IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

Holtville Canal Imperial Valley California: Pinterest
https://i.pinimg.com/originals/2c/8d/58/2c8d5801f25810814109c3499796ea5d.jpg

May 11, 2018
Exceptional Event Documentation
For the Imperial County PM_{10} Nonattainment Area

An exceedance of the National Ambient Air Quality Standard (NAAQS) for PM_{10} at the Brawley, El Centro, Niland, and Westmorland monitors in Imperial County, California on May 11, 2018

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ACRONYM	DESCRIPTIONS
AOD	Aerosol Optical Depth
AQI	Air Quality Index
AQS	Air Quality System
BACM	Best Available Control Measures
BAM 1020	Beta Attenuation Monitor Model 1020
BLM	United States Bureau of Land Management
BP	United States Border Patrol
CAA	Clean Air Act
CARB	California Air Resources Board
CMP	Conservation Management Practice
DCP	Dust Control Plan
DPR	California Department of Parks and Recreation
EER	Exceptional Events Rule
EPA	Environmental Protection Agency
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GOES-W/E	Geostationary Operational Environmental Satellite (West/East)
HC	Historical Concentrations
HYSPLIT	Hybrid Single Particle Lagrangian Integrated Trajectory Model
ICAPCD	Imperial County Air Pollution Control District
INPEE	Initial Notification of a Potential Exceptional Event
ITCZ	Inter Tropical Convergence Zone
KBLH	Blythe Airport
KCZZ	Campo Airport
KIPL	Imperial County Airport
KNJK	El Centro Naval Air Station
KNYL/MCAS	Yuma Marine Corps Air Station
KPSP	Palm Springs International Airport
KTRM	Jacqueline Cochran Regional Airport (aka Desert Resorts Rgnl Airport)
PST	Local Standard Time
MMML/MXL	Mexicali, Mexico Airport
MODIS	Moderate Resolution Imaging Spectroradiometer
MPH	Miles Per Hour
MST	Mountain Standard Time
NAAQS	National Ambient Air Quality Standard
NCAR	National Center for Atmospheric Research
NCEI	National Centers for Environmental Information
NEAP	Natural Events Action Plan
NEXRAD	Next-Generation Radar

NOAA	National Oceanic and Atmospheric Administration
nRCP	Not Reasonably Controllable or Preventable
NWS	National Weather Service
PDT	Pacific Daylight Time
PM_{10}	Particulate Matter less than 10 microns
$PM_{2.5}$	Particulate Matter less than 2.5 microns
PST	Pacific Standard Time
QA/QC	Quality Assured and Quality Controlled
QCLCD	Quality Controlled Local Climatology Data
RACM	Reasonable Available Control Measure
RAWS	Remote Automated Weather Station
SIP	State Implementation Plan
SLAMS	State Local Ambient Air Monitoring Station
SMP	Smoke Management Plan
SSI	Size-Selective Inlet
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UTC	Coordinated Universal Time
WRCC	Western Regional Climate Center

I Introduction

In 2007, the United States Environmental Protection Agency (US EPA) adopted the "Treatment of Data Influenced by Exceptional Events Rule" (EER)[1] to govern the review and handling of certain air quality monitoring data for which the normal planning and regulatory processes are not appropriate. Under the terms of the EER, the US EPA may exclude monitored exceedances of the National Ambient Air Quality Standard (NAAQS) if a State adequately demonstrates that an exceptional event caused the exceedance.

The 2016 revision to the EER added sections 40 CFR §50.1(j)-(r) [Definitions], 50.14(a)-(c) and 51.930(a)-(b) to 40 Code of Federal Regulations (CFR). These sections contain definitions, criteria for US EPA concurrence, procedural requirements and requirements for State demonstrations. The demonstration must satisfy all of the rule criteria for US EPA to concur with the requested exclusion of air quality data from regulatory decisions.

Title 40 CFR §50.14(c)(3)(iv) outlines the elements that a demonstration must include for air quality data to be excluded:

TABLE 1-1 TITLE 40 CFR §50.14(c)(3)(iv) CHECKLIST EXCEPTIONAL EVENT DEMONSTRATION FOR HIGH WIND DUST EVENT (PM_{10})		DOCUMENT SECTION
1	A narrative conceptual model that describes the event(s) causing the exceedance or violation and a discussion of how emissions from the event(s) led to the exceedance or violation at the affected monitor(s)	Pg. 9
2	A demonstration that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation	Pg. 19
3	Analyses comparing the claimed event-influenced concentration(s) to concentrations at the same monitoring site at other times to support the requirement at paragraph (c)(3)(iv)(B) of this section	Pg. 27
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	Pg. 36
5	A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event	Pg. 43

[1] "Treatment of Data Influenced by Exceptional Events; Final Guidance", 81 FR 68216, October 2, 2016

Aside from the above, a State must demonstrate that it has met several procedural requirements during the demonstration process, including:

	TABLE 1-2 PROCEDURAL CHECKLIST EXCEPTIONAL EVENT DEMONSTRATION FOR HIGH WIND DUST EVENT (PM_{10})	DOCUMENT SECTION
1	**Public Notification [40 CFR §50.14(c)(1)]** – In accordance with mitigation requirement at 40 CFR 51.930(a)(1), notification to the public promptly whenever an event occurs or is reasonably anticipated to occur which may result in the exceedance of an applicable air quality standard	Pg. 3 and Appendix C
2	**Initial Notification of Potential Exceptional Event [40 CFR §50.14(c)(2)]** - Submission to the Administrator of an Initial Notification of Potential Exceptional Event and flagging of the affected data in US EPA's Air Quality System (AQS) as described in 40 CFR §50.14(c)(2)(i),	Pg. 3
3	**Public Comment Process [40 CFR §50.14(c)(3)(v)]** - Documentation of fulfillment of the public comment process described in 40 CFR §50.14(c)(3)(v), and	Pg. 4 and Appendix C
4	**Mitigation of Exceptional Events [40 CFR §51.930]** - Implementation of any applicable mitigation requirements (Mitigation Plan) as described in 40 CFR §51.930	Pg. 4

The Imperial County Air Pollution Control District (ICAPCD) has been submitting criteria pollutant data since 1986 into the US EPA's Air Quality System (AQS). In Imperial County, prior to 2017, Particulate Matter Less Than 10 Microns (PM_{10}) was measured by either Federal Reference Method (FRM) Size Selective Instruments (SSI) or Federal Equivalent Method (FEM) Beta Attenuation Monitor's, Model 1020 (BAM 1020). Effective 2017 Imperial County stopped utilizing FRM instruments relying solely on BAM 1020 monitors to measure PM_{10}. It is important to note that the use of non-regulatory data within this document, typically continuous PM_{10} data prior to 2013, measured in local conditions, does not cause or contribute to any significant differences in concentration difference or analysis.

As such, this report demonstrates that a naturally occurring event caused an exceedance observed on Friday, May 11, 2018 which elevated particulate matter within San Diego, Riverside and Imperial Counties and affected air quality. The analyses contained in this report includes regulatory and non-regulatory data that provides support for the elements listed in **Table 1-1** and **Table 1-2**. This demonstration substantiates that this

event meets the definition of the US EPA Regulation for the Treatment of Data Influenced by Exceptional Events (EER)[2].

I.1 Public Notification [40 CFR §50.14(c)(1)]

The ICAPCD utilizes a web-based public notification process to alert the public of forecasted weather conditions and potential changes in ambient air concentrations that may affect the public. The ICAPCD identifies these public notifications as Advisory Events. On May 10, 2018 through May 11, 2018 the ICAPCD published advisories concerning the potential for elevated concentrations of particulate matter caused by gusty westerly winds preceding the passage of a low-pressure system by Friday, May 11, 2018. Along with the advisories the ICAPCD published wind advisories for all of Imperial County which included information regarding hazardous impacts, such as lower visibility due to blowing dust. **Appendix C** contains copies of notices pertinent to the May 11, 2018 event.

I.2 Initial Notification of Potential Exceptional Event (INPEE) [40 CFR §50.14(c)(2)]

When States intend to request the exclusion of one or more exceedances of a NAAQS as an exceptional event a notification to the Administrator is required. The notification process identified within the EER as the Initial Notification of Potential Exceptional Event (INPEE) is twofold: to determine whether identified data may affect a regulatory decision and whether a State should develop/submit an EE Demonstration.

On Friday, May 11, 2018, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing an exceedance at the Brawley (06-025-0007), El Centro (06-025-1003), Niland (06-025-4004), and Westmorland (06-025-4003) air quality monitoring stations. Subsequently, the ICAPCD made a formal written request to the California Air Resources Board (CARB) to place preliminary flags on SLAMS measured PM_{10} hourly concentrations from the Brawley, El Centro, Niland, and Westmorland monitors on May 11, 2018. After review, CARB submitted the INPEE, for the May 11, 2018 event in July of 2019. The submitted request included a brief description of the meteorological conditions for May 11, 2018 indicating that a potential natural event occurred. The ICAPCD has engaged in discussions with US EPA Region IX regarding the demonstration prior to formal submittal.

[2] "Treatment of Data Influenced by Exceptional Events; Final Guidance", 81 FR 68216, October 2, 2016

I.3 Public Comment Process [40 CFR §50.14(c)(3)(v)(A-C)]

(A) The CARB and USEPA have reviewed and commented on the draft version of the May 11, 2018 exceptional event prepared by the ICAPCD. After addressing all substantive and non-substantive comments by both CARB and USEPA the ICAPCD has published a notice of availability in the Imperial Valley Press announcing a 30-day public review process. The published notice invites comments by the public regarding the request, by the ICAPCD, to exclude the measured concentrations of 335 µg/m^3 measured by the Brawley monitor; 166 µg/m^3 measured by the El Centro monitor; 215 µg/m^3 measured by the Niland monitor; and 414 µg/m^3 measured by the Westmorland monitor on May 11, 2018.

(B) Concurrently with the Public Review period for the May 11, 2018 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Final May 11, 2018 exceptional event.

(C) Upon the ending of the review period the ICAPCD will remit to CARB and USEPA all comments received during the Public Review period along with a formal letter addressing any comments that dispute or contradict factual evidence in the demonstration.

The ICAPCD acknowledges that with the submittal to US EPA of the 2018 exceptional events, there is supporting evidence of documented recurring seasonal events that affect air quality in Imperial County.

I.4 Mitigation of Exceptional Events [40 CFR §51.930]

According to 40 CFR §51.930(b) all States having areas with historically documented or known seasonal events, three events or event seasons of the same type and pollutant that recur in a 3-year period, are required to develop and submit a mitigation plan to the US EPA.

The ICAPCD received notice from US EPA September 15, 2016 identifying Imperial County as an area required to develop and submit a mitigation plan within two years of the effective date, September 30, 2016, of the final published notification to states with areas subject to mitigation requirements. On September 21, 2018, after notice and opportunity for public comment the ICAPCD submitted the High Wind Exceptional Event Fugitive Dust Mitigation Plan (Mitigation Plan) for review and verification. Subsequently, on November 28, 2018 CARB received verification from US EPA of its review and approval of the

Mitigation Plan. For a copy of the Mitigation Plan visit the Imperial County Air Pollution Control District website at
https://www.co.imperial.ca.us/AirPollution/otherpdfs/MitigationPlan.pdf

The Imperial County Mitigation Plan contains important geographical and meteorological descriptions, pages 3 through 6, of the areas within Imperial County and the surrounding areas that are sources of transported fugitive dust. **Figure 1-1** helps depict the geological aspects that are within Imperial County and outside of Imperial County that affect air quality.

Essentially, the Anza-Borrego Desert State Park, which lies in a unique geologic setting along the western margin of the Salton Trough, extends north from the Gulf of California (Baja California) to the San Gorgonio Pass and from the eastern rim of the Peninsular Ranges eastward to the San Andreas Fault zone along the far side of the Coachella Valley. These areas are sources of transported fugitive dust emissions into Imperial County when westerly winds funnel through the unique landforms causing in some cases wind tunnels that cause increase in wind speeds.

During the monsoonal season, natural open desert areas to the east, southeast, and south of Imperial County are sources of transported fugitive dust emissions when thunderstorms cause outflows to blow winds across natural opens desert areas within Arizona and Mexico.

FIGURE 1-1
IMPERIAL COUNTY

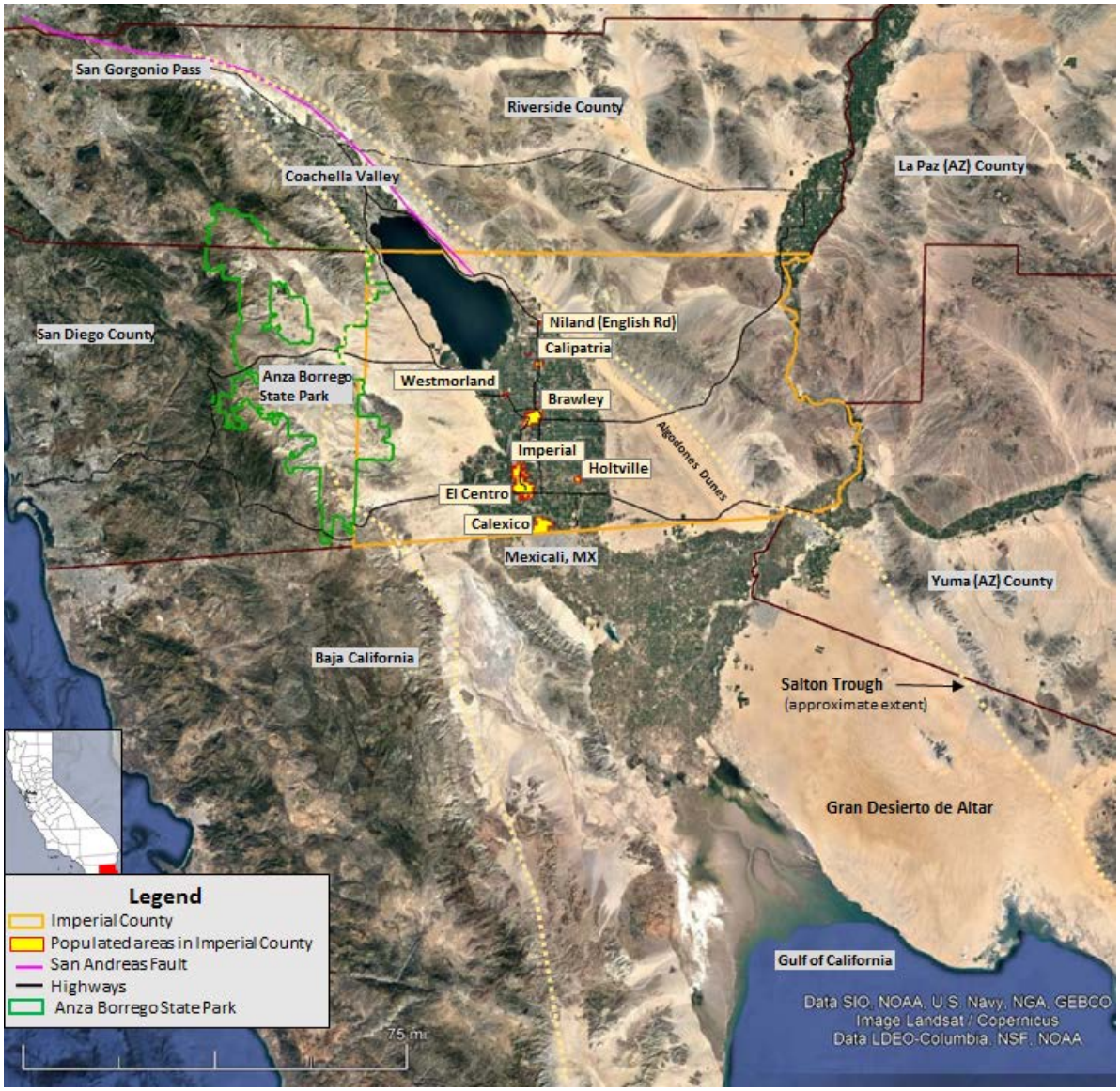


Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small economically diverse region with a population of 174,528

Likewise, the Mitigation Plan contains a high wind event meteorological analysis broken down into four types of seasonal natural occurrences that cause elevated particulate matter that affects Imperial, San Diego, Riverside and Yuma Counties. The historical analysis has defined the meteorological events that lead to high winds and elevated PM_{10} events in Imperial County, page 7, as follows:

- **Type 1:** Pacific storms and frontal passages;
- **Type 2:** Strong pressure and surface pressure gradients;
- **Type 3:** Monsoonal Gulf Surges from Mexico; thunderstorm downburst, outflow winds and gust fronts from thunderstorms
- **Type 4:** Santa Ana wind events

A complete description of these events begins on page 8 of the Mitigation Plan. While there is some overlap in discussed components between the Mitigation Plan and this demonstration such as the public notification process and the warning process, the Mitigation Plan does elaborate a little further. The Mitigation Plan discusses in detail the educational component, the notification component, the warning component and the implementation of existing mitigation measures, such as Regulation VIII.

Finally, the Mitigation Plan contains a complete description of the methods, processes and mechanisms used to minimize the public exposure, page 14, retain historical and real-time data, page 15, and the consultation process with other air quality managers to abate and minimize air impacts within Imperial County, page 16.

In all, the Mitigation Plan helps explain the recurring events, by type and influence upon Imperial County and provides supporting justification of a natural event.[3]

[3] Title 40 Code of Federal Regulations §50.1 (k) defines a Natural Event as meaning an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.

FIGURE 1-2
MONITORING SITES IN AND AROUND IMPERIAL COUNTY

Fig 1-2: Depicts a select group of PM_{10} monitoring sites in Imperial County, eastern Riverside County, and southwestern Arizona (Yuma County). Generated through Google Earth

II Conceptual Model – A narrative that describes the event causing the exceedance and a discussion of how emissions from the event led to the exceedance at the affected monitors

II.1 Description of the event causing the exceedance

Days before and during Friday, May 11, 2018, the National Weather Service (NWS) offices in Phoenix and San Diego issued Area Forecast Discussions describing an approaching upper level low-pressure system that would move into the Great Basin by Friday, May 11, 2018. The approaching system would bring tightening pressure gradients through Friday, May 11, 2018 increasing locally gusty westerly winds over the mountain ridge tops to the desert slopes within San Diego County and within Imperial and Yuma Counties.[4] Although the winds were not expected to "be too strong" the gustiness of the winds and the resulting blowing dust was of some concern.[5] As such the Phoenix office issued the first Urgent Weather Message for southwestern Imperial County, southeast Imperial County and the Imperial Valley, forecasting southwest to west winds 15 to 30 mph with gusts over 45 mph.[6] In total there were fifteen (15) Urgent Weather Messages that advised of advisory level winds within Riverside, San Diego, Imperial and Yuma counties. In addition to the gusty westerly winds, the weather system was forecast to bring cooler weather and patchy rain along and within the San Diego County Mountains.[7,8] Trace precipitation was measured at El Centro NAF (KNJK) late May 11, 2018 and early May 12, 2018. **Appendix A** contains all pertinent NWS notices.

II.2 How emissions from the event led to an exceedance

On May 11, 2018, the air monitors in Imperial, Riverside and Yuma counties measured elevated concentrations of particulate matter when a forecasted upper level trough moved inland from the Pacific coast over California.[9] The strong gusty westerly winds associated with the system generated emissions from within the open mountain ranges and surrounding open natural deserts within San Diego and Imperial Counties. These windblown dust emissions were transported to all the Imperial County regional air quality monitors causing an exceedance of the PM_{10} NAAQS at the Brawley, El Centro, Niland, and Westmorland stations (**Table 2-1).**

[4] National Weather Service, Area Forecast Discussion, May 9, 2018, San Diego office, 917pm PDT
[5] *Id.*
[6] National Weather Service, Urgent Weather Message, May 10, 2018, Phoenix office, 402am MST
[7] National Weather Service, Area Forecast Discussion, May 9, 2018, San Diego office, 917pm PST
[8] National Weather Service, Area Forecast Discussion, May 10, 2018, San Diego office, 149pm PST
[9] National Weather Service, Area Forecast Discussion, May 9, 2018, Phoenix office, 834pm MST

FIGURE 2-1
MONITORING AND METEOROLOGICAL SITES

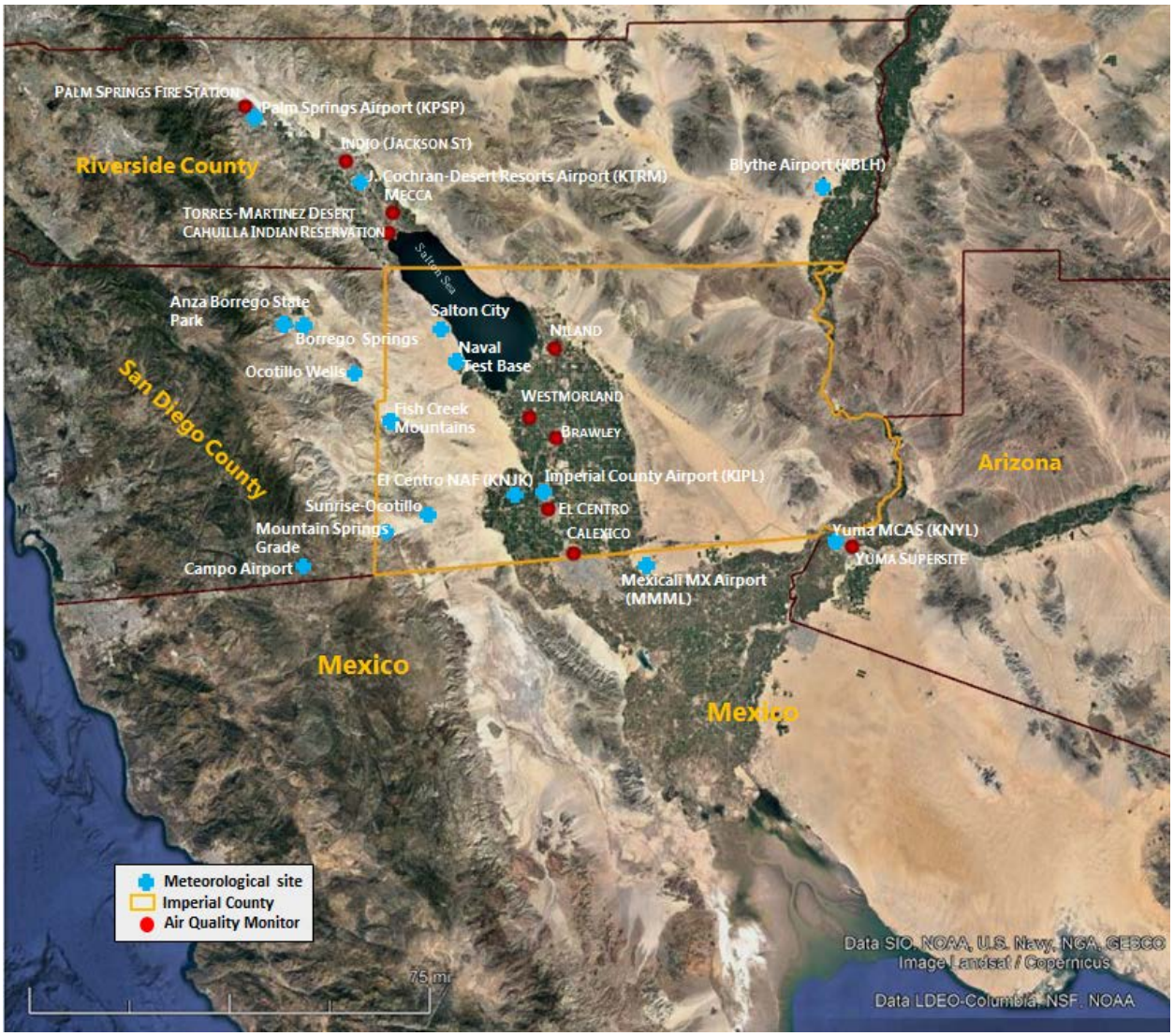


Fig 2-1: Includes a general location of the sites used in this analysis. The site furthest south is in Mexicali, Mexico and the site furthest north is the Palm Springs Fire Station

TABLE 2-1
HOURLY CONCENTRATIONS OF PARTICULATE MATTER

SITE	DATE	0000	0100	0200	0300	0400	0500	0600	0700	0800	0900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Hrly MAX	24-Hr AVERAGE
PALM SPRINGS FIRE STATION	20180510	27	28	29	36	30	40	30	22	24	20	25	21	28	31	42	42	35	33	40	35	25	23	25	37	42	30
	20180511	39	41	26	15	14	13	18	21	24	27	26	32	59	69	68	57	61	40	39	20	17	12	26	18	**69**	32
	20180512	17	20	18	15	14	14	11	9	10	12	13	18	22	22	22	25	20	18	20	21	16	13	12	11	25	16
INDIO	20180510	22	35	29	24	43	43	33	40	24	13	31	42	31	35	19	40	203	92	101	118	98	41	22	27	203	50
	20180511	34	36	30	23	23	26	26	26	25	21	27	35	82	84	78	66	98	136	98	66	91	63	73	118	**136**	57
	20180512	189	76	70	26	17	20	28	28	24	17	20	22	29	32	29	33	42	70	57	66	34	25	44	40	189	43
MECCA	20180510	37	44	38	23	11	105	77	27	37	24	21	34	38	7	52	39	52	50	113	188	181	81	27	35	188	55
	20180511	33	35	26	34	40	65	40	43	55	79	54	28	41	81	66	86	126	166	217	121	158	75	56	104	**217**	76
	20180512	67	62	40	7	26	22	20	72	61	27	82	112	27	30	31	33	55	168	96	40	39	25	57	103	168	54
TORRES-MARTINEZ TRIBAL	20180510	55	48	37	35	47	243	82	46	53	66	30	28	42	76	36	42	35	1004	90	230	130	84	46	34	1004	109
	20180511	38	37	31	34	59	93	61	35	35	50	50	36	49	100	92	199	179	296	149	210	174	216	76	111	**296**	100
	20180512	139	69	56	34	27	30	24	35	46	43	34	36	48	43	40	52	73	159	131	146	140	67	68	82	159	67
BRAWLEY	20180510	62	40	29	26	32	36	52	73	50	42	51	50	65	100	151	209	175	265	489	440	217	120	223	285	489	136
	20180511	578	111	127	75	61	51	74	58	53	39	87	314	489	516	564	629	410	422	995	995	679	288	209	235	**995**	335
	20180512	165	249	310	285	601	389	132	37	33	35	22	25	31	28	31	44	130	309	288	98	32	20	19	16	601	138
WESTMORLAND	20180510	42	36	34	31	27	45	109	73	69	51	89	88	73	81	99	233	173	459	668	199	207	120	73	107	668	132
	20180511	76	444	702	522	162	84	60	65	58	60	149	310	995	995	995			544	457	393	399	646	712	287	**995**	414
	20180512	371	300	491	118	172	316	68	38	27	56	39	35	30	29	33	36	184	149	97	78	109	62	37	49	491	121
NILAND	20180510	22	12	15	18	21	26	39	38	46	38	48	56	51	39	55	99	181	112	202	305	148	96	37	57	305	73
	20180511	63	92	117	214	336	316	207	95	62	66	50	154	173	401	589	793	334	210	127	110	270	123	91	172	**793**	215
	20180512	82	80	92	40	40	46	21	20	29	31	23	24	37	52	47	50	45	81	157	51	44	41	36	43	157	50
EL CENTRO	20180510	68	60	76	65	49	49	77	93	114	50	57	64	86	107	287	215	125	89	73	83	237	306	88	41	306	106
	20180511	49	36	24	43	74	64	42	57	61	46	44	75	136	174	181	137	142	79	57	162	643	995	610	62	**995**	166
	20180512	48	37	49	103	48	38	36	20	29	23	23	13	24	24	26	39	51	33	46	38	48	37	27	38	103	37
CALEXICO	20180510	47	47	54	46	60	82	69	118	79	45	41	51	68	150	232	165	131	96	58	64	86	191	117	69	232	90
	20180511	66	27	79	78	57	113	68	78	56	41	57	48	201	297	646	411	177	92	90	107	160	213	206	74	**646**	143
	20180512	22	117	147	82	69	32	37	35	17	14	18	28	30	30	28	29	28	48	98	76	81	108	62	49	147	53
YUMA AZ SUPERSITE (PST)	20180510	8	16	13	9	18	28	33	69		52	28	29	38	55	59	57	45	45	38	24	22	18	13	18	69	31
	20180511	20	28	24	22	22	33	41	48	44	38	30	51	55	29	72	224	342	161	117	70	125	322	798	785	**798**	145
	20180512	436	177	180	124	117	113	90	88	111	56	40	28	28	34	31	33	40	47	58	67	50	41	42	35	436	86
YUMA AZ SUPERSITE (MST)	20180510	11	8	16	13	9	18	28	33	69		52	28	29	38	55	59	57	45	45	38	24	22	18	13	69	31
	20180511	18	20	28	24	22	22	33	41	48	44	38	30	51	55	29	72	224	342	161	117	70	125	322	798	**798**	113
	20180512	785	436	177	180	124	117	113	90	88	111	56	40	28	28	34	31	33	40	47	58	67	50	41	42	785	117

Color coding information – **Red bold** highlighted sites indicate sites that exceeded the NAAQS. **Bold Blue** dates indicate date of Exceptional Event. **Red fill and Red bold** hourly concentrations represent concentrations above 100 µg/m^3. Pink squares around concentrations identify peak hourly concentrations

FIGURE 2-2
CONCENTRATIONS FOR ALL SITES LISTED IN TABLE 2-1

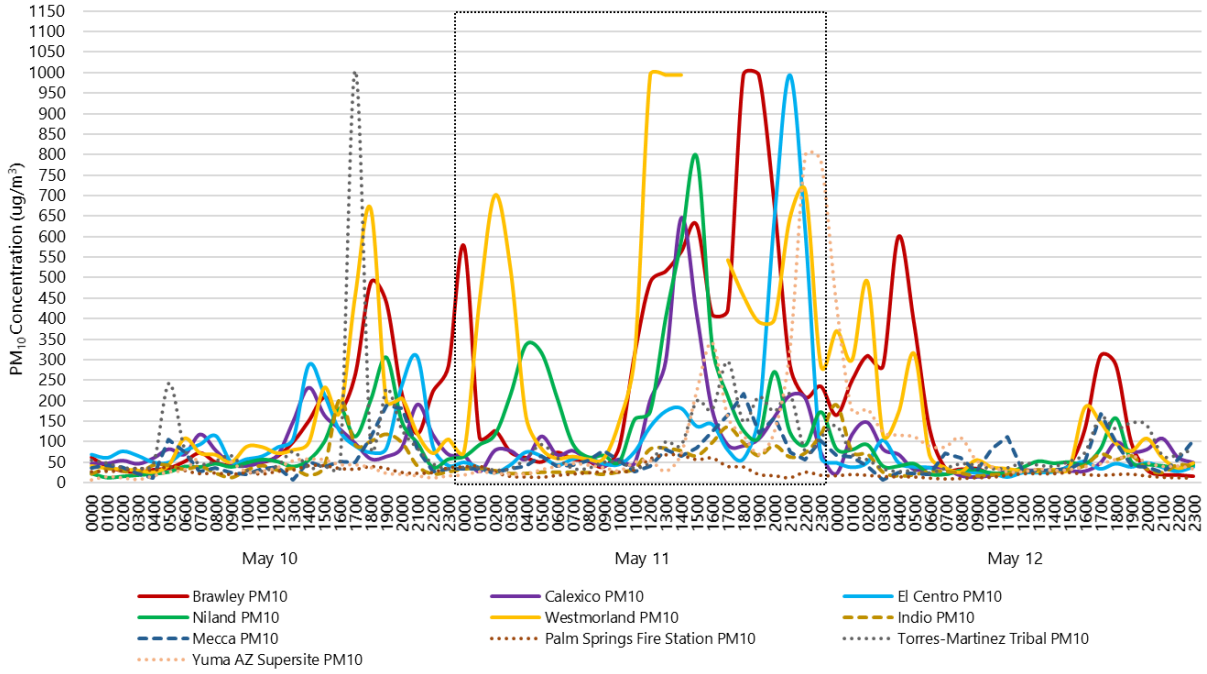


Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1**. Elevated concentrations are notable each day but in particular on May 11, 2018

Wind speed, wind direction and the airflow patterns combined all help explain how windblown emissions resulting from the strong gusty westerly winds associated with the passing of the upper level low affected all monitors in Imperial County on Friday, May 11, 2018.

As mentioned above, the early weather forecast notices and advisories issued by both the San Diego and Phoenix NWS offices indicated that an upper level trough moving over the Great Basin would strengthen the onshore pressure gradient and generate advisory-level gusty westerly winds across the Desert Southwest, including southeastern California by Friday, May 11, 2018. As mentioned above, fifteen (15) Urgent Weather Messages were issued by the NWS office in San Diego and Phoenix advising of advisory level westerly winds within the San Diego Mountains and Imperial County (**Appendix A**).

Figures 2-3 and 2-4 depict the compiled wind data for regional and neighboring airports and upstream sites. Airports within Imperial, Riverside, and San Diego counties measured wind speeds at or above 25 mph or measured wind gusts at or above 25 mph, coincident with measured elevated concentrations.

FIGURE 2-3
LOCAL AND VICINITY AIRPORT WIND SPEEDS AND GUST

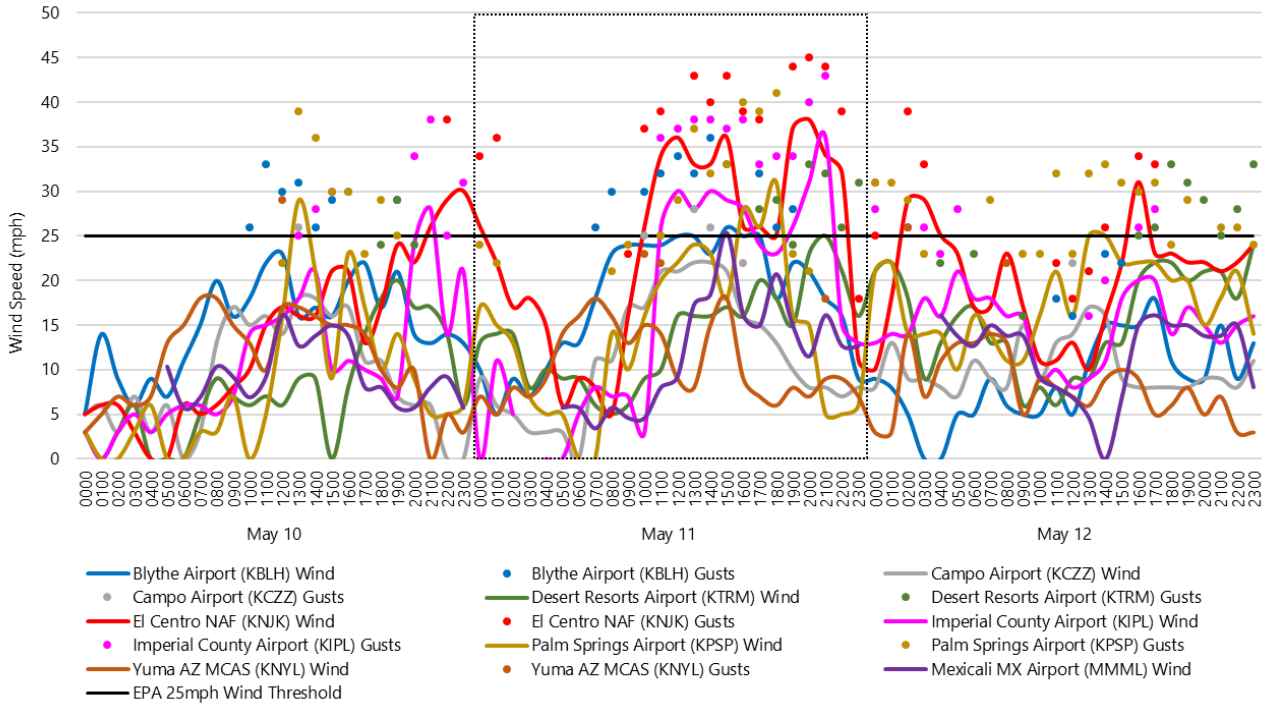


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gusts (if available) from local and neighboring airports. All data derived from the Local Climatological Data Hourly Observations (LCDHO) reports released by the NOAA https://www.ncdc.noaa.gov/. MMML is from the University of Utah's Meso West https://mesowest.utah.edu/index.html

FIGURE 2-4
WIND SPEEDS AND GUST UPSTREAM SITES

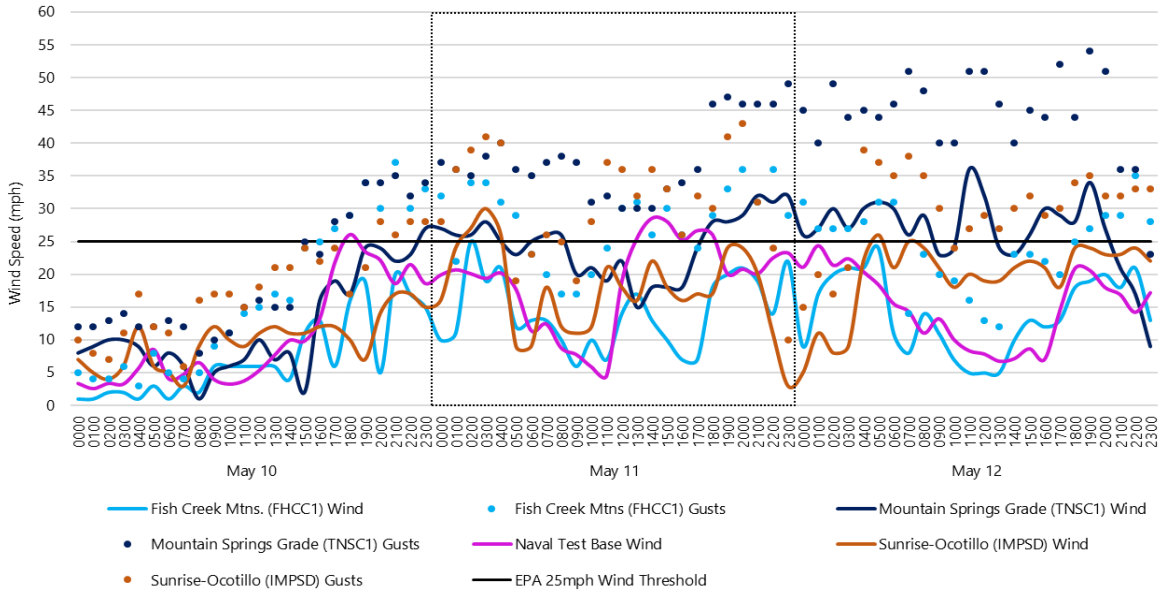


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upwind from the monitors in Imperial County on May 11, 2018. All data derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory models[10] provide supporting evidence of the westerly airflow within Imperial County on May 11, 2018. As an all-day event, the HYSPLIT back-trajectory models in **Figures 2-5 through 2-7** depict the airflow during the dawn hour (0000 PST), the late afternoon (1400 PST) and evening (1900 PST) to help illustrate the airflow and the slight influence during the dawn hours from the north, the slight southwest influence during the late afternoon and finally an almost due west influence during the evening hours.

Figure 2-5 depicts the general westerly airflow at all air quality monitors coincident with elevated concentrations above 100 µg/m^3 at the Brawley monitor and two monitors in Riverside. **Figure 2-6** depicts the late afternoon airflow with a slight southwest influence, coincident with peak hourly measured concentrations at the Westmorland and Calexico monitors. **Figure 2-7** depicts the due west airflow coincident with the highest measured wind speeds at the local airports in Imperial County. As the system moved further east the following day, concentrations reduced significantly.

[10] The Hybrid Single Particle Lagrangian Integrated Trajectory Model (**HYSPLIT**) is a computer model that is a complete system for computing simple air parcel trajectories to complex dispersion and deposition simulations. It is currently used to compute air parcel trajectories and dispersion or deposition of atmospheric pollutants. One popular use of HYSPLIT is to establish whether high levels of air pollution at one location are caused by transport of air contaminants from another location. HYSPLIT's back trajectories, combined with satellite images (for example, from NASA's MODIS satellites), can provide insight into whether high air pollution levels are caused by local air pollution sources or whether an air pollution problem was blown in on the wind The initial development was a result of a joint effort between NOAA and Australia's Bureau of Meteorology. Source: NOAA/Air Resources Laboratory, 2011.

FIGURE 2-5
HYSPLIT MODEL All SITES MAY 11, 2018 0000 PST

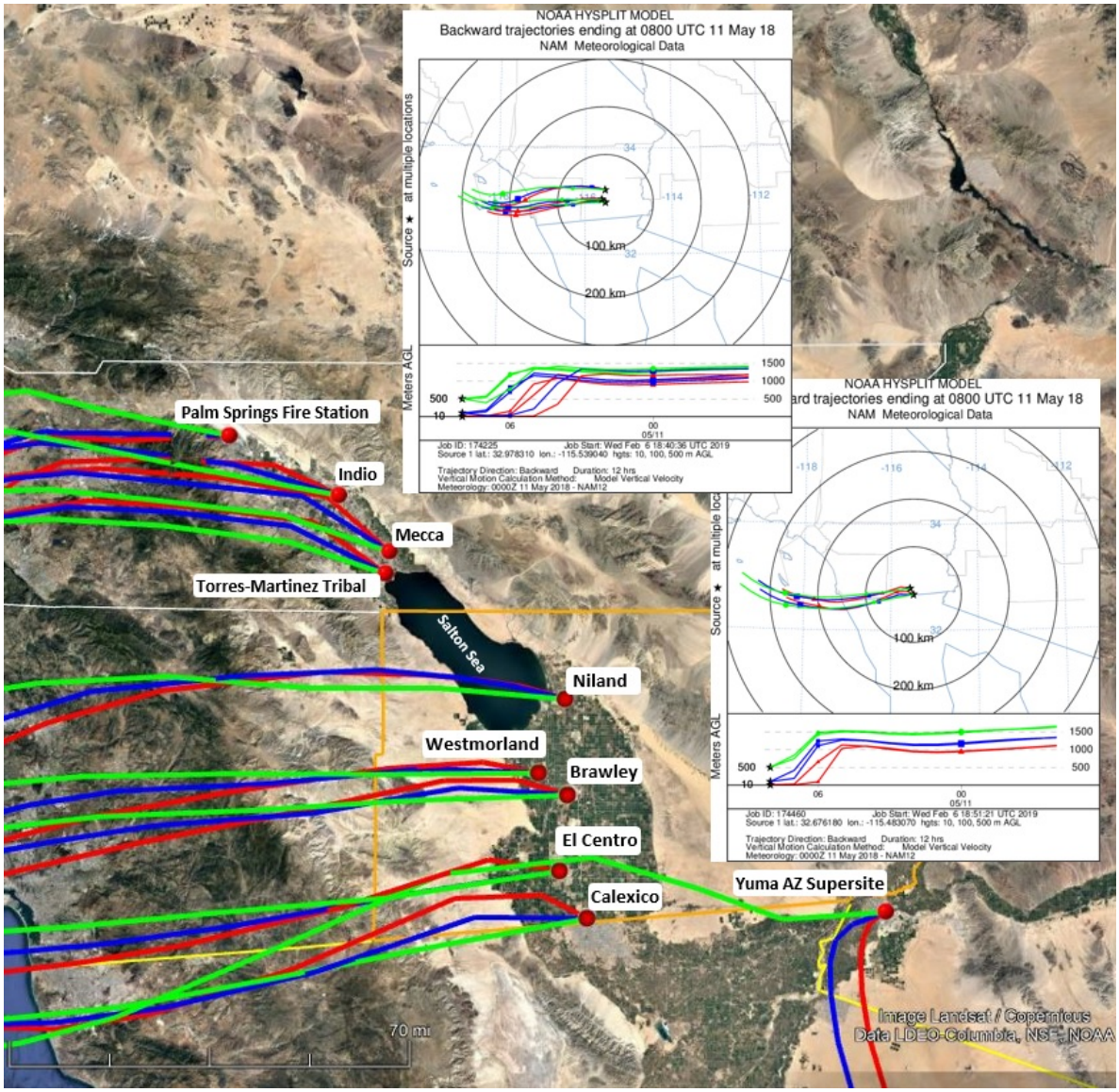


Fig 2-5: A 12-hour back-trajectory HYSPLIT ending at 0000 PST for all sites identified in **Table 2-1**. Airflow has a westerly airflow at the ICAPCD monitors for all trajectory heights. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-6
HYSPLIT MODEL All SITES MAY 11, 2018 1400 PST

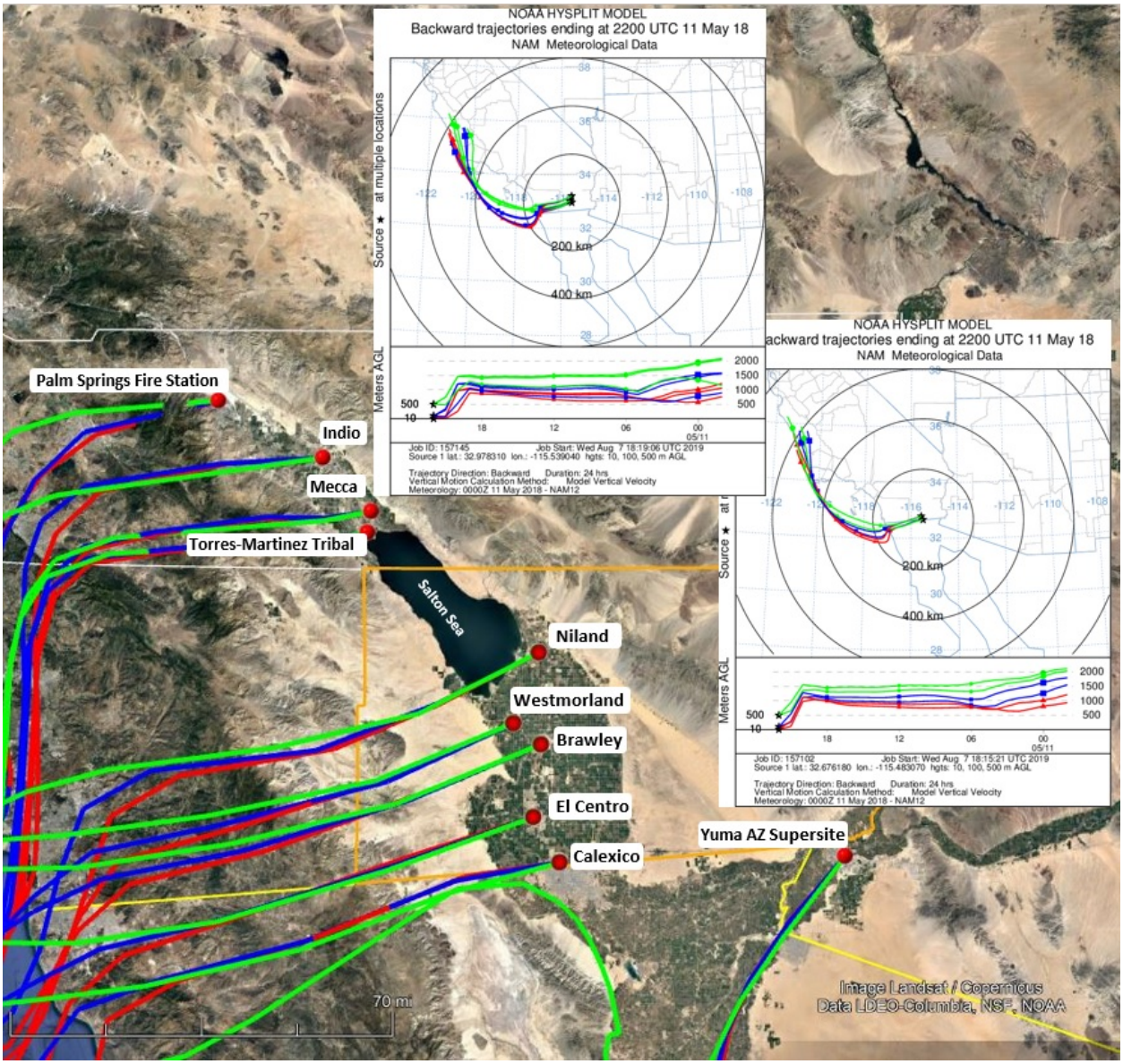


Fig 2-6: A 24-hour back-trajectory HYSPLIT ending at 1400 PST for all sites identified in **Table 2-1**. The airflow is generally west with a slight southwest influence at the ICAPCD monitors for all trajectory heights, coincident with elevated winds speeds at Imperial County airports. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

FIGURE 2-7
HYSPLIT MODEL All SITES MAY 11, 2018 1900 PST

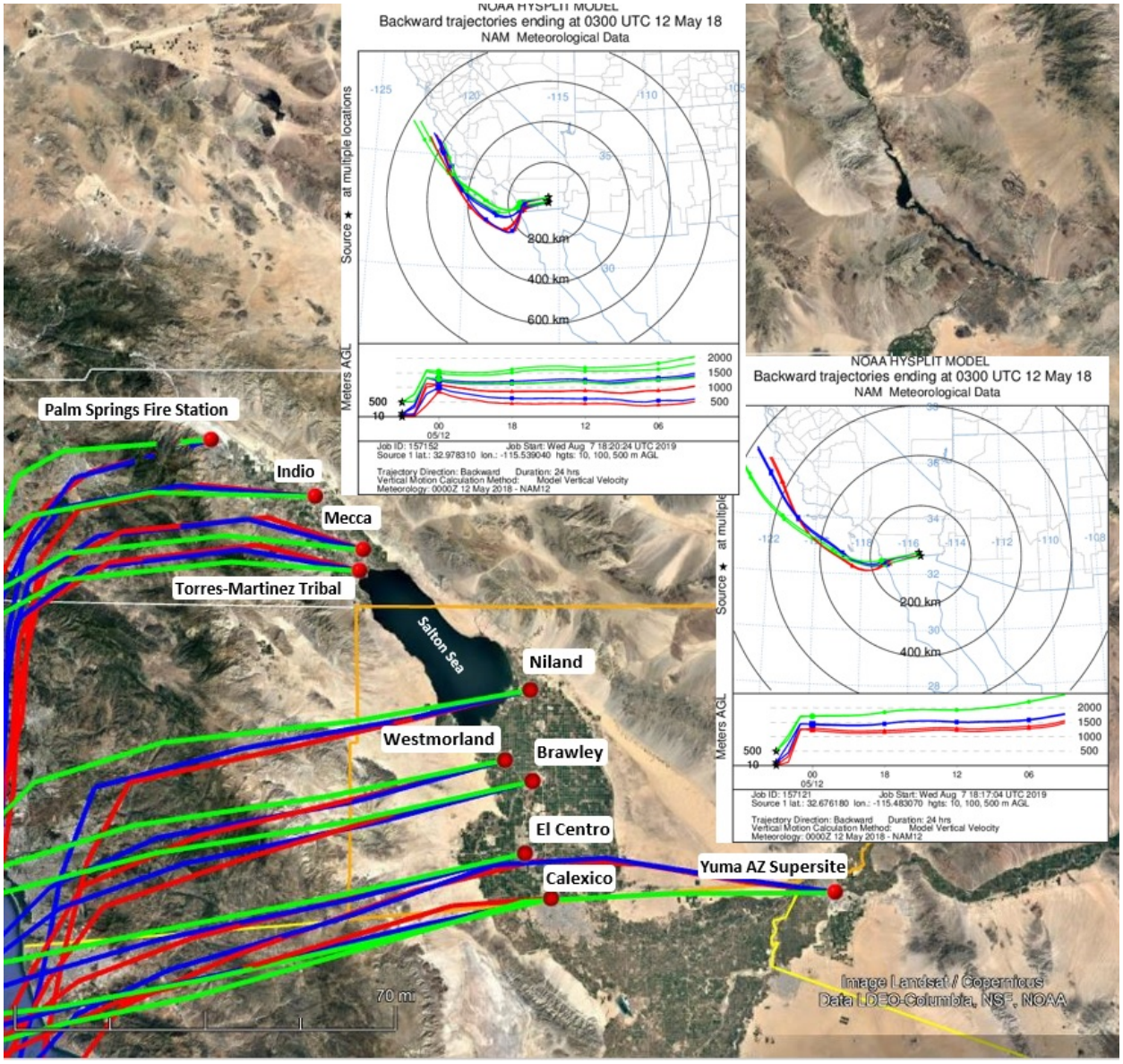


Fig 2-7: A 24-hour back-trajectory HYSPLIT ending at 1900 PST for all sites identified in **Table 2-1**. The airflow is primarily due west, coincident with the highest measured wind speeds at local airports in Imperial County. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

As strong gusty westerly winds blew over open natural mountains and desert areas west of Imperial County, fugitive windblown dust primarily affected all air quality monitors throughout the southeastern region. Anticipating the gustiness of the westerly winds the NWS offices issued sixteen (16) Urgent Weather Messages advising of wind speeds and gusts above 25 mph within the San Diego Mountains and within Imperial County. The El

Centro NAF (KNJK) and the Imperial County Airport (KIPL) each measured several hours of wind speeds at or above 25 mph. Peak gusts at KIPL reached 46 mph while peak gusts at KNJK reached 47 mph.

III Clear Causal Relationship – A demonstration that the event affected air quality illustrating the relationship between the event and the monitored exceedance

As mentioned above, an upper level low-pressure system over the Pacific Northwest moved into the Great Basin on Friday, May 11, 2018 causing surface pressure gradients to intensify and increasing locally gusty westerly winds over the mountain ridge tops to the desert slopes within San Diego County and within Imperial County.[11] In fact, the downsloping west to southwesterly winds were expected to reach Wind Advisory criterial for most of southeast California.[12] In addition, because the upper level low would become "quasi-stationary," a series of shortwaves rotating around the system provided the energy to help sustain elevated winds into the evening and overnight hours.[13] As a consequence, there were fifteen (15) Urgent Weather Messages that advised of advisory level winds within Riverside, San Diego, Imperial and Yuma counties. In addition to the gusty westerly winds, the weather system brought cooler weather and patchy rain along and within the San Diego County Mountains.[14,15] The trace precipitation as measured at the El Centro NAF (KNJK) during the late hours of May 11, 2018 and during the early morning hours of May 12, 2018 provided a damping effect upon saltation and deposition of particulates onto the air quality monitors in Imperial County on May 12, 2018.

While elevated wind speeds play a significant and important role in the transportation of dust, gusts and precipitation play an equally significant role in deposition of particulates onto a monitor and the overall affect onto ambient air.[16] As winds and gusts increased on May 11, 2018 and transported windblown dust from open natural mountains and deserts into Imperial County air quality degraded. As mentioned in Section I.1 above, the ICAPCD issued an advisory of the potential for elevated particulate matter and the potential for the degradation of air quality to a moderate or unhealthy level. In addition, the NWS service issued Area Forecast Discussions and Urgent Weather Messages advising of the potential for advisory level winds and reduced visibility due to blowing dust.

Figure 3-1 below provides an illustration of some of the meteorological conditions as described above and demonstrated in the HYSPLITS, for May 11, 2018, which affected air quality in Imperial County causing an exceedance at the Brawley, Westmorland, Niland and El Centro monitors in Imperial County. As windblown dust emissions, generated

[11] National Weather Service, Area Forecast Discussion, May 9, 2018, San Diego office, 917pm PDT
[12] National Weather Service, Area Forecast Discussion, May 11, 2018, Phoenix office, 359am MST
[13] National Weather Service, Area Forecast Discussion, May 11, 2018, Phoenix office, 359am MST
[14] National Weather Service, Area Forecast Discussion, May 9, 2018, San Diego office, 917pm PST
[15] National Weather Service, Area Forecast Discussion, May 10, 2018, San Diego office, 149pm PST
[16] Gust is a rapid fluctuation of wind speed with variations of 10 knots or more between peaks and lulls; National Weather Service Glossary https://w1.weather.gov/glossary/index.php?letter=g

within the natural open mountains within San Diego blew into and over natural open deserts within Imperil County air quality was affected by a significant amount of dust.

FIGURE 3-1
VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR MAY 11, 2018

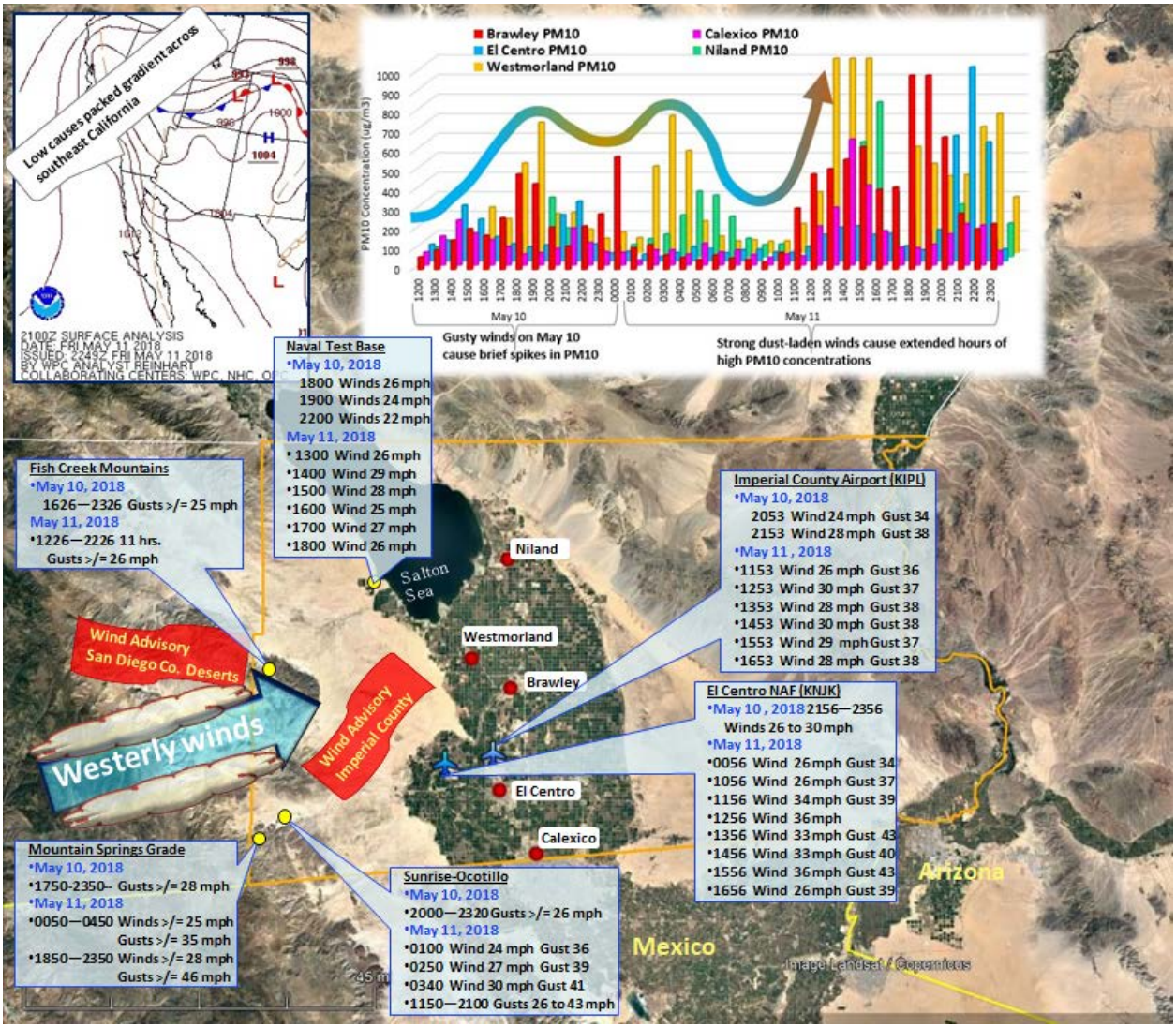


Fig 3-1: On May 11, 2018 gusty elevated westerly winds blew over and through the San Diego Mountains transporting windblown dust into Imperial County causing an exceedance of the NAAQS. Google Earth base map

An indicator of the effect to air quality can be discerned from the level of visibility at any given time and day. While the ICAPCD air monitoring stations do not measure levels of visibility the local and surrounding airports do.[17] The El Centro NAF (KNJK) and the

[17] According to the NWS there is a difference between human visibility and the visibility measured by an Automated Surface Observing System (ASOS) or an Automated Weather Observing System (AWOS). The automated sensors measure clarity of the air vs. how far one can "see". The more moisture, dust, snow, rain, or particles in the light beam the more light scattered. The sensor measures the

Imperial County Airport (KIPL) both reported reduced visibility coincident with elevated wind speeds, wind gusts and elevated hourly concentrations of particulates at all air quality monitors**.** **Figure 3-2** and **Table 3-1** provides information regarding the reduced visibility in Imperial County and the relation to hourly concentrations at local air monitors.

While **Figure 3-2** is a graphical representation of the reduced visibility within Imperial County and surrounding areas, **Table 3-1** provides a temporal relationship of wind speeds, wind direction, wind gusts (if available), and PM_{10} concentrations at the Brawley, El Centro, Niland, and Westmorland monitors. Together, the data provides the supporting relationship between the elevated winds, blowing dust and reduced visibility.

According to the compiled information found in **Figure 3-2,** visibility reduced at both the local airports in Imperial County, the El Centro NAF (KNJK), and the Imperial County Airport (KIPL) on May 11, 2018 coincident with elevated hourly concentrations at the air quality monitors in Imperial County.

return every 30 seconds. The visibility value transmitted is the average 1-minute value from the past 10 minutes. The sensor samples only a small segment of the atmosphere, 0.75 feet. Therefore, a representative visibility utilizes an algorithm. Siting of the visibility sensor is critical and large areas should provide multiple sensors to provide a representative observation; http://www.nws.noaa.gov/asos/vsby.htm

FIGURE 3-2
72-HOUR TIME SERIES PM_{10} CONCENTRATIONS AND VISIBILITY

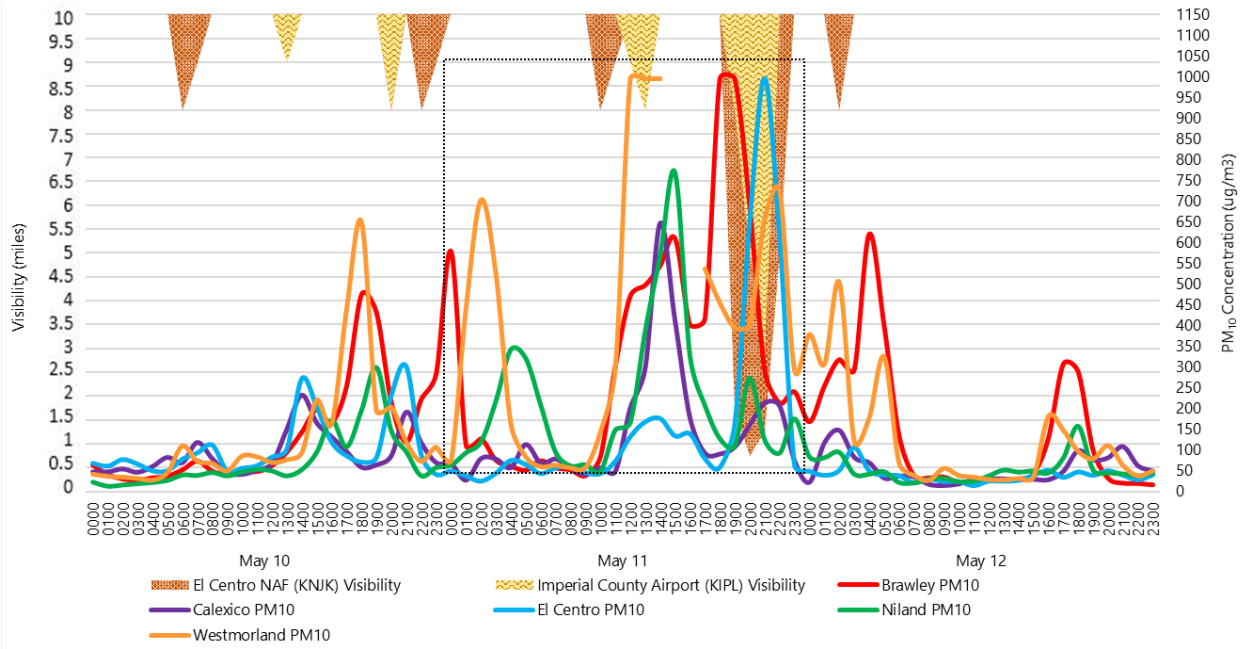


Fig 3-2: is a graphical representation of the compiled data from the Imperial County Airport (KIPL) and the El Centro NAF (KNJK). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations either just prior to peak concentrations or after. Visibility data from the NCEI's QCLCD data bank https://www.ncdc.noaa.gov/

Because the EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states[18] **Table 3-1** is provided in support of the relationship between the elevated winds and elevated concentrations. In the table the measured elevated concentrations of PM_{10} either follow or occur during periods of elevated winds or gusts. The table has a select group of meteorological sites that compare the hourly winds with the closest measured hourly concentration at each of the exceeding monitors.

[18] "Treatment of Data Influenced by Exceptional Events; Final Guidance", FR Vol. 81, No. 191, 68279, October 3, 2016

TABLE 3-1
WIND SPEEDS AND PM_{10} CONCENTRATIONS *MAY 11, 2018

	MOUNTAIN SPRINGS GRADE (TNSC1)			SUNRISE-OCOTILL0 (IMPSD)			EL CENTRO NAF (KNJK)			IMPERIAL COUNTY AIRPORT (KIPL)			NAVAL TEST BASE		BRLY	CX	EC	NLND	WSTMLD
HOUR	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/G	W/D	W/S	W/D	PM_{10} (ug/m^3)				
1200	10	16	59	11	18	228	17		140	16		130	5	74	65	68	86	51	73
1300	7	15	43	12	21	251	16		140	18	25	140	8	72	100	150	107	39	81
1400	8	15	71	11	21	255	16		170	21	28	140	10	87	151	232	287	55	99
1500	2	25	236	11	24	270	21		260	10	30	180	10	97	209	165	215	99	233
1600	16	23	243	12	22	271	21		280	11		220	13	304	175	131	125	181	173
1700	19	28	240	12	24	304	13		260	10		260	22	280	265	96	89	112	459
1800	17	29	227	10	17	277	17		270	9		280	26	281	489	58	73	202	668
1900	24	34	212	7	21	288	24		270	7		260	24	269	440	64	83	305	199
2000	24	34	209	14	28	252	22		260	24	34	260	22	264	217	86	237	148	207
2100	22	35	207	17	26	274	26		270	28	38	280	19	264	120	191	306	96	120
2200	23	32	205	17	28	276	29	38	260	14	25	260	22	257	223	117	88	37	73
2300	27	34	203	15	28	273	30		260	21	31	270	19	254	285	69	41	57	107
000	27	37	209	16	28	266	26	34	260	0		0	20	255	578	66	49	63	76
100	26	36	209	24	36	249	22	36	240	11		290	21	263	111	27	36	92	444
200	26	35	209	27	39	244	17		260	5		VRB	20	263	127	79	24	117	702
300	28	38	210	30	41	239	18		250				19	261	75	78	43	214	522
400	25	40	207	26	40	242	15		250	0		0	20	274	61	57	74	336	162
500	23	36	209	9	19	289	6		140	0		0	18	264	51	113	64	316	84
600	25	35	205	9	23	255	9		110	5		140	11	251	74	68	42	207	60
700	26	37	207	18	26	239	8		130	8		130	12	247	58	78	57	95	65
800	26	38	216	12	25	263	5		VRB	7		100	9	246	53	56	61	62	58
900	20	37	222	11	19	265	16	23	250	7		240	8	41	39	41	46	66	60
1000	21	31	227	12	28	259	26	37	260	3		VRB	6	66	87	57	44	50	149
1100	19	32	214	21	37	272	34	39	250	26	36	260	5	172	314	48	75	154	310
1200	22	30	211	18	36	266	36		250	30	37	260	19	272	489	201	136	173	995
1300	15	30	215	16	32	255	33	43	240	28	38	250	26	274	516	297	174	401	995
1400	18	30	241	22	36	272	33	40	240	30	38	250	29	271	564	646	181	589	995
1500	18	33	232	18	33	254	36	43	240	29	37	250	28	272	629	411	137	793	
1600	18	34	241	16	26	257	26	39	250	28	38	250	25	275	410	177	142	334	
1700	24	36	243	17	32	268	26	38	250	24	33	250	27	272	422	92	79	210	544
1800	28	46	236	17	30	259	25		250	23	34	260	26	271	995	90	57	127	457
1900	28	47	232	24	41	252	37	44	270	26	34	280	20	295	995	107	162	110	393
2000	29	46	224	24	43	256	38	45	270	31	40	290	21	296	679	160	643	270	399
2100	32	46	220	20	31	255	34	44	270	36	43	290	20	282	288	213	995	123	646
2200	31	46	225	11	24	270	32	39	270	15		290	23	283	209	206	610	91	712
2300	32	49	221	3	10	141		18	360	13		290	23	265	235	74	62	172	287

*Dates in **Blue** represent May 10, 2018 data. Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for Mountain Springs Grade (TNSC1), and Sunrise-Ocotillo (IMPSD) from the University of Utah's MesoWest system https://mesowest.utah.edu/index.html. Wind data for Naval Test Base from AQMIS2. Wind speeds = mph; Direction = degrees. VRB = Variable. Due to the different times that wind data and air quality data is sampled at various sites, the hour given represents the hour in which the measurement was taken

As mentioned above, Area Forecast Discussions and Urgent Weather Messages containing Wind Advisories all described the gusty westerly winds for the region extending from the San Diego County Mountains and deserts, Imperial County and western Arizona. The upper level low-pressure system caused the tightening of the pressure gradient producing gusty westerly winds that affected different regional air monitors in Riverside County, Imperial County and Arizona. (**Table 2-1**).

The ICAPCD monitors air quality for each of its stations and issues web-based Air Quality Indices in response to changes in air quality.[19] As transported windblown dust entered Imperial County on May 11, 2018 air quality degraded throughout Imperial County. Overall, the strong gusty westerly winds associated with the passing of the upper level low-pressure system affected air quality in Imperial County.

FIGURE 3-3
IMPERIAL VALLEY AIR QUALITY INDEX FOR BRAWLEY
MAY 11, 2018

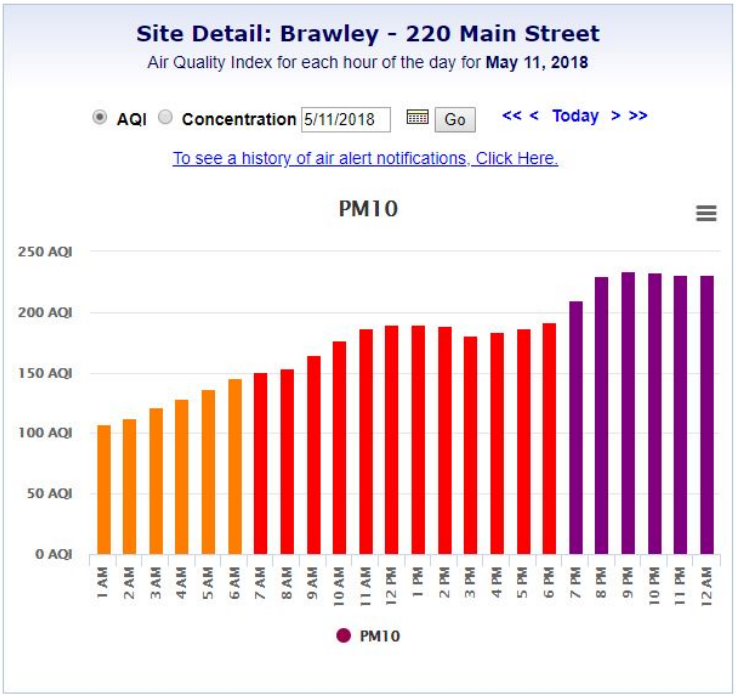


Fig 3-3: The degradation, or affect upon air quality, maybe determined when the AQI changes from an "Orange" level or Unhealthy for sensitive groups to a "Purple" or very unhealthy level

[19] The AQI is an index for reporting daily air quality. It tells you how clean or polluted your air is, and what associated health effects might be a concern for you. The AQI focuses on health affects you may experience within a few hours or days after breathing polluted air. EPA calculates the AQI for five major air pollutants regulated by the Clean Air Act: ground-level ozone, particle pollution (also known as particulate matter), carbon monoxide, sulfur dioxide, and nitrogen dioxide. For each of these pollutants, EPA has established national air quality standards to protect public health. Ground-level ozone and airborne particles are the two pollutants that pose the greatest threat to human health in this country. Source: https://airnow.gov/index.cfm?action=aqibasics.aqi

FIGURE 3-4
IMPERIAL VALLEY AIR QUALITY INDEX FOR EL CENTRO
MAY 11, 2018

Fig 3-4: The degradation, or affect upon air quality, maybe determined when the AQI changes to an "Orange" level or Unhealthy for sensitive groups

FIGURE 3-5
IMPERIAL VALLEY AIR QUALITY INDEX FOR NILAND
MAY 11, 2018

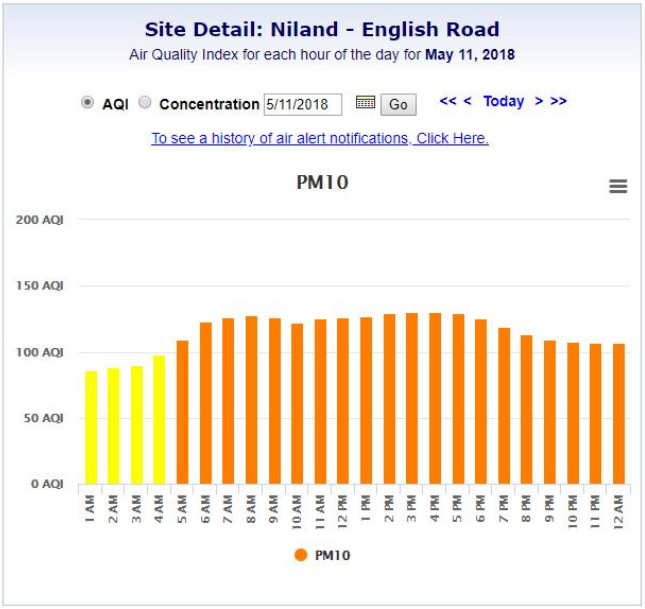


Fig 3-5: The degradation, or affect upon air quality, maybe determined when the AQI changes to an "Orange" level or Unhealthy for sensitive groups

FIGURE 3-6
IMPERIAL VALLEY AIR QUALITY INDEX FOR WESTMORLAND
MAY 11, 2018

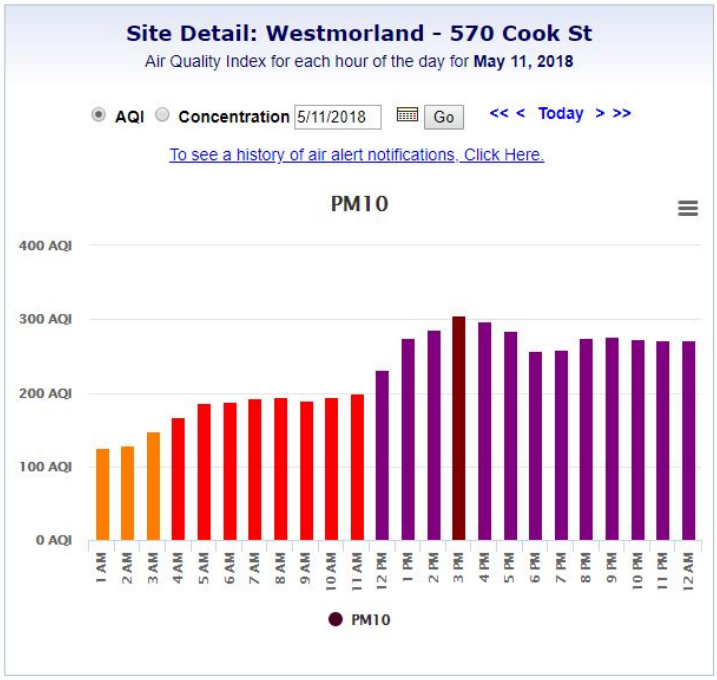


Fig 3-6: The degradation, or affect upon air quality, maybe determined when the AQI changes from an "Orange" level or Unhealthy for sensitive groups to a "Maroon" or Hazardous level

III.1 Summary of Forecasts and Warnings

Area Forecast Discussions issued by the NWS offices in Phoenix and San Diego described the moving upper level low-pressure system off the Pacific Northwest. Both NWS offices issued several Area Forecast Discussions anticipating gusty westerly winds through the region by Friday, May 11, 2018. Although the winds were originally not expected to be strong the winds were expected to be gusty prompting the NWS offices to issue Urgent Weather Message, containing wind advisories. In all sixteen (16) separate Urgent Weather Messages in anticipation of advisory level winds within the San Diego Mountains, adjacent deserts and Imperial County were issued. **Appendix A** contains all pertinent NWS notices

III.2 Summary of Wind Observations

As demonstrated above wind data during the event were available from airports in eastern Riverside County, southeastern San Diego County, southwestern Yuma County (Arizona), northern Mexico, and Imperial County as well as from other automated meteorological instruments upwind from the monitors. Data analysis indicates that on May 11, 2018 different sites measured wind speeds at or above (some instances in excess of) 25 mph.

IV Concentration to Concentration Analysis – An analyses comparing the event-influenced concentrations to concentrations at the same monitoring site at other times

While naturally occurring high wind events may recur seasonally and at times frequently and qualify for exclusion under the EER, historical comparisons of the particulate concentrations and associated winds provide insight into the frequency of events within an identified area.

Figures 4-1 through 4-8 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Brawley, El Centro, Niland and Westmorland air quality monitors for the period of January 1, 2010 through May 11, 2018. The compiled data set below includes non-regulatory data prior to 2013. As a consequence, continuous monitoring data (hourly concentrations) prior to 2013 were not reported into the US EPA Air Quality System (AQS).[20] The difference between the standard and local condition concentrations is not significant enough to change the outcome of the analysis.

Compiled and plotted 24-hour averaged PM_{10} concentrations, between January 1, 2010 and May 11, 2018, as measured by the Brawley, El Centro, Niland and Westmorland monitors, were used to establish the historical and seasonal variability over time.[21] All figures illustrate that the exceedance, which occurred on May 11, 2018, was outside the normal historical concentrations when compared to event and non-event days. Air quality data for all graphs obtained through the EPA's AQS data bank.

[20] Pollutant concentration data contained in EPA's Air Quality System (AQS) are required to be reported in units corrected to standard temperature and pressure (25 C, 760 mm Hg). Because the PM_{10} concentrations prior to 2013 were not reported into the AQS database all BAM (FEM) data prior to 2013 within this report are expressed as micrograms per cubic meter (mg/m^3) at local temperature and pressure (LTP) as opposed to standard temperature and pressure (STP 760torr and 25C). The difference in concentration measurements between standard conditions and local conditions is insignificant and does not alter or cause any significant changes in conclusions to comparisons of PM_{10} concentrations to PM_{10} concentrations with in this demonstration.

[21] FRM sampling ended December 2016.

FIGURE 4-1
BRAWLEY HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 11, 2018

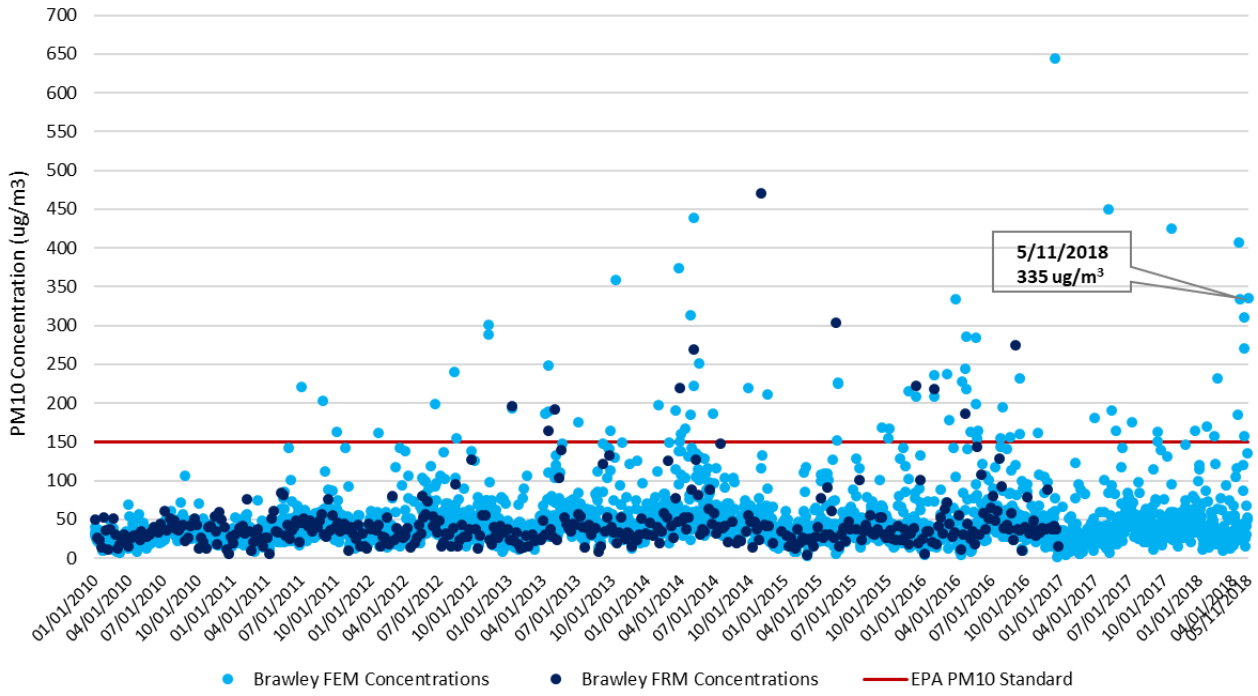


Fig 4-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 335 µg/m^3 on May 11, 2018 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Brawley includes 3,053 sampling days (January 1, 2010 through May 11, 2018). Of the 3,053 sampling days the Brawley monitor measured 77 exceedance days which translates into an occurrence rate less than 3%. Historically, there were fourteen (14) exceedance days measured during the first quarter; thirty-four (34) exceedance days measured during the second quarter; sixteen (16) exceedance days measured during the third quarter; and thirteen (13) exceedance days measured during the fourth quarter.

FIGURE 4-2
EL CENTRO HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 11, 2018

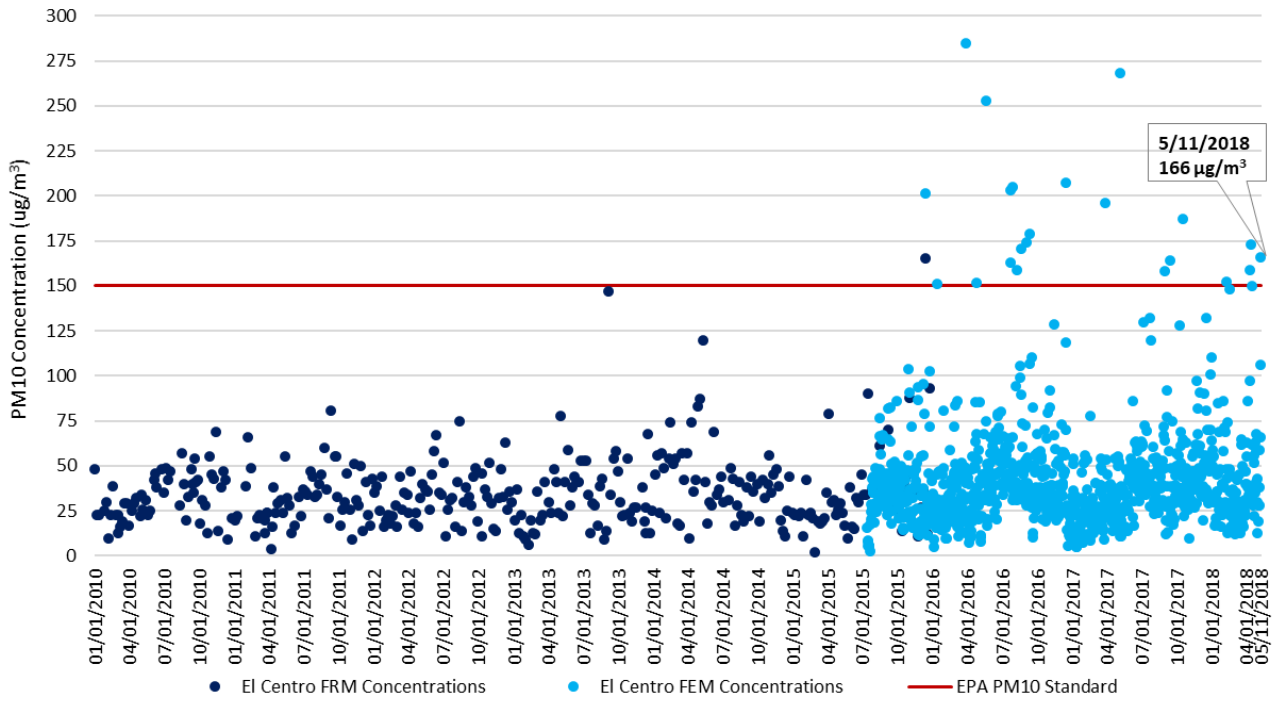


Fig 4-2: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 166 µg/m^3 on May 11, 2018 by the El Centro monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-2,** for El Centro includes 1,390 sampling days (January 1, 2010 through May 11, 2018). Of the 1,390 sampling days the El Centro monitor measured 19 exceedance days which translates into an occurrence rate less than 1.5%. Historically, there were two (2) exceedance days measured during the first quarter; five (5) exceedance days measured during the second quarter; nine (9) exceedance days measured during the third quarter; and three (3) exceedance days measured during the fourth quarter.

FIGURE 4-3
NILAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 11, 2018

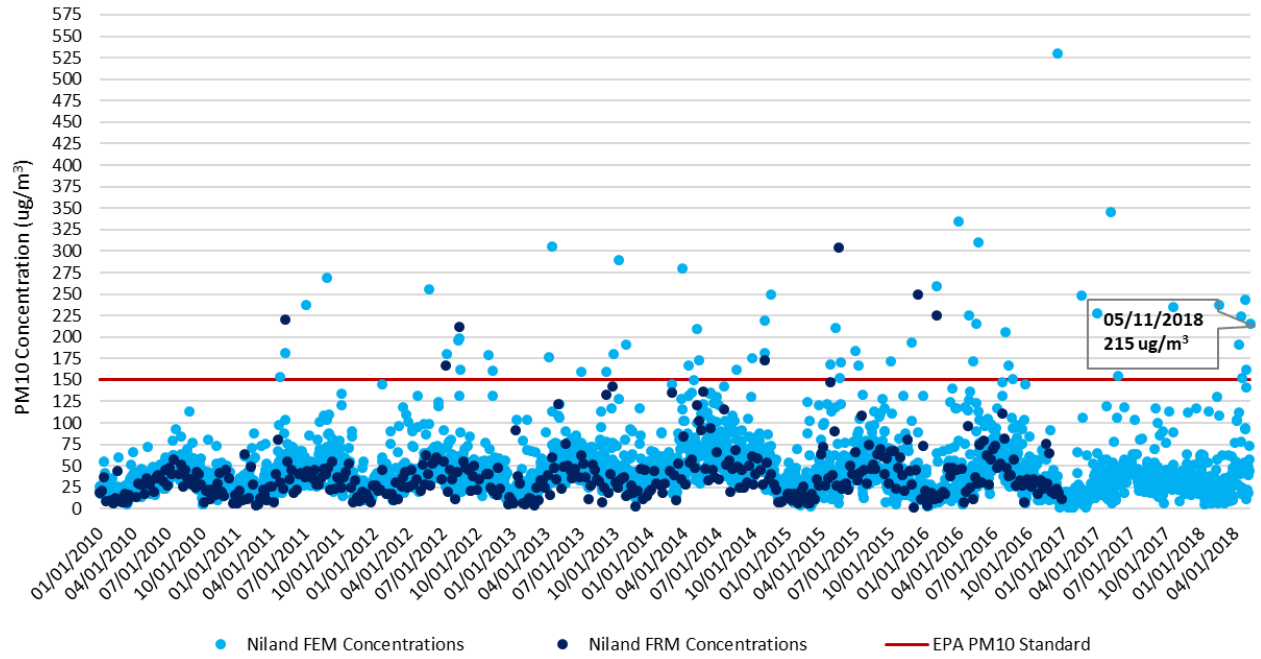


Fig 4-3: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 215 µg/m³ on May 11, 2018 by the Niland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-3,** for Niland includes 3,053 sampling days (January 1, 2010 through May 11, 2018). Of the 3,053 sampling days the Niland monitor measured 56 exceedance days which translates into an occurrence rate less than 2%. Historically, there were six (6) exceedance days measured during the first quarter; twenty-three (23) exceedance days measured during the second quarter; fifteen (15) exceedance days measured during the third quarter; and twelve (12) exceedance days measured during the fourth quarter.

FIGURE 4-4
WESTMORLAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 11, 2018

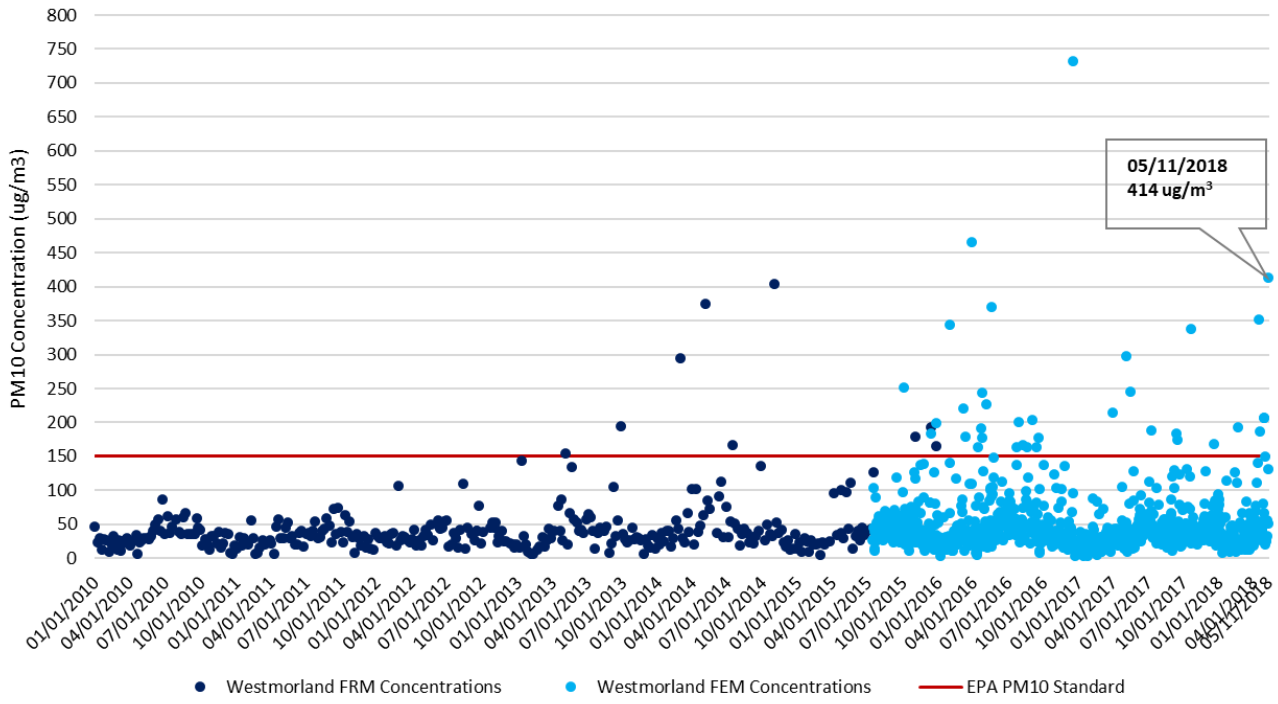
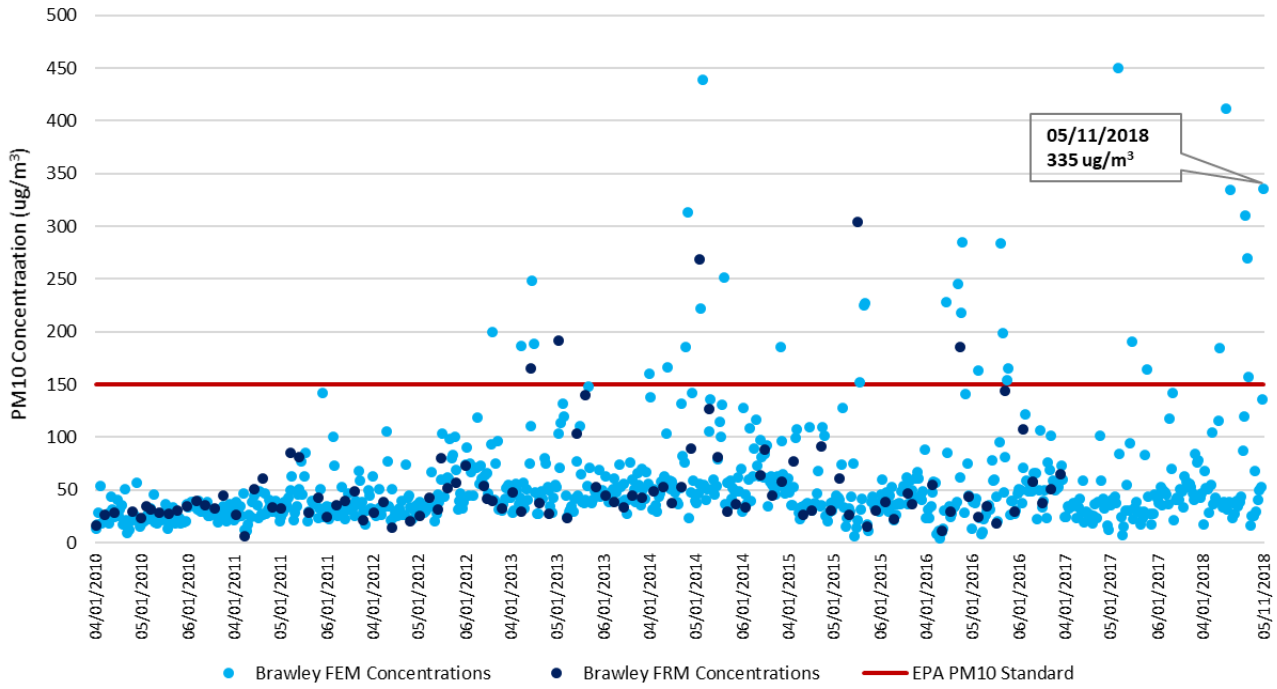


Fig 4-4: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 414 µg/m^3 on May 11, 2018 by the Westmorland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-4,** for Westmorland includes 1,382 sampling days (January 1, 2010 through May 11, 2018). Out of 1,382 sampling days the Westmorland monitor measured 42 exceedance days which translates into an occurrence rate less than 3.5%. Historically, seven (7) exceedance days measured during the first quarter; fifteen (15) exceedance days measured during the second quarter; twelve (12) exceedance days measured during the third quarter; and eight (8) exceedance days measured during the fourth quarter.

FIGURE 4-5
BRAWLEY SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO MAY 11, 2018**

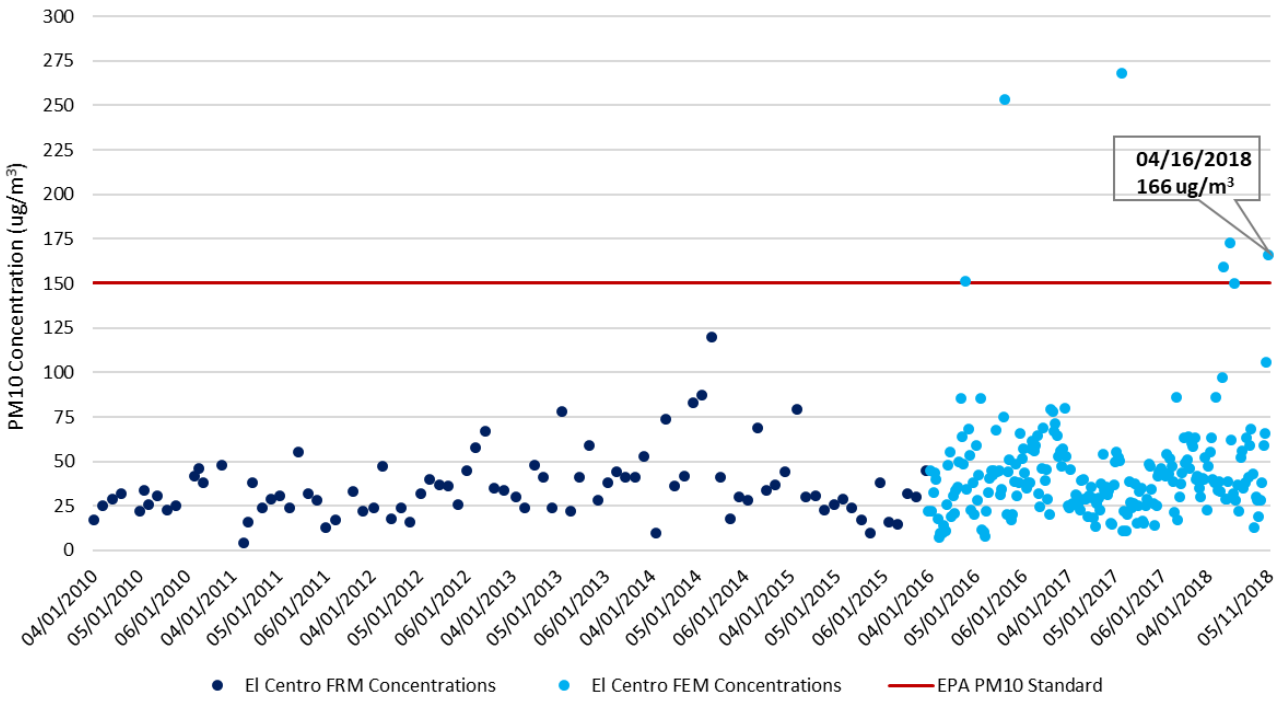


***Quarterly: April 1, 2010 to June 30, 2017 and April 1, 2018 to May 11, 2018**

Fig 4-5: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 335 µg/m^3 by the Brawley monitor on May 11, 2018 was outside the normal seasonal concentrations when compared to similar days and non-event days

Figure 4-5 illustrates the seasonal fluctuations over a period of 769 sampling days, 872 credible samples and thirty-four (34) exceedance days. This translates to less than a 1.5% seasonal exceedance occurrence rate.

FIGURE 4-6
EL CENTRO SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO MAY 11, 2018**

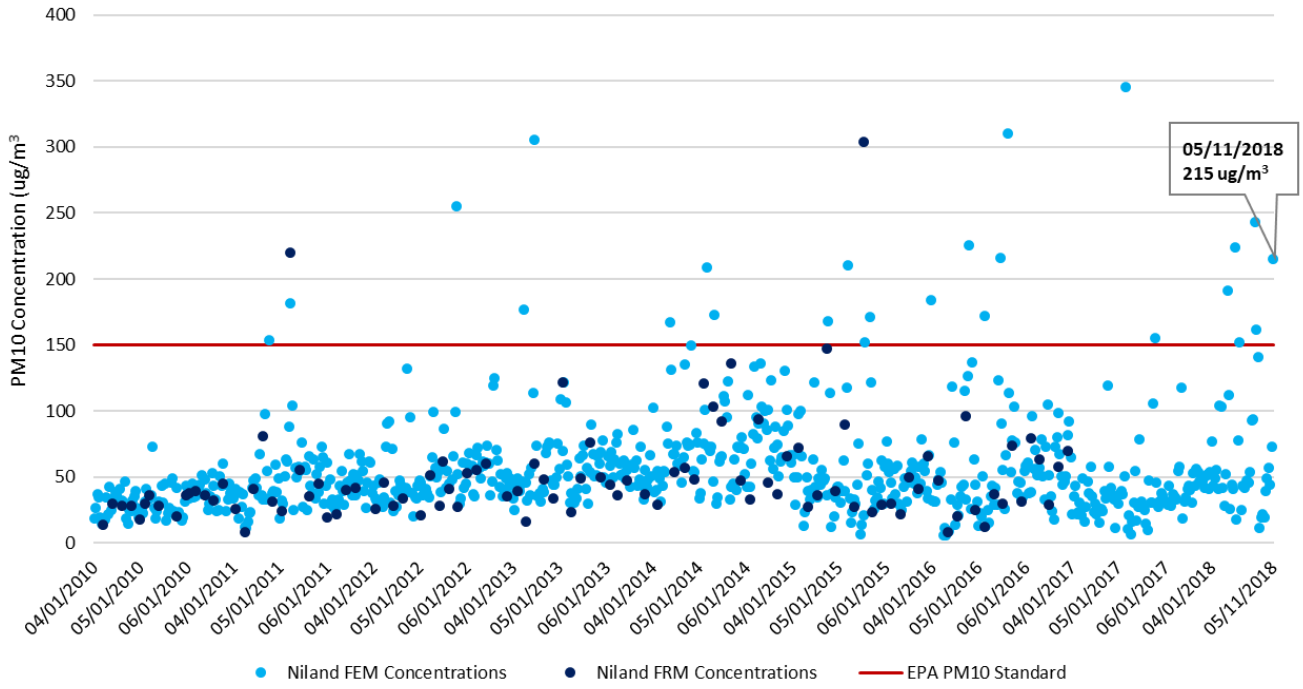


***Quarterly: April 1, 2010 to June 30, 2017 and April 1, 2018 to May 11, 2018**

Fig 4-6: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 166 µg/m^3 by the El Centro monitor on May 11, 2018 was outside the normal seasonal concentrations when compared to similar days and non-event days

Figure 4-6 illustrates the seasonal fluctuations over a period of 316 sampling days, 311 credible samples and five (5) exceedance days. This translates to less than a 1.6% seasonal exceedance occurrence rate.

FIGURE 4-7
NILAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO MAY 11, 2018**

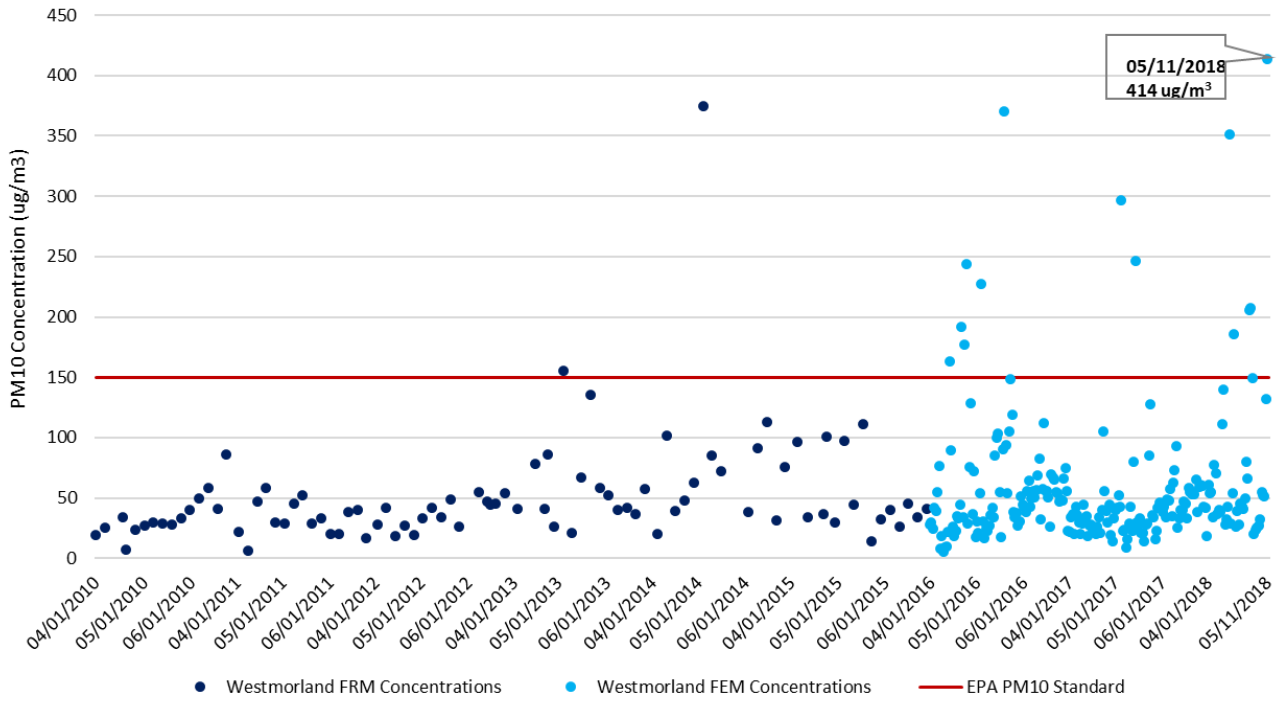


***Quarterly: April 1, 2010 to June 30, 2017 and April 1, 2018 to May 11, 2018**

Fig 4-7: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 215 µg/m^3 by the Niland monitor on May 11, 2018 was outside the normal seasonal concentrations when compared to similar days and non-event days

Figure 4-7 illustrates the seasonal fluctuations over a period of 769 sampling days, 869 credible samples and twenty-three (23) exceedance days. This translates to less than a 1.5% seasonal exceedance occurrence rate.

FIGURE 4-8
WESTMORLAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO MAY 11, 2018**



***Quarterly: April 1, 2010 to June 30, 2017 and April 1, 2018 to May 11, 2018**
Fig 4-8: A comparison of PM_{10} seasonal concentrations demonstrate that the measured concentration of 414 µg/m^3 by the Westmorland monitor on May 11, 2018 was outside the normal seasonal concentrations when compared to similar days and non-event days

Figure 4-8 illustrates the seasonal fluctuations over a period of 318 sampling days, 311 credible samples and fifteen (15) exceedance days. This translates to less than a 4.8% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the May 11, 2018 measured exceedances, the exceedances measured on May 11, 2018 are clearly outside the normal concentration levels when comparing to similar event days and non-event days.

V Both Not Reasonably Controllable and Not Reasonably Preventable – A demonstration that the event was both not reasonably controllable and not reasonably preventable

The analysis above, under the Clear Causal Relationship, indicates that the primary sources affecting air quality in Imperial County originated within the natural open areas of the San Diego Mountains and the natural open deserts to the west and southwest of Imperial County. The origination of these emissions from these areas affected all the air quality monitors significantly on May 11, 2018. Since Imperial County does not have jurisdiction over emissions emanating from San Diego County, it is not reasonably controllable or preventable by Imperial County. For a brief description of the controls implemented by sources beyond the control of Imperial County see section V.1 below.

As mentioned above in section I.4, Mitigation of Exceptional Events contains significant information regarding the application of Best Available Control Measures that are used as measures to abate or minimize contributing controllable sources of identified pollutants (**Page 12, sub-section II.2 of the High Wind Mitigation Plan**). In addition, the mitigation plan explains the methods utilized to minimize public exposure to high concentrations of identified pollutants, the process utilized to collect and maintain data pertinent to any identified event, and the mechanisms utilized to consult with other air quality managers within the affected area regarding the appropriate responses to abate and minimize affects.

Inhalable particulate matter (PM_{10}) contributes to effects that are harmful to human health and the environment, including premature mortality, aggravation of respiratory and cardiovascular disease, decreased lung function, visibility impairment, and damage to vegetation and ecosystems. Upon enactment of the 1990 Clean Air Act (CAA) amendments, Imperial County was classified as moderate nonattainment for the PM_{10} NAAQS under CAA sections 107(d)(4)(B) and 188(a). By November 15, 1991, such areas were required to develop and submit State Implementation Plan (SIP) revisions providing for, among other things, implementation of reasonably available control measures (RACM).

Partly to address the RACM requirement, ICAPCD adopted local Regulation VIII rules to control PM_{10} from sources of fugitive dust on October 10, 1994, and revised them on November 25, 1996. USEPA did not act on these versions of the rules with respect to the federally enforceable SIP.

On August 11, 2004, USEPA reclassified Imperial County as a serious nonattainment area for PM_{10}. As a result, CAA section 189(b)(1)(B) required all BACM to be implemented in the area within four years of the effective date of the reclassification, i.e., by September 10, 2008.

On November 8, 2005, partly to address the BACM requirement, ICAPCD revised the Regulation VIII rules to strengthen fugitive dust requirements. On July 8, 2010, USEPA finalized a limited approval of the 2005 version of Regulation VIII, finding that the seven Regulation VIII rules largely fulfilled the relevant CAA requirements. Simultaneously, USEPA also finalized a limited disapproval of several of the rules, identifying specific deficiencies that needed to be addressed to fully demonstrate compliance with CAA requirements regarding BACM and enforceability.

In September 2010, ICAPCD and the California Department of Parks and Recreation (DPR) filed petitions with the Ninth Circuit Federal Court of Appeals for review of USEPA's limited disapproval of the rules. After hearing oral argument on February 15, 2012, the Ninth Circuit directed the parties to consider mediation before rendering a decision on the litigation. On July 27, 2012, ICAPCD, DPR and USEPA reached agreement on a resolution to the dispute, which included a set of specific revisions to Regulation VIII. The October 16, 2012 adopted revision reflects the specific revisions to Regulation VIII, which USEPA approved on April 22, 2013. Since 2006, ICAPCD had implemented regulatory measures to control emissions from fugitive dust sources and open burning in Imperial County.

FIGURE 5-1
REGULATION VIII GRAPHIC TIMELINE DEVELOPMENT

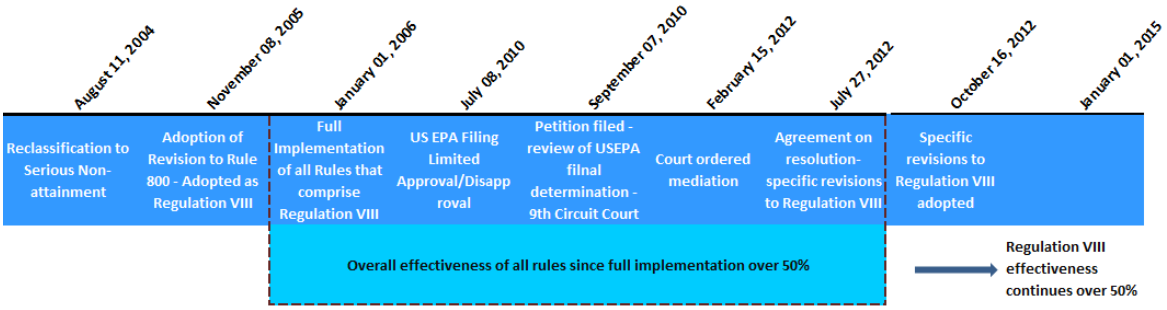


Fig 5-1: Regulation VIII Graphic Timeline

V.1 Other PM_{10} Control Measures

In addition to the rules and regulations listed above, other PM_{10} control measures have been committed to, and implemented by, local California air districts bordering ICAPCD. San Diego County (to the west of Imperial County) and eastern Riverside County (outside of the Coachella Valley Planning Area and to the north and northeast of Imperial County)

are both designated unclassified for the PM_{10} NAAQS and are not required to have BACM controls for PM_{10}. The Coachella Valley Planning Area in Riverside County, to the north and northwest of Imperial County, is designated a PM_{10} nonattainment area, and a redesignation request and maintenance plan were submitted to USEPA in 2010. These three areas and their relevant PM_{10} rules are indicated in **Tables 5-1 to 5-3**.

TABLE 5-1
SAN DIEGO AIR POLLUTION CONTROL DISTRICT (SDAPCD)

RULES REGULATING EXISTING AND NEW NON-POINT SOURCES IN SAN DIEGO COUNTY	
RULE NUMBER AND TITLE	DESCRIPTION
Rule 52 – Particulate Matter	Limits the amount of particulate matter that may be discharged from any source.
Rule 52.1 – NSPS and NESHAPS Particulate Matter Requirements	Ensures that sources subject to NSPS or NESHAPS also conform to Regulation X and XI, respectively.
Rule 54 – Dust and Fumes	Minimizes the amount of dust that can be discharged in a specified time period.
Rule 55 – Fugitive Dust Control	Provides a mechanism to regulate operations that may cause fugitive dust emissions.
Rule 101 – Burning Control	Establishes conditions, including high winds, under which burning would be curtailed or prohibited.

TABLE 5-2
MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT (AQMD)

RULES REGULATING EXISTING AND NEW NON-POINT SOURCES IN EASTERN RIVERSIDE COUNTY OUTSIDE OF THE COACHELLA VALLEY PLANNING AREA	
RULE NUMBER AND TITLE	DESCRIPTION
Rule 403 – Fugitive Dust	Limits the amount of particulate matter that may be discharged from specific sources, not including unpaved public roads or farm roads, or industrial or commercial facilities.
Rule 404 – Particulate Matter Concentration	Limits the concentration of PM_{10} allowed in discharged gas.
Rule 405 – Solid Particulate Matter Weight	Limits the amount of PM_{10} that can be discharged on an hourly basis.

TABLE 5-3
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)
RULES REGULATING
EXISTING AND NEW NON-POINT SOURCES IN RIVERSIDE COUNTY
AND THE COACHELLA VALLEY, INSIDE OF THE COACHELLA VALLEY PLANNING AREA

RULE NUMBER AND TITLE	DESCRIPTION
Rule 403– Fugitive Dust	Requires implementation of control measures to prevent, reduce, or mitigate fugitive dust emissions.
Rule 403.1 – Supplemental Fugitive Dust Control Requirements for Coachella Valley Sources	Establishes special requirements for Coachella Valley dust sources under high-wind conditions and requires SCAPCD approval of dust control plans for sources not subject to local government ordinances.
Rule 1156 – Further Reductions of Particulate Emissions from Cement Manufacturing Facilities	Establishes requirements to reduce particulate matter emissions from cement manufacturing operations and properties.
Rule 1157 – PM_{10} Emission Reductions from Aggregate and Related Operations	Establishes additional source specific performance standards and specifies operational PM_{10} controls specific to aggregate and related operations.
Rule 1186 – PM_{10} Emissions from Paved and Unpaved Roads and Livestock Operation	Limits the amount of particulate matter entrained as a result of vehicular travel on paved and unpaved public roads, and at livestock operations.
Rule 1466 – Control of Particulate Emissions from Soils with Toxic Air Contaminants	Establishes a PM_{10} ambient dust concentration limit, dust control measures, and notification requirements prior to earth-moving activities or when PM_{10} dust concentrations are exceeded.

V.2 Wind Observations

As previously discussed, wind data analysis indicates that on May 11, 2018 different sites measured wind speeds at or above (in some instances far in excess of) 25 mph. Wind speeds of 25 mph are normally sufficient to overcome most PM_{10} control measures. During the May 11, 2018 event, wind speeds were above the 25 mph threshold, overcoming the BACM in place.

V.3 Review of Source Permitted Inspections and Public Complaints

A query of the ICAPCD permit database was compiled and reviewed for active permitted sources throughout Imperial County and specifically around the Brawley, El Centro, Niland, and Westmorland monitors during the May 11, 2018 PM_{10} exceedances. Both permitted and non-permitted sources are required to comply with Regulation VIII requirements that address fugitive dust emissions. The identified permitted sources are Aggregate Products, Inc., US Gypsum Quarry, Imperial Aggregates (Val-Rock, Inc., and Granite Construction), US Gypsum Plaster City, Clean Harbors (Laidlaw Environmental Services), Bullfrog Farms (Dairy), Burrtec Waste Industries, Border Patrol Inspection station, Centinela State Prison, various communications towers not listed and various agricultural operations. Non-permitted sources include the wind farm known as Ocotillo Express, and a solar facility known as CSolar IV West. Finally, the desert regions are under the jurisdiction of the Bureau of Land Management and the California Department of Parks (Including Anza Borrego State Park and Ocotillo Wells).

An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of unusual anthropogenic-based PM_{10} emissions, officially declared as a No Burn Day, related to agricultural burning, waste burning or dust. Two complaints regarding dust were reported to the Air District on May 11, 2018. However, the complaints concerning dust were located in Calexico, the sole monitor that did not exceed. Since the location of the dust source was not upwind of the exceeding monitors, it had no impact on the exceedances at Brawley, El Centro, Niland, and Westmorland.

FIGURE 5-2
PERMITTED SOURCES

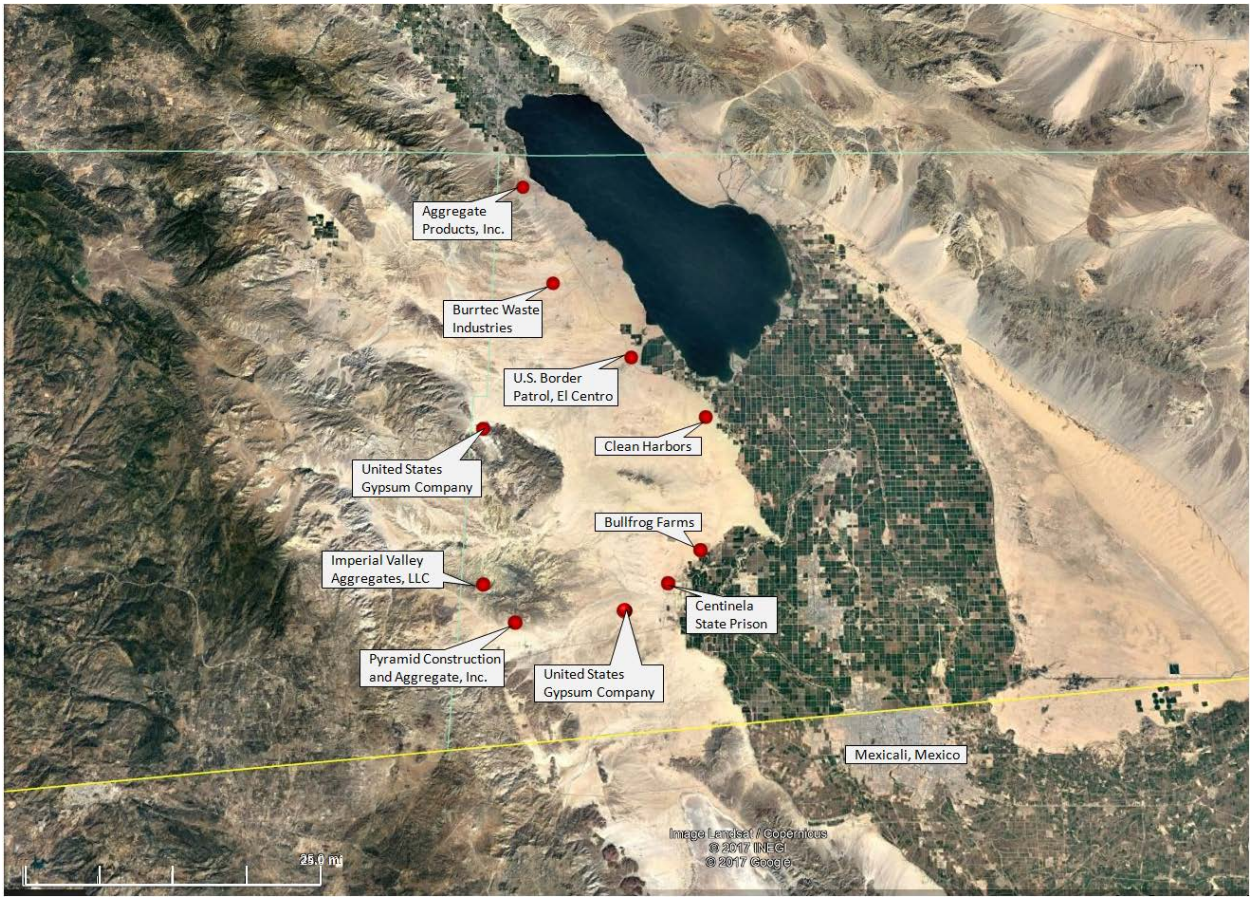


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of the Brawley, El Centro, Niland, and Westmorland monitors. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the United States and Mexico. The green checker-boarded areas are a mixed use of agricultural and community parcels. In addition, either the Bureau of Land Management or the California Department of Parks manages the desert areas. Base map from Google Earth

FIGURE 5-3
NON-PERMITTED SOURCES

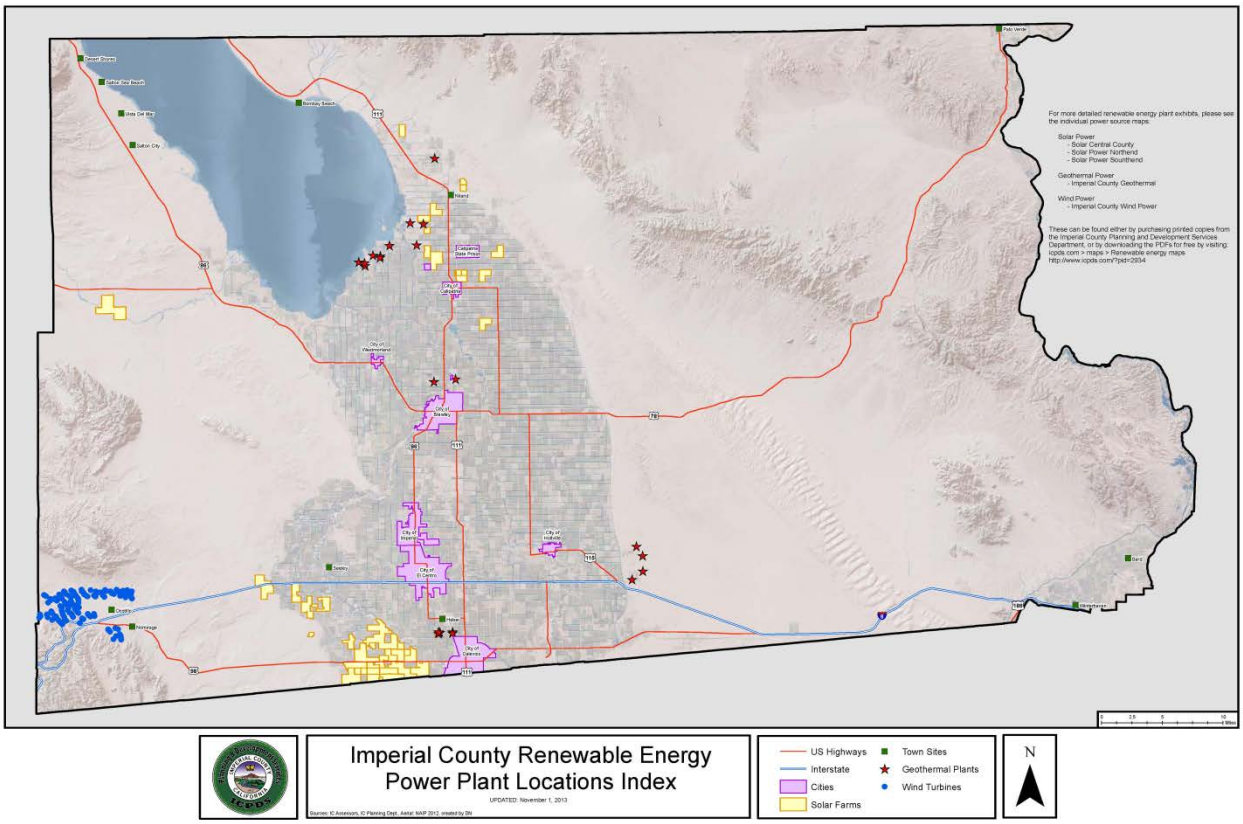


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the Brawley, El Centro, Niland, and Westmorland monitors. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

VI A Natural Event – A demonstration that the event was a human activity that is unlikely to recur at a particular location or was a natural event.

Typically, Pacific weather disturbances during this time of year will bring westerly winds into the region. The strong gusty westerly winds on May 11, 2018 resulted from what the NWS identified as an upper level low-pressure system that strengthened the onshore surface pressure gradient and generated strong gusty westerly winds across the region from southern California into southeastern California then into western Arizona. These strong gusty westerly winds blew through the region and were of a magnitude that prompted the NWS offices in San Diego and Phoenix to issue sixteen (16) separate Urgent Weather Messages. Strong gusty westerly winds blew over and through the San Diego Mountains generating and transporting dust emissions down slopes onto the open natural desert floor west of Imperial County.

In addition to the gusty westerly winds, the weather system brought cooler weather and patchy rain along and within the San Diego County Mountains.[22,23] It is unclear, as of the writing of this demonstration how much precipitation, similarly affected Mexico however, and inference can be made when we look at the areas within the San Diego Mountains that reported at least .01 inches of precipitation (**Table 6-1**). Because Campo is within line sight to the Calexico monitor and based on the HYSPLIT trajectories the Calexico monitor would have benefited from the reduced levels of transported emissions from the San Diego Mountains or in this case that part of the mountains within Mexico (**Figure 6-1**). In any event, the trace precipitation as measured at the El Centro NAF (KNJK), the precipitation amounts within the mountain ranges to the west of Imperial County during the late hours of May 11, 2018 and during the early morning hours of May 12, 2018 were sufficient enough to provide a damping effect upon saltation and deposition of particulates onto the air quality monitors in Imperial County. As such, those monitors located within urbanized areas, as in the case of Calexico and El Centro either measured just below the NAAQS or just above the NAAQS.

[22] National Weather Service, Area Forecast Discussion, May 9, 2018, San Diego office, 917pm PST
[23] National Weather Service, Area Forecast Discussion, May 10, 2018, San Diego office, 149pm PST

TABLE 6-1

PRECIPITATION TOTALS		
LOCATION*	**5/11/2018**	**5/12/2018**
El Centro NAF (KNJK)	T	T
Merdo Acres (KCAJULIA29)	0	0.09
Pine Creek (KCADESCA13)	0	0.03
Pine Tops (Julian) (KCAJULIA53)	0.15	0.33
Campo	0.01	0.01

*KCZZ and KIPL from QCLCD. Palomar Mountain and Desert Air Ranch from Weather Underground. Campo from NWS Quantitative Precipitation Forecast

FIGURE 6-1
PRECIPITATION REDUCES SALTATION AND DEPOSITION

Fig. 6-1: Light moisture in the San Diego County mountains both on May 11, 2018 and May 12, 2018 allowed for reduced saltation and deposition of transported fugitive emissions into Imperial County.

VI.1 Affects Air Quality

The preamble to the revised EER states that an event is considered to have affected air quality if it can be demonstrated that the event affected air quality in such a way that there exists a clear causal relationship between the specific event and the monitored exceedance or violation. Given the information presented in this demonstration, particularly Section III, we can reasonably conclude that there exists a clear causal relationship between the monitored exceedance and the May 11, 2018 event, which changed or affected air quality in Imperial County.

VI.2 Not Reasonably Controllable or Preventable

In order for an event to be defined as an exceptional event under section 50.1(j) of 40 CFR Part 50 an event must be "not reasonably controllable or preventable." The revised preamble explains that the nRCP has two prongs, not reasonably preventable and not reasonably controllable. The nRCP is met for natural events where high wind events entrain dust from desert areas, whose sources are controlled by BACM, where human activity played little or no direct causal role. This demonstration provides evidence that the primary source areas of windblown dust transported into Imperial County came from San Diego where Imperial County has no jurisdiction. In any event, despite BACM in place within Imperial County, high winds overwhelmed all BACM controls where human activity played little to no direct causal role. The PM_{10} exceedance measured at the Brawley, El Centro, Niland, and Westmorland monitors were caused by naturally occurring strong gusty westerly winds that transported windblown dust into Imperial County and other parts of southern California from areas located within the Sonoran Desert regions to the west of Imperial County. These facts provide strong evidence that the PM_{10} exceedance at the Brawley, El Centro, Niland and Westmorland monitors on May 11, 2018, were not reasonably controllable or preventable

VI.3 Natural Event

The revised preamble to the EER clarifies that a "Natural Event" (50.1(k) of 40 CFR Part 50) is an event with its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. Anthropogenic sources that are reasonably controlled are considered not to play a direct role in causing emissions. As discussed within this demonstration, the PM_{10} exceedance that occurred at the Brawley, El Centro, Niland, and Westmorland monitors on May 11, 2018, was caused by the transport of windblown dust into Imperial County by strong westerly winds associated with an upper level low-pressure system that passed through the region. At the time of the event, anthropogenic sources, within Imperial County were reasonably controlled with

BACM. The event therefore qualifies as a natural event.

VI.4 Clear Causal Relationship

The comparative analysis of different meteorological sites to PM_{10} concentrations measured at the Brawley, El Centro, Niland, and Westmorland monitors in Imperial County demonstrates a consistency of elevated gusty westerly winds with elevated concentrations of PM_{10} on May 11, 2018. In addition, temporal analysis indicates that the elevated PM_{10} concentrations and the gusty westerly winds were an event that was widespread, regional and not preventable. Days before the high wind event PM_{10} concentrations were well below the NAAQS. Overall, the demonstration provides evidence of the strong correlation between the natural event and the transported windblown dust to the exceedance on May 11, 2018.

VI.5 Concentration to Concentration Analysis

The historical annual and seasonal 24-hr average PM_{10} measured concentrations at the Brawley, El Centro, Niland, and Westmorland monitors were outside the normal historical concentrations when compared to event and non-event days.

VI.6 Conclusion

The preceding discussion, graphs, figures, and tables provide wind direction, speed and concentration data illustrating the spatial and temporal effects of the strong gusty westerly winds that preceded the upper level low-pressure system as it moved through California. The information provides a clear causal relationship between the entrained windblown dust and the PM_{10} exceedance measured at the Brawley, El Centro, Niland and Westmorland air quality monitors in Imperial County on May 11, 2018.

In particular, the clear causal relationship and not reasonably controllable or preventable sections provide evidence that high gusty westerly winds transported fugitive emissions from open natural Mountain and desert areas, located within San Diego County and Imperial County (all part of the Sonoran Desert). In addition, because anthropogenic sources in upwind areas were reasonably controlled at the time of the event, this event meets the definition of a Natural Event.[24]

[24] Title 40 Code of Federal Regulations part 50: §50.1(k) Natural event means an event and its resulting emissions, which may recur at the same location, in which human activity plays little or no direct causal role. For purposes of the definition of a natural event, anthropogenic sources that are reasonably controlled shall be considered to not play a direct role in causing emissions.