



DPM Exposure in Canadian Mines

Mining Diesel Emissions Conference

November 3rd, 1999





Brunswick Mining Division

Inco Limited

CANMET



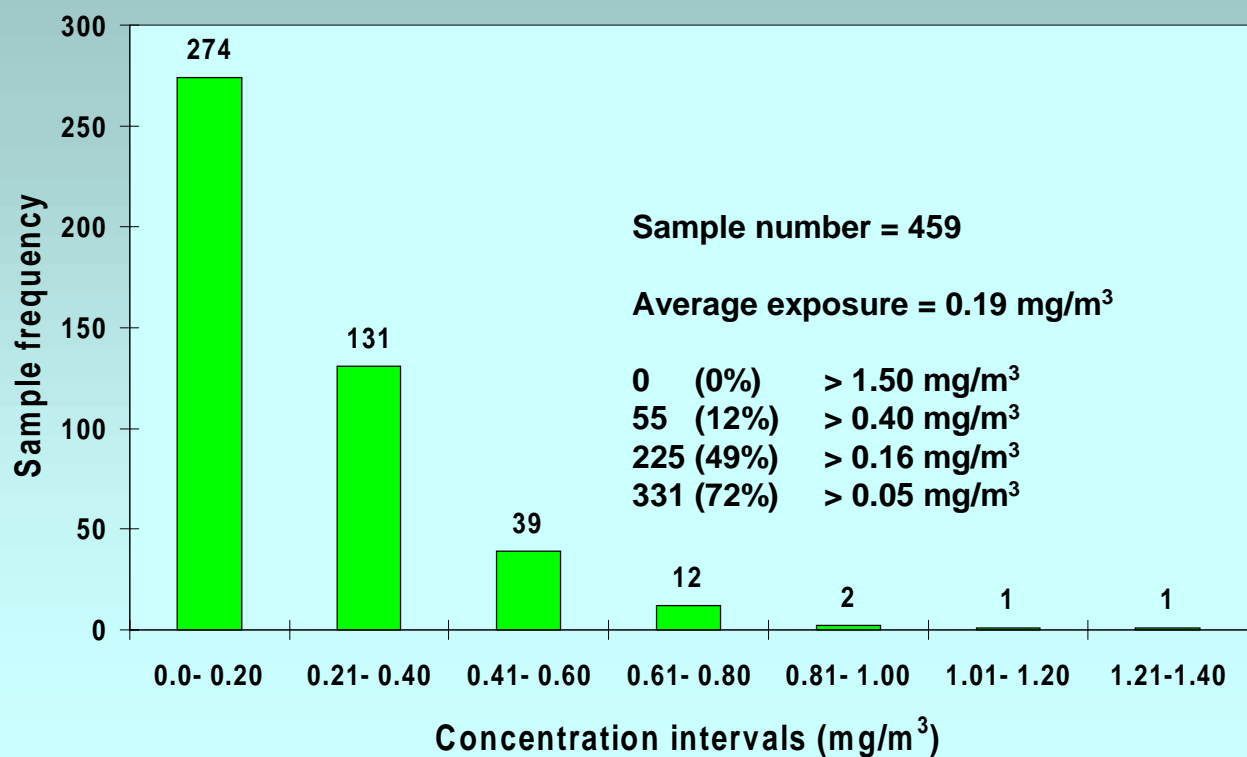
North American Regulation

Agency/Committee/Regulator	Date Submitted	Exposure Limit
Canadian ad hoc Diesel Comm.	1990	 1.50 mg/m ³
MSHA	1998	 0.40 mg/m ³
ACGIH	1996	 0.15 mg/m ³
ACGIH	1998	 0.05 mg/m ³

Canadian Miner Exposure - 1995

Diesel Particulate Matter Exposure (RCD) in Canadian Mines

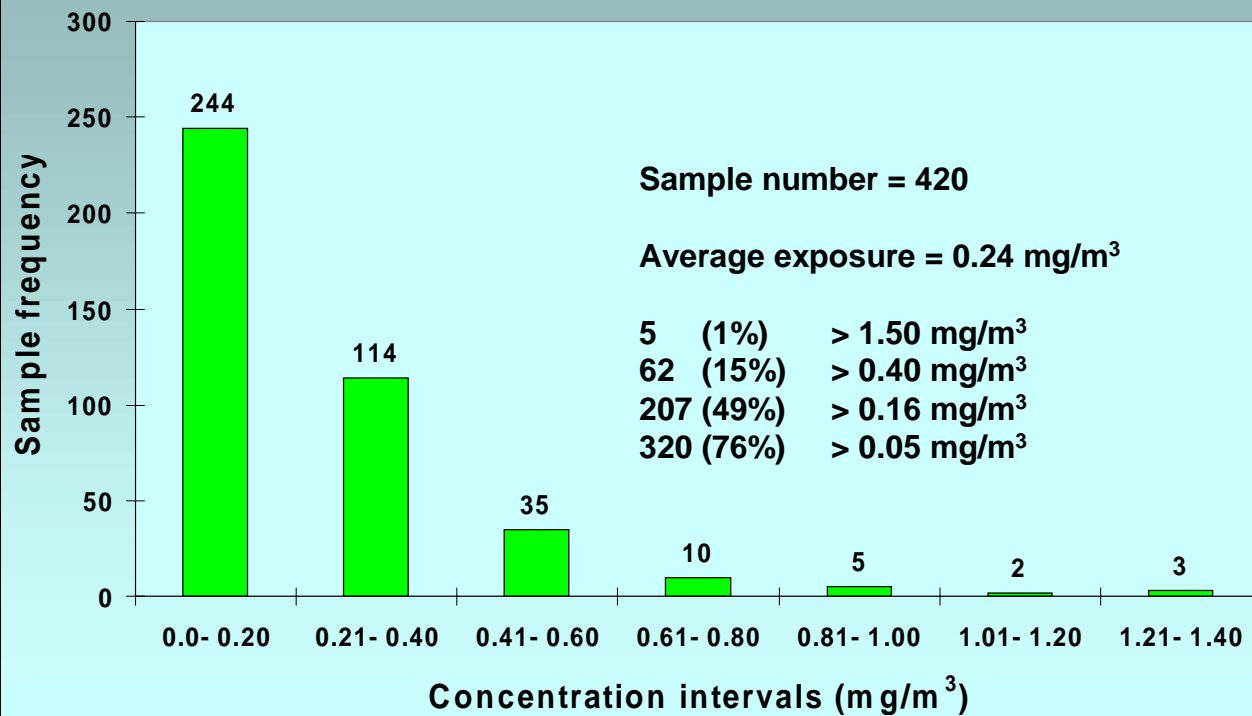
CANMET Sudbury Laboratory (Sept/94-Sept/95)



Canadian Miner Exposure - 1996

Diesel Particulate Matter Exposure (RCD) in Canadian Mines

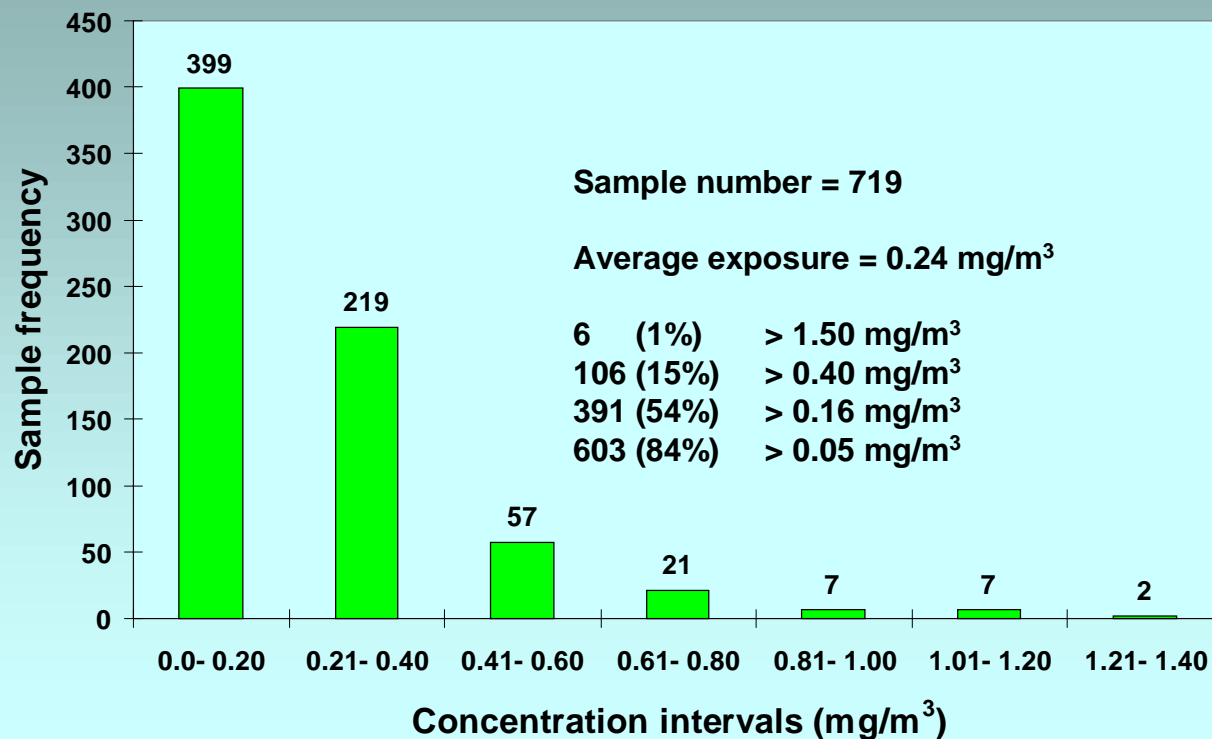
CANMET Sudbury Laboratory (Jan - Dec 1996)



Canadian Miner Exposure - 1997

Diesel Particulate Matter Exposure (RCD) in Canadian Mines

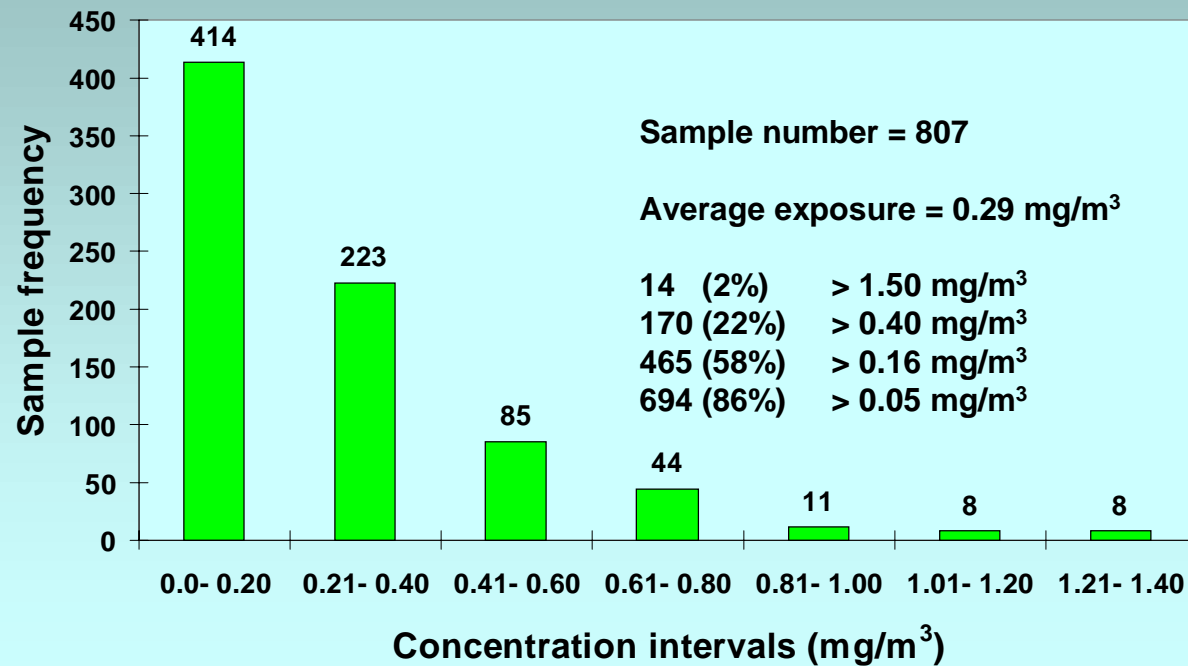
CANMET Sudbury Laboratory (Jan - Dec 1997)



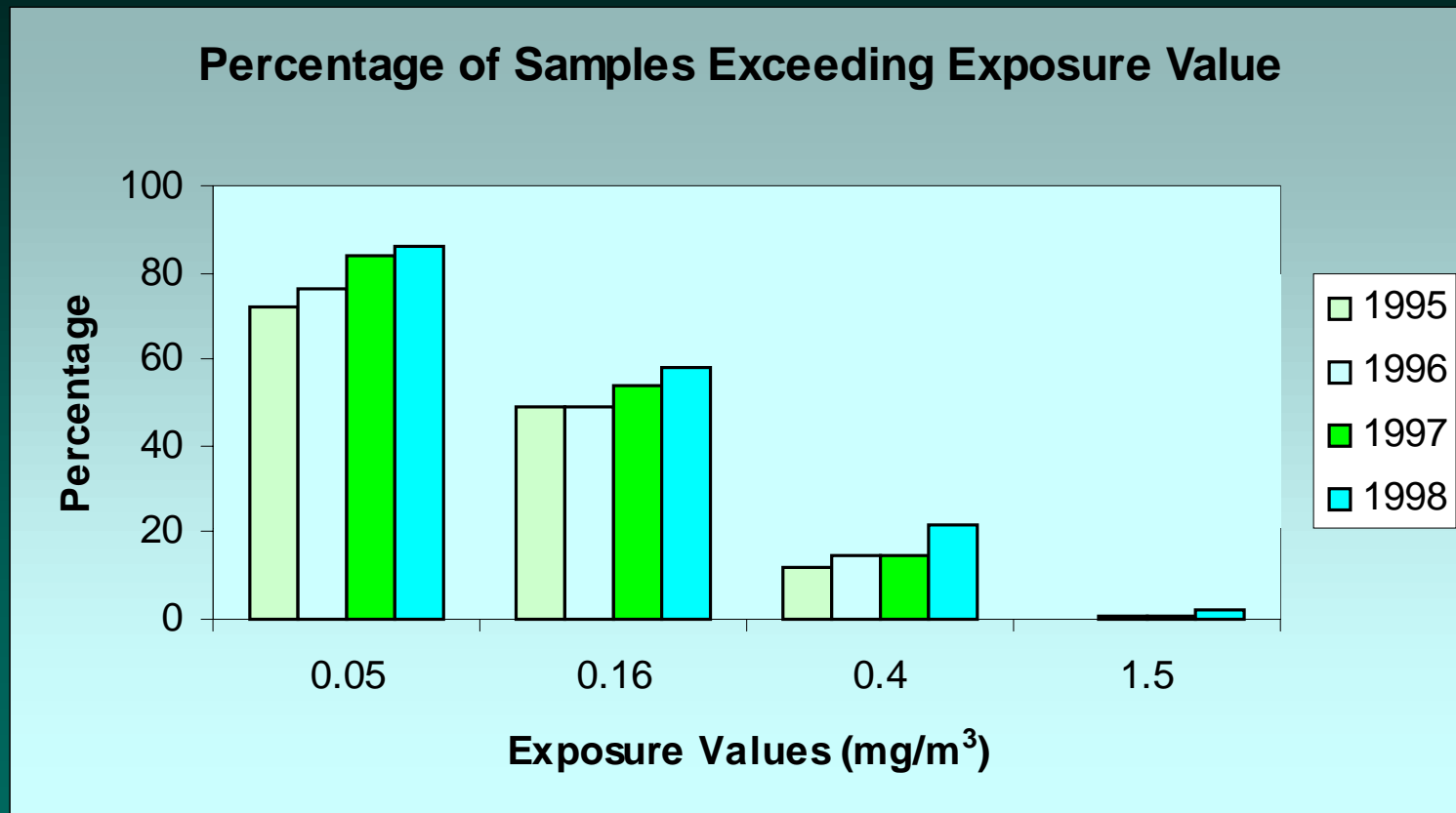
Canadian Miner Exposure - 1998

Diesel Particulate Matter Exposure (RCD) in Canadian Mines

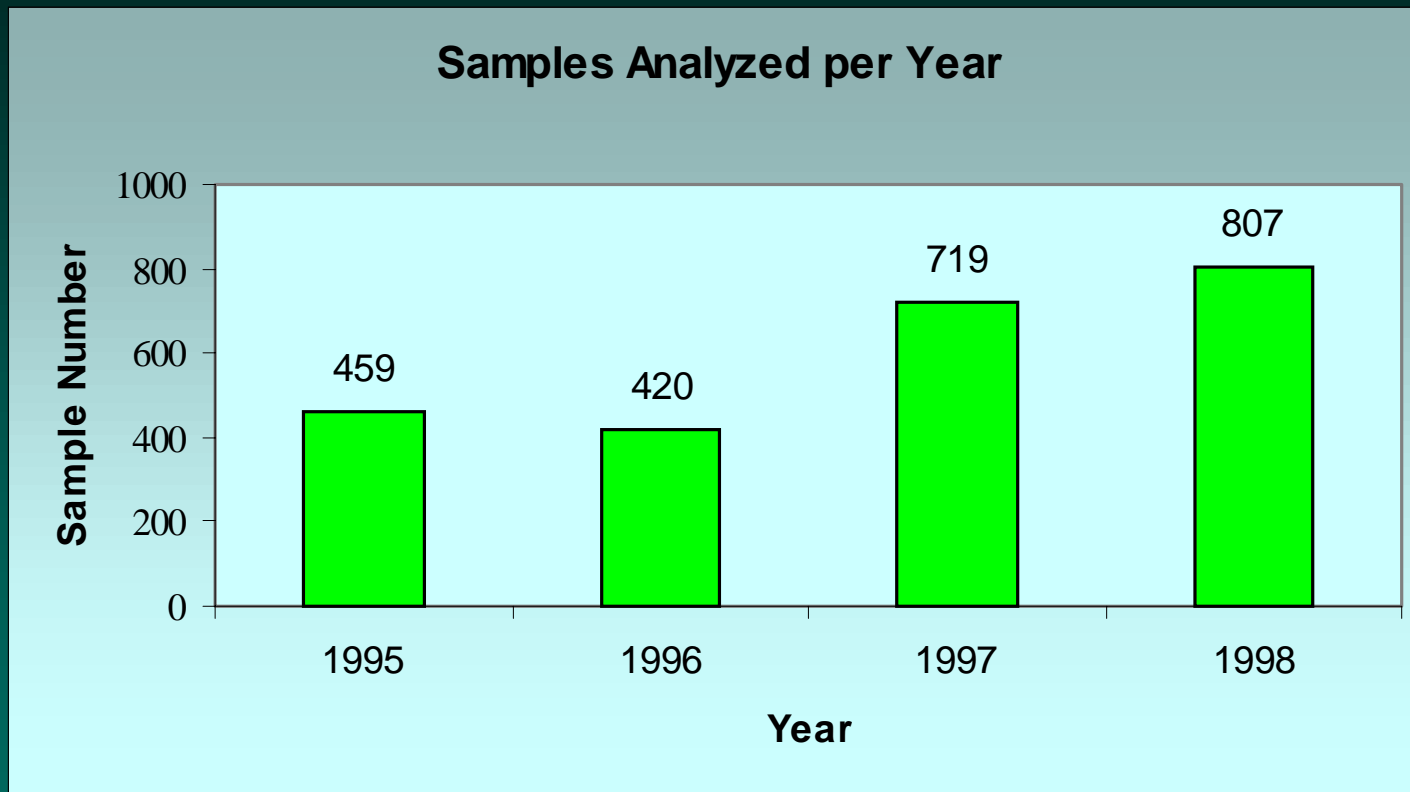
CANMET Sudbury Laboratory (Jan - Dec 1998)



Canadian Miner Exposure

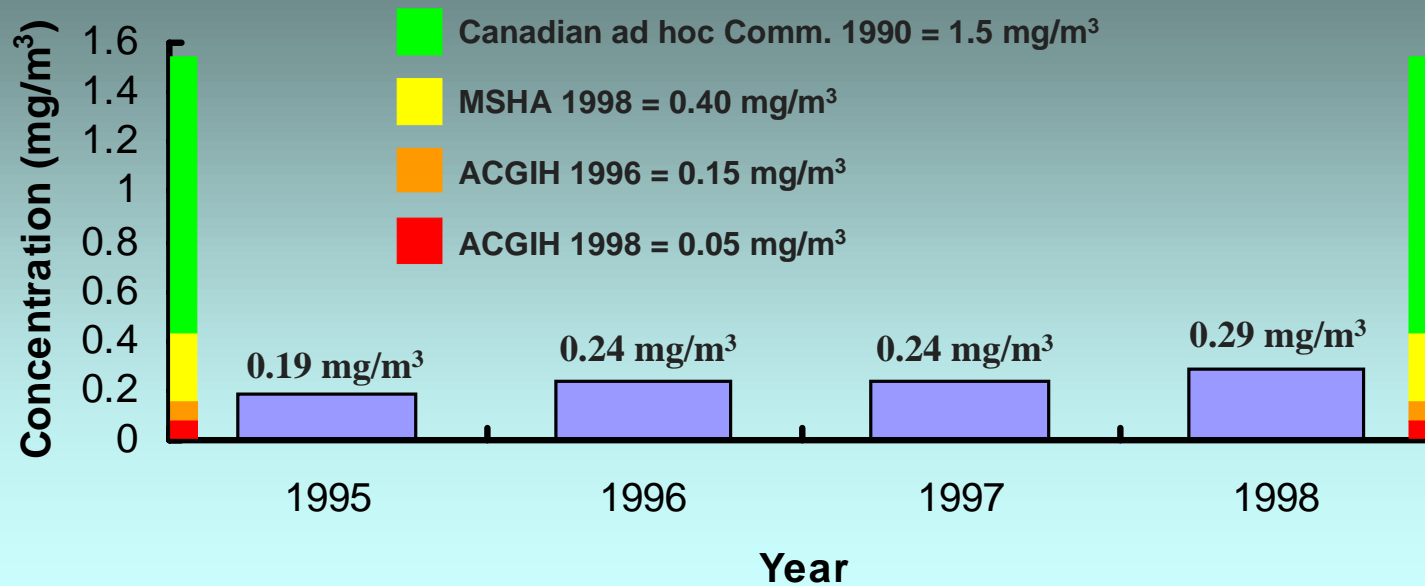


Canadian Miner Exposure



Canadian Miner Exposure

Averaged Yearly Exposure Values

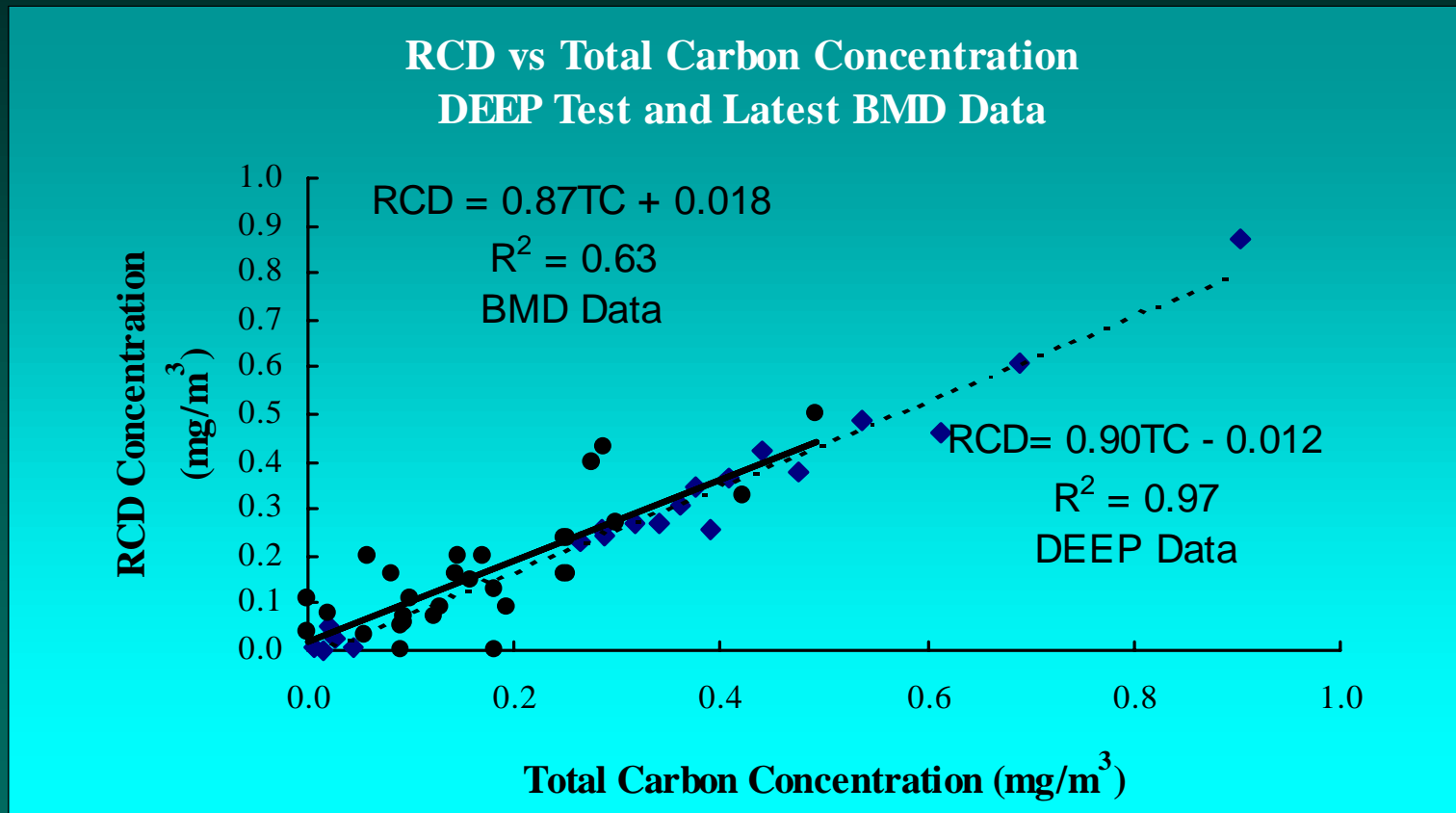




Brunswick Mining Division- Exposure Data (1999)

<u>Process</u>	<u>No. Samples</u>	<u>RCD</u> (mg/m ³)	<u>TC</u> (mg/m ³)
LHD	8	0.22	0.25
H. Trucks	5	0.09	0.12
Drilling	5	0.13	0.11
Misc.	10	0.18	0.17
Overall	28	0.17	0.17
CND (1998)	807	0.29	-----

Comparison of RCD and TC - Brunswick Mining Division





Brunswick Mining Division - Observations

- ❖ EC/TC Ratio of about 40%
- ❖ No observations of negative RCD values
- ❖ Average of 0.17 mg/m³
- ❖ Good agreement with previous DEEP work
- ❖ Excellent transition exercise RCD → TC



Inco Limited - Ontario Division

RCD Exposure Report (1995 - 1999)

<i>“Occupations with Potential Exposure”</i>	No. of Samples	Geometric Mean RCD	Lowest Result	Highest Result
Loaderman Diesel	60	0.16 mg/m³	0.06 mg/m ³	0.89 mg/m ³
Truck Driver Haulage	11	0.11	0.06	0.39
Haulageman	13	0.13	0.06	0.37
Tram Crew	37	0.09	0.06	0.64
Development Miner	81	0.15	0.06	1.62
Production Miner	20	0.10	0.03	0.72

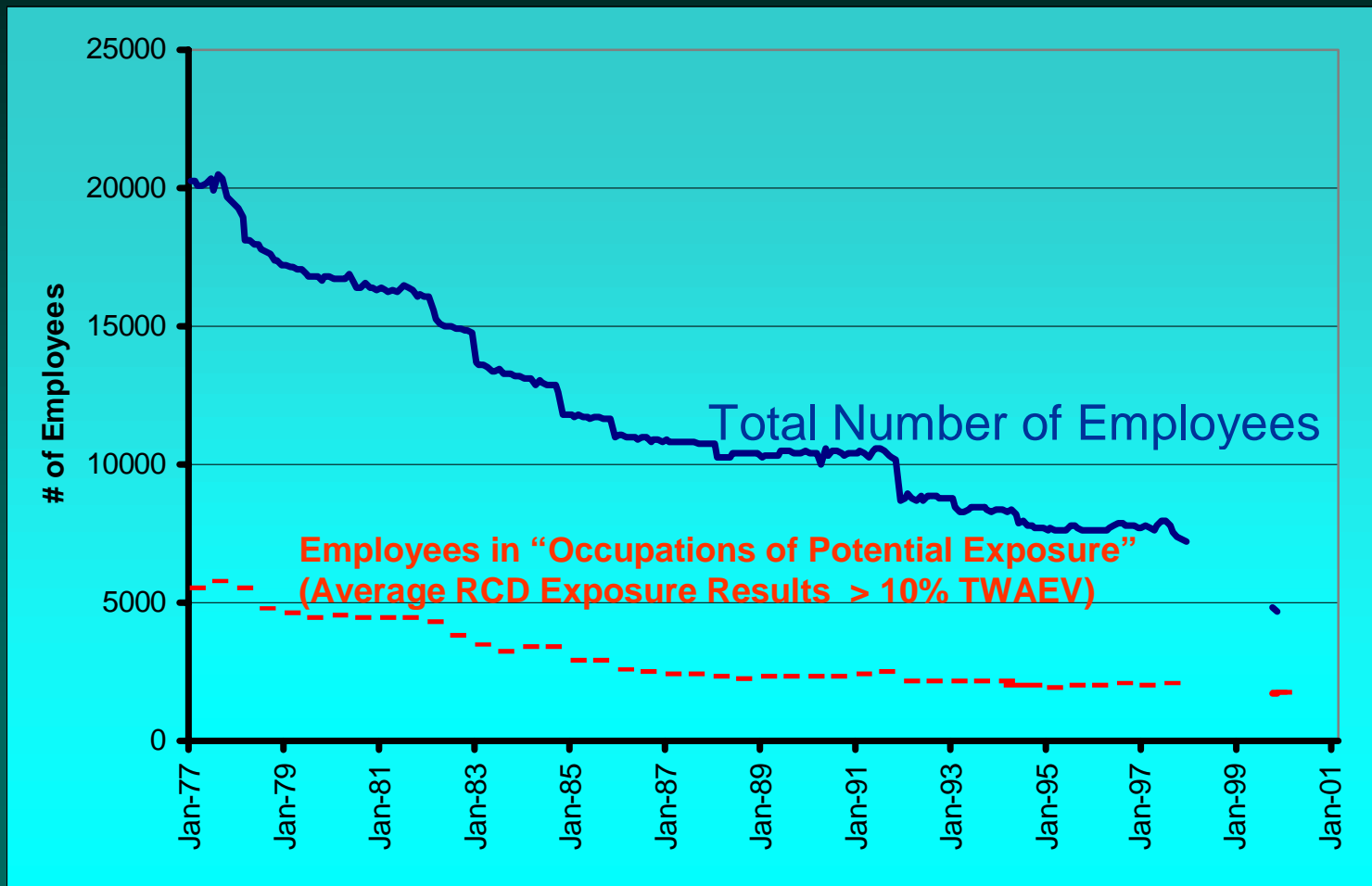


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"Old" RCD Exposure Report (1977 - 1981)

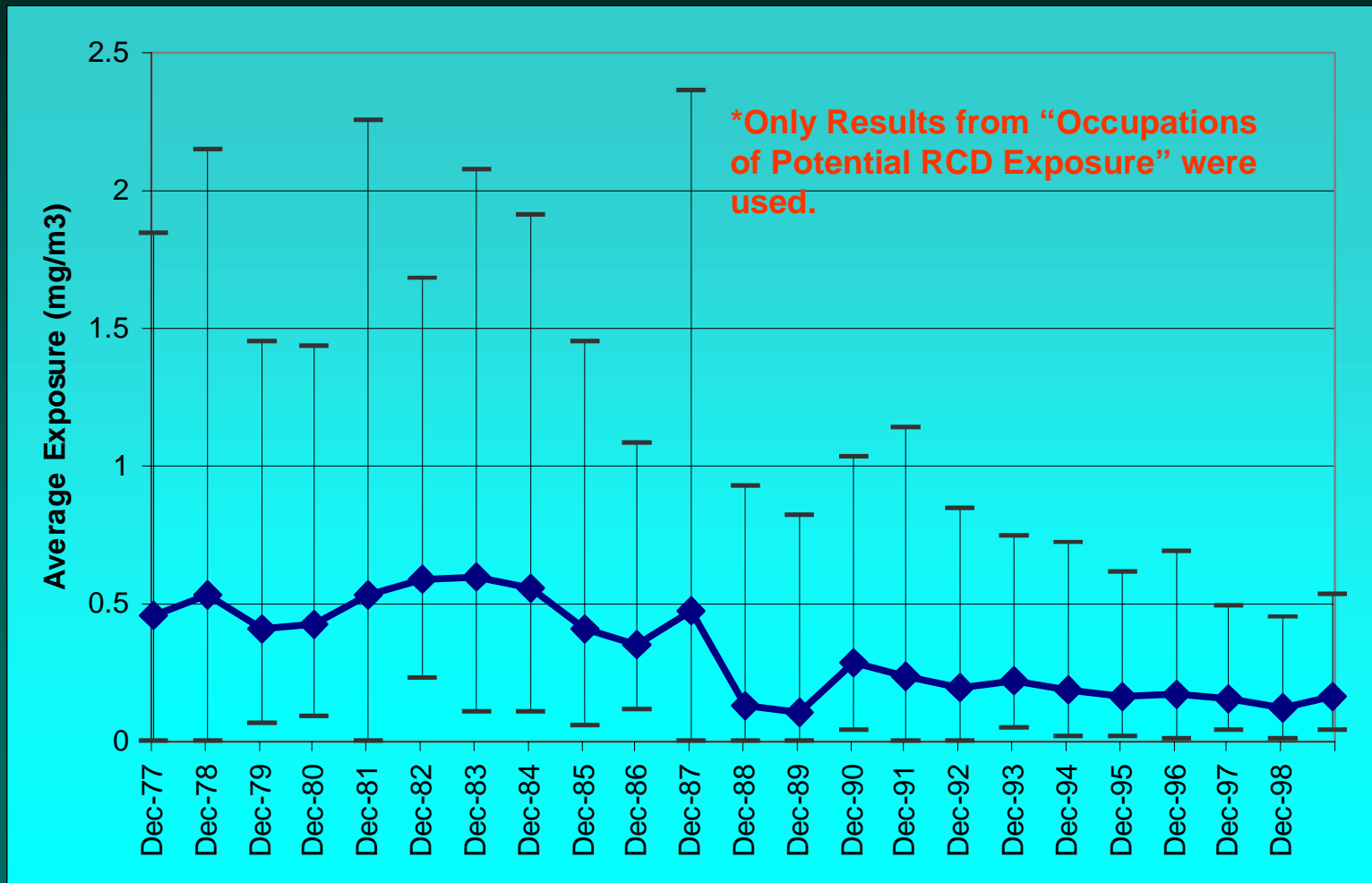
<i>"Occupations with Potential Exposure"</i>	No. of Samples	Geometric Mean RCD	Lowest Result	Highest Result
Loaderman Diesel	141	0.42 mg/m³	0.15 mg/m ³	1.6 mg/m ³
Truck Driver Haulage	7	0.52	0.33	1.1
Driller Stope Conventional	215	0.43	0.21	1.0
Leader Stope Conventional	75	0.24	0.03	2.2
Driller Drift	38	0.37	0.04	2.1
Driller Trackless Jumbo	41	0.62	0.18	5.0

Inco Limited - Sudbury District Workforce Changes Since 1977



Inco Limited - Sudbury District

*Average RCD Exposures - 1977 to Present**





Inco Limited - Ontario Division

Sampling Strategy for Year 2000

- ❖ Work with Joint Health & Safety Committees to quantify effect of extended shifts.
- ❖ No longer monitoring for compliance.
- ❖ Must change sampling method. - (in 1998, 38% of RCD Results from “Potential Concern Occupations” were below the analytical limit of detection)
- ❖ Have fewer workers doing multiple tasks - switch focus to “Potential Concern Activities”