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# Air Quality, Science and Public Health

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Environmental Law Education Center: Air Quality Seminar

April 18, 2016



PUBLIC HEALTH DIVISION

Environmental Public Health Section

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# Environmental Health: OHA and DEQ and Roles

## OHA

- What level of contaminants in the environment are acceptable?
- What do environmental sampling results mean for the health of Oregonians?
- Assess health of community (cancer rate investigations, biomonitoring, other indicators of population health)

## DEQ

- What contaminants are in the environment?
- How much?
- Where are they coming from?
- Source control and clean-up

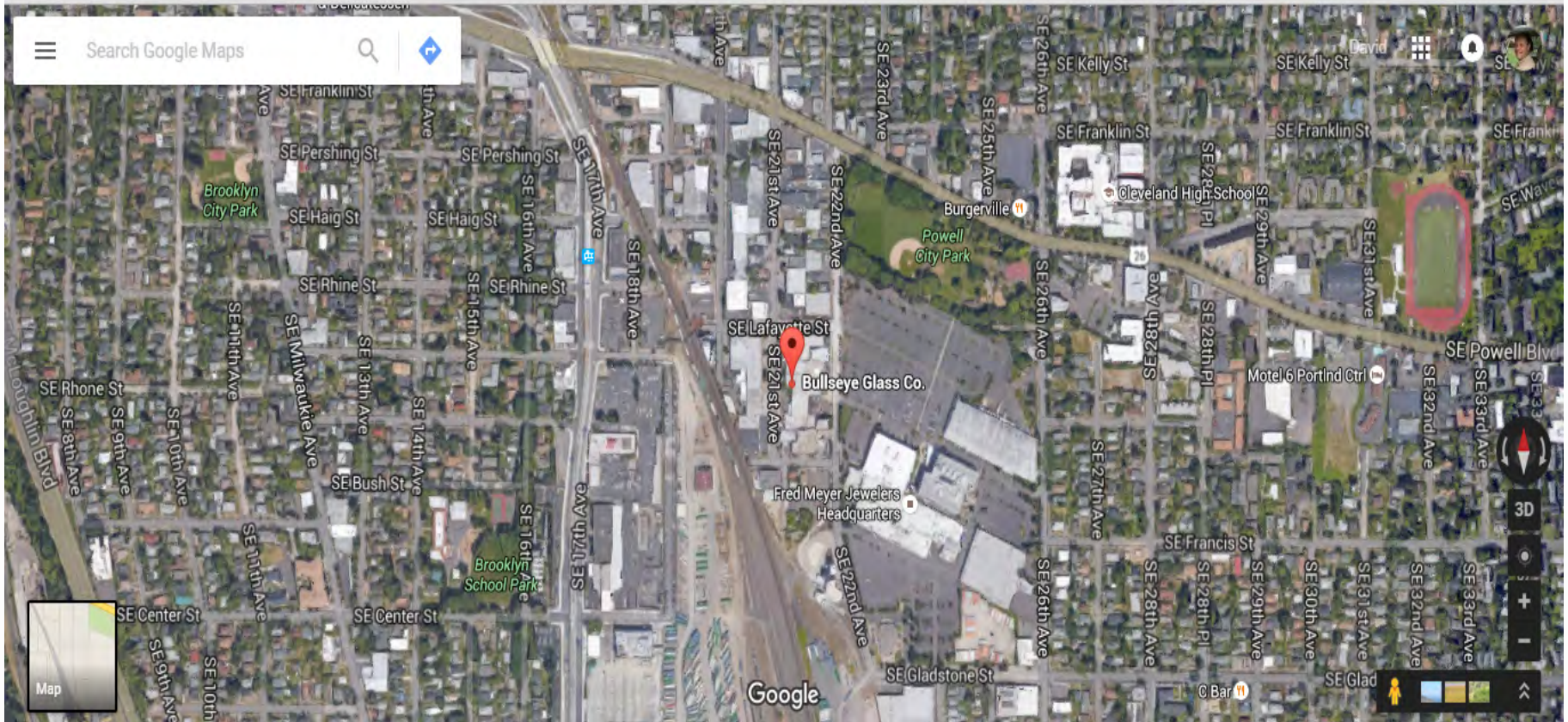
# Components of Response: Portland Metals

- Environmental sampling – soil, additional air (DEQ – input from OHA)
- Clinician guidance developed (First version online Feb. 5, several updates since) (Multco Health Officer, Oregon Poison Center, Pediatric Environmental Health Specialty Unit)
- Environmental Public Health Assessments (PHD – EHAP)
- Urine cadmium results became mandatory reporting Feb. 18 (PHD)
- Cancer investigations (PHD – OSCaR)
- Criteria to prioritize additional “moss hotspots” for additional investigation
- Regulation (DEQ – close collaboration with OHA)
- Three large public meetings plus meetings with parents at daycare (Multco, DEQ, OHA)
- Preparations for additional community engagement moving forward (Multco, DEQ, OHA)

# Development of Air Quality Goals

- Ambient Benchmark Concentrations (Air Toxics Science Advisory Committee)
- 24-Hour Screening Levels (Toxicologists at OHA and DEQ)

# Map of Bullseye Area



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# October 2015 Air Data – Available 1/21/2016

Metal	30-Day Average (ng/m <sup>3</sup> )	Ambient Benchmark Concentration (ng/m <sup>3</sup> )	Health Effect Driving ABC
Arsenic	31.7	0.2	Cancer
Beryllium	0.016	0.4	Cancer
Cadmium	29.4	0.6	Cancer
Chromium (total)	71.5	NA	---
Cobalt	0.9	100	↓ Lung Function
Lead	42.9	150	Neurotox
Manganese	18.6	90	Neurotox
Nickel	5.4	4	Cancer
Selenium	44.3	NA	---



# Potential Health Effects

- Arsenic
  - Lung cancer, bladder cancer, basal and squamous cell carcinomas
  - Skin abnormalities
  - Peripheral neuropathy
  - Neurodevelopmental deficits (only ever observed when exposure was via drinking water)
- Cadmium
  - Lung cancer (only when inhaled)
  - Lung and respiratory inflammation (only when inhaled)
  - Kidney damage – tubular necrosis
  - Skeletal brittleness
  - Some evidence of neurodevelopmental deficits

# Potential Health Effects

- Chromium +6
  - Lung cancer only when inhaled, some evidence of stomach cancer when swallowed
  - Lung irritation and ulceration at much higher levels (inhalation only)



# Oregon 24-Hour Screening Levels

Metal	Oregon 24-Hour Screening Level (ng/m <sup>3</sup> )	Texas (ng/m <sup>3</sup> )	New Hampshire (ng/m <sup>3</sup> )	Ontario (ng/m <sup>3</sup> )	ATSDR (ng/m <sup>3</sup> )
Arsenic	36	3000	36	300	NA
Beryllium	10	20	180	10	NA
Cadmium	30	100	36	25	30
Chromium (total)	---	---	---	---	---
Chromium 6	36	390	36	0.35	NA
Cobalt	100	200	71	100	NA
Lead	150	150	150	500	NA
Manganese	400	2000	1000	400	NA
Nickel	200	330	360	200	NA
Selenium	710	2000	710	10000	NA

# Oregon 24-Hour Screening Levels – Driving health effects

Metal	Oregon 24-Hour Screening Level (ng/m <sup>3</sup> )	Driving Health Effect
Arsenic	36	Respiratory irritation
Beryllium	10	Lung inflammation
Cadmium	30	Lung inflammation
Chromium (total)	---	---
Chromium 6	36	Respiratory irritation
Cobalt	100	↓ Lung Function
Lead	150	Neurotox
Manganese	400	Neurotox
Nickel	200	Lung inflammation
Selenium	710	Respiratory irritation

## October 2015 Air Data – Available 1/21/2016

Metal	30-Day Average (ng/m <sup>3</sup> )	Ambient Benchmark Concentration (ng/m <sup>3</sup> )	Oregon 24-Hour Screening Level (ng/m <sup>3</sup> )
Arsenic	31.7	0.2	36
Beryllium	0.016	0.4	10
Cadmium	29.4	0.6	30
Chromium (total)	71.5	NA	NA
Cobalt	0.9	100	100
Lead	42.9	150	150
Manganese	18.6	90	400
Nickel	5.4	4	200
Selenium	44.3	NA	710