# San Diego County Air Pollution Control District (District)

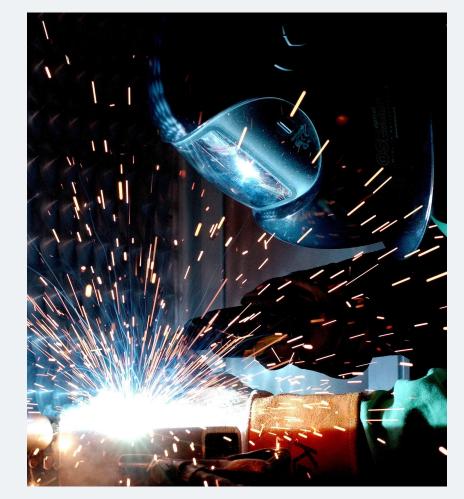


Welding Operations Public Meeting April 20, 2022

### **Welding Operations**

 Metal welding is a fabrication process whereby two or more parts are fused together by means of heat forming a join as the parts cool.

 Welding operations can create air toxic emissions that can create adverse health effects.



### **Different Types of Welding**

#### "SAW"

Submerged Arc Welding

#### "FCAW"

Flux-Cored Arc Welding

#### "SMAW"

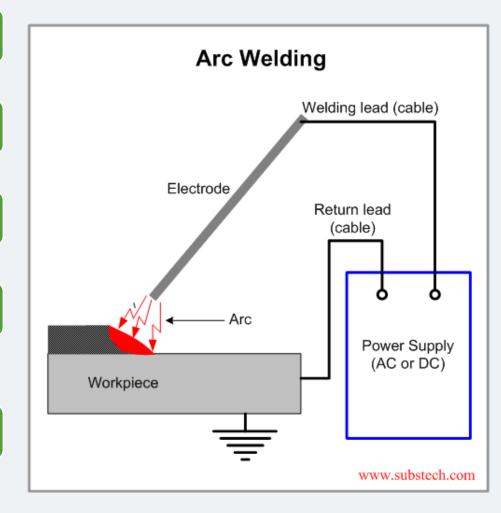
Shielded Metal Arc Welding

#### "GMAW"

Gas Metal Arc Welding a.k.a. "MIG" – Metal Inert
 Gas

#### "GTAW"

 Gas Tungsten Arc Welding a.k.a. "TIG" – Tungsten Inert Gas



### **Emissions from Welding Operations**

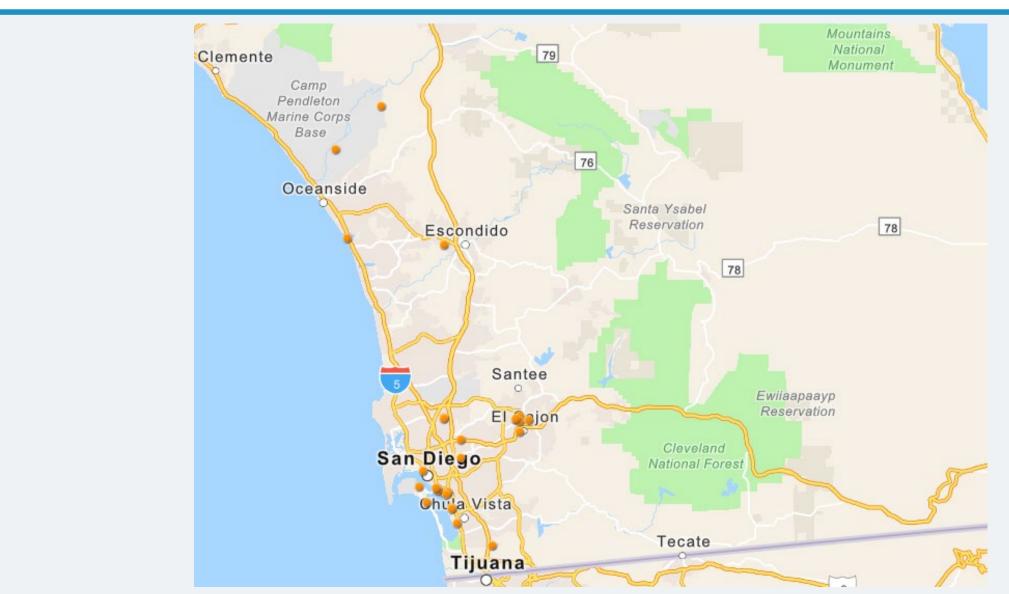
#### Emissions from Welding Fumes

- Particulate Matter (PM)
- Heavy Metals (Cr, Cr +6, Ni, Pb, Cd, Mn)

### What Impacts Emissions from Welding Operations

- Fume Generation Rate
- Fume Correction Factor
- Composition of Welding Rod
- Conversion of Total Cr to Cr+6

# Welding Operations Regulated under the Hot Spots Program



## **Welding Operations Data Request & Advisory\***



	Facility Name:	
	Facility Address:	
	Description of Facility Activities:	
2.	Does this facility perform welding a	t this location?
	☐Yes ☐ No, skip to 0	Question #9
3.	Did any of the welding activities beg	gin at this location after November 15, 2000?
	☐ Yes ☐ No	
4.	Were the welding operations at this increased air emissions? <sup>1</sup>	location modified after November 15, 2000 in such a manner that
	Yes, please describe the nature of	f the modification below (or attach more details) \( \sum \) No, skip to Question #9

# Welding Operations Data Request Outcomes



## New Welding Operations

Identified ~ 190 additional welding operations

### **New Welding Rods**

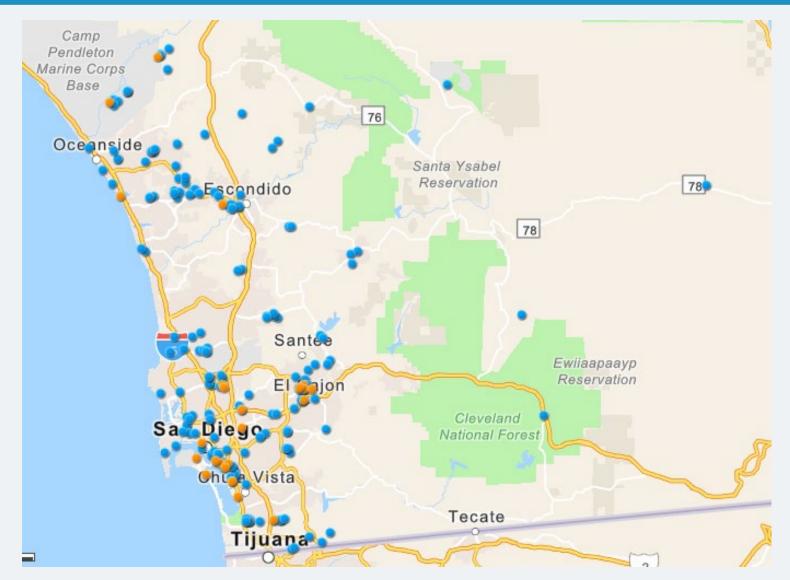
Identified seventeen (17) new rod compositions

## **Enhanced Emission Calculations**

 Applied a study by the Air & Waste Management Association (AMWA) and updated emissions calculations

## Welding Operations Existing Operations





- Facilities that conduct welding
- Welding operations evaluated under the Hot Spots Program

### Welding Operations Emission Calculation Procedures\*



His	toric
1 - SUBMERGED ARC WELDING (SAW), EM12K	17 - Shielded Metal Arc Welding (SMAW)-E 316
2 - FLUX CORE ARC WELDING (FCAW), E70T	18 - Shielded Metal Arc Welding (SMAW)-E 410
3 - Flux Core Arc Welding (FCAW)-E 71T	19 - Shielded Metal Arc Welding (SMAW)-E 6010
4 - Flux Core Arc Welding (FCAW)-E 110	20 - Shielded Metal Arc Welding (SMAW)-E 6011
5 - Flux Core Arc Welding (FCAW)-E 308LT	21 - Shielded Metal Arc Welding (SMAW)-E 6012
6 - Flux Core Arc Welding (FCAW)-E 316LT	22 - Shielded Metal Arc Welding (SMAW)-E 6013
7 - Flux Core Arc Welding (FCAW)-E 11018	23 - Shielded Metal Arc Welding (SMAW)-E 7018
8 - Gas Metal Arc Welding (GMAW)-E 70S	24 - Shielded Metal Arc Welding (SMAW)-E 7024
9 - Gas Metal Arc Welding (GMAW)-E 308L	25 - Shielded Metal Arc Welding (SMAW)-E 7028
10 - Gas Metal Arc Welding (GMAW)-ER 316	26 - Shielded Metal Arc Welding (SMAW)-E 8018
11 - Gas Metal Arc Welding (GMAW)-ER 1260	27 - Shielded Metal Arc Welding (SMAW)-E 9018
12 - Gas Metal Arc Welding (GMAW)-ER 5154	28 - Shielded Metal Arc Welding (SMAW)-E 11018
13 - Gas Metal Arc Welding (GMAW)-ER NiCrMo	29 - Shielded Metal Arc Welding (SMAW)-E CoCr
14 - Gas Metal Arc Welding (GMAW)-ER NiCu	30 - Shielded Metal Arc Welding (SMAW)-E 14Mn-4Cr
15 - Shielded Metal Arc Welding (SMAW)-E 308	31 - Shielded Metal Arc Welding (SMAW)-E NiCr
16 - Shielded Metal Arc Welding (SMAW)-E 310	32 - Shielded Metal Arc Welding (SMAW)-E NiCrMo

New* District Welding Study Ro	ds
33 - 4043	
34 - 5356	
35 - 309	
36 - 347	
37 - RN60	
38 - RN67	
39 - 4130	
40 - 5554	
41 - 5556	
42 - 718	
43 - 80S	
44 - 90S	
45 - 5786	
46 - 9015	
47 - ERTi-2	
48 - INCO 62	
49 - L-56	

**Emissions Calculation Procedures** 

### Welding Operations Emission Calculation Procedures



Welding		Historic		Revised						
Process	FGR	FCF	Cr(VI) Conv	FGR	FCF	Cr(VI) Conv				
SAW	5.00E-05	0.2865	-	5.00E-05	0.2865	0.0005				
FCAW	2.00E-02	0.2865	0.63	2.00E-02	0.2865	0.1				
SMAW	2.00E-02	0.2865	0.63	2.00E-02	0.2865	0.55				
GMAW/MIG/ TIG	1.00E-02	0.5464	0.05	1.00E-02	0.5464	0.05				

FGR = Fume Generation Rate
FCF = Fume Correction Factor
Cr(VI) Conv. = Conversion ratio of total chromium to Cr(VI)

# Welding Operations Permitting Requirements



Exemption

 Rule 11 exempts brazing and welding equipment, including arc welding equipment and laser welding, that DOES NOT create elevated health risks in accordance with Rule 1200

Exception

• Operations for which construction or modification commenced prior to November 15, 2000 and those operations were not subsequently modified in such a manner that increases emissions of toxic air contaminants

## Welding Operations Permit Screening Tool



#### Welding Permit Screening Tool



# Welding Operations Permit Screening Tool



							Weldir	ng Perm	it Scree	ening Too	ol <sub>(v22032)</sub>							
						Permit De												
Data Entry  Meteorological Station: KVR								l Cancer Risk		0 in a million								
Rural or Urban:	Rural							Chronic HH										
Nearest Residence:	30	Feet						er Cancer Risk: 0.00 in a million				xempt as						
Nearest Worker:	30	Feet						Chronic HH			Eval	uated						
PMI:	30	Feet						te HHI	0.0	0								
							Total Risk	per Rod at	Recentors				Rod Risk	,			χ/Q	
		Maximum		5			. Otal Mak	par nou ut					nou mar				,, <u> </u>	
	Annual Rod	Hourly	Use for	In Acute Calculation		Resident	Resident	Worker	Worker		Resident	Resident	Worker	Worker				
Rod and Welding type	Usage (lbs)	Usage (lbs)		Calcu	Shift	Cancer	Chronic	Cancer	Chronic	Acute	Cancer	Chronic	Cancer	Chronic	Acute	Resident	Worker	PMI
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# Welding Operations Permit Screening Tool Demonstration



							Welding	g Permi	t Screei	ning Too	(v22032)							
Data Entry							Scre	ening Re	sults and	Permit De	eterminat	tion						
Meteorological Station:							Residential			in a million								
_	Rural						Residential (	Chronic HHI:	HI: 0.00		Permit Exempt as							
Nearest Residence:	195	Feet					Worker	Cancer Risk:										
Nearest Worker:	130	Feet					Worker (	Chronic HHI:	0.00		Eval	uated						
PMI:	130	Feet					Acute	HHI	0.16									
							Total Risk p	er Rod at	Receptors				Rod Risk				χ/Q	
		Maximum																
	Annual Rod	<b>Hourly Usage</b>	Use for	In Acute Calculation		Resident	Resident	Worker	Worker		Resident	Resident	Worker	Worker				
Rod and Welding type	Usage (lbs)	(lbs)	Acute	Calo	Shift	Cancer	Chronic	Cancer	Chronic	Acute	Cancer	Chronic	Cancer	Chronic	Acute	Resident	Worker	PMI
E6010-SMAW	15	1		Υ	24	8.63E-08	2.63E-03	5.35E-08	4.84E-03	1.58E-01	6.338E-08	0.0019333	2.135E-08	0.0019333	0.371	1105.6873	2031.5857	62911.85
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# Welding Operations Permit Screening Tool Demonstration



							Welding	g Permi	t Screei	ning Too	(v22032)							
	Data	a Entry					Scre	ening Res	sults and	Permit De	eterminat	ion						
Meteorological Station:		,						10 in a million										
Rural or Urban:	Rural						Residential Cancer Risk: Residential Chronic HHI:			HI: 0.00								
Nearest Residence:	195	Feet						Cancer Risk:			Permit Application							
Nearest Worker:	130	Feet						r Chronic HHI: 0.01			Req	uired						
PMI:	130	Feet					Acute		0.17									
							Total Risk p	or Pod at I	Pacantars				Rod Risk				y/O	
		Maximum		_			rotal Kisk p	er nou at i	Receptors				NOU NISK			χ/Q		
	Annual Rod	Hourly Usage	Use for	at e		Resident	Resident	Worker	Worker		Resident	Resident	Worker	Worker				
Rod and Welding type	Usage (lbs)	(lbs)	Acute	In Acute Calculati	Shift					Acute	Cancer	Chronic	Cancer	Chronic	Acute	Resident	Worker	PMI
E6010-SMAW	15	1	ricate	N	24	8.63E-08						0.0019333				1105.6873		
E308-SMAW	2	0.1		Υ	24	2.01E-06				1.70E-01		0.0006919						62911.851
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				N	24													
				N	24													
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### **Next Steps**



1

Apply Calculation Methodologies

7

 Identify Facilities Subject to Permitting Requirements per Rule 11

3

 Notify Facilities Subject to Permitting Requirement and Require Applications within 6 months

### **Additional Information**



- Welding webpage:
  - https://bit.ly/38V5gC6

- Questions?
  - Email at: <u>apcdengineering@sdapcd.org</u>
  - Call us at: 858-586-2600