parties agree to establish the Owens Lake Scientific Advisory Panel ("OLSAP" or "Panel") under the authority of the California Health and Safety Code Section 42316 and the Los Angeles City Charter. The Parties will contract with the National Academy of Sciences ("NAS") to establish, staff and administer the OLSAP pursuant to the NAS study process found at http://www.nationalacademies.org/studyprocess/index.html.

B. The purpose of OLSAP is to evaluate, assess and provide ongoing advice on the reduction of airborne dust in the Owens Valley. The Panel will review scientific and technical issues related to the research, development and implementation of waterless and low-water use BACM, and other approaches to reduce dust in the Owens Valley. The Parties intend for the Panel to foster communication and understanding on the scientific and technical approaches and become a vehicle for increased cooperation and collaboration between District and the City in balancing the requirement to meet air quality standards and conserve water.

C. The Panel will hold meetings, analyze issues, review and compile information, produce reports, make recommendations and undertake other activities necessary to meet its responsibilities. The Panel will initially be assigned the following task:

i. Evaluate the effectiveness of alternative dust control methodologies for their degree of PM_{10} reduction at the Owens Lake bed and reduce use of water in controlling dust emissions from the dried lake beds. The evaluation should consider associated energy, environmental and economic impacts, and assess the durability and reliability of such control methods.

Additional issues for the NAS may be submitted to the Panel by the General Manager of the Los Angeles Department of Water and Power ("LADWP"), or the APCO. The OLSAP shall function per the "Study Process: Guidelines of the NAS" found at http://www.nationalacademies.org/studyprocess/index.html. The City and the District will promptly respond to requests for information from the Panel.

D. Term and Estimated Number and Frequency of Meetings. Until January 1, 2025, the Panel will meet in person at least once annually. When actively working on issues, the Panel shall meet in person at least two times a year. The Panel may meet more often in person, telephonically or by other networked conferencing means as needed. When issues are referred to the Panel, the Panel shall convene to discuss within 60 days, provide an initial work plan within three (3) months and a final report within eighteen (18) months, unless an extension is granted by agreement of both parties.

E. The NAS will submit the Panel's reports to the Chair of the District Governing Board and the APCO, and the President of the Board of the LADWP and General Manager of LADWP.

F. The duties of OLSAP are solely advisory in nature and in no way alter the authority and responsibility of the District, District Board or the APCO. The City and the District will give due consideration to the Panel's findings and recommendations.

G. All financial support for the OLSAP shall be provided by the City pursuant to fee orders from the District under Section 42316. The Parties estimate that the annual costs of the Panel will be approximately $500,000 to $750,000, but may vary based on the statement of work and tasks submitted to the NAS. The City shall be responsible to provide additional funding to the Panel for reporting and analyzing new and relevant testing data up to $2,000,000 annually. The City and the District will make best efforts to jointly seek further funding and in-kind support opportunities from other organizations.

13. Sacramento lawsuit and pending CARB appeals

A. The Parties stipulate and agree that all terms in the Stipulated Judgment are valid and reasonable under Section 42316 and under any and all other laws. The City waives any challenge to the terms of this Stipulated Judgment and shall not now or in the future challenge or oppose the terms of this Stipulated Judgment in any administrative or judicial forum, under any law, statute or legal theory whatsoever including but limited to Section 42316.

B. Within three days of entry of this Stipulated Judgment, the City shall dismiss its appeal of the 2012 SCRD by the District if CARB has not yet issued its written decision on that appeal. If CARB has issued that written decision on the 2012 SCRD appeal, that decision shall be deemed final and binding, and the City shall not appeal or otherwise challenge that CARB decision to the Superior Court or in any other judicial or administrative forum. The City shall dismiss its appeal of the 2013 SCRD and not appeal the 2014 SCRD by the District. The City shall not appeal or contest the 2012 SCRD, 2013 SCRD or 2014 SCRD now or in the future in any administrative or judicial forum, under any law, statute or legal theory whatsoever including Section 42316.

C. The CARB Decision referenced in Preamble Paragraph U shall be deemed final and binding on the Parties. In addition, if the Court has issued its final ruling on the City's writ of mandate as referenced in Preamble Paragraph V, that ruling shall also be deemed final and binding on the Parties. The City shall not challenge the orders for BACM Contingency Measures referenced in Paragraph 3.A, or the revised 2015 SIP as provided in Paragraph 11, based upon any of the arguments asserted by the City in its appeals of the 2011 SCRD, 2012 SCRD, 2013 SCRD or 2014 SCRD, or in the instant case.

14. Force Majeure

A. "Force Majeure" as used in the paragraphs above relating to the Phase 9/10 project

(Paragraph 2.A), Contingency Measure projects (Paragraph 3.E), and Transition Area projects (Paragraph 8.C), is defined as one of the following events that prevents the City's performance of the specified act by the deadline set forth in that Paragraph: (a) any act of God, war, fire, earthquake, windstorm, flood, severe drought that is declared as an official state of emergency by the Governor of the State of California, or natural catastrophe; (b) unexpected and unintended accidents (excluding those caused by the City or the negligence of its agents or employees); civil disturbance, vandalism, sabotage or terrorism; (c) restraint by court order or public authority or agency; (d) action or non-action by, or inability to obtain the necessary authorizations or approvals from any governmental agency, provided that the City demonstrates it has made a timely and complete application to the agency and used its best efforts to obtain that approval, or (e) the inability to obtain private property owner access, provided that the City demonstrates it has made a timely and complete request to the owner, and used its best efforts to obtain that access. Force Majeure shall not include normal inclement weather, other asserted shortages of water, economic hardship or inability to pay.

B. The City's performance of its duties under Paragraph 14.A will be temporarily postponed only during the condition of Force Majeure, but not excused, and the City will continue to be responsible to recommence performance of its actions to comply with the deadlines at the end of the Force Majeure event. The deadlines for performance shall automatically be extended by the period of interruption caused by the Force Majeure event. The City shall exercise due diligence to resolve and remove any Force Majeure event. Nothing in this paragraph shall be interpreted to relieve the City of its obligations and duties under all applicable laws.

C. Any party seeking to rely upon this paragraph to excuse or postpone performance under Paragraph 14.A shall have the burden of establishing each of these elements to this Court with jurisdiction over this Stipulated Judgment, and that it could not reasonably have been expected to avoid the event or circumstance, and which by exercise of due diligence has been unable to overcome the failure of performance.

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15. Stipulated Penalties

A. The City shall be subject to notices of violation from the APCO and stipulated daily penalties for failure to meet dust control measure completion deadlines set forth in this Stipulated Judgment for the Phase 9/10 project (Paragraph 2.A), Contingency Measure projects (Paragraph 3.E), and Transition Area projects (Paragraph 8.C), except as excused by a condition of Force Majeure as defined in Paragraph 14. The amount of the daily penalty for each missed deadline shall be determined by the following formula:

Stipulated daily penalty (\$/day) = \$10,000 – \$4500 (A_C/A_R),

where

A_C = Dust control area required by the APCO that is completed and compliant (square miles), and

A_R = Total dust control area required by the APCO (square miles).

B. The City shall pay any stipulated daily penalties within 90 days of any notice of violation from the APCO for failure to meet these deadlines. The City shall not challenge or oppose its duty to pay the stipulated daily penalty in any administrative or judicial forum, under any law, statute or legal theory whatsoever including H&S Section 42316(b).

C. This Paragraph 15 applies only to the failure to meet dust control measure completion deadlines as set forth in Paragraphs 2.A, 3.E and 8.C and does not apply to any other notice of violation or enforcement of laws by the District or its APCO.

16. Sacramento County Superior Court to Retain Jurisdiction

The Sacramento County Superior Court shall retain jurisdiction over the Stipulated Judgment including the enforcement of its terms. Either Party to this Stipulated Judgment may file an *ex parte* application or noticed motion before this Court to show a violation of the terms of this Stipulated Judgment and/or to enforce its terms. Before either Party files such a motion or application, they agree to meet and confer with the other Party at least seven days before the filing, either in person or by telephone, to attempt to resolve the dispute.

17. Final Resolution of Claims

This Stipulated Judgment is intended to be the full and final resolution of all claims and causes of action raised in this action by the Parties, including those relating to this action, the 2011 SCRD, 2012 SCRD, 2013 SCRD and 2014 SCRD.

18. Additional Provisions

A. Execution of Additional Documents. Each of the Parties agrees to promptly do such acts and execute such additional documents as might be necessary to carry out the provisions and effectuate the purposes of this Stipulated Judgment.

B. Authority. Each person executing this Stipulated Judgment on behalf of an agency or other entity represents that he or she has the full legal right, power and authority to execute and deliver this Stipulated Judgment and to bind the Party for whom such individual is signing, and to cause such Party to perform its obligations hereunder.

C. Exclusive Remedy. By executing this Stipulated Judgment, each of the Parties acknowledges and agrees that the rights and remedies provided in this Stipulated Judgment shall be the sole and exclusive rights and remedies surviving as between and among the Parties hereto relating to the subject matter of this Stipulated Judgment.

D. No Reliance on Others. No representations, oral or otherwise, express or implied, other than those contained herein have been made by any Party, or any officer, director, commissioner, agent, affiliate, attorney or employee thereof. By executing this Stipulated Judgment, each of the Parties warrants and represents that this Stipulated Judgment is made and entered into without reliance upon any statements or representations of any other Party, or in reliance upon any statements or representations made by any officers, directors, commissioners, agents, affiliates, insurer, attorneys or employees, of any other Party.

E. Independent Investigation. Each of the Parties warrants and represents that he, she or it has made its own independent investigation, in the manner deemed necessary and appropriate by them, of the facts and circumstances surrounding this Stipulated Judgment and the agreements contained herein, and that through such independent investigation, each Party has satisfied itself that the execution of this Stipulated Judgment and entry into the agreements contained herein is in his, her or its best interest and are in compliance with the law. Also, each of the Parties warrants and represents that his, her or its independent investigation has included, but not been limited to, receipt of independent advice by legal counsel on the advisability of entering into this Stipulated Judgment and making the agreements contained herein, and that the Stipulated Judgment is in compliance with the law.

F. Litigation Expenses. Upon the entry of the Stipulated Judgment, neither Party shall further seek an award from this Court of the costs of suit and attorneys' fees incurred and/or accrued in connection with this lawsuit.

G. Construction of Agreement. Each of the Parties has cooperated in the drafting and preparation of this Stipulated Judgment and, therefore, any construction of the intent of the Parties or language hereof to be made by a court or arbitrator shall not be construed against any of the Parties. This agreement shall be construed in accordance with the laws of the State of California.

H. Comprehension of Terms. Each of the Parties warrants and represents that he, she and it has read this Stipulated Judgment in full, consulted with their legal counsel regarding its terms, fully understands each and every provision hereof, and agrees to be bound by all of the terms and provisions set forth herein.

I. Severability. Any portion of this Stipulated Judgment found to be invalid, void or unenforceable shall be deemed severable from the remainder of this Stipulated Judgment and shall not invalidate the remainder of the paragraph in which it is located or the remainder of this Stipulated Judgment.

J. Merger and Integration. This Stipulated Judgment contains the full and entire agreement between and among the Parties with respect to the entire subject matter hereof and supersedes any and all prior or contemporaneous agreements and discussions, whether written or oral. Any and all prior or contemporaneous discussions, negotiations, writings, commitments and/or undertakings related hereto are merged therein.

K. Amendment. This Stipulated Judgment may be amended only by a written agreement signed by all Parties and approved by this Court.

L. Counterparts. This Agreement may be executed and delivered by facsimile or emailed in pdf format and in any number of counterparts, each of which shall be deemed an original.

M. Notice. Any notice required or permitted to be given under the terms of this Stipulated Judgment shall be in writing and delivered by email and Overnight Mail. Notices shall be sent to the following persons:

To: Great Basin Unified Air Pollution Control District

Theodore D. Schade
Air Pollution Control Officer
Great Basin Unified Air Pollution Control District
157 Short Street
Bishop, CA 93514
Telephone: (760) 872-8211
Email: tschade@gbuapcd.org

With a copy to:

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Notice shall be deemed given as of the date of transmission of the notice.

Any Party may change its addressee(s) for notice by providing written notice of such change in accordance with the requirements of this paragraph of the Stipulated Judgment.

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THE UNDERSIGNED SIGNATORIES represent that they have all necessary authority to agree and enter into this Stipulated Judgment on behalf of their respective party.

REVIEWED AND AGREED TO:

Dated: 12-3-14, 2014	Dated: December 19, 2014
Marcie L. Edwards General Manager, Los Angeles Department of Water and Power	Theodore D. Schade Air Pollution Control Officer
The City of Los Angeles By and Through the Los Angeles Department of Water and Power	Great Basin Unified Air Pollution Control District

APPROVED AS TO FORM AND LEGALITY:

Dated: 19 December, 2014	Dated: December 19, 2014
Michael N. Feuer, City Attorney Julie C. Riley Deputy City Attorney	Peter Hsiao Morrison & Foerster, LLP
Attorney for Petitioner and Plaintiff The City of Los Angeles By and Through the Los Angeles Department of Water and Power	Attorney for Respondent and Defendant People of the State of California and the Great Basin Unified Air Pollution Control District

Attachment A – Court Final Ruling and Order
Attachment B – TwB2 Operations Protocol
Attachment C – TwB2 Monitoring Protocol

THIS STIPULATED JUDGMENT IS REVIEWED, APPROVED AND ENTERED AS THE JUDGMENT OF THE COURT.

Dated: December 30, 2014

Honorable Shelleyanne W.L. Chang
Sacramento County Superior Court Judge

SUPERIOR COURT OF CALIFORNIA COUNTY OF SACRAMENTO

EXHIBIT A

SUPERIOR COURT OF CALIFORNIA

COUNTY OF SACRAMENTO

DATE: JUDGE:	December 16, 2014 HON. SHELLEYANNE W. L. CHANG	DEP. NO.: CLERK:	24 E. HIGGINBOTHAM

CITY OF LOS ANGELES, a California Municipal Corporation, ACTING BY AND THROUGH ITS DEPARTMENT OF WATER AND POWER, Petitioner and Plaintiff, v. CALIFORNIA AIR RESOURCES BOARD; EXECUTIVE OFFICER OF THE CALIFORNIA AIR RESOURCES BOARD, in his official capacity, GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT; and DOES 1-100, Respondents and Defendants. CALIFORNIA STATE LANDS COMMISSION; and DOES 101-500, Real Parties in Interest.	Case No. 34-2013-80001451
Nature of Proceedings:	RULING ON SUBMITTED MATTER AND ORDER: PETITION FOR WRIT OF MANDATE

The Court issued a Tentative Ruling on September 25, 2014, in which it denied the Petition for Writ of Mandate. The parties appeared for oral argument on September 26, 2014, and were represented by counsel as stated on the record. After oral argument, the Court took the matter under submission. The Court rules as follows

The City of Los Angeles (City) petitions for a writ of mandate that (1) declares void the 2011 Supplemental Control Requirements Determination (2011 SCRD) issued by Respondent Great Basin Unified Air Pollution District (District), and (2) invalidates the decision of Respondent California Air Resources Board (CARB) affirming the 2011 SCRD. The Petition is **DENIED**.

I. BACKGROUND

a. Background Facts and Law

This litigation reflects the long-running dispute between the City and agencies such as Respondents, which have jurisdiction over air quality affected by the City's water diversion. The City has been drawing water from the Owens River for over 100 years.

This diversion has dried the Owens Lake Bed, creating large volumes of dust, in particular, the pollutant PM_{10}.[1] (CARB OL A:006453.)[2]

The instant litigation arises from the District's issuance of an order (2011 SCRD) that requires the City to mitigate PM_{10} on an additional 2.86[3] square miles of the Owens Lakebed.

i. Background Law

Before discussing the facts, the Court provides an overview of the pertinent law to explain the regulatory relationship between the City, the District, and CARB.

Under the federal Clean Air Act, the United States Environmental Protection Agency (EPA) is charged with identifying air pollutants and setting National Ambient Air Quality Standards (NAAQS), identifying areas that do not meet the NAAQS for criteria pollutants, and directing the creation of State Implementation Plans (SIPs) to attain the NAAQS for the pollutants. (*See*, First Amended Petition (FAP), ¶¶ 22-26; *see also* 42 U.S.C. § 7410.) CARB has the responsibility and authority to meet the Clean Air Act's SIP requirements through each of the State's 35 air pollution control districts. (FAP, ¶ 28.) The District is one such air pollution control district.[4] (FAP, ¶¶ 22-26.)

In 1987, the EPA found that the Owens Valley Planning Area (OVPA) (in which the Owens Lake and District are located) did not meet the NAAQS for $PM_{10,}$ a designated criteria pollutant. (AR: 2g:1769; CARB OL A:006454.) In 1993, the EPA reclassified the OVPA as a "serious non-attainment area" for $PM_{10.}$ (*Id.*) The District manages air quality in the OVPA through SIPs, which are submitted to and approved by "the State" (CARB) and then to the EPA. (*See* 42 U.S.C. § 7410.) The District regulates the PM_{10} emissions caused by the City's water diversion through SIPs, SCRD orders, and an agreement, as described later in the ruling.

In 1983, Health and Safety Code[5] section 42316 was enacted to resolve disputes between the City and District regarding water diversion and air quality. Section 42316 provides in pertinent part:

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[1] PM_{10} refers to particulate matter 10 microns or less in diameter. (CARB OL A:006453.)

[2] Citations to the administrative proceedings before CARB appear as "CARB OL A:____." Other citations to the administrative record appear as "AR volume number, volume letter:bates number" (e.g., AR 2g:1789.)

[3] Although the SCRD initially required the City to implement mitigation on 2.93 square miles, the District issued a revised SCRD reducing the new control area from 2.93 to 2.86 square miles. (CARL OL A: 6458.)

[4] The District is formed pursuant to Health and Safety Code sections 40000 *et seq.*

[5] Unless otherwise specified, all future references shall be to the Health and Safety Code.

> (a) The Great Basin Air Pollution Control District may require the City of Los Angeles to undertake reasonable measures, including studies, to mitigate the air quality impacts of its activities in the production, diversion, storage, or conveyance of water and may require the city to pay, on an annual basis, reasonable fees, based on an estimate of the actual costs to the district of its activities associated with the development of the mitigation measures and related air quality analysis with respect to those activities of the city. The mitigation measures shall not affect the right of the city to produce, divert, store, or convey water and, except for studies and monitoring activities, the mitigation measures may only be required or amended on the basis of substantial evidence establishing that water production, diversion, storage, or conveyance by the city causes or contributes to violations of state or federal ambient air quality standards.
>
> (b) ***The city may appeal any measures or fees imposed by the district to the state board [CARB]*** within 30 days of the adoption of the measures or fees. [CARB], on at least 30 days' notice, ***shall conduct an independent hearing on the validity of the measures*** or reasonableness of the fees which are the subject of the appeal. The decision of [CARB] shall be in writing and shall be served on both the district and the city. Pending a decision by [CARB], the city shall not be required to comply with any measures which have been appealed. ***Either the district or the city may bring a judicial action to challenge a decision by [CARB] under this section. The action shall be brought pursuant to Section 1094.5 of the Code of Civil Procedure*** and shall be filed within 30 days of service of the decision of [CARB].... (Health & Saf. Code, 42316 (emphasis added).)

Thus, the District may require the City to undertake reasonable mitigation measures to mitigate the air quality impacts of diverting water, which must be supported by substantial evidence establishing that the City's water diversion causes the violations. Section 42316 also sets forth the process by which the City and District resolve disputes about the reasonableness of the mitigation measures. The City may appeal District orders to CARB. CARB then "conduct[s] an independent hearing on the validity of the measures." Either party may then file a petition for writ of mandate pursuant to Code of Civil Procedure, section 1094.5. (Health & Saf. Code, § 42316.)

The parties agree that Section 43216 governs this litigation.

b. Procedural Background

The City implements dust suppression measures on approximately 43 square miles of the Owens Lake Bed. (CARB OL A:6454-6455.) The City implements these measures pursuant to Supplemental Control Requirements Determinations (SCRD) from the District that have been incorporated into various SIPs, and a 2006 Agreement between the City and District. (*Ibid*; *see also*, AR 2g:1769-1770.)

In late 2006, the City and District entered into an Agreement to settle litigation in which the City challenged a SCRD issued by the District's Air Pollution Control Officer (APCO). (AR 2g:1769-1770.) The Court refers to this Agreement as the "2006 Agreement." Among other things, the City agreed to:

- **Apply Dust Control Measures on additional areas of the Owens Lakebed,** beyond the 29.8 square miles required by the 2003 SIP. (AR 2g:1770.)

- Work with the District to improve the current "Dust ID Program" used to monitor PM_{10} emissions. (AR 2g:1774-1775.)

- **Allow the APCO to "recommence" written SCRDs, under the "revisions to the 2003 SIP."** Pertinent here, the SCRDs will use Dust ID Data collected after April 1, 2010, and shall be made once every calendar year. (AR 2g:1778.)

- **Abide by a particular dispute resolution process if it did not agree to a SCRD issued by the APCO.** If the City and District dispute a SCRD, "the City may appeal future [SCRDs] to CARB under the provisions of... Section 42316....provided that the Parties expressly intend that this Agreement be the final resolution regarding existing disputes between the Parties that are the subject of this Agreement.....*[T]he City stipulates and agrees that all of the provisions and determinations*, including the measures and procedures, contained in the 2003 SIP, the provisions of this Agreement to be included in modifications to the 2003 SIP pursuant to this Agreement, and the [SCRD] dated April 4, 2006, which the City in good faith disputed, *shall be deemed to be valid and reasonable*, and that the City will not challenge those provisions or determinations by appeal under Section 42316 or in any other proceedings, including any other administrative or judicial forum. Subject to this Paragraph, the City may challenge any future [SCRD] under Section 42316; *however any arguments or challenges must be based on data or information that do not currently exist, but that exist after the execution of this Agreement.* (AR 2g:1779 (emphasis added).)

In 2008, the District issued order #080128-01 (2008 Order). The 2008 Order incorporated the 2006 Agreement and approved the 2008 SIP, which regulated the PM_{10} emissions caused by the City's water diversion. The 2008 Order has been approved by CARB and the EPA under the 2010 Coso Junction Maintenance Plan, and has not been challenged by the City. (See AR 2a:899-900; CARB OL A: 6457.)

The 2008 Order ordered the City to continue to implement certain PM_{10} controls (Best Available Control Measures or BACMs) on 29.8 square miles of the Owens Lakebed, and then on other specified portions of the Lakebed for a total of 43.0 square miles of "Total Dust Control Area." (AR 3a:1815-1816.) The 2008 Order specified the BACM mitigation measures that could be used by the City: shallow flooding, managed vegetation, and gravel blanket.[6] (AR 3a:1820-1842.)

[6] The 2008 Order also specified that "Moat and Row," an alternative mitigation measure, was not currently approved by the District. (AR 3a:1825-1825.)

The 2008 Order also provided that at least once a year, the District's APCO will make a written determination as to whether any areas, in addition to those required by the 2008 Order require additional mitigation to comply with the NAAQS for PM_{10}. (AR 3a:1817.) The 2008 Order further provided that once the APCO issues such a determination, the City must implement the BACM mitigation and comply with the California Environmental Quality Act (CEQA) and secure any necessary permits to implement the mitigation. (AR 3a:1818.)

On August 1, 2011, the District APCO issued the 2011 SCRD. The 2011 SCRD orders the City to "implement, operate and maintain air pollution control measures on an additional 2.86 square miles" of the Owens Lake Bed. (AR 2a:906.) The 2011 SCRD states that the City may use any combination of the three approved BACM measures: shallow flooding, managed vegetation, or gravel. (Id.; CARB OL A 6457.)

The City appealed the 2011 SCRD to CARB pursuant to Section 42316. Following a June 15, 2012 administrative hearing, CARB issued a decision affirming the District's SCRD on November 19, 2012. (CARB OL A: 006451-006483.)

The City filed a petition for a writ of mandate in the Superior Court for Los Angeles County, which was then transferred to the Superior Court for Sacramento County. The City amended its petition to add claims for declaratory relief. In February 2014, the Court granted Respondents' motion for judgment on the pleadings as to each claim for declaratory relief. This ruling addresses the remaining writ causes of action.

II. DISCUSSION

a. Requests for Judicial Notice

On January 21, 2014, the City submitted a request for judicial notice (RJN) in support of its Reply Briefs. Because the RJN was unopposed by any party, the Court granted the City's request in its tentative ruling.

At the hearing, the District objected to the Court's ruling, because the exhibit attached to the RJN, a statement from Governor's Office "Declar[ing] a Drought State of Emergency," was not in the administrative record. The District had nine months to make this objection. Because it is untimely, the District's objection is **OVERRULED**. In any event, the Court's consideration of the City's Request for Judicial Notice does not alter the outcome of the ruling.

The District also asked the Court at the hearing to disregard other evidence cited by the City in its Reply Brief (to the District) that was stricken from the administrative record. These objections are **OVERRULED**, as they are untimely. In any event the citations do not alter the Court's ruling.

b. California State Lands Commission

Real Party in Interest California State Lands Commission (CSLC) objects to being named as a party, because it did not take any actions subject to mandate. This contention is inapposite. A real party in interest includes any person or entity whose interest will be directly affected by the proceeding, or anyone having a direct interest in the result, which is therefore entitled to notice of the proceedings. (*Sonoma County Nuclear Free Zone v. Superior Court* (1987) 189 Cal.App.3d 167, 173-174.) CSLC owns a portion of the Owens Lakebed upon which the City must implement mitigation measures. As its ownership interests could be affected, it is properly named as a Real Party in Interest.

CSLC clarified at the hearing that it did not object to being named a Real Party in Interest, but objected to the extent that the City was trying to seek mandate relief against it. The City replied that it is not seeking mandate relief against the CSLC, and this contention is apparent from the Petition.

c. Standard of Review

i. The Court Reviews CARB's Decision

As a preliminary matter, the Court rejects the City's argument that because it "appealed" the 2011 SCRD issued by the District, the Court must review the District's decision to issue the 2011 SCRD, not the CARB decision that affirmed it. The plain language of Section 42316 says otherwise: "Either the district or the city may bring a judicial action to challenge a decision by [CARB]" pursuant to Code of Civil Procedure section 1094.5. (Health & Saf. Code, § 42316, subd. (b).) This language indicates that the Court reviews *CARB's* decision.

The City argues that, by analogy, the Court may review the District's decision because Water Code sections 13320 and 13330 allow courts to review a regional water board's order, which is administratively appealable to the State Water Resources Control Board (State Board). The Court rejects this argument.

Unlike Section 42316, Water Code sections 13330 and 13320 make express reference to the reviewability of regional board decisions for which the State Board denies review. (Water Code, § 13330, subd. (b).) Additionally, the California Supreme Court has interpreted these statutes to reflect that "decisions and orders of the [regional board], including the issuance and renewal of NPDES permits, are reviewable by administrative appeal to the State Water Board, and then by petition for administrative mandamus in the superior court." (*Voices of the Wetlands v. State Water Resources Control Board* (2011) 52 Cal.4th 499, 516.) In contrast to these Water Code provisions, no published appellate authority has construed Section 42316. Thus, procedurally, these statutes are inapposite as Petitioner is not seeking review of a decision by a regional board and this is not a case where the State Board has denied review.

The City also contends that the Court may review the District's decision, because CARB's hearing was an appellate hearing and not a true *de novo* hearing. However, Section 42316 provides that the City may appeal any mitigation measures or fees imposed by the District to CARB, which shall conduct an "independent hearing on the validity of the measures." (Health & Saf. Code, § 42316, subd. (b).) The statute expressly provides that the hearing by CARB is *de novo*.

Accordingly, the Court reviews CARB's decision.

ii. Review of CARB's Decision

The Court reviews CARB's decision to determine "whether the respondent has proceeded without, or in excess of, jurisdiction; whether there was a fair trial; and <u>whether there was any prejudicial abuse of discretion</u>. Abuse of discretion is established if the respondent has not proceeded in the manner required by law, the order or decision is not supported by the findings, or the findings are not supported by the evidence." (Code Civ. Proc., § 1094.5, subd. (b) (emphasis added).) "[A]buse of discretion is established if the court determines that the findings are not supported by substantial evidence in the light of the whole record." (*Ibid*, § 1094.5, subd. (c).)

The parties agree that the standard of review for CARB's factual determinations,[7] e.g., whether the mitigation measures in the 2011 SCRD are "valid," is whether they are supported by substantial evidence. (*Sierra Club v. California Coastal Comm'n* (1993) 19 Cal.App.4th 547, 556-557; Health & Saf. Code, § 42316, subd. (b).)

CARB's decision is presumed to be supported by substantial evidence, and Petitioner bears the burden of showing that there is no substantial evidence to support the findings of the agency. (*Ross v. California Coastal Comm'n* (2011) 199 Cal.App.4th 900, 921.) Petitioner argues that the Court must "weigh the evidence." This is incorrect. In reviewing CARB's decision, the Court examines the entire administrative record and considers all relevant evidence, including evidence that detracts from the decision. (*Ibid.*) Although this task may involve some weighing to fairly estimate the worth of the evidence, that limited weighing does not constitute independent review where the Court substitutes its own findings and inferences for the agency's. (*Id.* at p. 922.) Rather, it is for CARB to weigh the evidence, and the Court may reverse CARB's decision only if, based on the evidence, a reasonable person could not have reached the conclusion CARB reached. (*Ibid.*)

The parties agree that the Court reviews *de novo* whether CARB has complied with procedural requirements (*see Citizens for East Shore Parks v. California State Lands Comm'n.* (2011) 202 Cal.App.4th 549, 557) and issues of law (*see Pasternak v. Boutris* (2002) 99 Cal.App.4th 907, 918).

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[7] Such factual determinations include disagreements regarding the methodology used for assessing environmental impacts, and reliability or accuracy of data upon which the agency relies. (*North Coast Rivers Alliance v. Marin Mun. Water Distr.* (2013) 216 Cal.App.4th 614, 642-643.)

d. The City Has Failed to Show that CARB Did Not Follow Proper Procedures in Conducting the Hearing

The City argues that CARB abused its discretion by failing to comply with procedures required by law because CARB did not conduct a true "independent" hearing. Namely, the City argues that the CARB Executive Officer admitted some evidence but did not consider the City's. The City has shown no prejudicial abuse of discretion.

The Executive Officer conducting the hearing on behalf of CARB[8] declined to conduct a "new unlimited evidentiary hearing." (CARB OL A:006458-6459.) He interpreted Section 42316's "independent hearing" requirement to mean that he would apply his independent judgment in reviewing the 2011 SCRD. He also decided to limit the evidence to the "administrative record" before the District, plus any additional evidence admitted to augment the record, and rule *do novo* on this evidence. (*Ibid.*) The Executive Officer outlined these rules in January 17, 2012 First Procedural Order issued at the outset of the administrative process, and after argument and briefing from the parties. (CARB OL A:000915, *et seq.*)

Specifically, the Executive Officer issued a procedural order permitting the administrative record to be augmented only if (1) the evidence was presented to and accepted by the District but was mistakenly omitted from the record, (2) is relevant, but could not, with the exercise of reasonable diligence, have been presented to the District before the 2011 SCRD issued, or (3) the parties stipulated to admit the evidence. (CARB, OL A:000963.)

The City contends that the Executive Officer denied the City's motions and requests to introduce new evidence into the record. The City has failed to demonstrate how these alleged errors were prejudicial, notably, by not describing what the evidence was and how its omission assisted CARB or how its admission would have assisted the City.

The City argues that CARB erroneously disallowed the City from presenting unidentified new evidence—first on March 7, 2012, and then on November 19, 2012 when the City submitted some "declarations and supporting documents"[9] with its Opening and Reply briefs in the CARB hearing. (CARB OL A:006459-6460.) The improper exclusion of competent and material evidence may constitute a prejudicial abuse of discretion, particularly if it relates to a defense. (*King v. Board of Med. Examiners* (1944) 65 Cal.App.2d 644, 649.) Here, the City has not even identified what the evidence is and how it is competent and material. Accordingly, the City has not shown that the Executive Officer prejudicially abused his discretion.

Second, the City argues that CARB "re-ran" technical data and allowed its staff to testify as witnesses, but did not allow the City to cross-examine those staff. CARB disputes the accuracy of these statements. The City has not shown that CARB prejudicially abused its

[8] For the sake of convenience, this ruling may refer to the acts of the Executive Officer as "CARB."
[9] The City does not further explain the nature of the evidence it sought to introduce.

discretion. Beyond these vague statements, the City does not describe the technical data that CARB "re-ran" or the statements of staff at the hearing, and explain how they were relevant or critical to the decision.

The City cites to one page of a CARB staff report prepared for the CARB hearing. In the report, staff note that the City argues that the District did not accurately account for background concentrations and emissions for "Lone Violator" and "Watch Areas," because on certain "exceedance days," the District did not account for attributing the exceedances from other sources. CARB staff examined the exceedance days cited by the City and concluded that even if those days were omitted, there were a "sufficient number of other [violation] days in the modeling output records to qualify for control in each [2011 SCRD] area." (CARB OL A: 5814.)

The staff report rather notes that, even assuming that specific dates mentioned by the City were removed, it would not alter the District's findings. The City argues in a conclusory fashion that it is prejudiced because it could not respond to this conclusion. However, even if the City could "respond" to this conclusion, it would not alter the conclusions regarding the "Lone Violator" and "Watch Areas." (Id.) The City has shown no prejudice.

The City next avers that CARB improperly allowed three additional documents not before the District—the District's quality assurance plan for another pollutant; a maintenance plan for a different planning area; and an abatement order to the City. (AR 3b:1964, 5:3629, 4089.) The Court disposes of this argument on two grounds.

CARB responds that Petitioner made no attempt during the hearing to exclude the documents it now objects to. Accordingly, the City did not exhaust its administrative remedies for this argument.

Moreover, the City does not specify how the admission of these documents was improper or objectionable. First, the City does not identify how the documents were relevant to CARB's decision and to what extent the Executive Officer relied on them. Additionally, Petitioner has not established that the admission of this evidence was in error, namely that the Executive Officer admitted this evidence after a successful motion to augment the administrative record, e.g., he found that it was relevant but was omitted from the administrative record.

Generally, admission of improper evidence is generally not a prejudicial abuse of discretion if there is sufficient competent evidence to support the agency's decision. (*Southern Cal. Jockey Club, Inc. v. California Horse Racing Bd.* (1950) 36 Cal.2d 167, 175; *Carden v. Board of Prof'l Eng'rs.* (1985) 174 Cal.App.3d 736, 744.) As the City fails to identify how the admitted evidence was improper, it cannot show a prejudicial abuse of discretion.

e. The City's CEQA Challenge is Barred

The City contends that the 2011 SCRD Order (as affirmed by CARB) violates CEQA because it requires the City to implement one of three particular mitigation measures. (CARB OL A:6478-6479.) The gravamen of the City's argument is that it believes that the 2011 SCRD will require it to use additional water to mitigate PM_{10}, emissions, which will create additional environmental impacts that the City must evaluate under CEQA.

The City argues that requiring additional PM_{10} mitigation is a CEQA "project," but by restricting the mitigation measures, the District has precluded the City, as lead agency, from fully considering the environmental impacts of the 2011 SCRD, considering other alternatives and mitigation measures, and deciding whether to adopt a Statement of Overriding Considerations. The City also argues that the 2011 SCRD violates CEQA because implementing it will likely impact cultural resources in the area.

CARB found no substantial evidence that the 2011 SCRD violates CEQA. (CARB OL A:6480.) Having reviewed the administrative record, the Court agrees.

The City's CEQA challenge is based on its complaint that the 2011 SCRD restricts the City's choice of PM_{10} mitigation. But the 2008 Order already outlined the types of permissible mitigation measures, which the City did not challenge. In fact, the City agreed not to do so in the 2006 Agreement with the District.

The 2011 SCRD requires the City to use one of three mitigation measures to mitigate dust on an additional 2.86 square miles of the Owens Lakebed: shallow flooding, managed vegetation, or gravel. The District issued the 2011 SCRD pursuant to the 2008 Order, which was approved by CARB and the EPA in the Coso Junction Maintenance Plan, and not challenged by the City. (AR 2a:899-900.) These mitigation measures are also set forth in the District's most recent (2008) SIP, which is confirmed by the District's 2008 Order. The 2008 Order also reflects that the City will assume the role of CEQA lead agency, and prepare any documentation, related to additional mitigation.

Respondents observe that City stipulated in the 2006 Agreement "not to challenge (the 2008 Order) under CEQA to the extent the Order is consistent with [the 2006 Agreement]." This 2006 Stipulation is incorporated into the 2008 Order. (AR 2h:233, para. G.)

The City does not meaningfully dispute these contentions—that it now brings a CEQA challenge to mitigation measures set forth in a 2008 Order which formed the authority for the 2011 SCRD. Moreover, the City does not assert that it may bring a CEQA action now because the mitigation measures reflected in the 2011 SCRD and set forth in the 2008 Order are somehow inconsistent with the provisions of the 2006 Agreement. Rather, the City appears to argue that its 2006 Agreement was invalid: it could not stipulate to forego a CEQA challenge because the public has a right to be informed of decisions under the CEQA process. However, the City should have asserted this in a timely action to challenge the mitigation measures set forth in the 2008 Order, which it failed to do.

The mitigation measures the City seeks to challenge are contained in the 2008 Order. The statute of limitations for a CEQA action is "within 180 days from the date of the public agency's decision to carry out or approve the project." (Pub. Resources Code, § 21167, subd. (a).) Accordingly, the statute of limitations bars the City from asserting a CEQA challenge to particular mitigation measures that were the subject of the 2008 Order.

f. The City Has Not Shown that CARB's Factual Decisions are Unsupported by Substantial Evidence

As a preliminary matter, the Court addresses the City's contention that the 2008 Order (incorporating the 2006 Agreement and approving the 2008 SIP) does not bar the City's challenge to the SCRD. The City argues that by entering the 2006 Agreement, it did not waive its statutory right to challenge the mitigation measures in the SCRD, because Section 43216 is a public interest statute.

"Civil Code section 3513 provides: 'Any one may waive the advantage of a law intended solely for his benefit. But a law established for a public reason cannot be contravened by a private agreement.' Nonetheless, statutory benefit may be waived if (1) the statute does not prohibit waiver, (2) the statute's public purpose is incidental to its primary purpose, and (3) the waiver does not seriously undermine any public purpose the statute was designed to serve." (*Lanigan v. City of Los Angeles* (2011) 199 Cal.App.4th 1020, 1030.)

The City argues that because it is asserting the violation of "important public rights" (contained in either Section 43216 or the California Constitution), the City, as a public agency, apparently could not enter into the 2006 Agreement, which the 2008 Order incorporated. Were the Court to accept the City's argument, the City could negate any past consent to procedures and methodologies governing issuance future SCRDs. Moreover, the City does not meaningfully argue that any waiver in the 2006 Agreement "seriously undermines any public purpose the statute (or any law) was designed to serve."

The Court concludes that the City's entry into the 2006 Agreement does not allow the City to then challenge procedures and methodologies to which it previously agreed. Additionally, the 2008 Order functions as an independent order barring the City's challenges, regardless of whether the Court finds that the City did not waive any statutory or constitutional claims under the 2006 Agreement.

However, other grounds exist to defeat the City's specific challenges to the 2011 SCRD, which the Court will address.

The City argues the 2011 SCRD is unsupported by "substantial evidence establishing" that the City's water diversion causes the PM_{10}, emissions for which the City must impose additional mitigation. (Health & Saf. Code, § 42316.) CARB decided that the mitigation measures in the 2011 SCRD were supported by substantial evidence. The Court affirms CARB's decision, and discusses each "substantial evidence" argument.

i. Shoreline

The 2011 SCRD defines the Owens lakebed "regulatory shoreline" at 3,600 feet above sea level (fasl), "below which the City is responsible for air pollution emissions and above which air quality standards are expected to be maintained." (AR 2a:901-902.)

The City argues that the 2011 SCRD's selection of the 3,600 fasl level is not supported by substantial evidence, because, according to modeling done by the Desert Research Institute (DRI), the shoreline would have fluctuated during the 100 years in which the City has been diverting water. The City argues that the regulatory shoreline should be below 3,600 fasl.

The City stipulated in the 2006 Agreement not to challenge future SCRDs, unless the challenges were based on data that existed after the time of the 2006 Agreement. The Executive Officer found that the location of the "historic" or "regulatory" shoreline was data that existed at or before the time of the 2006 Agreement. Additionally, because the studies cited to by the City in support of its argument all predated the 2006 Agreement, the City's challenge was barred. (CARB OL A:006466.)

The SCRD procedure contained in the 2008 Order,[10] attachment B, allows the APCO to regulate the City if the monitored or modeled emissions exceed the NAAQS caused by emissions occurring "at or above the historic shoreline." (AR 1f:6; CARB OL A:006465.) The SCRD procedure definitions define a "shoreline monitor" as one located at the 3,600 feet elevation (historic shoreline) contour" or one in the "non-attainment area." (AR 1f:5.) Moreover, the 2008 Order and District Rule 401.D respectively specify that the historic shoreline is 3,600 fasl, and that 3,600 fasl is the "control to" elevation. (AR 2h:356, 2a:974.)

Thus, the Executive Officer did not abuse his discretion in concluding that the City's challenge to the regulatory shoreline is barred.

The City claims that it may revive this argument, because Section 42316 requires that components of the 2011 SCRD be supported by substantial evidence. Even if the Court accepts this argument, however, the City's citation to another modeling report, indicating that the lake levels could have fluctuated over time, does not establish that the District's choice of a 3,600 fasl "regulatory" shoreline is somehow unsupported by substantial evidence.

ii. Modeling and Methods

In the CARB hearing, the City asserted that the modeling procedure used by the District to identify source areas for mitigation is flawed for several reasons, and does not

[10] The Executive Officer refers to the 2008 Order as "Board Order 080128-01."

constitute substantial evidence establishing that the City caused the PM_{10} emissions. The Court considers and rejects each argument.

1. Recommendation of Expert Panel

The City first contends that the 2011 SCRD Order is invalid because the District did not adequately implement the recommendations of agreed-on technical experts (Expert Panel) with regard to measurement and monitoring of the PM_{10} emissions (e.g., DUST ID program).

As part of the 2006 Agreement, the City and District stipulated that they would select an Expert Panel to make recommendations to the DUST ID program, and that the District would "implement all mutually-agreeable changes to the DUST ID program." (AR 2g:1774.) The City faults the District for not making sufficient changes to the DUST ID program after the Expert Panel concluded that some components of the program should be improved. The City contends that the District adopted "a number of," but not all of, the Expert Panel's recommendations.

However, by the City's own admission, the Settlement Agreement required the District to implement all "mutually-agreeable" changes. Accordingly, the District's decision not make *all* changes recommended by the Expert Panel does not, in and of itself render the 2011 SCRD invalid.

The City argues that the 2006 Agreement is irrelevant, because under Section 42316, "substantial evidence" must show that the City's water diversion causes PM_{10} emissions, and the Executive Officer should not be permitted to "disregard" findings of the Expert Panel that the DUST ID program needs improvement.

However, the Executive Officer *did* consider the Expert Panel's recommendations. He found that it was impossible for the District to adopt all recommendations, because adoption of all of the Expert Panel recommendations required both the City and District's agreement, and that the City withheld its agreement by not meeting with the District to discuss implementing those recommendations. (CARB OL A:006470,)

The City does not appear to dispute this, but also argues that it offered its own solution to the potential problems caused by the DUST ID program, which the District rejected.

The Executive Officer further found that despite the City's lack of cooperation, the District implemented a "majority" of the Expert Panel's recommendations, that the record had substantial evidence to support the District's modeling approach, and even if the District could have, but did not, adopt all of the Expert Panel's recommendations, the SCRD was not invalid, as the City cited no substantial evidence that it tried to change the modeling protocols. (CARL OL A:006470.)

The Court has reviewed the record and concluded that the Expert Panel's statements do not show that the 2011 SCRD and decision affirming it were unsupported by substantial evidence..

The City cites its own technical data contending that the DUST ID model overpredicts PM_{10} concentrations by a factor of two and is inaccurate, and argues that the District improperly disregarded the recommendations of the Expert Panel. The District responds that the DUST ID program performs well based on comparisons to other air quality models, and that the DUST ID program's results are appropriate because they are conservative to protect public health and do not underestimate PM_{10} emissions.

While the City has shown that there may be a "battle of the experts" regarding the DUST ID program and that reasonable minds may differ, this is not a basis for finding that the 2011 SCRD was unsupported by substantial evidence to the extent that the District's mitigation measures were at variance with any recommendations of the Expert Panel. (*Association of Irritated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1397 (noting that "[w]hen the evidence on an issue conflicts, the decisionmaker is 'permitted to give more weight to some of the evidence and to favor the opinions and estimates of some of the experts over the others.'") (citation omitted).)

g. EPA Recommendations

The City also argues that CARB's decision affirming the 2011 SCRD is invalid because the District did not follow EPA rules and regulations in collecting the monitoring data that is the basis for the SCRD. The Court rejects these arguments.

i. QAPP

The City first argues that the District did not collect certain data pursuant to an EPA-approved Quality Assurance Project Plan (QAPP) to ensure that the District's methodologies are trustworthy. The District concedes that it used a "CARB-approved" QAPP, which it contends is sufficient. The City argues that this method is infirm, and renders the 2011 SCRD defective.

The Executive Officer found that the District was not required to operate under an EPA-approved QAPP. (CARB OL A:006473 (citing AR 5:3874, 4373).) However, other than challenging the QAPP-collected data on the basis that the CARB's approval is insufficient, the City does not identify the (1) specific data gathered under the QAPP, (2) its relationship to the SCRD, and (3) how the methodology or data is invalid. Additionally, the City cites no case law where particular data, *that may otherwise be accurate*, renders an agency enforcement order unsupported by substantial evidence because the EPA did not approve it. The City has not met its burden of showing that CARB's decision on this issue is unsupported by substantial evidence.

ii. CALPUFF

The City contends that the District improperly uses "CALPUFF," an "alternative" modeling tool that has not been approved by the EPA. The City argues that although CALPUFF is approved as a long-range dispersion model, it is not approved by the EPA for "near-field" assessments, that are used here.

The District contends that the EPA has approved CALPUFF for the SCRD modeling process. The Executive Officer found that CARB and the EPA approved the use of CALPUFF. Specifically, he found that the EPA approved the CALPUFF modeling system for the SCRD process when it approved the 2010 Coso Junction Management Plan, and the 2008 Order (#08128-01). (CARB OL A:06468 (citing AR 2f:4994; AR 5:4371.)

The Court rejects the City's claims that CARB's decision is unsupported by substantial evidence for the same reasons as discussed above. Other than challenging the CALPUFF-collected data on the basis that the CARB's approval is insufficient, the City does not identify the (1) specific data gathered by CALPUFF, and why it is "near-field" rather than "long range", (2) its relationship to the SCRD, and (3) how the methodology or data is invalid. Additionally, the City cites no case law where particular data, *that may otherwise be accurate*, renders an agency enforcement order unsupported by substantial evidence because the EPA did not approve it.

iii. Calibration of Data

The City also argues that the District improperly calibrates data from the DUST ID model by comparing model estimates and the actual PM_{10} measurements, a practice that is disapproved by the EPA. The City contends that the District "adjusts" the modeled K-factors to "force agreement" between the modeled K-factors and the actual observed PM_{10} concentrations at the shoreline. According to the City, this is improper "calibration."

The District responds that it does not "calibrate" DUST ID data with its own results. Rather, the District argues that it compares a small amount of paired predictions with actual emissions, to develop a K-Factor value for different areas and periods, to capture seasonal variations on the Owens Lakebed that cannot be predicted by independent means.

The Executive Officer found that the DUST ID protocol was not improper calibration, because it did not "change" the inner workings of the model, but used the model with the actual values to "improve" emissions estimates. (CARB OL A:006488.)

The Court defers to the technical expertise of CARB in determining that the District did not engage in "calibration" that is disapproved of by the EPA. Petitioner has not shown that CARB's decision was unsupported by substantial evidence.

iv. Other Federal Regulations

The City contends that the District did not comply with other federal regulations that require the District to account for PM_{10} emissions from other sources. Thus, the City argues that some amount of PM_{10} emissions are wrongly attributed to its water diversion. The City avers that off-lake sources cause a background level of dust that renders inaccurate the number of exceedances for a measured air quality level. The City also argues that the District did not properly consider the EPA's "exceptional events" policy.

The Executive Officer reviewed these arguments raised by the City, and found that, in this case, the identified federal regulations do not apply. (CARB OL A:006473-6477.) Additionally, the City has not attempted to quantify the amount of PM_{10} emissions attributable to other sources. Rather, the City appears to argue that if *any* PM_{10} emissions could come from other sources, this renders the 2011 SCRD order invalid and unsupported by substantial evidence. The City has not shown that CARB's decision is invalid in this regard.

h. Watch Areas

The City also contests the 2011 SCRD's order that the City to prepare 30 percent designs for dust controls on an additional 1.87 square miles, identified as "Watch Areas." (AR 2:a906; 4g:3544-3545.) The City argues that there is no legal authority for this requirement, because Section 42316 requires that mitigation measures must be supported with substantial evidence. The City argues that the District has *not* determined that Watch Areas cause any NAAQS PM_{10} violation.

However, the Executive Officer found that the District's use of "Watch Areas" is supported by legal authority—specifically the 2008 Order.

Section 11 of the 2008 Order, titled "CRITERIA FOR DETERMINING THE NEED FOR ADDITIONAL PM10 CONTROLS" states that the APCO will use the criteria, methods, and procedures in the SCRD procedure, incorporated as Attachment B and the "2008 Owens Lake Dust Source Identification Program Protocol" in Attachment C. (CARB OL A:006464; AR 2:h193).)

The SCRD Procedure states that if the DUST ID model predicts that emissions from a source will cause shoreline PM_{10} concentrations at or greater than 100 $\mu g/m^3$ but less than 150 $\mu g/m^3$, with the inclusion of 20 $\mu g/m^3$ background concentration, the APCO will direct the City to choose the mitigation it wishes to implement in the identified area. The City must then develop a detailed "scope of work" for the "identified potential source areas." The District may deploy monitors upwind and downwind of the area, and will notify the City if "additional controls" are needed. (CARB PL A:006464; AR 2h:271-274.) Although the SCRD Procedure in the 2008 Order does not use the term "Watch Area," the Executive Officer found that "Watch Area" criteria and requirements in the 2011 SCRD match those in the 2008 Order.

Accordingly, by designating a "Watch Area," the 2011 SCRD implicitly found that DUST ID model predicted that emissions from a source will cause shoreline PM_{10} concentrations within at or greater than 110 $\mu g/m^3$ but less than 150 $\mu g/m^3$, with the inclusion of 20 $\mu g/m^3$ background concentration. The City does not explain how this finding is not substantial evidence supporting the Order that the city prepare 30 percent design for dust controls on the "Watch Areas."

Accordingly, the City has not shown that CARB's decision is unsupported by substantial evidence.

i. The City's Constitutional Claim

The City contends that the 2011 SCRD (1) permits a "waste" of water prohibited by the California Constitution, and (2) interferes with its right to divert water under Section 42316. The Court rejects these arguments.

Although the City raised them in a slightly different context, the Executive Officer considered and rejected those claims. The Court agrees with CARB's decision.

First, the City agreed that the specific types of mitigation measures issued by the 2011 SCRD (shallow flooding, managed vegetation, gravel blanket) were valid and reasonable, and it agreed not to challenge them.

Further, the 2011 SCRD does allow the use of a mitigation measure (gravel blanket) that appears to require little or no water. The City discounts this mitigation measure as illusory. It observes that two of the three PM_{10} mitigation measures require it to use substantial amounts of water, and that CSLC, which owns the land upon which the City must implement mitigation, has opposed and effectively prevented the City from choosing the gravel blanket mitigation measure. Thus, the City argues that the 2011 SCRD will require it to use large amounts of water in violation of the California Constitution, and its right to divert water.

The Executive Officer found that this claim was speculative, because the City had not cited any substantial evidence where it communicated with CSLC about the issuance of leases (for land CSLC owns) for implementing the 2011 SCRD. The City cites other evidence that CSLC has opposed the gravel blanket mitigation measure.

The Court cannot conclude that the 2011 SCRD Order which allows a choice of mitigation measures,[11] combined with past statements of CSLC opposing gravel mitigation on *other* areas of the Owens Lakebed, means that the City will necessarily use huge quantities of water for mitigation.

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[11] Additionally, there may be a water use difference between the two mitigation measures that require water: shallow flooding and managed vegetation. The City does not explain this difference but asks the Court to assume that any use of water is necessarily wasteful.

Further, even if the City does use some water, the City has failed to demonstrate that such water use is a prohibited "waste" or constitutes "interference" with its ability to divert water.

III. DISPOSITION

The petition for writ of mandate is **DENIED**.

Counsel for Respondent District or CARB shall prepare a formal order and judgment, incorporating this ruling as an exhibit; submit it to all parties for approval as to form; and thereafter submit it to the Court for signature and entry of judgment in accordance with California Rules of Court, rule 3.1312.

Date: December 16, 2014

Shelleyanne W.L. Chang
Judge of the Superior Court of California
County of Sacramento

Declaration of Mailing

I hereby certify that I am not a party to the within action and that I deposited a copy of this document in sealed envelopes with first class postage prepaid, addressed to each party or the attorney of record in the U.S. Mail at 720 Ninth Street, Sacramento, California.

Dated: December 17, 2014

E. Higginbotham, Deputy Clerk **/s/ E. Higginbotham**

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EXHIBIT B

Attachment B to the Stipulated Judgment

Protocol for Operation and Maintenance of Owens Lake Tillage with BACM Backup

1.0 SITE SELECTION, OPERATION, AND MAINTENANCE

This report summarizes the methods used by the Los Angeles Department of Water and Power (LADWP) to select, operate, and maintain tilled areas with BACM backup (TwB2) on Owens Lake.

1.1 Site Selection

TwB2 sites will be selected based on the following criteria, shown in order of priority:

1. Sites within existing shallow flood (SF) infrastructure

2. Sites with predominantly deep fine-textured soils

3. Sites with other than predominantly deep fine-textured soils

4. Sites outside of existing SF infrastructure as allowed by GBUAPCD with predominantly deep fine-textured soils, provided an alternate source of water is in place to provide water for soil wetting on an as-needed basis.

5. Sites outside of existing SF infrastructure with other than deep fine-textured soils, provided an alternate source of water is in place to provide water for soil wetting on an as-needed basis.

1.2 Site Operation

Site operations encompass selection of the tillage method, activities to minimize emissions during the tilling operations, and the periodic inspections to ensure that the required site roughness is being maintained, particularly after large wind, rain, or flood events, and to focus maintenance activities where these are indicated. Each activity is discussed below.

1.2.1 Selection of Tillage Method

The method of tillage will be determined predominantly by soil type, texture, and moisture content. Preliminary methods are listed below. Final methods will be determined in the field by LADWP Operations, who will at that point understand site-specific constraints, and employ the tool(s) that confer the greatest, most sustainable degree of roughness.

1. If the soils are too wet for other implements, an excavator (possibly on mats) will be used.

2. If the soils are too wet for other implements but dry enough to use a switch plow, a switch plow will be used.

3. If the soils are also dry enough to run a Towner disk, it may be used as an option to the switch plow.

4. If soils are dry enough to operate a bull plow, a bull plow will be operated after switch plowing or disking.

5. The direction of the final operation will be generally east-west, in a gently curving/wave pattern, to the extent practicable.

6. If roughness conferred by other tools is not sufficiently durable, a Sandfighter or equivalent may be used to rapidly restore roughness.

1.2.2 Minimizing Emissions During Tilling Operations

Primary tillage such as that practiced and planned at Owens Lake generally does not generate excessive emissions because the objective is to avoid soil pulverization. The main approach to minimizing emissions is to minimize the number of passes across a field to achieve the required roughness.

A secondary protection from excessive emissions is soil moisture. Most soils on Owens Lake are naturally moist, further limiting potential emissions. When soils are re-tilled, LADWP will endeavor to take advantage of natural moisture (precipitation) to perform needed maintenance events.

1.2.3 Periodic Site Inspection

LADWP will inspect all tillage sites on a weekly basis to ensure that there are no visible dust plumes, and that the required site roughness is being maintained. LADWP's site inspection program will consist of a combination of drone inspection, periodic LiDAR flights to quantify site roughness, and ground-truth observations by human inspectors as determined useful by LADWP. Each of these elements is discussed below.

1.2.3.1 Drone Observation

Drones will provide observations because of their ability to travel quickly over large areas of rough terrain, recording videos as they go with GPS waypoint coordinates. If any areas of reduced roughness are observed, which would be most likely after a high wind event, rainstorm, or other type of inundation (e.g., berm breach, flash flooding), the drone would be used to GPS the boundaries of the area for later mapping and maintenance decision-making.

During their weekly flights, the drones will record the following parameters:

- Roughness relative to goal and/or historic levels
- Location and scale of any "blowouts," where roughness has been locally diminished by deposition and/or erosion.
- Evidence of excessively fine material deposition in areas where this poses a significant risk due to re-suspension.

1.2.3.2 Periodic LiDAR Observations for Use in Mapping and Roughness Calculations

Quantitative characterization of Tillage morphology is essential for accurately mapping, classifying, and evaluating compliance of the Tillage BACM over time.

On tilled areas, terrain analysis will be used to quantify measurements of Tillage elements, such as RH and RS. Several methods are possible for quantifying Tillage roughness through terrain analysis, including LiDAR (Light Detection and Ranging) and a new remote imaging.

At this juncture, LADWP believes that the best available method for quantifying tillage roughness is with aerial LiDAR. The following steps summarize the process for analyzing aerial LiDAR to assess tillage roughness:

1. Acquire Elevation Data: The first step in the roughness determination is to acquire digital elevation data with sufficient resolution and accuracy to capture the variability at different spatial scales. At least once a quarter, LADWP will capture high-resolution elevation data with aerial LIDAR and use it to produce a DEM for each tilled area.

2. Identify Tillage Elements: The next step in the process is to identify and extract tillage element morphological data from the DEM. Morphometric elements of interest include tillage ridge, inter-ridge, and furrow positions.

3. Characterize Tillage Elements: After the DEM data are acquired and quantified, elevation values for each identified Tillage element will then be estimated from the DEM and used to quantify RH and RS. These calculations result in local height and spacing estimates across the Tillage BACM area.

4. Reporting Scale: Tillage element characteristics will be aggregated to three spatial grid scales (i.e., 1-acre, 10-acre, and 100-acre grids), similar to the approach used in the Managed Vegetation BACM reporting process. Similar to Managed Vegetation, these reporting scales were chosen to ensure compliance at different spatial scales while also providing operational flexibility. This approach provides meaningful feedback on the Tillage row condition over time. Standard summary statistics (minimum, maximum, mean, median, range, and standard

deviation) will be summarized for row height and row spacing. A ratio of the representative row height and row spacing will then be reported at each grid level.

5. Reporting Frequency and Operational Considerations: Comprehensive coverage of high-resolution elevation data will be collected on a quarterly basis to quantify and report Tillage element characteristics using the methods outlined above. As part of the operational management process, regular evaluation of Tillage will be completed using a variety of tools, including high-resolution optical data (i.e., satellite imagery). It is anticipated that visual changes in texture of the Tillage site will be readily identified in the optical imagery and will provide a prioritization tool, identifying potential blowouts (i.e., highly eroded areas) or problems within the Tillage areas. If blowouts or areas of interest are identified, small-scale acquisition of elevation data may be acquired to further quantify and assess the change in row height and spacing. Elevation data acquisition for these localized areas will be accomplished through survey-grade GPS, terrestrial LIDAR, or other appropriate methods. Once the elevation data are captured, they will be analyzed using the same geomorphometric procedures outlined above. This information, combined with other factors, will be used to determine if operational enhancements to the localized Tillage problem areas are required.

1.2.3.3 Ground-based Observations

Ground observations are usually needed to complement aerial and satellite-based collections:

1. Important features that cannot be evaluated remotely with confidence, such as soil structure.

2. Information needed to calibrate remotely sensed data or interpretations.

3. Tactical, spot observations where remote observations are impractical, inconvenient, or in need of calibration.

Ground based observations will be employed sparingly, and focused on resolving questions and testing hypotheses of the day.

Initially, regular observations are expected to be tied to key features (roughness, loose and fine material deposition), and focused around the perimeter areas of tilled areas.

1.3 Site Maintenance

In this section, maintenance triggers and optional maintenance responses are described.

1.3.1 Maintenance Triggers

Maintenance will be undertaken on that portion of each tilled area that falls below the range of acceptable roughness as described in Section 3.3.2, Evaluating Tillage Control Efficiency Over Large Areas, in the Tillage BACM Application (pp. 39-42). The procedure for determining which portion of each tilled site is sufficient rough is described as follows.

1. Shortly after the initial tillage operation and periodically thereafter, roughness will be assessed by remote sensing on one-acre blocks encompassing the entire tillage area. One-acre blocks with an average RH/RS that exceeds the threshold RH/RS will be considered sufficiently rough to control sand motion and PM10 emissions. One-acre blocks with an average RH/RS that falls below the threshold RH/RS will be assigned a control efficiency (CE) based on the maximum of either Equation 7 (see Appendix B of Application) or a fetch relationship from SWEEP (described below). For mapping purposes, contiguous areas with similar roughness will be merged into larger polygons using remote sensing techniques.

2. Based on the same one-acre remote sensing grid system, the fetch distance for the merged polygons will be assessed along the predominant wind directions, which may vary for different locations on the playa. The CE associated with each fetch distance will be assessed using a set of relationships generated using the Single-event Wind Erosion Evaluation Program, or SWEEP. In this case, the CE is the fetch-limited sand motion relative to that achieved on the open playa with unlimited fetch. A site-appropriate SWEEP curve will be used, representing the unique soil and surface conditions that exist on each tilled site.

3. The CE generated by the SWEEP relationships in step #2 considers fetch effects but assumes a smooth, erodible surface with no aerodynamic sheltering from existing roughness. The CE in step #1 accounts for the aerodynamic sheltering but no fetch. Thus, the CE for each roughness area is the maximum of steps #1 and #2.

4. The CE of the entire tilled site will then be determined using the area-weighted average CE of the various roughness areas. The areas with high roughness (RH/RS > threshold RH/RS) are assumed to have 100 percent control because $u_{*t} > u_*$ using the methods described in Appendix B of the Application.

5. The overall site will be judged "sufficiently rough" if the adjusted area-weighted average CE is greater than or equal to the District-required CE for a site. Nominally, the control efficiency is 99% but could vary depending on the location, frequency, and magnitude of dust emissions from each tilled site.

Even if the entire site is judged "sufficiently rough," LADWP will have the option to enter tilled areas to re-roughen the surfaces that have degraded over time by a combination of wind and water erosions. If the entire site is deemed "not sufficiently rough," then LADWP will have to entire the site to maintain the surfaces using the methods summarized below.

1.3.2 Maintenance Options

When and where monitoring data so indicate, maintenance to re-roughen areas will be undertaken. Areas warranting such activity must (a) approach or fall below the required roughness thresholds, and (b) approach or exceed a scale large enough to produce emissions.

When/where/if, through field inspection or actual tillage, it is determined that no method of re-tillage is likely to restore adequate roughness, or for any other operational reason, LADWP may shift an area to some other method of dust control, or re-flooded. In the event of re-flooding, once soil has been thoroughly wetted, it may be re-drained, and re-tilled to restore roughness.

EXHIBIT C

Attachment C to the Stipulated Judgment
Protocol for Monitoring and Enforcing Owens Lake Tillage with BACM Backup

A. Objective

The Great Basin Unified Air Pollution Control District (District) intends to use this protocol as a basis for monitoring and enforcing the Owens Lake PM_{10} control method known as "Tillage with Best Available Control Measure (BACM) Backup" (TwB2). The District intends to use the methods set forth in this protocol as a basis for determining if TwB2 areas on the Owens Lake bed need maintenance and/or reflooding in order to maintain or reestablish control efficiency for compliance with the National Ambient Air Quality Standard for particulate matter less than or equal to 10 microns (PM_{10}). The District requires the Los Angeles Department of Water and Power (LADWP) to at all times maintain all TwB2 areas in compliance with all conditions and procedures contained in this document such that TwB2 areas provide the 99 percent PM_{10} reduction levels associated with the most stringent measure BACM required on Owens Lake.

B. Introduction

1. TwB2 is a District-approved variation of the approved Shallow Flood BACM that wets and/or roughens emissive Owens Lake bed surfaces to prevent air emissions. TwB2 consists of soil tilling and/or wetting within all or portions of Shallow Flood BACM PM_{10} control areas (TwB2 Areas) where sufficient shallow flood infrastructure and available water supply exists.

2. TwB2 can be used by LADWP throughout the Owens Lake bed where backup Shallow Flood BACM infrastructure exists and can be implemented as set forth in this protocol to ensure that tilled areas do not cause or contribute to PM_{10} Standard exceedances.

3. LADWP is required to reflood TwB2 Areas as set forth herein upon a written order issued by the District's Air Pollution Control Officer (APCO). LADWP may not appeal an APCO order to reflood a TwB2 Area to the District Governing or Hearing Boards or any other agency.

4. Within 37 calendar days of a written order by the APCO that all or part of a TwB2 Area must be reflooded, LADWP shall reflood so as to reestablish compliant Shallow Flooding in that area in accordance with the Shallow Flooding BACM requirements contained in the latest Owens Valley Planning Area State Implementation Plan (SIP). If feasible, reflooding can be limited to portions of TwB2 Areas that are determined by the APCO to require reflooding and not to the entire TwB2 Area as defined by LADWP.

5. Failure to comply with the Shallow Flooding BACM requirements in any area within 37 days of the APCO's written order to reflood may result in notices of violation from the APCO for each day of non-compliance.

6. Initial TwB2 tillage decisions are at LADWP's sole discretion, but shall follow the "TwB2 Site Selection and Operations & Maintenance Protocols for Owens Lake" prepared by LADWP and dated May, 2014 (O&M Protocol, attached as Attachment B to the Stipulated Judgment). LADWP reserves the right to modify the O&M Protocol based on supporting data and after consultation with the APCO. LADWP's right to modify its O&M Protocol does not extend to the sand flux or PM_{10} monitoring procedures or thresholds set forth in the O&M Protocol which may conflict with this overriding Monitoring and Enforcement Protocol. Those provisions may only be modified by LADWP with consent of the APCO.

7. LADWP shall also have sole discretion regarding implementing and maintaining TwB2 Areas such that they remain sufficiently non-emissive to maintain the 99 percent control efficiency required for Owens Lake BACM. Implementation and maintenance efforts shall follow the provisions of LADWP's O&M Protocol and can include any combination of retilling, reflooding, sprinkling, flattening, compacting or other measures intended to maintain or restore the PM_{10} control efficiency of tilled surfaces.

8. The boundaries for each TwB2 Area proposed for tillage will be pre-defined by LADWP prior to implementation. Each TwB2 Area will be monitored separately as specified in Section D, "TwB2 Monitoring Tests," below, in order to limit maintenance operations to the areas that require attention. LADWP shall notify the APCO of all pre-planned tillage activities in writing at least 14 calendar days before any tillage begins in an area. LADWP shall notify the APCO of emergency maintenance activities in writing as soon as practicable, but no later than the start of tillage activities. Failure to provide notifications may result in notices of violation from the APCO for each day on non-compliance.

9. Tillage shall create rows and furrows in roughly east to west directions in order to create maximum surface roughness for winds from the north and south. Additional roughness to protect surfaces from west winds shall be created in tilled areas sufficient to prevent emissions from east and west winds. Failure to protect tilled lakebed surfaces from all wind directions may result in an APCO reflood order. See Section F for requirements to provide protection from west winds.

10. If TwB2 maintenance is indicated by any of the below described TwB2 Monitoring Tests (Section D – Tillage Roughness Test, Sand Flux Test, PM_{10} Monitor Test, Induced

Particulate Emission Test or Surface Armoring Test) or by Surface Integrity Observations (Section E), LADWP will have 37 calendar days during the dust season (October 15 through June 30) and 74 calendar days during summer season (July 1 through October 14) to select and execute maintenance procedures. Any maintenance under way at the start of the dust season (October 15) shall be completed by November 1. Failure to execute maintenance procedures and reestablish a compliant tilled or flooded surface within specified time limits may result in notices of violation and/or reflood orders from the APCO.

11. TwB2 maintenance options include re-tilling, wetting with sprinkler systems, re-flooding or any other techniques selected at LADWP's discretion in accordance with the O&M Protocol.

12. After the maintenance activities have been performed, re-testing using the tests set forth in Section D will be conducted within 30 calendar days.

C. Dry-Down Period

1. A "dry down" period may be necessary to transition a Shallow Flood Area to TwB2. It is recognized that there is the possibility of dust emissions during the dry-down period after Shallow Flooding is shut off when the surface soils are emissive, but the deeper soils are too wet to allow tilling. To reduce risk of emissions during this time, LADWP will take reasonable precautions to prevent dust emissions during the dust season (October 15 – June 30). Reasonable precautions include installation of temporary controls (*e.g.,* sand fencing, roughness elements, such as straw bales, or other wind barriers and surface protections) and phased drying/tilling as may be required to prevent dust emissions.

2. Failure to adequately control dust emissions during dry-down of TwB2 Areas may result in notices of violation and/or reflood orders from the APCO.

D. TwB2 Monitoring Tests

The District will use the TwB2 monitoring tests set forth below to ensure TwB2 Areas provide the 99 percent emission reduction associated with the most stringent measure BACM required on the Owens Lake bed. The District acknowledges that the performance criteria set forth below may be more stringent than is necessary to meet the 99 percent emission reduction requirement, however, TwB2 did not go through the BACM development process set forth in the District's 2008 Owens Valley PM_{10} State Implementation Plan. Therefore, in order to provide assurance that TwB2 will provide the high level of public health protection associated with most stringent measure BACM, the District will initially require that TwB2 Areas pass the following tests. During the first year of TwB2 operation, the District will meet regularly with the LADWP to review and evaluate TwB2 performance. After one year of TwB2 operation experience, the APCO will consider revising the TwB2 performance criteria.

1. Tillage Roughness Test

a) The Tillage Roughness Test will use remote sensing and/or direct field measurements to determine Ridge Spacing (RS) and Ridge Height (RH) in order to calculate inverse roughness (RS divided by RH or RS/RH). The T-12 Tillage Test site (heavy clay soils) was tilled with a ridge spacing of approximately 12 to 14 feet and a furrow bottom to ridge top difference of between 3.2 and 4 feet (ridge height = 1.6 to 2 feet). This yields inverse roughness values of 6.00 to 8.75 and has, as of September 2014, been shown to provide sufficient PM_{10} control efficiency. Assuming that ridge tops will weather and lower, the inverse roughness value in TwB2 areas will be maintained at or below 10.0 (14/1.4) and the average ridge height will be at or above 1.25 feet (furrow depth to ridge top difference at least 2.5 feet). Averages will be calculated on 40-acre blocks as described in LADWP's O&M Protocol.

b) Lidar, aerial photography or other APCO-approved methods with comparable accuracies will be used by LADWP to measure inverse roughness and ridge height. Roughness measurements will be made in the north-to-south direction—the direction of the primary dust producing winds. Roughness measurements may also be made in other directions. See Section F for requirements to provide protection from west winds. Roughness measurements will be reported to the APCO within 30 days of measurement.

c) Inverse roughness and ridge height measurements will be made at 6 month, or more frequent, intervals. Inverse roughness and ridge height for a TwB2 Area will be tracked and plotted as a function of time. Where feasible, field measurements may also be taken to confirm lidar or other remotely sensed results. LADWP will conduct regular roughness measurements and report the measurements within 30 days to the APCO. The District reserves the right to conduct its own roughness measurements at any time.

d) Tillage maintenance will be performed by LADWP if average inverse roughness is between 10.1 and 12.0 or if average ridge height is less than 1.3 feet in a tilled area.

e) The APCO may issue a full or partial TwB2 Area reflood order if inverse roughness exceeds 12.0 (12/1) or ridge height falls below 1.0 foot for any defined 40-acre averaging area.

f) The APCO reserves the right to adjust the above criteria based on supporting data and after consultation with LADWP.

2. Sand Flux Test

a) Each tilled area, as defined in Section B.8, will be instrumented by LADWP with at least four Sensits and Cox sand catchers (CSCs) on untilled surfaces (circular pads with 3 m radius) in the general northern, southern, eastern and western portions of a tillage area. The APCO may require proportionally more sand catchers in tilled areas greater than 320 acres such that there is approximately one Sensit per 80 acres of TwB2 Area.

b) LADWP will pair CSCs with Sensits, radio equipment and dataloggers programmed to record 5-minute sand motion data. All Sensit data will be reported to the District via the District's radio data collection network. Sand motion data from the CSCs and Sensits will be processed to calculate the sand flux history of a site.

c) All sand flux monitoring equipment will be placed by LADWP as soon as practicable as Shallow Flood areas dry, but no later than the start of tillage activities. Failure to deploy monitoring equipment may result in notices of violation and/or reflood orders from the APCO.

d) High sand flux values recorded during maintenance activities and non-tillage sand flux sources shall be excluded from the sand flux data. Maintenance activities and non-tillage sand flux sources may include, but are not limited to, rain-splatters, bugs, adjacent grading and road construction activities, as well as vehicle traffic. Sensits should be placed so as to minimize impacts from non-tillage sand flux sources. The APCO shall have sole authority to determine if Sensits have been impacted by non-tillage area sand flux sources or activities.

e) When (other than during maintenance activities taking place in the tillage area) the sand flux exceeds 0.50 g/cm^2/day, LADWP will perform maintenance in the tillage area.

f) The APCO may issue a partial or full TwB2 Area reflood order if sand flux exceeds 1.0 g/cm^2/day at any sand flux site within a TwB2 Area.

g) The APCO acknowledges that these sand flux triggers may be conservative for TwB2 areas located away from the regulatory shoreline. The APCO may adjust the sand flux trigger value on a case-by-case basis for each TwB2 area based on its distance from the regulatory shoreline.

h) The APCO reserves the right to adjust the above criteria based on supporting data and after consultation with LADWP.

3. PM_{10} Monitor Test

a) Each TwB2 area will be assigned upwind and downwind PM_{10} monitors (not necessarily at the TwB2 Area boundary) to monitor PM_{10} emissions from the tillage area. For a given wind direction, the downwind monitors shall be within 22 degrees (±11.5°) of the upwind monitors. Upwind/downwind monitor assignments will be requested by LADWP and approved by the APCO. Existing monitors operated by the District may be used as upwind/downwind monitors. Additional EPA-approved monitors shall be operated by LADWP, unless mutually agreed otherwise. If a monitor is operated by LADWP, its operation and maintenance must follow District procedures and data collection must be incorporated into the District communications network. The District reserves the right to audit monitors and monitoring data collected by LADWP. The District also reserves the right to install and operate or require the LADWP to install and operate additional PM_{10} monitors to adequately monitor the PM_{10} emissions coming from tilled areas.

b) All PM_{10} monitoring equipment will be in place as soon as practicable as Shallow Flood areas dry, but no later than the start of tillage activities. Failure to deploy PM_{10} monitoring equipment may result in notices of violation and/or reflood orders from the APCO.

c) Impacts caused by maintenance activities and non-tillage sources shall be excluded from the PM_{10} data. Maintenance activities and non-tillage PM_{10} sources may include, but are not limited to, adjacent grading and road construction activities, as well as vehicle traffic. PM_{10} monitors should be placed so as to minimize impacts from non-tillage sources. The APCO shall have sole authority to determine if monitors have been impacted by maintenance activities and/or non-tillage area sources.

d) When the daily downwind to upwind PM_{10} concentration difference for any dust event (other than during maintenance activities in the tillage area) exceeds 50 μg/m^3 and there is no evidence to show that the additional downwind PM_{10} did not come from the TwB2 Area, maintenance will be performed in the tillage area.

e) The APCO may issue a reflood order if the daily PM_{10} difference between the downwind and upwind monitors exceeds 100 μg/m^3.

f) The APCO reserves the right to adjust the above criteria based on supporting data and after consultation with LADWP.

4. Induced Particulate Emission Test

a) The District will utilize the Induced Particulate Erosion Test (IPET) method to determine if tilled area surfaces are starting to become emissive and to advise LADWP with erosion potential alerts. The method described below may be modified based on the results of a study being conducted by the Desert Research Institute for the District. The District will discuss the results of the IPET study with LADWP.

b) The IPET method proposes to use a small radio-controlled helicopter-type craft (Radio-Controlled Wind Induction Device or RCWInD) to create wind on the surface. Because the winds created by the RCWInD will vary with differing craft designs, each craft will be pre-tested to determine the test height above the surface (H_t) at which the craft creates a target maximum horizontal wind speed (TWS) measured at 1 centimeter ($U_{0.01}$) above a flat surface. The initial TWS is 11.3 meters per second (m/s). The TWS may be modified by the APCO based on supporting data and after consultation with LADWP. If the payload on a craft is changed, *e.g.* a different camera is used, then H_t must be re-determined for the new payload since it will affect the amount of thrust needed to keep the RCWInD aloft. Testing to determine H_t and TWS will be done on a smooth flat surface, *e.g.* concrete or asphalt pavement or plywood test platform with calm ambient winds (< 2 m/s). The maximum wind speed for any flight height is taken at a height one centimeter above the surface at a point that is one rotor blade length away from the point beneath the center of the fastest rotor blade taken on a line extending outward from the rotor arm. The wind speed measurement is taken with a pitot tube pointing toward the center of the rotor blade. The RCWInD must be flown in a stationary position to get a sustained measurement from the anemometer. When the craft is flown over a ridged surface, the flight height is measured from the bottom of the craft's rotor blades to the highest surface projection anywhere directly below the craft.

c) The District will give LADWP field operations staff at least 24 hour notice of the time and place for RCWInD runs in order to allow LADWP staff an opportunity to observe those tests. LADWP staff does not need to be present for RCWInD testing to be used to call erosion alerts.

d) Three erosion alert levels are set using the IPET method: 1) an early warning of possible clod and surface stability deterioration, 2) a warning level to alert LADWP of a potential breakdown of the surface stability and to advise voluntary maintenance efforts, and 3) a mitigation action level to require retilling and/or reflooding of all or part of a TwB2 Area. The IPET method will be used to determine erosion alert levels as follows:

   i. Level 1 – An erosion early warning is indicated when any visible dust is observed to be emitted from a surface or particles are dislodged when the RCWInD is flown at a height below one half of H_t. Voluntary mitigation may be appropriate to prevent further surface degradation.

   ii. Level 2 – An erosion warning is indicated when any visible dust is observed to be emitted from a surface when the RCWInD is flown at a height below H_t and above one half of H_t. Voluntary mitigation is advised to prevent further surface degradation.

   iii. Level 3 – Mitigation action is required if visible dust is observed to be emitted from a surface when the RCWInD is flown at a height of H_t or higher. If ordered by the APCO, LADWP must retill and/or reflood all or part of a TwB2 Area that triggers a Level 3 alert.

   The APCO acknowledges that warning and mitigation triggers may be conservative for TwB2 areas located away from the regulatory shoreline. The warning and mitigation trigger values may be adjusted on a case-by-case basis by the APCO for each TwB2 area based on its distance from the regulatory shoreline. After one year of experience with TwB2 and the IPET test, LADWP and the District will meet to discuss the results of the testing and consider adjustments to the triggers.

e) The APCO reserves the right to adjust these criteria based on supporting data and after consultation with LADWP.

5. **Surface Armoring Test**

a) Previous studies indicate surface armoring with clods is essential to creating a tilled surface that prevents dust emissions. The District intends to review existing studies and conduct tests to develop a technique to measure the surface armoring or "cloddiness" of a tilled area and set a minimum required level of surface armoring.

b) In order to assure TwB2 areas do not cause or contribute to exceedances of the PM_{10} standard, an initial target clod cover of 60 percent will be used. Soil clods must be 1/2 inch diameter or larger. The APCO may issue a reflood order if the clod cover in a tilled area is less than 60 percent. This value will be reevaluated by the APCO after one year of TwB2 implementation and as appropriate thereafter.

c) Clod coverage will be measured concurrently with roughness measurements by LADWP and/or the District. Lidar, aerial photography, point-frame, or other APCO-approved methods with comparable accuracies will be used by LADWP to measure clod coverage. Clod cover measurements will be reported to the APCO within 30 days of measurement. The APCO shall approve the clod cover measurement method.

d) Upon completion of any additional testing or observation of TwB2 Areas, and after consultation with LADWP, the APCO reserves the right to adjust these criteria.

E. **Surface Integrity Observations**

1. The District will notify LADWP's designated representatives on monthly basis or as otherwise required during the dust season (October 15 through June 30) of District field observations to evaluate the overall erosion stability of the tillage areas based on surface observations, soil conditions, and the results of the above described TwB2 monitoring tests.

2. The District will use on-site visual observations, as well as photography, video or other remote sensing techniques to document the condition and potential emissivity of tilled areas. Conditions including, but not limited to, the presence or absence of ridge-top and furrow-bottom clods, loose soil deposits, efflorescence and ridge erosion will be used to evaluate the overall integrity of tilled areas. These observations will be used in conjunction with the above described tests to recommend that LADWP undertake maintenance activities or as a basis for an APCO reflood order.

F. **Protection from Winds Parallel to Tillage Rows**

1. Paragraph B.9., above, requires tillage rows and furrows in roughly east to west directions in order to create maximum surface roughness for winds from the north and south.

2. In order to ensure that tillage areas are protected from all wind directions, tilled areas will be jointly evaluated by District and LADWP staffs within 5 calendar days after initial tillage activities to determine if the tillage configuration and clodding will provide sufficient protection. If the District determines that the tilled areas will not provide protection from all wind directions the APCO will notify LADWP that additional protection measures will be required.

3. Upon such notification by the APCO, LADWP will take further actions to create additional protection from winds parallel to the initial rows and furrows, it will deploy other protection measures (*e.g.*, additional tillage ridges oriented perpendicular to the original tillage or creation of clod clover greater than 60%), or it may abandon tillage in the area of concern and reestablish compliant Shallow Flooding. The DWP must implement the additional protection measures within 15 days of being notified by the APCO.

4. Failure to protect tilled lakebed surfaces from all wind directions may result in an APCO reflood order.

PROOF OF SERVICE

I declare that I am employed with the law firm of Morrison & Foerster LLP, whose address is 707 Wilshire Boulevard, Los Angeles, California 90017-3543. I am not a party to the within cause, and I am over the age of eighteen years.

I further declare that on December 19, 2014, I served a copy of:

STIPULATED JUDGMENT FOR RESPONDENT AND DEFENDANT GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

☒ **BY U.S. MAIL [Code Civ. Proc sec. 1013(a)]** by placing a true copy thereof enclosed in a sealed envelope with postage thereon fully prepaid, addressed as follows, for collection and mailing at Morrison & Foerster LLP, 707 Wilshire Boulevard, Los Angeles, California 90017-3543 in accordance with Morrison & Foerster LLP's ordinary business practices.

I am readily familiar with Morrison & Foerster LLP's practice for collection and processing of correspondence for mailing with the United States Postal Service, and know that in the ordinary course of Morrison & Foerster LLP's business practice the document(s) described above will be deposited with the United States Postal Service on the same date that it (they) is (are) placed at Morrison & Foerster LLP with postage thereon fully prepaid for collection and mailing.

☒ **BY ELECTRONIC SERVICE [Code Civ. Proc sec. 1010.6; CRC 2.251]** by electronically mailing a true and correct copy through Morrison & Foerster LLP's electronic mail system to the email address(es) set forth below, or as stated on the attached service list per agreement in accordance with Code of Civil Procedure section 1010.6 and CRC Rule 2.251.

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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed at Los Angeles, California, December 19, 2014.

Holly Hickish	Holly Hickish
(typed)	(signature)

Board Order #160413-01
Attachment B

2016 Owens Valley Planning Area
Additional BACM Contingency Measures Determination

BACKGROUND

This attachment describes the evidence that will be used by the Air Pollution Control Officer to determine whether BACM Contingency Measures are required to meet the National Ambient Air Quality Standard at the shoreline of the dried Owens Lake bed and the State Standard in surrounding communities.

CONDITIONS

The 2016 Owens Lake Dust Source Identification Program Protocol (Dust ID Protocol) (Board Order #160413-01, Attachment C) contains the procedures to collect, screen, analyze and model the data used by the District's APCO to determine if exceedances of the 24-hour PM_{10} NAAQS or State Standard have occurred and additional dust controls are necessary on the Owens Lake bed. The following actions may be taken by the APCO and will not be considered a change to the Dust ID Protocol:

- Add, remove or move PM_{10} monitors and meteorological stations
- Selection and use of any USEPA-approved Reference or Equivalent Method monitors that collect hourly concentration data
- Selection and use of any sand flux monitor (SFM)
- Add, remove or move SFMs as long as the maximum grid cell size for modeling remains at one square kilometer
- Calculate "from-the-lake" wind directions for new PM_{10} monitor sites
- Determine default K-factors for new source areas
- The background value of 20 $\mu g/m^3$ may be changed to another value or a procedure may be established to calculate the background from upwind/downwind lake bed monitors
- The default K-factors may be updated
- The default seasonal cut points may be updated
- The CalPUFF modeling system may be changed to another USEPA guideline model
- The procedure for determining the sand flux from a Dust Control Measure (DCM) area may be updated
- The K-factor screening criteria may be updated
- From-the-lake wind directions in Table B-1 may be changed to avoid including off-lake sources
- Non-reference or non-equivalent method special purpose PM_{10} monitors may be added
- Procedures for determining source area boundaries may be updated
- Methods for directly measuring source area emission rates may be implemented

DEFINITIONS

A ***shoreline or near-shore PM_{10} monitor*** is a fixed or portable USEPA-approved Federal Reference Method or Equivalent Method PM_{10} Monitor located at or above the 3600-foot elevation (Regulatory Shoreline) contour within the Owens Valley Non-Attainment Area.

A ***special purpose PM_{10} monitor*** is a fixed or portable USEPA-approved Federal Reference Method or Equivalent Method PM_{10} monitor installed upwind of or near potential dust source areas on the lake bed below the 3600-foot elevation. These lake bed PM_{10} monitors will be used to monitor new dust sources areas to generate new K-factors and to evaluate model predictions at the PM_{10} sites.

An ***exceedance*** is a midnight to midnight Pacific Standard Time 24-hour average PM_{10} concentration greater than 150 $\mu g/m^3$ measured by a shoreline or near-shore PM_{10} monitor.

From-the-lake wind directions are determined by extending two straight lines from the PM_{10} monitor site to the points on the 3600-foot contour of the Owens Lake bed that maximize the angle in the direction of the lake bed between the two straight lines. From-the-lake and non-lake wind directions for the existing PM_{10} monitor sites are shown in Attachment B, Table B-1.

Physical evidence of a source area boundary consists of Global Positioning System (GPS) data, visual observations, photographic observations, video observations, or any other method described for this purpose in the Dust ID Protocol.

Extreme violators are areas currently required to implement BACM, but BACM are found to be insufficient to adequately control emissions.

Environmental analysis document complete means that a project level environmental document has been certified covering the location and the BACM selected for implementation by the City.

Regulatory Shoreline is the 3,600-foot above sea level elevation contour surrounding Owens Lake and within the Owens Valley Planning Area. The APCO shall be solely responsible for determining the location of the regulatory shoreline.

Communities are areas zoned for residential use in the latest Inyo County General Plan Land Use Diagrams.

PROCEDURE TO IDENTIFY EVIDENCE FOR ADDITIONAL BACM CONTIGENCY MEASURE DETERMINATION

For the purpose of making BACM contingency measure determinations, exceedances of the federal 24-hour PM_{10} National Ambient Air Quality Standard of 150 $\mu g/m^3$ at or above the Regulatory Shoreline of Owens Lake or exceedances of the State Standard of 50 $\mu g/m^3$ within communities, can either be measured directly via a PM_{10} monitor or they can be modeled following the procedures in the latest version of the Dust ID Protocol. Set forth below are the two procedures to be used by the APCO to identify evidence for use in making these determinations: the first uses directly monitored exceedances and the second uses modeled exceedances.

A. Monitored Exceedances

A.1 – Do lake bed source areas cause or contribute to a monitored 24-hour average PM_{10} concentration greater than 150 µg/m³ at a PM_{10} monitor located at or above the Regulatory Shoreline or exceedances of the State Standard of 50 µg/m³ within communities?

Any event that causes a monitored 24-hour average PM_{10} concentration greater than 150 µg/m³ at a PM_{10} monitor located at or above the Regulatory Shoreline or greater than 50 µg/m³ within communities will be evaluated to determine if lake bed dust source areas caused or contributed to the exceedance. The following steps will be used to screen hourly PM_{10} concentrations to determine if a lake bed source area caused or contributed to a monitored exceedance:

1) For hourly average from-the-lake wind directions, use the recorded hourly PM_{10} concentration.
2) For hourly average non-lake wind directions or missing data, replace the recorded hourly PM_{10} concentration with the background concentration of 20 µg/m³.
3) Average the adjusted hourly concentrations from steps 1 and 2 for the 24-hour period from midnight to midnight, Pacific Standard Time.

If the 24-hour average of the adjusted hourly PM_{10} concentrations exceeds 150 µg/m³ at the shoreline monitor site or 50 µg/m³ at the community monitor site, go to A.2. If not, go to B.1.

A.2 – Is there physical evidence of lake bed emissions and/or air quality modeling sufficient to define boundaries for the area to be controlled?

Source Delineation.
If possible, the boundary of a dust source area will be delineated by a survey using GPS equipment or APCO-approved remote sensing techniques. Under certain circumstances, the surveyed boundary of the dust source area will not result in a closed polygon. If the GPS survey yields a partial boundary and not a closed polygon, then the polygon area may be closed, if the length of the closure is equal to or less than one-half kilometer or is less than 20 percent of the surveyed source area perimeter, whichever is smaller. The ends of the partial surveyed area boundary will be completed with a straight line, unless survey notes or visual observations indicate that a different shaped boundary should be used. If the surveyed source area boundary has a complex shape, then the partial boundary to be closed will use the best available field and visual data to connect the two ends and form the polygon. Boundaries of existing controlled areas or other previously located boundaries will be used in place of a GPS survey boundary, if the survey notes or visual observations indicate the erosion area extends to that boundary.

If the GPS boundary described above is not available, the area will be defined by any one or a combination of GPS surveying, visual observations, remote sensing and/or video observations or any other method approved by the APCO.

If neither the GPS boundary nor other physical evidence, as described above, is available, the default area size will be one square kilometer centered on the sand flux monitor (SFM), or one grid cell if the SFMs are in a closer array.

If there is physical evidence, as described above, to define the boundaries for the area to be controlled, and no K-factor for that area or no sand catch data above one gram for the sampling period from a sand flux sampler located within a 30 degree upwind cone centered on the wind direction of the defined source, then modeling cannot be performed. Go to A.3.

Modeling.

If sand flux data is available for the exceedance identified in A.1, the District will model the event. Modeling will be performed following the latest Dust ID Modeling Protocol using the source area determined above.

The order of priority for applying K-factors in the model will be:

1) When available, the District will use event specific storm-average K-factors to model dust events at the PM_{10} monitor if there are three or more hours of screened hourly K-factors for a 48-hour period. If not,

2) The District will use the most recent temporal and spatial 75-percentile hourly K-factors to model events, if there are nine or more screened hourly K-factors for a period and they are determined by the methods described in the most current Dust ID Protocol. If not,

3) The District will use the default K-factors in Table B-2 to model events, based on the month of the event being investigated and the K-factor area.

Only those on-lake and off-lake dust sources with sand flux data will be included in the model.

The modeling results will be used to prioritize multiple upwind source areas for control, or to determine the fraction of a single upwind source area that needs to be controlled.

If there is insufficient physical evidence and no sand flux monitor data to determine the emissive area on the lake bed that caused the monitored or modeled exceedance, the District will install sand flux monitors or other physical evidence gathering equipment in the suspected area. The District will continue to collect physical evidence. If the APCO determines that the cumulative evidence collected in Paragraph A.2 is sufficient to show an exceedance, go to A.3.

A.3 – Dust Controls Required.

Based on the evidence, the APCO may order the City to implement BACM on the emissive area.

B. Modeled Exceedances

B.1 – Does the Dust ID model predict a 24-hour shoreline concentration greater than 150 μg/m³ including background?

Dispersion Modeling Analysis.
At least once a year, the District will examine the Dust ID information and dispersion model to determine if there have been any modeled shoreline exceedances since the period included in the last model run. Modeling will be performed following the Dust ID Protocol.

K-factors.
New K-factors may be generated from PM_{10} concentrations measured at any PM_{10} monitor using the methods described in the Dust ID Protocol. The order of priority for applying K-factors in the model will be:

1) The current temporal and spatial 75th percentile hourly K-factors. The District will use the current modeling period temporal and spatial 75th percentile hourly K-factors to model events, if there are nine or more hourly K-factors for a seasonal period and area determined by the methods described in the most current Dust ID Protocol.

2) If there are fewer than nine hourly K-factors for any area and period, the District will use the default K-factors in Table B-2 to model events, based on the month of the event being investigated and the K-factor area. If the new dust source area is not within a K-factor area shown on the map in Figure B-1, the APCO shall determine the default K-factor for the new source area based on the default K-factors of areas with similar soil characteristics.

Source Area Size, Location and Sand Flux.
The boundary of a dust source area will be delineated by a survey using GPS equipment or APCO-approved remote sensing techniques. Under certain circumstances, the surveyed boundary of the dust source area will not result in a closed polygon. If the survey yields a partial boundary and not a closed polygon, then the polygon area may be closed, if the length of the closure is equal to or less than one-half kilometer or is less than 20 percent of the surveyed source area perimeter, whichever is smaller. The ends of the partial surveyed area boundary will be completed with a straight line, unless survey notes or visual observations indicate that a different shaped boundary should be used. If the surveyed source area boundary has a complex shape, then the partial boundary to be closed will use the best available field and visual data to connect the two ends and form the polygon. Boundaries of existing controlled areas or other previously located boundaries will be used in place of a GPS survey boundary, if the survey notes or visual observations indicate the erosion area extends to that boundary.

If the GPS boundary described above is not available, the area will be defined by any one or a combination of GPS surveying, visual observations, remote sensing and/or video observations or any other method approved by the APCO.

The details of how to delineate source area boundaries are contained in the Dust ID Protocol.

If neither the GPS boundary nor the other physical evidence as described above is available, the default area size will be one square kilometer centered on the SFM, or one grid cell if the SFM are in a closer array.

If the modeling shows that lake bed source areas have caused or contributed to any modeled shoreline PM_{10} impact greater than 150 µg/m³ for a 24-hour average, go to B.6. If not, go to B.2.

B.2 – Is the modeled concentration less than 100 µg/m³?

This refers to the modeled concentration calculated in B.1 and includes the background PM_{10} level of 20 µg/m³. If yes, go to B.5. If no, go to B.3.

B.3 – District deploys reference and/or non-reference method Special Purpose PM_{10} monitor(s) to confirm model (if not already deployed).

The District will deploy reference and/or non-reference method Special Purpose PM_{10} monitor(s) on the lake bed upwind and downwind of the identified emissive area, if there are no existing monitors at locations that can be used in Section B.4 to refine the model predictions. Monitors will be located between 250 and 5000 meters outside of any delineated source area boundaries. These PM_{10} monitoring sites may be removed after the model confirmation procedure described in B.4. Shoreline and near-shore PM_{10} monitors that are sited to confirm the model may be used for NAAQS compliance. If an exceedance is monitored, go to B.6. If not, go to B.4

B.4 – Is the refined model prediction greater than 150 µg/m³?

For each event measured under Section B.3 that results in a 24-hour monitored concentration of greater than 100 µg/m³, the event-specific K-factor (defined in the Dust ID Protocol) will be used to model the concentration at the shoreline receptors. If the event-specific K-factor was derived for the same year and season as the original event modeled in B.1, the Section B.1 event will be remodeled using the new K-factor. If either that remodeled concentration for the Section B.1 event, or the new modeled concentration for the on-lake monitored event, is greater than 150 µg/m³ at a shoreline receptor, go to B.6. If not, go to B.5.

The District will make a determination if any currently modeled event within the same season and K-factor area using the appropriate K-factors as determined by this procedure causes a shoreline receptor to exceed 150 µg/m³. If yes, go to B.6. If not, go to B.5.

B.5 – No action required.

No action is required of the City at this time. Data collected during this period can be used in conjunction with data collected at a later time to define emissive areas on the lake bed according to this protocol and to develop K-factors for emissive areas.

B.6 – Dust Controls Required.

Based on this evidence, the APCO may order the City to implement BACM on the emissive area.

Attachment B Maps and Tables

Figure B-1: Owens Lake Dust ID Monitor and K-factor Area map.
Table B-1: Wind Directions to Determine Lakebed-caused Monitored Exceedances.
Table B-2: Default Spatial and Temporal K-factors for the Dust ID Model

Figure B-1 Owens Lake Dust ID Monitor and K-factor Area Map

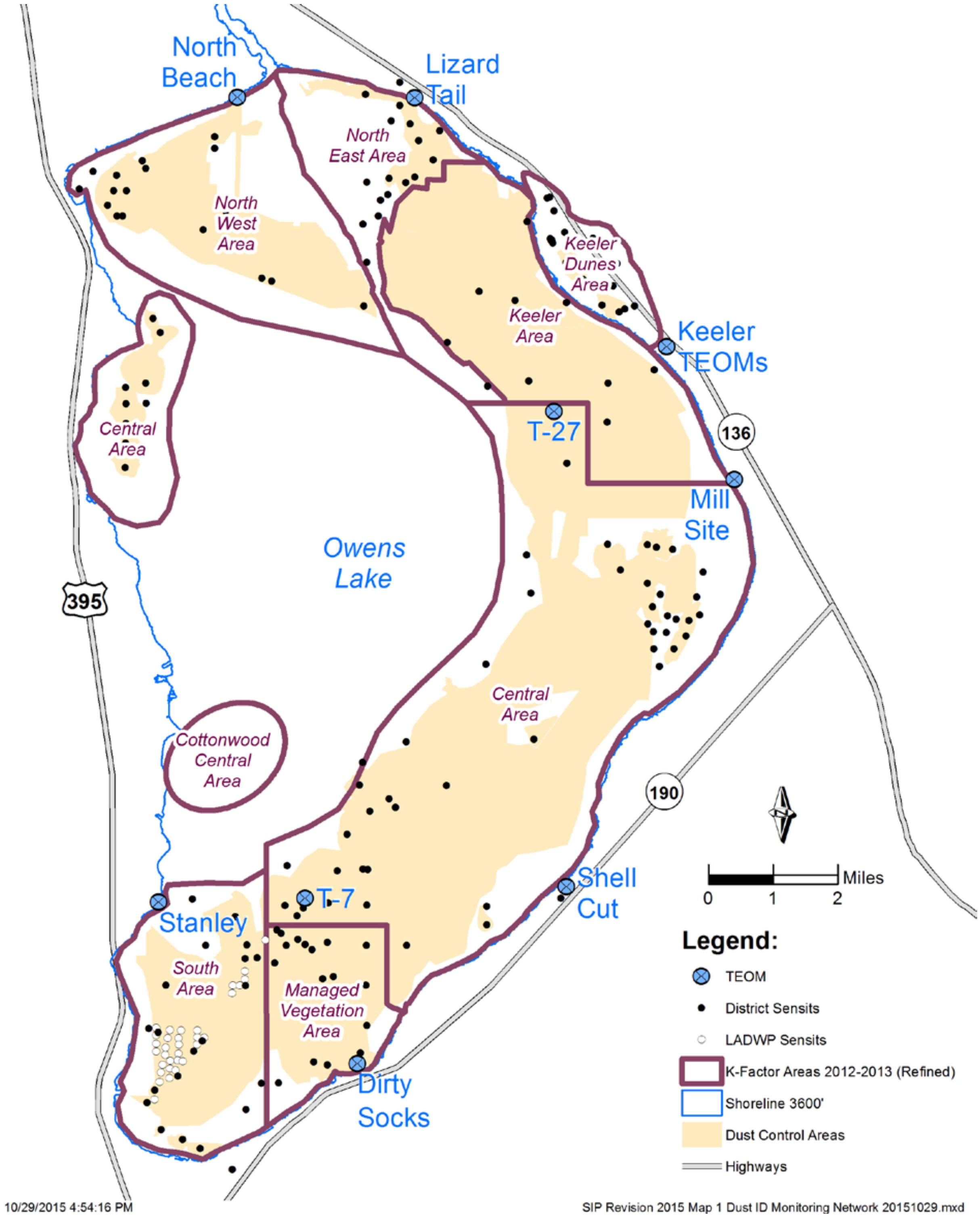

Table B-1

Wind Directions to Determine Lakebed-caused Monitored Exceedances

PM_{10} Monitor Site	From-the-Lake Wind Dir. (Deg.)	Non-lake Wind Dir. (Deg.)
Lone Pine	126≤WD≤176	WD<126 or WD>176
Keeler	151≤WD≤296	WD<151 or WD>296
Flat Rock	224≤WD≤345	WD<224 or WD>345
Shell Cut	WD≥227 or WD≤ 33	33<WD<227
Dirty Socks	WD≥234 or WD≤50	50<WD<234
Olancha	WD≥333 or WD≤39	39<WD<333
Bill Stanley	WD≥349 or WD≤230	WD<349 or WD>230
Lizard Tail	128≤WD≤288	WD<128 or WD>288
North Beach	55≤WD≤250	WD<55 or WD>250
Mill Site	157≤WD≤333	WD<157 or WD>333
New and Portable Sites	TBD	TBD

TBD – From-the-lake and non-lake wind directions will be determined for new and portable sites by the APCO when sites are selected.

Table B-2

Default Spatial and Temporal K-factors for the Dust ID Model

K-factor Area	**K-factor Jan.-Apr. & Dec.**	**K-factor May-Nov.**
Keeler Dunes	2.5×10^{-5}	2.5×10^{-5}
Keeler	2.2×10^{-5}	2.2×10^{-5}
Northwest Area	17.6×10^{-5}	6.6×10^{-5}
Northeast Area	21.2×10^{-5}	6.0×10^{-5}
Central Area	18.1×10^{-5}	5.3×10^{-5}
Managed Vegetation	4.0×10^{-5}	4.2×10^{-5}
South Area	7.4×10^{-5}	4.3×10^{-5}

Board Order 160413-01
Attachment C

2016 Owens Lake Dust Source Identification Program Protocol

Great Basin Unified Air Pollution Control District
157 Short Street, Bishop, California 93514
Telephone (760) 872-8211

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2016
Owens Lake Dust Source Identification Program Protocol

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Glossary of Terms and Symbols

ATV	All-Terrain Vehicle
APCO	Air Pollution Control Officer
AQS	US Environmental Protection Agency's Air Quality System
BACM	Best Available Control Measure
BACT	Best Available Control Technology
CALMET	A meteorological preprocessor program for CALPUFF.
CALPUFF	An air pollution model
CARB	California Air Resources Board
CSC	Cox Sand Catcher, a passive sand flux measurement device.
DCA	Dust Control Area
DCM	Dust Control Measure
Dust ID Program	Owens Lake Dust Source Identification Program
Event-specific K_f	Weighted-average of hourly K-factors for a dust event, weighted by the hourly PM_{10} concentration
Exceedance	Modeled or monitored PM_{10} > 150 µg/m^3 at the shoreline
GBUAPCD	Great Basin Unified Air Pollution Control District
GIS	Geographic Information System
GPS	Global Positioning System
KE	Kinetic energy
K-factor	Proportionality constant for sand flux and PM_{10} emissions, K_f
LADWP	City of Los Angeles Department of Water and Power (also City)
m^3	cubic meter
met	meteorological
NAAQS	National Ambient Air Quality Standards
PC	Particle count
PM_{10}	Particulate matter less than 10 microns aerodynamic diameter
QA	Quality Assurance
RASS	Radio Acoustic Sounding System
Sensit	An electronic sand motion detector.
Settlement Agreement	2006 Settlement Agreement between LADWP and GBUAPCD
Storm-average K_f	Arithmetic average of hourly K-factors for a dust event
SCD	Sand-collecting type sand flux device (e.g., Cox Sand Catcher)
SFM	Sand flux monitor
TEOM	Tapered-Element Oscillating Microbalance, measures PM_{10}.
TRD	Time-resolving type sand flux device (e.g., Sensit)
USEPA	United States Environmental Protection Agency
USGS	US Geological Survey
WD	Wind direction
µg	microgram

2016 Owens Lake Dust Source Identification Program Protocol

1. Program Overview

1.1 Introduction

The objective of the Owens Lake Dust Source Identification (Dust ID) Program is to identify dust source areas at Owens Lake that can cause or contribute to violations of the National Ambient Air Quality Standards (NAAQS) for PM_{10}. The Dust ID Program is a long-term monitoring program that is intended to identify dust source areas for control under the provisions of the BACM contingency measures in Attachment B of Board Order #160413-01.

1.2 Locating Dust Source Areas

A network of sand flux samplers, PM_{10} monitors, meteorological towers and remote camera sites will be used to monitor and locate dust source areas at Owens Lake. Figure C.1.1 shows a map of the Dust ID network at Owens Lake as it existed at the end of 2015. At the discretion of the Air Pollution Control Officer (APCO), additional sand flux, PM_{10} and met sites will be added as necessary to collect information that can be used to monitor and model the impact from new areas that may become emissive on the lakebed.

The automated monitoring network will be augmented with information from observers who will map dust source locations from off-lake sites when dust events take place during normal work hours, additionally remote High Definition cameras will be used to observe and map emissive areas. These cameras will operate during all daylight hours, and dust observation maps will be created yearly. In addition to remote cameras, the District may use other remote sensing techniques to develop source area maps. These maps will be used to help document source areas that may be outside the sand flux network or that may be within the network, but missed by the samplers. Field personnel will inspect active source areas and map the source area boundaries using a GPS (Global Positioning System) or Unmanned Aerial Vehicles (UAVs) as conditions allow. Data collected from the sand flux network, visual mapping and GPS surveys will be included in a Geographic Information System (GIS) database for mapping and analysis. Maps generated using these different methods will be compared qualitatively to help delineate source area boundaries.

1.3 Monitored Exceedances

Analysis of hourly PM_{10} concentrations at shoreline and off-lake monitoring sites may show that lakebed source areas cause or contribute to PM_{10} exceedances. Monitoring of PM_{10} concentrations will be done using US EPA-approved monitors. If a PM_{10} exceedance is monitored, PM_{10} concentrations will be paired with the local wind direction for each hour of that event to determine if lakebed source areas caused or contributed to the exceedance.

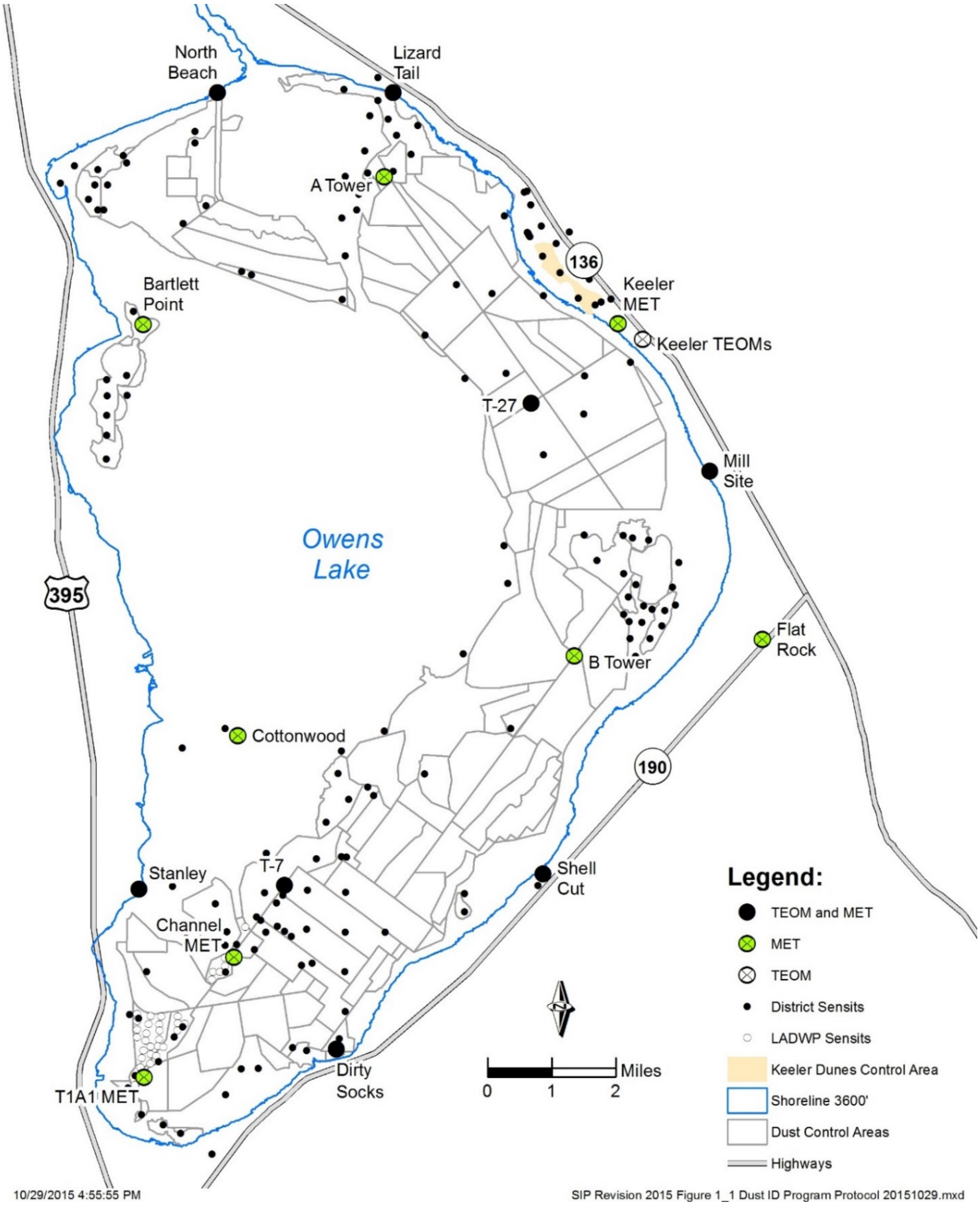


Figure C.1.1. Owens Lake Dust ID network map.

Twenty-four hour average PM_{10} monitor concentrations will be adjusted for winds coming from the direction of the lake to the monitor (from-the-lake) and from directions not from the lake to the monitor (non-lake). PM_{10} concentrations during any hour with winds from a non-lake wind direction will be assumed to have an average background concentration of 20 μg/m^3 and from-the-lake wind directions will be given their hourly value. If the adjusted 24-hour average is greater than 150 μg/m^3, then an exceedance will have been monitored from a lakebed source or sources.

If a lakebed source area causes or contributes to an exceedance, hourly PM_{10} concentrations and wind directions will be reviewed to see if a new source area (or areas) is associated with that exceedance. If sand flux data are available that show erosion activity in the direction of a new source area, this event will also be modeled as described in the air quality modeling protocol. If the PM_{10} monitor data indicate that a new source area caused or contributed to an exceedance, DCMs may be required.

1.4 Modeled Exceedances

Air quality modeling will be performed with the CALPUFF modeling system or other United States Environmental Protection Agency (USEPA) approved modeling method. At least once a year, the Dust ID information will be examined and the model will be run to determine if there were any modeled shoreline exceedances since the period covered by the last model run. PM_{10} emissions for the model will be based on hourly sand flux measured at lakebed sites and spatial and temporal factors derived using the empirical relationship between sand motion on the lake bed and measured PM_{10} values. CALPUFF will be run using the following equation to estimate emissions and to model PM_{10} impacts at the shoreline:

Equation 1.1

$$PM_{10} = K_f \times q$$

where,

q = Sand flux measured at 15 cm above the surface [g/cm^2/hr]
K_f = K-factor, empirically-derived ratio of the PM_{10} emission flux to the sand flux at 15 cm.

The ratio of PM_{10} to sand flux (K_f) is referred to as the K-factor. The initial Dust ID program results showed that K-factors could be derived empirically by comparing model predictions to monitored PM_{10} concentrations. Initial studies also showed that average K-factors can vary spatially and seasonally at Owens Lake. Default K-factors will be used with Equation 1.1 to estimate hourly PM_{10} emissions unless new K-factors are generated from future dust events following the modeling procedures in this program protocol. If the CALPUFF model results indicate that a new lakebed source area caused or contributed to an exceedance at a shoreline location, additional dust controls may be required.

1.5 Sand Flux Measurements

Sand flux is measured using a combination of sand-collecting type devices (such as Cox Sand Catchers (CSC)) and time-resolving type devices (such as Sensits). Sand-collecting devices (SCD) provide a mass collection amount for a certain time period (about 1 to 3 months). Time-resolving devices (TRD) are electronic sand motion detectors used to time-resolve the collected mass to estimate hourly sand flux rates. The sand flux rate is applied to the area represented by the sand flux sampling site, which may vary in size and shape depending on the source area delineated by field observations.

1.6 Dust ID Program Protocol Content

Section 2 of the Dust ID Program Protocol describes the methods and instrumentation that will be used to monitor sand flux with Sensits and CSCs on the lakebed. Section 3 provides a brief description of the PM_{10} and meteorological monitoring network that will be used to monitor PM_{10} exceedances, develop K-factors and to call public health advisories. Section 4 describes methods that will be used by visual observers and field personnel to map lakebed dust source areas and delineate boundaries using GPS. Section 5 explains the procedures for developing K-factors using air quality modeling and monitoring data. Section 6 provides the protocol for dispersion modeling.

2. Protocol for Measuring Sand Flux Rates

2.1 Objective

Sand flux measurements will be used as a surrogate to estimate PM_{10} emissions coming off the lakebed. The objective of the sand flux measurements is to provide an hourly emissions estimate for all active source areas on the lakebed.

2.2 Methods and Instrumentation

Sand flux will be measured with time-resolving devices (TRD), such as a Sensit, and sand-collecting devices (SCD), such as a Cox Sand Catcher (CSCs). Although the District has used the Cox SCD and Sensit TRD for many years, it continues to investigate other sand flux devices that could improve the accuracy and/or efficiency of its sand flux monitoring network. The District reserves the right to use alternative devices for measuring the mass and time resolution of sand flux. This protocol is based on the use of Sensits and CSCs. If other SCD or TRD units or systems are employed in the future, alternative procedures may be needed to utilize these devices for the purpose of determining sand flux rates from active erosion areas.

Collocated Sensits and CSCs are used to measure hourly sand flux rates at different locations on the lakebed. The 2014-15 Sensit/CSC monitor site locations are shown in Figure C.1.1. The instruments are placed with their sensors or inlets positioned 15 cm above the surface. Sensits are electronic sensors that measure the kinetic energy or the particle counts of sand-sized particles as they saltate, or bounce, across the surface. Sensits are used to time-resolve the CSC mass to provide hourly sand flux rates.

Figure C.2.1 shows a Sensit suspended above the ground on the right, and a CSC in the ground to the left. The photo was taken at a site that was used to test the accuracy of Sensits and CSCs before the Dust ID Program began. The battery powered Sensits are augmented with a solar charging system. A datalogger records 5-minute Sensit data during active saltation periods. Data collection is triggered by particle count activity and continues until particle counts are zero for an hourly period. Each datalogger has a radio transmitter that sends Sensit data to the District's Keeler field office once a day to provide updates on erosion activity at each site. These daily updates are used to alert field personnel to active source areas for possible mapping and inspection. Daily transmission of the data may be temporarily suspended if the solar battery power is low due to extended days of cloud cover.

CSCs are passive collection instruments that capture windblown, sand-sized particles. The Cox Sand Catcher type SCD was designed and built by the District as a reliable instrument that could withstand the harsh conditions at Owens Lake. CSCs have no moving parts and can collect sand for a month or more at Owens Lake without overloading the collectors. Field personnel periodically visit CSC sites to collect the sampling tubes, which are then taken to a lab to measure the collected mass. A diagram of the Cox Sand Catcher SCD is shown in Figure C.2.2. Not shown in the diagram is an internal sampling tube that can be seen in the photo in Figure C.2.3. The internal sampling tube is removed from the PVC casing to measure the sand catch sample. The lengths of the sampling tubes and casings are adjusted during construction to accommodate the amount of sand flux expected in each area and to avoid overloading the CSC. The CSC length ranges from about one to three feet. Because the PVC casing is buried in the ground, an adjustment sleeve is used to keep the inlet height at 15 cm to compensate for surface erosion and deposition. Field techs use a standardized measuring device to check or adjust the sampling inlets to 15 cm after collecting each sample.

Figure C.2.4 shows an example of the linear relationship between the CSC collected sand mass and the kinetic energy measured with a co-located Sensit. Sensits measure saltation in terms of kinetic energy (KE) and particle count (PC). The District uses the output (KE or PC) that provides the best precision and accuracy for the range of saltation activity expected at each site.

Because the electronic Sensit response to the saltation flux can vary, Sensits were used in combination with CSCs to determine hourly sand flux rates. This combination takes advantage of the good precision and accuracy of the CSC sand catch data, and the ability of Sensits to time-resolve the sand flux for each hour of the CSC sampling period. In this way, the sum of the hourly sand catches always matches the CSC sand catch for each sampling period, and it minimizes the error in the hourly sand flux.

Changes to the sand flux monitoring network are made as necessary to improve the characterization of dust source areas on the lakebed. Sand flux sampler sites are added to the network to monitor new source areas or to improve the sand flux estimates for known dust source areas. Although the sand flux network was originally designed in a fixed grid pattern with 1 km site spacing, the current practice is to place the samplers at sites that represent smaller source areas. Some sites may be less than 250 m apart, and their locations may be off the regular grid pattern to better represent sand flux activity in the dust source area. In addition, many of the

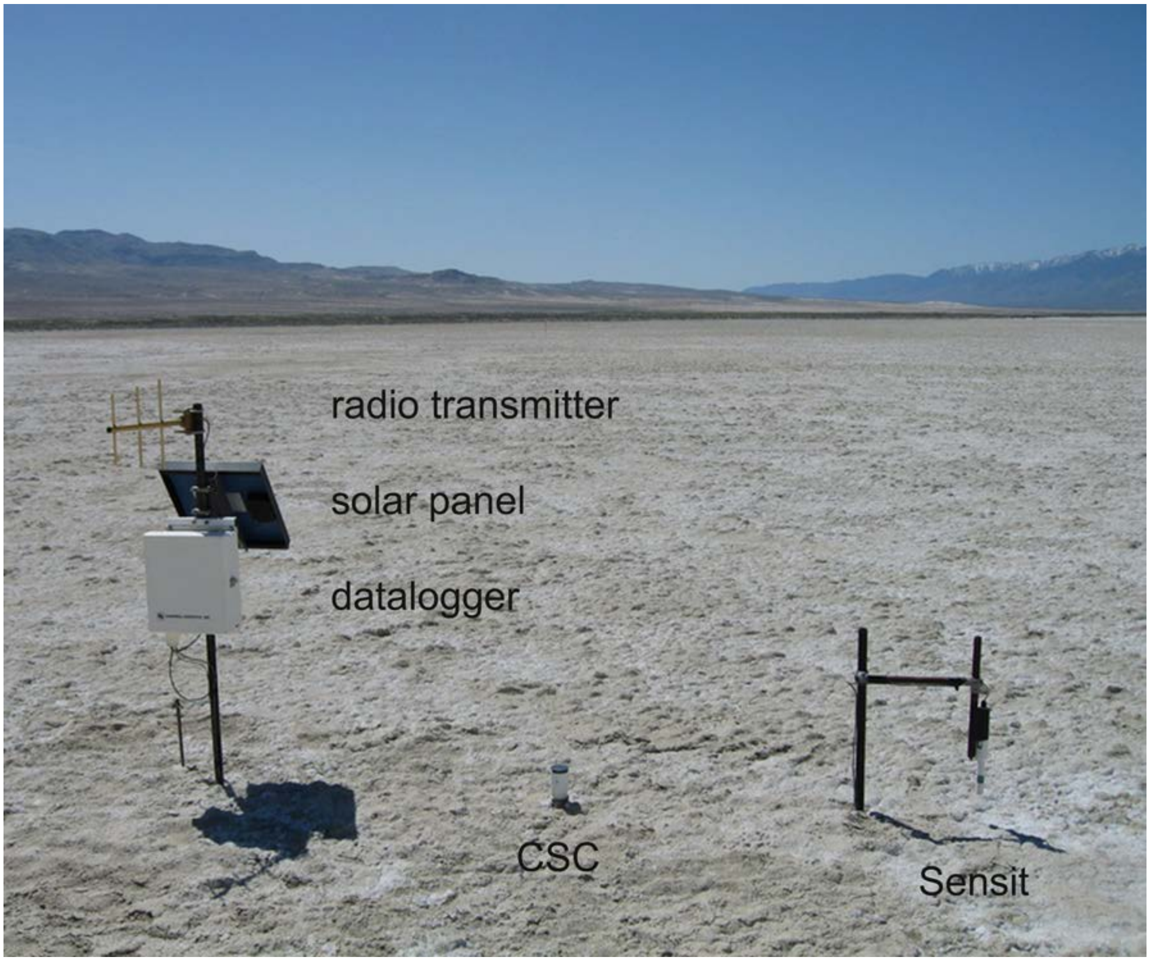


Figure C.2.1 - Dust ID sand flux monitor sites measure wind erosion activity using CSCs to collect sand-sized particles and Sensits that electronically detect moving particles. Sensit data are recorded on dataloggers and transmitted by radio from each site to the District's office in Keeler.

Figure C.2.2 - Diagram of the Cox Sand Catcher (CSC) used to measure sand flux at Owens Lake.

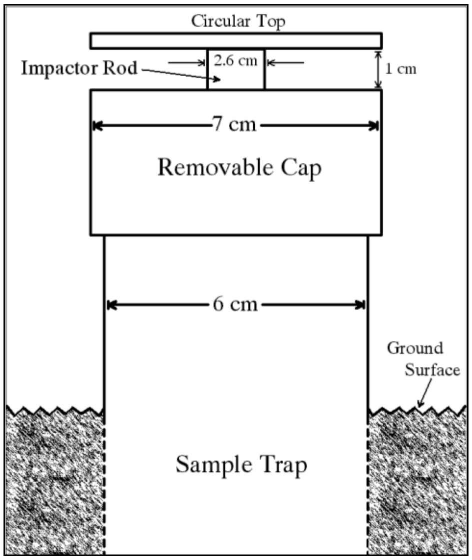


Figure C.2.3 - Example of a Cox Sand Catcher (CSC) with the inner sampling collection tube removed.

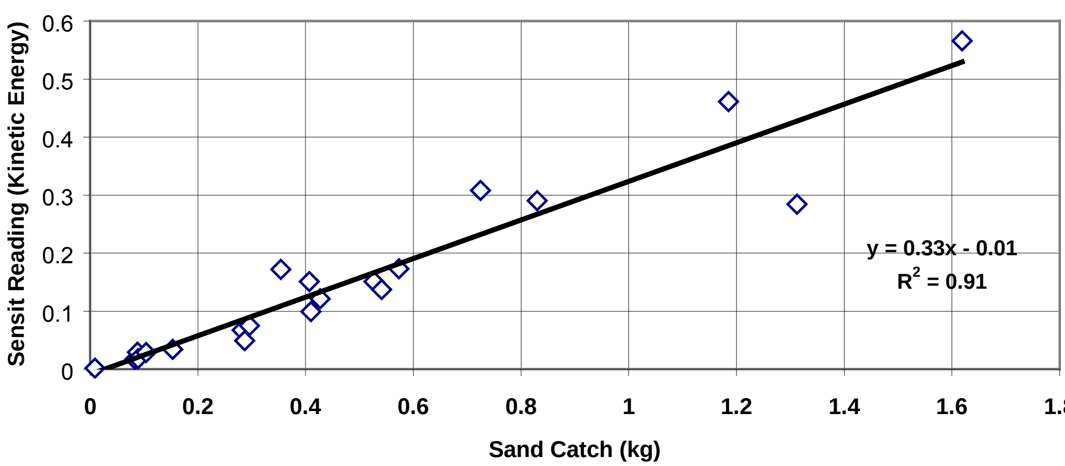


Figure C.2.4 - Example of the linearity between CSC mass and a Sensit reading using kinetic energy reading (Sensit No. 7291).

original sampling sites that are now in flooded portions of the shallow flood DCM were removed, since PM_{10} emissions from the flooded sites can be assumed to be zero in the Dust ID model.

2.3 Operating Procedures

Sand captured in the CSCs will be weighed by the District to the nearest tenth of a gram. A field technician will visit each site every one to four months, or sooner if analysis of data indicates a collection of sample tubes is required. The following procedures will be used when collecting the CSC samples and downloading Sensit data:

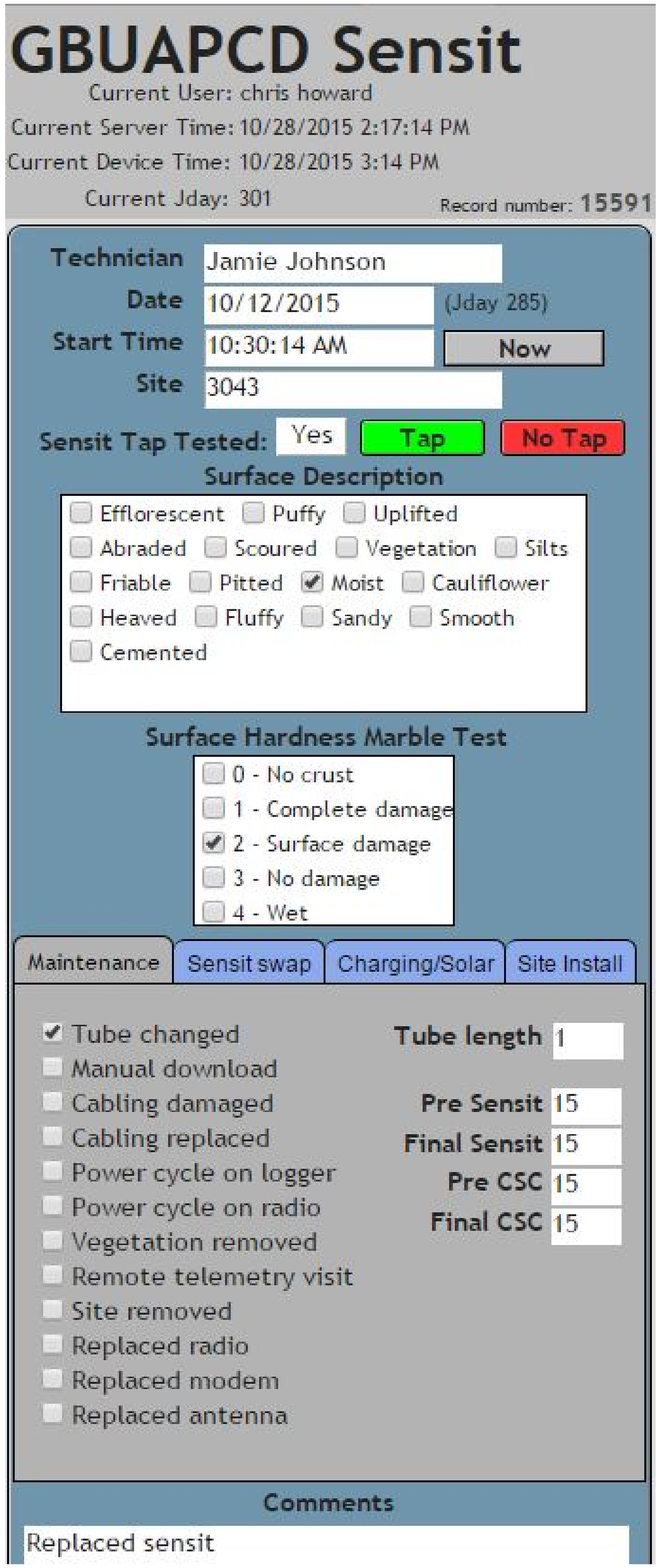
1. Park field vehicle 10 meters or more east of the site and walk the remaining distance to the sampling site. Field personnel will access all Sensit and CSC sites from an easterly approach to minimize upwind surface impacts near the sampling sites.
2. Measure and record the CSC inlet height above the surface to the middle of the inlet.
3. Remove the sample collection tube from the CSC.
4. Seal the collection tube, write the site number and collection date on the tube and place the tube in the rack for transport to the lab.
5. Place a clean collection tube in the CSC.
6. Replace the CSC inlet and adjust the height to 15 cm (±1 cm).
7. Measure and record the Sensit sensor height above the surface to the center of the sensor and adjust if necessary to 15 cm. See Figure C.2.5.
8. Inspect the sensor and radio transmitter wiring and clean or repair, if needed.
9. A field operational response test on the Sensit will be completed during each visit and the Sensit will be replaced, if it fails the test.
10. CSC samples will be removed from the sample collection tubes and weighed on a calibrated bench-top scale to the nearest 0.1 gram.
11. Wet samples will be removed from the collection tubes and oven dried before weighing in the lab.

2.4 Data Collection

A cloud based form will be used to document the information for the CSC and Sensit (see example in Figure C.2.6). The form will have the site number, date, start and end time of visit (Pacific Standard Time), "as is" CSC inlet and Sensit sensor height (± 1 cm), Sensit response test (particle counts or kinetic energy), operator's initials, and a comments section where the condition of the sampler and any other relevant factors, such as surface condition will be documented. The District's Data Processing Department will calculate the net sand catch weight from the CSC during data analysis. CSC lab weights, measured to the nearest 0.1 g will be recorded on the Lab Form shown in Figure C.2.7. The completed forms will be stored on a secure computer system and the data will be analyzed by Data Processing in the Bishop office to calculate hourly sand flux at each site.

Each day, dataloggers for all Sensit sites will be downloaded by radio transmission to the Keeler Field office. The radio transmitted Sensit data will be used as the data of record.

Figure C.2.5 - A Height Adjustment Tool is used to measure the height of Sensits and CSCs and to adjust the sensor and inlet height to 15 cm above the soil surface.


GBUAPCD Sensit
Current User: chris howard
Current Server Time: 10/28/2015 2:17:14 PM
Current Device Time: 10/28/2015 3:14 PM
Current Jday: 301
Record number: 15591

Technician: Jamie Johnson
Date: 10/12/2015 (Jday 285)
Start Time: 10:30:14 AM [Now]
Site: 3043

Sensit Tap Tested: Yes [Tap] [No Tap]

Surface Description
- [ ] Efflorescent
- [ ] Puffy
- [ ] Uplifted
- [ ] Abraded
- [ ] Scoured
- [ ] Vegetation
- [ ] Silts
- [ ] Friable
- [ ] Pitted
- [x] Moist
- [ ] Cauliflower
- [ ] Heaved
- [ ] Fluffy
- [ ] Sandy
- [ ] Smooth
- [ ] Cemented

Surface Hardness Marble Test
- [ ] 0 - No crust
- [ ] 1 - Complete damage
- [x] 2 - Surface damage
- [ ] 3 - No damage
- [ ] 4 - Wet

Maintenance | Sensit swap | Charging/Solar | Site Install

- [x] Tube changed
- [ ] Manual download
- [ ] Cabling damaged
- [ ] Cabling replaced
- [ ] Power cycle on logger
- [ ] Power cycle on radio
- [ ] Vegetation removed
- [ ] Remote telemetry visit
- [ ] Site removed
- [ ] Replaced radio
- [ ] Replaced modem
- [ ] Replaced antenna

Tube length: 1
Pre Sensit: 15
Final Sensit: 15
Pre CSC: 15
Final CSC: 15

Comments
Replaced sensit

Figure C.2.6. CSC and Sensit Electronic Field Documentation Form.

Site #	2709
Collection Date	12/5/2014
Weigh Date	12/17/2014
Initial Weight	35.6
Dry Weigh Date	12/22/2014
Dry Weight	31.3
Percent Difference	12.1
Catch Weight	31.3
Comments	wet catch
Technician	Jamie Johnson
Tube Number	1ft

Figure C.2.7. CSC Electronic Lab Form.

The electronic sand flux form will be a log of all the repairs, maintenance, or replacement of Sensits or CSCs, radio transmitters, and datalogger equipment.

2.5 Quality Assurance

All lab scales will be checked at least every two months using Class F weights. The bench-top scale in the District lab will be checked with the Class F weights before each set of sand catches are weighed. The test weights will be recorded on the scale log sheet in the laboratory. Lab scales will be calibrated and certified at least once every year. Ten percent of the CSC sand catch samples will be stored for at least one year from the date of collection before discarding.

2.6 Calculating Hourly Sand Flux

For modeling purposes discussed in Section 6, hourly sand flux is calculated for each Sensit/CSC site using the sand catch to Sensit reading ratio for each collection period and apportioning the sand catch to the hourly Sensit reading. The hourly sand flux is divided by 1.2 cm^2, which is the equivalent inlet opening size of the CSC for flux calculation purposes.

For Sensits using kinetic energy,

Equation 2.1

$$q_{n,t} = \left(S_{n,t} - S_{n,bg}\right) \times \frac{CSC_{n,p}}{\sum_{t=1}^{N}\left(S_{n,t} - S_{n,bg}\right)} \times \frac{1}{1.2}$$

Where,

$q_{n,t}$ = hourly sand flux at site n, for hour t [g/cm^2/hr]
$CSC_{n,p}$ = CSC mass for site n, for collection period p [g]
$S_{n,t}$ = Sensit total KE reading for site n, for hour t [non-dimensional]
$S_{n,bg}$ = Sensit KE background reading for site n, [non-dimensional]
N = Total number of hours in CSC collection period p.

For Sensits using particle count,

Equation 2.2

$$q_{n,t} = S'_{n,t} \times \frac{CSC_{n,p}}{\sum_{t=1}^{N} S'_{n,t}} \times \frac{1}{1.2} \quad q_{n,t} = S'_{n,t} \times \frac{CSC_{n,p}}{\sum_{t=1}^{N} S'_{n,t}} \times \frac{1}{1.2}$$

Where,

$S'_{n,t}$ = Sensit total PC reading for site n, for hour t [non-dimensional]

2.7 Sensit Calibration and Data Analysis

2.7.1 Sensit Calibration Check

Data Processing will track Sensits by their serial number. After each sample collection period, Sensit and CSC data will be added to data from other sample collections. Data Processing will determine the average sand catch to Sensit ratio for each Sensit. Sensit readings will be collected for particle counts and kinetic energy for each Sensit. Due to differences in individual Sensit responses, some Sensits have a more consistent sand flux to Sensit reading ratio using particle count rather than kinetic energy. This normally depends on the manufacturer's electronic design. At high sand flux sites, kinetic energy provides a more linear response for most Sensits. If KE is used, a background KE is subtracted from the reading if it is not zero. A background KE is determined from the KE reading when the PC reading is zero.

The ratio of the Sensit response to the collected mass will be compared for each collection period to previous ratios for the same instrument to ensure that the Sensit is responding consistently. As seen in Figure C.2.4 this ratio can vary, especially at low collection masses, so large deviations in the ratio should only be used as an indicator for a possible problem. Sensits will be replaced if they show no readings with significant sand associated CSC collection, have significant readings during calm wind periods, have an erratic response as compared to previous collection periods, or if they fail the field operational response test.

2.7.2 Replacing Missing Sand Catch Data

Sand catch data can be lost if the CSC collector is full, or damaged, or if the sample is spilled during weighing. The lost sand catch data will be estimated using Sensit data. A cumulative sand catch to Sensit ratio is calculated by adding all of the valid sand catches and all of the corresponding Sensit data for that particular Sensit/CSC pair, and then dividing them to obtain the total ratio. The cumulative ratio is applied to the Sensit data to estimate the hourly sand flux. If there was a Sensit change, only data generated after the Sensit change is used to calculate the cumulative sand catch to Sensit ratio.

CSC collection tubes will be collected and replaced at the same time as any Sensit change at a site in order to maintain the time correlation between the two devices.

2.7.3 Replacing Missing Sensit Data

Sensit data can be lost when the datalogger or Sensit fails. In such cases, the sand catch data will be time resolved using a neighboring site. The historical hourly sand flux data are compared to determine which neighboring site behaves most similarly to the site with the lost data. The correlation coefficients between the data sets will be used to determine which site behaves most similarly. If no adjacent sites were active during the period of lost Sensit data, then the nearest active sites will be used for comparison.

3. Protocol for Measuring Ambient PM_{10} and Meteorological Conditions

3.1 Objective

Ambient PM_{10} monitors will be placed at locations generally around the shoreline of Owens Lake and in local communities to monitor the ambient air for exceedances of the PM_{10} NAAQS and to develop K-factors for modeling PM_{10} emissions from lakebed sources. PM_{10} monitors placed on the lakebed for monitoring dust control areas may also be used as upwind and downwind monitors for the Dust ID Program.

3.2 Methods and Instrumentation for PM_{10} and Meteorological Data

PM_{10} monitoring will be performed using USEPA-approved reference or equivalent method monitors. The 2014-15 monitoring network in Figure C.1.1 shows the location of PM_{10} monitors on the shoreline at a two sites on the lakebed. Each PM_{10} site is equipped with an EPA-approved reference or equivalent PM_{10} monitor. Monitors used in the Dust ID Program must be capable of measuring hourly PM_{10} concentrations. The Dust ID Program will rely on the continuous monitors on the shoreline to determine if an exceedance is caused by a lakebed source, since the data can be correlated with hourly wind directions to determine dust source directions. Continuous PM_{10} data will also be used to generate K-factors to model the PM_{10} emissions from lakebed sources.

Ten-meter meteorological towers will be located near each PM_{10} monitor site and at other locations around the lakeshore and on the lakebed. The 2014-15 met site network is shown in Figure C.1.1. The met data are used to create wind fields with the CALMET model that are used with CALPUFF to model air quality impacts. All met towers include instrumentation to measure wind speed and wind direction. Met sites may also measure wind speed at different heights (0.5, 1, 2, 5 and 10 m) to determine surface roughness and vertical wind speed profiles. Met sites may also measure temperature, relative humidity, barometric pressure, and/or precipitation.

3.3 Operating Procedures, Instrument Calibration and Quality Assurance

PM_{10} monitoring will be performed in accordance with USEPA monitoring guidelines found in 40 CFR, Part 58 and meteorological monitoring will be performed in accordance with USEPA Quality Assurance Handbook for Air Pollution Measurement Systems, Volumes I, II, and IV.

3.4 Data Handling and Data Access via Modem

TEOM PM_{10} data will be delivered to Data Processing on a routine monthly schedule. After the data pass the proper data review and QA checks they will be submitted to the USEPA's AQS database. PM_{10} data from special-purpose monitors that may be located on the lakebed will not be submitted to the AQS database.

All the PM_{10} sites and met sites are equipped with modem links that allow for access to the hourly concentration and wind data. These data are useful for alerting field personnel to possible new sources of PM_{10}, and for alerting the public in case of high concentrations. For hourly concentrations above 400 $\mu g/m^3$ the District will issue public health advisories when the communities of Keeler, Lone Pine or Olancha are affected. The public can view real-time wind speed, direction and PM_{10} data from the Dust ID monitoring network on the District's website at www.gbuapcd.org/data.

4. Protocol for Observing and Mapping Source Areas and Dust Plume Paths

4.1 Objective

The objective for source area mapping is to use the best available information from visual observations, GPS mapping, and sand flux measurements to delineate the boundaries of dust source areas for as many events as possible. This information will be used to help delineate the control area boundaries for new sources.

4.2 Methods and Instrumentation

In late 2015, the Dust ID Program included four methods to help locate dust source areas and to delineate the source area boundaries. The methods were: 1) visual mapping by trained observers,

2) time-lapse cameras, 3) surface inspections with GPS mapping, and 4) sand flux activity (as measured with Sensits and CSCs).

Two additional methods of delineating source areas were under development in 2015 that utilize the Induced Particulate Erosion Test (IPET) method to locate dust source areas, as well as aerial mapping using a small UAV. The IPET is approved for use to test the emissivity of a surface in order to determine if areas controlled by tillage with shallow flood BACM back-up need to be re-flooded. The IPET and aerial mapping can be used together to accurately determine emissive boundaries. If the APCO approves the methods for use at Owens Lake for delineating source area boundaries it will be incorporated into this Dust ID Program Protocol.

4.2.1 Mapping Dust Source Areas from Off-Lake Observation Sites

One or more trained observers will complete observations from viewpoints to best observe the active dust source areas. For instance, two observers may be at viewpoints on the east side of the dust plume in the Inyo and Coso Mountains and a third may be on the west side in the Sierra. The observers will create hourly maps of the visible boundaries of any dust source areas, their plume direction and note if the visible plume crosses the shoreline. To the extent practicable, all lakebed and off-lake dust sources will be included in the observations. Figure C.4.1 shows an example of sand flux measurements and the cumulative information that can be collected by observers mapping the dust plumes from different locations.

4.2.2 Video Cameras

Remote time-lapse video cameras will record dust events during daylight hours. This information will be reviewed to help identify source areas that may have been missed by observers, or to help confirm source area activity detected by PM_{10} monitors or the sand flux network. Remote time-lapse video can also be used to help verify modeled impacts that were not monitored by the PM_{10} network, to check compliance of dust control areas, and to identify off-lake sources not measured by any of the other methods. Additionally a method known as TIG (Terrestrial Image Georefferencing) has been developed that uses these remote HD cameras to map source areas. The advantage of using TIG is that the cameras run during all daylight hours regardless if Keeler personnel are working. This allows the data to be looked at any time, as well as repeated analysis can be done if any questions arise.

4.2.3 Mapping Using GPS

4.2.3.1 "Trigger" Levels for Initiating Field Inspections and GPS Surveys

Dust observations, Sensit activity, elevated PM_{10} concentrations and video will be used as "trigger data" to determine the time and location for a Dust Source Area Survey (survey). Sensit and PM_{10} data will be automatically collected via radio transmission every workday. A technician will summarize and review the data each workday. The summary will list all Sensit activity greater than background output levels, and hourly TEOM PM_{10} concentrations over 50 $\mu g/m^3$ with corresponding wind speed and direction data. If dust observations are available from a recent dust storm, they will be used to confirm the location of the dust source(s) that

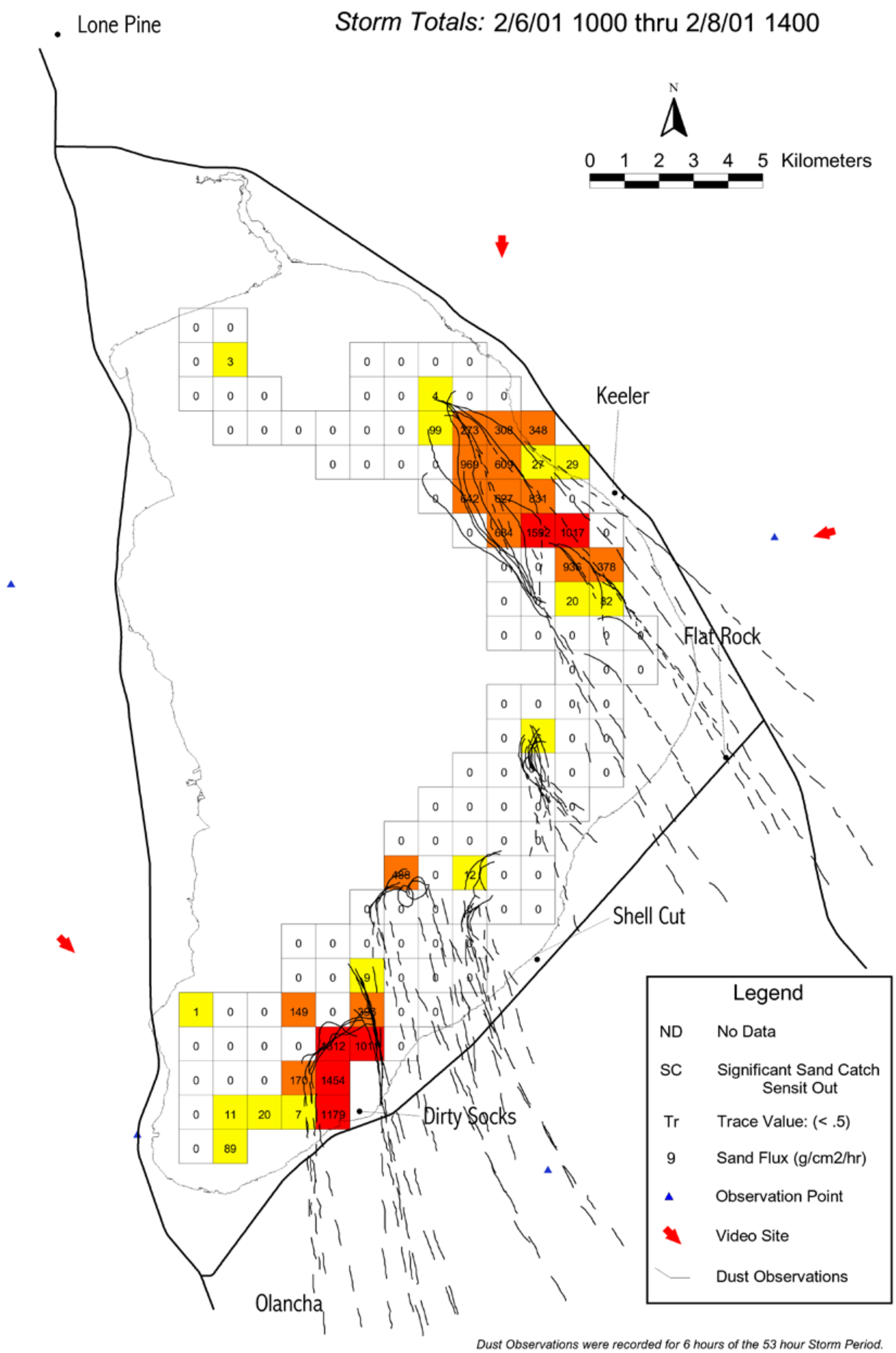


Figure C.4.1 - Example of dust plume maps drawn by observers during daylight hours and total sand flux for a dust event on February 6-8, 2001.

correspond with the Sensit activity and elevated PM_{10} concentration. Video will be used to identify a source or sources that were not identified by observations, Sensit data or PM_{10} information. Wind speed and wind direction data will be used to help determine if a lakebed dust source could have caused elevated PM_{10} concentrations. All of the trigger information will be used to identify any lakebed dust source area to initiate a dust source survey and/or surface inspection. The survey should be completed the same day if weather conditions are favorable. For larger areas, surveying may continue for several days or until precipitation obscures the boundaries of the source area.

In addition to the above process, general field inspections will be completed after dust storms to verify lakebed emission activity and the need for a survey. A survey will be completed if the trigger data and /or field inspections indicate emissive conditions in an area that has not been previously surveyed during the current dust period (Section 4.3) or in an area that has been previously surveyed but has increased in size since its last survey. The priorities for completing a survey are:

1) new lakebed source areas outside the instrumented Sensit network;
2) new lakebed source areas that have not been surveyed within the instrumented Sensit network; and
3) lakebed source areas that have previously been surveyed.

4.2.3.2 GPS Mapping Procedures

After a dust source is identified by dust observation, Sensit data, sand catch data, video, PM_{10} concentration or inspection of the lake bed surface, District staff will map the exterior boundary of as many of the source areas identified as possible during daylight hours, as weather conditions allow. The mapping will begin as soon as possible after a dust storm and continue until all the identified areas are mapped or precipitation occurs. The boundary of the emissive area(s) will be mapped using a Global Positioning System (GPS). Surveyors conducting the mapping will ride an ATV or walk around the outer boundary of the wind-damaged surface surveying a line with the GPS. A wind-damaged surface is defined as a soil surface with wind erosion evidence and/or aeolian deposition that has not been modified to an unrecognizable point by precipitation since the last identified dust storm.

GPS line data should be collected at an interval of one record every 10 seconds or less. Data should be collected in NAD83 UTM Zone 11 coordinates. Only GPS units capable of continuously recording line data will be used. Data should be processed and corrected using base station data (either from a commercial correction service or using data from the District's Keeler base station) to ensure positional accuracy.

Before beginning a survey, the edge of the source area is determined by a visual review of the surface conditions within a representative one square meter area along the edge of the source area. An undamaged surface is evident if there is no visible evidence of a disturbed lakebed surface due to wind damage. As an aid to calibrate the level of disturbed surface, a surveyor will begin each survey by estimating the percentage of surface that is undamaged by the wind. The surveyor visually determines where a surface with 70 to 80 percent of undisturbed surface is located. The surveyor completes the survey by following a line of travel that closely represents the initial one-meter calibration. The following defined list, Boundary Conditions and Survey Procedures (see below), can be used to determine how to map the source boundary under differing surface boundary conditions.

Boundary Conditions and Survey Procedures:

Distinct Boundary: A visibly sharp transition, 25 feet or less in width, between a wind-damaged lakebed surface and an undamaged lakebed surface. The surveyor should travel directly along this distinct outside edge, if possible, and may deviate 25 feet to the inside or outside on occasion. Small (25-foot wide or less) channels, boundary indentations, roads, mounds, and other obstacles may be directly crossed if the continuation of the main source boundary is clearly visible on the opposite side.

Diffuse Boundary: A visibly distinct transition, 25 to 100 feet in width, between a wind-damaged lakebed surface and an undamaged lakebed surface. Every effort should be made to travel along the outermost edge of the visible distinction.

Indistinct Boundary:A boundary that is not obvious to the surveyor where the edge of the source is located. Mapping would be stopped at this point until a Distinct or Diffuse Boundary can be located.

Generally the surveyor will maintain a constant course of travel following the Distinct Boundary of the wind-damaged area. As the boundary becomes less distinct, it is recommended to move the course of travel further into or outside the source to maintain recognition of surface damage. It is acceptable to travel within approximately 50 feet of the outer or inner edge of the larger more noticeable active area if the boundary is Diffuse. When encountering an Indistinct Boundary condition, the surveyor should note if the boundary can be found or if the boundary cannot be mapped during the existing survey and why. If the boundary cannot be mapped, the survey shall end at that point leaving an unclosed source area polygon.

It is possible for the surveyor to find himself or herself greater than 50 feet within or outside of the source area boundary. When this happens, the surveyor should turn perpendicular to the direction they were traveling and travel in the direction where the distinct edge should be located. For example, if the surveyor were inside the source area, they would turn in the direction where erosion evidence was not observed earlier along their path. If the surveyor were outside the source area, they would turn toward the side where they previously observed the source. Boundary loss may occur because of an Indistinct Boundary or unfavorable lighting conditions. The time and coordinates should always be noted when it is necessary to relocate the boundary during a survey.

Another alternative for relocating a source area edge is to pause the GPS unit from recording data until the boundary is located and then resume with data collection. This allows the surveyor to travel in any direction until the edge is relocated or end the survey if an edge cannot be located. The line produced between the point where the GPS unit was paused and then restarted would be deleted and considered un-surveyed during post processing.

The presence of Indistinct Boundaries or conditions that cause the ending of a survey must be annotated on the GPS data or explained in the field notes, including point coordinates. Examples would include dust storm, precipitation, lightning, mud, and channel with flowing water, pond, and time constraint or equipment malfunction.

4.2.4 Using Sand Flux Monitors to Map Source Area Boundaries

Dust source area boundaries can be delineated or refined using default cell boundaries represented by active sand flux monitors. The area represented by the active SFM site may be shaped to exclude known non-emissive areas, such as; DCM areas, wetlands, or areas with different soil texture where there is evidence that it is non-emissive.

4.3 Composite Dust Source Map Development

Data Processing will compile the cumulative mapping information from the visual observers and field inspections using the GPS into a GIS database for two periods each year, December through June and July through November. Weather anomalies (late or early winter precipitation) may dictate modifying these time periods. The APCO will have sole discretion as to the selection of the mapping periods. A new composite map will be developed for each period containing only those data collected during that period. Observation maps will be input into the GIS database. Observation maps will be compared with source area locations from other methods through the GIS generated layers. Overlays of the maps generated from sand flux monitors, video cameras, visual observers and GPS'd source areas will be compared qualitatively, considering the information may have been collected at different times.

5. Protocol for Determining K-factors and PM_{10} Emission Rates from Sand Flux Data

5.1 Objective

The objective of this portion of the Dust ID Program is to estimate the PM_{10} emission flux for each cell or source area using the relationship *PM_{10} emission flux = sand flux x K-factor*. PM_{10} emissions for each area will be used with the CALPUFF modeling system or other USEPA approved model to determine if the PM_{10} emissions will cause or contribute to a NAAQS violation at the shoreline.

5.2 Method for Determining PM_{10} Emissions and New K-factors

5.2.1 PM_{10} Emission Flux = Sand Flux x K-factor

PM_{10} emissions will be estimated using the sand flux for each area represented by a Sensit and CSC and an appropriate K-factor for the area and period. The sand flux values will come from the Sensit and CSC data as discussed in Section 2. New K-factors for each area and period will be developed as discussed in this section, and default K-factors will be used to model dust events unless newer K-factors are determined.

5.2.2 Default Temporal and Spatial Storm-average K-factors

PM_{10} emissions may be estimated from default K-factors that were developed from previous dust events that occurred in the same area and the same range of calendar months in previous years.

The areas for K-factor groupings are shown in Figure C.5.1: Northwest Area, Northeast Area, Keeler, Central Area, Keeler Dunes, Managed Vegetation and the South Area. Any new source area within the depicted boundaries will be associated with that area for the spatial grouping of new K-factor values. If a new source area and K-factor is developed for an area outside these boundaries, the area and default K-factor will be associated with the K-factor for an existing area with the most similar surface soil texture. The determination of the most similar existing area will be made by the Air Pollution Control Officer.

5.2.3 Method to Determine Sand Flux from Areas with Implemented Dust Control Measures (DCM)

Sand flux will be measured at sites within the DCAs. Sensits and CSCs will be sited on dry areas within the shallow flood DCM to represent dry areas near the site. DCM areas covered with standing water will be assumed to have zero sand flux. For the Managed Vegetation DCM, sand flux sites will be placed in spatially representative areas and in areas within the DCM where windblown dust may have been previously observed.

5.2.4 New K-factors Seasonal Cut-points

The APCO will review the K-factor data and select seasonal cut-points by reviewing temporal trends in the K-factor values for each area.

5.2.5 Using CALPUFF Modeling System to Generate New K-factors

New hourly K-factors can be inferred from the CALPUFF model by using hourly sand flux as a surrogate for PM_{10} emissions. Modeled PM_{10} predictions can then be compared to monitored concentrations at PM_{10} monitor sites to determine the K-factor that would correctly predict the monitored concentration for each hour. More information on the modeling procedures is included in Section 6.

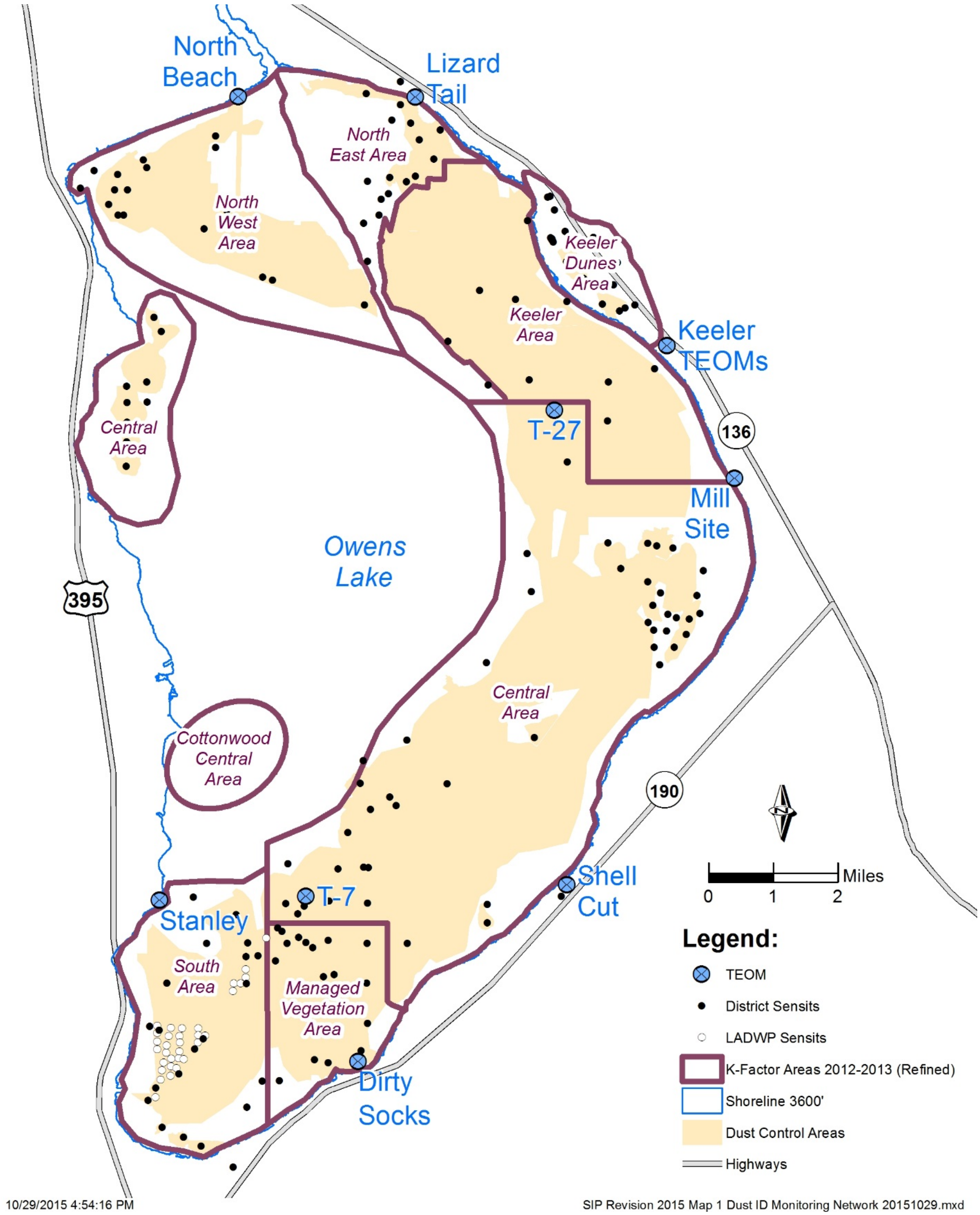


Figure C.5.1 – K-factor Areas.

A K-factor of 5 x 10^{-5} will be used initially to run the CALPUFF model and to generate concentration values that are close to the monitored concentrations. Hourly K-factor values will then be adjusted in a post-processing step to determine the K-factor value that would make the modeled concentration match the monitored concentration at the PM_{10} monitor site. The initial K-factor will then be adjusted using Equation 5.2.

Equation 5.2

$$K_f = K_i \left(\frac{C_{obs.} - C_{bac.}}{C_{mod.}} \right) \quad K_f = K_i \left(\frac{C_{obs.} - C_{bac.}}{C_{mod.}} \right)$$

Where,

K_i = Initial K-factor (5 x 10^{-5})
$C_{obs.}$ = Observed hourly PM_{10} concentration. [µg/m^3]
$C_{bac.}$ = Background PM_{10} concentration
$C_{mod.}$ = Model-predicted hourly PM_{10} concentration. [µg/m^3]

5.2.6 Screening Hourly K-factors

K-factors will be calculated for every hour that has active sand flux in cells upwind from a PM_{10} monitor. These hourly K-factors will be screened to remove hours that did not have strong source-receptor relationships between the active source area (target area) and the downwind PM_{10} monitor. For example, the screening criteria will exclude hours when a PM_{10} monitor site is located on the edge of a dust plume. Because the edge of a dust plume has a very high concentration gradient, a few degrees error in the plume direction could greatly affect the calculated K-factor. The APCO may also eliminate hours with other anomalous conditions that could affect the source-receptor relationship, such as sources of PM not associated with wind erosion.

The following general criteria will be used to screen the hourly K-factors:

1) Wind speed is greater than 5 m/s at 10 m height at any network site.

2) Hourly modeled and monitored PM_{10} concentrations were both greater than 150 µg/m^3 at the same monitor-receptor site.

3) Hourly wind direction for each monitor site. The hourly wind directions for the monitors in place at the end of 2015 are shown in Table 5.1.

4) At least one sand flux site located within the target area and within a 30-degree upwind cone has sand flux greater than 0.5 g/cm^2/hr.

5) More than 65 percent of the PM_{10} contribution at a monitor site came from the target source area (Northeast, Northwest, Keeler, Central, Managed Vegetation, South Area, and Keeler Dunes).

6) Eliminate hours when upwind and downwind sites located less than 15 km from a target source area show the upwind PM10 concentration is more than 50% higher than the downwind monitor concentration.

The from-the-lake wind directions for the initial K-factor screening criterion 3) for the monitors in place at the end of 2015 are shown in Table C.5.1. From-the-lake wind directions for any new PM_{10} sites will be determined by the APCO as needed for the K-factor screen. Note that 'From-the-Lake' wind directions for assessing the lakebed impacts at PM_{10} monitor sites in Attachment B to BO #160413-01 are different from these K-factor screening wind directions.

Hourly K-factors that pass through the screening criteria will be used to develop new event-specific spatial K-factors, and new 75-percentile hourly average temporal and spatial K-factors, if enough K-factors are available.

Table C.5.1 – Wind Directions for the K-factor Screen

PM_{10} Monitor Site	**From-the-Lake Wind Direction (Degrees)**
Lone Pine	$110 \leq WD \leq 190$
Keeler (without Dunes)	$135 \leq WD \leq 310$
Keeler (with Dunes)	$135 \leq WD \leq 345$
Shell Cut	$WD \geq 210$ or $WD \leq 50$
Dirty Socks	$WD \geq 220$ or $WD \leq 65$
Olancha	$WD \geq 320$ or $WD \leq 55$
Bill Stanley	$WD \geq 335$ or $WD \leq 245$
Lizard Tail	$115 \leq WD \leq 305$
North Beach	$40 \leq WD \leq 265$
Mill Site	$140 \leq WD \leq 350$
New and Portable Sites	TBD

5.3 Temporal and Spatial Event-specific K-factors

5.3.1 Event-Specific K-factors

Screened hourly K-factors will be used to generate event-specific K-factors for the active source areas. The event-specific K-factor will be calculated as the arithmetic average using all the hours when the hourly K-factor passes the screening criteria for the target area. Three or more screened hourly K-factor values during a 48-hour period are needed to calculate an event-specific K-factor for an active area.

5.3.2 Temporal & Spatial 75-Percentile K-factors

The statistical 75-percentile value will be determined from the distribution of the hourly K-factors that pass the screening criteria for that area and period, whenever there are nine or more hourly K-factors. The 75^{th} percentile will be calculated using the Microsoft Excel PERCENTILE function. The Microsoft Excel PERCENTILE function works by sorting values from lowest to highest, then assigns the 0^{th} percentile is the lowest value, the 100^{th} percentile is the largest value, and the values in between as (k-1)/(n-1) where n is the number of data values in the list and k is index of the k^{th} lowest value in the list. Thus, each value is placed 1/(n-1) apart. If a requested percentile does not lie on a 1/(n-1) step, then the PERCENTILE function linearly interpolates between the neighboring values.

5.3.3 Default K-factors

Table C.5.2 shows the 2015 default K-factors for each of the K-factor areas and periods. These default values are based on K-factors from previous Dust ID model runs and may be modified by the APCO based on new model results that show changes in K-factor values for these areas.

Table C.5.2 – Default Spatial and Temporal K-factors for the Dust ID Model

K-factor Area	K-factor Jan.-Apr. & Dec.	K-factor May-Nov.
Keeler Dunes	2.5×10^{-5}	2.5×10^{-5}
Keeler	2.2×10^{-5}	2.2×10^{-5}
Northwest Area	17.6×10^{-5}	6.6×10^{-5}
Northeast Area	21.2×10^{-5}	6.0×10^{-5}
Central Area	18.1×10^{-5}	5.3×10^{-5}
Managed Vegetation	4.0×10^{-5}	4.2×10^{-5}
South Area	7.4×10^{-5}	4.3×10^{-5}

6. Protocol For Dispersion Modeling

This section of the *Protocol* discusses the dispersion model methods planned for the simulation of windblown dust at Owens Lake using data from the Dust ID Program. The modeling techniques will be used both diagnostically to infer emission rates for source areas and prognostically to predict PM_{10} concentrations at the regulatory shoreline. Following an overview of the modeling approach, the remainder of this section discusses construction of the meteorological data set, dispersion model options, background concentrations and source area characterization.

6.1 Overview of Modeling Procedures and Rationale for Model Selection

The CALPUFF modeling system has been selected for continuing studies in the Dust ID Program. CALPUFF is the USEPA recommended modeling approach for long-range transport studies and USEPA has approved the use of CALPUFF in their *Guideline on Air Quality Models* (40 CFR Part 51, Appendix W). EPA has found that the CALPUFF modeling system is applicable to near-field dispersion problems where the three-dimensional qualities of the wind field are important and for stagnation episodes when pollutants remain within the modeling domain over periods of several hours or more. CALPUFF is appropriate for modeling dust events on Owen Lake which are sometimes influenced by complex wind patterns, with plumes from the northern portion of the lakebed traveling in different directions than plumes in the southern portion.

The model domain shown in Figure C.6.1 includes a 34 km-by-48 km area centered on Owens Lake. The meteorological and computational grid will use a one-kilometer horizontal mesh size with ten vertical levels extending from the surface to four kilometers aloft. The extent of the model domain was selected to include the "data rich" Dust ID Program study area, terrain features that act to channel winds, and receptor areas of interest. This same model domain and mesh size were used in the simulations supporting the 2003 and 2008 Owens Valley PM_{10} State Implementation Plans.

6.2 Meteorological Data Set Construction

Three-dimensional wind fields for CALPUFF will be constructed from surface and upper air observations using the CALMET meteorological preprocessor program and the procedures employed in this protocol. CALMET combines surface observations, upper air observations, terrain elevations, and land use data into the format required by CALPUFF. Winds are adjusted objectively using combinations of both surface and upper air observations according to options specified by the user. In addition to specifying the three-dimensional wind field, CALMET also estimates the boundary layer parameters used to characterize diffusion and deposition by the CALPUFF dispersion model.

6.3 CALPUFF Options and Application

Surface Observations. The necessary surface meteorological data will come from the District's network of ten-meter towers shown in Figure C.1.1. The District may also install additional stations to better characterize winds near suspect source areas not currently near an existing site. The District's historic meteorological database contains very few periods of missing data. Periods of missing data will be flagged and CALMET will construct the wind fields using the data from the remaining stations. In addition to the District's network, surface data from other field programs at Owens Lake will be used when available.

Cloud Cover Data. The current version of CALMET also requires cloud cover and ceiling height observations. Cloud cover is a variable used by CALMET to estimate the surface energy fluxes and, along with ceiling height, is used to calculate the Pasquill stability class. Hourly cloud cover and ceiling height observations are being collected from the surrounding surface airways observations at China Lake and Bishop Airport. During dust event conditions, the sensitivity of the CALPUFF modeling system to these variables is reduced, as the stability class becomes neutral under moderate to high winds. Algorithms within the modeling system that depend on the surface energy fluxes are dominated by the momentum flux and tend to be insensitive to cloud cover under high winds. For these reasons, the absence of local cloud cover and ceiling height measurements are not expected to significantly affect the results of the modeling study.

Surface Characteristics and Terrain. The CALPUFF modeling system requires land use and terrain data. These data are used by CALMET to adjust the wind field and affect the calculations performed by the CALPUFF dispersion model. CALPUFF considers spatial changes in land use, including the surface roughness, and the input data are specified on a horizontal grid. The terrain data influence the constructed wind fields and plume trajectories in regions of sparse observations. Land use and terrain data have been obtained from the U.S. Geological Survey (USGS) data sets on the Internet. The resolution of these land use and terrain data sets are 200 m and about 30 m, respectively. The District has prepared these data sets using the pre-processing software provided with the CALPUFF modeling system. The resulting grids have been plotted and checked against data from the District's GIS database where the modeling domain overlaps the District's data. The 1-km mesh size terrain used by CALMET and CALPUFF is shown in Figure C.6.1.

Upper air data. Upper air data will be collected from a number of different sources for construction of the wind fields and estimation of mixing heights with CALMET. Historically, both local and regional data were collected as follows:

- A 915 MHz Radar Wind Profiler and Radio Acoustic Sounding System (RASS) were used to collect upper level wind and temperature measurements. The Wind Profiler was initially located at Dirty Socks then moved to the Mill Site during the 4th quarter of 2001. The District discontinued measurements with the Wind Profiler on June 30, 2003. The Wind Profiler with RASS samples wind and temperature from 100 m, up to 5000 m with a vertical resolution as low as 60 m depending on the clutter environment, atmospheric scattering conditions, and pulse length. Experience at Owens Lake indicates wind data recovery is sometimes poor above 1000 m due to the dry environment and the RASS data are limited to the lower levels during windy conditions.

- Regional twice-daily upper air soundings from Desert Rock Airport (Mercury, Nevada) and China Lake Naval Air Station.

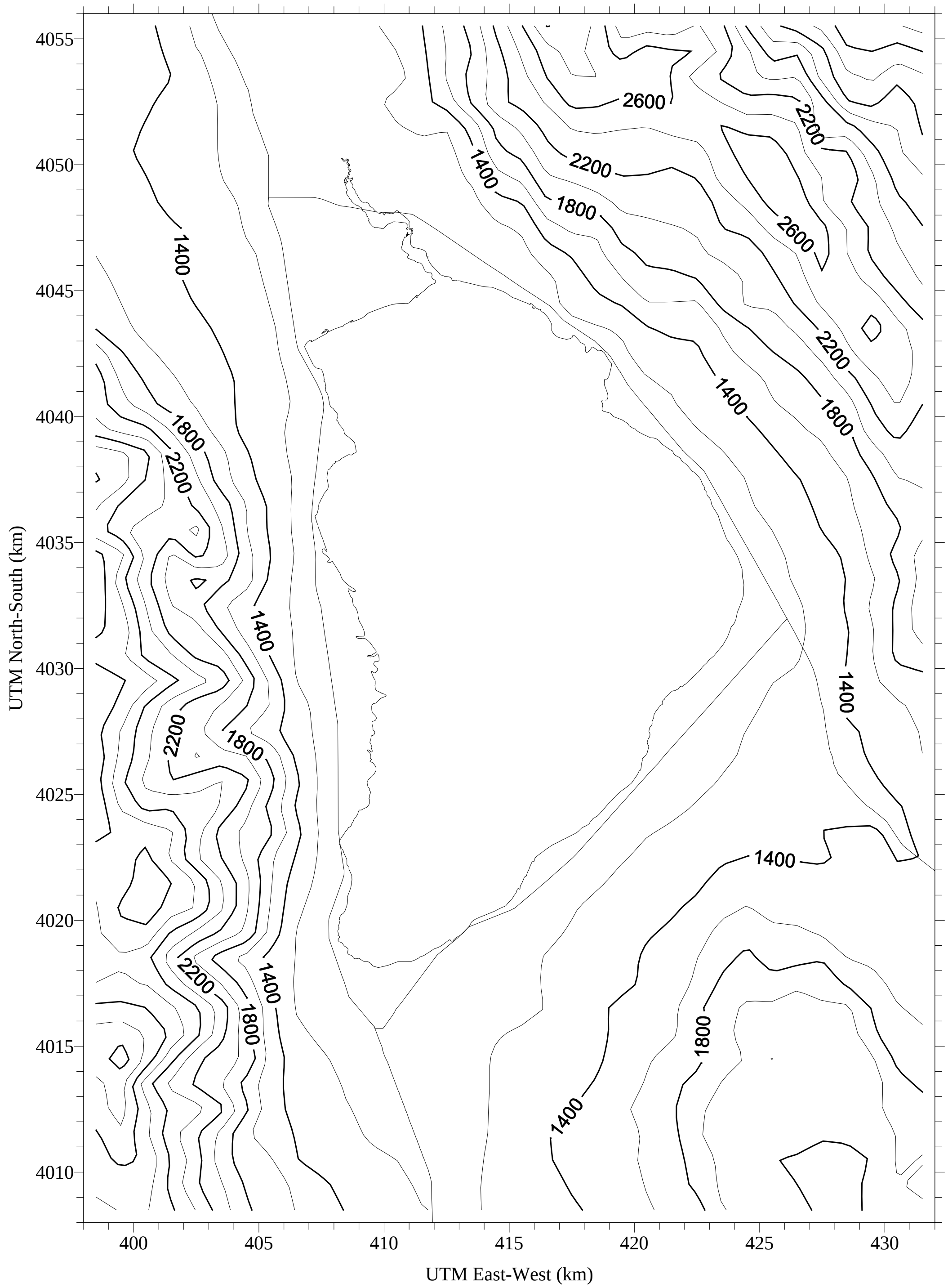


Figure C.6.1 - Model Domain, elevation contours and UTM coordinates for the Dust ID Model

During high wind events, observations from the Wind Profiler at both the Mill Site and Dirty Socks indicate very little wind speed or wind direction shear with height. Previous CALPUFF simulations suggest concentrations predicted at PM_{10} monitoring sites and at the regulatory shoreline are not usually influenced by upper level winds because the sources are ground based. The highest impacts occur close to the source areas, and there is very little wind shear during high winds.

Following removal of the Wind Profiler, soundings from China Lake and Desert Rock have been used to construct the data set. The China Lake and Desert Rock sounding will primarily be used for upper level temperature lapse rates. Winds aloft will be based on extrapolation of the surface wind measurements. The default algorithms employed by CALMET based on Similarity Theory often adjust the winds in the wrong direction and predict too much increase in wind speed with height even for very small surface roughness lengths. As an alternative, wind speeds aloft will be adjusted using the empirical results suggested by the previous Wind Profiler measurements. No wind direction turning with height will be assumed.

CALMET options. The options employed for the application of CALMET to construct the wind fields were provided in the "Modeling Protocol" (MFG, 2001). The majority of the selected model options are based on the defaults incorporated in the code by the model author. Notable model options include:

- Ten vertical levels varying geometrically from the surface to 4000 m. The geometric spacing provides better resolution near the surface and the upper limit is high enough to be above the boundary layer height.

- Vertical extrapolation of surface winds aloft using the results of the Wind Profiler studies.

Wind fields constructed with CALMET will be randomly checked by plotting the resultant fields and the surface observations on a base map. The CALDESK™ software package will also be used to view the CALMET wind fields.

The application of CALPUFF involves the selection of options controlling dispersion. Although the simulations are primarily driven by the meteorological data, emission fluxes, and source characterization, the dispersion options also affect predicted PM_{10} concentrations. The model options used in the past will continue to be considered for the Dust ID Program. These options include:

- Dispersion according to the conventional Pasquill-Gifford dispersion curves. Sensitivity tests were also performed by applying CALPUFF with dispersion routines based on Similarity Theory and estimated surface energy fluxes. These tests did not indicate improved performance over the Pasquill-Gifford based simulations.

- Near-field puffs modeled as Gaussian puffs, not elongated "slugs." CALPUFF contains a computation intensive "slug" algorithm for improved representation of plumes when wind directions vary rapidly in time. This option was tested, but did not significantly influence the CALPUFF predictions.

- Consideration of dry deposition and depletion of mass from the plume. The particle size data used will be based on measurements taken within dust plumes on Owens Lake as discussed below.

Dry deposition and subsequent depletion of mass from the dust plumes depend on the particle size distribution. Several field studies have collected particle size distributions within dust plumes at Owens Lake. Based on results from Niemeyer, *et al*. (1999), the CALPUFF simulations will assume a lognormal distribution with a geometric mean diameter of 3.5 µm and a geometric standard deviation of 2.2.

6.4 Background PM_{10} Concentrations

The dispersion model simulations include only windblown emissions from the source areas with sand flux activity measurements. During high wind events, other local and regional sources of fugitive dust can contribute to the PM_{10} concentrations observed at the monitoring locations. In past analyses, a constant background concentration of 20 µg/m^3 was added to all predictions to account for background sources. The constant background was calculated from the average of the lowest observed PM_{10} concentrations for each dust event when 24-hour PM_{10} concentrations at any of the sites were above 150 µg/m^3. To avoid including impacts from lakebed dust source areas in the background estimate, the procedures used a simple wind direction filter to exclude hours when the lakebed may have directly influenced observed PM_{10} concentrations. Such hours were removed and daily average background concentrations were recalculated based on the remaining data. Based on these analyses, a default background of 20 µg/m^3 will be added to the model prediction for each receptor location.

6.5 Area Source Characterization

CALPUFF simulations at Owens Lake are sensitive to source configuration. Emissions will be varied hourly according to the methods described in Section 6.6 and dust sources represented as rectangular area sources. CALPUFF contains an area source algorithm that provides numerically precise calculations within and near the area source location. The area source configuration used for the Dust ID model run for the period from July 2002 through June 2003 is shown in Figure C.6.2. The paired Sensit and CSC measurements were assumed to be representative of the horizontal sand flux for irregularly shaped source areas near the sand flux site. Field observers determined the size and shape of the source areas based on GPS mapping after the storms, observation maps made during the storms, and physical surface characteristics. All source areas were represented by sand flux measured at a single site that was applied to a series of 250 m x 250 m cells that were configured to conform to the general shape of the source area represented by the sand flux site.

The following general rules are used to characterize and map source areas on the lakebed:

- Actual source boundaries will be used when available to delineate emission sources in the simulations. Actual source boundaries will be determined using a weight-of-evidence approach considering visual observations, GPS mapping, and surface erosive characteristics. Erosive characteristics that might be considered when defining a source boundary include properties of the soil, surface crusting, wetlands, and the proximity of the brine pool and existing DCMs.

- Source boundaries will also be defined based on the DCM locations. For example, sand flux measurements outside the DCM will be assumed to apply up to the boundary of the DCM. Sand flux measurements inside the DCM will be assumed to apply to the area inside the DCM.

- All source areas will be represented by a series of 250 m x 250 m cells that generally conform to the shape of the source area and share the same hourly sand flux rates as the sand flux site representing that source area. Cells small than 250 m x 250 m may be used near the shoreline to better represent source areas where predicted concentrations are expected to be particularly sensitive to the source area configuration. (Figure C.6.2)

6.6 Estimation of PM_{10} Emissions

Hourly PM_{10} emissions for each source area will be estimated using Dust ID sand flux data and K-factors following the procedures described in Section 5. See also Attachment B of Board Order #160413-01 Sections A.2 and B.1 regarding the order of priority for using K-factors for modeling.

6.7 Simulation of Shoreline Concentrations

CALPUFF simulations will be used to assess whether lakebed source areas cause or contribute to an exceedance of the PM_{10} NAAQS in areas without PM_{10} monitoring sites. Predictions will be obtained using the receptor network that contains more than 1000 receptor locations placed at the regulatory shoreline (approximately at the 3600' elevation) of Owens Lake (see Figure C.6.3).

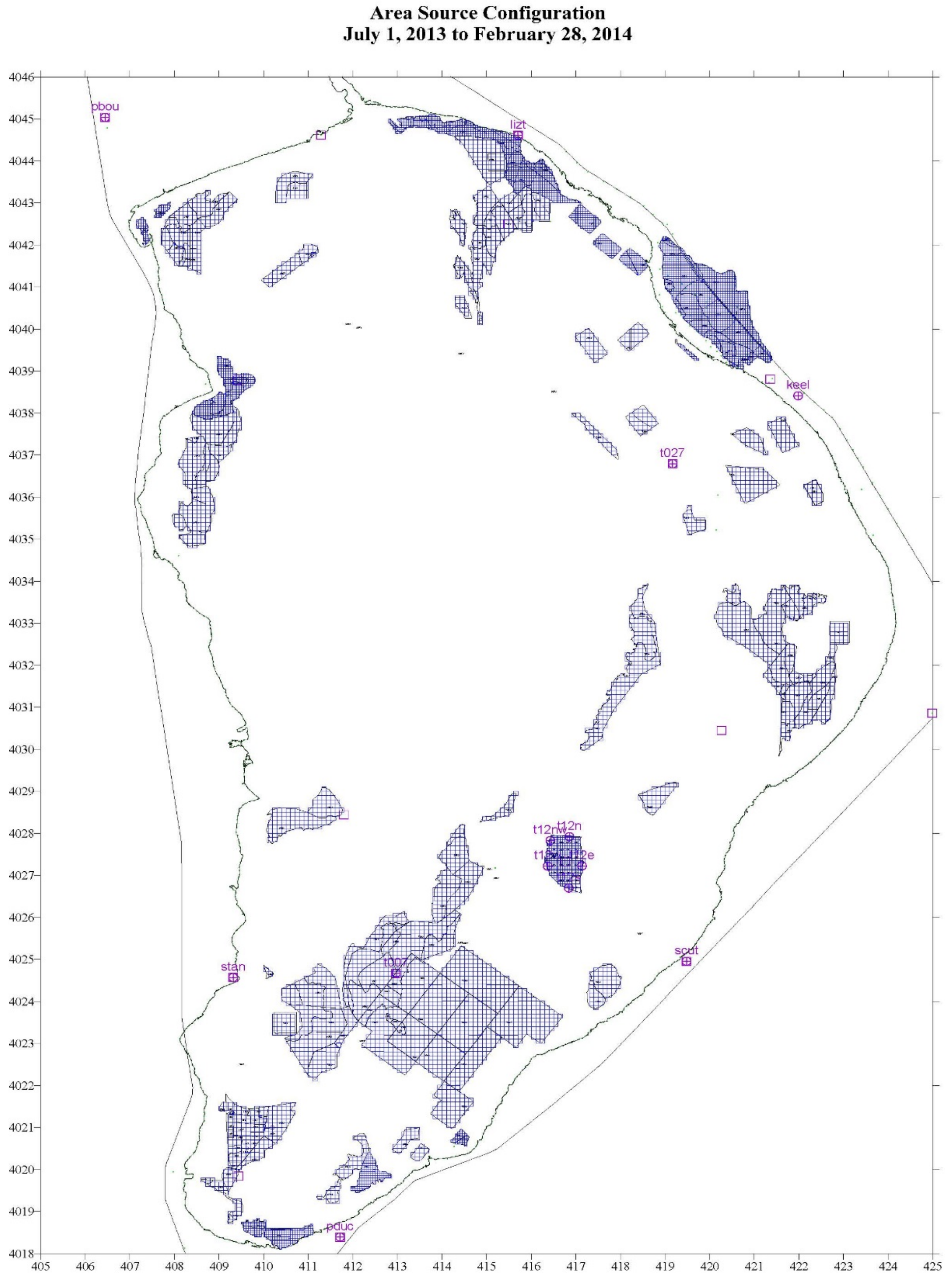


Figure C.6.2. Area Source Configuration.

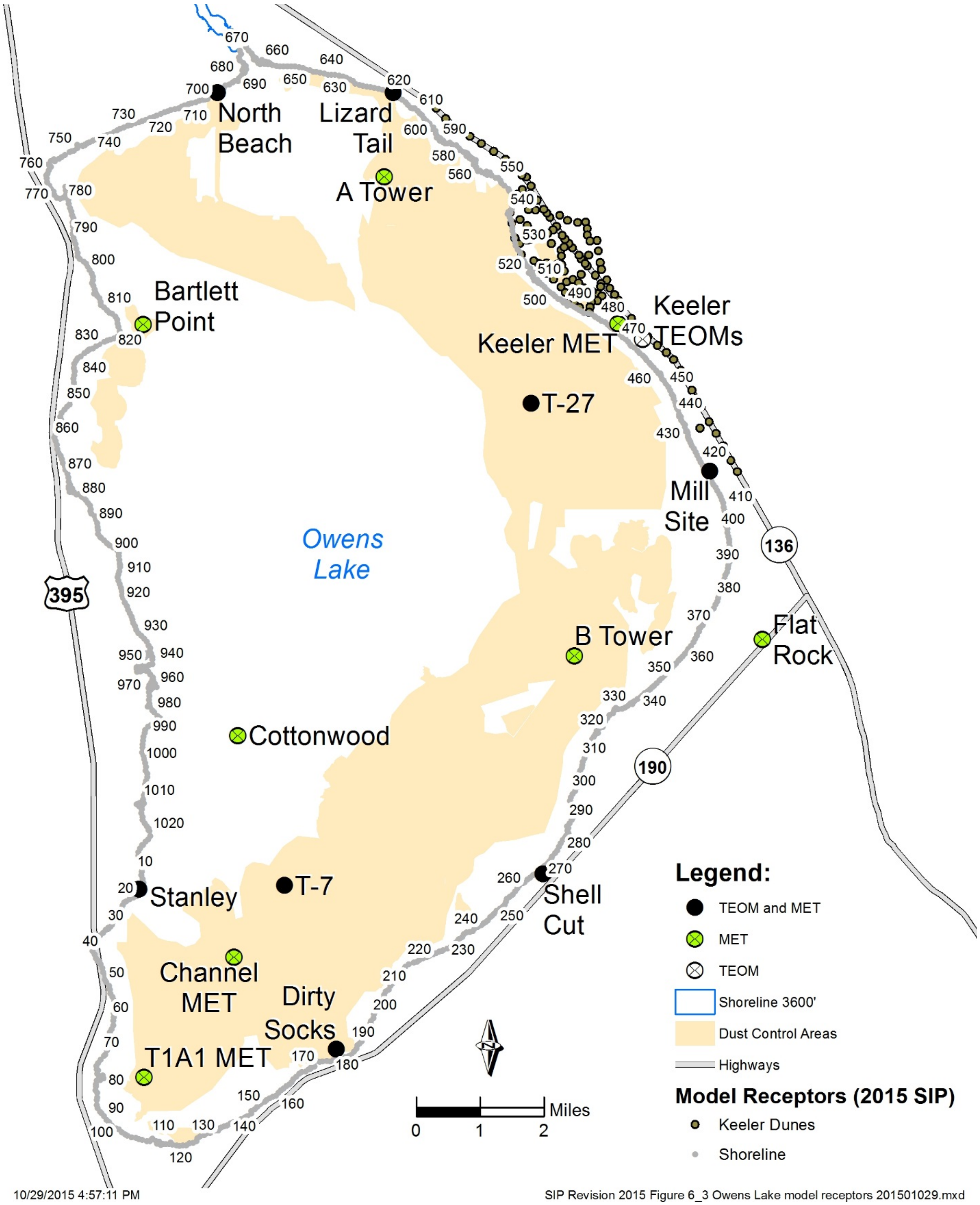


Figure C.6.3. Dust ID Model Receptor Locations.

Board Order 160413-01
Attachment D

2016 Procedure for Modifying Best Available Control Measures (BACM) for the Owens Valley Planning Area

The City of Los Angeles Department of Water and Power (City) may transition from one approved BACM to another provided that, with the exceptions addressed below, the performance standard of one or the other BACM is met at all times during the transition, and that the City makes a complete and technically well-supported written demonstration of that performance, with a built-in margin of safety, to the satisfaction of the APCO in advance of any actions by the City to transition. There are three circumstances under which temporary modifications may be allowed to the BACM identified in this SIP, if certain conditions are met. The circumstances are:

1. Adjustments to existing BACM. Research to demonstrate that sufficient PM_{10} control efficiency during the dust season can be achieved and the NAAQS can be attained everywhere on or above the Regulatory Shoreline with a different performance standard for an existing BACM.

2. Research on new BACM

3. Transition from one BACM to another that requires a time period where neither BACM's performance standards can be met.

The City may make an application for any of these modifications in writing to the APCO. The complete application must include all necessary data and other technical information to support the application. Except for the specific limitations set forth below for BACM adjustments to Shallow Flooding, the APCO shall have full and sole discretion to accept, reject or condition the City's application for modifications to BACM on Owens Lake, to require additional technical information, and/or to independently monitor the results of the project, and shall provide her/his decision in writing. This same discretion shall apply to the APCO's consideration of each of the other applications that the City may make as further described below. The APCO will consider and respond to comments made by the City regarding any decision by the APCO to reject, condition or modify an application. Failure by the City to comply with any condition of the project approval may result in the APCO revoking the project approval and directing closure procedures be implemented for the project.

The flexible BACM description under the terms of the Order preclude the application of the U.S. Environmental Protection Agency's Natural Events Policy or Exceptional Events Rule for monitoring data used to make the determinations in this Attachment. All monitored PM_{10}

concentrations that meet the EPA quality-assurance requirements contained in 40 CFR Part 58 and are measured at stations located at or no more than 3 kilometers above the Regulatory Shoreline (shoreline monitors) will be used in the analysis. The monitored values will be used as measured, and will not be adjusted for from-the-lake and non-lake wind directions. The modeling for the determinations will be performed in accordance with the 2016 Owens Lake Dust Source Identification Program Protocol (Board Order 160413-01, Attachment C).

1. ADJUSTMENTS TO EXISTING BACM

A. BACM Adjustments to Shallow Flooding

1. The City shall have the option to conduct field testing to refine the wetness cover requirement to achieve 99 percent control efficiency in Shallow Flood areas (Shallow Flood Cover Test) within the boundaries of the 2016 Dust Control Areas identified in Paragraph 1 of Board Order 160413-01 (2016 TDCA).

    A. The Shallow Flood Cover Test shall occur on one or more areas totaling not more than 1.5-square-miles, to be selected by the City and approved by the APCO, which approval shall not be unreasonably withheld, from within the 2016 TDCA areas requiring 99 percent control.

    B. The Shallow Flood Cover Test design shall be prepared by the City and approved by the APCO, which approval shall not be unreasonably withheld, prior to implementation. Based on that design, the APCO will reasonably determine wetness cover requirements for the Shallow Flood Cover Test.

    C. The City will be CEQA lead agency for the Shallow Flood Cover Test and shall secure all required responsible agency approvals, permits and leases.

2. If the APCO reasonably determines in writing that all required PM_{10} Dust Control Measures in the 2016 TDCA have been operational for one continuous year (defined as 365 consecutive days) with no exceedance of the federal standard at monitors located at or above the Regulatory Shoreline caused solely by sources within the 2016 TDCA, the City shall be permitted to reduce the wetness cover by an average of 10 percent over those Shallow Flood areas requiring 99 percent control efficiency, excluding areas identified in Section A.2.C, below, provided that:

    A. Application of the 10 percent reduction in wetness cover during the May 16 through June 30 Shallow Flood areal wetness cover reductions provided for in Paragraphs 9.B and 9.C of Board Order 160413-01 shall result in the lower of:

        i The areal cover resulting from a 10 percent reduction; or

        ii. The areal cover required in Paragraphs 9.B and 9.C of Board Order 160413-01.

B. To implement the reductions set out in this Section, the City shall be required to first submit a written Wetness Cover Plan to the District for reducing the wetness cover on the eligible areas. The Wetness Cover Plan shall take into account:

   i. The results of testing carried out pursuant to Section A.1, if conducted; and

   ii. The results of fall and spring Shallow Flood wetness cover reduction operations carried out pursuant to Paragraphs 9.B and 9.C of Board Order 160413-01.

C. If, in any year, the Wetness Cover Plan proposes reductions in wetness cover greater than 10 percent in any portion of the Shallow Flood areas covered by the Plan (consistent with the 10 percent limit on the overall average reduction), the City shall obtain the additional written approval of the APCO, which approval shall not be unreasonably withheld.

D. In the event shoreline monitors show an exceedance of the federal standard, whether that exceedance is caused by sources within, outside, or both within and outside of the 2016 TDCA, no further reductions in wetness cover shall be permitted for any Shallow Flood area that has contributed to the exceedance, as determined by the methodology in the "2016 Owens Valley Planning Area Additional BACM Contingency Measures Determination Procedure " (BO #160413-01, Attachment B) and subject to the provisions of Section A.4, below.

E. Except as provided in Section A.4, below, the City may continue to operate using reductions of wetness cover pursuant to a previously approved Wetness Cover Plan.

3. For each Dust Control Season (October 1 of each year through June 30 of the next year) that wetness cover reductions have taken place under the provisions of Section A.2, the City shall prepare and submit to the District a written report summarizing the results of the wetness cover reductions within 90 days after conclusion of the corresponding Dust Control Season. The report shall document the percentage of wetness cover for Shallow Flood areas and the effect(s) of wetness cover reductions on PM_{10} concentrations at the 3,600-foot elevation Regulatory Shoreline.

4. Any areas for which wetness cover has been reduced pursuant to Section A.2 and that cause or contribute to an exceedance of the federal standard at the Regulatory Shoreline shall be remediated by the City under the Remedial Action Plan prepared pursuant to the requirements of Board Order 160413-01, Para. 8.I.

   A. Subject to APCO written approval, which approval shall not be unreasonably withheld, the City may further reduce the wetness cover beyond that allowed in Section A.2 provided that:

      i. The maximum 24-hour PM_{10} shoreline monitor values for at least 365 consecutive days of operation following initiation of the last approved Wetness Cover Plan does not exceed 130 $\mu g/m^3$; and

ii. The City demonstrates to the reasonable satisfaction of the APCO that the modeled contributions from the lake bed for the same time period set forth in Section A.4.A.(i) plus the background of 20 µg/m^3 do not exceed 120 µg/m^3 at the Regulatory Shoreline.

B. If the monitored values at the Regulatory Shoreline exceed 130 µg/m^3, and it is determined that non-lake bed sources are contributing greater than 20 µg/m^3, then the District will expeditiously seek to identify and require control of those non-lake bed sources so that the City may continue to implement efficient DCMs on the lake bed.

C. If the City is entitled to further reduce wetness cover pursuant to this Section, the City shall prepare and submit an updated Wetness Cover Plan to the District to describe the wetness cover proposed for the subsequent, applicable Dust Control Season. The updated Wetness Cover Plan shall include:

i. A map that depicts the eligible Shallow Flood areas;

ii. The proposed amount of wetness cover for each eligible Shallow Flood area; and

iii. The method for determining effectiveness of the proposed wetness cover.

D. The Wetness Cover Plan shall be subject to approval of the APCO, which approval shall not be unreasonably withheld.

B. BACM Adjustment to Measures Other than Shallow Flooding within Existing Dust Control Areas

Requirements to Begin the Process

At least once per year, the District's APCO will determine whether the Owens Lake bed will require BACM Contingency Measures in order to attain or maintain the federal 24-hour PM_{10} NAAQS. The APCO will use the procedure forth in Attachment B of Board Order 160413-01 to make the determination.

If the APCO determines that there were no monitored or modeled exceedances of the PM_{10} NAAQS as described above for the previous calendar year, each calendar year the APCO will do the following:

1) determine from the modeling if there are shoreline receptors where the model shows the combined predicted yearly maximum 24-hour contribution from all source areas on the lake bed contributing to those receptors plus background (24-hour average of 20 µg/m^3) is less than 120 µg/m^3, and

2) determine if there were no concentrations greater than 120 µg/m^3 measured at any shoreline or near-shore monitoring site in the area of those receptors.

The APCO has full and sole discretion to make this determination.

First Step on Test Areas

If there are receptors that meet the requirements described above, and provided that the City is in compliance with SIP control requirements on all areas of the lake bed, the APCO will inform the City that they may submit an application to reduce the level of control within a 1 to 2-square-mile test area of an existing Shallow Flooding Dust Control Measure (DCM) area or within a 160 to 320 acre test area of an existing Managed Vegetation DCM area that the modeling shows contributes to, and only to, the shoreline receptors described above where the yearly maximum 24-hour contribution from the lake bed plus background is less than 120 $\mu g/m^3$. Application may be made for more than one area to be tested simultaneously provided the test areas do not impact any of the same modeled shoreline receptors or monitors (no overlapping impacts). The above limitations on test area size and location do not apply outside the boundaries of existing Dust Control Areas.

For the Managed Vegetation DCM, the cover may be reduced by no more than 5%, *e.g.*, 50% to 45% (one step). For other BACM or changes to compliance averaging areas (*e.g.*, one acre for Managed Vegetation), the APCO will determine the permitted test area size, averaging area, test location and step amount. An area with a non-zero contribution to a receptor will be considered not to contribute to a receptor if the contribution from that area is less than 5 $\mu g/m^3$ and the yearly maximum 24-hour contribution from the lake bed plus background (20 $\mu g/m^3$) to that receptor is less than 140 $\mu g/m^3$. (A "zero contribution" is defined by the accuracy of the instruments used to collect the data, but in no case shall it be greater than 1 $\mu g/m^3$.) The City may also satisfy the requirements of a BACM test for Managed Vegetation with documentation of a site-specific BACM test, along with written justification for more general application of the results of this test.

The City's application to reduce the level of control over any area within the boundaries of existing Dust Control Areas must be accompanied by a modeling analysis that demonstrates that increasing PM_{10} emissions within the test area will not cause the predicted yearly maximum 24-hour concentrations along the shoreline to exceed 120 $\mu g/m^3$, including background (20 $\mu g/m^3$).

The application must also include, but is not limited to:

1) a project description,
2) site plan,
3) any necessary environmental documentation, responsible agency approvals, permits and leases,
4) a protocol to measure PM_{10} emissions and performance standards,
5) a time frame for project milestones and completion,
6) plans to control PM_{10} emissions if they exceed project limits,
7) project closure procedures if the project is discontinued,

8) soil texture information, soil chemistry, groundwater chemistry and applied water chemistry, and
9) a protocol to evaluate control effectiveness, estimate emissions and determine whether the results are transferable to other areas of the lake bed.

For BACM other than Shallow Flooding, the City will submit a relationship between control efficiency and performance standards based upon research results. The APCO has full and sole discretion to accept, reject, or modify that relationship. All modeling will be done according to the Dust ID Protocol in Attachment C.

Rectified aerial photography or satellite images of the area of adjusted BACM, or any other method approved by the APCO, will be used by the APCO to determine the performance standards for the adjusted BACM for this step and all subsequent steps.

All raw data must be shared with the APCO, and all data screening criteria must be approved (or disapproved) in writing by the APCO. The APCO may terminate the test at any time if modeling or monitoring show that modeled (including background of 20 μg/m^3) or monitored emissions are increasing above trigger levels set by the APCO based upon a 140 μg/m^3 modeled or monitored PM_{10} concentration at the shoreline, or if the City is not following the APCO-approved protocol. The APCO has full and sole discretion to determine whether these conditions have been met.

The APCO has full and sole discretion to approve or reject the City's application or require conditions. The APCO will take action and notify the City in writing within 90 days of receipt of the written application. No changes may be made to BACM in advance of the APCO's approval. Any adjustments to BACM will be reported to CARB and the EPA by the APCO within 60 days of the APCO's approval.

Subsequent Steps on Test Areas

The adjusted BACM shall be maintained by the City for one year. No other adjustments to BACM may be made during that year that impact any of the same set of model shoreline receptors. At the end of the year, the City may submit a new application to the APCO to reduce the level of control in the test area by another step provided:

1) the modeled yearly maximum 24-hour contribution at all of the shoreline receptors identified above from all lake bed sources including the test area, plus background (20 μg/m^3), during the test period is less than 120 μg/m^3, and

2) no concentrations greater than 120 μg/m^3 were measured at any shoreline monitor in the area of those receptors during the test period.

The new application must contain all the same elements as the original application, and all the data and modeling from the first step of the test.

The APCO has full and sole discretion to approve or reject the City's application, or to require conditions. Subsequent steps may be made in the same manner. The APCO will take action and notify the City in writing within 90 days of receipt of the written application.

Requirement to Increase Controls on Test Areas

If, at the end of the year the predicted yearly maximum 24-hour contribution from all lake bed sources including the test area plus background (20 µg/m^3) exceeds 140 µg/m^3 at any of the shoreline receptors identified above, and/or concentrations greater than 140 µg/m^3 were measured at a shoreline monitor in the area of the identified receptors, then the City must increase the control efficiency on the test area to the last step that achieved concentrations below the 140 µg/m^3 threshold. For Managed Vegetation, this action must be taken within 12 months of the written determination by the APCO that the requirements for adjusting BACM were not met. For all other PM_{10} control measures, this action must be taken within 60 days of the written determination by the APCO that the requirements for adjusting BACM were not met. The APCO has full and sole discretion to make that determination. The APCO will determine the time scale for compliance for other BACM as part of the approval of the application.

SIP Revision for BACM for the Test Area

After three consecutive years of successful operation of the adjusted-BACM test area (modeled and monitored concentrations less than 140 µg/m^3 as described above), the City may apply to the District for a SIP Revision to redefine BACM for that test area on the Owens Lake bed provided:

1) the predicted yearly maximum 24-hour PM_{10} contribution for each year of the test from the test area plus background (20 µg/m^3) at all shoreline receptors is 140 µg/m^3 or less, and

2) no PM_{10} concentrations greater than 140 µg/m^3 were measured at any shoreline monitor during the three years of the test.

The APCO has full and sole discretion to determine whether these conditions have been met. After public notice and comment and a public hearing, the District Board has full and sole discretion to determine whether to adopt the SIP revision.

Lake-Wide SIP Revision for BACM for a Soil Type

If, after three consecutive years of successful operation of the adjusted-BACM test area, the predicted yearly maximum 24-hour contribution from the test area and all source areas on the lake bed plus background (20 µg/m^3) at all shoreline receptors for all three years of the test is 140 µg/m^3 or less and no concentrations greater than 140 µg/m^3 were measured at any shoreline monitor during the three years of the test, the research conducted on these test areas can be used to determine the relationship between the PM_{10} emissions, control efficiency and DCM performance standards. After the relationship has been identified, the City will use the research results in an updated modeling analysis that applies the test results to other areas on the lake bed with the same general soil type (sand-dominated, silt-dominated or clay-dominated) and under the same range of evaluated emissions or control efficiencies and performance standards as the test. The modeling will cover the entire test period, and will be done in accordance with the Dust ID Protocol. A DCM control map (map) will be prepared of lake bed control efficiencies (with corresponding DCM performance standards) that would be required to achieve the PM_{10} NAAQS everywhere along the Regulatory Shoreline with that DCM in the same general soil type (sand-dominated, silt dominated or clay-dominated) as the test area and under the same range of control efficiencies, emissions, and performance standards evaluated in the test.

The City will then submit this draft map to the APCO for approval. The submittal must contain all the data from the test area and the modeling that produced the map. The APCO has full and sole discretion to approve, disapprove, or modify the draft map.

If the APCO approves the map, the City may apply to the District Board for a SIP Revision to redefine that BACM for that mapped area on the Owens Lake bed. After public notice and comment and a public hearing, the District Board has full and sole discretion to determine whether to adopt the SIP Revision. If a SIP Revision identifying a redefined BACM for Owens Lake is adopted by the District Board and approved by EPA, the redefined BACM may be implemented anywhere designated by the new DCM control map. If the City has implemented a different DCM in the mapped area, the requirements of the following section below titled "Transitioning From One BACM to Another BACM" must also be met. If any modeled or monitored exceedance of the PM_{10} NAAQS results from these adjustments to BACM, the City shall implement the necessary actions and measures to restore the area to attainment with the NAAQS (BO 160413-01, para. 8.I.).

As many of the existing and potential dust control areas on the Owens Lake bed fall under the jurisdiction of the California State Lands Commission and other responsible agencies, the City must secure the appropriate approvals, leases and permits prior to implementing adjustments to existing BACM. However, nothing in this section is intended to give any responsible agency any authority beyond their authority under law.

2. RESEARCH ON POTENTIAL NEW BACM

The City may test new dust control measures at any time on areas of the lake bed that are emissive, except within the 2016 TDCA footprint where BACM must be implemented by December 31, 2017 or within any contingency measure areas where existing BACM has been implemented or is scheduled for implementation. If the City has tested a new control measure for three years in this manner, it may apply in writing to the APCO for a SIP Revision to designate the new dust control measure as BACM. The application must meet all USEPA requirements for BACM designation and demonstrate to the APCO's satisfaction that the new control measure is sufficient to achieve the required PM_{10} emission reductions or control efficiency during the dust season and attain the NAAQS everywhere on the shoreline. The APCO has full and sole discretion to determine whether these conditions have been met.

The application shall include, but not be limited to:

1) a description of the new dust control measure
2) a description of the test site and the meteorological conditions under which it was tested

3) the measured PM_{10} emissions during the test
4) the test time frame
5) all raw data collected during the test
6) all data screening criteria and final data sets
7) data supporting the conclusion that the required control efficiency was achieved
8) a performance standard that the new dust control measure must meet in order to achieve the required emission reductions or control efficiency
9) an analysis of any environmental impacts of the dust control measure
10) the appropriate responsible agency approvals, permits and leases

The application must include modeling that demonstrates that the required PM_{10} emission reductions or control efficiency can be achieved during the dust season anywhere this control measure may be implemented on Owens Lake, and the NAAQS can be met at all times everywhere along the 3,600-foot elevation Regulatory Shoreline.

If the APCO determines that the application is complete and the above conditions have been met, the APCO shall have full discretion to select or approve a method of determining compliance of the proposed new BACM with its performance standard and include that method in the description of the proposed BACM for the SIP Revision. The District Governing Board has full and sole discretion to determine whether to adopt a SIP Revision for approval of any new BACM.

Upon adoption by the District Board, approval by CARB, and submission to USEPA of a SIP Revision that identifies a new BACM for Owens Lake, the City may implement only this one new control measure on one-half square mile of the next area to be identified as needing control as a BACM Contingency Measure until EPA approves this new measure as BACM. No other new control measures may be implemented on areas identified as needing control as a BACM Contingency Measure until EPA approves this new measure as BACM. The District Governing Board may limit the new BACM to specific circumstances, for example, distance of the new dust control measure from the shoreline or approval in a specific general soil type. Upon approval by USEPA, the new BACM may be implemented per the requirements described in the following section, "Transitioning From One BACM to Another BACM," or on any subsequent areas requiring control as a BACM Contingency Measure, subject to any limitation to specific circumstances.

As many of the existing and potential dust control areas on the Owens Lake bed fall under the jurisdiction of the California State Lands Commission and other responsible agencies, the City must secure the appropriate approvals, leases and permits prior to implementing any BACM test or new BACM. However, nothing in this section is intended to give any responsible agency any authority beyond their authority under law.

3. TRANSITIONING FROM ONE BACM TO ANOTHER BACM

If the City wishes to transition from one existing BACM to another existing BACM without meeting the performance standard of one or the other BACM at all times, it may submit an application to the APCO in writing for permission to do so. The APCO has full and sole discretion to accept, reject or condition the City's application. The transition may be done on areas that in total comprise no more than three (3.0) square miles lake-wide for any BACM at one time. These transition areas shall be in addition to the Tillage with BACM Back-up areas implemented by the City. The City shall not begin the transition in advance of the APCO's written approval.

The application shall include, but not be limited to:

1) a protocol that includes a project description
2) a site plan
3) a plan to measure PM_{10} emissions
4) a time frame for project milestones and completion
5) plans to control PM_{10} if emissions exceed any trigger value set by the APCO based upon a 140 µg/m^3 modeled (including background of 20 µg/m^3) or monitored PM_{10} concentration at the shoreline
6) data supporting the assumption that the transition can be completed and the BACM performance standards can be achieved within three years of the start-up of construction
7) project closure procedures if the project is discontinued for any reason or if the PM_{10} trigger value is exceeded
8) any necessary environmental documentation, responsible agency approvals, permits and leases
9) a dust control plan for the construction and transition period consistent with District Rule 401.A.

The protocol must include modeling in accordance with the Dust ID Protocol that predicts that the NAAQS will be met at all times everywhere on the shoreline during the transition period, and must include a method to monitor emissions continuously throughout the transition period. The transition must be complete, and the new BACM performance standard achieved, within three years of written notification from the City to the APCO that they are no longer maintaining the performance standard for the existing BACM, and are beginning the transition.

All raw data must be shared with the APCO, and all data screening criteria must be approved (or disapproved) in writing by the APCO. The APCO may terminate the transition at any time if modeling or monitoring show that emissions are increasing above any pre-set trigger level described in 5) above, or if the City is not following the APCO-approved protocol. The APCO has full and sole discretion to determine whether these conditions have been met.

During construction of the Transition Areas, the Transition Areas may not be compliant at all times with the BACM requirements set forth in Governing Board Order 080128-01. The City therefore shall take "Reasonable Precautions" to control particulate matter emissions to the extent practicable during construction of the Transition Areas as set forth in District Rule 401A (adopted 09/05/74; amended 12/04/06). The City will develop a Conceptual Dust Control Plan for the Transition Areas consistent with, and considered to be the Reasonable Precautions required by District Rule 401.A. – Fugitive Dust.

Upon completion of the design of the Transition Areas and prior to any construction or any time when dust control measures in Transition Areas may be modified in a manner that would cause the areas not to comply with BACM requirements, the City shall submit to the APCO for the APCO's approval a final Dust Control Plan. The APCO shall expeditiously review the City's plan and shall not unreasonably withhold his approval of such plan.

If the Transition Areas are not BACM compliant and if there is a monitored exceedance or if the Dust ID Protocol predicts an exceedance of the National Ambient Air Quality Standard for PM_{10} caused solely by emissions from the Transition Areas (as determined by the Dust ID Protocol in Attachment C, the City shall immediately implement additional controls as provided in the approved Dust Control Plan to eliminate the exceedance. The APCO shall require additional controls beyond those contained in the approved Dust Control Plan if the original plan's provisions are not sufficient to prevent exceedances of the air quality standards. If the City fully complies by immediately implementing the necessary controls, the District shall not take further enforcement action pursuant to the Health and Safety Code, a variance will not be required and the Respondent shall not be deemed in violation of this Order.

If the data show to the APCO's satisfaction that the transition has been accomplished while attaining the NAAQS everywhere at the shoreline, the City may submit an application to the APCO to allow another area to be transitioned. The APCO has full and sole discretion to accept, reject or condition the City's application. The same procedures outlined above will apply.

As many of the existing and potential dust control areas on the Owens Lake bed fall under the jurisdiction of the California State Lands Commission and other responsible agencies, the City must secure the appropriate approvals, leases and permits prior to BACM transitions. However, nothing in this section is intended to give any responsible agency any authority beyond their authority under law.

Brine with BACM Backup
(Brine BACM)

Description of the use of Brine as a PM_{10} Dust Control Measure on Owens Lake

Report By:
Great Basin Unified Air Pollution Control District
January 2016

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Brine with BACM Backup
(Brine BACM)

Description of the use of Brine as a PM_{10} Dust Control Measure on Owens Lake

Great Basin Unified Air Pollution Control District

January 2016

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LIST OF FIGURES

Abbreviations and Acronyms

APCO	Air Pollution Control Officer
BACM	Best Available Control Measure
Brine BACM	Brine with BACM Back-up
cm	centimeter
DCA	Dust Control Area
DCM	Dust Control Measure
DEM	Digital Elevation Model
District	Great Basin Unified Air Pollution Control District
DWMP	Dynamic Water Management Plan
IPET	Induced Particulate Emission Test
LADWP	Los Angeles Department of Water and Power
PM_{10}	Particulate matter 10 micron or less in size
SIP	State Implementation Plan
TwB2	Tillage with BACM Back-up

Terms and Definitions

Saturated Salt Solution: A solution is saturated if it won't dissolve any more of the salt at that particular temperature - in the presence of crystals of the salt. The saturation point of a salt solution is dependent primarily on the composition of the dissolved salts and temperature. The saturation level of a sodium chloride solution is about 26-28% and changes only a small amount with temperature. The saturation levels of sodium carbonate, sodium bi-carbonate, and sodium sulfate solutions are highly variable with temperature.

Evaporative Salt Deposit: A deposit of interlocking salt crystals formed by precipitation of salts from standing brine on top of the soil surface. This is different from the conventional "capillary salt crust" found on much of the Owens Lake bed.

Capillary Salt Crust: A crust formed at the soil surface by upward capillary movement of saline water through the soil column and subsequent precipitation of salt minerals. The crust generally consists of a mix of salt minerals and soil particles.

Brine with BACM Backup
(Brine BACM)

Description of the use of Brine as a
PM_{10} Dust Control Measure on Owens Lake

Great Basin Unified Air Pollution Control District

January 2016

1.0 Overview of Brine BACM for PM_{10} Dust Control

The Owens Lake system is enriched with salts. The salts are present both in solution in water and in solid form in the soils and at the surface as salt crusts. Using those salts for dust control purposes has been proposed by multiple people and entities over the years as a way to utilize the local mineral resource and as a way to reduce overall fresh water consumption on the lakebed. Use of salts for dust control can be incorporated into an overall salt management plan for the dust controls on the lake bed. Proposals have ranged from two extremes which utilize "brine" either to directly wet the surface (i.e. a form of Shallow Flooding) to managing the chemistry by controlled precipitation of salt phases from a "brine" solution in order to create a non-emissive stable evaporative salt deposit (salt ponds/salt flats). The use of brine as a dust control measure, as described here, is based on observations and measurements from both test areas as well as naturally occurring areas on Owens Lake.

Mining of the mineral trona (a hydrated sodium carbonate-bicarbonate salt) has a long history on Owens Lake in order to produce soda ash. Mining operations first began in the late 1800's on the eastern shore of the lake in association with the narrow gauge Carson and Colorado railroad. As the lake receded following diversions of water from the Owens River and tributary streams, mining operations moved largely to the western side of the lake shore. Additionally, as the salt concentration of the lake water increased, mining methods switched from controlled precipitation of trona directly from lake water in evaporation panels to harvesting precipitated trona deposits on the lakebed. Currently, salt mining on Owens Lake is conducted by Rio Tinto Minerals with operations on the lakebed in the southern portion of the brine pond.

The salt chemistry on Owens Lake is dominated by five main elements and/or compounds. The main cation, sodium (Na^{+1}), is bonded with four different anions, carbonate (CO_3^{-2}), bi-carbonate (HCO_3^{-1}), sulfate (SO_4^{-2}) and chloride (Cl^{-1}), to form a suite of different salt minerals many of which have molecules of water incorporated into their crystal structure. The sodium carbonate, bi-carbonate, and sulfate minerals are highly sensitive to temperature such that the order of crystallization during evaporation and the hydration state of the minerals changes seasonally. These dynamic mineral phase changes and crystallization sequence changes make development and maintenance of a long-term compositionally stable salt flat difficult for dust control.

In 2013, as part of a Settlement Agreement between the District and LADWP, the use of "brine" was approved as a BACM modification termed "Brine Shallow Flood" for use on Owens Lake (2013 SOA). However, no definition of Brine Shallow Flood was ever developed such that the requirements for Brine Shallow Flood were the same as for the original Shallow Flooding BACM (72 to 75% wetness cover for 99% dust control, depending on location). Although shallow flooding areas with brine reduces water use in a given area due to the low evaporation rate of brine as compared with fresher water, both the District and LADWP recognize that "brine" is capable of providing required dust control with reduced wetness cover levels combined with a precipitated evaporative deposit with little to no visible liquid, thereby reducing overall water use even further.

Six separate areas totaling 0.92 square miles have been tested collaboratively between the District and LADWP since 2012-2013 in an effort to learn more about the effectiveness and requirements for PM_{10} dust control (Figure 1). Investigations of brine test areas show that effective dust control is provided by a combination of wetness cover and presence of thick stable salt crusts. Thus, the definition of "Brine BACM", presented here, is based on the presence of these stable surfaces.

Fundamentally, "Brine BACM", as described here, is a version of Shallow Flooding BACM except that the requirement for covering the surface with water to meet prescribed Shallow Flooding wetness cover is only needed when the surface condition of an area deteriorates such that it is in a potentially emissive state. Officially, the dust control measure described here is termed Brine with BACM Back-up, due to the provision for re-wetting areas per Shallow Flooding requirements, however, for ease of use, the synonymous term Brine BACM shall be used.

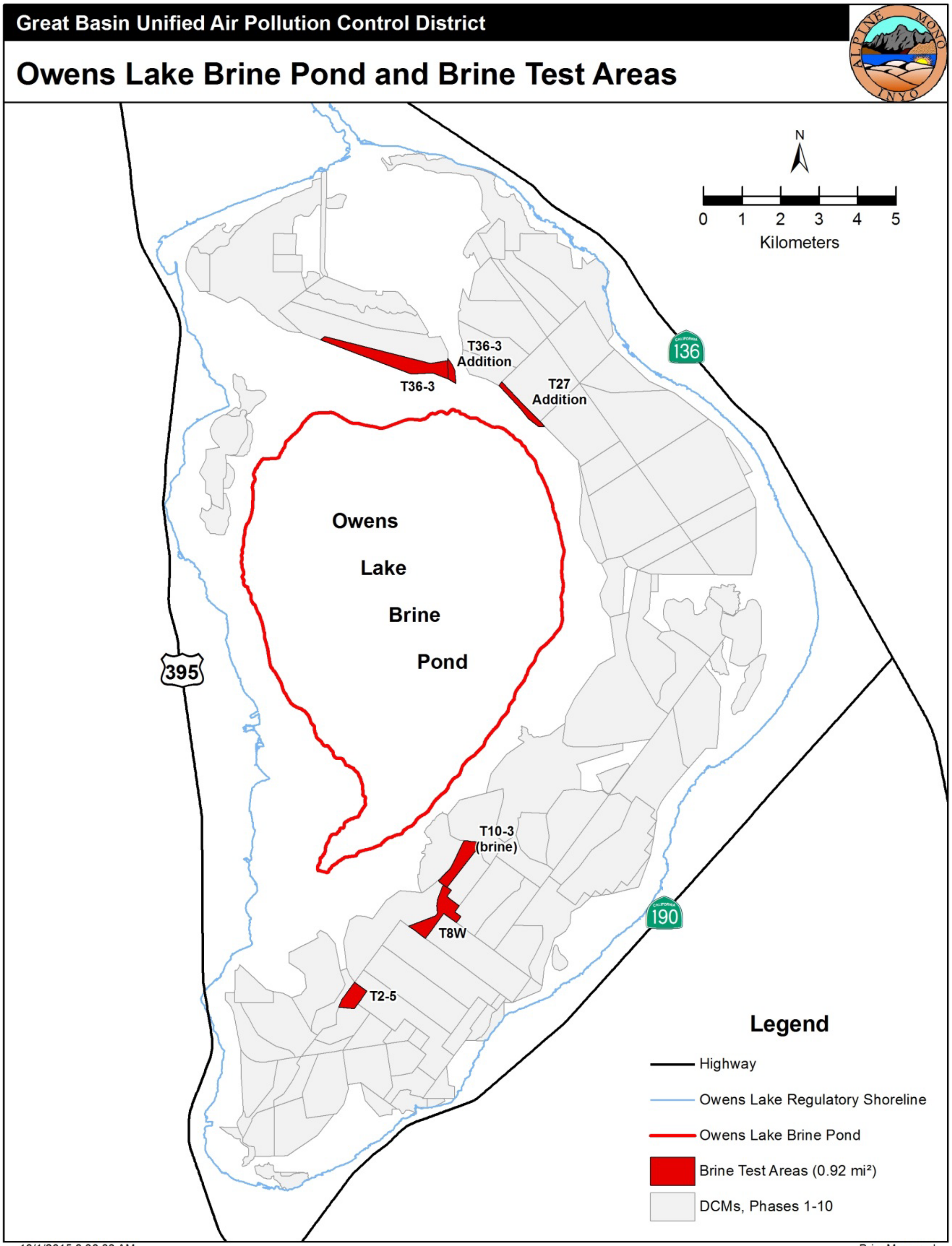

Figure 1. Map of Owens Lake dust controls showing brine test areas and Owens Lake Brine Pond.

2.0 Brine Test Areas

All of the test areas are located on the inner or lower elevation portions of the dust control project near or adjacent to the brine pond (Figure 1). Prior to the start of testing, all of the areas were operated as Shallow Flooding BACM. In the Owens Lake dust control project, the salinity of the water in the Shallow Flooding areas generally increases through the system such that the areas at the lowest elevation or with the longest flow path have the highest salt content. All DCAs being tested as brine areas contained high salinity water and low habitat value for birds prior to the initiation of testing. As with other forms of water-efficient DCMs (e.g., gravel, tillage), brine areas have low habitat value.

The first brine test area began operation in 2012 in the northwestern portion of the T10-3 DCA. The condition of the T10-3 test area has been monitored through visual and surface observations and with sand flux monitoring instrumentation since 2012. During this period there have been no observed or monitored dust emissions or source area activity. The T10-3 brine test has been operated with little to no water inflow added (other than direct precipitation) into the DCA cell during its operation.

The surface of the T10-3 brine test area consists of a mix of brine, wet[1] and dry evaporite crust[2], and wet and dry conventional salt crust (termed capillary crust). Additionally, within the T10-3 brine test area there are areas of preserved tillage ridges from temporary tillage conducted in 2009 during Phase 7 project construction. While the preserved tillage ridges provide some surface roughness, they are covered with a thick (10-15 cm) capillary salt crust such that the surface protection mechanism is considered to be from the thick crust development and not the surface roughness.

Based on the success of the T10-3 brine test, five additional test areas started operation in 2013. Monitoring of these areas shows that they have remained non-emissive since testing began. Photos of the three main stable surfaces present in the brine test areas are provided in Figures 2 through 5.

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[1] The term “wet” crust is used here instead of “saturated” to note that the surface meets the criteria for Shallow Flooding compliance. This is to distinguish between the dual meanings of the term indicating being hydrologically saturated as opposed to chemically saturated. Hypersaline brine and associated evaporite crusts on Owens Lake in many cases are both.

[2] The term evaporite crust is used to describe a deposit of interlocking salt crystals formed by precipitation of salts from standing brine on top of the soil surface. This is different from formation of conventional salt crust on the lakebed surface formed by upward capillary movement of saline water through the soil and subsequent precipitation of salts.

Figure 2. Oblique air photo of T36-3 DCA test area. Open brine is visible as dark red to pink colored areas. White surface is an evaporite crust forming from precipitation of salts from the brine. Heaved pressure ridges in the evaporite crust are visible and divide the brine into a polygonal structure. The width across the dust control cell is approximately 100 meters.

Figure 3. Stable non-emissive evaporite crust formed in T8W DCA test area. Heaved pressure ridges in the evaporite crust create large-scale polygonal structure.

Figure 4. Photo of non-emissive capillary brine salt crust present in the western portion of the T36-3 test area. Crust is located on a slightly elevated portion of the area. The capillary brine crust is 15 to 20 centimeters thick in this area. Note the presence of a mix of open brine and evaporite crust in the upper left.

Figure 5. Photo of the T27-Addition test area with thick heaved capillary brine crust in the foreground transitioning to an evaporite salt deposit in the middle of the picture.

3.0 PM_{10} Control Effectiveness for Brine BACM

Brine test areas have been very effective in controlling wind-blown dust and PM_{10} at Owens Lake with no observed or monitored dust emissions. The design of Brine BACM is modeled on these test areas as well as the approximately 25 square mile brine pond, situated in the lowest portion of the lake bed. The test areas and brine pond consist of a mixture of open brine, evaporite salt deposit and conventional capillary salt crust. The brine pond has been observed to be stable with respect to dust emissions and has not been identified as a source of PM_{10} exceedances within the Owens Valley Planning Area since monitoring and observations of dust sources began in the late 1980's. The conditions found in the brine pond have been successfully replicated in the test areas controlling PM_{10} emissions from those areas.

Visual observations and sand motion monitoring conducted on the brine test areas have shown no dust plumes originating from the test areas such that the control effectiveness for reduction in PM_{10} is estimated to be at least 99 to 100% during the testing period. However, since testing of the brine areas has been conducted from 2012- 2015, during a multi-year drought, it is unknown if the brine areas would continue to be stable when subjected to typical winter storms and precipitation. This uncertainty is due to the dynamic nature of the salt minerals on Owens Lake which go through compositional phase changes when subjected to precipitation in the winter. Under the right conditions (typically following winter snow or rain events), the daily transitioning between the hydrated and dehydrated phases of the salt minerals can create an emissive salt powder on the surface. Some of the highest concentrations of PM_{10} from the lake bed have been measured under these conditions.

Thus, Brine BACM is not designated as a standalone measure but has the requirement that should the surface conditions within an area deteriorate or the overall extent of the protective brine and salt crust cover decrease below prescribed levels; the area will either be re-wetted such that it meets Shallow Flooding BACM control requirements or will have maintenance activities performed to restore compliant surface coverage. Triggers for maintenance and re-flooding activities are provided in Sections 5.1 and 5.2. In this manner, the control effectiveness will always be maintained at least at 99%.

4.0 Brine BACM Compliance Monitoring and Enforcement

The distribution of component stable surfaces in the areas controlled with Brine BACM can be determined by visual observation, aerial photography, satellite imagery or any other method approved by the APCO. The combined areal surface cover of qualifying component stable surfaces within a Brine BACM area must be at least the percentage required for fully compliant Shallow Flooding BACM. Currently, Shallow Flooding areas requiring 99% control efficiency must have 72% to 75% wetness cover, depending on location. Similarly, Brine BACM areas requiring 99% control must have 72% to 75% total surface cover (depending on the original Shallow Flooding cover requirement) of a mix of stable qualifying surfaces. For areas requiring less than 99% control, the surface coverage of component surfaces shall be determined by the current Shallow Flooding control efficiency curve (Figure 6). Surface cover percentages required to achieve required control efficiencies may be modified based on approved results of Shallow Flooding curve refinement testing.

4.1 Qualifying Stable Surfaces in Brine BACM

Stable surfaces for Brine BACM shall be defined as consisting of standing water, evaporite salt deposit, and capillary brine salt crust with the following conditions:

1) Water: Standing water or hydrologically saturated surface as defined by Shallow Flooding BACM. Water may have any salinity.

2) Evaporite Salt Deposit: A crystalline deposit of salt minerals precipitated on the surface of the lake bed from evaporation of Owens Lake brine. The evaporite salt deposit does not include the development of salt crust by upward capillary movement of saline fluids through the soil column. The evaporite salt deposit must have an average thickness of 1.5 centimeters or greater and may be either wet or dry.

3) Capillary Brine Salt Crust: A crust enriched in salt minerals formed at the soil surface by upward capillary movement of water through the soil. The capillary brine crust typically consists of a mix of salt minerals and soil particles in various proportions. The capillary brine salt crust within a Brine BACM area must have an average thickness of 10 centimeters or greater and may be either wet or dry.

There is no salinity threshold requirement for water within a Brine BACM area since dust control is achieved by the wetness of the water and not the salt content. However, for long term maintenance of a Brine BACM area, use of hypersaline water or “Owens Lake brine” is recommended due to the extremely low evaporation rate and so it can be used to create stable evaporite salt deposits.

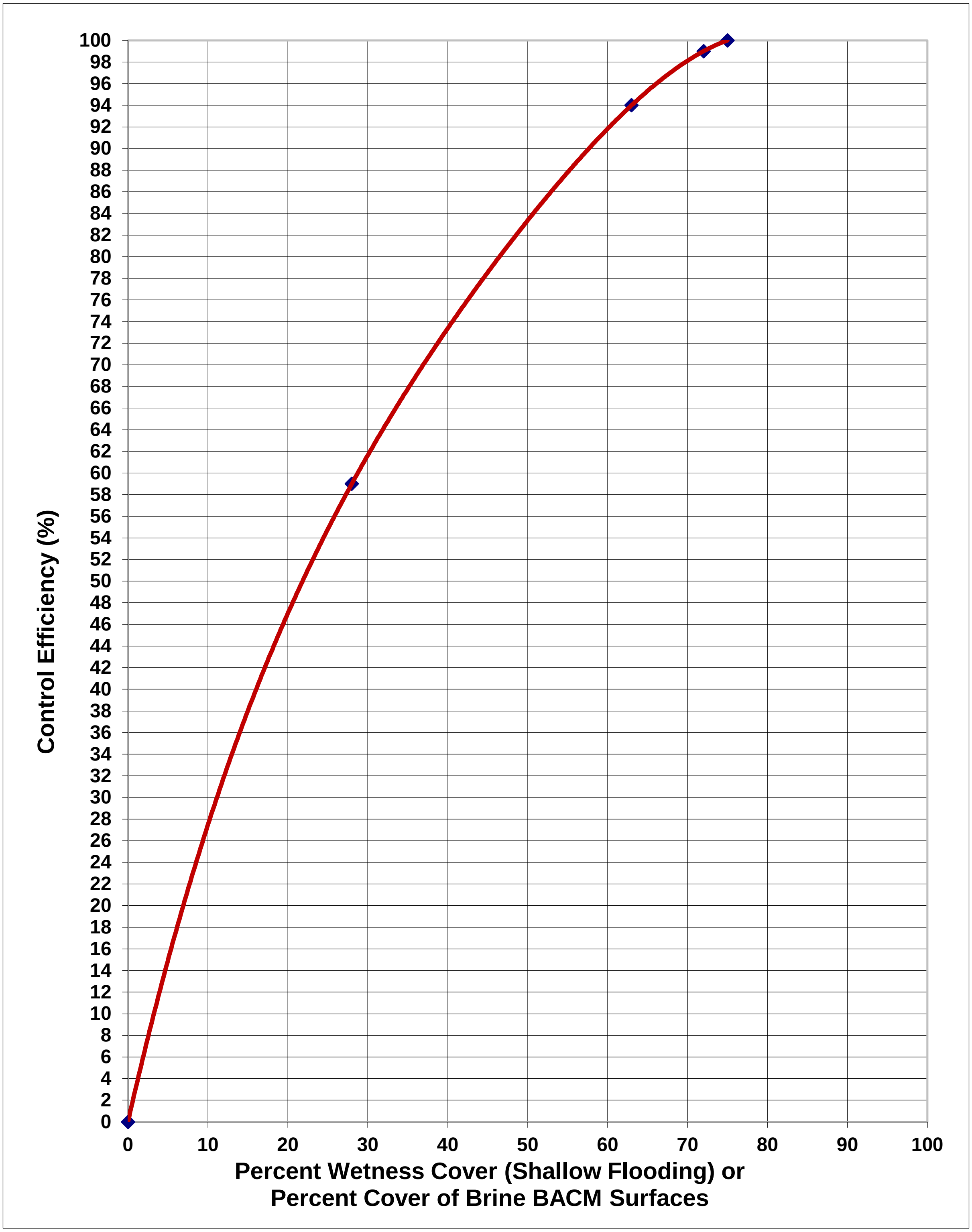

Figure 6. Shallow Flooding control efficiency curve used to determine the percentage of surface cover required for the three qualifying stable surfaces that are part of Brine BACM.

The required surface cover within each Brine BACM area can be achieved solely with water or solely with an evaporite salt deposit (≥1.5 cm thickness). Thus compliance can be determined based on the presence of these two surfaces by themselves. However, a capillary brine salt crust (≥ 10 cm thickness) must be accompanied by either water and/or an evaporite salt deposit. The proportion of qualifying capillary brine crust within a Brine BACM area cannot exceed one-third of the required total compliant cover within a Brine BACM area.

Currently, the District will use publically available USGS Landsat satellite imagery and a process described by the District's remote sensing consultant, Desert Research Institute (DRI, 2014) for Shallow Flooding areas to assess the percent cover of Brine BACM areas by water, wet evaporite salt deposit, and wet capillary crust. The proportion of a Brine BACM area consisting of stable dry evaporite salt deposit or stable dry capillary brine crust will be determined using airborne photography or imagery and remote sensing techniques combined with field verification. The details for compliance monitoring of the Brine BACM areas to determine if they meet the required performance criteria are available in Section C of Attachment A to this report.

4.2 Exempted Portions of Brine BACM Areas

The following portions of the areas designated for control with Brine BACM are exempted from the stable surface requirements:

1. Raised berms, roadways and their shoulders necessary to access, operate, and maintain the control measure which are otherwise controlled and maintained to render them substantially non-emissive.
2. Raised pads containing vaults, pumping equipment or control equipment necessary for operation of existing infrastructure which are otherwise controlled and maintained to render them substantially non-emissive.

"Substantially non-emissive" shall be defined to mean that the surface is protected with gravel or durable pavement sufficient to meet the requirements of District Rules 400 and 401 (visible emissions and fugitive dust).

5.0 Brine BACM Operation and Maintenance

The protocol for operation and maintenance of Brine BACM areas is provided in Attachment B to this report. Brine BACM areas shall at all times during the dust season, consist of a mixture of water, evaporite salt deposit with a minimum average thickness of 1.5 centimeters, and capillary brine salt crust with a minimum average thickness of 10 centimeters such that the total percent areal coverage meets that required for compliant Shallow Flooding BACM. There is no limit on the proportion surface cover of water or evaporite salt deposit within a Brine BACM area, however, the proportion of capillary brine salt crust shall not exceed more than one-third of the required total compliant surface cover of a Brine BACM area.

The dust season shall be defined as extending from October 16 to June 30 of the following year except as modified by the Dynamic Water Management Plan (GBUAPCD, 2016b). Brine BACM can be implemented for dust control on Owens Lake where Shallow Flooding infrastructure exists and Shallow Flooding can be implemented to ensure that Brine BACM areas do not cause or contribute to PM_{10} standard exceedances.

Site operations are expected to be minimal since the component stable surfaces that contribute to the required aggregated surface coverage in Brine BACM areas generally change slowly. Each Brine BACM area shall be operated such that the total areal extent of the surface cover of the qualifying surfaces are maintained such that they meet or exceed those as defined by the Shallow Flooding control efficiency curve (or its approved refinement). The total combined mosaic of stable Brine BACM surfaces shall be substantially evenly distributed across the dust control area per the requirement of Shallow Flooding BACM.

The areas operated with Brine BACM will be monitored by the District to ensure that the stable surfaces within the Brine BACM areas meet the required cover requirement (Figure 6) and that they remain stable and non-emissive. Wetness cover monitoring of Brine BACM DCAs will be conducted regularly throughout the dust season as part of the routine Shallow Flooding compliance determinations. Evaluation of the stable evaporite salt deposit and capillary brine crust surfaces will be conducted primarily in the fall prior to the beginning of the October 16 dust season. Additional crust surface monitoring will be conducted, as needed, if conditions are observed to change within a Brine BACM area or within 30 days of ordered maintenance or re-flooding activities. The technical method for conducting compliance monitoring for Brine BACM areas is provided in Section C of Attachment A.

Monitored areas that have deteriorated such that the three component qualifying stable surfaces no longer meet the aggregated required surface coverage and/or are determined to no longer provide the required PM_{10} control will require either some type of maintenance action or addition of water to re-establish the performance criteria. The protocol for operation and maintenance of Brine BACM areas is provided as Attachment B to this report.

The District will use results from Induced Particulate Emission Test (IPET) testing, sand flux monitoring, field measurements of the thickness of evaporite and capillary crusts along with surface integrity observations, aerial photography, video and remote sensing techniques to document the condition and potential emissivity of Brine BACM areas. Conditions including, but not limited to, presence of loose soils, powdery salt efflorescence, and erosion of heaved crust ridges will also be used to evaluate the integrity of Brine BACM areas. Since vehicle and foot access across the Brine BACM areas is expected to be difficult, and in some cases impossible, the evaluation for compliance with overall coverage requirements and emissivity will, in many cases, be conducted primarily through remote sensing, aerial photography and visual dust observations.

The conditions that trigger maintenance activities or addition of water (Re-Flooding) are discussed below. Note that the term re-flooding is used throughout the definition of Brine BACM since this measure is a variation of Shallow Flooding BACM. If re-flooding is performed with fresh or relatively low salinity water, although it will re-establish a fully compliant dust control area, it may actually be detrimental to the long term operation of the re-flooded area as Brine BACM since it may dissolve some of otherwise compliant evaporite salt deposit and capillary brine crusts. For long-term successful operation and maintenance of Brine BACM areas it is recommended that, if possible, the re-flooding be completed with "Owens Lake brine" or high salinity water.

5.1 Maintenance Activities in Brine BACM Areas

Maintenance will be undertaken on a Brine BACM area that does not meet the required total aggregate cover of qualifying surfaces or the proportion of capillary brine crust exceeds the allowed one-third of the total required cover, provided the area has not been triggered for re-flooding by conditions in Section 5.2 and Attachment A. If it is feasible, maintenance activities may be conducted only on portions of a Brine BACM area to re-establish the required surface cover.

Examples of maintenance activities that may be undertaken include, but are not limited, to the following.

1) Addition of water to increase the surface coverage within a Brine BACM area.

2) Spreading of existing water within a Brine BACM area to increase surface coverage.

3) Spreading of brine conveyed to the site from elsewhere.

4) Alteration of topography to facilitate items 1, 2, or 3, above.

The goal of maintenance activities is to re-establish the total combined cover of qualifying stable surfaces within a Brine BACM area. Should maintenance activities be needed, the LADWP shall submit a maintenance plan to the District within 14 calendar days of written notification by the APCO. The maintenance plan shall include a description of the activities planned and a schedule for their implementation. Upon approval by the APCO, the plan shall be implemented according to the approval schedule.

5.2 Re-Flooding of Brine BACM Areas

Re-Flooding will be required when a Brine BACM area deteriorates such that it is determined to be potentially emissive. The monitoring and enforcement protocol for Brine BACM areas is provided in Attachment A to this docment.

Conditions that may trigger a re-flood order by the APCO are given below, but are not limited to:

1) Deterioration of an otherwise compliant evaporite salt deposit or capillary brine salt crust such that it is an emissive state. An emissive state will be determined by using the IPET method in the TwB2 monitoring and enforcement protocol (see Attachment C of the 2014 Stipulated Judgement (2014 SJ)).

2) Sand flux at a sand flux monitoring (SFM) site exceeds 5 grams/cm^2/day. Sand flux will be measured following methods in the Dust ID protocol (GBUAPCD, 2016c).

3) Dust plume and surface integrity observations. Dust plume and surface integrity observations will be used in conjunction with sand flux monitoring and/or IPET testing to determine if an area is deteriorating and requires re-flooding. Dust plume observation methods shall follow those in the 2016 Dust ID protocol (GBUAPCD, 2016c).

4) Reduction in total surface cover of qualifying stable brine surfaces. A Brine BACM area shall require re-flooding if the total aggregated combined surface cover of the qualifying Brine BACM surfaces falls below 60% for areas requiring 99% control efficiency. Areas requiring less than 99% control efficiency will require re-flooding if the total aggregated cover of Brine BACM surfaces drops such that there is a 10% loss or more of control efficiency. The relationship between total surface cover and control efficiency shall be determined by the most current approved Shallow Flooding curve. In these cases of reduced surface coverage, there does not need to

be observed dust plumes, mitigation level action from IPET runs or active sand flux greater than 5 grams/cm^2/day.

When a written re-flood order has been made by the APCO, then LADWP shall, within 37 calendar days of such order, re-flood a Brine BACM area so as to re-establish fully compliant Shallow Flooding in accordance with the most current Shallow Flooding BACM requirements. If physically feasible, re-flooding can be limited to portions of the Brine BACM areas that are determined by the APCO to require re-flooding and not the entire Brine BACM area. Such re-flooding orders are not appealable by the LADWP to the District Governing Board, Hearing Board, or any other agency.

6.0 Brine BACM Refinements

Research has shown that all of the brine test areas have provided 99-100% PM_{10} control effectiveness during their operation as brine areas. However, none of the test areas were allowed to "fail" by having their surfaces deteriorate such that they became emissive. Thus it is possible that the areal coverage requirement of component stable surfaces within Brine BACM areas is conservative and that the same level of PM_{10} control can be achieved with less overall surface coverage. Additionally, the minimum thickness requirements for the evaporite deposit and capillary crusts may be greater than what is needed to achieve the level of dust control required on Owens Lake. The surface cover requirements and crust thickness were set at levels supported by investigation of test areas and naturally stable areas on the lake bed and where the District is confident that the required level of PM_{10} control will be achieved.

The total cover of qualified Brine BACM surfaces required in Brine BACM areas is tied to the Shallow Flooding BACM wetness cover curve. Should there be refinements to the Shallow Flooding wetness cover curve, such refinements shall apply to the cover requirements for Brine BACM areas.

The APCO acknowledges that IPET, sand flux and crust thickness action thresholds may be conservative for Brine BACM areas. The warning and mitigation trigger values may be adjusted by the APCO for Brine BACM areas based on additional data collected from operating Brine BACM areas. LADWP and the District will meet annually to discuss the results of the monitoring and testing and consider adjustments to the triggers. The APCO reserves the right to adjust the above Brine BACM performance criteria based on supporting data and after consultation with LADWP.

The 2016 SIP contains provision to “fine-tune” the requirements for Brine BACM including: (1) the amount of areal coverage needed of the three stable component brine surfaces to achieve the required PM_{10} control efficiency, and 2) the thickness thresholds of the stable crusted surfaces, respectively. The detailed procedure for the Brine BACM refinements is provided in GBUAPCD, 2016a.

7.0 References

The references listed here include those cited in Attachments A and B to this document.

2013 SOA. 2013 Stipulated Order for Abatement. Board Order 130916-01 Order of the Governing Board Of The Great Basin Unified Air Pollution Control District Amending the 2008 Owens Valley Pm10 Planning Area Demonstration of Attainment State Implementation Plan To Incorporate Revisions To The Date Required For The Implementation Of Best Available Control Measures For The "Phase 7a" Dust Control Areas, Modifying Certain Best Available Control Measure Descriptions And Modifying Provisions For Pm10 Control In The Keeler Dunes. September 16, 2013.

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GBUAPCD, 2016b. 2016 Owens Lake Dynamic Water Management Plan. Great Basin Unified Air Pollution Control District. Attachment F of 2016 SIP. Great Basin Unified Air Pollution Control District. January 2016.

GBUAPCD 2016c. 2016 Owens Lake Dust Source Identification Program Protocol. Attachment C of 2016 SIP. Great Basin Unified Air Pollution Control District. 2016.

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Attachment A

Monitoring and Enforcement Protocol for Owens Lake Brine with BACM Backup (Brine BACM)

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Attachment A

Monitoring and Enforcement Protocol for Owens Lake Brine with BACM Backup (Brine BACM)

January 2016

1.0 Objective

The Great Basin Unified Air Pollution Control District (District) intends to use this protocol as a basis for monitoring and enforcing the Owens Lake PM_{10} control method known as Brine with Best Available Control Measure (BACM) Back-up (Brine BACM). The District intends to use the methods set forth in this protocol as a basis for determining if Brine BACM areas on the Owens Lake bed need maintenance and/or re-flooding in order to maintain or reestablish control efficiency for compliance with the National Ambient Air Quality Standard for particulate matter less than or equal to 10 microns (PM_{10}). The District requires the Los Angeles Department of Water and Power (LADWP) to at all times maintain all Brine BACM areas in compliance with all conditions and procedures contained in this document such that Brine BACM areas provide the percent PM_{10} reduction levels required on Owens Lake.

If a written re-flood order is issued by the APCO, then the LADWP shall within 37 calendar days of such order, re-flood a Brine BACM area so as to re-establish fully compliant Shallow Flooding in accordance with the most current Shallow Flooding BACM requirements. If a written order for maintenance activities is issued by the APCO, then the LADWP shall within 14 calendar days submit a maintenance plan to the District for approval by the APCO. Upon approval, the plan shall be implemented according to the approved schedule. If physically feasible, re-flooding or maintenance activities can be limited to portions of the Brine BACM areas that are determined by the APCO to require re-flooding or maintenance and not the entire Brine BACM area. Re-flooding or maintenance activity orders are not appealable by the LADWP to the District Governing Board, Hearing Board, or any other agency.

A. Introduction

1. Brine BACM is a District-approved variation of the approved Shallow Flood BACM that covers emissive Owens Lake bed surfaces to prevent air emissions with a mix of three stable brine surfaces. The three qualifying component surface classes allowed within Brine BACM areas that contribute to the overall required coverage, as defined by the Shallow Flooding wetness cover curve (Figure A1), include:

   a) <u>Water</u>: Standing water or hydrologically saturated surface as defined by Shallow Flooding BACM. Water may have any salinity.

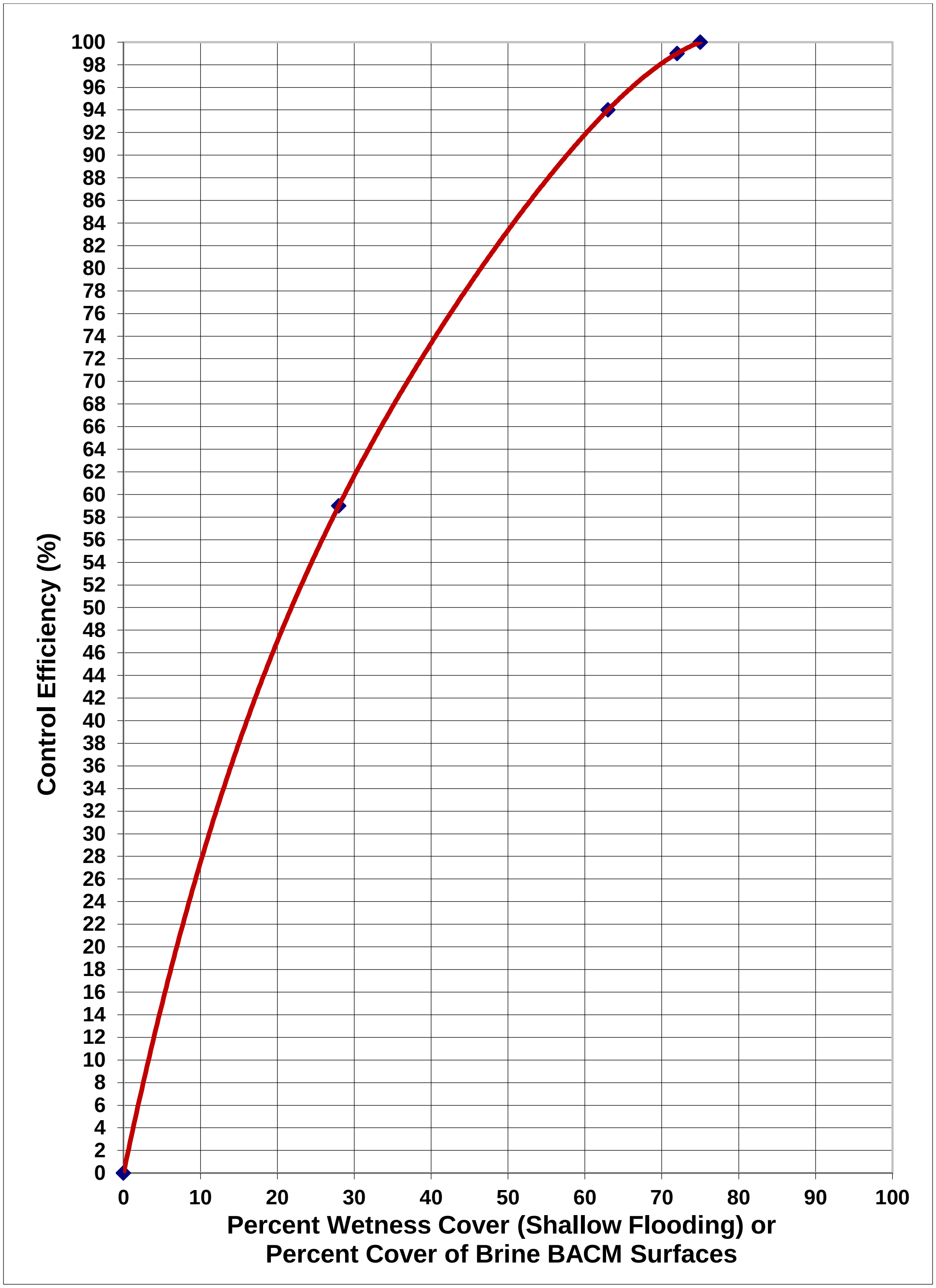

Figure A1. Shallow Flooding control efficiency wetness cover curve used to determine the percentage of surface cover required for the three qualifying stable surfaces that are part of Brine BACM.

b) Stable Evaporite Deposit: Crystalline deposit of evaporite minerals formed from precipitation of salts of the surface of the lake bed from Owens Lake brine. Evaporite deposit must have a thickness of 1.5 centimeters or more to be included in this class.

c) Stable Capillary Brine Salt Crust: Crust formed at the surface of the lake bed by capillary wicking of salts through the soil to the surface. Capillary brine crust must have a thickness of 10 centimeters or more to be included in this class.

2. The required surface cover within each Brine BACM area can be achieved solely with water or solely with an evaporite salt deposit ($\geq$1.5 cm thickness). Thus compliance can be determined based on the presence of these two surfaces by themselves. However, a capillary brine crust must be accompanied by either water and/or an evaporite crust. The proportion of capillary brine crust within a Brine BACM area cannot exceed one-third of the required total compliant cover within a Brine BACM area.

3. Each Brine BACM area shall be operated such that the total areal extent of the surface cover of the qualifying surfaces are maintained such that they meet or exceed those as defined by the Shallow Flooding control efficiency curve (or its approved refinement) (Figure A1). The total combined mosaic of stable Brine BACM surfaces shall be substantially evenly distributed across the dust control area.

4. Brine BACM can be used by LADWP throughout the Owens Lake bed where backup Shallow Flood BACM infrastructure exists and can be implemented, as set forth in this protocol, to ensure that Brine BACM areas do not cause or contribute to exceedances of the NAAQS for PM_{10}.

5. The boundaries for each Brine BACM area will be pre-defined by LADWP prior to implementation. Each Brine BACM area will be monitored separately to determine compliance with required surface cover conditions, as specified in Sections B and C, below.

6. LADWP is required to re-flood Brine BACM areas, as set forth herein, upon a written order issued by the District's Air Pollution Control Officer (APCO). LADWP may not appeal an APCO order to re-flood a Brine BACM area to the District Governing or Hearing Boards or any other agency.

7. Within 37 calendar days of a written order by the APCO that all or part of a Brine BACM area must be re-flooded, LADWP shall re-flood so as to re-establish compliant Shallow Flooding

BACM in that area in accordance with the Shallow Flooding BACM requirements contained in the latest Owens Valley Planning Area State Implementation Plan (SIP). If feasible, re-flooding can be limited to portions of Brine BACM areas that are determined by the APCO to require re-flooding and not to the entire Brine BACM area as defined by LADWP.

8. Failure to comply with the Shallow Flooding BACM requirements in any area within 37 days of the APCO's written order to re-flood may result in notices of violation from the APCO for each day of non-compliance.

9. If re-flooding is performed with fresh or relatively low salinity water, although it will re-establish a fully compliant dust control area, it may be detrimental to the long term operation of the re-flooded area as Brine BACM since it may dissolve some of otherwise compliant evaporite and capillary crusts. For long-term successful operation and maintenance of Brine BACM areas it is recommended that, if possible, the re-flooding be completed with “Owens Lake brine” or high salinity water.

10. LADWP shall operate the Brine BACM areas to ensure that the surfaces remain in a non-emissive condition and meet the cover and thickness requirements in order that the areas maintain the control efficiency required for Owens Lake BACM. Implementation and maintenance efforts shall follow the provisions of the Brine BACM Operations and Maintenance Protocol (see Attachment B to this document).

11. The goal of maintenance activities is to re-establish the total combined cover of qualifying stable surfaces within a Brine BACM area. Should maintenance activities be ordered by the APCO, the LADWP shall submit a maintenance plan to the APCO within 14 calendar days of written notification by the APCO. The maintenance plan shall be include a description of the activities planned and a schedule for their implementation. Upon approval by the APCO, the plan shall be implemented according to the approval schedule. Failure to execute maintenance procedures and reestablish a compliant Brine BACM or surface within specified time limits may result in notices of violation and/or re-flood orders from the APCO. LADWP may not appeal an APCO order for maintenance of a Brine BACM area to the District Governing or Hearing Boards or any other agency.

12. After the ordered re-flooding or maintenance activities have been performed, compliance monitoring as set forth in Sections B and C will be conducted within 30 calendar days.

B. Brine BACM Monitoring

The District will monitor the Brine BACM areas, as set forth below, to ensure Brine BACM areas provide the percent emission reduction as required on the Owens Lake bed. The District will use Induced Particulate Emission Testing (IPET), sand flux monitoring, dust plume visual observations, field observations, as well as photography, video or other remote sensing techniques to document the condition and potential emissivity of Brine BACM areas.

1. Induced Particulate Emission Test (IPET)
    a) The District will utilize the Induced Particulate Erosion Test (IPET) method developed for monitoring of TwB2 to determine if Brine BACM area surfaces are starting to become emissive and to advise LADWP with erosion potential alerts.

    b) IPET testing will follow procedures provided in Attachment C of the 2014 Stipulated Judgement (2014 SJ).

    c) The District will give LADWP field operations staff at least 24 hour notice of the time and place for IPET runs in order to allow LADWP staff an opportunity to observe those tests. LADWP staff does not need to be present for IPET testing to be used to call erosion alerts.

    d) Three erosion alert levels are set using the IPET method: 1) an <u>early warning</u> of possible surface stability deterioration, 2) a <u>warning</u> level to alert LADWP of a potential breakdown of the surface stability and to advise voluntary maintenance efforts, and 3) a <u>mitigation</u> action level to require re-flooding of all or part of a Brine BACM Area. The IPET method will be used to determine erosion alert levels as follows:

        i. Level 1 – An erosion <u>early warning</u> is indicated when any visible dust is observed to be emitted from a surface or particles are dislodged when the RCWInD is flown at a height below one half of H_t. Voluntary mitigation may be appropriate to prevent further surface degradation.

        ii. Level 2 – An erosion <u>warning</u> is indicated when any visible dust is observed to be emitted from a surface when the RCWInD is flown at a height below H_t and above one half of H_t. Voluntary mitigation is advised to prevent further surface degradation.

iii. Level 3 – Mitigation action is required if visible dust is observed to be emitted from a surface when the RCWInD is flown at a height of H_t or higher. If ordered by the APCO, LADWP must re-flood all or part of a Brine BACM area that triggers a Level 3 alert.

The APCO acknowledges that warning and mitigation triggers may be conservative for Brine BACM areas covered with durable brine crusts and/or located away from the regulatory shoreline. The warning and mitigation trigger values may be adjusted on a case-by-case basis by the APCO for each Brine BACM area based on further research on the emissivity of brine crusts and/or its distance from the regulatory shoreline. After one year of experience with Brine BACM and the IPET test, LADWP and the District will meet to discuss the results of the testing and consider adjustments to the triggers.

e) The APCO reserves the right to adjust the IPET criteria based on supporting data and after consultation with LADWP.

2. Sand Flux Monitoring

a) Each Brine BACM area will be instrumented by the District with at least one sand flux monitoring (SFM) site. Each SFM site will pair CSCs with Sensits, radio equipment and dataloggers programmed to record 5-minute sand motion data. All Sensit data will be reported daily to the District office. Sand motion data from the CSCs and Sensits will be processed to calculate the sand flux history of a site per the protocol set forth in the 2016 Dust ID Protocol (GBUAPCD, 2016c).

b) SFM sites will primarily be located in portions of Brine BACM areas covered with a capillary crust.

c) The APCO may issue a partial or full Brine BACM area re-flood order if sand flux exceeds 5.0 $g/cm^2/day$ at any SFM site within a Brine BACM Area.

d) The APCO reserves the right to adjust the above criteria based on supporting data and after consultation with LADWP.

3. Dust Plume Observation

a) The District will monitor the dust plume activity from the Brine BACM areas following the 2016 Dust ID protocol (GBUAPCD, 2016c).

b) Dust observations may be completed using human observers located either off the lake bed at one of the vantage points in the surrounding mountains or on the lakebed close to the Brine BACM areas.

c) Dust activity may also be completed remotely using video or photos collected as part of the District's Dust Camera network. Such video or photos may be analyzed using the District's Terrestrial Imaging Georeferencing (TIG) methodology.

d) Dust plume observations may be used in conjunction with the above described sand flux and IPET tests as a basis for an APCO re-flood order.

4. Surface Integrity Observations

a) The District will regularly monitor the conditions of the Brine BACM surfaces to verify that they meet the performance criteria for each surface class. Vehicle and foot access to much of the Brine BACM areas is expected to be difficult to impossible such that most of the field monitoring is expected to be concentrated to the edges of Brine BACM areas. The conditions of surfaces in portions of Brine BACM areas that are not accessible will be evaluated through aerial photography and/or imagery.

b) The average crust thickness and surface condition of accessible surfaces will be measured for evaporite salt deposit crusts and capillary brine salt crusts.

c) Surface condition observations will be conducted to determine if the surface has deteriorated and if it is potentially emissive. Observations will include classification of the surface based on the presence/absence of loose soil or salt deposits, erosion, and surface hardness.

d) The APCO may issue a partial or full order for re-flooding if the surface observations in conjunction with IPET and sand flux tests indicate that the evaporite or capillary brine crust surfaces in a Brine BACM area is determined to be emissive.

e) The APCO may issue a partial or full order for maintenance activities if the evaporite or capillary crust surfaces do not meet the required average thickness performance criteria but has not yet been observed to be emissive based on surface observations in conjunction with IPET and sand flux testing.

f) The APCO reserves the right to adjust the above criteria based on supporting data and after consultation with LADWP.

5. Air Photography and Remote Sensing

a) The District will regularly monitor the conditions of the Brine BACM areas using aerial photography and remote sensing techniques to verify that they meet the required surface coverage performance criteria.

b) The percentage of a Brine BACM covered with water, wet evaporite deposit and wet capillary brine salt crust will be determined using Landsat imagery following the established methodology as described in DRI (2014) or any other method approved by the APCO in consultation with LADWP.

c) The areal extent of the lake bed surface covered with stable evaporite deposit and stable capillary crust will be determined using the methodology as described here in Section C (*Technical Method for Monitoring Brine BACM Compliance*) or any other method approved by the APCO in consultation with the LADWP.

d) The APCO may issue an order for re-flooding for a whole Brine BACM area, or for any portion of a Brine BACM area, if the total aggregated combined surface cover of qualifying Brine BACM surfaces (as defined in Section A.1.) in a Brine BACM area falls below 60% for areas requiring 99% control efficiency. The surface cover requirement within a Brine BACM area shall be determined by the Shallow Flooding wetness cover-control efficiency curve (Figure A1).

e) The APCO may issue an order for re-flooding for a whole Brine BACM area, or for any portion of a Brine BACM area, for areas requiring less than 99% control efficiency if the total aggregated cover of Brine BACM qualified surfaces drops such that there is a 10% loss or more of control efficiency. The surface cover requirement within a Brine BACM area shall be determined by the Shallow Flooding wetness cover-control efficiency curve (Figure A1).

f) The APCO may issue an order for maintenance activities for a whole Brine BACM area, or any portion of a Brine BACM area, if the proportion of capillary brine crust exceeds the allowed one-third of the total required aggregated cover of qualifying surfaces provided has not been ordered for re-flooding by conditions in Sections B.1.d.iii. (IPET), B.2.c. (sand flux), B.4.e. (crust thickness) or B.5.d. and B.5.e. (less than required surface cover). The surface cover requirement within a Brine BACM area shall be determined by the Shallow Flooding wetness cover-control efficiency curve (Figure A1).

g) The APCO may issue an order for maintenance activities in a Brine BACM area that does not meet the aggregate cover of qualifying surface, provided the area has not been ordered for re-flooding by conditions in Sections B.1.d.iii. (IPET), B.2.c (sand flux), B.4.e. (crust thickness) or B.5.d and B.5.e. (less than required surface cover). The surface cover requirement within a Brine BACM area shall be determined by the Shallow Flooding wetness cover-control efficiency curve (Figure A1).

h) The APCO reserves the right to adjust the above criteria based on supporting data and after consultation with LADWP.

C. Technical Method for Monitoring Brine BACM Compliance

Brine BACM control areas will be monitored using a combination of photo-interpreted maps of surface types and the recurring shallow flood mapping method that was originally documented in HydroBio (2005) and most recently updated in DRI (2014). The mapping of surface types will distinguish protective evaporite salt deposit and capillary brine salt crusts that meet the Brine BACM performance criteria from non-compliant surfaces. The union of protective crust surfaces and those areas that meet the shallow flood wetness criteria on a given date will be used to measure the areal extent of qualifying Brine BACM surfaces within each Brine BACM control area. Mapping of the surface types within each Brine BACM control area will be conducted annually prior to, or at the beginning of, the dust season. Additionally, as needed during the dust season, surface mapping will also be re-evaluated within 30 days of any ordered maintenance and/or re-flooding activities.

The use of visually interpreted maps of surface types assumes that:

- the processes that create protective evaporite and capillary crusts operate in a relatively uniform manner over regions that have a similar geomorphic position and histories of brine exposure and disturbance, thereby creating a patchwork that can be effectively mapped, and

- crust surfaces that meet the required Brine BACM performance criteria when dry will maintain their integrity after a wetting/drying cycle.

Image Characteristics

Surface types may be mapped using a range of imaging platforms, including satellites, aircraft, or unmanned aerial vehicles (UAVs). Regardless of the collection platform, the imagery should be analyzed as a natural color composite of red, green, and blue wavelengths. The multispectral imagery must have a spatial resolution of 2 meters or finer. If satellite imagery is being used and a higher resolution panchromatic band is available, then pan sharpening should be applied. If imagery is collected from aircraft or UAV platforms, efforts should be made to avoid brightness variations that are not related to inherent surface conditions which may hamper visual analysis. For example,

- flights should be performed at times of day with high sun angles, preferably near noon,
- individual brine BACM control areas should be completely imaged in less than 30 minutes to minimize changes in illumination,
- flight lines should overlap to avoid gaps and to allow cropping of image edges where illumination artifacts are strongest, and
- the use of fewer flight lines at a coarser spatial resolution will be easier to interpret than a composite of unnecessarily high resolution images that have many brightness discrepancies and geometric misregistrations from one image to the next.

Annual image acquisitions should be performed in the fall during a time when water levels are at their lowest (typically September – early October). Surface moisture conditions should reflect the norm for that time of year, so imagery should not be collected immediately following precipitation events.

Geocorrection

Satellite imagery should be geo-corrected to the current Geocorrection Gold Standard Image (DRI, 2015). A minimum of twenty ground control points should be distributed in and around the various brine control areas. A first or second order polynomial should be used to register the new satellite data to within 5 meters RMSE of the Geocorrection Gold Standard. Imagery from aircraft or UAV may be geocorrected using onboard GPS and IMU data, or by photogrammetric methods, provided that it meets the 5 m RMSE criteria. The imagery should be resampled at its original spatial resolution using cubic convolution.

Mapping Soil Surface Types

Mapping will be completed in two steps. The first step is to complete an initial set of maps through visual interpretation of the imagery. The second step is to field check the initial set of maps in the field and make adjustments to the mapped units as needed based on the field verification. A final set of maps will be completed following field verification that will be used to determine if a Brine BACM control area meets the performance requirements.

Initial mapping will be performed using visual interpretation, so there is no specific need to correct satellite brightness values to surface reflectance. Different brine control areas have different characteristics, so a range of contrast enhancements should be tested to maximize overall image contrast within each control area. Enhancements might include a linear stretch with 2% clipping of high and low extremes, histogram equalization, or a Gaussian stretch using 1 to 2 standard deviations. The statistics for calculating these contrast enhancements should be generated from the control area and its immediate surroundings. If the area surrounding the control area is generally brighter or darker than the control area itself, the analyst might set a higher clipping percentage on the overrepresented extreme for a linear stretch.

Judgement is required to distinguish what types of visual variation within a control area are significant enough to be mapped. One important criterion is the minimum mapping unit (MMU) which sets the required spatial extent that a feature should have in order to be mapped. For judging compliance of Brine BACM areas, the map of surface types will be intersected with a shallow flood map from Landsat that has a spatial resolution of 30 meters. The MMU will be half the Landsat resolution: 15 meters. Before delineating polygons of apparently different surface types, the analyst should use an interactive measurement tool to test the size of a number of smaller features within the control area in order to train their perception for the level of generalization of the 15 meter MMU. If the scale of the image on a computer display changes during the mapping effort, the analyst should retrain their perception of distances with the measurement tool. The analyst should expect that there will be unavoidable inclusions within some polygons and that boundaries should be smoothed to capture trends rather than every jagged edge. If there are distinct transition zones between two large polygons of different surface types and that transition zone is generally narrower than the MMU, the transition should not be explicitly mapped. Instead, the line dividing the two larger surface types should run down the middle of the transition zone.

The analyst should take time to assess the visually different subregions within each control area before delineating polygons for different surface types. A consistent strategy will be enforced by first generating a legend of general surface types that will be mapped based on a relatively common range of surface brightness and texture, geomorphic characteristics, and disturbance history (e.g. "tilled with dark ridges and troughs", "tilled with bright ridges and light to bright troughs", "uniform medium tone with fine texture along western boundary"). Surface types composed of discrete patches that do not exceed the MMU should not be included in the legend. The analyst can use field experience to assess what changes in image tone and texture are associated primarily with variations in moisture content rather than protective attributes (e.g. moist versus dry evaporite crust greater than 1.5 cm). Patches of a given surface type should not be subdivided based on moisture content alone, since that distinction will be handled by the Landsat-based shallow flood map. Further subdivisions of polygons within the visually interpreted map may be made based on knowledge of relevant heterogeneity within the control area.

Initial maps of the surface types will be used for field checking the identified polygons within each Brine BACM control area. The initial maps should include the legend for that control area, show the mapped polygon boundaries on a backdrop of the imagery that was used to make them, and each polygon should be labeled with its class from the legend. The map legend also should include a circle or square indicating the size of the MMU.

Field Verification and Modifications

Field personnel will be provided a GPS device that provides better than 2.5 meter X/Y accuracy and maps of the visually interpreted polygons in a format similar to that described above. The field crew will perform a reconnaissance of each mapped polygon to determine whether the image-defined boundaries correspond to a relatively uniform surface cover type. The goal of the reconnaissance is to assign a predominant surface type description to each polygon as either having either:

- evaporite crust,
- capillary crust,
- no developed crust, or
- surface water

Field personnel may find that visually interpreted polygons may benefit from subdivisions that better delineate these general surface types. However, it is important that field personnel recognize that there may be a number of inclusions and boundary generalizations within a polygon due to the 15 meter MMU. If field personnel do believe that a map polygon should be subdivided, the shortest apparent distance across the differing landscape features should be determined to ensure that they consistently exceed 15 meters. Polygons should not be subdivided based solely on moisture status since that distinction will be made from the Landsat teeter point method.

If a mapped polygon is to be divided, field personnel should draw the approximate shape of the feature on their field map and collect GPS data to ensure that it is properly digitized afterwards. If the feature is unambiguously traceable on the field map, then a single GPS coordinate should be collected anywhere on the new boundary to verify the specific feature on the image. If the subdivided area is not clearly visible on the image in the map, GPS boundary coordinates should be collected. For a simple linear border that divides a polygon, two GPS coordinates are sufficient. More coordinates are necessary for complex boundaries, but generally spaced by 8 meters or more to capture the overall shape at a scale that is appropriate to the MMU.

The field crew may encounter one or more inclusions of non-protective surfaces within a polygon that otherwise has protective characteristics, but those inclusions are too small to justify a mapped polygon based on the MMU. A description of the nature of these inclusions should be recorded, and a GPS coordinate should be collected for a large representative example of these inclusions in case it is necessary to return and install in situ monitoring devices.

Field Measurements

For polygons that are not predominantly covered by surface water, field personnel will identify a representative point within each polygon that typifies the surface condition. This survey point should be located at least 15 meters from the polygon boundary, and GPS coordinates will be recorded. If the predominant surface cover is a complex of multiple characteristics (e.g. ridge versus trough of prior tillage), the least protective surface type as judged by GPUAPCD staff will be used to represent the polygon. Three primary parameters will be recorded at each survey point:

1. predominant surface type (evaporite crust, capillary crust, or no crust),
2. crust thickness (cm), and
3. moisture (dry, slightly moist, moist, or saturated).

Based on these three observations and the criteria in section 4.1 of this report, the field site will be classified as protective or not protective. Additionally, six other parameters will be evaluated and recorded.

Macro Relief Type

Code	Description
1	Platy

2	Heaved
3	Extreme heaved
4	Flat uplifted
5	Cauliflower
6	Polygonal

Micro Relief Type

Code	Description
1	Powdery
2	Puffy
3	Cauliflower
4	Efflorescent
5	Loose

Crust Hardness (marble test)

Code	Description
0	No crust
1	Weak
2	Moderate
3	Strong
4	Hard

Macro Relief Scale

Code	Description
1	0 to 5.0 cm
2	5.0 to 10.0 cm
3	10 to 20 cm
4	20 to 30 cm
5	> 30 cm

Micro Relief Scale

Code	Description
1	0 to 0.5 cm
2	0.5 to 1.0cm
3	1.0 to 2.0 cm
4	2.0 to 5.0 cm
5	5.0 to 10.0 cm
6	> 10 cm

Erosion Type

Code	Description
1	None
2	Surface abrasion

3 Surface stripped
4 Blowout
5 Flutes
6 Other

Inaccessible Polygons

There may be polygons in the map that were inaccessible to the field crew. In this case the analyst will judge the likely surface characteristics of the inaccessible polygons based on image tone/texture and geomorphic position compared to known surfaces in the same control area, as well as any ancillary information that may be available. A UAV may be used to collect high resolution photography and digital elevation data to better interpret conditions at the remote location. The following features should be apparent in high resolution photography and would contribute to the assignment of a protective status to inaccessible polygons.

- Heaving: thick, protective, evaporite crusts often become heaved along linear segments and can create a polygonal patchwork on an otherwise flat surface
- Macro-relief: thick, protective, capillary crusts generally develop a high degree of localized relief that has a cauliflower-like structure with protrusions that are at least 30 cm across. Heaving may also occur in these regions.
- Smooth upslopes: protective evaporite crusts form on low, flat areas and protective capillary crusts develop macro-relief, so the presence of relatively smooth surfaces on sloping or upslope positions might only have efflorescence or non-protective capillary crust.
- Color: It may be possible to distinguish the tan color of exposed soils from protective salt crusts that are generally shades of gray (or colored by red biological material). Emissive areas may have sand interspersed with some degree of heaved or cauliflower structure.

Each inaccessible polygon will be labelled as protective or not based on judgement of the surface type that makes up the majority of the polygon.

Compliance Testing

Prior to testing compliance, maps of Brine BACM surface types must be updated with any subdivisions of polygons that were drawn by field personnel and judgements on the condition of inaccessible polygons. GPS coordinates taken by the field crew will be overlain on imagery of the control area, and the map of surface types will be edited to match the field crew's drawing.

Each Brine BACM control area will be tested for compliance with required performance criteria separately. A map of surface type classification will be generated for each control area by recoding polygons as:

1. not protective,
2. protective capillary brine crust, or
3. protective evaporite salt crust.

This map of surface type classification for each control area will be rasterized at a 15 meter spatial resolution.

Areas that are protected by high moisture content will be determined using the approved teeter point method with Landsat imagery. The resulting shallow flood map will be coded with a value of 4 for wet surfaces, and 0 for dry surfaces. The shallow flood map will be combined with the rasterized protective cover map by assigning the maximum value of either map. The value of each pixel value (1-4) in the combined map will be calculated and used in the following two equations to generate the compliance statistic:

$$N_{>1}/N_{>0} \qquad \text{[Eqn 1]}$$

$$\frac{N_{>2} + \text{minimum}\,(N_2, N_{>1} * C)}{N_{>0}} \qquad \text{[Eqn 2]}$$

where N_i is the count of pixels with value i and C is the maximum allowed ratio of capillary to other protective surfaces (currently 1/3).

Equation 1 calculates the surface extent percentage of qualified Brine BACM surfaces within each control area. Equation 2 provides the percentage cover of the capillary brine crust in order to determine if it is within that allowed for a Brine BACM control area. The Brine BACM area must meet two conditions (Tests) for the area to be in compliance with required conditions.

1) Test 1: the value of $N_{>1}/N_{>0}$ must exceed the percentage cover as defined by the Shallow Flooding wetness curve (Figure A1) [Eqn 1]. And

2) Test 2: the value of N_2 must not exceed more than one third of the required complaint cover [Eqn 2].

The calculations are demonstrated in the following example where 75% cover of qualifying protective surfaces is required per the Shallow Flooding wetness curve:

Surface Type	Value	Count
Emissive (Non-protective)	1	2,807
Protective capillary brine crust	2	3,502
Protective evaporite salt deposit	3	1,001
Wet	4	4,008
Total		11,318

Where $N_{>1}$ = 8,511, $N_{>2}$ = 5,009, and $N_{>0}$ = 11,318.

Test 1 = 8,511/11,318 = 75.2% (pass test 1)

$$\text{Test 2} = \frac{5{,}009 + \text{minimum}\ (3{,}502,\ 8{,}511/3)}{11{,}318} = \frac{5{,}009 + 2{,}837}{11{,}318} = 69.3\%$$ (fail test 2)

In this example, even though the combined cover of protective crusts and wet surfaces is greater than the required 75% (Test 1), the limit on the extent of capillary brine crust creates a noncompliant value of 69.3% (Test 2). No more than one-third of the required compliance cover is permitted to consist of capillary brine crust.

Updating Surface Maps

Surface cover maps will be updated annually, or for specific Brine BACM control areas within 30 days of any ordered maintenance and/or re-flooding activities. Areas that appear to have no significant changes from imagery used in the prior mapping efforts can maintain the prior polygon boundaries, but polygons must be checked in the field as described above in the Field Modifications section and new field data must be collected. The location of representative field sampling points for polygons may change each time. For resurveys associated with ordered maintenance or re-flooding, only affected polygons and field survey points need to be assessed prior to recalculation of the compliance statistic.

References

Cited references are listed in Section 7.0 of the main document.

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Attachment B

Protocol for Operation and Maintenance of Owens Lake Brine with BACM Backup (Brine BACM)

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Attachment B

Protocol for Operation and Maintenance of Owens Lake Brine with BACM Backup (Brine BACM)

January 2016

1.0 SITE SELECTION, OPERATION, AND MAINTENANCE

This Attachment summarizes the methods to be used by the Los Angeles Department of Water and Power (LADWP) to select, operate, and maintain Brine with BACM Backup (Brine BACM) on Owens Lake.

1.1 Brine BACM Site Selection

Brine BACM can be implemented anywhere on Owens Lake for dust control in areas where there is existing Shallow Flooding infrastructure. If an area is outside of existing Shallow Flooding infrastructure, it may be allowed by the District provided an alternate source of water is in place to provide water, as needed.

1.2 Site Operation

Site operations and maintenance activities are expected to be minimal since the component stable surfaces that contribute to the required aggregated surface coverage in Brine BACM areas generally change slowly. Each Brine BACM area shall be operated such that the total areal extent of the surface cover of the qualifying surfaces are maintained such that they meet or exceed those as defined by the Shallow Flooding control efficiency curve (or its approved refinement).

The required surface cover within each Brine BACM area can be achieved solely with water or solely with an evaporite salt deposit (≥1.5 cm thickness). Thus compliance can be determined based on the presence of these two surfaces by themselves. However, a capillary brine crust must be accompanied by either water and/or an evaporite crust. The proportion of capillary brine crust within a Brine BACM area cannot exceed greater than one-third of the total required surface cover as determined by the Shallow Flooding cover curve. The total combined mosaic of stable Brine BACM surfaces shall be substantially evenly distributed across the dust control area.

Qualifying stable surfaces for Brine BACM shall be defined as consisting of water or hydrologically saturated surface, evaporite salt deposit, and capillary salt crust with the following conditions:

1) Water: Standing water or hydrologically saturated surface as defined by Shallow Flooding BACM. Water may have any salinity.

2) Evaporite Salt Deposit: A crystalline deposit of salt minerals precipitated on the surface of the lakebed from evaporation of Owens Lake brine. This does not include the development of salt crust by upward capillary movement of saline fluids through the soil column. The evaporite salt deposit must have an average thickness of 1.5 centimeters or more and may be either wet or dry

3) Capillary Brine Salt Crust: A crust enriched in salt minerals formed at the soil surface by upward capillary movement of water through the soil. The crust typically consists of a mix of salt minerals and soil particles in various proportions. The capillary salt crust must have an average overall thickness of 10 centimeters or more and may be either wet or dry.

In order to maintain required dust control efficiency within the Brine BACM areas, periodic addition of water or maintenance activities may be required to restore areas that have deteriorated or that fail to meet the necessary aggregated surface coverage of the three component stable brine surfaces. The conditions that trigger addition of water or maintenance activities are discussed below.

1.2.1 Periodic Site Inspection

The District will inspect all Brine BACM sites regularly to ensure that that the required stable surfaces are being maintained. The District's site inspection program will consist of a combination of aerial inspection conducted via Unmanned Aerial Vehicle (UAV) and/or helicopter inspection and ground-truth observations by human inspectors as determined useful by the District. Each of these elements is discussed below. Additionally, all Brine BACM areas will be included in regular sand flux monitoring and dust plume observations conducted by the District following procedures in the 2016 Dust ID protocol (GBUAPCD, 2016c).

1.2.1.1 Aerial Inspection

Aerial inspections are required of Brine BACM areas because of the difficulty in foot or vehicle access in these areas and their large size. Aerial inspections will be conducted using a UAV (or when needed, by LADWP helicopter) and satellite imagery. UAVs are capable of collecting ground terrain information that can be used to create a digital elevation model (DEM) that can be useful in mapping the extent of different surfaces present. Additionally, if LIDAR is collected over the Brine BACM area, it may be used to generate an accurate DEM that can be used as part of the Brine BACM monitoring program. Photos and imagery collected during aerial inspection may be used to map the extent of surface cover in the Brine BACM areas and to help with re-flooding and maintenance activity decision-making.

Aerial inspection of the Brine BACM areas will also be conducted by UAV in order to conduct Induced Particulate Emission Testing (IPET) as described in Attachment A (*Monitoring and Enforcement Protocol for Brine BACM*).

1.2.1.2 Ground-Based Observations

Ground observations are usually needed to complement aerial and satellite-based collections. Information that may be collected from ground observations include:

1. Important features that cannot be evaluated remotely with confidence, such as crust thickness and surface integrity.

2. Information needed to calibrate and ground-truth air photos or satellite imagery or remotely sensed data and interpretations.

3. Tactical, spot observations where remote observations are impractical, inconvenient, or in need of calibration.

Initially, observations are expected to be tied to key surface attributes (crust thickness and presence of loose and fine material deposition). Due to difficult access across most Brine BACM areas, ground observations will generally be focused around the perimeter of Brine BACM areas.

1.3 Site Maintenance and Re-Flooding

In this section, re-flooding and maintenance triggers are described. The actions may be triggered and ordered for a whole Brine BACM area, or for any portion of an area as determined by the APCO.

1.3.1 Re-Flooding Triggers

Re-flooding of will be required when a Brine BACM area deteriorates such that it is determined to be potentially emissive or when the aggregate cover of Brine surfaces (as defined in Section 1.2) fall below a critical level. When a re-flood order has been made by the APCO, then a Brine BACM area shall be re-wetted (with water of any salinity) such that the wetness cover is as required by the Shallow Flooding wetness cover-control efficiency curve within 37 days of such order. Re-flooding may be ordered for a whole or partial Brine BACM area. Conditions that may trigger a re-flood order by the APCO are given below:

1) The District will utilize the Induced Particulate Erosion Test (IPET) method developed for monitoring of TwB2 to determine if Brine BACM area surfaces are starting to become emissive and to advise LADWP with erosion potential alerts. IPET testing will follow procedures provided in Attachment C of the 2014 Stipulated Judgement (2014 SJ). (Also described in the Monitoring and Enforcement Protocol for Owens Lake Brine With BACM Back-Up, Attachment A, Section 1.B.1)

2) Monitored sand flux at a SFM site exceeds 5 grams/cm^2/day. Sand flux monitoring shall follow procedures in the 2016 Dust ID protocol (GBUAPCD, 2016c).

3) The total aggregated combined surface cover of the qualifying Brine BACM surfaces falls below 60% for areas requiring 99% control. Areas requiring less than 99% control will require re-flooding if the total aggregated cover of Brine BACM surfaces drops such that there is a 10% loss or more of control efficiency. In these cases, there does not need to be a level 3 erosion alert from IPET runs or active sand flux greater than 5 grams/cm^2/day.

4) Observations of dust plumes and surface integrity indicate that the surface condition in a Brine BACM area has deteriorated such that it is potentially emissive. Dust plume observation and surface integrity observations will be used in conjunction with sand flux monitoring and/or IPET runs. Dust plume observation methods shall follow those in the 2016 Dust ID protocol (GBUAPCD, 2016c).

5) The APCO reserves the right to determine additional re-flood triggers based on supporting data and after consultation with LADWP.

In the event of re-flooding, once the area to which the order applies has been thoroughly wetted, it may continue to be operated as a Brine BACM areas provided it consists of the required total combined aggregated stable qualifying Brine BACM surfaces.

1.3.2 Maintenance Triggers

Maintenance will be undertaken on a Brine BACM area that does not meet the required aggregate cover of qualifying surfaces, provided the area has not been ordered for re-flooding by conditions in Section 1.3.1 (Re-Flooding Triggers, above). If it is feasible, maintenance activities may be conducted only on portions of a Brine BACM area to re-establish the required stable surface cover.

The goal of maintenance activities is to re-establish the total combined cover of qualifying stable surfaces within a Brine BACM area. Should maintenance activities be needed, the LADWP shall submit a maintenance plan to the District within 14 calendar days of written notification by the APCO. The maintenance plan shall be include a description of the activities planned and a schedule for their implementation. Upon approval by the APCO, the plan shall be implemented according to the approval schedule.

1.3.3 Maintenance Options

When and where data so indicate, maintenance will be undertaken to re-establish the required total aggregated coverage of Brine BACM surfaces. For long term operation of an area as Brine BACM, it is recommended that hypersaline Owens Lake brine be used for maintenance activities in order to create evaporite and capillary crusts that, given proper thickness, will meet performance criteria. Examples of maintenance activities that may be undertaken include, but are not limited, to the following.

1) Addition of Owens Lake brine to increase the surface coverage within a Brine BACM area.

2) Spreading of brine within a Brine BACM area to allow for better surface coverage.

3) The APCO reserves the right to approve additional maintenance activities based on supporting data and after consultation with LADWP.

2.0 REFERENCES

Cited references are listed in Section 7.0 of the main document.

Board Order 160413-01
Attachment F

2016 Owens Lake
Dynamic Water Management Plan

Great Basin Unified Air Pollution Control District
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2016 Owens Lake

Dynamic Water Management Plan

Great Basin Unified Air Pollution Control District

January 2016

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Abbreviations and Acronyms

APCO	Air Pollution Control Officer
BACM	Best Available Control Measure
CDFW	California Department of Fish and Wildlife
cm	centimeter
CSC	Cox sand catcher
CSLC	California State Lands Commission
d	day
DCA	Dust Control Area
District	Great Basin Unified Air Pollution Control District
Dust ID	Dust Source Identification Program
Dust Year	365 day period starting on July 1 of one year and ending on June 30 of the following year
Dust Season	portion of the dust year when dust controls are operating. The standard dust season extends from October 16 of one year to June 30 of the following year.
DWP or LADWP	City of Los Angeles Department of Water and Power
DWMP	Dynamic Water Management Plan
g	grams
GBUAPCD	Great Basin Unified Air Pollution Control District
NAAQS	National Ambient Air Quality Standard (for PM_{10} = 150 $\mu g/m^3$ for 24-hours)
PM_{10}	Particulate matter 10 microns or less in size
Regulatory shoreline	elevation contour of 3,600 feet above mean sea level
SF	Sand flux, given in grams per square centimeter (g/cm^2)
SFM	Sand flux monitoring site
SIP	State Implementation Plan
sq. mi.	Square miles
TwB2	Tillage with BACM Back-up

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2016 Owens Lake

Dynamic Water Management Plan

Great Basin Unified Air Pollution Control District

January 2016

1.0 BACKGROUND AND INTRODUCTION

Article 7 of the 2014 Stipulated Judgement between the Great Basin Unified Air Pollution Control District (District) and the Los Angeles Department of Water and Power (LADWP) commits the parties to work together to develop a Dynamic Water Management Plan (DWMP). The goal of the DWMP is to reduce the volume of water used on Owens Lake while still maintaining required dust control. The reasoning behind the concept of a DWMP is that lake bed surface erosion does not behave uniformly in time or space due to the diverse soils and surface conditions present and that there may be areas in which the dust season, during which dust controls are required, may be modified allowing for reduced water usage.

The dust season in the 2008 SIP (GBUAPCD, 2008) is defined as extending from October 16 to June 30 of the following year. During this 8 ½ month period dust control areas must meet the requirements as defined in the 2008 SIP. In recognition that the emissivity of areas are generally less at the end of the dust season, Shallow Flooding areas which are operated to achieve 99% control are permitted to follow a designated ramp down schedule which starts on May 15 and extends to June 30.

The October 16 to June 30 dust season was originally designated in the mid-1990's prior to any dust control implementation on the lake bed based on the overall timing of PM_{10} exceedances measured at air monitoring stations located around Owens Lake. Until now, with the development of the DWMP, there was only one standard dust season applied to Owens Lake dust controls such that there were no modifications made to better fit the spatial and temporal timing of dust activity on different portions of the lake bed.

In 1999 and 2000, the District implemented a sand motion monitoring network on Owens Lake as part of the Owens Lake Dust Identification Program (Dust ID) in order to better characterize the surface wind erosion activity on the lake bed causing PM_{10} violations at the 3,600 foot elevation regulatory shoreline. The sand motion monitoring network has been in place for over 15 years progressively changing as more is learned about the lake bed and dust control areas have been implemented.

This technical report was prepared as an analysis of the sand flux data from the Owens Lake Dust Identification (Dust ID) program as part of the development of the Dynamic Water Management Plan. The primary basis for this analysis is an evaluation of the sand flux data record collected for the past 15 years. The main goal of this analysis is to identify areas on the lake bed where surface activity starts later in the beginning of the dust year and/or ends earlier at the end of the dust year. This analysis evaluates if the dust season of the Shallow Flooding BACM areas can reasonably be modified to have a delayed start in the beginning of the dust season and/or an early end at the end of the dust season without jeopardizing air quality and causing violations of the NAAQS for PM_{10} at the regulatory shoreline.

2.0 DATA EVALUATION METHOD AND ANALYSIS CRITERIA

Over 300 sand flux monitoring (SFM) sites (also called Sensist sites[1]) have been operated as part of the Dust ID program since 2000. The data record from these sites was included in this analysis to determine the timing, frequency and magnitude of the source area activity. The Sensit network has been dynamic over the years such that not all of the 300+ sites have been operated simultaneously. The Sensit network is evaluated regularly and adjustments are made, as needed, to best represent the source areas on the lake bed.

At the beginning of the Dust ID program, the lake bed had no dust controls in place and sites were installed on the lake bed in a grid pattern with 1 km spacing between Sensit sites. Starting in 2001 and 2002, as dust control measures were constructed on the lake bed and began operation, many of the original sites were removed. In other portions of the lake bed additional Sensit sites were added to the network as new dust sources became active. Most of the new sites were installed at locations to best represent the identified source area and were not located on a regular grid. At its peak, the Sensit network included over 200 sites operating at one time. In the 2015-2016 dust year, there are approximately 170 Sensit sites operating in the network.

[1] A sand flux monitoring site consists of a sand trap (called a Cox sand catcher or CSC), a Sensit (an electronic sand motion monitor) and a datalogger system. The overall site is generally termed a “sand flux” or “Sensit” site.

The method of collection and processing of the data from each Sensit site follows a detailed procedure given in the Dust ID protocol (GBUAPCD, 2016a). The data record from each Sensit site contains both 5-minute and hourly sand flux values. The purpose of collecting the sand flux data is for input into the Dust ID air quality model in order to determine which areas on the lake bed cause violations of the Federal PM_{10} standard at the regulatory shoreline. However, the data in this analysis are being used to evaluate the spatial and temporal sand motion patterns on the lake bed. For this analysis, the hourly sand flux data was totaled for each day. Graphs of the cumulative daily sand flux for each year for each site in the Dust ID network were plotted in order to determine the pattern of sand flux both in the fall during the beginning of the dust season and in the spring at the end of the dust season. The graphs for areas in the DWMP areas are provided in GBUAPCD (2016b).

Criteria were established upon which to evaluate the sand flux data in the development of the DWMP. A list of the criteria is provided below:

Data Analysis Criteria:

- 5 years or more of data record from before dust control implementation
- Date of first sand flux $\geq$5 g/cm^2/day
- Date of last sand flux $\geq$5 g/cm^2/day
- Frequency in number of years in which 5 g/cm^2/day thresholds were measured in the beginning and end portions of the dust season
- Surface condition behavior of dust control areas operated under Variance Order Docket No. GB15-01

A minimum of 5 years of data from before dust control implementation was considered important for each area due to the dynamic nature of the lake bed and varied climatic conditions. An area with a representative SFM site with at least 5 years of data is considered to have experienced a full range of conditions that occur on the lake bed such that the emissivity of the surface is well characterized. A frequency of 1 or more in 5 years that the 5 grams/cm^2/day threshold sand flux value was measured during the beginning and end portions of the dust season was considered significant. If elevated sand flux occurred at a frequency of less than 1 in 5 years (for example: 1 in 6 or more years) during the beginning and end portions of the dust season it was considered as not a regular condition of the lake bed surface at that location.

In July 2015, the Hearing Board of the Great Basin Unified Air Pollution Control District granted a regular variance for specific dust control areas from the requirement to meet the required Shallow Flooding wetness cover starting October 16 per the 2008 SIP Board Order (Docket No.

GB15-01, GBUAPCD, 2015). The variance along with the necessary permits and approvals from California Department of Fish and Wildlife (CDFW) and California State Lands Commission (CSLC) allowed LADWP to postpone wetting of the lake bed surface on 7.46 square miles (4,774.4 acres) of Shallow Flooding areas. The DCAs were selected through a combination of a technical analysis of the sand flux history and soil type and the habitat value allowing LADWP to save water on the lake bed. The delayed Shallow Flooding start also served as a precursor test of the proposed DWMP.

During the delayed start of the DCAs in the variance, the District conducted visual observations of surface conditions within each area to determine if the areas were behaving as expected based on the sand flux history analysis and were not deteriorating and becoming potentially emissive. In November and December 2015, two of the DCAs (T17-2 and T21) in the variance were observed to be sources of significant dust. The active source areas were mapped using GPS and video from the dust camera network. Based on the observed dust activity the beginning portion of the dust season for portions of these two DCAs areas was not modified but kept as October 16 (see discussion of these areas in GBUAPCD, 2016b). Other DCAs included in the variance remained stable and did not become active dust sources.

The areas on the lake bed included in this analysis consist of areas that are either currently controlled using Shallow Flooding BACM or areas that are currently uncontrolled but will have controls implemented as part of the upcoming dust control construction (i.e. Phase 9/10 areas). Additionally, areas which are part of the brine testing or are controlled with a variation of Shallow Flooding such as Tillage With BACM Back-Up (TwB2) were also included in this analysis.

<u>Areas included in analysis</u>

- Existing Shallow Flooding control areas
- Phase 9/10 areas
- TwB2 areas
- Phase 7a areas (excluding completed gravel areas)
- Brine areas

<u>Areas NOT included in analysis</u>

- Existing Gravel areas (Phase 8, T35, T1A-3)
- Managed Vegetation area in T5 through T8 (Farm)
- Sand Fence area (T1A-1)
- Channel Area

The following maps are provided to help the reader with the data analysis.

- Figure 1: Index map of the dust control areas on Owens Lake.
- Figure 2: Map of areas included in the Dynamic Water Management analysis.
- Figure 3: Map of the different phases of dust control implementation.
- Figure 4: Map of the recommended eligible Dynamic Water Management Plan areas.

Figure1. Index map of dust control areas on Owens Lake.

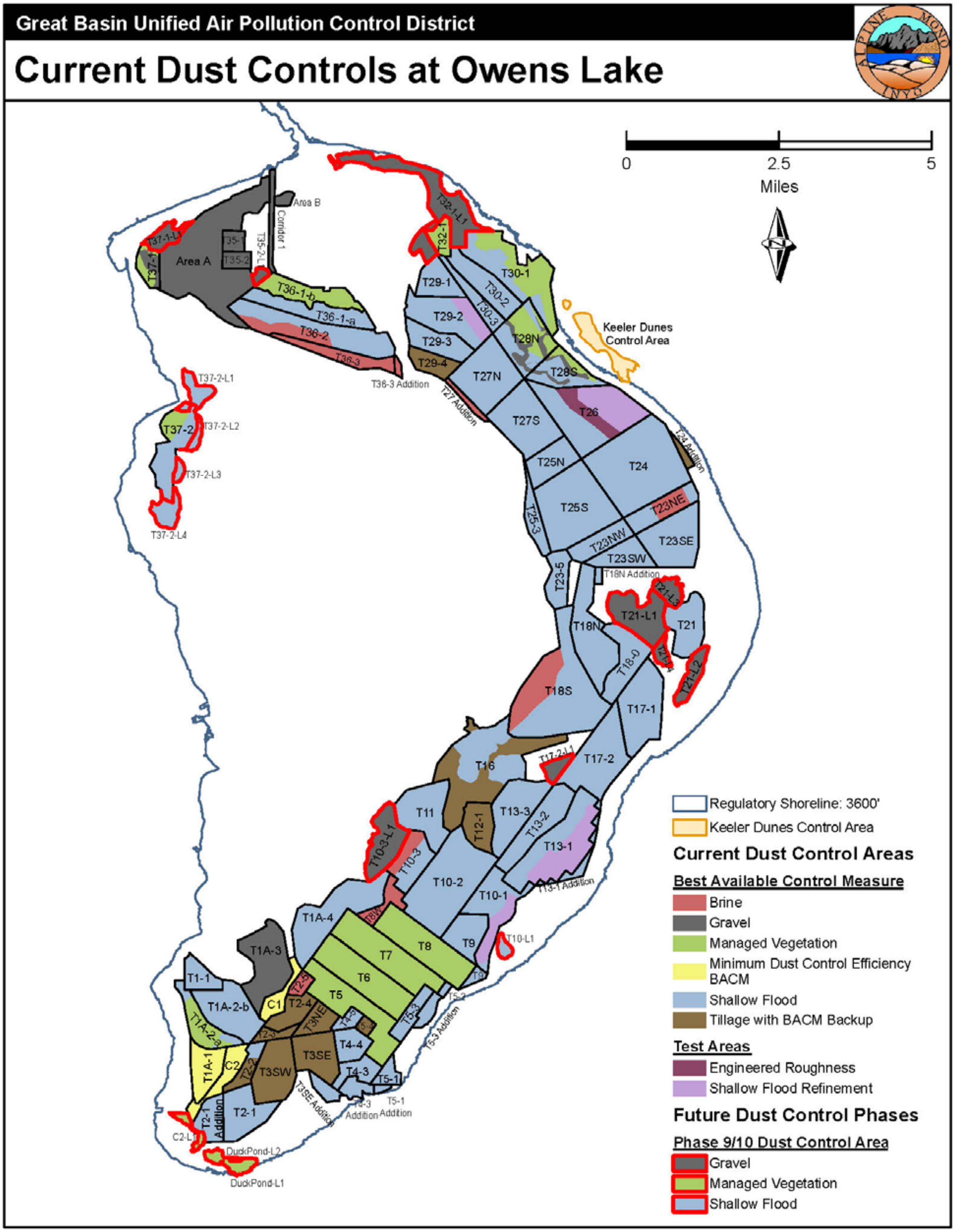


Figure 2. Map of areas included in the Dynamic Water Management analysis.

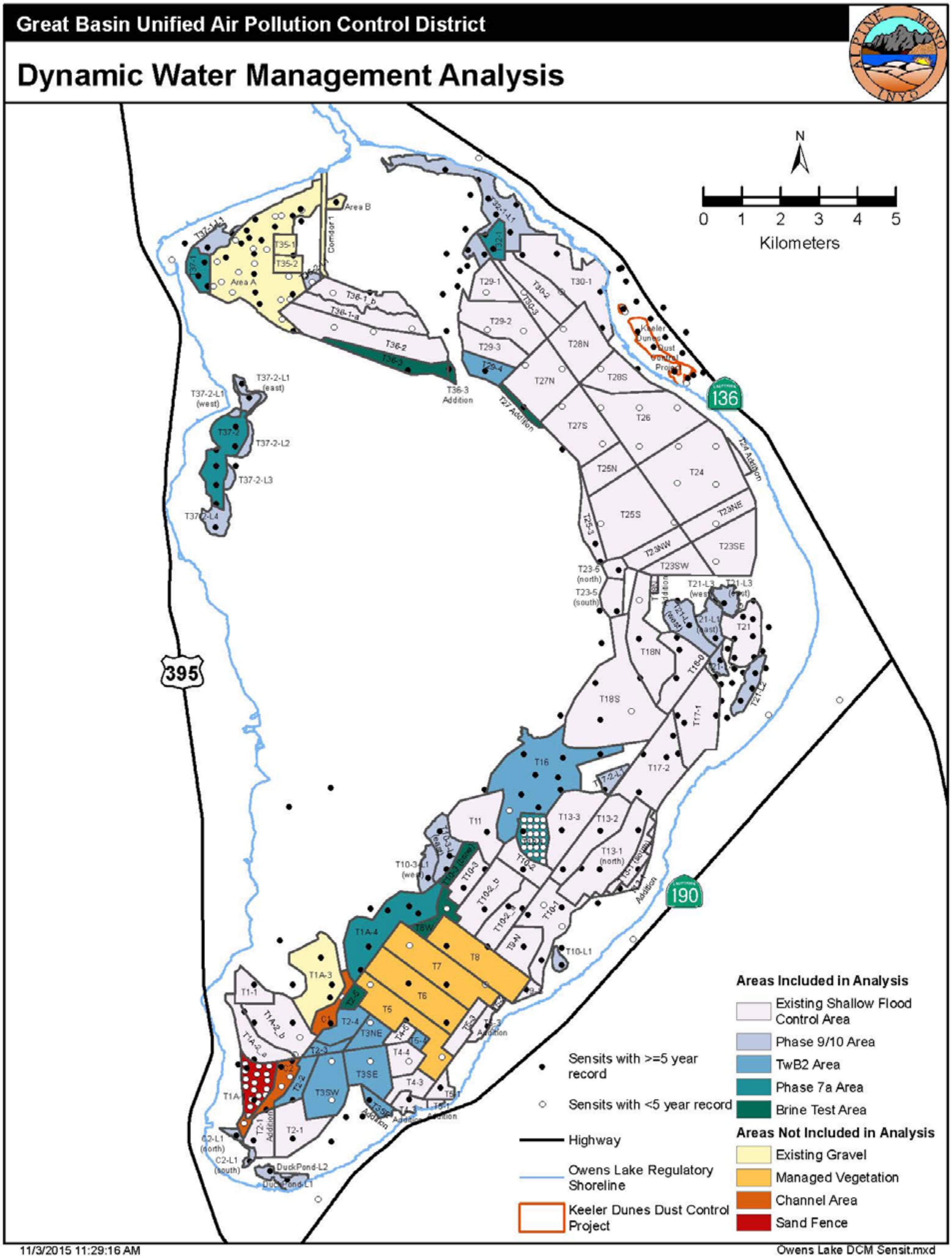


Figure 3. Map of the phases of dust control implementation on Owens Lake.

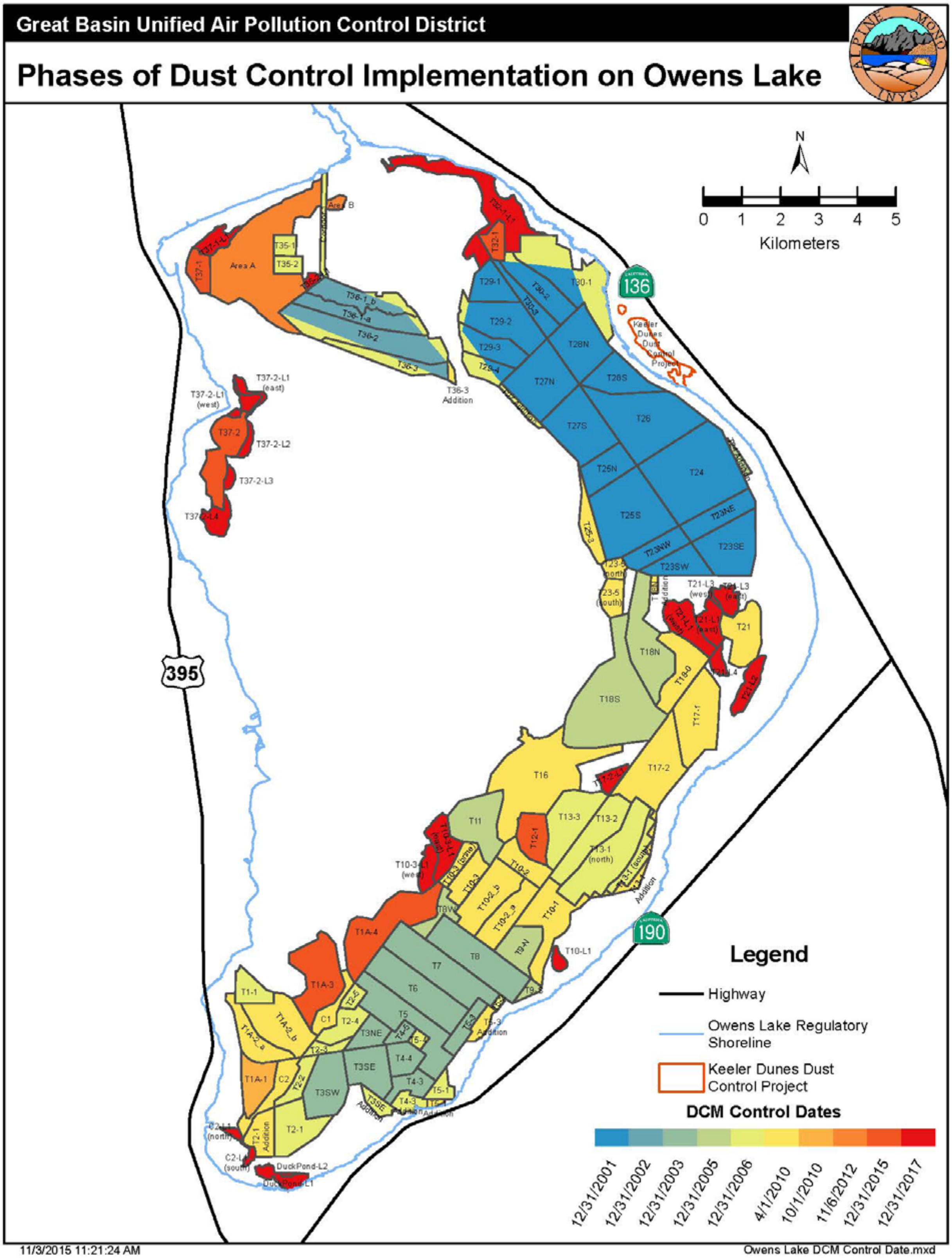
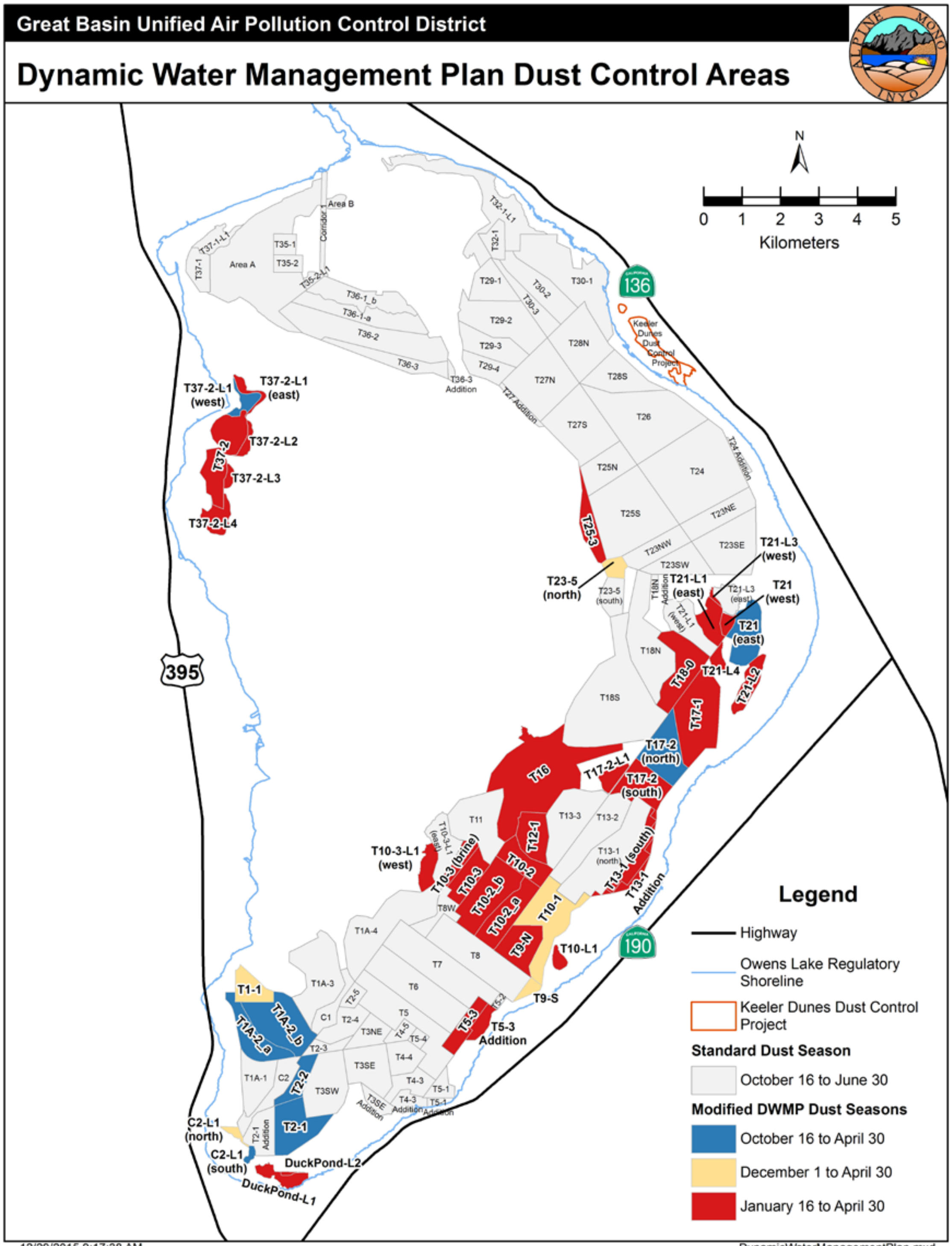


Figure 4. Map of the recommended eligible Dynamic Water Management Plan areas. The modified DWMP seasons are shown for conventional pond and lateral Shallow Flooding areas. The dust season for DWMP areas irrigated with sprinklers shall start two weeks earlier and end one month later than shown on the map (see Section 3.1.1).



3.0 SUMMARY AND RECOMMENDATIONS FOR THE DYNAMIC WATER MANAGEMENT PLAN

3.1 Modified Dust Seasons

Based on the pattern of surface erosion across the lake bed three modified dust seasons have been identified for the DWMP for Shallow Flooding areas. The modified dust seasons are in addition to the standard dust season provided in the 2008 SIP (GBUAPCD, 2008). The modified dust seasons for the DWMP have three different start dates in the beginning of the season that reflect the timing of the start of source area activity across the lake bed.

Standard Dust Season (as defined in the 2008 SIP)
October 16 to June 30 (with ramping of 99% control areas after May 15)

Modified Dust Seasons for Dynamic Water Management Plan

1) October 16 – April 30
2) December 1 – April 30
3) January 16 – April 30

The earliest start of the modified dust seasons is October 16 for areas in which surface activity is regularly observed early in the dust year. These early start areas consist of coarser textured soils in the southern portion of the lake bed and just to the east of Bartlett Point. The second modified start date is December 1 and is recommended for areas in which the sand flux record shows that significant surface activity and erosion is not observed until December to early January. The third modified start date is January 16 for areas that do not become emissive until January or later. The DCAs in this January 16 start group primarily consist of fine textured soils in which significant surface activity and dust emissions are delayed until the surface conditions break down in the winter months (mid-January or later).

All three modified dust seasons for the DWMP end on April 30. For these eligible DCAs, the sand flux record showed that significant sand motion and dust emissions ceased by the end of May or earlier. It is recommended that wetting of these DCAs continue through April 30 at which time water inflows for dust control may end and that due to gradual dry down of areas throughout the month of May sufficient dust control will be provided.

3.1.1 Adjustments for Sprinkler Irrigation Areas

Since the dates of the modified DWMP seasons assumes that there is an initial ramp-up of water at the beginning of the dust season and gradual drying of the DCAs at the end of the dust season, the modified DWMP seasons (as given in Section 3.1, above) only apply to eligible areas where conventional Shallow Flooding is in place. Conventional Shallow Flooding areas are those that are wetted through ponding or irrigation laterals and bubblers.

For eligible areas that are Shallow Flooded with sprinkler irrigation, the modified DWMP seasons shall be adjusted to provide water two weeks earlier in the beginning of the dust season and one month later at the end of the dust season. The adjustments to the DWMP seasons for sprinkler irrigated Shallow Flooding areas are provided below.

Modified Dust Seasons Adjusted for Sprinkler Irrigated Shallow Flooding Areas

1) October 16 – May 31
2) November 16 – May 31
3) January 1 – May 31

The two week adjustment at the beginning of the dust seasons allows for wetting of the surface prior to the start of the modified seasons in Section 3.1 in order to simulate a ramp-up as provided in conventional Shallow Flooding areas. Irrigation is required during the month of May, since, unlike conventional shallow flooding area, dry down is immediate in sprinkler areas such that there is little to no dust control provided at the end of the dust season within a sprinkler area once the water is shut off.

3.2 Dynamic Water Management Plan Implementation

The recommendations provided here for the modified DWMP dust seasons are based on sand flux data from prior to dust control implementation in an area. Thus it represents the best estimate of what the surface activity might be should dust controls be removed from an area. However, it is unknown if and how the operation of dust controls within an area may change the nature of the surface activity both in time and space.

A test of the DWMP concept was conducted on 7.46 square miles of Shallow Flooding areas included in the fall 2015 variance Docket No. GB15-01 (GBUAPCD, 2015) allowing a delay in achieving full wetness cover from October 16 to either December 1 or January 16. During the variance period, portions of two DCAs (T17-2 and T21) became emissive in November and December 2015 such that the LADWP rewetted them early upon the request of the District. The active portions of these two areas were removed from the modified early dust season start in the DWMP (GBUAPCD, 2016b). The remaining DCAs in the variance remained stable and did not become emissive dust sources.

All areas operating with modified DWMP dust seasons must be monitored and observed as part of the District's Dust ID program and through use of the Induced Particulate Emission Test (IPET) methodology developed as part of the Tillage With BACM Back-Up (TwB2) monitoring and enforcement protocol (see Attachment C of 2014 Stipulated Judgement). Furthermore, it is required that the modified dust seasons for the DWMP have the provision that an area must be re-wetted (re-flooding) quickly if monitoring and observations show that the surface conditions within an area deteriorate such that they become potentially emissive. The goal of re-flooding is to bring an area back into fully compliant dust control such that there are no exceedances caused by emissions from an identified area.

3.2.1 Re-Flooding Order

Re-Flooding will be required when a DWMP area deteriorates such that it is determined to be potentially emissive. When this determination has been made and a written re-flood order has been made by the APCO, then LADWP shall, re-flood a DWMP area so as to re-establish fully compliant Shallow Flooding in accordance with the most current Shallow Flooding BACM requirements. The wetness cover requirement shall be determined by the Shallow Flooding wetness cover curve[2] that shows the relationship between wetness cover and control efficiency for Shallow Flooding BACM areas.

The length of time to achieve full wetness cover is dependent on the amount of area that must be re-flooded and the method of irrigation.

> For DCAs with conventional Shallow Flooding irrigated with laterals or ponds:
> If the total amount of DWMP area that needs to be re-flooded is less than 25% of the total extent of area being operated under the DWMP then re-flooding must occur within 15 calendar days of a re-flood order being issued. If the total amount of DWMP area that needs to be re-flooded is 25% or more of the total extent of area being operated under the DWMP then the re-flooding must occur within 21 calendar days of a re-flood order being issued. This re-flooding compliance schedule is set with the goal of achieving fully compliant dust control as soon as possible and with the recognition of the limitations in the existing water delivery infrastructure.
>
> For DCAs with sprinkler Shallow Flooding:
> Shallow Flooding areas irrigated with sprinklers shall be re-flooded within 15 calendar days of a re-flood order being issued regardless of the amount of DWMP area that is ordered.

A re-flooding order shall be issued for entire or partial DWMP areas based on the results of monitoring and testing. For example, if only a portion of a DWMP area fails the testing and

[2] The Shallow Flooding wetness cover curve may be refined through testing. Any approved refinement of this curve can be used to determine the wetness cover required should a DWMP area be ordered for re-flooding.

monitoring conditions (items 1-3 summarized below and described in Section 3.3) then only that portion of the area associated with the monitoring and testing shall be included in the re-flooding order. The APCO will determine the areas associated with monitoring and testing results, in consultation with LADWP. Re-flooding orders are not appealable by the LADWP to the District Governing Board, Hearing Board, or any other agency.

Conditions that may trigger a re-flood order by the APCO are given below. The primary basis for a re-flooding order will be the results of sand flux monitoring and/or IPET testing. Details of how each item will be monitored are provided in Section 3.3.

1) Sand flux at a sand flux monitoring (SFM) site within a DWMP area exceeds 5 grams/cm^2/day.

2) Deterioration of the lake bed surface in a DWMP area such that it is a potentially emissive state. A potentially emissive state will be determined by using the TwB2 monitoring and enforcement protocol (see Level 3 – Mitigation Action as described in Attachment C to the 2014 Stipulated Judgement).

3) Dust plume and surface integrity observations. Dust plume and surface integrity observations will be used in conjunction with sand flux monitoring and/or IPET testing to determine if an area is deteriorating and requires re-flooding.

3.2.1.1 Re-Flooding Order More than Once in a Rolling 6 Year Period

Once an entire or partial DWMP area has been ordered for re-flooding more than once in a rolling 6 year period, that entire or partial area subject to the re-flood order may no longer operate with a modified DWMP dust season and must operate under the standard October 16 to June 30 dust season. The foundation for eligibility of an area in the DWMP is that an area is not emissive during the modified start or end periods of the dust season. If an area is identified for re-flooding multiple times within a continuous rolling six year period then the basis for inclusion in the DWMP is broken and the area will be required to revert back to the standard October 16 to June 30 dust season.

3.2.1.2 Re-Flooding Order Less than Once in a Rolling 6 Year Period

Should a re-flooding order be issued by the APCO for a DWMP area less than once in a rolling six year period, that re-flooding order shall only apply to the modified start or end period upon which the area was identified for re-flooding and not to the entire dust year. Examples include:

<u>i. Re-Flooding Order in Modified Fall Season</u>: If the surface of a DWMP area, scheduled to be in full compliance by January 16, deteriorates in November causing a re-

flooding order to be issued by the APCO, that area must then be re-wetted according to the schedule provided in Section 3.2.1 for the remainder of the fall period but that DWMP area will be allowed to shut down for the modified spring season.

ii. Re-Flooding Order in Modified Spring Season: If the surface of a DWMP area deteriorates in the modified spring season causing a re-flooding order to be issued by the APCO, that area must re-wetted according to the schedule provided in Section 3.2.1 for the remainder of the dust year (until June 30), however, the date for wetting in the fall period would not change.

3.3 Monitoring and Testing of Dynamic Water Management Plan Areas

The District will use the monitoring tests set forth below to ensure DWMP areas provide the emission reduction required on the Owens Lake bed. The District acknowledges that the performance criteria set forth below may be more stringent than is necessary to meet the percent emission reduction requirement, however, DWMP did not go through the BACM development process set forth in the 2008 Owens Valley PM_{10} State Implementation Plan (GBUAPCD, 2008). Therefore, in order to provide assurance that DWMP areas will provide the high level of public health protection required for BACM, the District will initially require that DWMP areas pass the following monitoring thresholds. During the first year of DWMP operation, the District will meet regularly with the LADWP to review and evaluate DWMP performance. After one full year of DWMP operation experience, the APCO will consider revising the DWMP performance criteria.

3.3.1. Sand Flux Test

a) Each DWMP area will be instrumented by LADWP with sand flux monitoring (SFM) sites (Sensit and CSCs) during the modified start and end periods. The locations of SFM sites at the modified start and modified end periods of the dust season are anticipated to be different due to the variation in the pattern of existing wetness during these two periods. The locations of SFM sites shall be determined by the LADWP in coordination with the District.

i) The number of SFM sites at the modified start of the dust season will be proportional to the areal extent of the DWMP area. All DWMP areas will require at least one SFM site. Proportionally more SFM sites are required for DWMP areas greater than 160 acres such that there is approximately one SFM site per 160 acres of DWMP area.

ii) During the modified end period of the dust season, the LADWP shall install SFM sites incrementally in stages as a DWMP area dries. The number of SFM sites is provided in Table 1 below.

Table 1. Number of SFM sites required per DWMP area during the modified end of the dust season.

Drying Stage	Exposed Lake bed	Number of SFM sites
1	Less than 50 acres	0
2	50 – 160 acres	1
3	>160 acres	1 per every 160 acres

b) LADWP will pair CSCs with Sensits, radio equipment and dataloggers programmed to record 5-minute sand motion data. All Sensit data will be reported electronically daily to the District. Sand catches from the SFM sites will be weighed and reported to the District within 7 calendar days of collection in the field. Sand motion data from the CSCs and Sensits will be processed to calculate the sand flux history of a site per the protocol set forth in the 2016 Dust ID Protocol (GBUAPCD, 2016a).

c) During the modified start of the dust season all sand flux monitoring equipment will be installed and operational by LADWP no later than October 16. During the modified end of the dust season all SFM sites will be installed and operational by LADWP within 7 calendar days of reaching each drying stage. LADWP shall inform the District of all SFM site installations within 7 days of installation. Failure to deploy monitoring equipment may result in notices of violation and/or re-flood orders from the APCO.

d) SFM sites installed for monitoring in the modified start of the dust season may be removed from a DWMP area once the modified dust season has started for each DWMP area or once the site location is endanger of getting flooded. The LADWP shall inform the District of all SFM site removals within 7 calendar days of their removal date. SFM sites installed for monitoring of the modified end of the dust season may be removed from a DWMP area after June 30.

e) All SFM sites shall be installed, operated and maintained according to the 2016 Dust ID Protocol (GBUAPCD, 2016a).

f) The APCO may issue a partial or full DWMP area re-flood order if sand flux exceeds 5.0 $g/cm^2/day$ at any sand flux site within a DWMP area.

g) The APCO acknowledges that the sand flux triggers may be conservative for DWMP areas located away from the regulatory shoreline. The APCO may adjust the sand flux trigger value on a case-by-case basis for each DWMP area based on its distance from the regulatory shoreline or other factors.

h) The APCO reserves the right to adjust the above criteria based on supporting data and after consultation with LADWP.

3.3.2. Induced Particulate Emission Test (IPET)

a) The District will utilize the Induced Particulate Emission Test (IPET) method developed for monitoring of TwB2 to determine if DWMP area surfaces are starting to become emissive during the modified start and modified end seasons and to advise LADWP with erosion potential alerts.

b) IPET testing will follow procedures provided in Attachment C of the 2014 Stipulated Judgement (2014 SJ).

c) The District will give LADWP field operations staff at least 24 hour notice of the time and place for RCWInD runs in order to allow LADWP staff an opportunity to observe those tests. LADWP staff does not need to be present for RCWInD testing to be used to call erosion alerts.

d) Three erosion alert levels are set using the IPET method: 1) an early warning of possible surface stability deterioration, 2) a warning level to alert LADWP of a potential breakdown of the surface stability and to advise voluntary maintenance efforts, and 3) a mitigation action level to require re-flooding of all or part of a DWMP Area. The IPET method will be used to determine erosion alert levels as follows:

   i. Level 1 – An erosion early warning is indicated when any visible dust is observed to be emitted from a surface or particles are dislodged when the RCWInD is flown at a height below one half of H_t. Voluntary mitigation may be appropriate to prevent further surface degradation.

   ii. Level 2 – An erosion warning is indicated when any visible dust is observed to be emitted from a surface when the RCWInD is flown at a height below H_t and above one half of H_t. Voluntary mitigation is advised to prevent further surface degradation.

iii. Level 3 – <u>Mitigation</u> action is required if visible dust is observed to be emitted from a surface when the RCWInD is flown at a height of H_t or higher. If ordered by the APCO, LADWP must re-flood all or part of a DWMP area that triggers a Level 3 alert.

The APCO acknowledges that warning and mitigation triggers may be conservative. The warning and mitigation trigger values may be adjusted on a case-by-case basis by the APCO for each DWMP area based on its distance from the regulatory shoreline or other considerations. After one year of experience with DWMP and the IPET test, LADWP and the District will meet to discuss the results of the testing and consider adjustments to the triggers.

e) The APCO reserves the right to adjust the IPET criteria based on supporting data and after consultation with LADWP.

3.3.3. Dust Plume Observations and Surface Integrity Observations

a) The District will conduct regular inspection of DWMP areas and conduct dust plume observations on DWMP areas to determine if DWMP area surfaces are starting to become emissive during the modified start and modified end seasons.

b) Dust plumes will be observed by a combination of visual observation, photography, or video following procedures provided in the 2016 Dust ID Protocol (GBUAPCD, 2016a).

c) Surface Integrity observations will be conducted monthly or as needed during the modified start and modified end dust seasons to document the condition and potential emissivity of DWMP areas. Conditions including, but not limited to, the presence or absence of loose soil deposits and salt efflorescence will be used to evaluate the overall stability of DWMP areas.

d) Dust plume observations and surface integrity monitoring will be used in conjunction with the above described sand flux and IPET tests as a basis for an APCO re-flood order.

<u>3.4 Relationship of DWMP to Brine BACM and TwB2 Areas</u>

Due to the slow changes observed within DCAs that are operated with the newly defined Brine BACM, it is reasonable to expect adequate control prior to the beginning and after the end of the modified dust season such that they may operate under the provisions of the DWMP. Brine BACM areas may follow testing and monitoring provisions required for Brine BACM areas instead of those provided here in Section 3.3.

DCAs operating under the provisions for Tillage With BACM Back-up (TwB2) may not participate in the DWMP even if designated as potential candidates based on the analysis presented in GBUAPCD (2016b). All areas being operated as TwB2 areas must follow all operation, maintenance, monitoring and testing protocols for TwB2. If a TwB2 area is ordered for re-flooding, it may participate in the DWMP once it has achieved fully compliant wetness coverage as long as the tillage features have been flattened and the area smoothed prior re-flooding such that the soils are reconsolidated and provided written approval by the APCO.

3.5 Summary of DWMP Areas

A summary table of the recommended dust season for each of the 44 DCAs in the DWMP is given in Table 2. An overall summary of the number of areas and the areal extent in each DWMP season is provided in Table 3. The total extent of the areas recommended for modified dust season as part of the DWMP is 13.15 square miles (8,416 acres). The supporting analysis of the data from the Sensit sites within each DCA and graphs of the cumulative daily sand flux plotted for each year of data before dust control implementation is available in the supporting technical report for the Dynamic Water Management Plan (GBUAPCD, 2016b).

The recommended dust season is primarily based on the analysis of sand flux data from before dust control implementation within each dust control area as well as the surface conditions and stability observed in areas included in variance Docket No. GB15-01. Recommendations are given in Table 2 for change to the beginning of the dust season as well as to the end of the dust season. The recommendations for DWMP dust season modifications are given for conventional Shallow Flooding and Brine BACM areas. For areas irrigated with sprinklers, the DWMP season shall be further adjusted so that irrigation starts two weeks earlier in the beginning of the dust season and end one month later at the end of the dust season.

Ten of the DCAs were split into two parts such that the recommended dust season is different in either side of the split (shown with grey cells in Table 2). If the operation of these DCAs cannot be split to accommodate the different dust seasons then the entire DCA must be operated to the longer of the two dust seasons.

As many of the existing and potential dust control areas on the Owens Lake bed fall under the jurisdiction of the California State Lands Commission and other responsible agencies, the LADWP must secure the appropriate approvals, leases and permits prior to implementing the modified dust seasons in the Dynamic Water Management Plan. Nothing in this report is intended to give any responsible agency any authority beyond their authority under law. Therefore, listing of these eligible areas in Table 2 should be considered as a preliminary step to seeking full approval for implementation of the DWMP.

Table 2: Summary table of recommended dust season modifications for eligible DCAs in the DWMP. DCAs split with two seasons are shown in grey.

	Label	Recommended DWMP start	Recommended DWMP end	Square Miles	Acres
1	C2-L1 (south)	16-Oct	30-Apr	0.035	22.1
2	C2-L1 (north)	1-Dec	30-Apr	0.044	28.3
3	DuckPond-L1	16-Jan	30-Apr	0.158	101.3
4	DuckPond-L2	16-Jan	30-Apr	0.014	9.2
5	T1-1	1-Dec	30-Apr	0.242	155.0
6	T1A-2_a	16-Oct	30-Apr	0.399	255.3
7	T1A-2_b	16-Oct	30-Apr	0.693	443.5
8	T2-1	16-Oct	30-Apr	0.521	333.2
9	T2-2	16-Oct	30-Apr	0.209	133.9
10	T5-3	16-Jan	30-Apr	0.221	141.4
11	T5-3 Addition	16-Jan	30-Apr	0.123	78.4
12	T9-N	16-Jan	30-Apr	0.388	248.2
13	T9-S	1-Dec	30-Apr	0.070	44.6
14	T10-1	1-Dec	30-Apr	0.699	447.5
15	T10-2	16-Jan	30-Apr	0.307	196.7
16	T10-2_a	16-Jan	30-Apr	0.442	282.8
17	T10-2_b	16-Jan	30-Apr	0.644	412.3
18	T10-3	16-Jan	30-Apr	0.279	178.6
19	T10-3 (brine)	16-Jan	30-Apr	0.159	101.8
20	T10-3-L1 (west)	16-Jan	30-Apr	0.169	108.1
21	T10-L1	16-Jan	30-Apr	0.064	41.1
22	T12-1	16-Jan	30-Apr	0.343	219.4
23	T13-1 (south)	16-Jan	30-Apr	0.238	152.6
24	T13-1 Addition	16-Jan	30-Apr	0.125	79.7
25	T16	16-Jan	30-Apr	1.680	1075.3
26	T17-1	16-Jan	30-Apr	0.826	528.8
27	T17-2 (north)	16-Oct	30-Apr	0.508	325.0
28	T17-2 (south)	16-Jan	30-Apr	0.426	272.9
29	T17-2-L1	16-Jan	30-Apr	0.119	76.1
30	T18-0	16-Jan	30-Apr	0.529	338.5
31	T21 (east)	16-Oct	30-Apr	0.431	275.6
32	T21 (west)	16-Jan	30-Apr	0.064	40.8
33	T21-L1 (east)	16-Jan	30-Apr	0.216	138.3
34	T21-L2	16-Jan	30-Apr	0.216	138.5
35	T21-L3 (west)	16-Jan	30-Apr	0.019	11.9
36	T21-L4	16-Jan	30-Apr	0.086	55.3
37	T23-5 (north)	1-Dec	30-Apr	0.108	69.3
38	T25-3	16-Jan	30-Apr	0.261	167.3
39	T37-2	16-Jan	30-Apr	0.590	377.8
40	T37-2-L1 (east)	16-Jan	30-Apr	0.074	47.1

41	T37-2-L1 (west)	16-Oct	30-Apr	0.108	69.1
42	T37-2-L2	16-Jan	30-Apr	0.065	41.6
43	T37-2-L3	16-Jan	30-Apr	0.049	31.3
44	T37-2-L4	16-Jan	30-Apr	0.188	120.1

Table 3. Summary of DWMP areas by modified dust season.

DWMP Season	Number of areas	Square Miles	Acres
October 16 - April 30	8	2.903	1,857.9
December 1 - April 30	5	1.164	745.0
January 16 - April 30	31	9.083	5,813.1
TOTAL	**44**	**13.150**	**8,416.0**

4.0 REFERENCES

2014 SJ. Stipulated Judgement for Respondent and Defendant Great Basin Unified Air Pollution Control District. Superior Court of the State of California, County of Sacramento. December 19, 2014.

2014 SJ, Attachment C. Protocol for Monitoring and Enforcing Owens Lake Tillage with BACK Backup. Found In: Stipulated Judgement for Respondent and Defendant Great Basin Unified Air Pollution Control District. Superior Court of the State of California, County of Sacramento. December 19, 2014.

GBUAPCD, 2008. 2008 Owens Valley PM10 Planning Area Demonstration of Attainment State Implementation Plan, Great Basin Unified Air Pollution Control District, Bishop, CA, January 2008.

GBUAPCD 2015. Findings and Order Granting Regular Variance For Shallow Flood Areas on Owens Lake. Variance Order - Docket No. GB15-01 by the Hearing Board of the Great Basin Unified Air Pollution Control District. Hearing date July 22, 2015.

GBUAPCD 2016a. 2016 Owens Lake Dust Source Identification Program Protocol. Great Basin Unified Air Pollution Control District. 2016.

GBUAPCD 2016b. Technical Report, 2016 Owens Lake Dynamic Water Management Plan. Great Basin Unified Air Pollution Control District. 2016.

GB22-01 - Interim Variance Staff Report - Exhibit 3

RULE 433. CONTROL OF PARTICULATE EMISSIONS AT OWENS LAKE

Adopted: 04/13/2016

The purpose of this regulation is to effectuate a regulatory mechanism under the federal Clean Air Act to attain the National Ambient Air Quality Standards ("NAAQS") and to implement the Stipulated Judgment between the Great Basin Unified Air Pollution Control District ("District") and the City of Los Angeles ("City") dated December 30, 2014 and entered by the Superior Court of the State of California, County of Sacramento. This regulation does not alter or supersede any provision in the Stipulated Judgment, nor does it relieve any party from full compliance with the requirements of the Stipulated Judgment. This regulation sets the basic requirements for the Best Available Control Measures ("BACM") and defines the areal extent of these controls at Owens Lake, California required in order to meet the NAAQS. This regulation does not preclude the City or the District from implementing more stringent or additional mitigation pursuant to the Stipulated Judgment.

A. DEFINITIONS

1. "BACM PM_{10} Control Areas" are areas on the dried bed of Owens Lake at or below the Regulatory Shoreline elevation of 3,600 feet and at or above Owens Lake's ordinary high water elevation of 3,553.55 feet on which BACM PM_{10} Control Measures shall be implemented, and

   BACM PM_{10} Control Areas are:

   a. Areas, as shown on the map in Exhibit 1 – Dust Control Area Map, including:

      i. 29.8 square miles of the Owens Lake Bed with approved BACM PM_{10} Control Measures ("2003 Dust Control Area");

      ii. 13.2 square miles of the Owens Lake Bed with approved BACM PM_{10} Control Measures, except for Eligible Cultural Resource Areas where PM_{10} BACM selection and implementation dates will be deferred as set forth in Paragraph C.3. ("2006 Dust Control Area" and "Channel Area");

      iii. 2.0 square miles of the Owens Lake Bed with approved BACM PM_{10} Control Measures ("Phase 8 Area");

      iv. 3.62 square miles of the Owens Lake Bed with approved BACM PM_{10} Control Measures to be installed by December 31, 2017, except for Eligible Cultural Resource Areas, where PM_{10} BACM selection and implementation dates will be deferred as set forth in Paragraph C.3. ("Phase 9/10 Area"); and

   b. Additional areas as designated pursuant to Section C., "CONTINGENCY MEASURES" of this rule.

2. "BACM PM_{10} Control Measures" are best available control measures designed to reduce PM_{10} emissions to Control Efficiency ("CE") levels specified below through compliance with performance standards specified in Attachment A or in specific control measure definitions below. The following BACM PM_{10} Control Measures are approved to be used.

a. “BACM Shallow Flooding” means the application of water to the surface of the lake bed in accordance with the performance standards for shallow flooding in Attachment A, Section I - Performance Requirements for BACM Shallow Flooding. Water shall be applied in amounts and by means sufficient to meet a CE level of 99% or CE targets for Minimum Dust Control Efficiency Areas.

b. “Tillage with BACM (Shallow Flood) Backup or TWB^2” means the roughening of a soil surface using mechanical methods in accordance with the specifications in Attachment A, Section IV – Performance Requirements for Tillage with BACM Back-up, and to utilize BACM shallow flooding as a back-up control method in order to prevent NAAQS violations. BACM Shallow Flooding must be implemented in TWB^2 areas if the erosion threshold as defined in Paragraph A.2.h is exceeded. Water shall be applied in amounts and by means sufficient to meet the CE level of 99% or CE targets for Minimum Dust Control Efficiency areas.

c. “Brine BACM” means the application of brine and the creation of wet and/or non-emissive salt deposits sufficient to meet the CE level of 99% as described in Attachment A, Section V – Performance Requirements for Brine BACM. BACM Shallow Flooding must be implemented in Brine BACM areas if the erosion threshold as defined in Paragraph A.2.h is exceeded.

d. “BACM Managed Vegetation” means planting surfaces of the BACM PM_{10} Control Areas with protective vegetation to meet the CE level of 99% by maintaining overall average vegetation cover of at least 37% for each contiguous Managed Vegetation area and an areal distribution based on vegetation cover thresholds and grid size.

e. “BACM Gravel Blanket” means the application of a layer of gravel sufficient to meet the CE level of 100% by covering the control area with
   - a layer of gravel at least four inches thick with gravel screened to a size greater than ½ inch in diameter, or
   - a layer of gravel at least two inches thick with gravel screened to ½ inch in diameter underlain with a permanent permeable geotextile fabric.

e. “Dynamic Water Management or DWM” is a BACM Shallow Flooding operational modification that allows delayed start dates and/or earlier end dates required for shallow flooding in specific areas that have historically had low PM_{10} emissions within the modified time periods. The truncated dust control periods allows for water savings while achieving the required CE level. Areas eligible for the DWM program and their modified start and/or end dates for shallow flooding are identified in Attachment A, Section VI – Performance Requirements for Dynamic Water Management. If any DWM area becomes susceptible to wind erosion outside of the modified dust control period the area will be required to be flooded to meet the required CE for that area. BACM Shallow Flooding must be implemented in DWM areas if the erosion threshold as defined in Paragraph A.2.h is exceeded.

g. “Minimum Dust Control Efficiency or MDCE” BACM is a dust control measure for which the control efficiency target is adjusted to match the required control level based on air quality modeling for the 2006 dust control areas as shown on the map in Exhibit 2 – Dust Control Efficiency Requirements. The control efficiency targets may be less than 99%, but the level of control in all areas is intended to prevent exceedances of the NAAQS. MDCE BACM includes:

i. Shallow flood areas where the wetness cover is adjusted following the curve in Exhibit 3 - Shallow Flood Control Efficiency and Wetness Cover Curve,

ii. Channel Area - a state-regulated wetland area as shown in Exhibits 1 and 2 where vegetation cover is enhanced by irrigation and seeding with native plants in a manner sufficient to prevent windblown dust from causing exceedances of the NAAQS, and

iii. Sand Fence Area – an area as shown in Exhibits 1 and 2 located in area T1A-1 where sand fences, vegetation and natural water runoff combine to provide sufficient protection to prevent windblown dust from causing exceedances of the NAAQS.

h. "Erosion Threshold" is applicable to TWB^2, DWM, and Brine BACM to trigger BACM Shallow Flooding which must be implemented to comply with the shallow flood CE target for that area. The erosion threshold is determined from sand flux measurements or the Induced Particulate Erosion Test (IPET) test method as described in Attachment A, Paragraphs IV.C.2 and IV.C.4. BACM Shallow Flooding must be implemented in TWB^2, DWM or Brine BACM areas if any of the following thresholds are exceeded as determined using the methods described in Attachment A:

i. Sand flux measured at 15 cm above the surface exceeds 5.0 grams per square centimeter per day on DWM or Brine BACM areas or 1.0 gram per square centimeter per day on TWB^2 areas, or

ii. Induced Particulate Erosion Test method shows visible dust emissions when operated at the reference test height.

i. "Approved BACM" includes the control measures specified above and other measures approved by the APCO and the US Environmental Protection Agency as equivalent to these methods.

3. "Eligible Cultural Resource Area or ECR Area" is an area or areas where dust control measures will be implemented on a deferred schedule due to the presence of significant cultural resources that make the areas eligible for listing under the California Register of Historic Resources.

B. REQUIREMENTS

1. For the 2003 Dust Control Area the City shall continuously operate and maintain any mix of approved BACM PM_{10} Control Measures as defined above in Section A to meet the 99% efficient CE level. Selection of the type and location of BACM PM_{10} Control Measures within the area is solely the responsibility of the City.

2. For the 2006 Dust Control Area the City shall continuously operate and maintain approved BACM PM_{10} Control Measures defined above in Section A to meet the CE target specified in Exhibit 2, except for ECR Areas where BACM PM_{10} Control Measure selection and implementation dates will be deferred as set forth in Paragraph C.3., and any areas of BACM Managed Vegetation, for which the City shall comply with the

minimum 37% average vegetation cover target and areal distribution requirements by December 31, 2017.

3. For the Phase 8 Area consisting of 2.0 square miles the City shall continue to operate and maintain BACM Gravel Blanket.

4. For the Phase 9/10 Project Area consisting of 3.62 square miles the City shall select and install BACM PM_{10} Control Measures by December 31, 2017, except for ECR Areas, where PM_{10} BACM selection and implementation dates will be deferred as set forth in Paragraph C.3.

5. In areas containing infrastructure capable of achieving and maintaining compliant BACM Shallow Flooding the City may implement TWB[2], Brine Shallow Flooding or Dynamic Water Management as alternatives to BACM Shallow Flooding or MDCE BACM shallow flooding.

C. CONTINGENCY MEASURES

1. At least once each calendar year, the District shall determine whether additional areas of the lake bed require BACM PM_{10} Control Measures in order to attain or maintain the PM_{10} NAAQS.

2. If the District has not demonstrated attainment with the PM_{10} NAAQS on or before December 31, 2017, or has not met reasonable further progress milestones, the District shall order the City to apply one or more BACM PM_{10} Control Measures as set forth in Paragraphs A.2 and C.4 on those areas of the Owens Lake bed that cause or contribute to exceedances of the PM_{10} NAAQS.

3. If monitoring and/or modeling demonstrates BACM PM_{10} Control Measures are needed in an ECR Area(s) to attain or maintain the PM_{10} NAAQS after BACM PM_{10} Control Measures are implemented in adjacent areas, the District shall order the City to select and implement BACM PM_{10} Control Measures set forth in Paragraph A.2.

4. The District may order the City to implement, operate and maintain a total of up to 53.4 square miles of waterless or water-neutral BACM PM_{10} Control Measures on the Owens Lake bed below the Regulatory Shoreline (elev. 3,600 feet) and above the ordinary high water level of Owens Lake (elev. 3,553.55 feet).

5. As expeditiously as practicable and not more than three years after any such order for additional BACM PM_{10} Control Measures, the City shall install, operate and maintain BACM PM_{10} Control Measures that achieve a control efficiency of 99%. If BACM Managed Vegetation is chosen up to two additional years for vegetation growth is allowed to achieve the 37% vegetation cover requirement.

EXHIBIT 1 – Dust Control Area Map

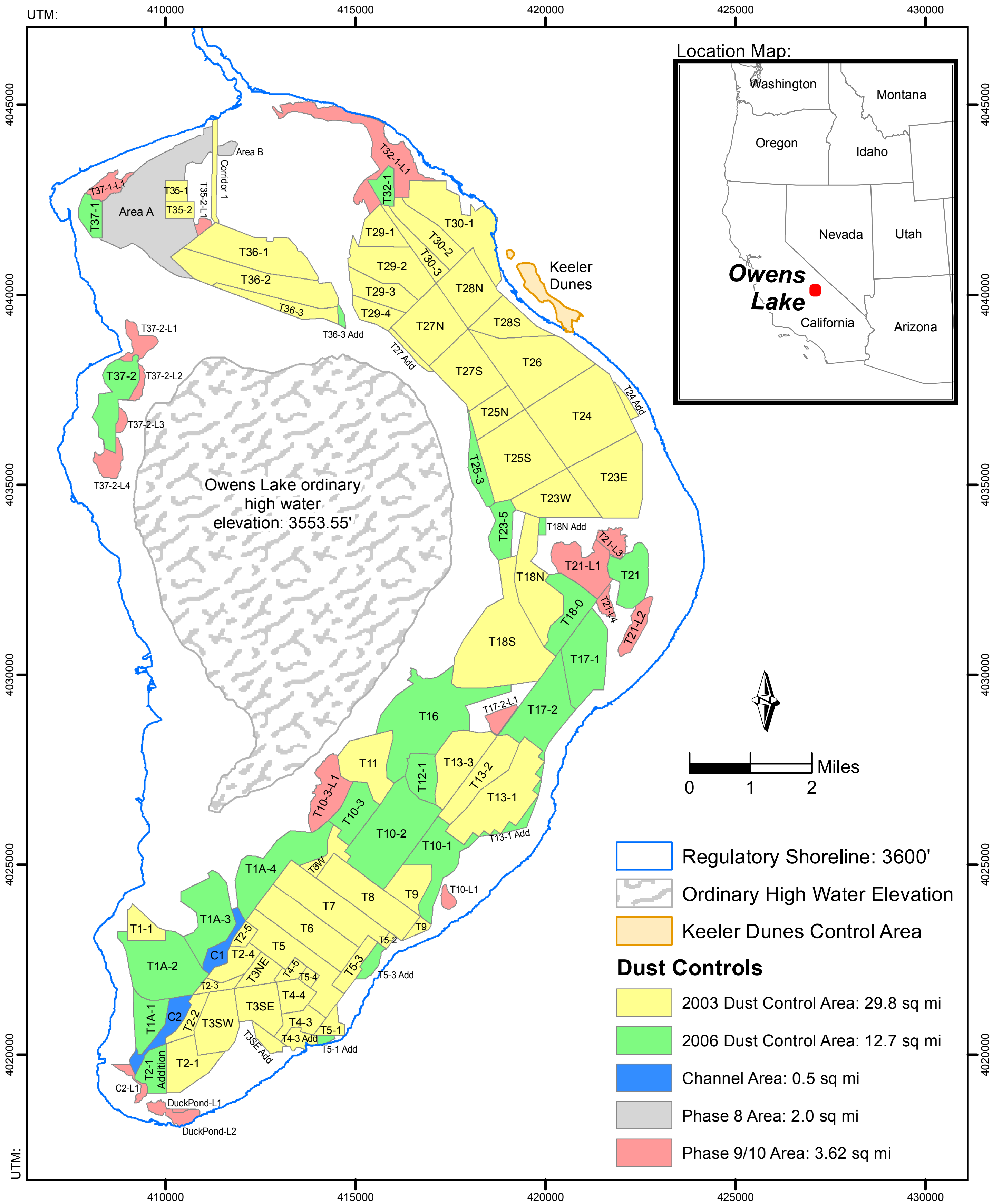
EXHIBIT 2 – Dust Control Efficiency Requirements

EXHIBIT 3 – Shallow Flood Control Efficiency and Wetness Cover Curve

ATTACHMENT A – Performance Requirements for BACM

Great Basin Unified Air Pollution Control District

Exhibit 1 - PM10 Dust Control Areas



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Great Basin Unified Air Pollution Control District

Exhibit 2 - Dust Control Efficiency Map

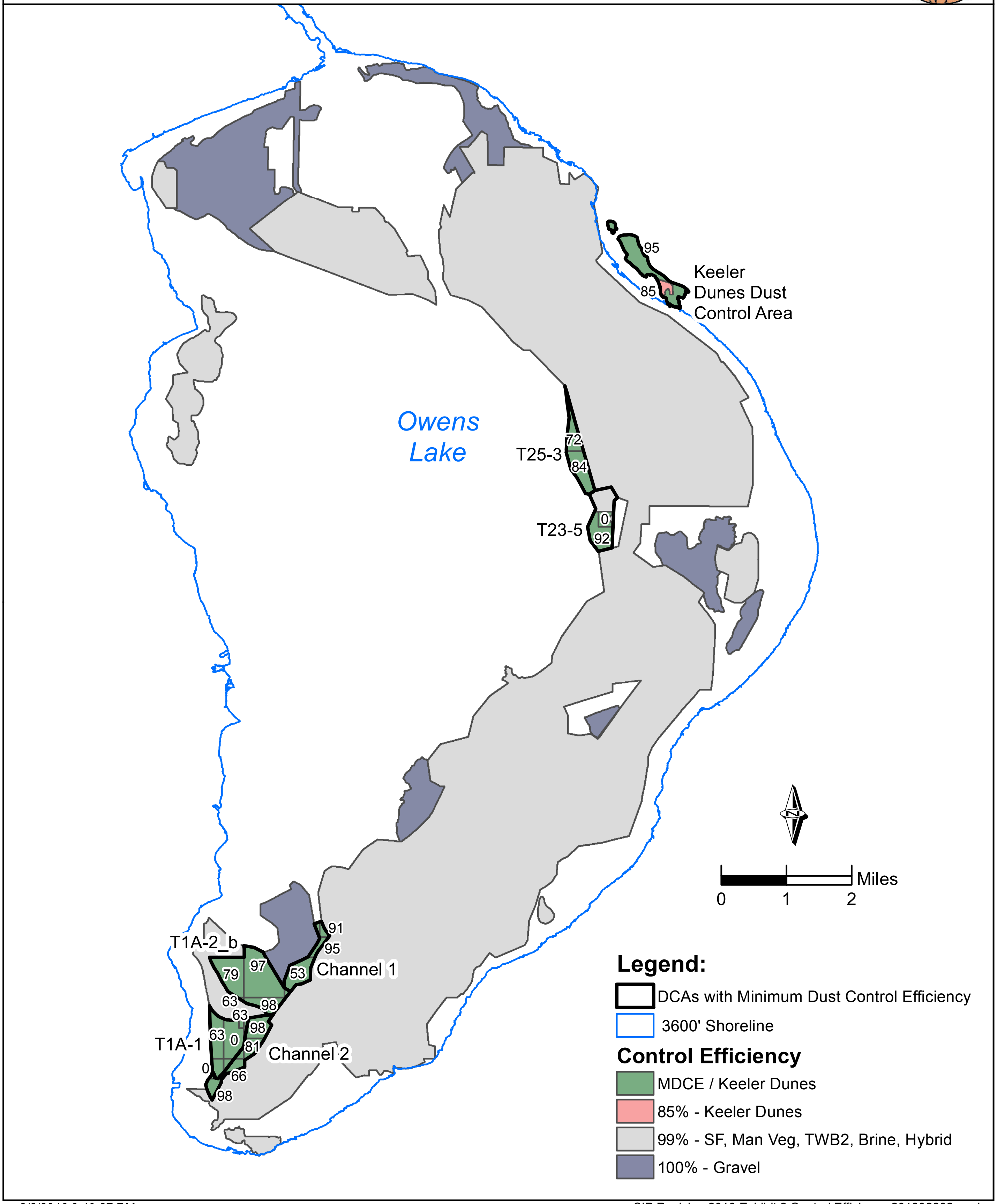

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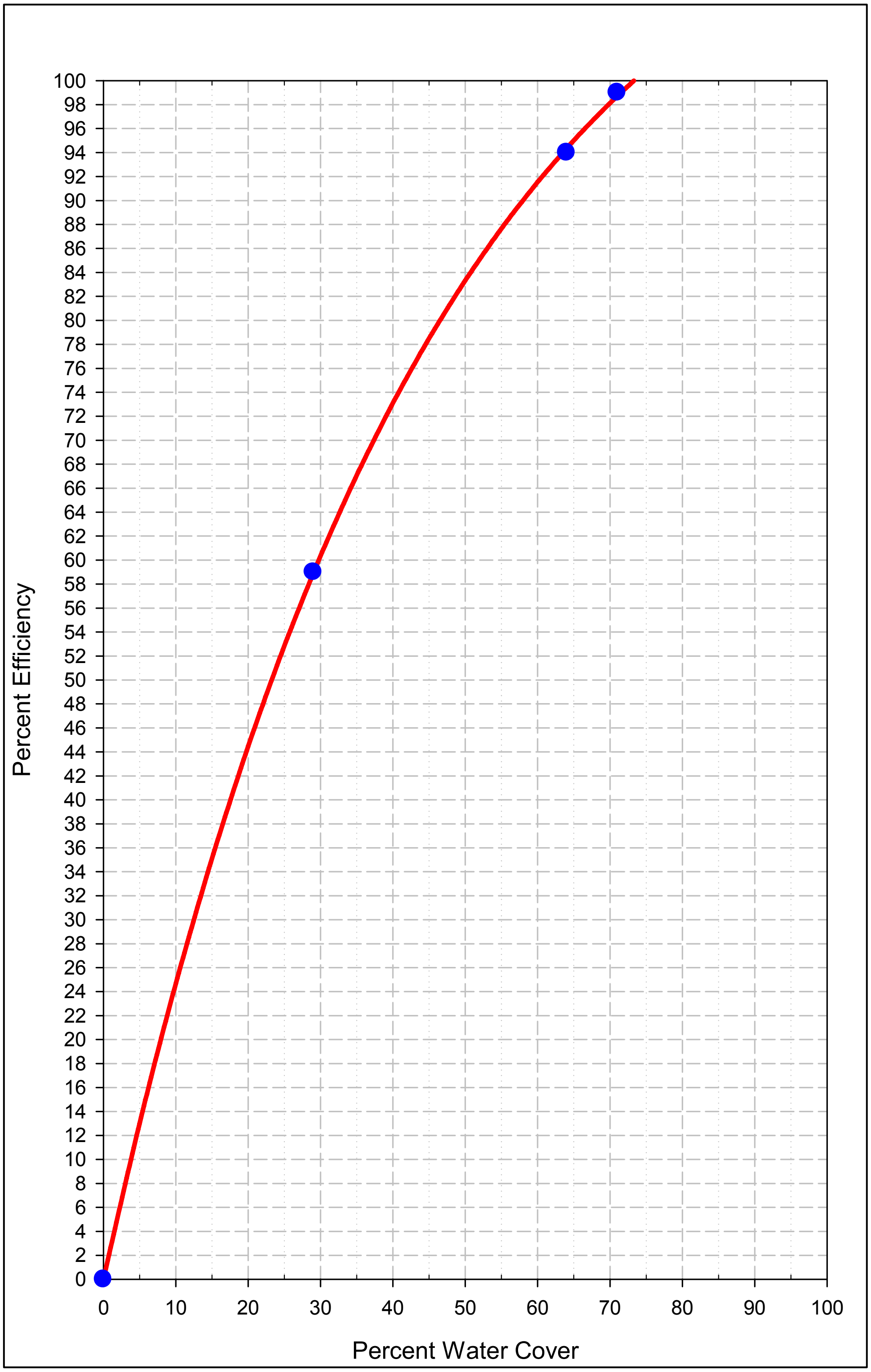
Exhibit 3 - Shallow Flood control efficiency curve



Rule 433 – Attachment A
Performance Requirements for BACM

I. BACM Shallow Flooding

A. The "BACM Shallow Flooding" PM_{10} control measure will apply water to the surface of those areas of the lake bed where shallow flooding is used as a PM_{10} control measure. Water shall be applied in amounts and by means sufficient to achieve the performance standards set forth in Paragraphs I.B and I.C of this attachment. The dates by which BACM Shallow Flooding areas are to comply with these performance standards may be modified by the Dynamic Water Management provisions set forth in Rule 433.A.2.f and Paragraph VI.B.

B. For all BACM Shallow Flooding areas except those within the 2006 DCA:

1. At least 75 percent of each square mile designated as BACM Shallow Flooding areas shall continuously consist of standing water or surface-saturated soil, substantially evenly distributed for the period commencing on October 16 of each year, and ending on May 15 of the next year. For these BACM Shallow Flood dust control areas, 75 percent of each entire contiguous area shall consist of substantially evenly distributed standing water or surface- saturated soil.
2. Beginning May 16 and through May 31 of every year, shallow flooding areal wetness cover may be reduced to a minimum of 70 percent.
3. Beginning June 1 and through June 15 of every year, shallow flooding areal wetness cover may be reduced to a minimum of 65 percent.
4. Beginning June 16 and through June 30 of every year, shallow flooding areal wetness cover may be reduced to a minimum of 60 percent.

C. For BACM Shallow Flooding areas within the 12.7 square-mile 2006 DCA:

1. The percentage of each area that must have substantially evenly distributed standing water or surface-saturated soil shall be based on the Shallow Flood Control Efficiency Curve (Exhibit 3) to achieve the control efficiency levels in the Minimum Dust Control Efficiency (MDCE) Map (Exhibit 2).
2. For only those BACM Shallow Flooding areas with control efficiencies of 99 percent or more:
   a. Beginning May 16 and through May 31 of every year, shallow flooding areal wetness cover may be reduced to a minimum of 70 percent.

b. Beginning June 1 and through June 15 of every year, shallow flooding areal wetness cover may be reduced to a minimum of 65 percent.

c. Beginning June 16 and through June 30 of every year, shallow flooding areal wetness cover may be reduced to a minimum of 60 percent.

II. BACM Managed Vegetation

The "BACM Managed Vegetation" PM_{10} control measure requires planting surfaces of the BACM PM_{10} control areas with protective vegetation to meet the control efficiency level of 99% by maintaining an overall average vegetation cover of 37% for each contiguous managed vegetation area.

III. BACM Gravel Blanket

The BACM Gravel Blanket" PM_{10} control measure requires the application of a layer of gravel sufficient to meet the control efficiency level of 100% by one of the following means:

- covering 100% of the control area with a layer of gravel at least four inches thick with gravel screened to a size greater than ½ inch in diameter, or
- covering 100% of the control area with a layer of gravel at least two inches thick with gravel screened to ½ inch in diameter underlain with a permanent permeable geotextile fabric.

IV. Tillage with BACM (Shallow Flood) Backup (or TWB^2)

A. The City of Los Angeles ("City") may implement or transition BACM Shallow Flood areas to "Tillage with BACM (Shallow Flood) Back-up (TWB^2)," which shall consist of (1) soil tilling within all or portions of BACM Shallow Flood PM_{10} control areas (TWB^2 Areas), and (2) the installation of all necessary shallow flood infrastructure so that the TWB^2 Areas can be shallow-flooded if the erosion threshold is exceeded or the performance criteria are not met.

B. Construction of TWB^2 Areas

1. Tillage shall create rows and furrows in roughly east to west directions in order to create maximum surface roughness for winds from the north and south. Additional roughness to protect surfaces from west winds shall be created in tilled areas

sufficient to prevent emissions from east and west winds.

2. The tilled surfaces will also be armored with soil clods of 1/2 inch diameter or larger covering 60 percent or more of the tilled surface.
3. TWB^2 areas shall be constructed with ridge heights (RH) averaged on 40-acre blocks at or above 1.25 feet (furrow depth to ridge top difference at least 2.5 feet) and row spacing (RS) sufficient to provide a ratio of the row spacing to ridge height (RS/RH) below 10, e.g. distance between rows is 12.5 feet with average ridge height greater than 1.25 feet.

C. Monitoring and Maintenance

1. Surface Roughness
   a. Lidar, aerial photography or other field measurement methods with equivalent accuracies will be used by the City to measure RS/RH ratio and ridge height. Roughness measurements will be made in the north-to-south direction --- the direction of the primary dust producing winds. Roughness measurements may also be made in other directions. Roughness measurements will be reported to the APCO within 30 days of measurement.
   b. The RS/RH ratio and ridge height measurements will be made at 6 month, or more frequent, intervals. Inverse roughness and ridge height for a TwB^2 Area will be tracked and plotted as a function of time. Where feasible, field measurements may also be taken to confirm Lidar or other remotely sensed results. The City will conduct roughness measurements at least once every 6 months and report the measurements within 30 days to the APCO. The District reserves the right to conduct its own roughness measurements at any time.
   c. Assuming that degradation of the tilled ridges may occur over time, tillage maintenance will be performed by the City if the average RS/RH roughness ratio is between 10.1 and 12.0 or if the average ridge height is less than 1.1 feet in a tilled area.
   d. The City shall re-flood a TWB^2 area to comply with the required BACM Shallow Flood control efficiency for the area if the RS/RH ratio is greater than 12.0 (12/1) or the ridge height falls below 1.0 feet for any defined 40-acre averaging area.
   e. The City shall measure clod coverage using the point-intercept method (U.S. Bureau of Land Management, Sampling Vegetation Attributes, Method G,

Technical Reference BLM/RS/ST-96/002+1730) or other field measurement methods with equivalent accuracy. Clod cover will be measured concurrently with surface roughness at least once every 6 months and reported to the APCO within 30 days of measurement.

2. Sand Flux
   a. The City shall monitor each TWB^2 area with at least four Sensits and Cox sand catchers (CSCs) with inlets set at 15 cm above untilled surfaces (circular pads with 3 m radius) in the general northern, southern, eastern and western portions of a tillage. In TWB^2 areas greater than 320 acres the City shall install one Sensit and CSC pair per 80 acres.
   b. The City will pair CSCs with Sensits, radio equipment and dataloggers programmed to record 5-minute sand motion data. All Sensit data will be reported daily to the District. Sand motion data from the CSCs and Sensits will be processed to track sand flux at each site.
   c. All sand flux monitoring equipment will be installed prior to the start of tillage activities.
   d. High sand flux values recorded during maintenance activities or from non-tillage sand flux sources shall be excluded from the sand flux data. Maintenance activities and non-tillage sand flux sources may include, but are not limited to, rain-splatters, bugs, adjacent grading and road construction activities, as well as vehicle traffic. Sensits should be placed so as to minimize impacts from non-tillage sand flux sources.
   e. When (other than during maintenance activities taking place in the "tillage area" which is defined as the tilled portion of the TWB^2 area) the sand flux exceeds 0.50 g/cm^2/day, the City will perform maintenance in the tillage area, which may include surface wetting, re-establishment of the surface roughness, or full or partial reflooding of a TWB^2.

3. PM_{10} Monitoring
   a. Each TWB^2 area will be assigned upwind and downwind PM_{10} monitors (not necessarily at the TwB^2 Area boundary) to monitor PM_{10} emissions from the tillage area. For a given wind direction, the downwind monitors shall be within

22 degrees (±11.5°) of the upwind monitors. Upwind/downwind monitor assignments will be requested by the City and approved by the APCO. Existing monitors operated by the District may be used as upwind/downwind monitors. Additional EPA reference and equivalent method PM_{10} monitors (40 CFR Part 53) shall be operated by the City, unless mutually agreed otherwise.

b. If a monitor is operated by the City, its operation and maintenance must follow District procedures and data collection must be incorporated into the District communications network. The District reserves the right to audit monitors and monitoring data collected by the City. The District also reserves the right to install and operate or require the City to install and operate additional PM_{10} monitors to adequately monitor the PM_{10} emissions coming from tilled areas.

c. All PM_{10} monitoring equipment will be in place as soon as practicable as shallow flood areas dry, but no later than the start of tillage activities.

d. Impacts caused by maintenance activities and non-tillage sources shall be excluded from the PM_{10} data. Maintenance activities and non-tillage PM_{10} sources may include, but are not limited to, adjacent grading and road construction activities, as well as vehicle traffic. PM_{10} monitors should be placed so as to minimize impacts from non-tillage sources.

e. When the daily downwind to upwind PM_{10} concentration difference for any dust event (other than during maintenance activities in the tillage area) exceeds 50 $\mu g/m^3$ and there is no evidence to show that the additional downwind PM_{10} did not come from the TWB[2] Area, maintenance will be performed in the tillage area.

4. Induced Particulate Erosion Test

a. The Induced Particulate Erosion Test (IPET) method will be used to determine if tilled area surfaces are starting to become emissive. The IPET method uses a small radio-controlled helicopter-type craft (Radio-Controlled Wind Induction Device or RCWInD) to create wind on the surface. Each RCWInD craft shall be pre-tested to determine the test height above the surface (H_t) at which the craft creates a target maximum horizontal wind speed (TWS) measured at 1 centimeter ($U_{0.01}$) above a flat surface equal to 11.3 meters per second (m/s). If the payload on a craft is changed, e.g. a different camera is used, then H_t must be re-determined for the new payload since it will affect the amount of thrust needed to keep the RCWInD aloft.

b. Testing to determine H_t and TWS will be done on a smooth flat surface, e.g. concrete or asphalt pavement or plywood test platform with calm ambient winds (< 2 m/s). H_t is measured from the bottom of the rotor blade to the surface. The maximum wind speed for any flight height is taken at a height one centimeter above the surface at a point that is one rotor blade length away from the point beneath the center of the fastest rotor blade taken on a line extending outward from the rotor arm. The wind speed measurement is taken with a pitot tube pointing toward the center of the rotor blade. The RCWInD must be flown in a stationary position to get a sustained wind speed measurement.

c. When the craft is flown over a ridged surface H_t is measured from the bottom of the craft's rotor blades to the highest surface projection anywhere directly below the craft.

d. Three erosion alert levels are set using the IPET method: 1) an early warning of possible clod and surface stability deterioration, 2) a warning level to alert the City of a potential breakdown of the surface stability and to advise voluntary maintenance efforts, and 3) a mitigation action level to require re-tilling and/or re-flooding of all or part of a TWB[2], DWM or Brine BACM Area.

e. The IPET method will be used to determine erosion alert levels as follows:

- Level 1 – An erosion early warning is indicated when any visible dust is observed to be emitted from a surface or particles are dislodged when the RCWInD is flown at a height below one half of H_t. Voluntary mitigation may be appropriate to prevent further surface degradation.
- Level 2 – An erosion warning is indicated when any visible dust is observed to be emitted from a surface when the RCWInD is flown at a height below H_t and above one half of H_t. Voluntary mitigation is advised to prevent further surface degradation.
- Level 3 – Mitigation action is required if visible dust is observed to be emitted from a surface when the RCWInD is flown at a height of H_t or higher.

D. The City shall re-flood TwB[2] areas to comply with the BACM Shallow Flood control efficiency target for that area, if either of the following erosion thresholds are exceeded as determined using the sand flux and IPET measurements described in Paragraphs IV.C.2 and IV.C.4.

1. Sand flux measured at 15 cm above the surface exceeds 1.0 gram per square centimeter per day, or
2. Induced Particulate Erosion Test method shows visible dust emissions when operated at the reference test height, H_t.

V. <u>Brine BACM</u>

A. Stable surfaces for Brine BACM shall be defined as consisting of standing water, evaporite salt deposit, and capillary brine salt crust as follows:

1. Water: Standing water or hydrologically saturated surface as defined by BACM Shallow Flooding, regardless of salinity level.
2. Evaporite Salt Deposit: A crystalline deposit of salt minerals precipitated on the surface of the lakebed from evaporation of Owens Lake brine. The evaporite salt deposit does not include the development of salt crust by upward capillary movement of saline fluids through the soil column. The evaporite salt deposit must have an average thickness of 1.5 centimeters or greater and may be either wet or dry.
3. Capillary Brine Salt Crust: A crust enriched in salt minerals formed at the soil surface by upward capillary movement of water through the soil. The capillary brine crust typically consists of a mix of salt minerals and soil particles in various proportions, and must meet the following three conditions:
   a. The capillary brine salt crust within a Brine BACM area must have an average thickness of 10 centimeters or greater and may be either wet or dry,
   b. a capillary brine salt crust must be accompanied by either water and/or an evaporite salt deposit, and
   c. the proportion of qualifying capillary brine crust within a Brine BACM area cannot exceed one-third of the required total compliant cover within a Brine BACM area.

B. Each Brine BACM area shall be operated such that the total areal extent of the surface cover of the qualifying surfaces are maintained such that they meet or exceed those as defined by the Shallow Flooding Control Efficiency Curve in Exhibit 3. The combined mosaic of stable Brine BACM surfaces shall cover the entire dust control area.

C. Brine BACM can be used by the City of Los Angeles (City) throughout the Owens Lake bed where backup BACM Shallow Flood infrastructure exists and can be implemented, as set forth in this protocol, to ensure that Brine BACM areas do not cause or contribute to exceedance of the NAAQS for PM_{10}.

D. The boundaries for each Brine BACM area will be pre-defined by the City prior to implementation. Each Brine BACM area will be monitored separately to determine compliance with required surface cover conditions.

E. The City will monitor each Brine BACM area with at least one sand flux monitor (SFM) site instrumented with paired Cox Sand Catchers (CSCs) and Sensits with inlets positioned 15 cm above the surface, radio equipment, and dataloggers programmed to record 5-minute sand motion data. SFM sites will primarily be located in portions of Brine BACM areas covered with a capillary crust. All Sensit data will be reported daily to the District. Sand motion data from the CSCs and Sensits will be processed to track sand flux at each site.

F. Brine BACM areas will be monitored using the IPET method following the procedures used for Tillage with BACM Back-up areas in Paragraph IV.C.4.

G. The City shall re-flood Brine BACM areas to comply with the BACM Shallow Flood control efficiency target for that area, if either of the following erosion thresholds are exceeded as determined using the sand flux and IPET measurements described in Paragraphs IV.C.2 and IV.C.4.

   1. Sand flux measured at 15 cm above the surface exceeds 5.0 grams per square centimeter per day, or
   2. Induced Particulate Erosion Test method shows visible dust emissions when operated at the reference test height, H_t.

VI. Dynamic Water Management

A. Areas that are eligible for Dynamic Water Management (DWM) must meet the following sand flux history criteria:

   1. 5 years or more of sand flux data from before dust control implementation, and

2. The frequency of significant sand flux ($\geq$5 g/cm^2/day) taking place outside of the modified shallow flood dust control period did not occur in more than one calendar year over any continuous six year period.

B. The modified dust seasons for DWM have three different start dates in the beginning of the season that reflect the delayed start of source area activity across the lakebed. The modified start dates are applicable to certain dust control areas based on the sand flux history as evaluated in Paragraph VI.A and the method of shallow flooding using conventional flooding or sprinkler irrigation.

1. For areas shallow flooded by methods other than sprinkler irrigation, the standard and modified dust control periods are:

   Standard Dust Season

   October 16 to June 30 (with ramping of 99% control areas after May 15)

   Modified Dust Seasons for Dynamic Water Management

   October 16 – April 30

   December 1 – April 30

   January 16 – April 30

2. For eligible areas that are shallow flooded with sprinkler irrigation, the modified DWM seasons shall be adjusted to provide water two weeks earlier in the beginning of the dust season to simulate ramp up as applied in conventional BACM Shallow Flood areas and one month later at the end of the dust season due to the lack of wetness during the dry down period with conventional BACM Shallow Flood areas. The adjustments to the DWM seasons for sprinkler irrigated shallow flooding areas are provided below.

   Modified Dust Seasons Adjusted for Sprinkler Irrigated Shallow Flooding Areas

   October 16 – May 31

   November 16 – May 31

   January 1 – May 31

3. In areas approved for DWM, the City of Los Angeles (City) shall meet the shallow flood control efficiency and wetness targets indicated in Exhibits 2 and 3 by or before the applicable start dates in Paragraph VI.B and water may be shut off with no spring ramping at the end of the modified season.

C. Each DWM area will be instrumented by the City with sand flux monitoring (SFM) sites using paired Sensits and Cox Sand Catchers (CSCs) during the modified start and end periods. The locations of SFM sites shall be determined by the City in coordination with the District.

1. The number of SFM sites at the modified start of the dust season will be proportional to the areal extent of the DWM area. All DWM areas will require at least one SFM site however; the APCO may require proportionally more SFM sites for DWM areas greater than 320 acres such that there is approximately one SFM site per 160 acres of DWM area.
2. During the modified end period of the dust season, the LADWP shall install SFM sites incrementally in stages as a DWM area dries. The number of SFM sites is provided in Table 1 below.

Table 1. Number of SFM sites required per DWM area during the modified end of the dust season.

Drying Stage	Exposed Lakebed	Number of SFM sites
1	Less than 50 acres	0
2	50 – 160 acres	1
3	>160 acres	1 per every 160 acres

3. The City will pair CSCs with Sensits with inlets positioned at 15 cm above the surface, radio equipment and dataloggers programmed to record 5-minute sand motion data. All Sensit data will be reported daily to the District. Sand motion data from the CSCs and Sensits will be processed to track sand flux at each site.
4. During the modified start of the dust season all sand flux monitoring equipment will be placed by the City no later than October 16. During the modified end of the dust season all SFM sites will be placed by the City within 7 calendar days of reaching each drying stage. The City shall inform the District of all SFM site installations within 7 days of installation.
5. SFM sites installed for monitoring in the modified beginning dust season may be removed from a DWM area once the modified dust season has started for each DWM area or once the site location is endanger of getting flooded. The City shall inform the District of all SFM site removals within 7 calendar days of their removal

date. SFM sites installed for monitoring of the modified end of the dust season may be removed from a DWM area after June 30.

D. DWM areas will be monitored using the IPET method following the procedures used for Tillage with BACM Back-up areas in Paragraph IV.C.4.

E. The City shall re-flood a DWM area or sub-area as indicated by the available information to comply with the BACM Shallow Flood control efficiency target for that area, if either of the following erosion thresholds are exceeded as determined using the sand flux and IPET measurements described in Paragraphs IV.C.2 and IV.C.4.

   1. Sand flux measured at 15 cm above the surface exceeds 5.0 grams per square centimeter per day, or
   2. Induced Particulate Erosion Test method shows visible dust emissions when operated at the reference test height, $H_{t.}$

F. If any DWM area exceeds either erosion threshold in Paragraph VI.E in more than one calendar year over any continuous six-year period, that area will revert to the standard BACM Shallow Flood dust season as shown in Paragraph VI.B.1 since the area will no longer meet the DWM criteria in Paragraph VI.A.

GB22-01 - Interim Variance Staff Report - Exhibit 4

Phillip L. Kiddoo
Air Pollution Control Officer

GREAT BASIN UNIFIED AIRPOLLUTION CONTROL DISTRICT

157 Short Street, Bishop, California 93514-3537
Tel: 760-872-8211 Fax: 760-872-6109
www.gbuapcd.org

April 28, 2022

Paul Liu
Owens Lake Dust Mitigation Program Manager
Los Angeles Department of Water & Power
111 N. Hope Street
Los Angeles, California 90012

Via electronic mail and US CERTIFIED MAIL: 7019 0700 0000 3251 8313

Subject: Notice to Comply 2002 to the City of Los Angeles Department of Water and Power

Dear Mr. Liu:

The Great Basin Unified Air Pollution Control District (District) hereby issues this Notice to Comply 2002 to the City of Los Angeles Department of Water and Power (LADWP) for its failure to meet Best Available Control Measure (BACM) Shallow Flooding wetness compliance performance requirements as required by District Governing Board Order 160413-01, and to require LADWP develop and implement corrective actions. The specific BACM Shallow Flooding dust control areas with ongoing compliance issues include T10-1a, T13-1, T23E, T24, T25, T25-3a, T26, T27 and T30-3.

In spring 2021, the District and LADWP discussed the need for more extensive maintenance in several BACM Shallow Flooding dust control areas that were regularly failing to meet BACM Shallow Flooding wetness compliance performance criteria. The District recognizes LADWP's efforts performing smaller maintenance projects in 2021 and the efforts this spring to meet wetness compliance performance criteria in the reoccurring deficient areas. However, this Notice to Comply is issued due to the multi-year trends of noncompliance, expansion of the deficient areas, and increasing frequency of failure to meet required standards. As detailed in the attached Notice to Comply 2002, LADWP shall provide the District a written response on or before May 31, 2022, outlining immediate corrective actions to be taken to achieve compliance in all areas on October 16, 2022.

The District looks forward to assisting LADWP in resolving Notice to Comply 2002 and fulfilling the requirements of District Governing Board Order 160413-01 to meet BACM Shallow Flooding wetness compliance performance criteria in all areas operated and maintained as BACM Shallow Flooding for PM10 control measures.

Sincerely,

Phillip L. Kiddoo
Air Pollution Control Officer

Enclosure:

1. Notice To Comply 2002

Cc: (via email only)
Arrash Agahi, LADWP
Liz Calderon, LADWP
Ann Logan, GBUAPCD
Nik Barbieri, GBUAPCD
Grace Holder, GBUAPCD
Chris Howard, GBUAPCD
Kim Mitchell, GBUAPCD

Phillip L. Kiddoo
Air Pollution Control Officer

GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT

157 Short Street, Bishop, California 93514-3537 Tel: 760-872-8211 www.gbuapcd.org

NOTICE TO COMPLY

I. General Information			**№** 2002
Owner or Operator Name: **Los Angeles Department of Water & Power**			
Premises or Operations Location: **BACM Shallow Flooding Dust Control Areas, Owens Lake, Inyo County, CA**			
Contact: **Paul Liu**	Title: **Dust Mitigation Program Manager**	Phone №: **N/A**	
Mailing Address: **111 N. Hope Street Los Angeles, California 90012**			
Email: **paul.liu@ladwp.com**	GBUAPCD Permit # (if applicable): **N/A**		

II. Compliance Issue

YOU ARE HEREBY NOTIFIED THAT YOUR FACILITY, OPERATIONS OR PREMISES ARE NOT IN COMPLIANCE WITH STATE OR FEDERAL CODES, AND/OR OF GREAT BASIN UNIFIED AIR POLLUTION CONTROL DISTRICT RULES & REGULATIONS.

List of Code Sections, Rules or Regulations Violated:

District Board Order 160413-01 Paragraph 9

Immediately correct the following items that are out of compliance:

Failure to meet BACM Shallow Flooding wetness compliance performance requirements as detailed in District Governing Board Order 160413-01.

Recommended corrective action:

Provide a written response on or before May 31, 2022, including a list of corrective actions, to meet BACM Shallow Flooding requirements in all deficient areas by October 16, 2022.

CORRECTION DUE DATE: **October 16, 2022**. If this corrective action is completed by the due date, no further action will be taken on the lack of compliance noted above. Failure to complete the corrective action by the due date may result in further enforcement action by the District. If corrective action is not possible by the due date, an extension or variance may be requested by contacting the District. To appeal the issuance of this Notice to Comply, send a written appeal to the APCO within 10 days of receipt of this notice. Specify in detail why you believe these allegations are incorrect and attach a copy of the Notice to Comply and all supporting documentation.

III. Notification

Notice Issued by: **Phillip L. Kiddoo, APCO**		Signature: [signature]			
Date Issued: 20220428	Issued Via: ☐ Hand Delivered	☑ Email	☑ Mail	Certified Mail #: **7019 0700 0000 3251 8313**	

IV. Corrective Action – to be completed by the Owner/Operator

Please complete this section after the corrective action is complete and return a copy to the District.

Thank you for your timely attention to this matter.

Corrective Action Taken (Include Date Completed): If required, attach additional sheets.

Name:	Title:	Signature:

NTC Form: Revised 12/2021