IMPERIAL COUNTY
AIR POLLUTION CONTROL DISTRICT

https://desertlands.org/portfolio-item/yuha-desert/ - Photograph by Julie Vargo

May 15, 2017
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 and Westmorland monitors in Imperial County, California on May 15, 2017

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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. 17
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. 25
4	A demonstration that the event was both not reasonably controllable and not reasonably preventable	Pg. 30
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. 35

[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 May 15, 2017, which elevated particulate matter within San Diego, Riverside, Imperial and Yuma 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. Unfortunately, as of the writing of this documentation, due to ransomware, random archival files were deleted in order to protect the integrity of the network system. May, June and July files have been effectively deleted as infected files.

In any event, both the San Diego and Phoenix NWS offices posted notices of a trough of low pressure moving inland through California Sunday (May 14, 2017) and Monday, (May 15, 12017). If available, **Appendix C** contains copies of notices pertinent to the May 6, 2017 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 May 15, 2017, a naturally occurring event elevated particulate matter within San Diego, Riverside and Imperial Counties, causing an exceedance at the Brawley (06-025-0007) and Westmorland (06-025-4003) monitors. 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 and Niland monitors on May 15, 2017. After review, CARB submitted the INPEE, for the May 15, 2017 event in July of 2017. The submitted request included a brief description of the meteorological conditions for May 15, 2017 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 15, 2017 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 190 µg/m^3 measured by the Brawley monitor and 246 µg/m^3 measured by the Westmorland monitor on May 15, 2017.

(B) Concurrently with the Public Review period for the May 15, 2017 exceptional event, the ICAPCD is formally submitting to CARB for remittance to USEPA the Draft May 15, 2017 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 2017 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

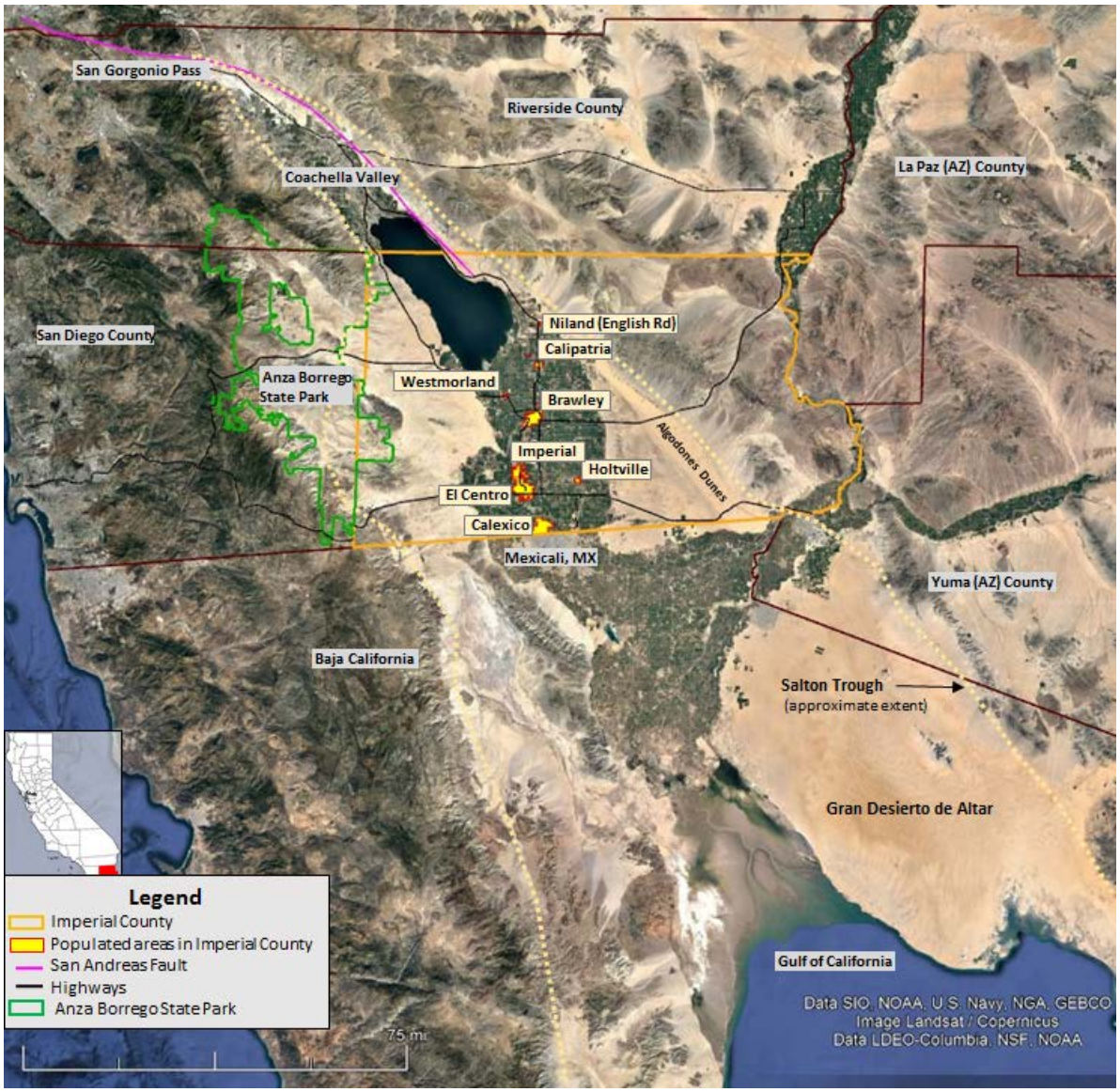


Fig 1-1: Imperial County a Southern California border region, within far southeast California bordering Arizona and Mexico has a small most economically diverse region with a population of 174,528

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 monitor

II.1 Description of the event causing the exceedance

Days before and during Monday, May 15, 2017, the San Diego National Weather Service (NWS) office identified a closed upper level low-pressure over the Pacific Northwest and Southern British Columbia with a secondary trough of low-pressure moving inland through California Sunday, May 14, 2017 and Monday, May 15, 2019. The low-pressure system was forecast to move into central California on Monday, May 15, 2017. By Sunday, reports by the San Diego NWS included gusty southwest winds over the mountains and deserts. In addition, scattered light showers, snow and locally strong and gusty west winds along the desert slopes and passes were forecasted throughout the region for Monday, May 15, 2017. Interestingly enough, the strongest winds were expected for Monday night into Tuesday morning. As a result, the San Diego NWS did not issue an Urgent Weather message for Monday but issued advisories for Tuesday. The evening forecast discussion issued by the San Diego NWS office (902 pm PDT, Monday, May 15, 2017) confirmed the increase in shower activity during the evening hours and as moving east from western San Diego County and Riverside County.

Although the Phoenix NWS office, concurred with the upper level low-pressure trough and its movement inland, the majority of the area forecast discussions only mentioned the impacts to eastern or central Arizona. However, by the early evening hours of Sunday, May 14, 2017, the Phoenix NWS office began to report on the effects of the trough upon Southeast California. As a result of the strong gusty winds reported by the Imperial Airport, the Phoenix NWS office issued an Urgent Weather Message containing a Wind Advisory for Imperial County, effective through Tuesday, May 16, 2017.

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

Both the San Diego and Phoenix evening area forecast discussions properly describe the events of the day on May 15, 2017. To start, the San Diego NWS office confirmed that the "NWS radar [showed] an increase in shower activity this evening off the San Diego County Coast, moving east" and with "[a] closed low…centered near Death Valley this evening, with a trailing wave swinging cyclonically south and then SE overnight" unstable conditions would allow a "threat of scattered, mostly light showers into Tuesday morning."[4] This was followed by the Phoenix NWS office discussion indicating that

[4] National Weather Service, Area Forecast Discussion, San Diego Office, 902pm PDT

reports already had been confirmed of "…strong gusty southwest winds across the deserts this afternoon and evening – especially in the Imperial Valley – reflecting the tightening of the low/mid level gradients ahead of the trof…"[5] As such, windblown dust emissions, carried into Imperial County, from as far as the San Diego County Mountains affected air quality in Imperial County causing an exceedance of the NAQQS at the Brawley and Westmorland monitors (**Table 2-1**). The weather system, a regional event, provided sufficient moisture from isolated showers and snow that assisted in maintaining lower levels of transported windblown dust, explaining why an exceedance was not measured at all the air quality monitors in Imperial County.

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

[5] National Weather Service, Area Forecast Discussion, Phoenix Office, 840pm MST

TABLE 2-1
HOURLY CONCENTRATIONS OF PARTICULATE MATTER

		000	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	1700	1800	1900	2000	2100	2200	2300	Hrly MAX	24-HR AVERAGE
PALM SPRINGS FIRE STATION	20170514	27	28	25	24	26	29	28	28	31	30	29	25	19	42	35	34	24	24	23	20	23	30	28	25	42	27
	20170515	20	20	19	18	18	17	22	18	18	17	22	21	28	23	26	26	28	26	26	27	19	18	19	17	**28**	21
	20170516	17	12	13	17	16	20	20	23	27	25	28	32	31	40	37	37	31	27	24	24	22	25	24	27	40	25
INDIO	20170514	91	55	32	25	26	22	25	31	21	20	17	12	17	12	20	21	26	30	21	34	25	31	36	34	91	29
	20170515	25	22	31	32	28	32	33	28	24	16	18	16	21	32	57	25	97	43	42	51	34	35	33	23	**97**	33
	20170516	24	23	18	18	20	25	33	40	31	24	23	24	26	30	34	79	119	94	53	49	39	35	25	27	119	38
MECCA	20170514	41	34	27	29	23	31	28	27	25	20	26	17	13	7	9	9	32	29	85	51	94	29	126	298	298	46
	20170515	206	59	29	37	78	150	67	87	28	28	20	15	25	100	39	25	112	165	54	381	153	43	49	48	**381**	83
	20170516	55	37	22	14	22	29	46	50	41	29	43	33	43	28	29	50	79	63	63	85	54	32	49	26	85	43
TORRES-MARTINEZ TRIBAL	20170514	27	39	31	29	28	28	29	31	38	30	38	30	15	15	20	9	636	318	38	44	67	33	89	109	636	74
	20170515	60	58	89	50	32	113	92	46	58	229	106	20	96	77	53	60	35	55	29	76	73	37	53	43	**229**	68
	20170516	32	38	27	18	23	54	34	23	31	29	38	35	33	189	45	46	141	331	105	52	54	44	33	34	331	62
WESTMORLAND	20170514	23	20	29	21	20	53	64	23	25	9	6	24	10	10	17	21	54	136	681	412	34	30	43	167	681	80
	20170515	134	76	71	62	84	53	79	103	75	130		117	138	348	74	492	656	995	866	574	232	147	133	22	**995**	246
	20170516	16	22	12	20	16	37	25	19	24	15	12	13	37	92	82	72	52	25	22	24	25	18	18	26	92	30
BRAWLEY	20170514	14	23	22	14	17	19	21	14	11	10	10	17	17	10	17	13	30	123	314	599	382	57	69	441	599	94
	20170515	136	95	38	66	162	224	155	98	113	90	129	50		171	218	278	479	665	569	307	223	85	21	12	**665**	190
	20170516	14	13	9	14	13	21	24	29	23	15	11	16	18	21	32	55	39	27	29	27	31	20	19	20	55	22
NILAND	20170514	25	24	23	33	29	23	21	27	22	19	16	19	13	17	8	28	36	38	48	47	61	29	22	23	61	27
	20170515	21	32	31	32	46	84	67	37		118	60	39	58	50	112	117	101	196	182	206	92	61	34	20	**206**	78
	20170516	23	19	17	21	16	49	48	18	21	13	14	16	19	12	48	44	121	55	53	34	30	22	23	17	121	31
EL CENTRO	20170514	22	23	21	20	15	18	14	14	26	41	26	22	19	11	10	19	24	34	67	82	29	26	25	30	82	26
	20170515	45	44	21	32	27	38	37	57	62	37	23	33	39	49	37	30	57	71	39	28	24	21	23	19	**71**	37
	20170516	15	10	15	16	5	19	11	10	9	10		12	14	20	22	23	17	19	17	14	22	17	17	16	23	15
CALEXICO	20170514	29	28	19	24	19	23	32	53	68	49	35	29	17	25	20	11	46	46	41	39	39	38	35	37	68	33
	20170515	41	54	45	51	40	28	44	40	30	23	41	23	64	110	97	70	73	117	68	44	20	28	20	20	**117**	49
	20170516	9	9	17	13	10	10	10	13	13	13	14	12	23	22	23	35	37	35	22	32	26	24	26	20	37	19
YUMA SUPERSITE (PST)	20170514	30	28	27	34	28	28	20	24	19	18	24	23	27	20	27	18	38	38	28	28	23	33	24	68	68	28
	20170515	81	73	128	140	84	55	59	75	112	138	97	63	33	31	52	111	101	110	153	108	56	53	38	24	**153**	82
	20170516	30	25	19	14	19	23	19	17	22	19	18	20	22	30	35	27	27	29	36	44	41	24	22	18	44	25
YUMA SUPERSITE (MST)	20170514	44	30	28	27	34	28	28	20	24	19	18	24	23	27	20	27	18	38	38	28	28	23	33	24	44	27
	20170515	68	81	73	128	140	84	55	59	75	112	138	97	63	33	31	52	111	101	110	153	108	56	53	38	**153**	84
	20170516	24	30	25	19	14	19	23	19	17	22	19	18	20	22	30	35	27	27	29	36	44	41	24	22	44	25

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

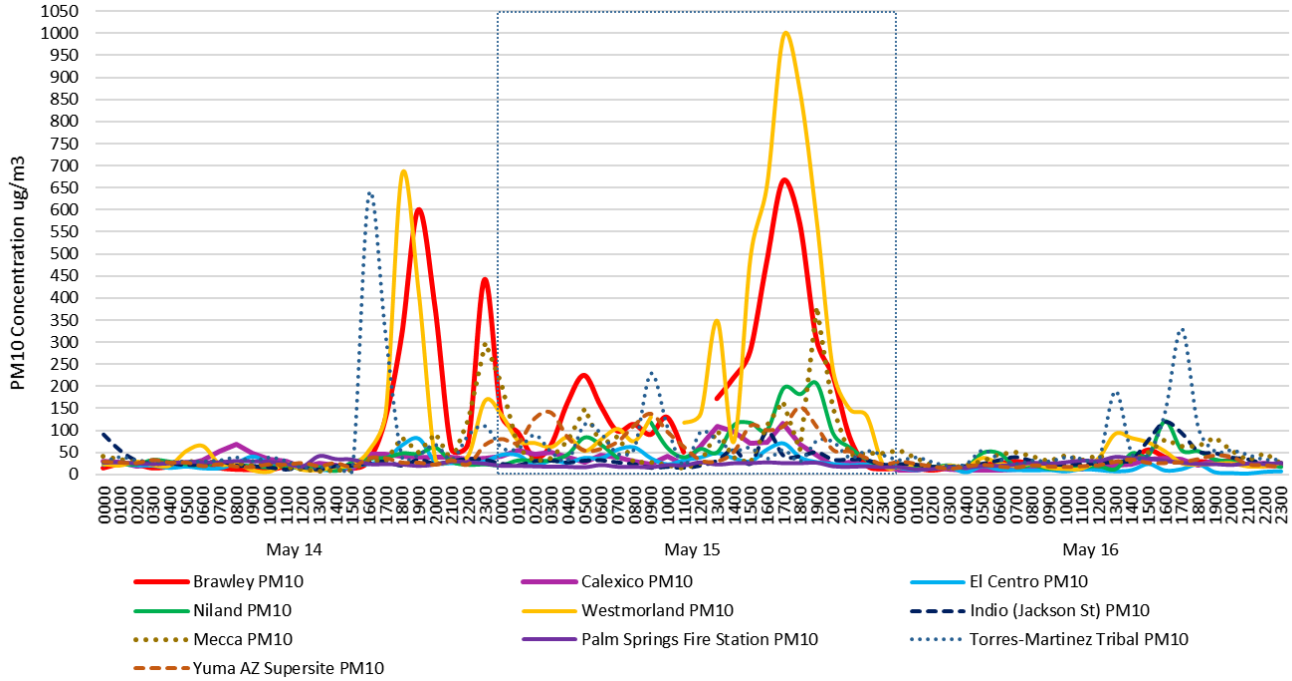


Fig 2-2: is a three-day graphical representation of the PM_{10} concentrations measured at the sites identified in **Table 2-1**

Wind speed, wind direction, moisture content and the airflow patterns combined all help explain how windblown emissions resulting from the gusty southwest to west winds associated with the passing of the low-pressure system affected the Brawley and Westmorland monitors on Monday, May 15, 2017.

As mentioned above, precipitation or moisture within the San Diego Mountains and mountains located to the northwest of Imperial County kept transported windblown dust at a reduced level allowing less affect upon monitors located further north or further south.

Figures 2-3 and 2-4 depict the compiled wind data for regional and neighboring airports and upstream sites. Airports within Imperial, Riverside and Yuma Counties measured wind speeds at or above 25 mph or measured wind gusts at or above 25 mph. Sites to the southwest and west of Imperial County measured elevated wind speeds sooner than sites within the Imperial County, coincident with measured elevated concentrations.

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

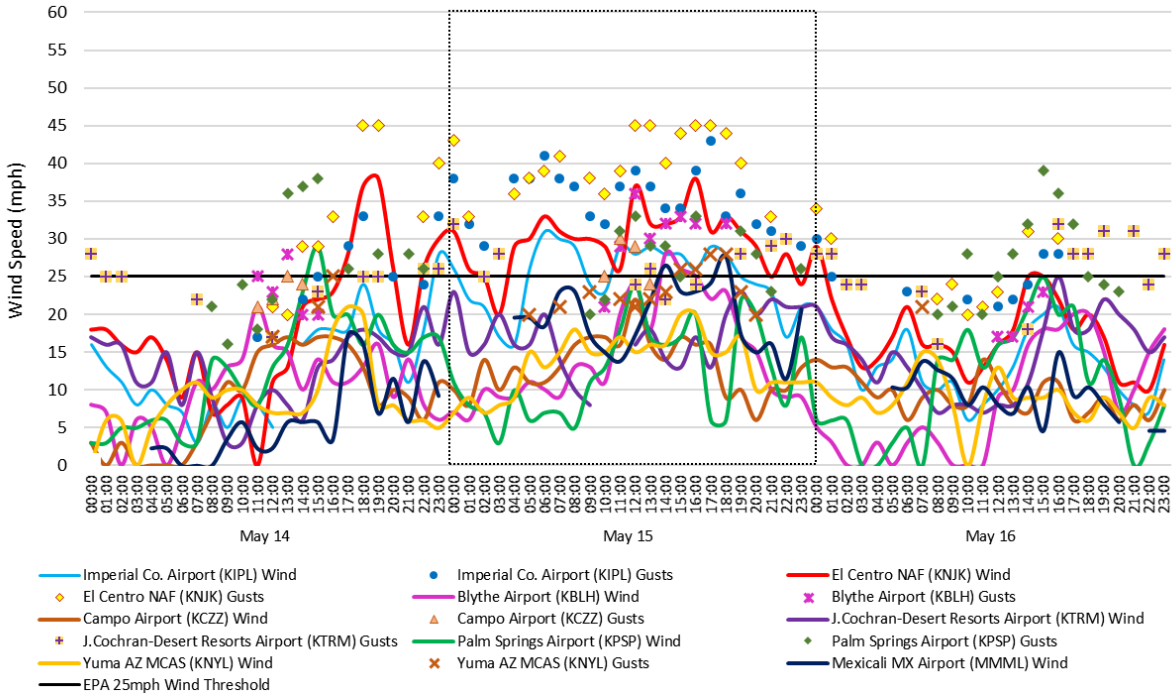


Fig 2-3: is a three-day graphical representation of the measured wind speed and wind gust (if available) from local and neighboring airports upstream of Imperial County. All data derived from the Local Climatological Data Hourly Observations (LCDHO) reports released by the NOAA https://www.ncdc.noaa.gov/

FIGURE 2-4
WIND SPEEDS AND GUST UPSTREAM SITES

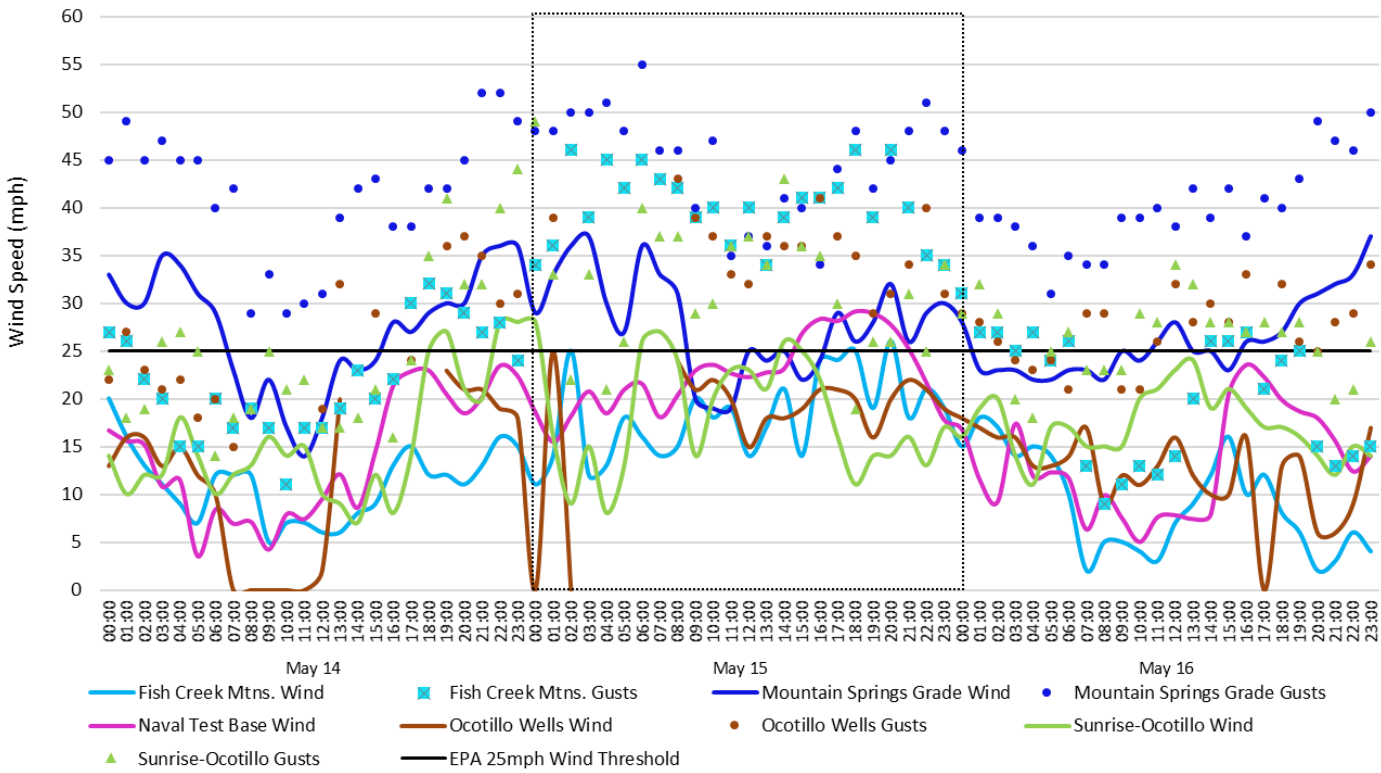


Fig 2-4: is a three-day graphical representation of the measured wind speed and wind gust (if available) from sites located upstream from the Brawley and Westmorland monitors. All data derived from the University of Utah's Meso West https://mesowest.utah.edu/index.html

The National Oceanic and Atmospheric Administration (NOAA) Laboratory HYSPLIT back-trajectory models[6] provide supporting evidence of the westerly airflow within Imperial County on May 15, 2017.

The HYSPLIT back-trajectory model in **Figure 2-5** represents a 6-hour back-trajectory ending at 0500 PST, coincident with measured concentration over 100 µg/m^3 at more than one air monitor. Note, airflow at northern monitors have a southwest to northwest flow while southern monitors have a southwest flow. The low level of particulate concentration during the early morning hours is consistent with the moisture, albeit scattered, left by showers and snow that began to fall within the mountains within San Diego and Riverside. As the trough continued to move into Southern California,

[6] 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. Used, currently, 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.

precipitation along these mountain ranges would have minimized the levels of transported windblown.

FIGURE 2-5
HYSPLIT MODEL All SITES MAY 15, 2017 ENDING 0500 PST

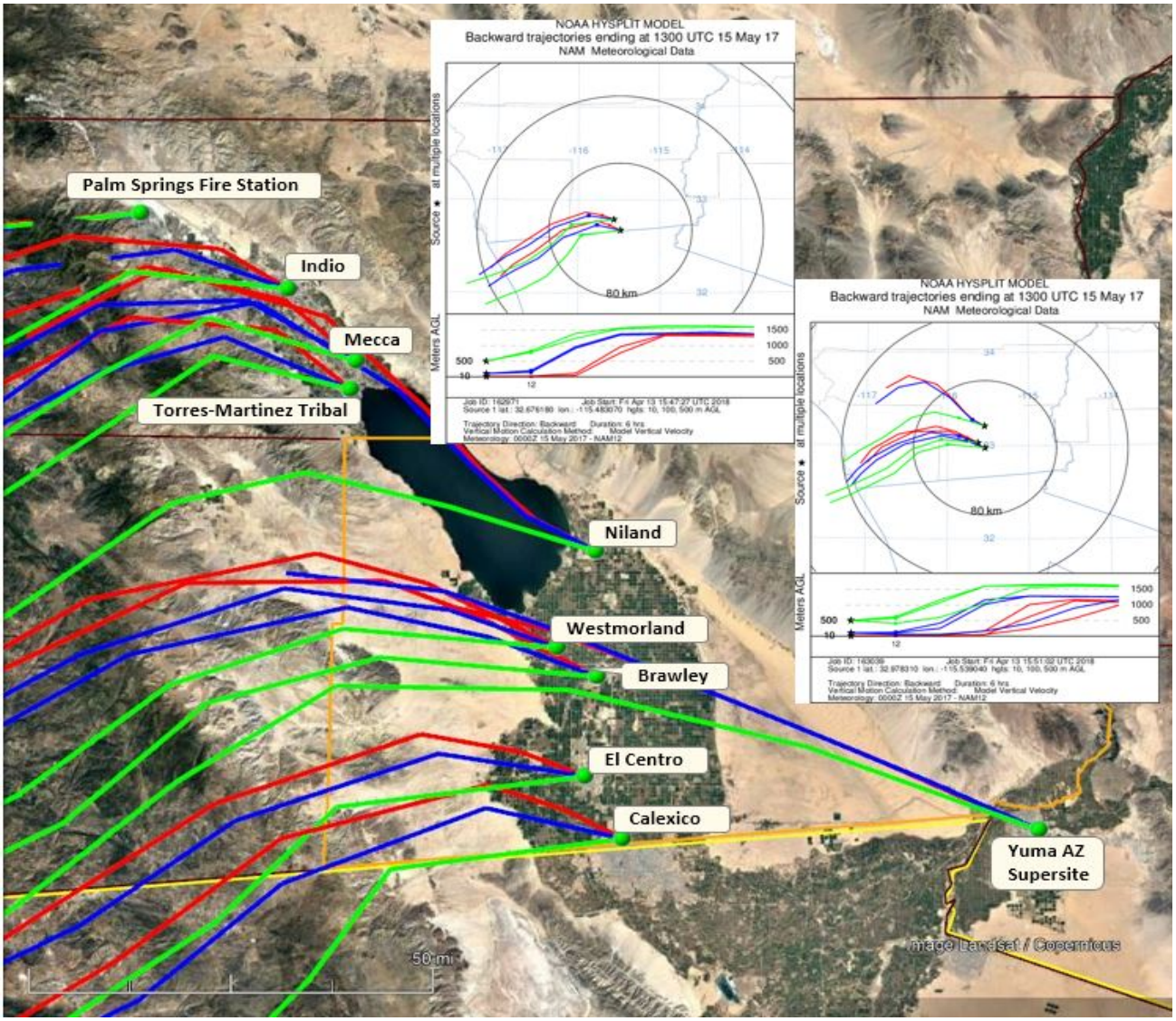


Fig 2-5: A 6-hour back-trajectory ending at 0500 PST for all sites identified in **Table 2-1**. The 0500 PST hour reflects an early elevated hourly concentration hour for Mecca, Torres-Martinez Tribal and Brawley. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates 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 depicts a 12-hour back-trajectory ending at 1700 PST generally during peak hourly concentrations at most monitors. Airflow is now much more pronounced with a southwesterly flow. By this hour, the trough has moved considerably eastward pushing stronger winds into the area. Unlike the Brawley and Westmorland monitors, the airflow

at the Niland monitor is over the Salton Sea, where saltation would be minimized allowing for less deposition of particulates onto the monitor. Both the El Centro and Calexico monitors are located further south and surround by urbanized obstructions.

FIGURE 2-6
HYSPLIT MODEL ALL SITES MAY 15, 2017 ENDING 1700 PST

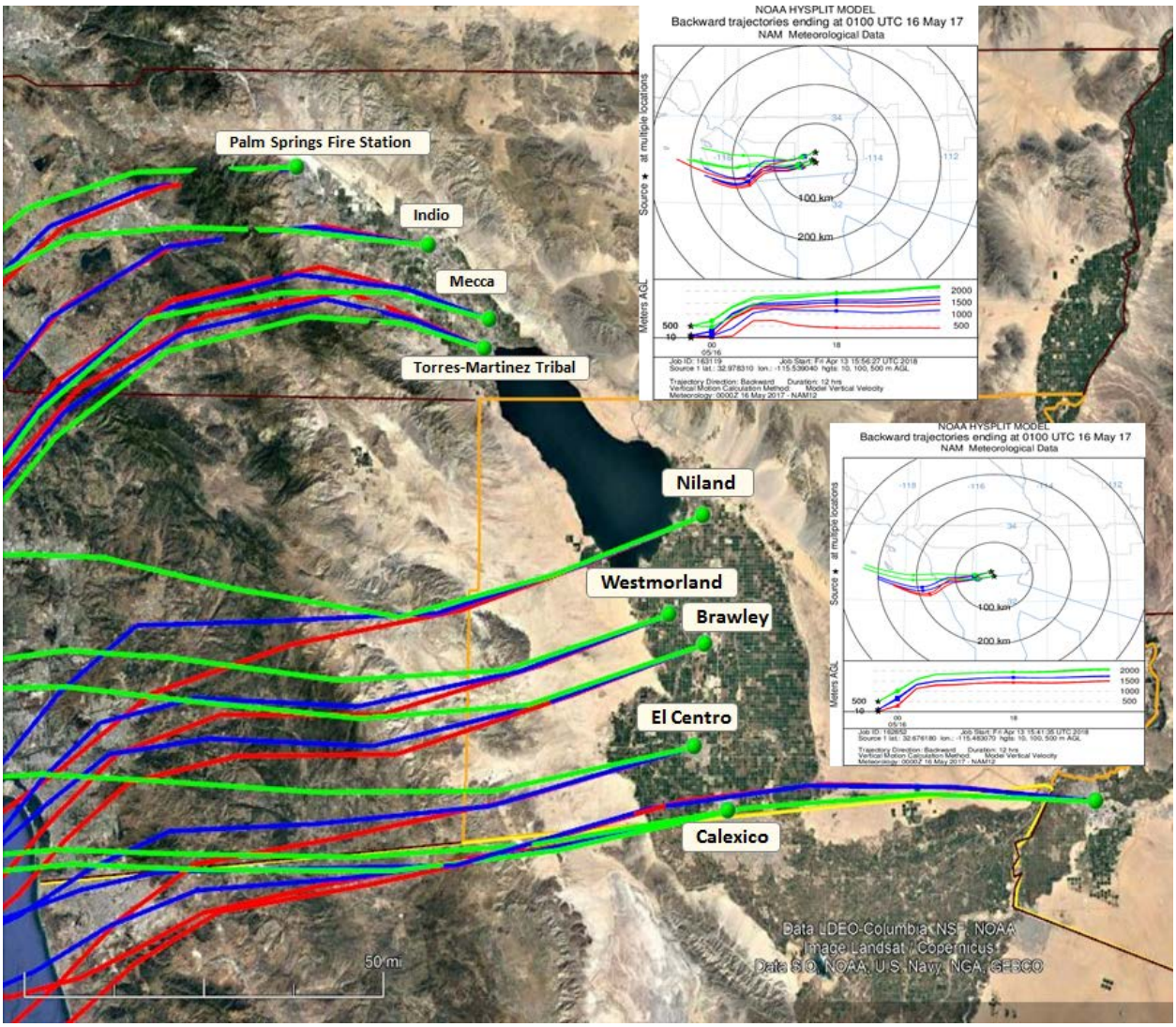


Fig 2-6: A 12-hour back-trajectory ending at 1700 PST for all sites. The shift in airflow is coincident with measured elevated wind speeds. Red trajectory indicates airflow at 10 meters AGL (above ground level); blue indicates airflow at 100m; green indicates airflow at 500m. Yellow line indicates the international border. Dynamically generated through NOAA's Air Resources Laboratory HYSPLIT model. Base map from Google Earth

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, windblown dust emissions, carried into Imperial County, from as far as the San Diego County Mountains affected air quality in Imperial County causing an exceedance of the NAQQS at the Brawley and Westmorland monitors (**Table 2-1**).

While elevated wind speeds and gust play a significant and important role in the transportation of dust, the deposition of particulates onto a monitor and the overall affect onto ambient air is similarly affected by the amount of moisture within outlaying areas.[7] As mentioned above, the weather system of May 15, 2019 was a regional event affecting San Diego, Riverside and Yuma counties over a period of three days. The earliest indications, Saturday, May 13, 2017 identified a closed upper level low-pressure system and a secondary trough of low-pressure. While the closed upper level low-pressure system was forecast to remain over the Pacific Northwest, a secondary trough of low-pressure was forecast to move inland through California by Sunday, May 14, 2017 and Monday, May 15, 2017.[8] The deepening of the secondary trough along the west coast was expected through Monday allowing for a cooling pattern over southern California, some light rain showers, and a strong onshore flow causing gusty winds over the mountains and deserts, with some areas of blowing dust for Monday, May 15, 2017.

These two distinct systems were forcing an enhanced subtropical jet and upper level moisture into the southwest.[9] This allowed surface pressure gradients to continue accelerating onshore creating gusty westerly winds over the mountains and deserts.[10] As the trough continued moving inland, a continued deep marine layer, mostly cloudy skies, scattered light showers, cooler conditions, snow at higher elevations and locally strong and gusty west winds existed within the Pacific southwest.[11] While the San Diego office began issuing Urgent Weather Messages for Tuesday, the Phoenix office issued a Wind Advisory for Imperial County when westerly gusty winds above 25 mph were reported on Monday, May 15, 2017.[12] By the evening hours, an increase in shower activity was noted by the San Diego office just off the San Diego County coast moving east. Sufficient moisture from isolated showers and snow, within the Riverside and San Diego County Mountains, kept transported windblown dust at a reduced level, throughout the day on

[7] 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
[8] National Weather Service, Area Forecast Discussion, San Diego Office, 0342am PDT, May 13, 2017
[9] National Weather Service, Area Forecast Discussion, Phoenix Office, 0840am MST, May 14, 2017
[10] National Weather Service, Area Forecast Discussion, San Diego Office, 128pm PDT, May 14, 2017
[11] National Weather Service, Area Forecast Discussion, San Diego Office, 122pm, May 15, 2017
[12] National Weather Service, Urgent Weather Message, Phoenix Office, 635pm MST, May 15, 2017

May 15, 2017 allowing less deposition upon air quality monitors located further north or further south within Imperial County.

Figure 3-1 below provides an illustration of some of the meteorological conditions, as described above for May 15, 2017, which affected air quality in Imperial County causing an exceedance at the Brawley and Westmorland monitors. It is worth mentioning again, that the low level of particulate concentration during the early morning hours is consistent with the moisture, from scattered showers and snow as reported within the mountains in San Diego and Riverside. As the trough continued to move into Southern California, precipitation allowed lower levels of transported windblown to be transported into Imperial County.

FIGURE 3-1
VISUAL RAMP-UP ANALYSIS AS DISCUSSED FOR MAY 15, 2017

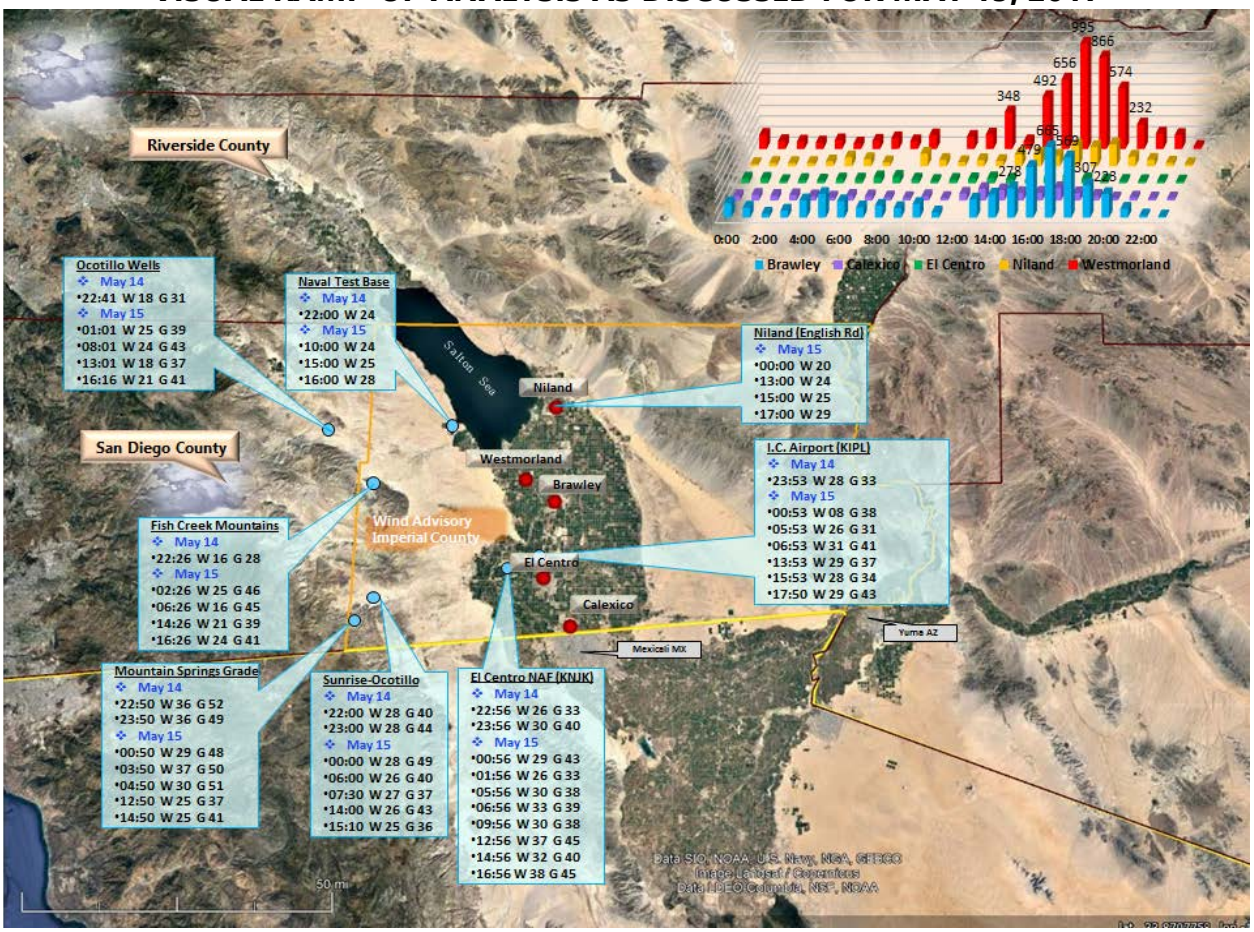


Fig 3-1: Gusty elevated winds at upstream sites transported dust into Imperial County from as far as the San Diego County Mountains. The Brawley and Westmorland had unobstructed paths of transported windblown dust from the mountains and the open natural desert areas. Air quality data is from the EPA's AQS data bank. The 12-hour HYSPLIT back-trajectory ends at 1700 PST. Red trajectory depicts airflow at the 10m level; blue is 100m. Generated through NOAA's Air Resources Laboratory. Google Earth base map

An indicator of the affect 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.[13]

The El Centro Naval Air Facility (KNJK) reported reduced visibility coincident with elevated wind speeds, wind gusts and hourly concentrations of particulates. KNJK reported blowing dust coincident with the highest measured concentrations at the Brawley and Westmorland monitors (1600 through 2000). **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 and Westmorland monitors. Together, the data provides the supporting relationship between the elevated winds, blowing dust and reduced visibility.

[13] 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 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

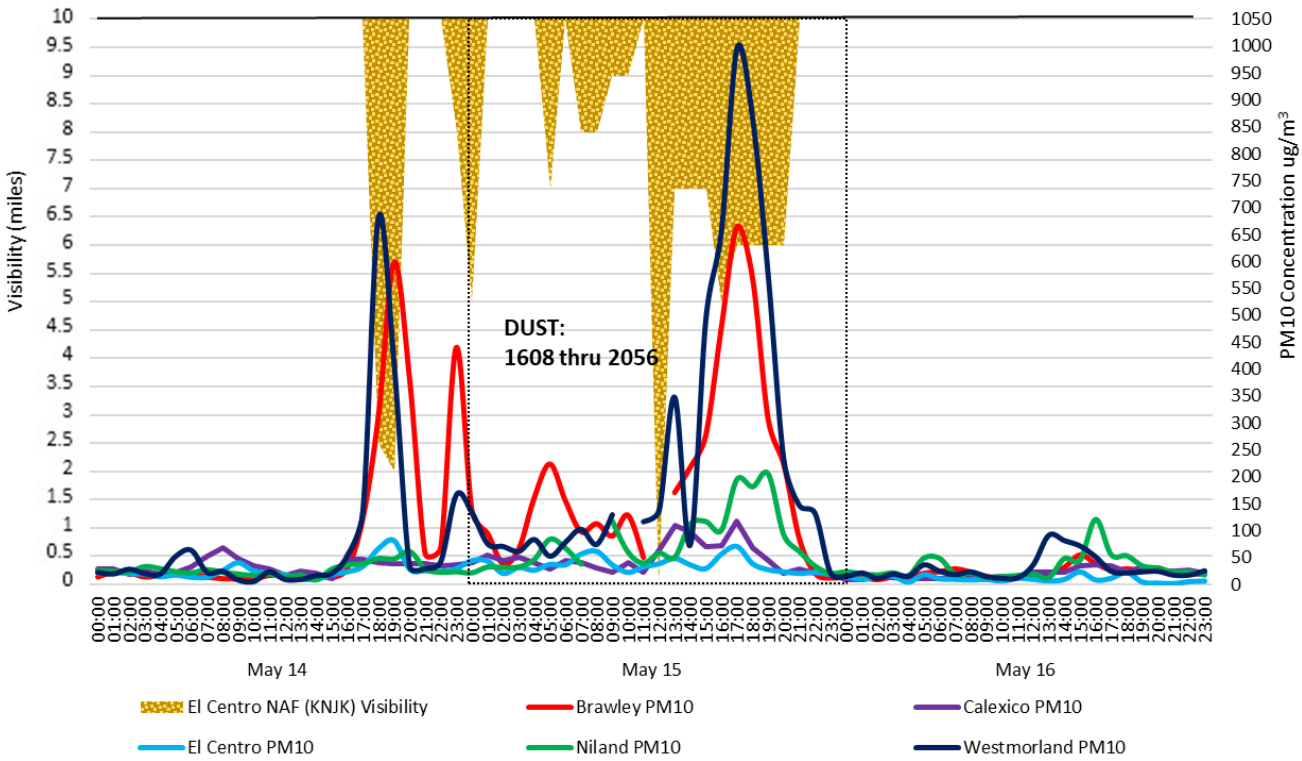


Fig 3-2: is a graphical representation of the compiled data from the El Centro NAF (KNJK). Reported reduced visibility is coincident with elevated winds and hourly levels of concentrations either just prior to peak concentrations or after. Visibility data from the NCEI's QCLCD data bank

Because the EPA accepts a high wind threshold for sustained winds of 25 mph in California and 12 other states[14] the **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 the Brawley and Westmorland monitors.

[14] "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 FOR BRAWLEY AND WESTMORLAND ON MAY 15, 2017

MOUNTAIN SPRINGS GRADE (TNSC1)				FISH CREEK MTNS. (FHCC1)				OCOTILLO WELLS (AS938)				EL CENTRO NAF (KNJK)					IMPERIAL COUNTY AIRPORT (KIPL)				BRAWLEY ($\mu g/m^3$)	WESTMORLAND ($\mu g/m^3$)
HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	HR	W/S	W/G	W/D	Obs.	HR	W/S	W/G	W/D	HR	PM_{10}	PM_{10}
0:50	29	48	219	0:26	11	34	228	0:01				0:53	31	43	270		0:53	26	38	270	0:00	136	134
1:50	33	48	214	1:26	14	36	226	1:01	25	39	320	1:56	26	33	260		1:53	22	32	270	1:00	95	76
2:50	36	50	207	2:26	25	46	251	2:01				2:56	25		280		2:53	21	29	280	2:00	38	71
3:50	37	50	208	3:26	12	39	239	3:01				3:56	20		280		3:53	17		280	3:00	66	62
4:50	30	51	218	4:26	13	45	274	4:01				4:56	29	36	290		4:53	16	38	290	4:00	162	84
5:50	27	48	213	5:26	18	42	238	5:01				5:56	30	38	270		5:53	26	38	270	5:00	224	53
6:50	36	55	212	6:26	16	45	264	6:01				6:56	33	39	270		6:53	31	41	280	6:00	155	79
7:50	33	46	219	7:26	14	43	251	7:01				7:56	31	41	270		7:53	30	38	270	7:00	98	103
8:50	31	46	214	8:26	15	42	267	8:01	24	43	354	8:56	30		270		8:53	29	37	280	8:00	113	75
9:50	20	40	230	9:26	20	39	270	9:26	21	39	319	9:56	30	38	260		9:53	24	33	280	9:00	90	130
10:50	19	47	235	10:26	18	40	265	10:01	22	37	334	10:56	29	36	270		10:53	23	32	280	10:00	129	
11:50	19	35	230	11:26	19	36	261	11:06	20	33	4	11:56	26	39	250		11:53	29	37	260	11:00	50	117
12:50	25	37	250	12:26	14	40	273	12:01	15	32	313	12:59	37	45	260		12:53	28	39	260	12:00		138
13:50	24	36	241	13:26	17	34	245	13:01	18	37	331	13:07	32	45	260		13:53	29	37	260	13:00	171	348
14:50	25	41	231	14:26	21	39	259	14:01	18	36	355	14:56	32	40	250		14:53	28	34	250	14:00	218	74
15:50	22	40	236	15:26	14	41	247	15:01	19	36	347	15:56	33	44	260		15:53	28	34	270	15:00	278	492
16:50	24	34	220	16:26	24	41	251	16:16	21	41	282	16:01	38	45	260	DU	16:53	26	39	270	16:00	479	656
17:50	29	44	220	17:26	24	42	255	17:05	21	37	343	17:56	31	45	260	DU	17:53	29	43	260	17:00	665	995
18:50	26	48	222	18:26	25	46	248	18:01	20	35	326	18:56	33	44	260	DU	18:53	28	33	260	18:00	569	866
19:50	28	42	225	19:26	19	39	251	19:01	16	29	319	19:56	31	40	260	DU	19:53	25	36	260	19:00	307	574
20:50	32	45	219	20:26	26	46	251	20:01	20	31	312	20:56	29		260	DU	20:53	24	32	260	20:00	223	232
21:50	26	48	217	21:26	18	40	245	21:01	22	34	348	21:56	25	33	260		21:53	23	31	270	21:00	85	147
22:50	29	51	213	22:26	21	35	247	22:01	21	40	306	22:56	28		260		22:53	17		270	22:00	21	133
23:50	30	48	207	23:26	19	34	245	23:11	19	31	305	23:56	24		260		23:53	21	29	260	23:00	12	22

Wind data for KIPL and KNJK from the NCEI's QCLCD system. Wind data for TNSC1 and FHCC1 from the University Utah's MesoWest system. Wind speeds = mph; Direction = degrees. BLDU = blowing dust. DU = widespread dust. 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 an Urgent Weather Message was issued by the Phoenix office in response to reported gusty westerly winds in Imperial County. As the low-pressure moved into the area and the pressure gradient strengthened, the gusty westerly winds affected both the Brawley and Westmorland air monitors causing an exceedance of the NAAQS (**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.[15] As transported windblown dust entered Imperial County, air quality within the Brawley and Westmorland areas degraded. As gusty westerly winds continued through the day, the level of the AQI in Brawley reached a hazardous level by 800 pm PST. Overall, the gusty westerly winds associated with the weather disturbance affected air quality in Imperial County.

FIGURE 3-3
IMPERIAL VALLEY AIR QUALITY INDEX FOR BRAWLEY
MAY 15, 2017

Fig 3-3: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate to a "Maroon" or Hazardous level

[15] 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 WESTMORLAND
MAY 15, 2017

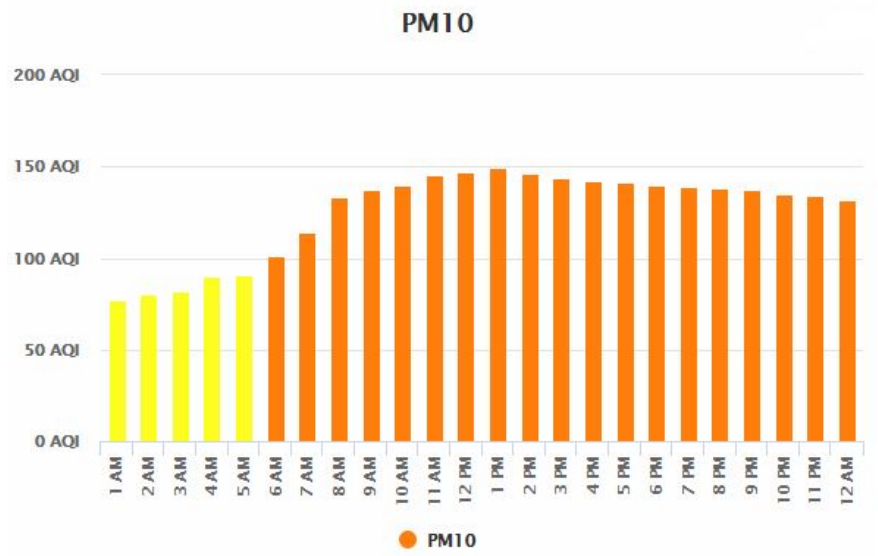


Fig 3-4: The degradation, or affect upon air quality, maybe determined when the AQI changes from a "Yellow" or Moderate level to an "Orange" or Unhealthy for Sensitive Groups level

III.1 Summary of Forecasts and Warnings

Both the San Diego and Phoenix NWS offices issued several Area Forecast Discussions describing the two distinct weather systems that affected Imperial County on Monday, May 15, 2017. The notices described gusty westerly winds, scattered showers, snow and strong gusty westerly winds within the regions of San Diego, Riverside and Imperial counties. While the Phoenix NWS office took longer to concur with the effects upon Imperial County, the Phoenix NWS office did issue an Urgent Weather Message advising the public of winds 25 to 35 mph with gusts up to 45 mph during the late afternoon hours of Monday, May 15, 2017. The weather system was a regional event, with snow levels maintained at higher elevations and light scattered showers on Sunday, May 14, 2017 during the evening hours along the San Diego Mountains which continued through Tuesday morning. The San Diego NWS office issued precipitations reports where Imperial County is listed has measuring trace (T) amounts of moisture.[16]

[16] National Weather Service, Southwestern California Temperature and Precipitation Summary, San Diego Office, 430pm PDT, May 15, 2017

III.2 Summary of Wind Observations

As demonstrated above wind data during the event were available from airports in Imperial County as well as from other automated meteorological instruments upstream from the Brawley and Westmorland monitors. Data analysis indicates that on May 15, 2017 different sites measured wind speeds at or in far 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 4-4 show the time series of available FRM and BAM 24-hr PM_{10} concentrations at the Brawley and Westmorland monitors for the period of January 1, 2010 through May 15, 2017. 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).[17] 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 15, 2017, as measured by the Brawley and Westmorland monitors, were used to establish the historical and seasonal variability over time.[18] All figures illustrate that the exceedance, which occurred on May 15, 2017, were 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.

[17] 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, 760 torr and 25 C). 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.

[18] 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 15, 2017

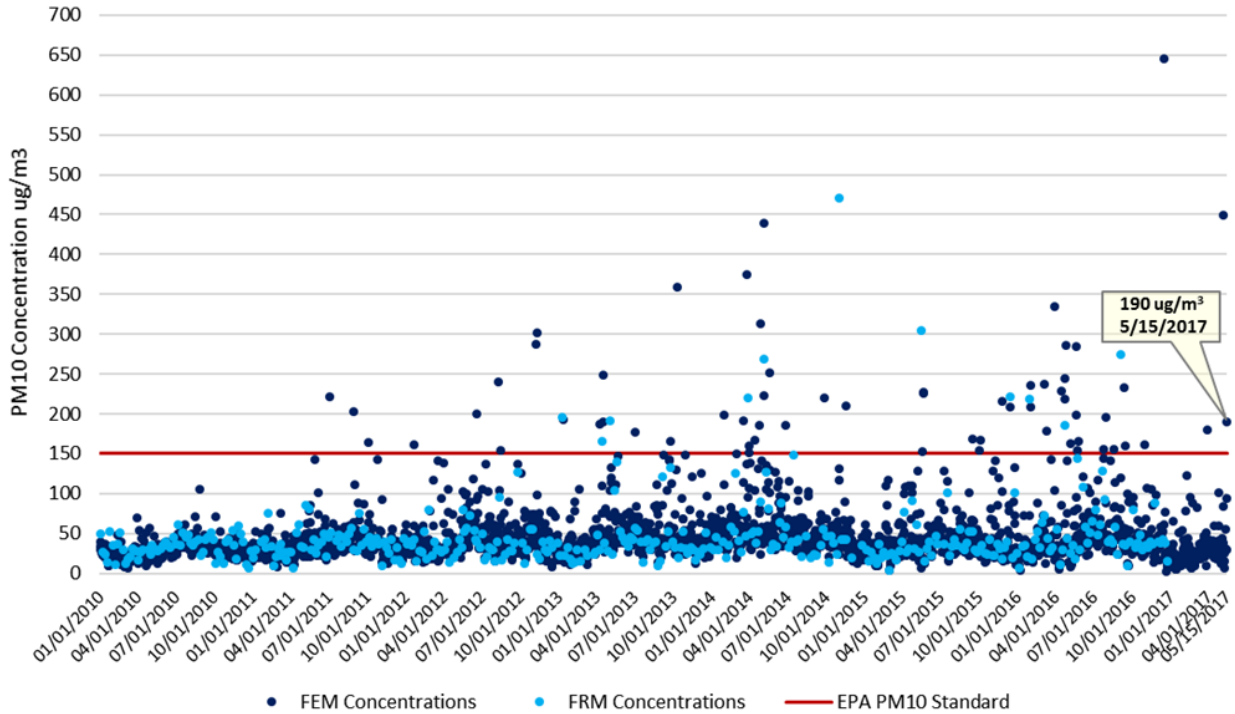


Fig 4-1: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 190 µg/m^3 on May 15, 2017 by the Brawley monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-1,** for Brawley included 2,692 sampling days (January 1, 2010 through May 15, 2017). Of the 2,692 sampling days the Brawley monitor measured 62 exceedance days which translates into an occurrence rate less than 2.5%. Historically, there were twelve (12) exceedance days measured during the first quarter, twenty-six (26) exceedance days measured during the second quarter, thirteen (13) exceedance days measured during the third quarter; and eleven (11) exceedance days measured during the fourth quarter.

FIGURE 4-2
WESTMORLAND HISTORICAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
JANUARY 1, 2010 TO MAY 15, 2017

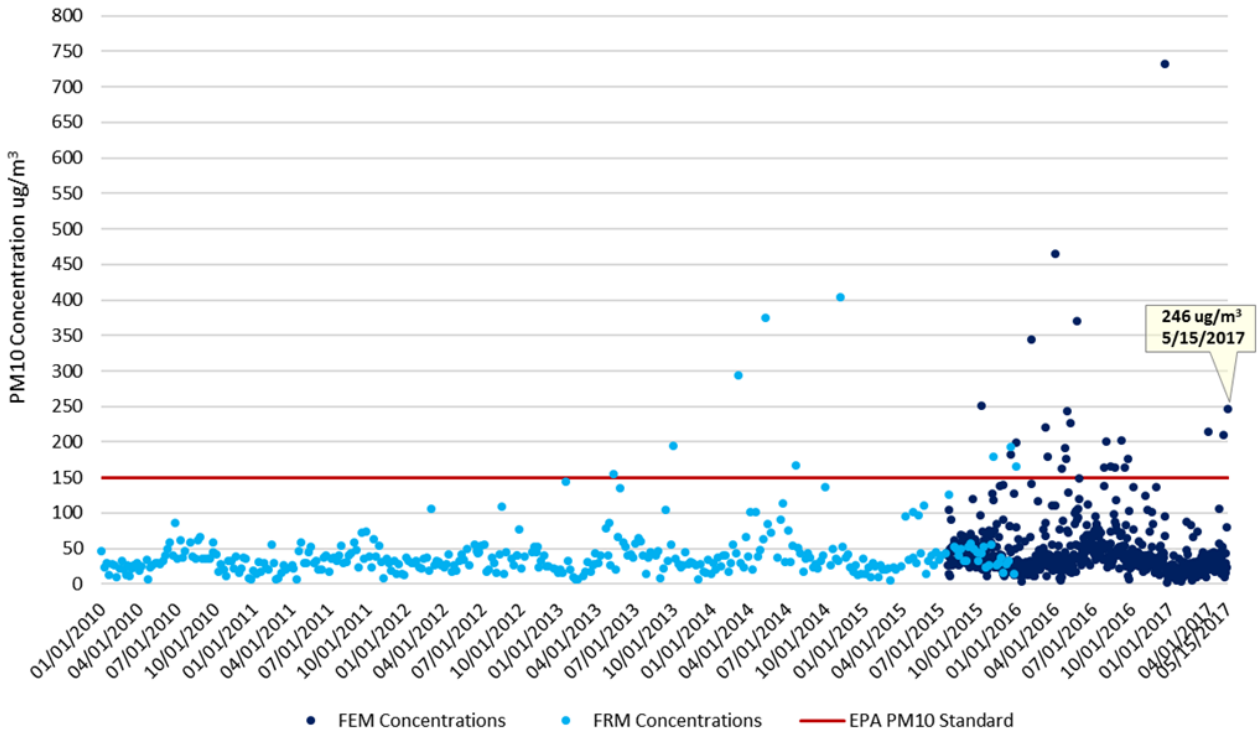
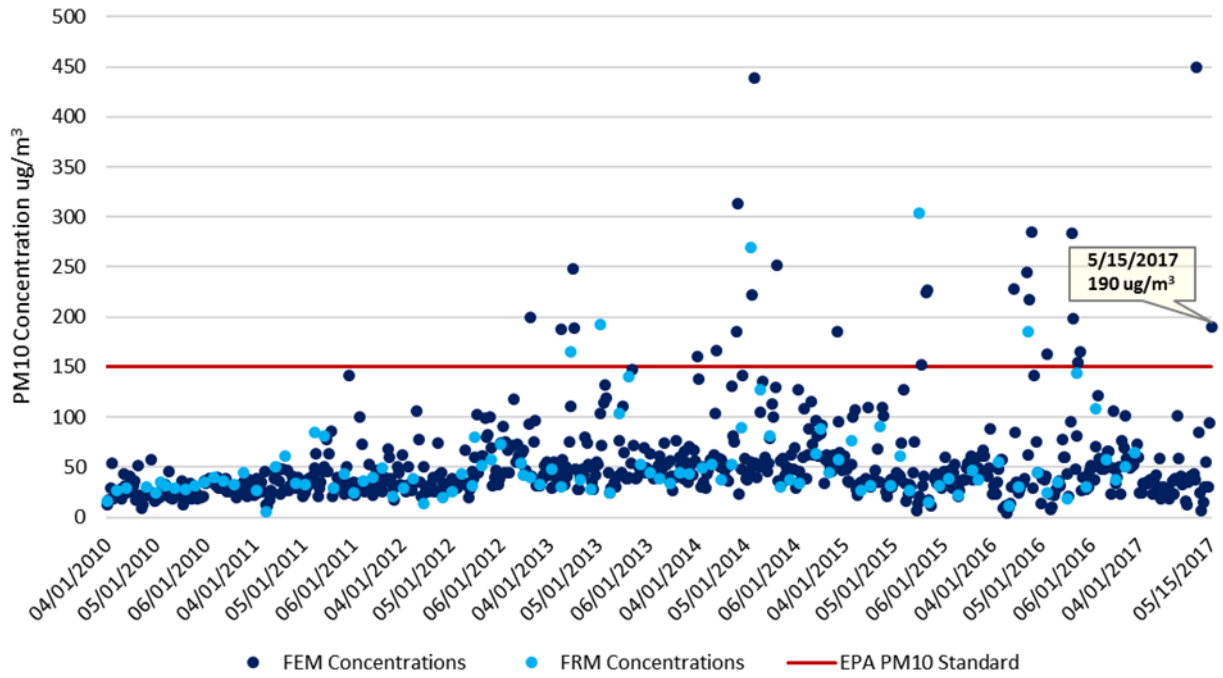


Fig 4-2: A comparison of PM_{10} historical concentrations demonstrates that the measured concentration of 246 µg/m^3 on May 15, 2017 by the Westmorland monitor was outside the normal historical concentrations when compared to similar event days and non-event days

The time series, **Figure 4-2,** for Westmorland included 1,020 sampling days (January 1, 2010 through May 15, 2017). Of the 1,020 sampling days the Westmorland monitor measured 31 exceedance days which translates into an occurrence rate less than 3%. Historically, there were six (6) exceedance days measured during the first quarter, ten (10) exceedance days measured during the second quarter, nine (9) exceedance days measured during the third quarter; and six (6) exceedance days measured during the fourth quarter.

FIGURE 4-3
BRAWLEY SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO MAY 15, 2017**

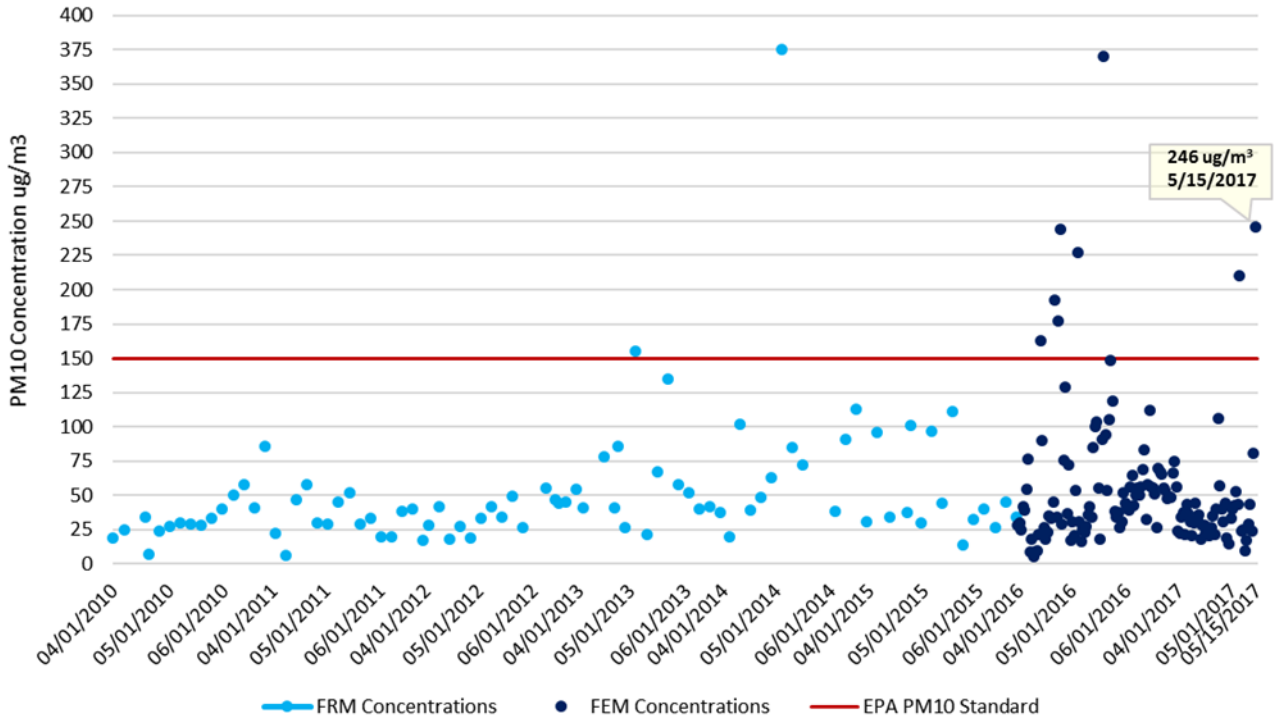


***Quarterly: April 1, 2010 to June 30, 2016 and April 1, 2017 to May 15, 2017**

Fig 4-3: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 190 µg/m^3 by the Brawley monitor on May 15, 2017 was outside the normal seasonal concentrations when compared to similar event days and non-event days

Figure 4-3 illustrates the seasonal fluctuations over a period of 682 sampling days, 785 credible samples and twenty-six (26) exceedance days. This translates to less than a 4% seasonal exceedance occurrence rate.

FIGURE 4-4
WESTMORLAND SEASONAL COMPARISON
FRM AND FEM PM_{10} 24-HR AVG CONCENTRATIONS
***APRIL 1, 2010 TO MAY 15, 2017**



***Quarterly: April 1, 2010 to June 30, 2016 and April 1, 2017 to May 15, 2017**

Fig 4-4: A comparison of PM_{10} seasonal concentrations demonstrates that the measured concentration of 246 µg/m^3 by the Westmorland monitor on May 15, 2017 was outside the normal seasonal concentrations when compared to similar event days and non-event days

Figure 4-4 illustrates the seasonal fluctuations over a period of 231 sampling days, 224 credible samples and ten (10) exceedance days. This translates to less than a 4.5% seasonal exceedance occurrence rate.

Examining the historical and seasonal time series concentrations as they relate to the May 15, 2017 measured exceedance, the exceedance measured on May 15, 2017 is 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 San Diego Mountains and the natural open deserts located within the western section of Imperial County. Since Imperial County does not have jurisdiction over emissions emanating from San Diego County, those attributable emissions are not reasonably controllable or preventable by Imperial County.

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

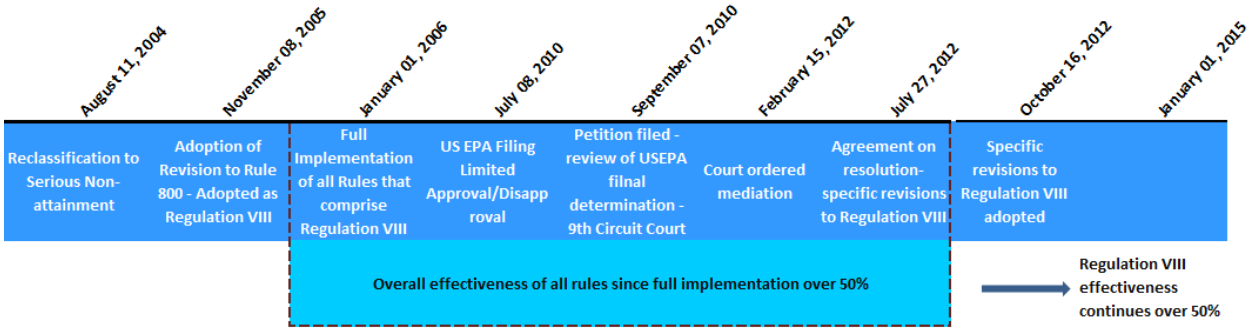


Fig 5-1: Regulation VIII Graphic Timeline

V.1 Wind Observations

As previously discussed, wind data analysis indicates that on May 15, 2017 different sites measured wind speeds at or above 25 mph. Wind speeds of 25 mph are normally sufficient to overcome most PM_{10} control measures. During the May 15, 2017 event, wind speeds were above the 25 mph threshold, overcoming the BACM in place.

V.2 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 Westmorland and Brawley during the May 15, 2017 PM_{10} exceedance. 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).

The ICAPCD declared a No Burn day for May 15, 2017 (**Appendix C**). An evaluation of all inspection reports, air quality complaints, compliance reports, and other documentation indicate no evidence of significant unusual anthropogenic-based PM_{10} emissions. However, compliance personnel received a single anonymous complaint (approximately at 12 pm) on May 15, 2017 regarding illegal trash burning. The location of the illegal burn, occurred in Desert Shores approximately 35 miles northwest of Westmorland. Evidence indicated the burn was less than 20 square feet in size and not within the project airflow for that time of day (**Appendix C**). There is no apparent effect from this incident to the exceedance measured at the Westmorland or the Brawley monitors on May 15, 2017.

FIGURE 5-2
PERMITTED SOURCES

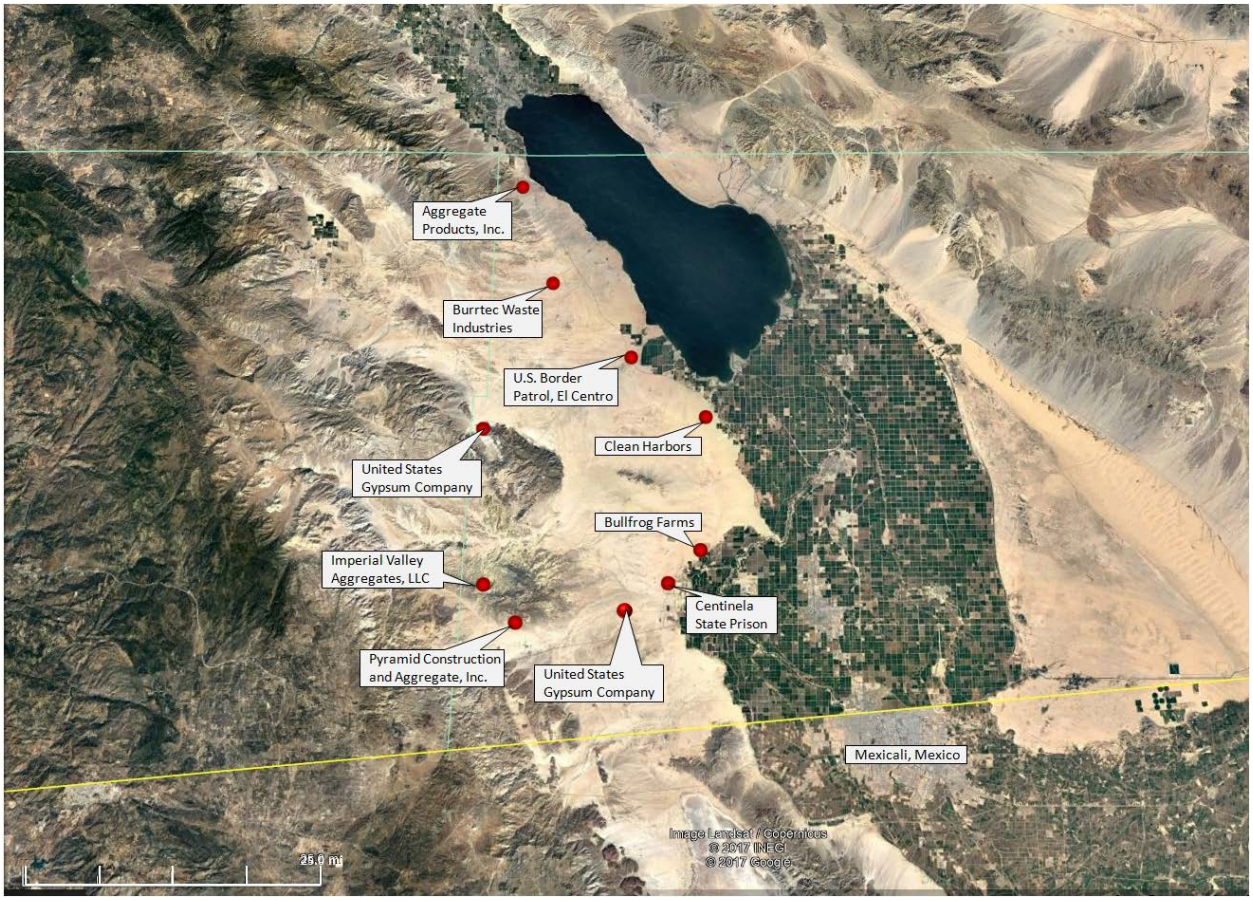


Fig 5-2: The above map identifies those permitted sources located west, northwest and southwest of the Brawley and Westmorland monitors. The green line to the north denotes the political division between Imperial and Riverside counties. The yellow line below denotes the international border between the 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

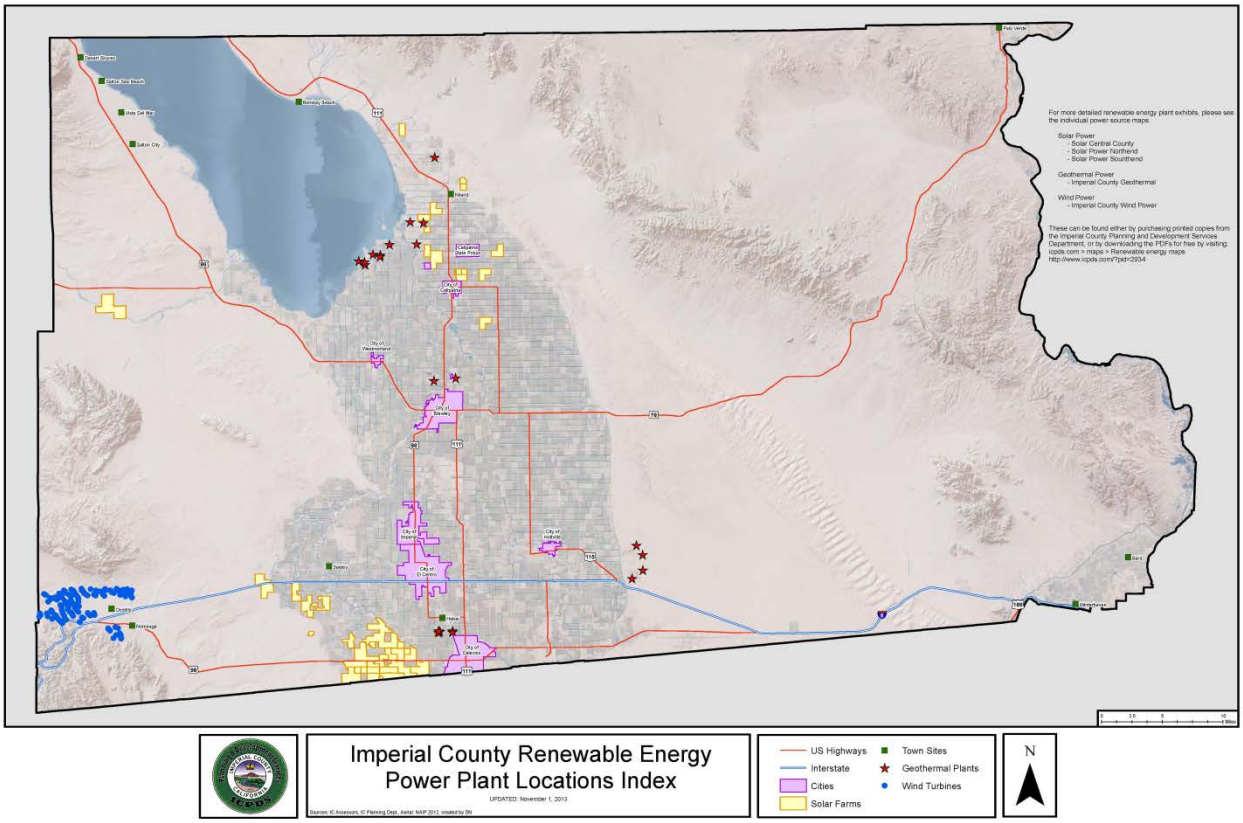


Fig 5-3: The above map identifies those power sources located west, northwest and southwest of the Brawley and Westmorland monitors. Blue indicate the Wind Turbines, Yellow are the solar farms and stars are geothermal plants

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. Two distinct weather systems caused gusty westerly winds to blow over and through the San Diego Mountains and deserts, onto the open natural desert floor of Imperial County. Gusty westerly winds as measured at the Sunrise-Ocotillo and the Fish Creek Mountain stations blew through the canyons and slopes transporting suspended dust into Imperial County affecting air quality on May 15, 2017.

The exceedance at the Brawley and Westmorland monitors occurred when strong gusty westerly winds preceding two distinct low pressure systems transported and suspended windblown dust into Imperial County. The monitors located in Brawley and Westmorland were the only two monitors to exceed the NAAQS on May 15, 2017. Precipitation and early morning northwesterly airflow on May 15, 2017 combined to allow less deposition of particulates onto monitors located far north in Riverside and far south in Imperial County. The preceding discussion explained that although the event was regional, the instability caused by the two distinct systems, brought sufficient moisture, in the form of showers or snow to allow a lower level of transported emissions into Imperial County. In fact, measured trace amounts of precipitation in Imperial was reported by the San Diego NWS office on May 15, 2017. Once the winds shifted to a more westerly direction during the late afternoon hours, those monitors closest and unobstructed by urbanized structures, measured the highest elevated concentrations of particulates (**Table 2-1**).

TABLE 6-1

PRECIPITATION TOTALS		
LOCATION*	**5/14/2017**	**5/15/2017**
El Centro NAF (KNJK)	T	T
Imperial County Airport (KIPL)	T	T

*KNJK and KIPL from QCLCD

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 15, 2017 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 the mountains and slopes within San Diego County 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 and Westmorland monitors were caused by naturally occurring strong gusty westerly winds that transported windblown dust into Imperial County from areas located within the Sonoran Desert regions primarily to the west of Imperial County. These facts provide strong evidence that the PM_{10} exceedance at Brawley and Westmorland on May 15, 2017, was 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 Brawley and Westmorland on May 15, 2017, was caused by the transport of windblown dust into Imperial County by strong westerly winds associated with the passing of two distinct weather systems 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 and Westmorland monitors in Imperial County demonstrates a consistency of elevated gusty westerly winds with elevated concentrations of PM_{10} on May 15, 2017. 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. Although winds remained elevated the day following, moisture from the weather system was sufficient to keep PM_{10} 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 15, 2017.

VI.5 Concentration to Concentration Analysis

The historical annual and seasonal 24-hr average PM_{10} measured concentrations at the Brawley 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 produced by the low-pressure systems as they passed through the southern region of California. The information provides a clear causal relationship between the entrained windblown dust and the PM_{10} exceedance measured at the Brawley and Westmorland monitors on May 15, 2017.

In particular, the clear causal relationship and not reasonably controllable or preventable sections provide evidence that high winds associated with the May 15, 2017 high wind dust event generated emissions from as far as the mountain ranges within San Diego County and the natural open desert areas within Imperial County (all part of the Sonoran Desert). In addition, during the May 15, 2017 event, anthropogenic sources within upwind areas were reasonably controlled at the time of the event thus the May 15, 2017 event meets the definition of a Natural Event.[19]

[19] 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.