

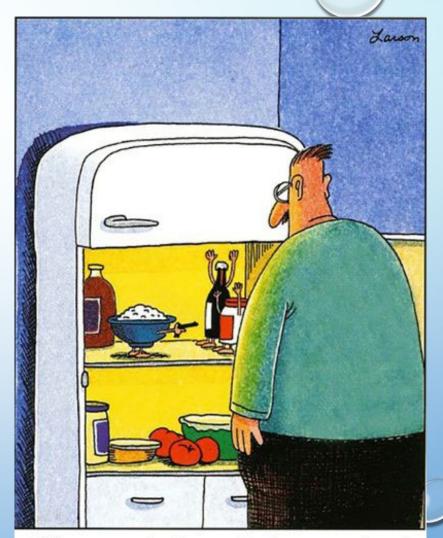
MAYBE THE TITLE NEEDS SOME WORK

ARE ANY EXCEEDANCES EVER GOOD?

The Far Side

By

Gary Larson.



When potato salad goes bad

DEFINITION

40 CFR PART 50.1 L

• EXCEEDANCE WITH RESPECT TO A NATIONAL AMBIENT AIR QUALITY STANDARD (NAAQS):

 MEANS ONE OCCURRENCE OF A MEASURED OR MODELED CONCENTRATION THAT EXCEEDS THE SPECIFIED CONCENTRATION LEVEL OF SUCH STANDARD FOR THE AVERAGING PERIOD SPECIFIED BY THE STANDARD.

NATIONAL AMBIENT AIR QUALITY STANDARDS

- 40 CFR PART 50
- CRITERIA POLLUTANTS
 - OZONE (O₃)
 - CARBON MONOXIDE (CO)
 - SULFUR DIOXIDE (SO₂)
 - NITROGEN DIOXIDE (NO₂)
 - PARTICULATE MATTER
 - PM₁₀
 - PM_{2.5}
 - LEAD (Pb)

www.ecfr.gov



OZONE

- CURRENT NAAQS = 0.070 PPM (70 PPB)
 - 3 YR AVG OF ANNUAL 4TH MAX 8 HOUR CONCENTRATIONS
- 8 HOUR STANDARD
 - COLLECT 8 1 HOUR CONCENTRATIONS (AVG IN START HOUR)
 - VALID HOUR = 45/60 MINUTES OF DATA
- MINIMUM OF 6 HOURS MAKES A VALID 8 HOUR VALUE
 - LATEST TWIST 2015 17 CONSECUTIVE 8 HOUR PERIODS ...
 - 7:00 AM TO 11 PM

17 CONSECUTIVE 8 HOUR PERIODS?

- 40 CFR PART 50, APPENDIX U, SECTION 3 C & D
- (C) THE DAILY MAXIMUM 8-HOUR AVERAGE O₃ CONCENTRATION FOR A GIVEN DAY IS THE HIGHEST OF THE 17 CONSECUTIVE 8-HOUR AVERAGES BEGINNING WITH THE 8-HOUR PERIOD FROM 7:00 A.M. TO 3:00 P.M. AND ENDING WITH THE 8-HOUR PERIOD FROM 11:00 P.M. TO 7:00 A.M. THE FOLLOWING DAY (I.E., THE 8-HOUR AVERAGES FOR 7:00 A.M. TO 11:00 P.M.). DAILY MAXIMUM 8-HOUR AVERAGE O₃ CONCENTRATIONS SHALL BE DETERMINED FOR EACH DAY WITH AMBIENT O₃ MONITORING DATA, **INCLUDING DAYS OUTSIDE THE O₃ MONITORING SEASON IF THOSE DATA ARE AVAILABLE.**
- (D) A DAILY MAXIMUM 8-HOUR AVERAGE O₃ CONCENTRATION SHALL BE CONSIDERED VALID IF VALID 8-HOUR AVERAGES ARE AVAILABLE FOR AT LEAST 13 OF THE 17 CONSECUTIVE 8-HOUR PERIODS STARTING FROM 7:00 A.M. TO 11:00 P.M. IN ADDITION, IN THE EVENT THAT FEWER THAN 13 VALID 8-HOUR AVERAGES ARE AVAILABLE, A DAILY MAXIMUM 8-HOUR AVERAGE O₃ CONCENTRATION SHALL ALSO BE CONSIDERED VALID IF IT IS GREATER THAN THE LEVEL OF THE NAAQS. HOURLY O₃ CONCENTRATIONS THAT HAVE BEEN APPROVED UNDER §50.14 AS HAVING BEEN AFFECTED BY EXCEPTIONAL EVENTS SHALL BE INCLUDED WHEN DETERMINING WHETHER THESE CRITERIA HAVE BEEN MET.

OZONE DATA COMPLETENESS / OZONE SEASON

• 90% OVER 3 YEARS 40 CFR PART 50, APP U

NO YEAR LESS THAN 75%

• OZONE SEASONS - 40 CFR PART 58 APP D, TABLE D-3

REGION 4

JAN - DEC : FL

MAR - OCT : AL, GA, KY, MS, NC, SC, TN



QUESTIONS ON ANY OF THIS? PLEASE CALL YOUR REGIONAL CONTACT



THE QA EYE NEWSLETTER - VOL. 21

https://www3.epa.gov/ttn/amtic/qanews.html

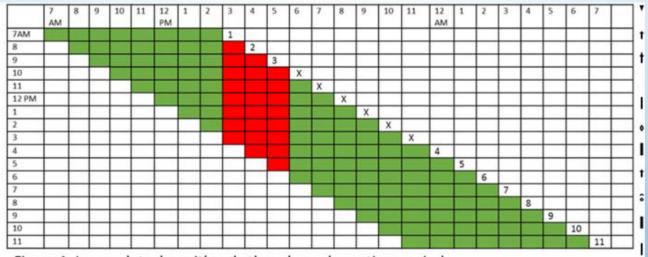


Figure 1. Incomplete day with only three hour down-time period



ANOTHER CHART...

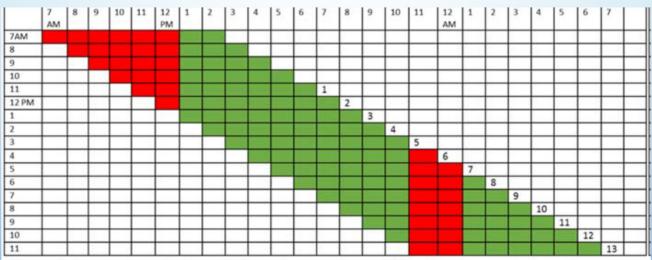


Figure 2. A complete day for a 24 hour day starting at 7:00 with 8 hours of down time.



AND ANOTHER CHART...

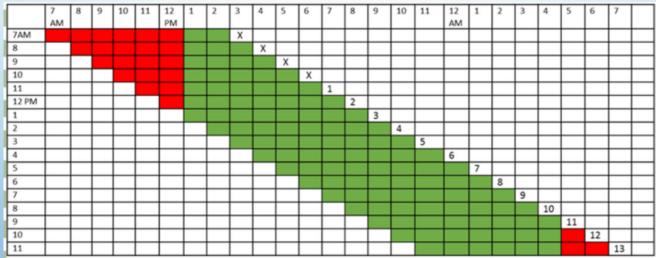


Figure 3. A complete day for a 24 hour day starting at 7:00 with 8 hours of down time



NOT SO OBVIOUS IMPACTS TO DATA

Review the scenarios above with operators and QA staff and develop acceptable time periods for any down-time work. Strive to get work done before 10:00 AM to avoid running up against the critical time period due to unforeseen circumstances and to

avoid elimination of high ozone concentration 8hour blocks. A 3-hour QC check can be performed from 1:00-10:00 AM

• Try to automate zero, span, and 1-point QC for early morning hours (5:00-6:59 AM).

 If a high ozone day is forecast and QC (Annual PE Audits or a NPAP Audit) and/or maintenance activities are not critical, consider

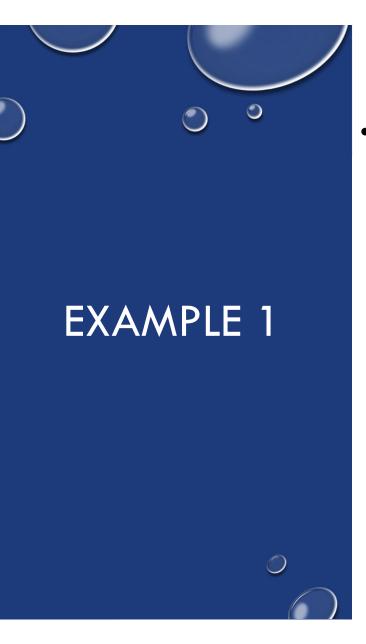
postponing this work for a "cleaner" day. -Chris Hall & Ben Wells



DON'T SHOOT YOURSELF IN THE FOOT

DON'T LET EPA SHOOT YOUR FOOT EITHER!





- OUR TALE OF WOE BEGINS, THE DAY BEFORE...
 - OZONE FORECAST
 - DELAYED/INCORRECT/DUE TO A SAVE BUTTON?
 - (WHOLE OTHER ISSUE AND WE WILL TRY TO GET SONOMA AT THE NEXT WORKSHOP)
 - HOW MANY PEOPLE FORECAST?
 - HOW MANY PEOPLE USE THE FORECAST?



MONITORING AGENCY BELIEVED IT WAS NOT GOING TO BE AN OZONE CONDUCIVE DAY

- AN OZONE CONDUCIVE DAY?
 - OZONE IS A SECONDARY POLLUTANT
 - REACTION OF NO_X VOC EMISSIONS AND SUNLIGHT
 - HIGH AMBIENT TEMPERATURES
 - LOW WIND SPEEDS



WHAT ELSE DID MURPHYS LAW BRING...

NPAP Audit

Equipment issues

Delayed the start of the Audit Audit went longer than expected Finished about 11:00 am

Uh oh, turns out it was an Ozone Conducive Day...

WHAT DOES THE MATH SHOW?

HOURLY OZONE CONCENTRATIONS (11:00 AM – 6:00 PM)

1 2 3 4 5 6 7 8

• SITE 1 062, 065, 070, 071, 071, 069, 068, 067 AVG = 543/8 = .067

• SITE 2 ----, 076, 077, 075, 074, 071, 069 AVG = 442/6 = .073

WHAT'S THE LEVEL OF THE OZONE NAAQS (.070)

QUESTIONS TO PONDER?

- IS THIS A REAL EXCEEDANCE?
 - Was the equipment functioning properly?
 - Is the 8 hour AVG Concentration VALID?

WHAT DO YOU THINK?



WHAT'S THE IMPACT...

- IN THIS EXAMPLE:
 - THIS IS THE 2018 4TH MAX FOR THE AREA...
 - THE GIFT THAT KEEPS ON GIVING...
 2018, 2019, 2020 DESIGN VALUES WILL USE THIS DATA...
- IT'S IMPORTANT TO KNOW THE NAAQS

 AND HOW THEY ARE CALCULATED? ...





- THIS STORY BEGINS WITH
- A TSA DATA REVIEW
 - 1 HOUR VS 8 HOUR OZONE DATA
 - AMP 350 RAW DATA REPORT

MONTHLY MAX CONCENTRATIONS

QUICK LOOK (TOP 4) & MAX VALUES (TOP 10) REPORTS

• 1 HR MAX = .237 8 HR EXCEEDANCE = .076



WHAT'S THE SCOOP

2016 HOURLY OZONE DATA FROM AQS

• HOUR 1700 1800 1900 2000 2100 2200

CONCENTRATION 031 DA 237 105 050 014

DA code is for ABHORRENT DATA

• A .237 WOULD BE ONE OF THE HIGHEST HOURLY OZONE CONCENTRATIONS EVER RECORDED IN REGION 4. IN THE TOP 5.

FROM THE AGENCY DATABASE

2016 HOURLY OZONE DATA FROM AIRVISION

• HOUR 1700 1800 1900 2000 2100 2200

CONCENTRATION 031 991 237 105 050 014

- AGENCY DISCOVERED
 - AQS WILL NOT ACCEPT A VALUE ABOVE .500 FOR OZONE



- PREVIOUS PRECISION CHECK PASSED
- FOLLOWING PRECISION CHECK PASSED
- AGENCY PERFORMED A MULTIPOINT VERIFICATION PASSED
- NO ERRORS OR WARNINGS RECORDED FROM INSTRUMENT
- NO LOCAL FIRES, ELECTRICAL DISTURBANCES, LIGHTNING STORMS →
- OTHER MSA OZONE MONITORS DID NOT SHOW ELEVATED READINGS.

AGENCY COULD FIND NO REASON TO INVALIDATE THE DATA...





WEIGHT OF EVIDENCE APPROACH

- 40 CFR PART 58, APPENDIX A, SECTION 1.2.3
- IS THIS A REAL EXCEEDANCE
- AGENCY CONDUCTED A THOROUGH INVESTIGATION
 - DOCUMENTATION AVAILABLE
- WHATS MISSING?



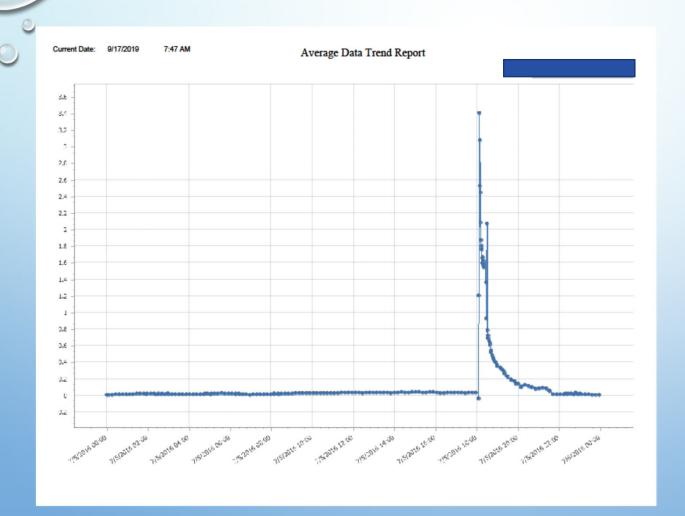


Expected Ozone Diurnal Pattern

24-hr view of data

HOURLY DATA STRIP CHART 9:02 AM Current Date: 9/13/2019 Average Data Trend Report 0.7 0.6 0.5 0.4 0.3 115/2016 10:00 715/2016 12:00 115/2016 18:00

MINUTE DATA STRIP CHART



What do you think?



- A Sharp spike in the concentration, gradual decrease
- Ozone does not behave this way
 Does not follow the normal diurnal pattern of ozone formation
- Appears more like an electrical spike in the instrumentation or data recovery system
- CONSULT WITH EPA



RESULTS

- TSA REPORT
 - RECOMMENDED AGENCY GATHER THE REMAINING DOCUMENTATION
 - SUBMIT WITH THE TSA CORRECTIVE ACTION PLAN
- AS A RESULT OF THAT DOCUMENTATION
 - DATA WAS INVALIDATED...
- KUDOS TO THE AGENCY...

TAKE AWAY MESSAGE(S)

- CONDUCT YOUR QC / QA CHECKS EARLY IN THE DAY

 THE EARLIER THE BETTER / AUTOMATION HELPS BUT BE CAREFUL
- KNOW YOUR CRITERIA POLLUTANTS AND HOW THEY BEHAVE
 WHAT IMPACTS THEM, INFLUENCES THEIR CONCENTRATIONS
- WHEN YOU HAVE AN EXCEEDANCE —
 PUT ON YOUR QA HAT, ASK YOURSELF IF THE VALUE IS REAL/VALID
- VERIFY & VALIDATE YOUR DATA MONTHLY, QUARTERLY, ANNUALLY DEVELOP A SOLID DATA HANDLING PROCEDURE
- IF YOU USE THE WEIGHT OF EVIDENCE APPROACH TO INVALIDATE AN EXCEEDANCE
 - CONFER WITH EPA..., DOCUMENT YOUR DECISION, PRESERVE YOUR INVESTIGATION, EVIDENCE



QUESTIONS / DISCUSSION

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