

# Evaluation of the P2 Experience at Alcan Primary Metals - British Columbia

*From an Industry and Stakeholder  
Perspective*

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Canadian Pollution Prevention Roundtable

**Michael Gordon**, M.R. Gordon and Associates  
**Shawn Zettler**, Alcan Primary Metal - British Columbia

# Introduction

## P2 in Experience in Kitimat

### Evaluation:

- Lessons
- Outcomes
- Opportunities

### Relationship:

- P2 experience
- From the perspective of industry and stakeholders.



*Aluminum tri-lock ingots ready for shipment to Asia*

# Introduction

## *Scope:*

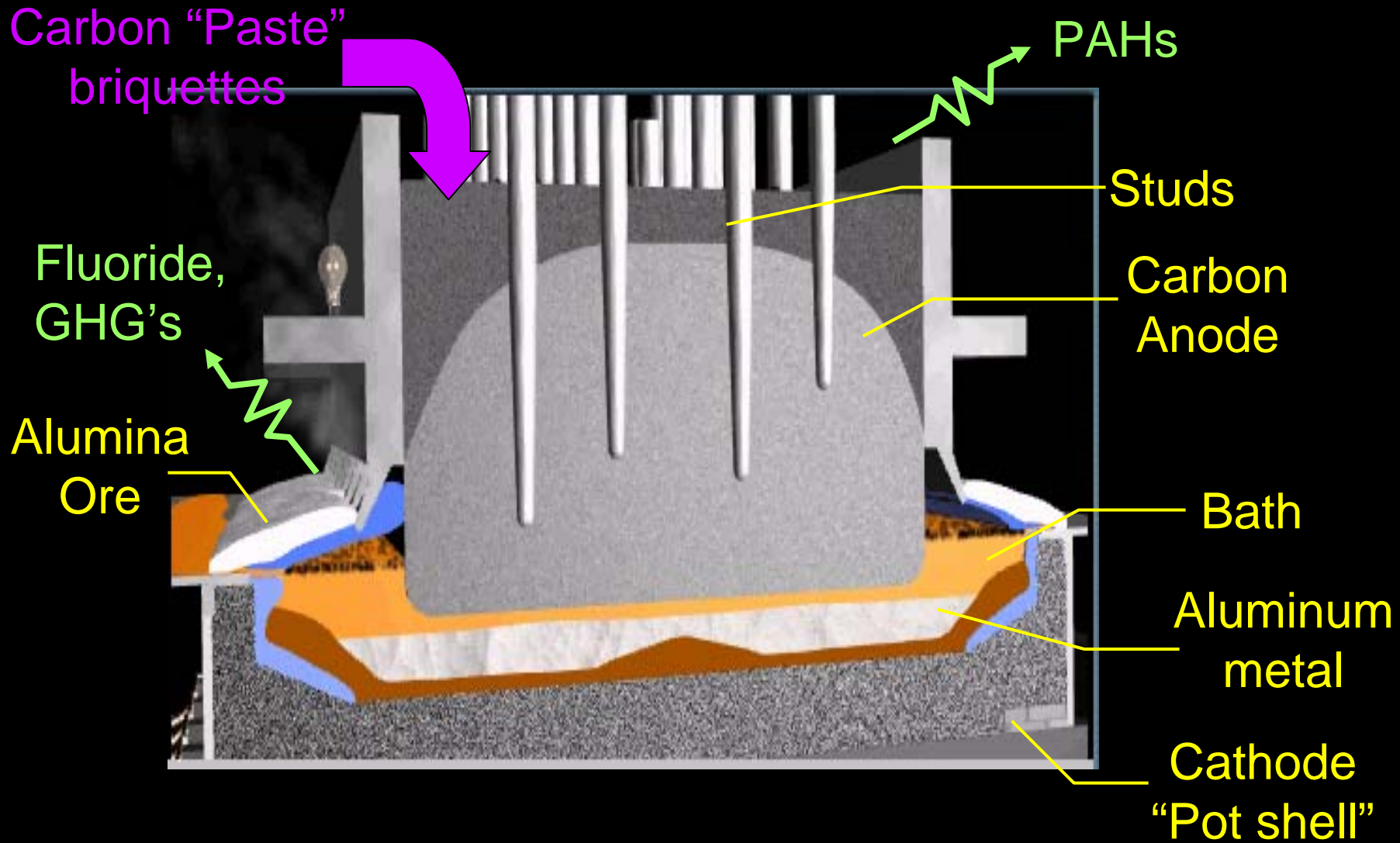
- Review of P2 history and program implementation
- Evaluation through case studies of P2 Initiatives
- Discussion of the evaluation of the P2 Program and
- Summary of key learnings



*Aerial view  
of Alcan,  
Kitimat Works*

# Aluminum Smelting Process

## Vertical Stud Söderberg (VSS) Technology



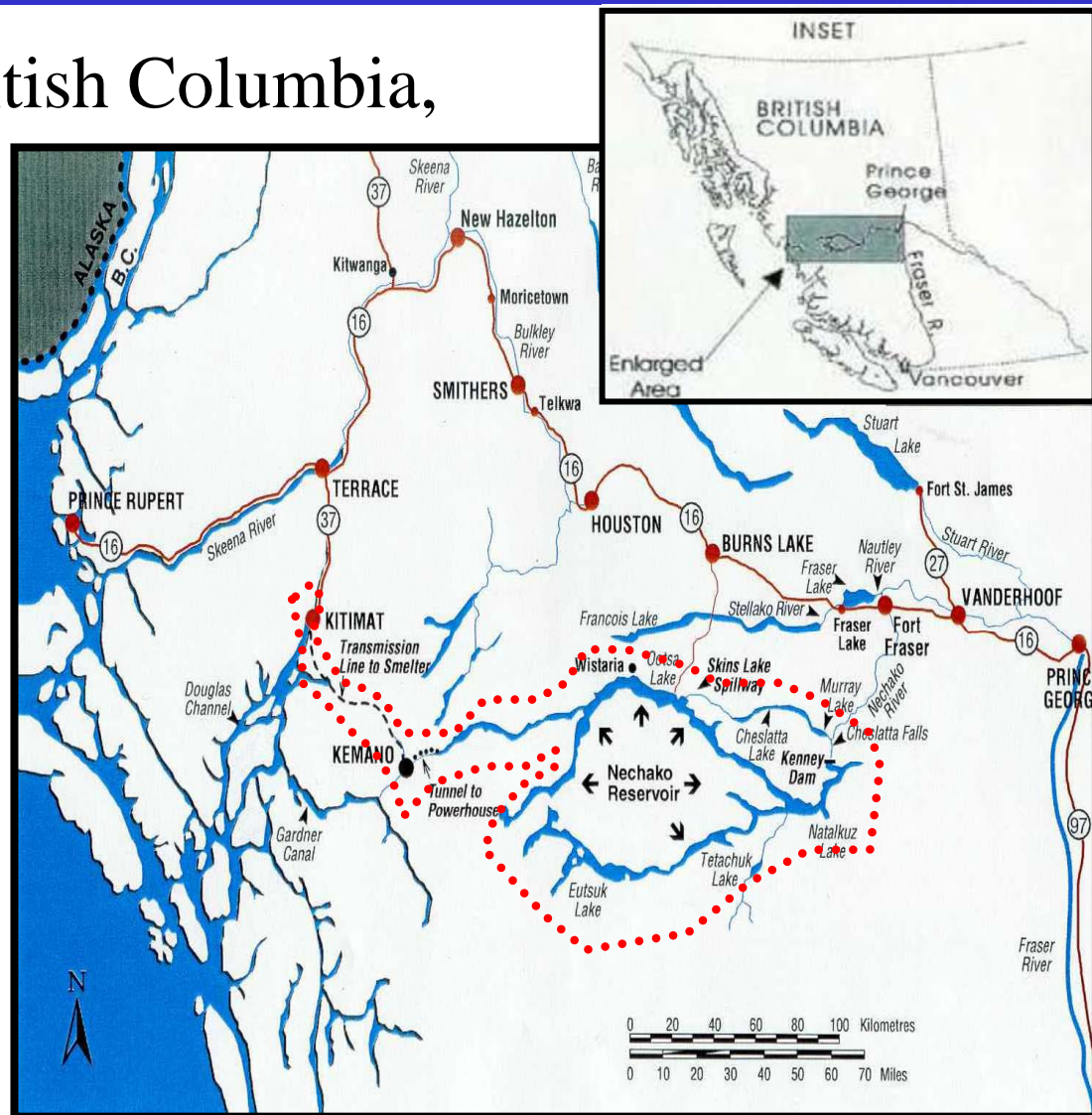
# Aluminum Smelting Process



*Vertical Stud Söderberg (VSS) Cells*

# APM-BC Scope

- Located in Northern British Columbia,  
Kitimat to Vanderhoof
- 780 km<sup>2</sup> Reservoir
- 860 mW Powerhouse
- A 80 kilometer  
Transmission Line
- 272,000 tonne  
Aluminum Smelter
- Commissioned  
in 1954



*Extent of APM-BC in British Columbia*

# APM-BC Products and Process

Raw Materials

Carbon



Electrolytic Reduction  
VS Söderberg



Alloying agents  
Chlorine Gas



Metal Casting



Aluminum  
Ingots

Key  
Emissions

GHG's  
Fluoride  
Aluminum  
PAHs  
Spent Potlining

# Environment and Stakeholders

- Coastal environment surrounded by highly valued ecosystems
- Marine / Estuarine receiving environment
- Temperate rainforest
- Two salmon spawning streams
- Migratory wildlife
- Complex airshed

## Key Stakeholder Groups:

- Haisla First Nation
- Regulatory Agencies
- Community of Kitimat
- Union (CAW)



*Kitimat Valley at the head of the Douglas Channel*

# Why P2 at Kitimat Works

- Non-Compliance Issues
- Permit Appeal
- Environmental Audit
- New Environmental Policy
- Need to improve stakeholder relations
  
- Key Issues for the Haisla:
  - Stop or reduce pollution
  - Remediate contamination where ever possible



# P2 Implementation

- Stakeholder acceptance and involvement
- Education of process and problems
- Workshop for identifying key aspects of P2 Plan
- Detail and track P2 Opportunities, information gaps and outcomes
- Program development:
  - Transparency with stakeholders
  - Compliance Issues: EIP plan
  - Beyond Compliance: 5 year P2 Plan
  - P2 Multimedia Operating Permit



*P2 Information gap -  
metal emissions from furnace stacks*

# P2 Evolution

- New Local Environmental Policy
- Root cause investigations for all non-compliances
- Risk Management System
- ISO 14001 certification



*P2 Opportunity- New caustic waste collection facility at metallurgy lab*



*P2 Information gap - effluent polishing through cat tail treatment*

# Case Study - Marine Monitoring

PAH effects in the receiving environment?

- Unique collaboration with scientific experts.
- Unprecedented undertaking to determine extent and degree of effects.
- Results demonstrate lower bioavailability and fewer effects than expected.
- Baseline to track improvements from ongoing and future P2 work.



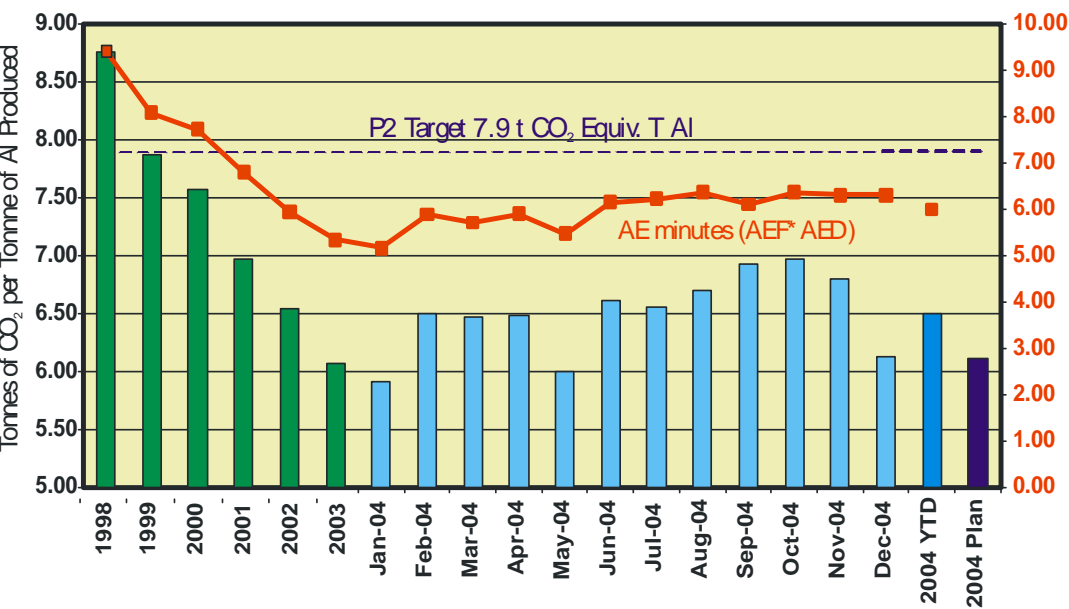
*Sediment sampling -  
Inner harbour by Plant site*

# Case Study - Emissions Reduction

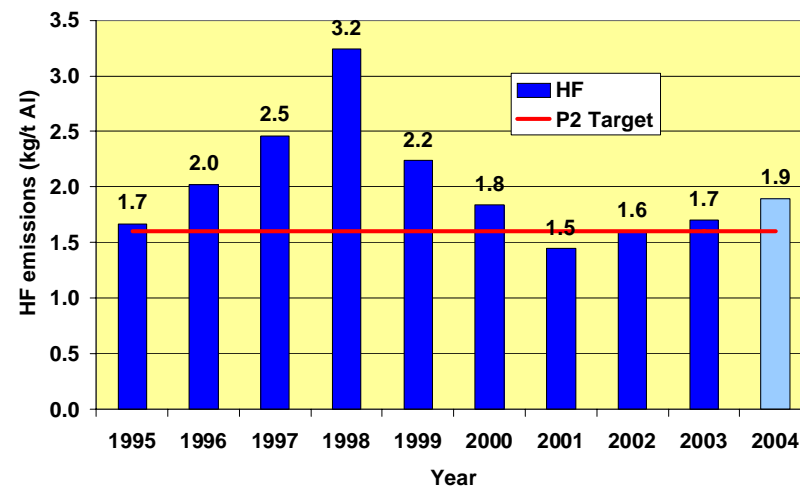
- Commitment to green house gas and gaseous fluoride reduction
- P2 targets set to beyond compliance
- Detailed systematic cause and effect investigations
- Developed tighter process controls and beyond compliance culture shift
- Involved stakeholder consultation, education and dialogue

## GHG emissions

Tonnes of CO<sub>2</sub> Equiv./Tonnes Al, and Anode Effects Minutes



## Hydrogen Fluoride (HF) Emissions



# Case Study - SPL Management

- Objectives - 1) Reduce SPL Waste generation and  
2) Find alternative disposal/recycling opportunities

## Approach:

- Systematic analysis of potshell failure
- Potshell replacement program
- Improved pot startup and process

## Result

- 27% decrease in annual SPL generation
- 5% gain in potshell life

## SPL Recycling opportunities:

- Trials for using SPL as an alternative fuel in cement kilns



*Cross section of potshell showing layers of refractory brick (red) and SPL (black)*

# Evaluation

## Lessons

- Takes time and dedicated commitment of resources
- Requires open and transparent approach to problem solving
- Requires setting realistic and challenging targets
- Demands creativity willingness to take risk

## Outcomes

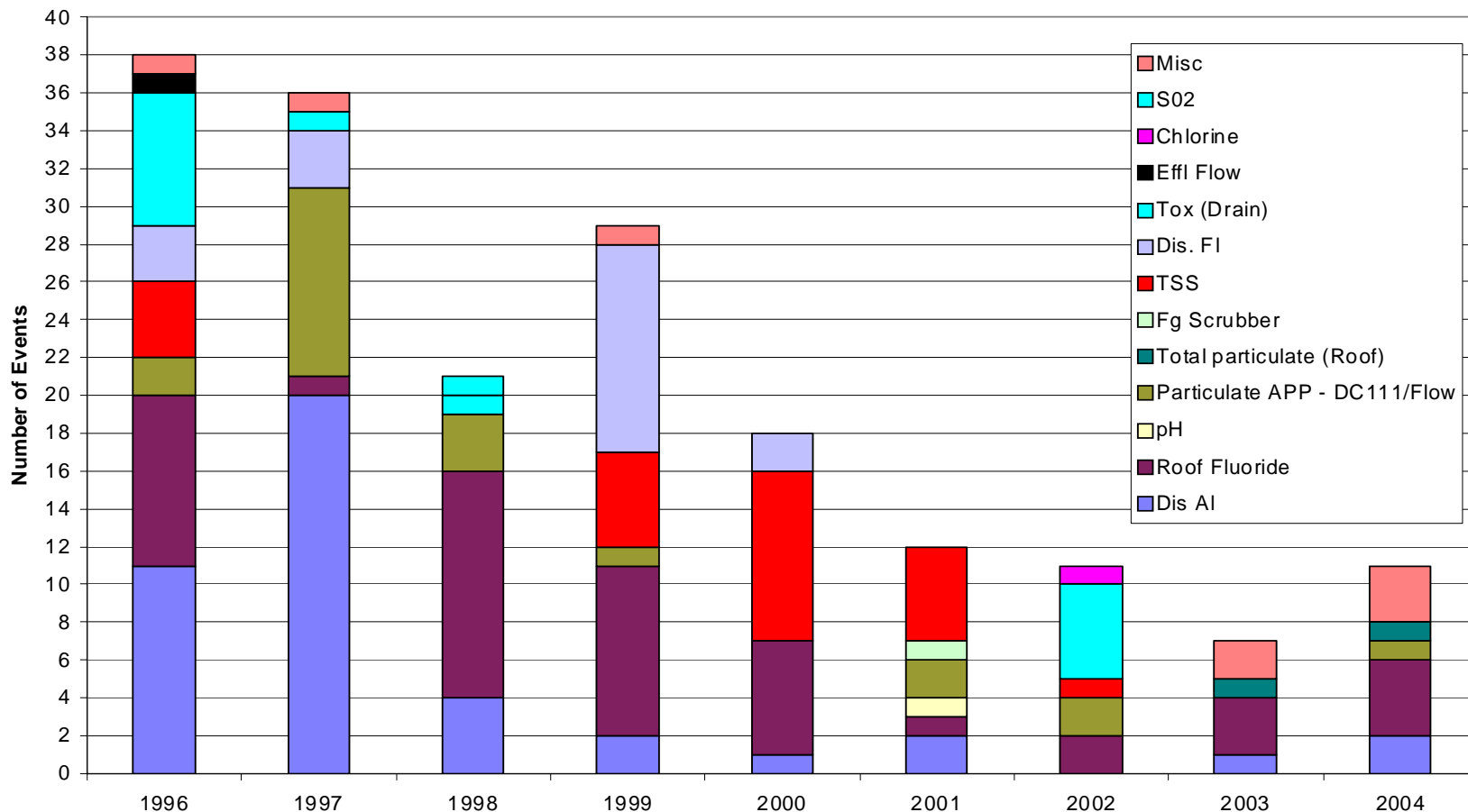
- Reduced emissions and improved waste handling
- Improved tracking and monitoring of outputs
- Productivity, economic, and sustainability benefits

## Opportunities

- Positive and dynamic stakeholder relationships
- Culture shift to beyond compliance
- Created basis for environmental risk management and ISO14001 certification

# Evaluation - P2 1999-2004 Success

## Environmental Permit Non-compliances

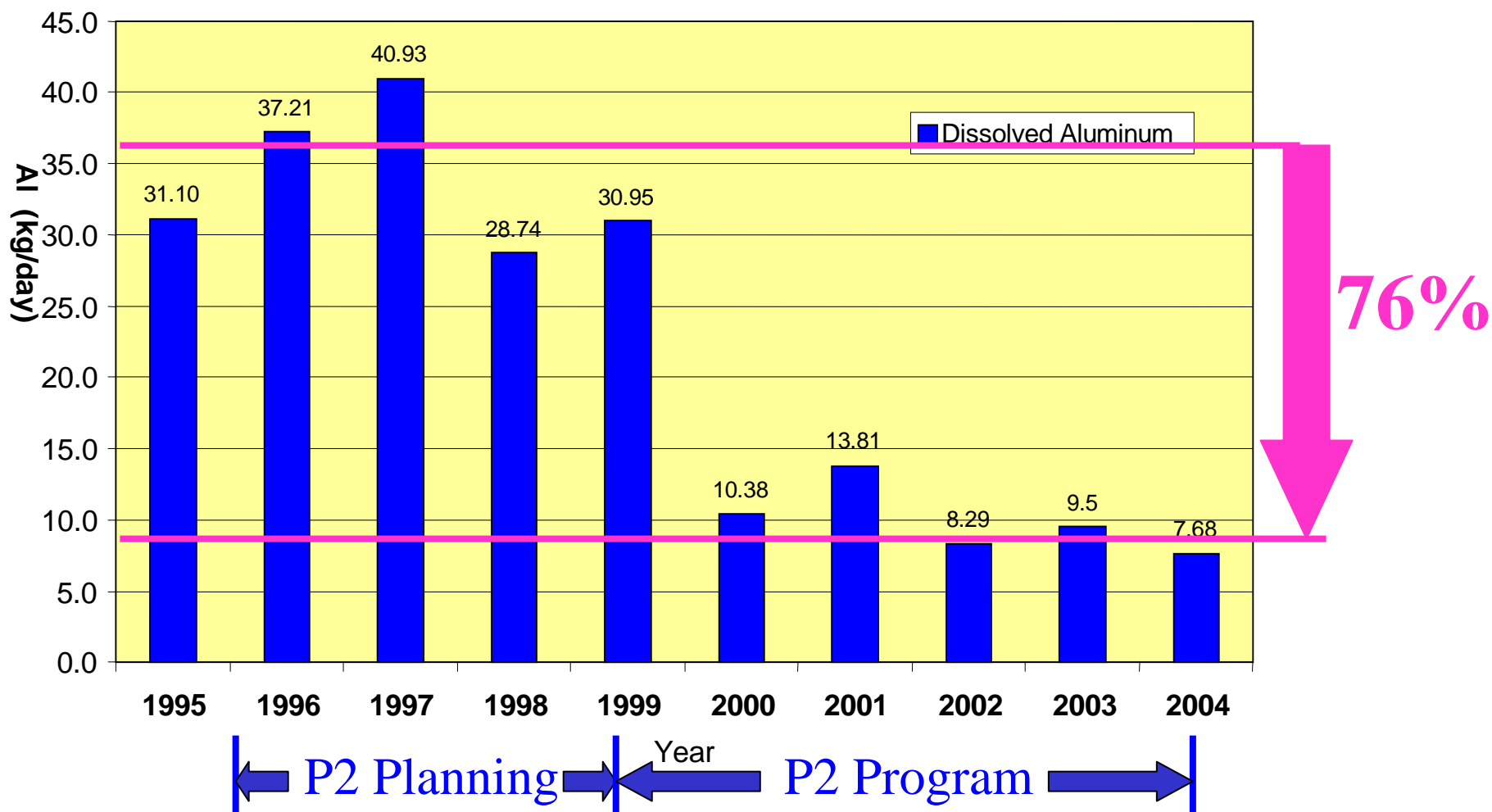


73%



# Evaluation - P2 1999-2004 Success

## B-Lagoon - Dissolved Aluminum Loadings



# Summary and Conclusions

- Improved stakeholder relations creating new ways for cooperation.
- Created new and lasting way of doing business.
- Pushing the limits 50 year old technology .
- Economic gains of addressing environmental inefficiencies of the past.
- Provides foundation to address new and upcoming challenges.
  
- P2 works!

# The End

