

# From Policy to Practice: Tracing the EPA's Origins to the 2022 Construction General Permit



Stormwater Awareness Week, 2025

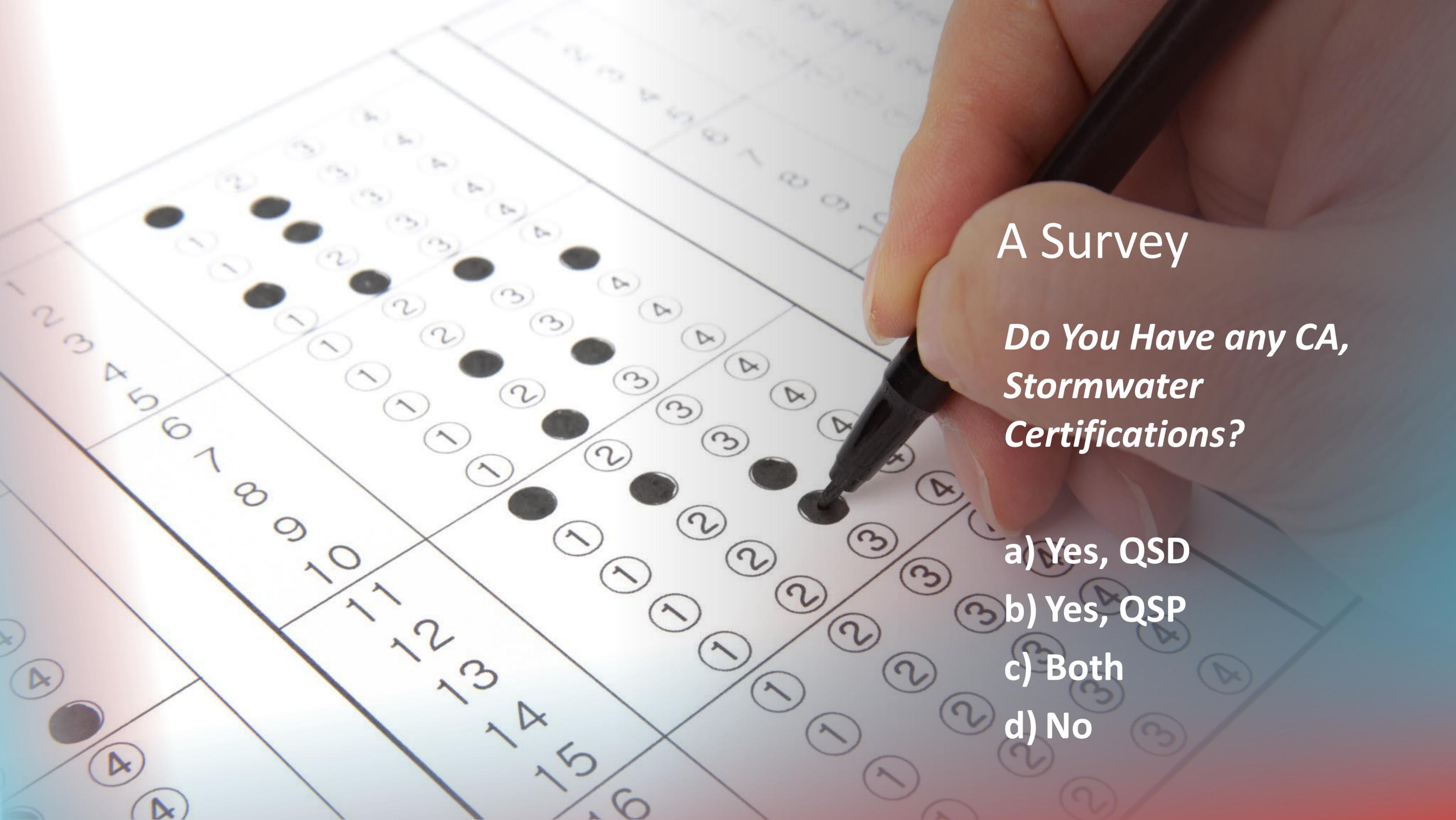
John Price, Ph.D.

Dígame Systems

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September 26, 2025 (v 1.2)

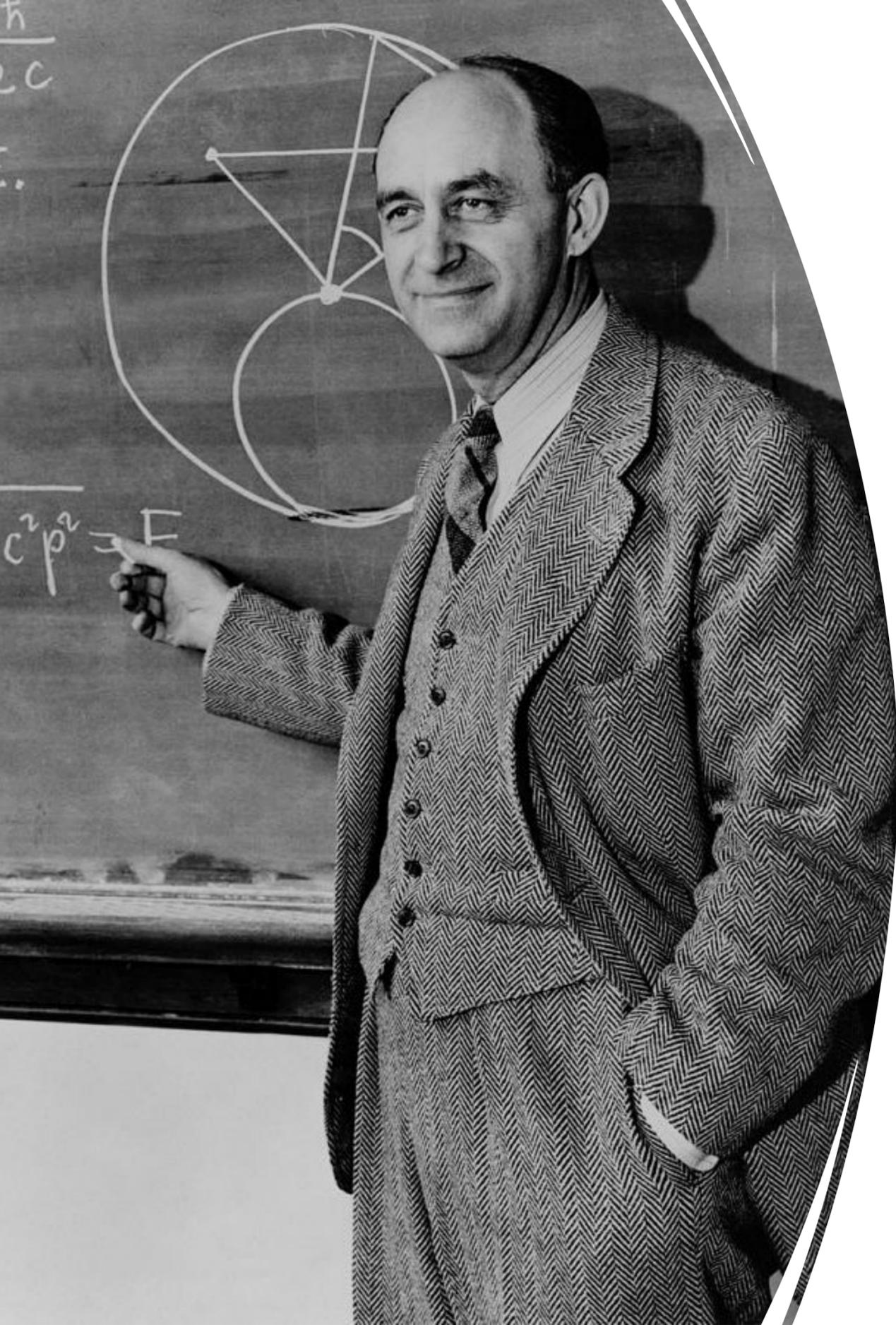




## A Survey

*Do You Have any CA,  
Stormwater  
Certifications?*

- a) Yes, QSD
- b) Yes, QSP
- c) Both
- d) No



## **Enrico Fermi, Ph.D., N.L.**

**“Never underestimate the joy  
a person takes in hearing  
something they already  
know.”**

(I'm relying on this today!)

# Today



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An Admission

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A Philosophical Question

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Some History

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Some Policy – CGP 2022

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The Nuts and Bolts of QPEs

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Automating QPE Predictions (NWS API)

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QPE Assistant -A Demo

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Questions and Discussion



# An Admission

John M. Price, Ph.D., *“MT QSD/QSP”*

- Personal Background
  - Chemistry
  - Pacific NW National Laboratory (PNNL / EMSL)
  - Scientific Instrumentation
  - Software Engineering
  - Product Development
- Dígame Systems
  - Silicon Valley Software Consulting Firm
  - Custom IoT Application Development
  - Sensors / Wireless
- *Stormwater Management Credentials*
  - *Married to a QSD/QSP*

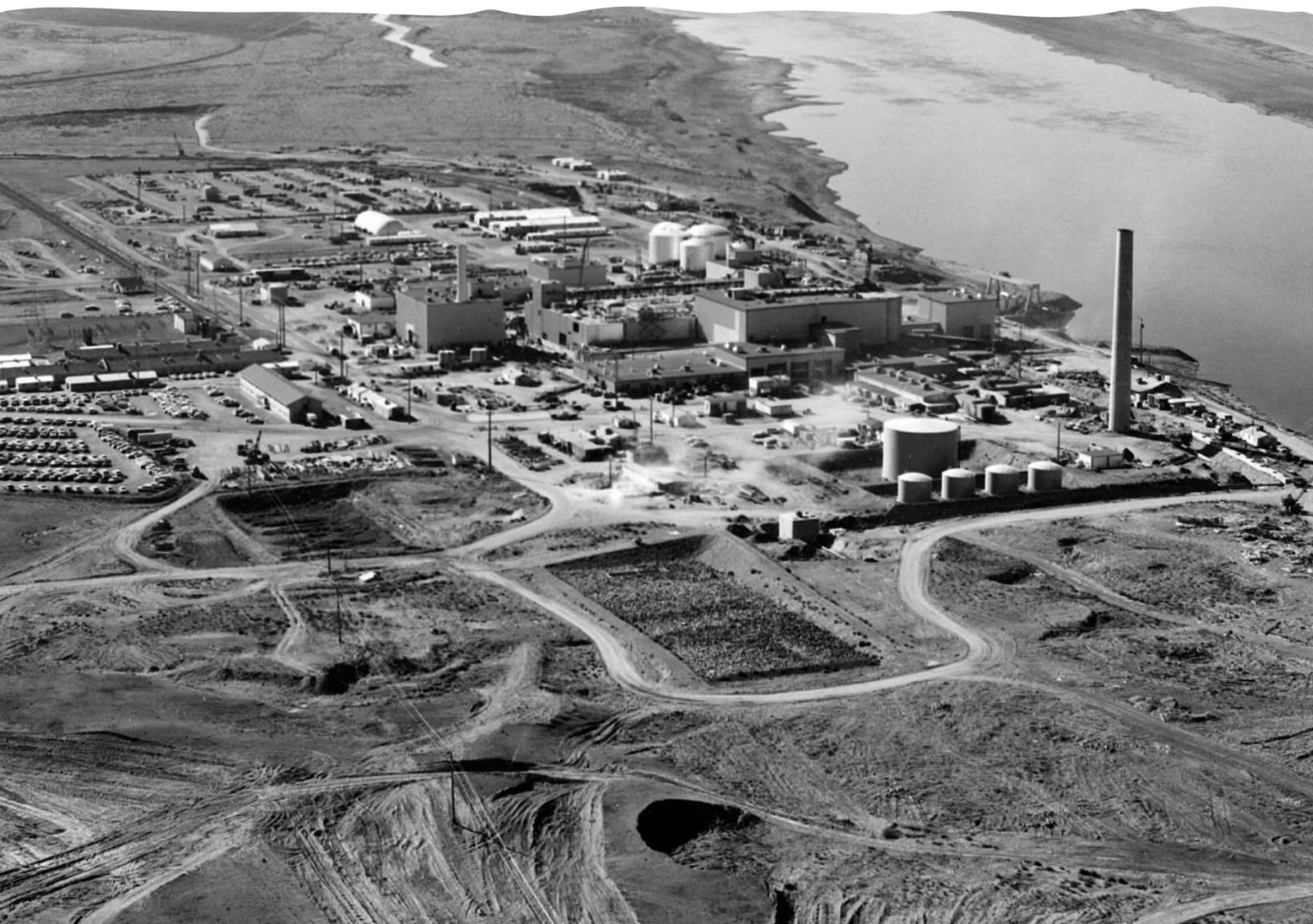
*Our Production Release to  
Version 1.0.0 is Here!*

## Welcome to *QPE Assistant!*



# Hanford Site

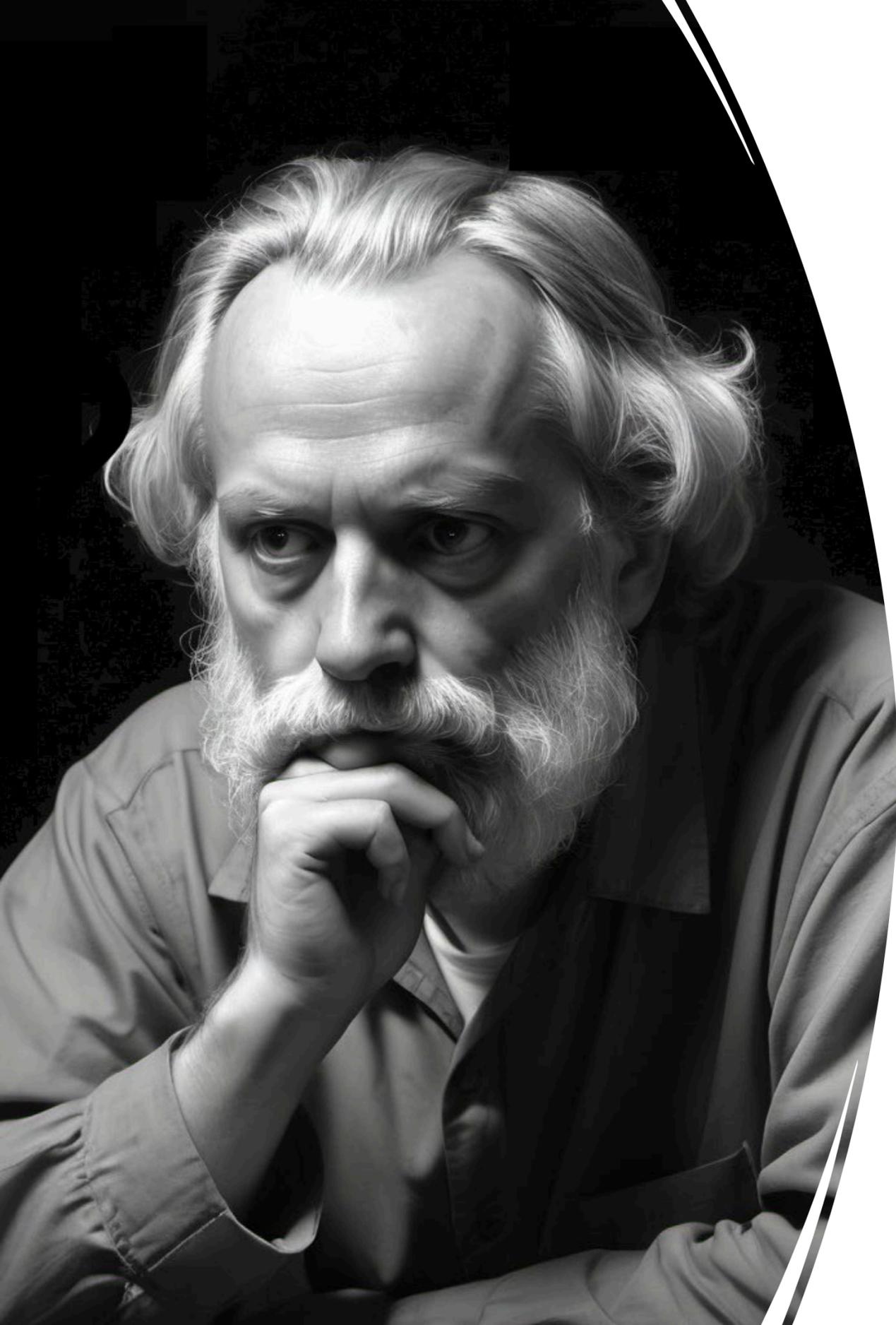
- The legacy of 40 years of plutonium production starting in WW2 with the B Reactor
- Cooled by the Columbia River which flows through prime farmland across Washington and out to Portland
- The largest toxic site in the country (586 sq. miles)



# “Tank Farms”

- The Hanford site has **177 underground tanks** total, 28 double-shell and 149 single-shell, holding 53 million gallons of highly radioactive and hazardous waste
- **67 of the single-shell tanks have assumed to have leaked into the groundwater**
- **The Mission from the DOE:**  
“New Technologies for Containment”





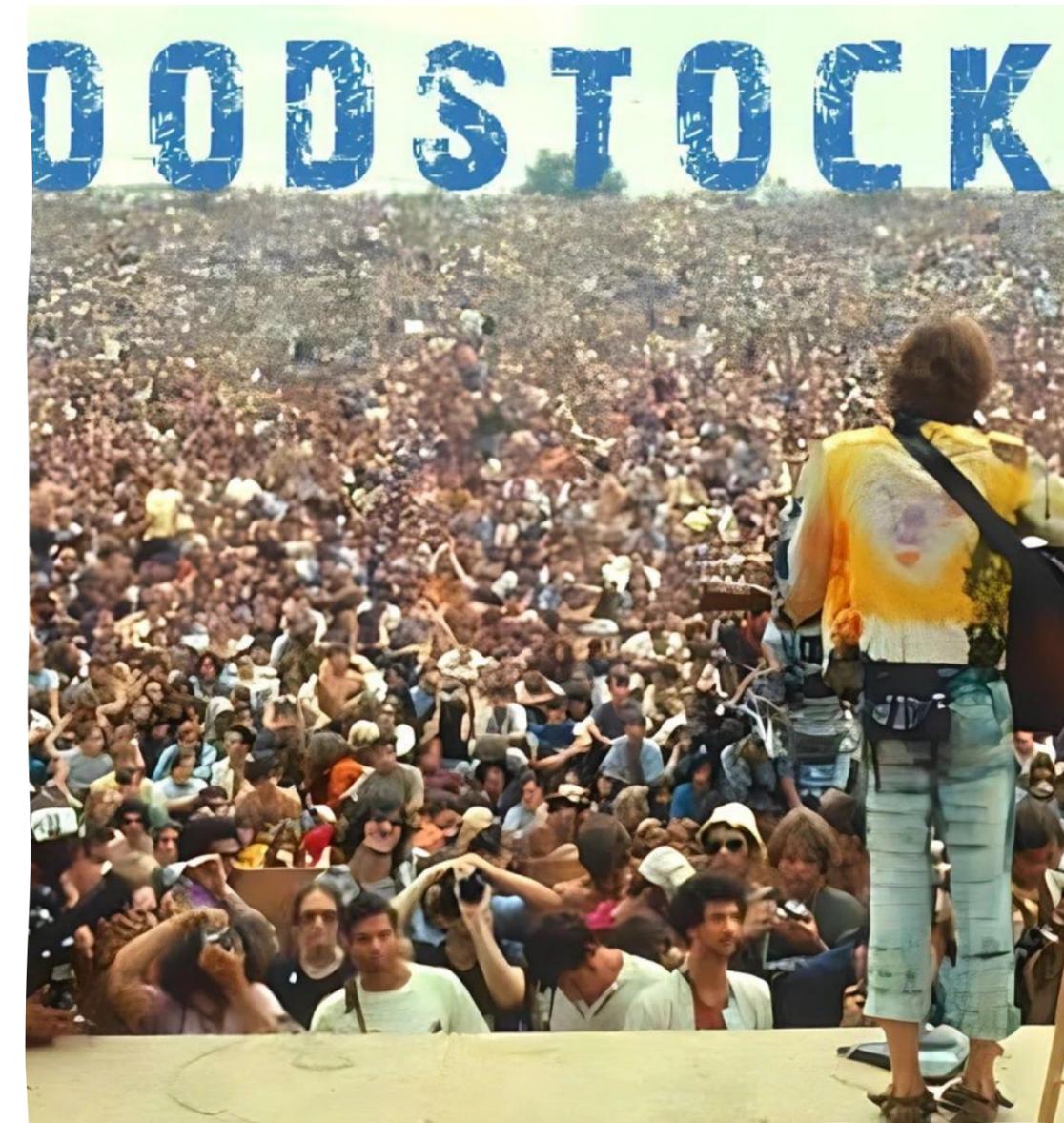
# A Philosophical Question

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*“ Why are we here? ”*

*“ Do you mean: ‘Why do we exist’? ”*

*“ No. Why are we on Zoom at this  
Workshop? ”*



## Some History 1969

Woodstock  
The Moon Landing  
Little Johnny turned 5...

# Some History 1969

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... and,  
just outside of  
Cleveland,  
the Cuyahoga River  
*Catches Fire*  
...again.



# “Again”?

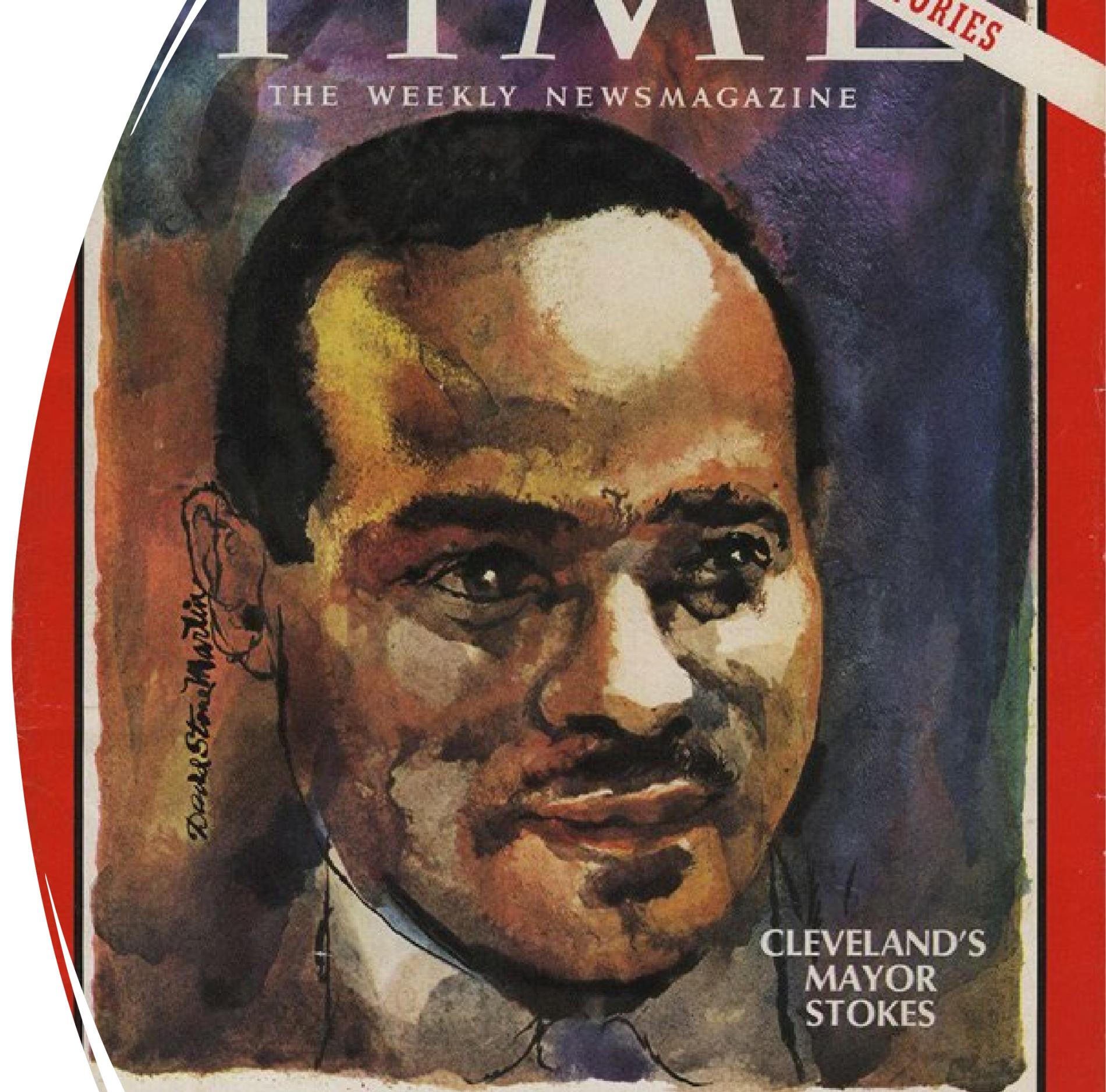
Yes, the Cuyahoga River had caught fire before.

- Documentation is a bit sketchy, but there are clear accounts in newspapers of fires in:
  - 1868, 1883, 1887, 1912, 1922, 1936, 1941, 1948 and in 1952!
  - It was said that the river “oozes rather than flows.”
- As the Environmental movement in the U.S. gained momentum in the 1960’s the latest fire became a symbol of how bad things had gotten.
- Time Magazine and international publications came to take pictures of the “Man-made disaster” near Cleveland.



# Carl B. Stokes Cleveland's Mayor

- Native-Born Clevelander
- Elected In 1967
- First African American Mayor of a Major City
- Disturbed by the state of the river
- ***"Pollution Tour"*** to call attention to the problem
- It worked...



# Some History

## 1972

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**NPDES**

*National Pollution Discharge  
Elimination System  
“point sources”*



# Some History

## 1972



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## **NPDES**

***National Pollution Discharge  
Elimination System***  
*“point sources”*

*“The NPDES permit will contain limits on what you can discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health.”*

EPA Website

([NPDES Permit Basics](#) | [US EPA](#))

# California Construction General Permit (CGP)

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- The Federal Clean Water Act requires certain stormwater discharges to waters of the United States to be regulated by an NPDES permit
- The State Water Board of California adopted the existing statewide NPDES Construction Stormwater General Permit in 2009
- The 2009 permit expired in 2014 and was administratively extended



# 2022 CGP: Effective Date and Regulatory Transition Period

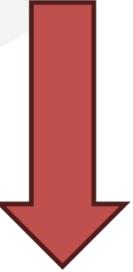


# 2022 CGP: Effective Date and Regulatory Transition Period



**That's why we're here.**

2-year regulatory transition period



**September 8, 2022**

State Water Board adopts the 2022 CGP

**December 17, 2022**

Statewide programmatic permitting, under the 2009 CGP, available to implement Executive Order N-72-20

**September 1, 2023**

2022 CGP becomes effective

**September 1, 2025**

Regulatory transition period ends, the 2022 CGP is the only effective permit

# The California 2022 CGP

Applying for Permit Coverage

Post-Construction Plan Submittals

Programmatic Permitting for Linear Projects

Notice of Non-Applicability

QSD/QSP Responsibilities

Stormwater Professional Training

Qualifying Precipitation Events

Site Inspections (Scheduling)

Stormwater Discharge Monitoring

Non-Visible Pollutant Monitoring

Total Maximum Daily Load Implementation

Active Treatment Systems

Passive Treatment

Exceptions to the California Ocean Plan

Dewatering Activities

Surface Water Buffers

Changes of Information

Inactive Project Status

Reducing Acreage for Residential Lots

Notice of Termination

# Qualified SWPPP Developer / Practitioner (QSD/QSP) Responsibilities

- **QSDs** are required to prepare the site-specific SWPPP and *conduct inspections*:
  - Start of construction, when replacing a QSD, twice annually, and following a numeric action level exceedance
- **QSPs** oversee monitoring and implementation of the SWPPP and *conduct inspections*:
  - Once per month, pre-qualifying precipitation event, following a numeric action level exceedance, and for the Notice of Termination
  - Train Delegates (CASQA guidelines, February 2024)
- **QSP Trained Delegates** – Recent changes to formalize this role and responsibilities.
- The 2022 permit allows the Water Boards to suspend or rescind QSD/QSP certifications as an enforcement action
  - *More ‘teeth’ than the 2009 CGP.*

# Inspections

Inspection Type	Qualified SWPP Developer (QSD)	Qualified SWPP Practitioner (QSP)	Trained Delegate
Weekly	X	X	X
<i>Pre-Precipitation Event</i>	X	X	
<i>During Precipitation Event</i>	X	X	X
<i>Post-Precipitation Event</i>	X	X	X
Inactive Projects (2 Weeks after Change of Information approval)	X		
Inactive Projects (Monthly Inspection and Pre-Precipitation Events)	X	X	X
Active Projects (Monthly Inspection)	X	X	
Twice-Annual Inspection	X		
Within 30 days of construction commencing or replacing a QSD	X		
Within 14 days of a NAL exceedance	X	X	
Prior to NOT and COI submissions	X	X	

**QPE**

# Qualified Precipitation Events (QPEs)

“Qualifying precipitation event is any weather pattern that is forecast to have a 50 percent or greater Probability of Precipitation (PoP) and a Quantitative Precipitation Forecast (QPF) of 0.5 inches or more within a 24-hour period.

The event begins with the 24-hour period when 0.5 inches has been forecast and continues on subsequent 24- hour periods when 0.25 inches of precipitation or more is forecast. “

ORDER WQ 2022-0057-DWQ NPDES No. CAS000002  
ATTACHMENT B B-12, Page 328.

**Side Note:** An “Event”, for the most part, has nothing to do with *Actual Rainfall!* Inspection requirements are based on *Predictions (PoPs and QPFs)*.



# Predictions Drive Inspection Requirements

- **Pre-, during-, and post-qualifying precipitation event inspections**
  - Pre-qualifying precipitation event inspections must occur within 72 hours and up to 120 hours prior to event
  - Post-qualifying precipitation event inspections must occur within 96 hours of the last 24-hour period with 0.25 inches or more of precipitation
- **Weekly Inspections**
  - Pre-, during-, and post-qualifying precipitation event inspections may count towards the weekly inspection requirement





National Oceanic and  
Atmospheric Administration  
U.S. Department of Commerce

## Where do These Predictions Come from?

NOAA / NWS - Your tax dollars at work  
Up-to-date weather data including long-term predictions  
Freely-available NWS web pages for users  
***api.weather.gov for Developers!*** (more below)

# NWS Weather Table

- *The entire US is covered in 2.5 x 2.5 km 'grid-points'*
- *Detailed forecast data available for each grid-point*
- *Data provided by 122 NWS state forecast field offices*

## Weather Table

[Weather.gov](#) > [Western Region Headquarters](#) > Weather Table

Western Region Headquarters

Regional Headquarters

[Local Forecast Offices A-K](#)

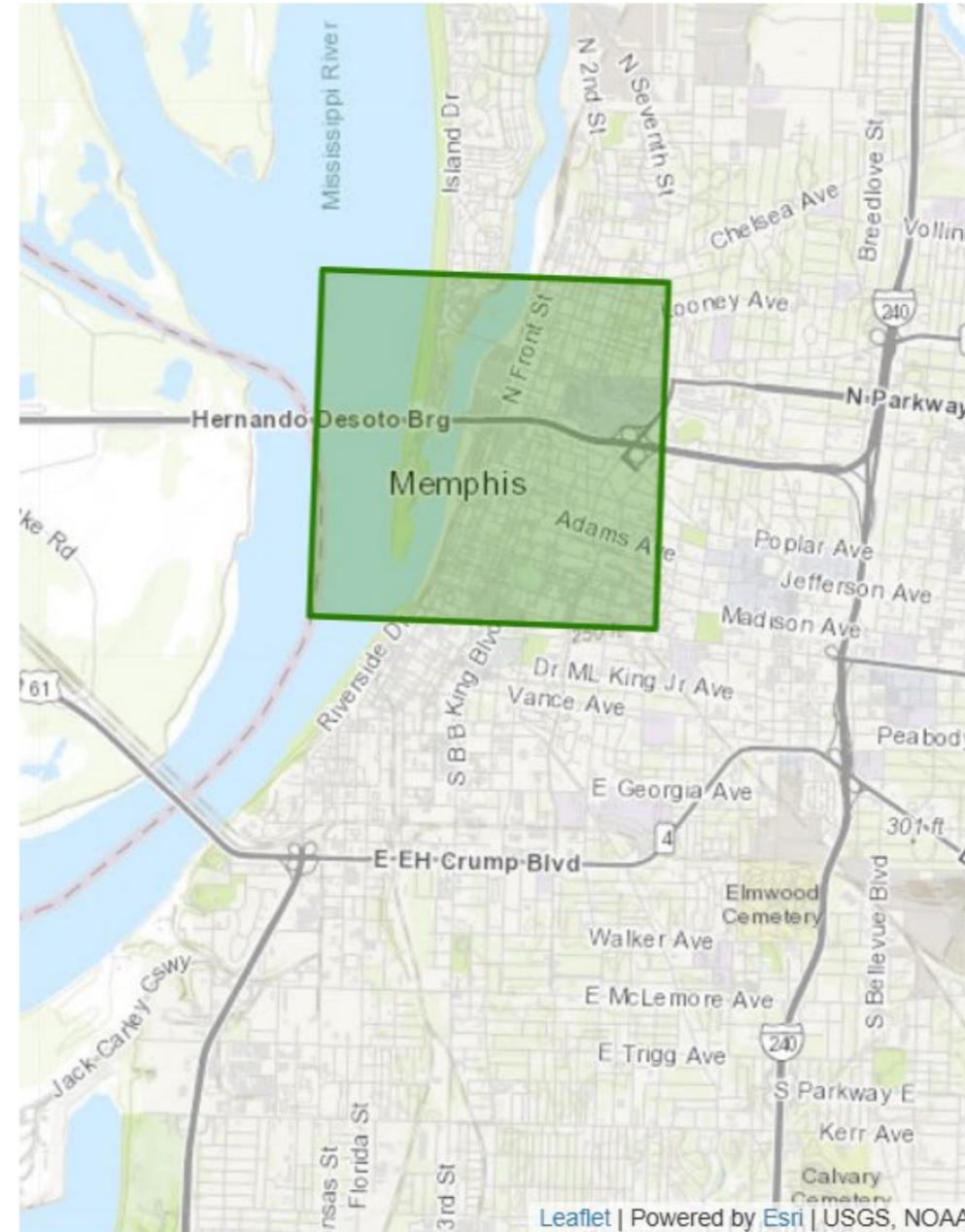
[Local Forecast Offices L-Z](#)

[River Forecast Centers](#)

[Center Weather Service Units](#)

[Regional HQ](#)

[How to use this page](#)



Select Number of Days, and Interval, then click on the map to get forecast options for that location, or enter coordinates below:

Number of Days:  1  2  3  4  5  6  7

Interval (hours):  1  3  6

Forecast for 35.1495N -90.04898W (Elev 197FT)  
5 miles NW of Memphis, TN  
Issued by National Weather Service [WFO MEG](#)  
0845 AM CDT Thu Sep 12 2024

[Permanent link for this location](#)

[Other data for this location:](#)

Point Forecast Page

Hourly Tabular Forecast

Hourly Weather Graph

Printer friendly link:



<https://www.weather.gov/wrh/wxtable>



Forecast for 35.1495343N -90.0489801W (Elev 197FT)  
 5 miles NW of Memphis, TN  
 Issued by National Weather Service WFO MEG  
 0845 AM CDT Thu Sep 12 2024

Date	Thu Sep 12				Fri Sep 13				Sat Sep 14				Sun Sep 15				Mon Sep 16				Tue Sep 17				Wed Sep 18				
High Temp(F)	69				68				78				81				83				84				86				
Low Temp(F)	66				65				64				65				66				65				66				
Time					"50 percent or greater ...and continues				1am 7am 1pm 7pm				1am 7am 1pm 7pm				1am 7am 1pm 7pm				1am 7am 1pm 7pm				1am 7am 1pm 7pm				
Temp(F)	Probability of				on subsequent				65	75	74	68	66	79	76	69	67	80	77	69	65	81	78	69	66	83	80	72	
Dew Point	Precipitation (PoP) and				24- hour				65	70	70	68	66	71	71	69	67	70	69	69	65	69	69	69	66	70	70	70	
Relative Humidity(%)	a Quantitative				periods when				100	84	87	100	100	77	85	100	100	72	76	100	100	67	74	100	100	65	72	93	
Wind Direc	Precipitation Forecast				0.25 inches of				N	N	NE	E	NE	NE	NE	E	E	NE	NE	E	E	N	NE	SE	SE	SW	SE	SE	
Wind Speed	(QPF) of 0.5 inches or				precipitation or				2	6	3	2	2	6	5	2	2	7	5	2	2	6	5	2	3	6	5	3	
Wind Gust	more within a 24-hour				more is				7	10	7	5	6	10	9	8	7	10	8	7	7	9	8	7	8	10	8	8	
Cloud Cover (%)	period..."				forecast."				75	60	35	40	55	50	45	25	50	45	25	15	30	25	20	10	15	15	10	15	
Prob. of Precip(%)	80	95	90	50	75	65	40	30	20	30	15	15	15	Room for Interpretation															
6 Hr. Precip(in)	0.94	2.04	0.81	0.22	0.20	0.13	0.03	0.03	0.02	0.04	0.00	0.00	0.00	"24 Hour Period"?															
6 Hr. Snow(in)	QPE Starts				QPE Continues				QPE Over				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Snow Level(ft)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

# Qualifying Precipitation Example #1

	December 31				January 1				January 2				January 3			
Time	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p
PoP	55	95	100	40	15	-	-	-	-	5	50	55	30	30	30	35
QPF	0.02	0.13	0.83	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.1	0.01	0.01	0.01	0.04
QPE	<b>1<sup>st</sup> QPE – Start &amp; End</b>				<b>No QPE</b>				<b>No QPE</b>				<b>No QPE</b>			

	January 4				January 5				January 6				January 7			
Time	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p	4a	10a	4p	10p
PoP	35	45	60	80	75	55	35	30	20	15	15	15	-	-	-	-
QPF	0.05	0.11	0.28	0.51	0.35	0.30	0.27	0.11	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00
QPE	<b>No QPE</b>		<b>2<sup>nd</sup> QPE – Day 1 (Start)</b>				<b>2<sup>nd</sup> QPE – Day 2 (End)</b>				<b>No QPE</b>				<b>No QPE</b>	

PoP = Probability of Precipitation

QPF = Quantitative Precipitation Forecast

QPE = Qualifying Precipitation Event

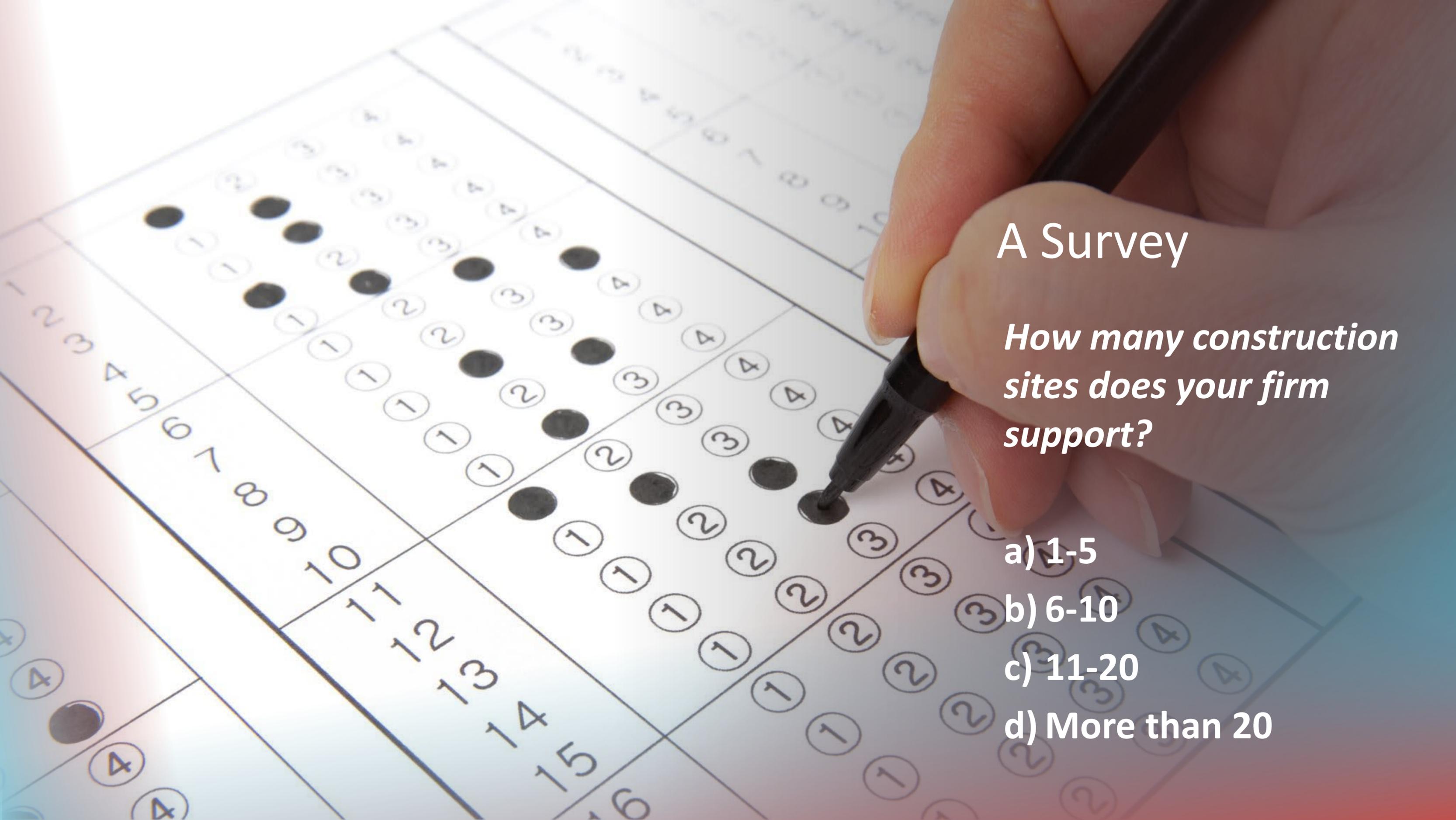
# Real-Life Example

Courtesy of:  
**Teresa Price, P.E., QSD/QSP**  
**Hanna-Brunetti, Gilroy, California**

Forecast for 37.1203N -121.6540W (Elev 331FT)  
 1 miles SW of Morgan Hill, CA  
 Issued by National Weather Service WFO MTR  
 1056 AM PST Wed Dec 13 2023

**(She had 6 of these...)**

Date	Wed Dec 13				Thu Dec 14				Fri Dec 15				Sat Dec 16				Sun Dec 17				Mon Dec 18				Tue Dec 19							
High Temp(F)	67				69				70				74				62				63				61							
Low Temp(F)	39				42				44				46				49				51				49							
Time	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm	4am	10am	4pm	10pm												
Temp(F)	41	51	64	49	44	54	65	51	46	58	66	52	48	58	69	56	50	54	59	55	53	56	61	56	52	55	59	54	52	55	52	51
Dew Point(F)	41	44	40	41	37	38	37	37	35	39	37	35	32	34	37	38	40	49	50	52	52	56	55	54	52	55	52	51				
Relative Humidity(%)	99	76	42	73	77	54	35	58	67	49	34	50	54	40	31	52	70	82	73	88	98	100	80	91	100	100	77	90				
Wind Direction	N	NW	W	SE	E	SE	NW	E	E	E	E	E	E	SE	SE	E	E	E	E	SE	SE	SE	SE	S	SE	SE	S	SW	S			
Wind Speed(mph)	3	6	7	3	2	5	6	3	3	6	8	6	6	10	10	6	8	10	12	9	9	10	10	7	5	8	10	8				
Wind Gust(mph)	5	8	10	6	5	7	9	6	6	9	12	8	9	16	16	10	12	15	17	14	13	15	16	10	8	12	16	12				
Cloud Cover(%)	20	5	30	60	50	35	70	55	55	50	70	40	15	20	55	0.84 > 0.5				0.46 > 0.25				0.20 < 0.25				70				
Prob. of Precip(%)	--	--	--	--	--	--	--	--	--	--	--	--	--	15	35	55	70	85	90	85	80	80	70	50	40	60	60	55				
6 Hr. Precip(in)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.09	0.26	0.31	0.18	0.07	0.22	0.09	0.08	0.02	0.03	0.07	0.08	0.17				
6 Hr. Snow(in)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0	QPE		0.0	0.0	QPE		0.0	No QPE				0	0.0			
Snow Level(ft)	5800	5800	5800	5700	5700	5700	5800	5800	6100	6000	6200	6600	6500	7500	8800	9300	3500	780			500	7000	7000	7000	7000	6600						



## A Survey

*How many construction sites does your firm support?*

- a) 1-5
- b) 6-10
- c) 11-20
- d) More than 20

# The Cost of Compliance?

## Inputs

Staff Cost (\$/hr)

Number of Sites to Monitor

Min Per Site for QPE evaluation

Calculate Annual Staff Cost

## Calculation

*Cost = Staff Rate x  
Num. Sites x  
Hrs./Site x  
Days/Week x  
Weeks/Mo x  
Mos./year*



**\$ 430 / year**

# ***“We can automate this.”***

## ***The NWS API***

- Gives access to up-to-date weather information from the thousands of grid-point locations across the country
- Rich data sets for each location, updated multiple times per day
- Note: The NWS API is used to generate the Weather Table available from the NWS Web Site



# What's an 'API'?

- API = “Application Programming Interface”
- A Web Browser provides a “User Interface”
- An API provides a “Developer Interface”
- Like your browser, the NWS API uses URLs (web addresses) to access data
- [https://api.weather.gov/...](https://api.weather.gov/)
- Instead of a web page, the NWS API returns text in a nicely-structured format for other computers

```
mirror_mod = modifier_ob.  
# Add mirror object to mirror  
mirror_mod.mirror_object =  
    operation == "MIRROR_X":  
    mirror_mod.use_x = True  
    mirror_mod.use_y = False  
    mirror_mod.use_z = False  
    operation == "MIRROR_Y":  
    mirror_mod.use_x = False  
    mirror_mod.use_y = True  
    mirror_mod.use_z = False  
    operation == "MIRROR_Z":  
    mirror_mod.use_x = False  
    mirror_mod.use_y = False  
    mirror_mod.use_z = True  
  
#selection at the end -add  
mirror_ob.select= 1  
modifier_ob.select=1  
context.scene.objects.active  
("Selected" + str(modifier_ob.  
mirror_ob.select = 0  
= bpy.context.selected_object  
data.objects[one.name].select  
  
print("please select exactly  
  
-- OPERATOR CLASSES ----  
  
types.Operator):  
X mirror to the selected  
object.mirror_mirror_x"  
mirror X"  
  
context):  
context.active_object is not
```

# Using the NWS API - Examples

Ask for information about a GPS location. (Lat, Lon)

<https://api.weather.gov/points/{lat},{lon}>

“nicely-structured”?

```
52 ]
53 },
54 "properties": {
55   "@id": "https://api.weather.gov/points/37.3382,-121.8863",
56   "@type": "wx:Point",
57   "cwa": "MTR",
58   "forecastOffice": "https://api.weather.gov/offices/MTR",
59   "gridId": "MTR",
60   "gridX": 99,
61   "gridY": 82,
62   "forecast": "https://api.weather.gov/gridpoints/MTR/99,82/forecast",
63   "forecastHourly": "https://api.weather.gov/gridpoints/MTR/99,82/forecast/hourly",
64   "forecastGridData": "https://api.weather.gov/gridpoints/MTR/99,82",
65   "observationStations": "https://api.weather.gov/gridpoints/MTR/99,82/stations",
66   "relativeLocation": {
67     "type": "Feature",
68     "geometry": {
69       "type": "Point",
```

Grid-point at this GPS Location

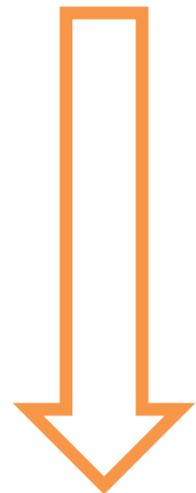
Link to Detailed Forecast Data for this Grid-point

# Using the NWS API - Examples

## Ask for a forecast

`https://api.weather.gov/gridpoints/{gridID}/{gridX},{gridY}`

> 8000  
Lines



```
4699     "values": []
4700   },
4701   "probabilityOfPrecipitation": {
4702     "uom": "wmoUnit:percent",
4703     "values": [
4704       {
4705         "validTime": "2024-09-17T09:00:00+00:00/PT3H",
4706         "value": 1
4707       },
4708       {
4709         "validTime": "2024-09-17T12:00:00+00:00/PT6H",
4710         "value": 2
4711       },
4712       {
4713         "validTime": "2024-09-17T18:00:00+00:00/PT12H",
4714         "value": 8
4715       },
4716       {
4717         "validTime": "2024-09-18T06:00:00+00:00/PT6H",
4718         "value": 9
4719       }
4720     ]
4721   }
4722 }
```

Probability of Precipitation (%)

Value=1 valid for 3hrs from this time

Value=2 valid for 6hrs from this time

Value=8 valid for 12hrs from this time



# Reports View

## National Weather Service Grid Point: MEG/42/67

Forecast Last Updated: Wednesday September, 11 - 09:41

Hourly Forecast Table: [MEG/42/67](#)

Hourly Graph: [View](#)

### Sites

Site Name	Address
Memphis	Memphis, TN, USA

### Qualifying Precipitation Events (QPEs)

Number of QPE Events: 1

Wed Sep 11				Thu Sep 12				Fri Sep 13				Sat Sep 14				Sun Sep 15				Mon Sep 16				Tue Sep 17			
05am	11am	05pm	11pm																								
0%	0%	0%	5%	85%	95%	85%	70%	60%	50%	30%	20%	10%	15%	5%	10%	5%	15%	10%	10%	15%	20%	5%	10%	10%	15%	0%	5%
0.0	0.0	0.0	0.03	1.24	1.43	0.52	0.26	0.19	0.09	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.13
				3.45				0.30				0.00															

Event	Date	Time (US/Pacific)	Prob (%)	24 Hr.Quant (in)
Begins	2024-09-12	05:00	85	3.45
Ends	2024-09-14	05:00	10	0.00



# QPE Assistant

A Tool for Stormwater Professionals

Web User  
Interface

Data Mgt

Background  
Services

GoogleMaps API

Historical Data

Forecasts

Geocoding API

User Data

Notifications

[api.weather.gov](https://api.weather.gov)

# QPEA Features



- Secure Registration
- Site Creation
- QPE Reports
- NWS Forecast History
- Email Notifications
- Delegates / Inspectors
- One Site Always Free!
- Extended Plans Available



# QPE Assistant



# The Cuyahoga River Today

## Summary

- The Origins of the CGP
  - “Why we are here?”
- An Introduction to the 2022 CGP
- Predicting QPEs
- QPEs and CGP 2022 Compliance
- An Introduction to ***QPE Assistant***
  - A resource for the community



2019 “River of the Year” by  
the American Rivers Conservation Association



*Thank You!*

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*...Questions?*



# Contact Us



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