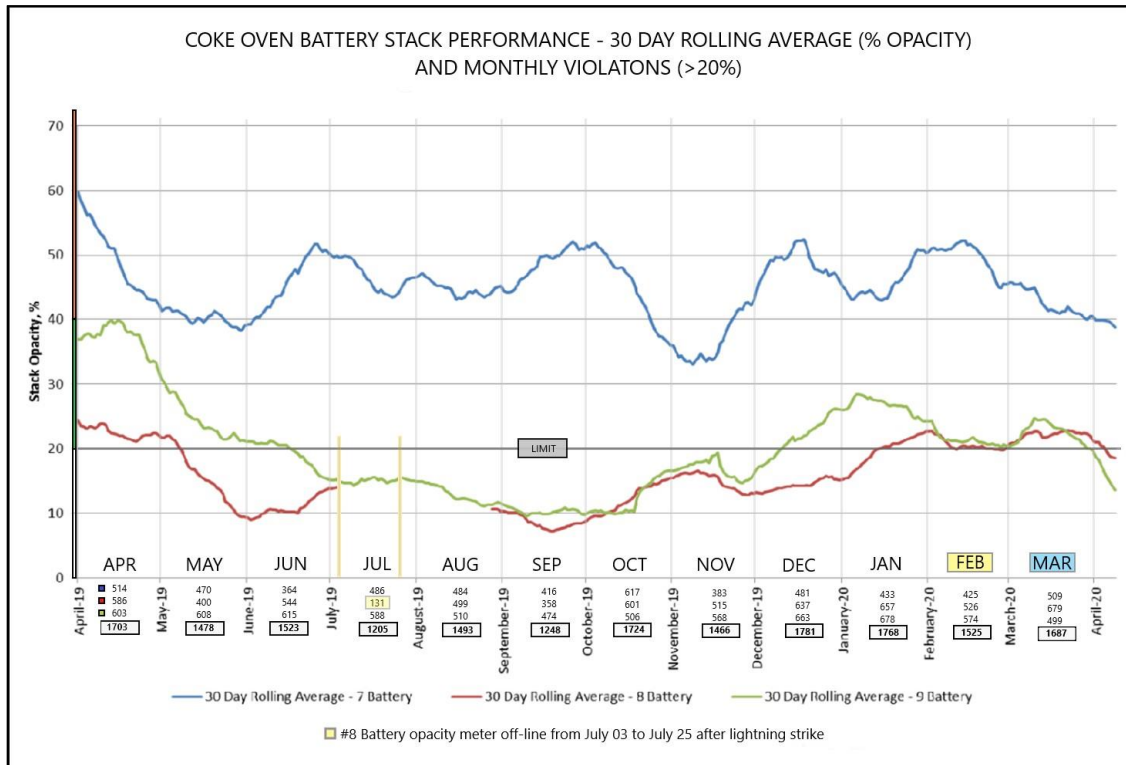




## ALGOMA STEEL INC. COKE OVEN BATTERY OPACITY VIOLATIONS (2019-2020)



Modified from: ASI ACLC Meeting Presentation #33, June 09, 2020, slide 7.

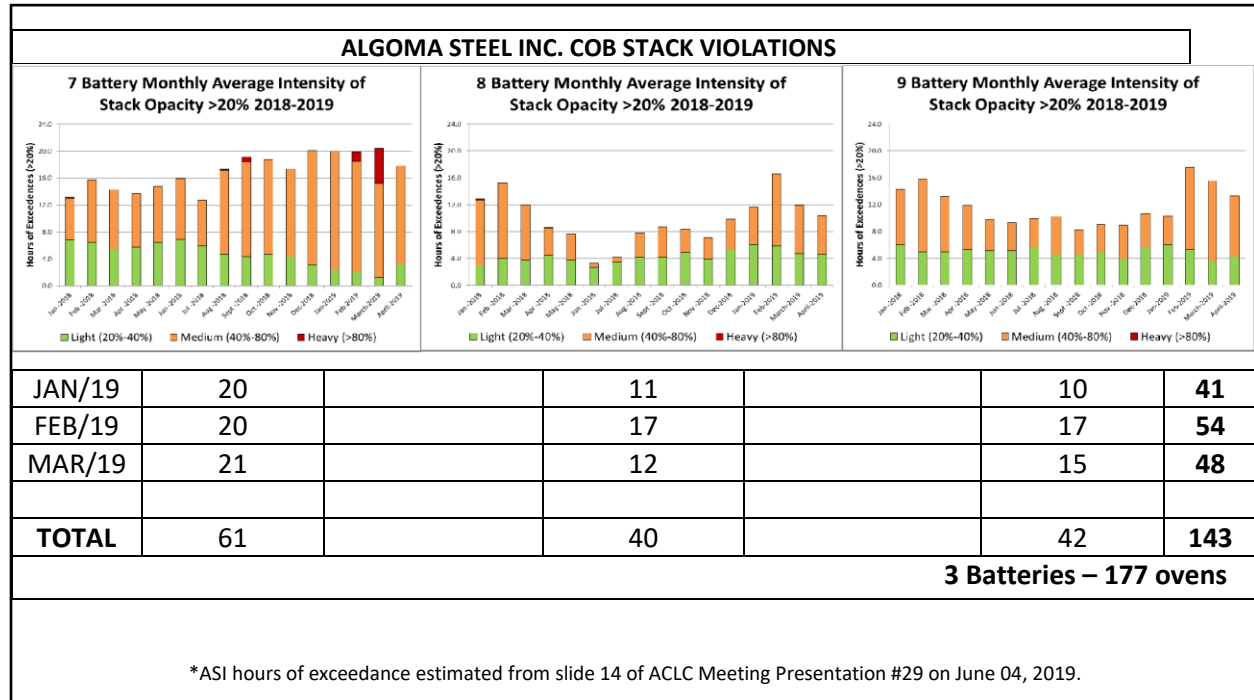
**COMPARISON OF ASI COKE OVEN BATTERY STACK  
MONTHLY VIOLATIONS FOR 2019-2020**

Total Year Violations 2019					Total Year Violations 2020				
Month	7 Battery	8 Battery	9 Battery		Month	7 Battery	8 Battery	9 Battery	
JAN	no data	no data	no data	no data	JAN	433	657	678	1768
FEB	270	545	530	1345	FEB	425	526	574	1525
MAR	323	633	488	1444	MAR	509	679	499	1687
APR	514	586	603	1703	APR	437	610	618	1665
MAY	470	400	608	1478	MAY	341	443	638	1422
JUN	364	544	615	1523	JUN	506	484	562	1552
JUL	486	131	588	1205	JUL	479	462	444	1385
AUG	484	499	510	1493	AUG	324	536	349	1209
SEPT	416	358	474	1248	SEPT*	117	323	198	638
OCT	617	601	506	1724	OCT	*	*	*	*
NOV	383	515	568	1466	NOV				
DEC	481	637	663	1781	DEC				
TOTAL	4808	5449	6153	16410	TOTAL	3571	4720	4560	12851

All data compiled from ASI Process Upset Tables  
 \*Data incomplete, data no longer posted on ASI Process Upset Table

Chart showing the difference in the number of monthly violations from 2019 to 2020.

**COMPARISON OF HOURS OF STACK VIOLATIONS TO ALLEGHENY COUNTY FINES FOR US STEEL – (CLAIRTON) 2019**



**Photo 1:** Modified from: ASI ACLC Meeting Presentation #29, June 04, 2019, slide 14

**UNITED STATES STEEL - CLAIRTON PLANT  
OPACITY VIOLATIONS (HOURS OF EXCEEDENCE >20%)**

Combustion Stack COM Non-compliant Clock Hours

Battery	July	August	September	Total Clock Hours 2nd Qtr 2019	amount
1	5	2	4	11	\$2,200
2	13	12	10	35	\$8,600 *
3	4	5	10	19	\$3,800
13	2	2	6	10	\$2,000
14	4	2	8	14	\$2,800
15	3	10	11	24	\$4,800
19	3	9	10	22	\$4,400
20	13	1	1	15	\$3,000
B	5	5	2	12	\$2,400
C	0	1	1	2	\$400
<b>Count:</b>	<b>52</b>	<b>49</b>	<b>63</b>	<b>164</b>	<b>\$34,400 subtotal</b>

\* Note: 33 hrs. @ \$200 & 2 hrs. @ \$1000 = \$8,600

**10 Batteries - 708 ovens**

Modified from: \*Report by Allegheny Health Department Air Quality Program (January 14, 2020), pg.9

\*United States Steel Clairton Plant; Demand for Stipulated Penalties Under Settlement Agreement and Order #190604 Section IX. Stipulated Penalties April 1, 2019 through September 30, 2019 (2<sup>nd</sup> and 3<sup>rd</sup> Quarters)

**Note:** There is currently no fines issued for opacity violations at ASI. US regulations in Allegheny County are also stricter than Ontario where an opacity violation (>20%) occurs after 3 consecutive minutes versus 6 consecutive minutes in Ontario.

**MARCH 09, 2019 HEAVY EMISSIONS EVENT COMPARED TO TYPICAL EMISSIONS**

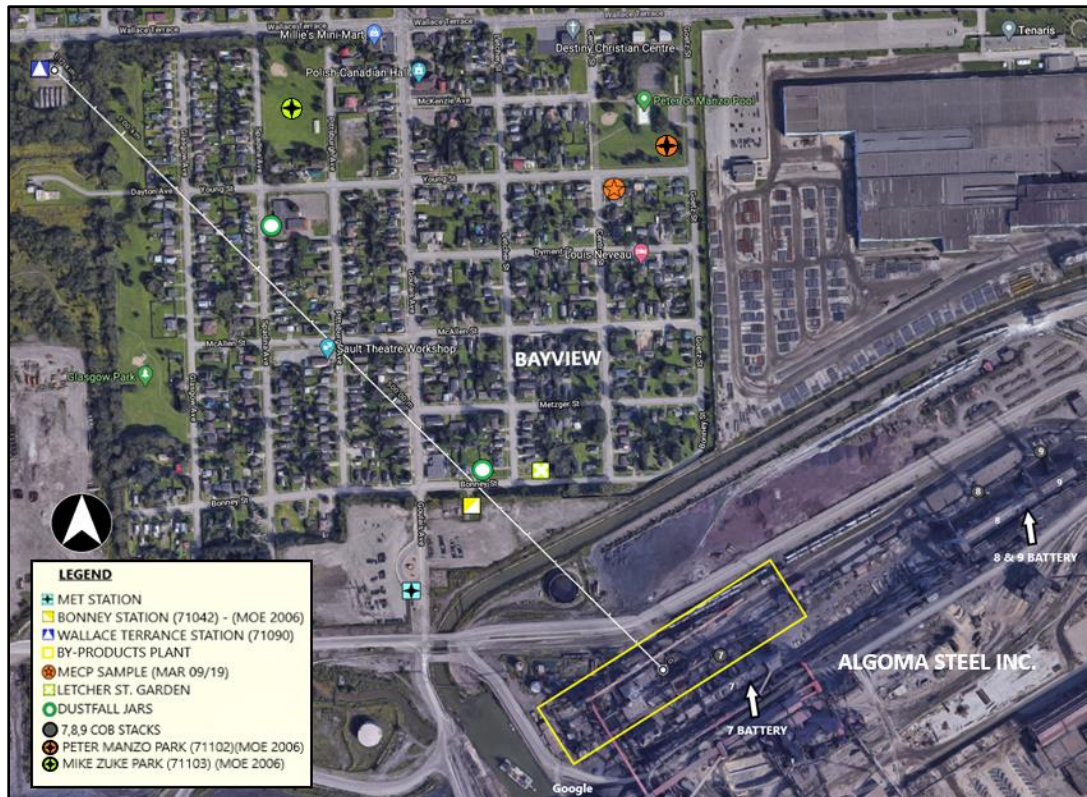


Heavy emissions from ASI at 10:39 am photographed from Cathcart St. - March 09/19



A view of "normal" or typical emissions from ASI (L to R: 7,8 and 9 battery stacks) - April 24/19

## MECP PARTICULATE SAMPLE RELATIVE TO HISTORICAL DEPOSITION (AIR) 2006



Modified google map showing monitoring devices relative to sources of contaminants

The continuous particulate monitoring illustrated that TSP concentrations quickly decline as one moves away from the ASI property line. The majority of exceedances of the schedule 1 0.5-hr suspended particulate standard and the highest TSP concentrations were measured at the 71042 Bonney St. location which is on the fence-line of ASI. The 71042 Bonney St. data also showed that storage piles and unpaved areas associated with ASI are the most significant contributor to TSP concentrations at this location.

There were over 1000 exceedances measured of the schedule 1 0.5-hr standard at 71042 Bonney St. The other two sites within the Bayview area (71102 Peter Manzo Pool and 71103 Mike Zuke Park) had approximately 6 to 8 times fewer 0.5-hr suspended particulate exceedances: the number of exceedances at these locations was comparable to those measured at locations outside the Bayview area (i.e., 71100 WESTP, 71101 Second Line West Pump House, 71104 Cathcart).

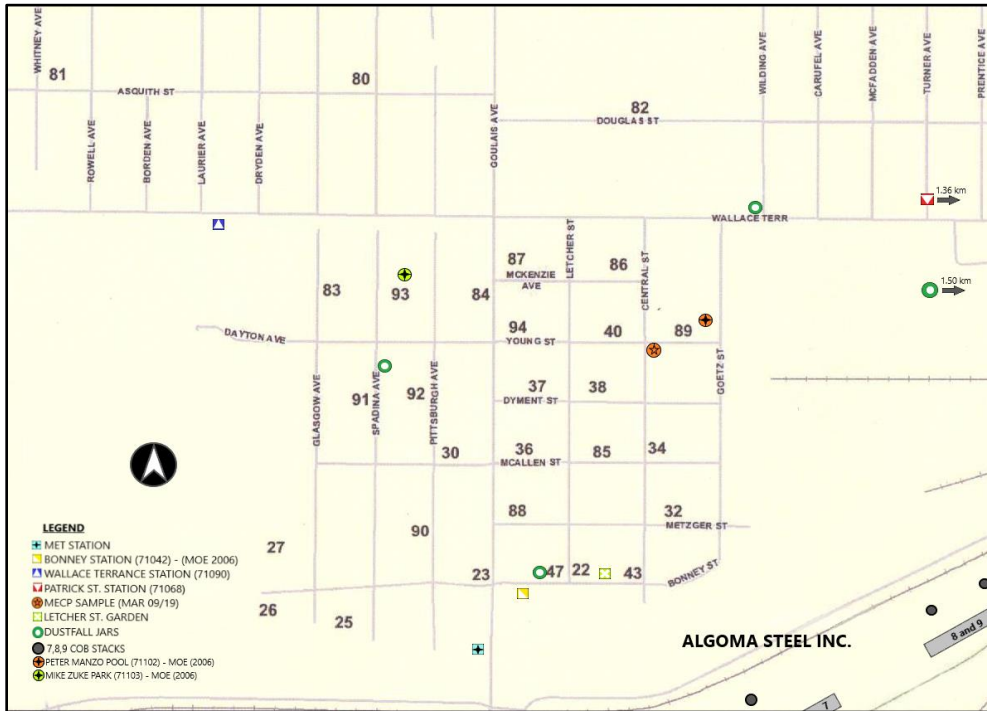
Through averages calculated from the continuous data, 71042 Bonney St. also recorded the highest number of exceedances of the schedule 3 24-hr suspended particulate standard with 33. The only other location at which the 24-hr standard was exceeded was 71101 Second Line West Pump House. 24-hr TSP averages were highest at Bonney St.: averages at the other Bayview monitoring stations were comparable to those outside Bayview.

Portion of the conclusion of MOE particulate study conducted in 2006\*

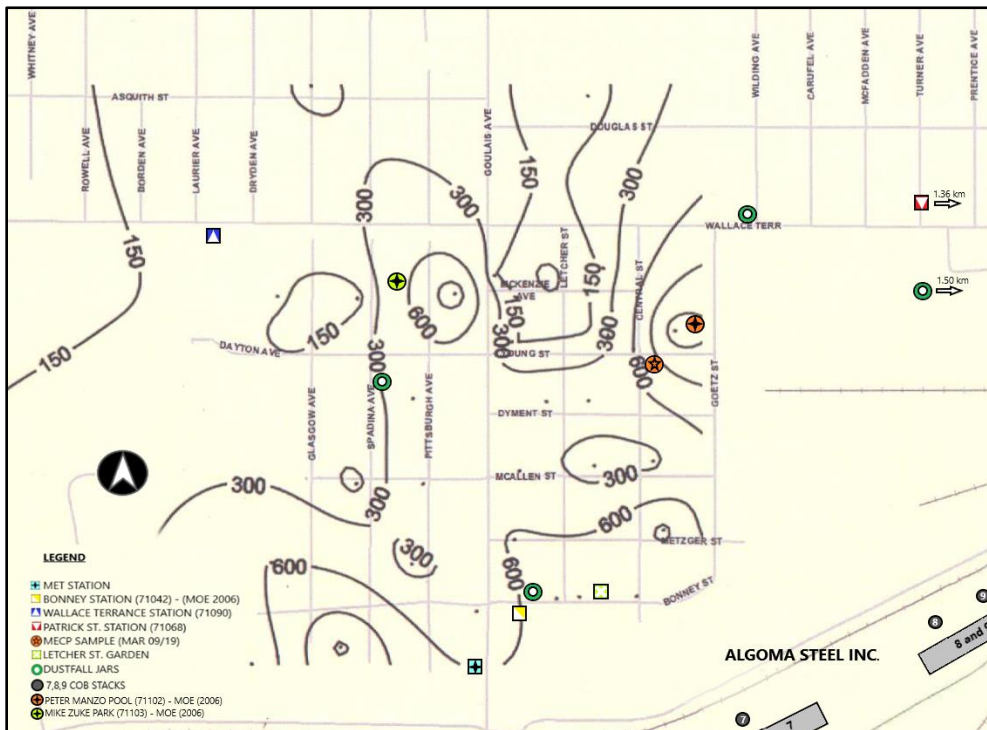
\*Report on Sault Ste. Marie 2006 Particulate Monitoring Special Study, pg. 19

**Note:** The only current continuous monitor close ASI's property line near Bayview is the Wallace Terrace Station (71090)

**BENZO-A-PYRENE CONCENTRATIONS IN SOIL SAMPLES FROM BAYVIEW NEIGHBOURHOOD (SOIL) 2012**



Locations of soil samples taken in MOE soil study\* relative to MECP sample (Mar09/19)



Concentration Contour Map showing pattern of BaP (Benzo-a-pyrene) in surface soil samples

\*Soil Survey in the Bayview Neighbourhood Adjacent to Essar Steel Algoma Incorporated, Sault Ste. Marie, Ontario (2012)

## RESEARCH

## Open Access



# Exposure to air pollution near a steel plant is associated with reduced heart rate variability: a randomised crossover study

Robin H. Shutt<sup>1\*</sup>, Lisa Marie Kauri<sup>1</sup>, Scott Weichenthal<sup>2</sup>, Premkumari Kumarathasan<sup>3</sup>, Renaud Vincent<sup>4</sup>, Errol M. Thomson<sup>4</sup>, Ling Liu<sup>1</sup>, Mamun Mahmud<sup>1</sup>, Sabit Cakmak<sup>1</sup> and Robert Dales<sup>1</sup>

**Abstract**

**Background:** Epidemiological studies have shown that as ambient air pollution (AP) increases the risk of cardiovascular mortality also increases. The mechanisms of this effect may be linked to alterations in autonomic nervous system function. We wished to examine the effects of industrial AP on heart rate variability (HRV), a measure of subtle changes in heart rate and rhythm representing autonomic input to the heart.

**Methods:** Sixty healthy adults were randomized to spend five consecutive 8-h days outdoors in one of two locations: (1) adjacent to a steel plant in the Bayview neighbourhood in Sault Ste Marie Ontario or (2) at a College campus, several kilometers from the plant. Following a 9–16 day washout period, participants spent five consecutive days at the other site. Ambient AP levels and ambulatory electrocardiogram recordings were collected daily. HRV analysis was undertaken on a segment of the ambulatory ECG recording during a 15 min rest period, near the end of the 8-h on-site day. Standard HRV parameters from both time and frequency domains were measured. Ambient AP was measured with fixed site monitors at both sites. Statistical analysis was completed using mixed-effects models.

**Results:** Compared to the College site, HRV was statistically significantly reduced at the Bayview site by 13% (95%CI 3.6,19.2) for the standard deviation of normal to normal, 8% (95%CI 0.1, 4.9) for the percent normal to normal intervals differing by more than 50 ms, and 15% (95%CI 74.9, 571.2) for low frequency power. Levels of carbon monoxide, sulphur dioxide, nitrogen dioxide, and fine and ultrafine particulates were slightly, but statistically significantly, elevated at Bayview when compared to College. Interquartile range changes in individual air pollutants were significantly associated with reductions in HRV measured on the same day. The patterns of effect showed a high degree of consistency, with nearly all pollutants significantly inversely associated with at least one measure of HRV.

**Conclusions:** The significant associations between AP and changes in HRV suggest that ambient AP near a steel plant may impact autonomic nervous system control of the heart.

**Keywords:** Air pollution, Steel production, Heart rate variability, Industrial air pollution, Environment, Epidemiology

\* Correspondence: robin.shutt@hc-sc.gc.ca

<sup>1</sup>Population Studies Division, Environmental Health Science Research Bureau Health Canada, 50 Colombine Driveway, Ottawa, ON K1A 0 K9, Canada

Full list of author information is available at the end of the article



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**LOCAL PRESENTATION BY DR. ROBERT SUPPES SHOWING INCREASED CANCER RATES IN THE P6C AREA CODE**

### Local Importance

- Higher incidence of Follicular Lymphoma within 5 km of industry (22)
- Acute Myeloid leukemia rate significantly higher for Sault Ste. Marie (23)
  - National average rate 30.61 per 1,000,000 persons/year
  - Sault Ste Marie's rate was 44.91
    - ✦ P6C area code had a rate of 65.1

P6C area code has higher rates of acute myeloid leukemia than local and national rates (\*Slide 25)

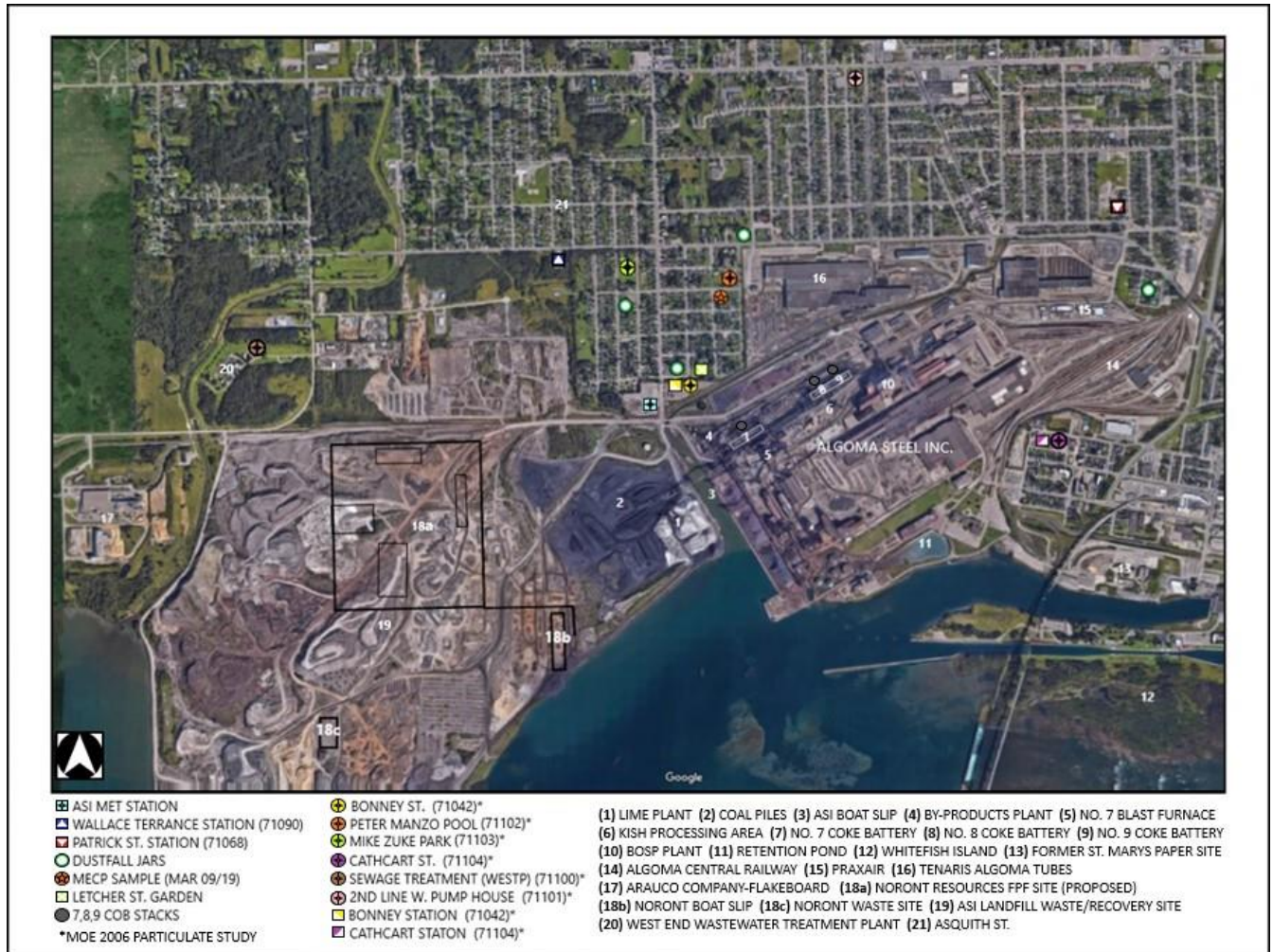


Boundary of the P6C area code (\*Slide 26 - Modified)

\* Ferrochrome in Sault Ste. Marie, Dr. Robert Suppes (Contributors: Dr. Geoff Skelton, Dr. Pedro Antunes), 2019.



## MAP OF LANDMARKS AND LOCATIONS RELATIVE TO ASI'S AAQM NETWORK



Modified Google Image (2020) of current Algoma Steel Inc. AAQM (Ambient Air Quality Monitoring) network with MOE 2006 Aerocet Met Stations, MECP March 09 sample and key landmarks.

**Note:** The only current monitoring station near the Bayview neighbourhood (where the MECP collected a particulate sample on March 09, 2019) which has continuous monitors that measure particulate matter (TSP) and PAHs (ex. benzene) are located at the Wallace Terrance Station (71090)

There are currently no monitoring devices on the east side (Cathcart St.) of ASI in the Jamestown neighbourhood.

The proposed Noront Ltd. Ferrochrome Production Facility (FPF) will have cumulative impacts on air and water quality in the area surrounding Algoma Steel Inc. Health impacts to residents are anticipated due to the highly carcinogenic chemical, Chromium VI, that this facility will generate during its operations. There is insufficient annual continuous real-time and measured data to determine the accuracy and reliability of ASI's AAQM network to account for any potential cumulative impacts from the addition of another industry located on or near their property.