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REASONABLE FURTHER PROGRESS REPORT FOR THE MONO BASIN PM-10 STATE IMPLEMENTATION PLAN

September 2010

Executive Summary

This document provides a progress report on air quality trends in the Mono Basin federal PM-10 nonattainment area since the adoption of the Mono Basin PM-10 State Implementation Plan in May 1995. It was preceded by similar RFP Reports prepared in 2001, 2004 and 2007.

The PM-10 nonattainment problem in the Mono Basin is caused by windblown dust from the exposed lakebed of Mono Lake. Exposure of the lakebed was primarily caused by the diversion of water from the Mono Basin by the City of Los Angeles from 1941 through 1989. The solution to controlling windblown dust from these exposed areas is to raise the lake level to 6,391 feet above mean sea level. At this lake level, most of the shoreline areas that are causing windblown dust will be submerged. In 1994, the State Water Resources Control Board (SWRCB) approved Decision 1631, which limited the diversion of water from the Mono Basin until the lake reaches 6,391 feet.

Since the 1994 SWRCB decision the lake level rose to a high level of 6,385.1 feet in July 1999 and August 2006. During that time PM-10 concentrations decreased at Mono Lake to a point where a monitor site that had previously recorded violations on the north shore of Mono Lake (Simis), showed compliance with the federal PM-10 standard. However, the District's air quality analysis indicated that other areas on the north shore could have higher PM-10 concentrations.

A new monitor site (Mono Shore) was installed in 2000 on the north shore, east of Simis. PM-10 concentrations at the new site showed 2 to 16 violations of the PM-10 standard each year. In the first 6 months of 2010, 16 violations were monitored indicating that this year may have the highest number of violations since monitoring began. The highest daily PM-10 concentration was monitored at the Mono Shore site in 2009 (14,147 micrograms per cubic meter). This monitor reading is almost 100 times higher than the federal standard of 150 micrograms per cubic meter, and was the highest PM-10 concentration measured in the country in 2009.

After an initial rise in the lake level, measurements show that the lake level has fluctuated around 6,383 feet. Over the last 14 years, runoff has been close to the long-term average runoff value for the Mono Basin. Measurements showed that the lake level increased during periods with above average runoff, and decreased during periods with below average runoff, however since LADWP runoff only represents 55% of Mono Lake inflow, and precipitation east of the Sierra has been significantly below the long-term average the lake level fluctuations seem to be consistent with what would be expected for the actual hydroclimatic conditions. These fluctuations around 6,383 feet, while potentially explainable, are still cause for concern. Changing climatic conditions may result in a longer transition period to 6,391 feet. The hydrologic model performance and water balance components should be evaluated as we previously called for in the 2001 and 2004 RFP Reports.

Because of the likelihood that PM-10 violations will continue if the lake level doesn't reach the 6,391 foot target, and the need to have an updated lake level forecast model, the District encourages the SWRCB and other interested parties to work together on these tasks well before the 2014 hearing that the SWRCB will hold if the lake has not reached 6,391 feet by that time. In addition, the District is collecting wind erosion, PM-10 and meteorological data to improve the air quality model that was used to predict the air quality impact from windblown dust. The improved modeling effort will be similar to the method that has been used successfully to model windblown dust at Owens Lake, CA.

Introduction

The Mono Basin PM-10 planning area experiences episodes of high PM-10 concentrations due to windblown dust from the exposed lakebed of Mono Lake. PM-10 stands for particulate matter less than 10 microns in average diameter. PM-10-sized particles are extremely small, less than one tenth the diameter of a human hair. Because of their small size they can penetrate deeply into the lungs causing health problems. These small airborne particles can aggravate asthma, bronchitis, heart disease and other lung diseases.

Exposure of the lakebed to wind erosion was primarily caused by the diversion of Mono Lake's tributary streams by the City of Los Angeles (City) from 1941 through 1989. During this period, the City's water diversions caused Mono Lake's surface level to drop approximately 45 feet, exposing more than nine square miles of highly erodible material to wind erosion. Lakebed sediments and efflorescent salts become airborne under wind conditions producing PM-10-sized particles in extremely high concentrations. The largest dust storms occur during spring and late fall. Prior to 1995, PM-10 monitors located downwind from dust source areas at Mono Lake measured peak PM-10 concentrations of around 1,000 micrograms per cubic meter ($\mu g/m^3$), which was more than six times higher than the National Ambient Air Quality Standard (federal standard) of 150 $\mu g/m^3$ for a 24-hour average.

These high air pollution levels at Mono Lake prompted the U.S. Environmental Protection Agency to designate the California portion of the Mono Lake hydrologic basin a federal PM-10 nonattainment area in 1993. It is formally referred to as the Mono Basin PM-10 Nonattainment Area. In response to this federal nonattainment designation, a Mono Basin PM-10 State Implementation Plan (SIP) was adopted by the Great Basin Unified Air Pollution District (District) and the State of California to comply with the requirements of the 1990 federal Clean Air Act (Patton and Ono, 1995). The SIP provided an analysis of the air quality problem and identified control measures necessary to reduce air pollution to a level that will attain the federal air quality standards. The Mono Basin SIP relies on a decision of the California State Water Resources Control Board (SWRCB), known as Decision 1631. The SWRCB decision provided an enforceable mechanism to reduce particulate air pollution by requiring that the level of Mono Lake be raised to 6,391 feet above mean sea level as measured on April 1 of each year. At this lake level most of the exposed shoreline areas that are the source of windblown dust will be submerged.

Clean air was only one of several public trust values considered in SWRCB Decision 1631, which was approved on September 28, 1994. Decision 1631 amended the City's water rights licenses in the Mono Basin to require specific actions to help recover the natural resources degraded by 48 years of diverting large portions of water from Mono Lake's tributary streams. The decision established minimum stream flows and higher flushing flows in tributaries to protect fisheries. It also required an increase in the surface level of Mono Lake to 6,391 feet to protect aquatic and terrestrial ecosystems, enhance scenic resources, and to meet clean air standards by submerging sources of windblown PM-10 (SWRCB, 1994).

Air Quality and Lake Level

The air quality modeling analysis in the SIP predicted that the 6,391-foot lake level would likely be sufficient to bring the area into attainment with the federal PM-10 standard, since the lake would then submerge much of the exposed lakebed that was causing dust storms. The time it would take to reach this final lake level would depend on yearly runoff, precipitation, and evaporation in the Mono Basin.

The SIP estimated (Figure 1) that it would take 26 years for Mono Lake to rise to 6,391 feet assuming each year experienced average hydroclimatic conditions. This hydrologic modeling was performed after the SWRCB Decision 1631by LADWP. Since actual conditions vary between wet and dry years, the lake level is not expected to continuously rise as shown in Figure 1. 26 years is approximately midway between projections using historic hydrologic sequences. These sequences showed that a series of extremely wet years could result in the lake reaching the target level in as little as nine years. Conversely, a prolonged series of drought years could extend the period to for lake level to reach 6,391 feet to 38 years (Figure 2).

Figure 3 provides a comparison of lake level to annual runoff from four creeks that are monitored in the Mono Basin by the City of Los Angeles: Rush, Lee Vining, Parker and Walker Creeks. A runoff year runs from April 1 to March 31 of the following year (e.g runoff year 2009 is April 1, 2009 – March 31, 2010). This runoff data does not include other creeks in the basin or sources of inflow such as precipitation on Mono Lake, but because the LADWP-reported runoff comprises about 55% percent of annual inflow to the basin (Vorster, 1985) and it corresponds to lake level fluctuations, it is considered to be representative of total annual basin inflow. The long-term mean runoff of the four creeks is 122,124 acre-feet per year (ac-ft/yr), based on the 50-year runoff average from 1941 to 1990. Since 1997, the City has been allowed to export 16,000 ac-ft/yr of water from the Mono Basin under the SWRCB decision and their revised water license. In addition to the exported water, about 6,500 ac-ft/yr is diverted to the groundwater in the Mono Crater tunnel. Greg Reis from the Mono Lake Committee calculates that the City diverted an average of 15,879 ac-ft/yr from the tributaries to Mono Lake during that time. (Reis, 2010a,b) From the 4 creeks, an average of around 100,914 ac-ft/yr of surface flow is currently bypassing the diversion dams and flowing towards Mono Lake. The remainder is accounted for by evaporation, seepage, Grant Lake Reservoir storage, and gauge error.

After SWRCB's decision in 1994, the lake level rose significantly. The upper graph in Figure 3 shows that annual runoff in the Mono Basin was higher than average from 1995 through 1998. As seen in the lower graph of Figure 3, this wet period corresponded to a 9 foot increase in the lake level that peaked at 6,385.1 feet in August 1999. This dramatic increase in the lake level in the years following the Water Board decision seemed to be an indicator that Mono Lake was well on its way to meeting the lake level target of 6,391 feet as predicted by the hydrologic models. However, the 4 wet years were followed by 6 near to below average runoff years. During this below average period the lake level dropped, until wet years in 2005 and 2006 caused the lake level to again increase. This was followed by 3 more below average runoff years, including one of the driest years on record, and the lake level decreased. The April 1, 2010 lake level was at 6,382 feet. Averaging the annual runoff through the series of wet and dry periods over the last 14 years (121,822 ac-ft/yr) showed that it was very close to the 50-year mean runoff rate (122,124 ac-ft/yr) that is expected to bring the lake level up to 6,391 feet with 16,000 af of export. However, during that period the lake level, had a net rise of only 2.8 feet and during most of that time fluctuated around 6,383 feet. (MLC, 2010; Reis, 2010a) The interesting observation is that above average runoff years corresponded to increases in lake level and below average runoff years corresponded to decreases in lake level. This cause and effect relationship leads to one hypothesis that the lake level has reached an equilibrium condition under the current hydroclimatic conditions and 16,000 af of export. Despite the average runoff from the LADWP streams, the hydroclimatic conditions over the last 14 years are different than what the projections were in the SIP as evidenced by the significantly below average precipitation east of the Sierra. Greg Reis of the Mono Lake Committee performed a preliminary analysis using LADWP's annual predictions of lake rises and falls based on forecasted runoff. He added together the annual predictions over the 14-year period and adjusted it for the below-average precipitation. The lake is currently 0.3 feet higher than the runoff-based prediction adjusted for precipitation. (Reis, 2010b) The question becomes: Are the recent hydroclimatic conditions a long-term deviation from the assumptions made in the model projections, or are they a temporary fluctuation in climate? These questions regarding model projections and changing climate should be investigated by updating the Mono Basin hydrologic model developed by Vorster, and the monthly forecast models developed by the SWRCB and LADWP.

If the lake level doesn't reach 6,391 feet, Decision 1631 states, *"In the event that the water level of Mono Lake has not reached an elevation of 6,391 feet by September 28, 2014, the SWRCB will hold a hearing to consider the conditions of the lake and the surrounding areas, and will determine if any further revisions to this license are appropriate."* (SWRCB. 1994, para. 4.a.(4) of the order). It is anticipated that the lake level will not reach 6,391 feet by 2014 unless the next 4 year period has significantly above average precipitation. Based on the need to understand lake level fluctuations with the current climate and make updated projections, it would be beneficial to initiate a cooperative process of updating and recalibrating the hydrologic models with interested stakeholders to analyze model performance and assumed hydroclimatic sequences. The District encourages the stakeholders to work together to develop a forecast model that all parties can use as soon as possible and have a common basis for moving forward.

Reasonable Further Progress

An air quality modeling analysis was performed as part of the SIP to estimate PM-10 concentrations at the historic Mono Lake shoreline. This model was based on wind erosion data collected near the Simis PM-10 monitor site. The model predicted that as the lake level rose and submerged portions of the exposed shoreline that PM-10 emissions due to windblown dust would be reduced proportionally. The air quality model predicted that the 6,391-foot lake level, required by Decision 1631, would bring the Mono Basin into attainment with the federal air quality standard for PM-10. Figure 4 shows the results of modeled design day PM-10 impacts for Receptor 45 (magenta line), which is the receptor site with the highest modeled PM-10 concentrations. The modeled design day concentration is the 6th highest PM-10 concentration that would be expected over a 5-year period.[1] Predicted concentrations at Receptor 45 are shown for each year, based on the lake level trend for normal runoff, as shown in Figure 1. The Receptor 45 trend line for normal runoff (dashed blue line) shown in Figure 4 is the "reasonable further progress" trend expected as a result of implementation of the SIP.

In addition to the Receptor 45 normal runoff trend line, Figure 4 also includes modeled air quality trends from 1995 to 2010 at four receptor sites (Simis, Warm Springs, Mono Shore and Receptor 45), based on the actual April 1 lake level for each year. To demonstrate that the Mono Basin has made reasonable further progress to attain the federal standard, the model-predicted trend line for Receptor 45 (magenta line) in Figure 4 should be at or below the line for Receptor 45 under normal runoff conditions (dashed blue line). Based on the April 1, 2010 lake level and the model prediction Mono Basin is not currently meeting the reasonable further progress trend. This is primarily due to the lake level in 2010 being about 4 feet below the expected lake level to demonstrate reasonable further progress.

[1] Compliance with the federal PM-10 standard allows no more than 1 exceedance of the 24-hour standard per year, thus if the 6th highest monitor value over a 5 year period is less than 150 µg/m^3 then the site would be considered to be in compliance.

The accuracy of the model predictions in Figure 4 can be evaluated by comparing the model prediction for the design concentration at Mono Shore to the actual monitor value at that site. The 6^{th} highest monitored PM-10 concentration at Mono Shore from 2005 through 2009 was 2,563 µg/m^3. This is about 8 times higher than the expected concentration predicted by the air quality model, which is 326 µg/m^3. This indicates that the model is under-predicting concentrations near the Mono Shore site. However, a comparison of modeled and monitored concentration at the Simis site showed good agreement between the model prediction and monitor concentrations. The statistical 6^{th} high concentration monitored value for the last five years at Simis was 110 µg/m^3 (monitored 2^{nd} high for a 1 in 3-day sampling schedule). For the same period the model predicted a 6^{th} high concentration was around 110 µg/m^3 at the Simis site. Since the emissions used for the model were based on wind tunnel measurements of surface erosion at sites near Simis, a good model prediction for this area seems reasonable. The 7 times lower prediction by the model of PM-10 concentrations at the Mono Shore site, however, indicates that PM-10 emissions near Mono Shore may have been significantly under-estimated in the model.

The District plans to improve the air quality modeling analysis in the Mono Shore area by utilizing measurement and modeling techniques that have been applied successfully to model windblown dust at Owens Lake, CA. In 2005, the District installed additional monitoring equipment at the Mono Shore site to measure wind erosion using sand flux monitors and hourly PM-10 concentrations. The results from this new model will help the District to re-evaluate the relationship between PM-10 concentrations and the lake level near the Mono Shore site.

Ambient PM-10 Monitor Concentrations

The District has operated PM-10 monitors in the Mono Basin since 1988. These sites are shown in Figure 5, which includes a graphical representation of source areas for wind-blown dust. Monitor site locations included Lee Vining, Simis, Warm Springs and Mono Shore. Warm Springs was shut down in 1993 due to operational difficulties at this remote site. The Simis site was shut down in 2008 after recording no exceedances of the federal standard for 12 years. Lee Vining and Mono Shore are still operating. See Attachment A.

The Mono Shore PM-10 monitor site was installed to monitor concentrations at a location the District expected the highest windblown dust levels in the Mono Basin. A worst-case PM-10 site was needed to verify in the future if the area was in attainment with the federal standard. From January 2000 through June 2010, 130 violations of the federal PM-10 standard (>150 µg/m^3) were monitored at the Mono Shore site, or about 12 violations per year). The 24-hour average concentrations on 18 of these violation days exceeded 1,000 µg/m^3, with the highest concentration being 14,147 µg/m^3. See Attachment B.

Conclusion

Dust storms and federal PM-10 violations continue to occur in the Mono Basin PM-10 nonattainment area. Since it began operation in January 2000, the Mono Shore monitor on the north shore of Mono Lake has recorded 130 violations of the federal PM-10 standard, or about 12 per year. The Simis PM-10 data indicate that PM-10 concentrations at Simis currently meet the federal standard. No violations have been recorded at Simis since 1996 and the highest concentration in the last five years was 120 $\mu g/m^3$. The air quality model was found to properly predict the concentrations at Simis, but under-predicted concentrations at Mono Shore site. This indicates that PM-10 emissions near Mono Shore were higher than expected. In 2005, the District installed additional wind erosion monitoring equipment at the Mono Shore site to improve the air quality model. The District will employ a PM-10 air quality modeling method that has been used successfully to model windblown dust at Owens Lake, CA.

Over the last 14 years, runoff has been close to the long-term average runoff value for the Mono Basin and precipitation east of the Sierra has been 74% of average while stream diversions were close to 16,000 acre-feet per year. During the same time period the lake level has fluctuated around 6,383 feet. Runoff measurements show that the lake level increased during periods with above average runoff, and decreased during periods with below average runoff. Assuming future runoff is around the long-term average and the other components of the water balance are different than what was projected in the models (e.g. precipitation over Mono Lake below average and evaporation above average), these measurements raise the question that future lake levels could fluctuate around a level below 6391 feet or take longer to reach that level. Because of the likelihood that PM-10 violations will continue if the lake doesn't reach the 6,391 foot target, the District encourages the SWRCB and other interested parties to cooperatively investigate the climate and lake level projections and update the models as soon as possible.

References

MLC, 2010. Mono Lake Committee, *Mono Lake Levels 1979 to Present*, http://www.monobasinresearch.org/data/levelmonthly.htm, July 2010.

Patton, Christopher and Duane Ono, 1995, *Mono Basin Planning Area PM-10 State Implementation Plan – Final*. Great Basin Unified Air Pollution Control District, Bishop, California, May 1995.

Reis, 2010a. Creek flow data for the Mono Basin were provided by Greg Reis, Mono Lake Committee, Lee Vining, CA, July 30, 2010.

Reis, 2010b. Email communication with Greg Reis, Mono Lake Committee, RE: Update on Mono Basin Air Quality, September 3, 2010.

SWRCB, 1994. State of California Water Resources Control Board, *Mono Lake Basin Water Right Decision 1631*. Sacramento, California, September 28, 1994.

Vorster, 1985. *A Water Balance Forecast Model for Mono Lake*, California Earth Resources Monograph No. 10 USDA, United States Forest Service Region 5.

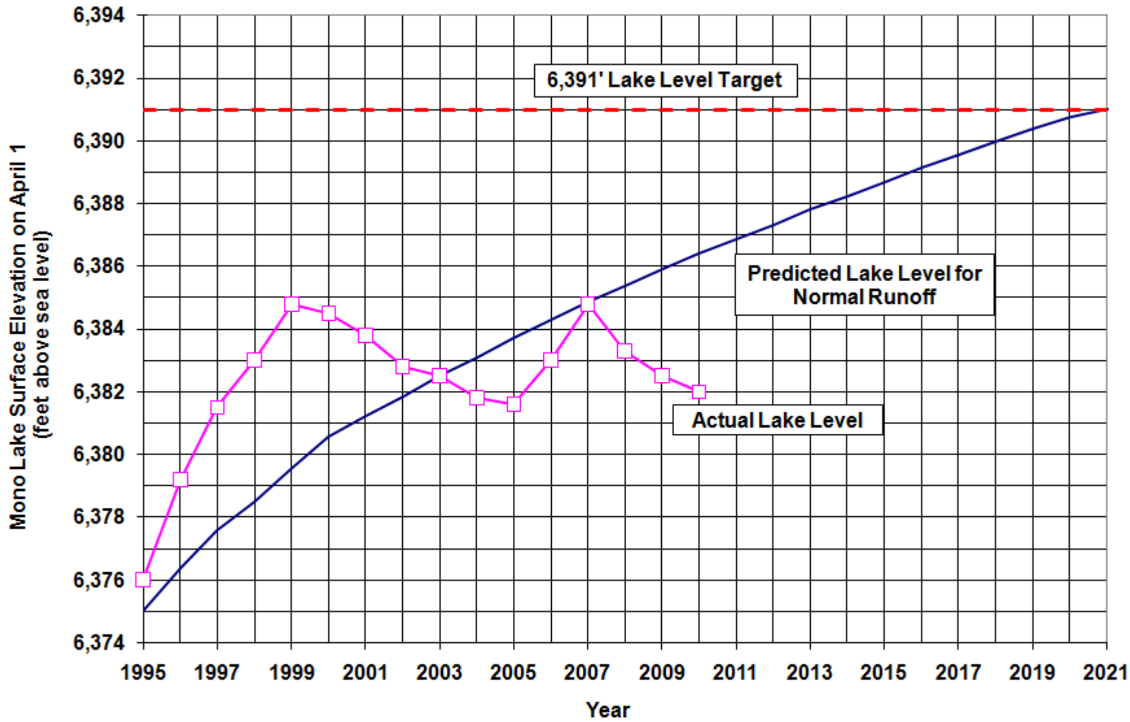

Figure 1. Mono Lake's surface elevation as measured on April 1 of each year was 4 feet below the lake level predicted by LADWP's hydrologic model which assumes the same average runoff, precipitation, and evaporation and 16,000 acre-feet of exports in each year. Preliminary analysis suggests that when the prediction is adjusted for actual runoff and precipitation, the current lake level is close to the predicted value.

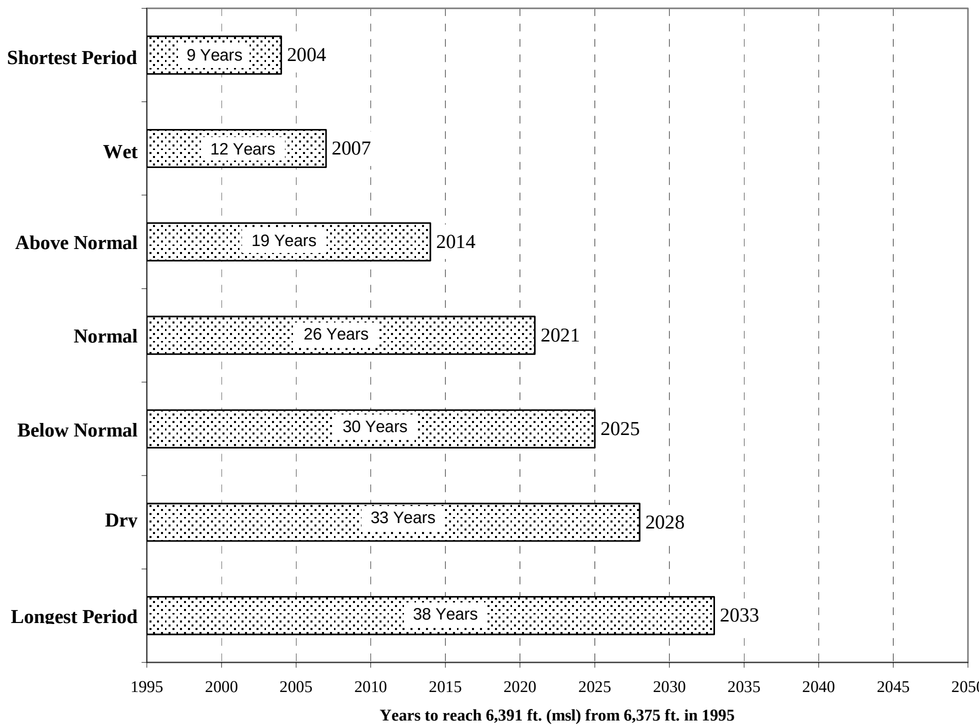

Figure 2. LADWP's hydrologic model in 1995 predicted that under the same average hydroclimate conditions it would take 26 years for the lake level to reach 6,391 feet using the D-1631 Operational Rules for water management. Depending on the sequence of wet and dry years, the target level of 6391 feet could be achieved in 9 years or as long as 38 years.

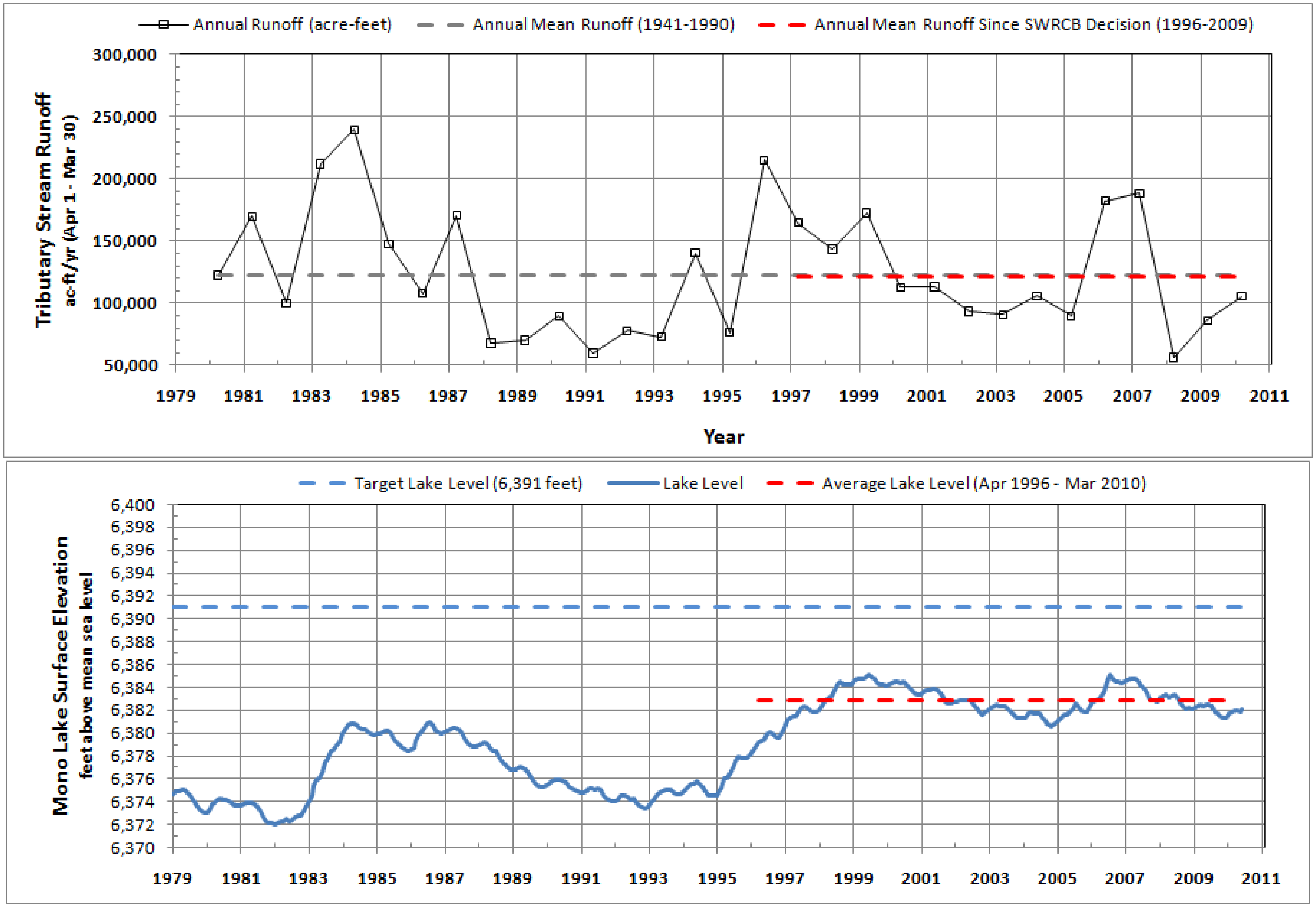

Figure 3. The upper graph shows that average runoff to Mono Lake from April 1996 through March 2010 was close to the long-term average runoff value used in the hydrologic models, an index representing 55% of the inflow to Mono Lake. During the same period Mono Lake's surface elevation averaged 6,382.9 feet. As seen in the lower graph, increases and decreases in lake level appeared to correspond to years when runoff was above or below average runoff. Further investigation is required to determine if the lake level will continue fluctuating around 6,383 feet with the current hydroclimatic conditions.

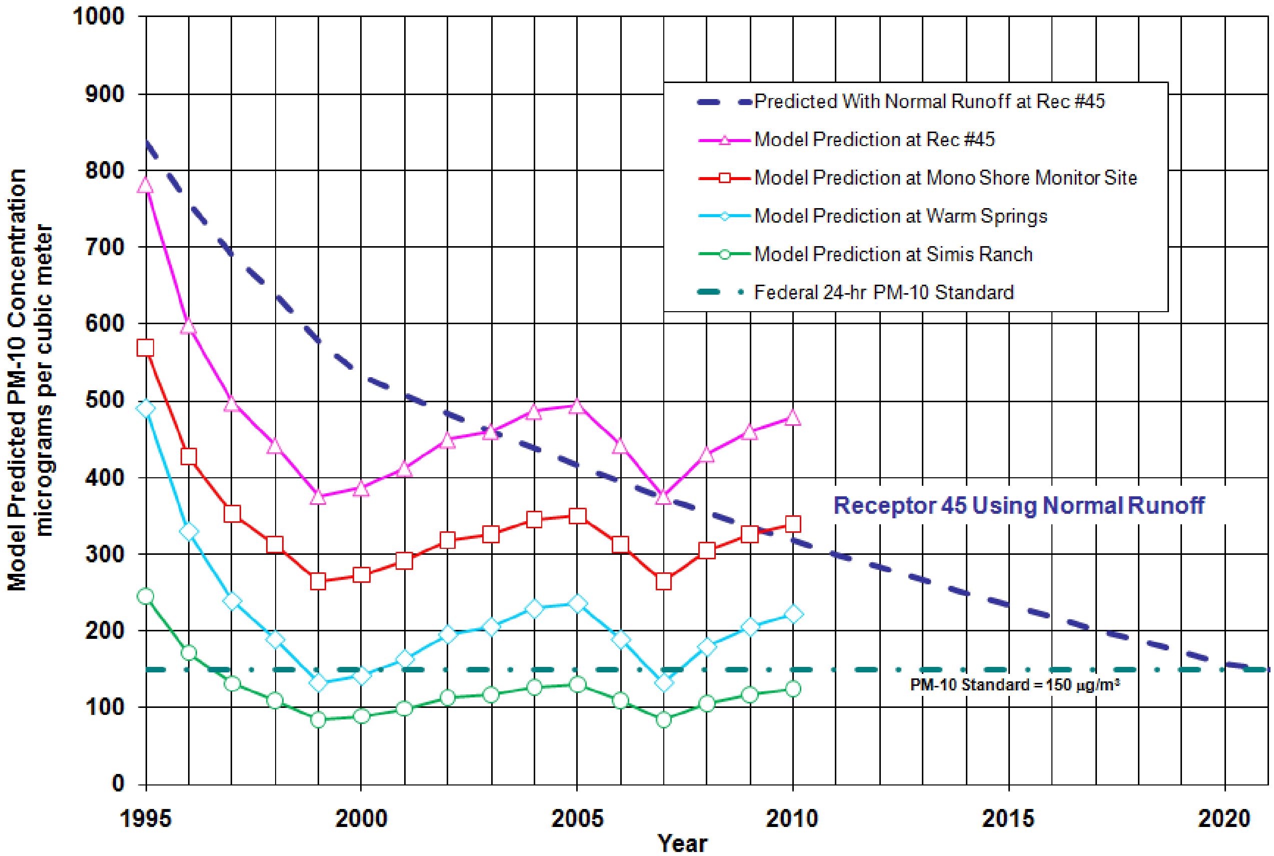

Figure 4. Modeled PM-10 impacts at Mono Lake sites compared to the reasonable further progress trend at Receptor 45 for average runoff. A comparison of monitored values at Mono Shore to the model predicted PM-10 value shows that the 2009 monitored design day concentration was about 7 times higher than predicted by the model. The district is collecting data to improve the air quality model.

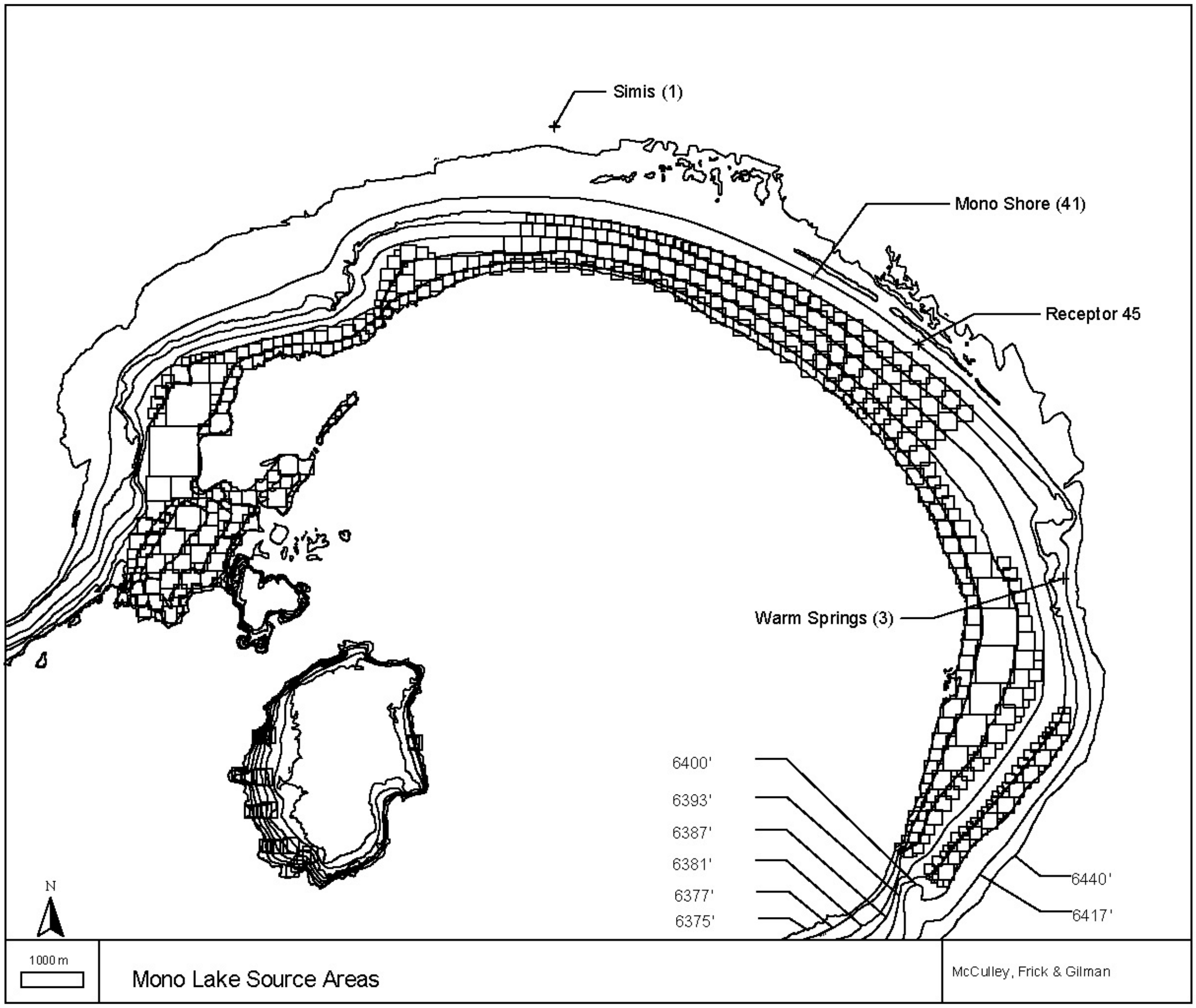

Figure 5. Mono Lake dust source areas and locations of Receptor 45 and monitoring sites at Simis, Mono Shore and Warm Springs.

ATTACHMENT A

PM-10 SITES IN MONO BASIN

AND NUMBER OF MONITORED VIOLATIONS

Mono Basin PM-10 Monitor Violation Summary				
Year	**Monitor Site**	**Number of Violations**	**Number of Sample Days**	**Sample Method**
1986	Simis	0	16	a
1987	Simis	0	45	a
1988	Simis	0	81	a
1988	Lee Vining	0	51	b
1989	Simis	0	132	a
1989	Lee Vining	0	60	b
1990	Warm Springs	0	2	a
1990	Simis	0	168	a
1990	Lee Vining	0	62	b
1991	Warm Springs	1	7	a
1991	Simis	0	85	a
1991	Lee Vining	0	58	b
1992	Warm Springs	1	9	a
1992	Simis	2	77	a
1992	Lee Vining	0	59	b
1993	Simis	2	42	a
1993	Lee Vining	0	31	b
1994	Simis	0	27	a
1994	Lee Vining	0	56	b
1995	Simis	0	41	a
1995	Lee Vining	0	51	b
1996	Simis	1	56	a
1996	Lee Vining	0	60	b
1997	Simis	0	60	a
1997	Lee Vining	0	61	a,b
1998	Warm Springs	0	4	a
1998	Simis	0	66	a
1998	Lee Vining	0	47	a
1999	Simis	0	98	a
1999	Lee Vining	0	106	a

a-Andersen, b-Wedding, c-BGI, d-Partisol, e-TEOM, *Mono Shore (Jan-June) and Lee Vining (Jan-Mar)

ATTACHMENT A - CONTINUED

PM-10 SITES IN MONO BASIN

AND NUMBER OF MONITORED VIOLATIONS

Mono Basin PM-10 Monitor Violation Summary				
Year	**Monitor Site**	**Number of Violations**	**Number of Sample Days**	**Sample Method**
2000	Mono Shore	9	272	c
2000	Simis	0	92	a
2000	Lee Vining	0	113	a
2001	Mono Shore	2	221	c
2001	Simis	0	104	a
2001	Lee Vining	0	110	a,d
2002	Mono Shore	8	276	c
2002	Simis	0	79	c
2002	Lee Vining	1	100	d
2003	Mono Shore	9	212	c
2003	Simis	0	70	c
2003	Lee Vining	0	107	d
2004	Mono Shore	11	166	c
2004	Simis	0	48	c
2004	Lee Vining	0	102	d
2005	Mono Shore	14	189	c
2005	Simis	0	73	c
2005	Lee Vining	0	90	d
2006	Mono Shore	16	167	c
2006	Simis	0	67	c
2006	Lee Vining	0	121	d
2007	Mono Shore	15	238	c
2007	Simis	0	99	c
2007	Lee Vining	0	109	d
2008	Mono Shore	14	245	c,e
2008	Simis	0	55	c
2008	Lee Vining	0	116	d
2009	Mono Shore	16	365	e
2009	Lee Vining	0	115	d
2010*	Mono Shore	16	181	e
2010*	Lee Vining	0	23	d

a-Andersen, b-Wedding, c-BGI, d-Partisol, e-TEOM, *Mono Shore (Jan-June) and Lee Vining (Jan-Mar)

ATTACHMENT B

MONITORED PM-10 VIOLATIONS

AT MONO SHORE SITE

Violation Date	PM-10 (µg/m³)	Violation Date	PM-10 (µg/m³)
2000 – 9 violations		**2004 – 11 violations**	
April 8, 2000	690	May 11, 2004	192
May 4, 2000	1,063	May 12, 2004	843
May 6, 2000	490	May 17, 2004	913
May 9, 2000	3,059	June 7, 2004	447
May 10, 2000	1,513	September 18, 2004	987
June 7, 2000	1,642	October 8, 2004	430
June 8, 2000	241	October 17, 2004	322
October 9, 2000	387	October 18, 2004	898
November 29, 2000	10,466	October 19, 2004	871
2001 – 2 violations		October 26, 2004	208
June 2, 2001	414	November 3, 2004	152
September 25, 2001	4,482	**2005 – 14 violations**	
2002 – 8 violations		April 7, 2005	285
February 28, 2002	195	April 13, 2005	386
March 10, 2002	396	May 28, 2005	990
April 14, 2002	3,089	June 6, 2005	507
April 15, 2002	1,157	June 17, 2005	235
May 18, 2002	201	June 18, 2005	292
May 19, 2002	6,505	June 19, 2005	328
May 20, 2002	1,481	June 20, 2005	298
November 7, 2002	1,745	June 21, 2005	541
2003 – 9 violations		September 10, 2005	546
March 13, 2003	487	September 11, 2005	487
March 14, 2003	1,658	October 1, 2005	940
March 26, 2003	333	October 2, 2005	264
April 13, 2003	1,170	October 13, 2005	477
April 21, 2003	467	**2006 – 16 violations**	
April 24, 2003	5,283	May 19, 2006	1,915
April 25, 2003	5,745	May 20, 2006	238
April 26, 2003	341	May 21, 2006	174
April 27, 2003	399	June 12, 2006	450

ATTACHMENT B - CONTINUED

MONITORED PM-10 VIOLATIONS
AT MONO SHORE SITE

Violation Date	PM-10 (µg/m³)	Violation Date	PM-10 (µg/m³)
2006 – 16 violations, continued		**2008 – 14 violations, continued**	
June 13, 2006	168	June 4, 2008	694
June 27, 2006	210	June 5, 2008	913
September 14, 2006	1,012	June 21, 2008	906
September 15, 2006	306	August 31, 2008	858
November 8, 2006	624	September 19, 2008	287
November 10, 2006	434	October 30, 2008	310
November 21, 2006	231	October 31, 2008	330
November 22, 2006	174	November 3, 2008	410
November 28, 2006	1,764	December 13, 2008	470
December 8, 2006	300	**2009 – 16 violations**	
December 23, 2006	721	March 3, 2009	490
December 26, 2006	4,300	March 9, 2009	625
2007 – 15 violations		March 29, 2009	477
January 10, 2007	1,909	April 14, 2009	1,131
January 11, 2007	359	May 1, 2009	159
April 6, 2007	168	May 3, 2009	766
April 14, 2007	2,008	May 4, 2009	1,377
April 17, 2007	726	September 29, 2009	236
September 30, 2007	1,500	October 3, 2009	335
September 30, 2007	2,154	October 13, 2009	717
October 4, 2007	1,657	October 19, 2009	364
October 10, 2007	10,020	November 11, 2009	343
October 16, 2007	266	November 12, 2009	249
October 19, 2007	1,347	November 20, 2009	14,147
October 20, 2007	304	December 6, 2009	1,462
November 27, 2007	1,336	December 7, 2009	182
November 29, 2007	480	**2010 (-July) – 16 violations**	
November 30, 2007	2,736	March 25, 2010	340
2008 – 14 violations		March 29, 2010	159
April 6, 2008	247	March 30, 2010	495
April 11, 2008	930	April 2, 2010	755
April 30, 2008	2,769	April 3, 2010	740
May 7, 2008	161	April 4, 2010	444
May 20, 2008	2,563	April 11, 2010	795

ATTACHMENT B - CONTINUED

MONITORED PM-10 VIOLATIONS AT MONO SHORE SITE

Violation Date	PM-10 (μg/m^3)
2010 (-July) – 16 violations, continued	
April 20, 2010	182
April 27, 2010	4,345
May 9, 2010	305
May 10, 2010	308
May 21, 2010	3,096
May 25, 2010	1,529
May 26, 2010	318
May 27, 2010	460
June 16, 2010	319
June 16, 2010	319