FINAL SUBMITTAL

HARRIS EXAM
50-40012004-301

FEBRUARY 23 - 27,2004
& MARCH 4,2004 (WRITTEN)

FINAL SRO LICENSE EXAM

REFERENCE MATERIAL

MATERIALS PROVIDED TO SRO APPLICANTS FOR WRITTEN EXAM

1. Steam Tables

2. AOP-018 Attachment 1 Sheet 2 of 2

3 OP-141 Attachment 5

4. Curves H-X-15 a/b/c

5. Curve D-2

Attachment 1
Sheet 2 of 2

Reactor Coolant Pump Trip Limits

NOTE

ALB-5-1-2B, RCP THERM BAR HDR LOW FLOW, indicates loss of CCW to all RCP thermal barriers.

4. Loss of RCP seal injection when ANY of the following conditions exist:

- CCW flow is lost to the associated RCP Thermal Barrier HX
- RCS temperature is greater than or equal to **400°F** AND CCW **HX** outlet temperature is greater than 105°F
- RCS temperature is less than 400°F AND CCW HX outlet temperature is greater than 120°F

5. RCP vibration in excess of the following: **[A.1]**

- 20 mils shaft
- 15 mils shaft and increasing greater than 1 mil/hr
- 5 mils frame
- For A and C RCPs ONLY: 3 mils frame and increasing greater than 0.2 mil/hr
- For B RCP ONLY: 3.5 mils frame and increasing greater than 5.2 mils/hr

6. RCP Motor current fluctuations of 40 amps peak-to-peak:

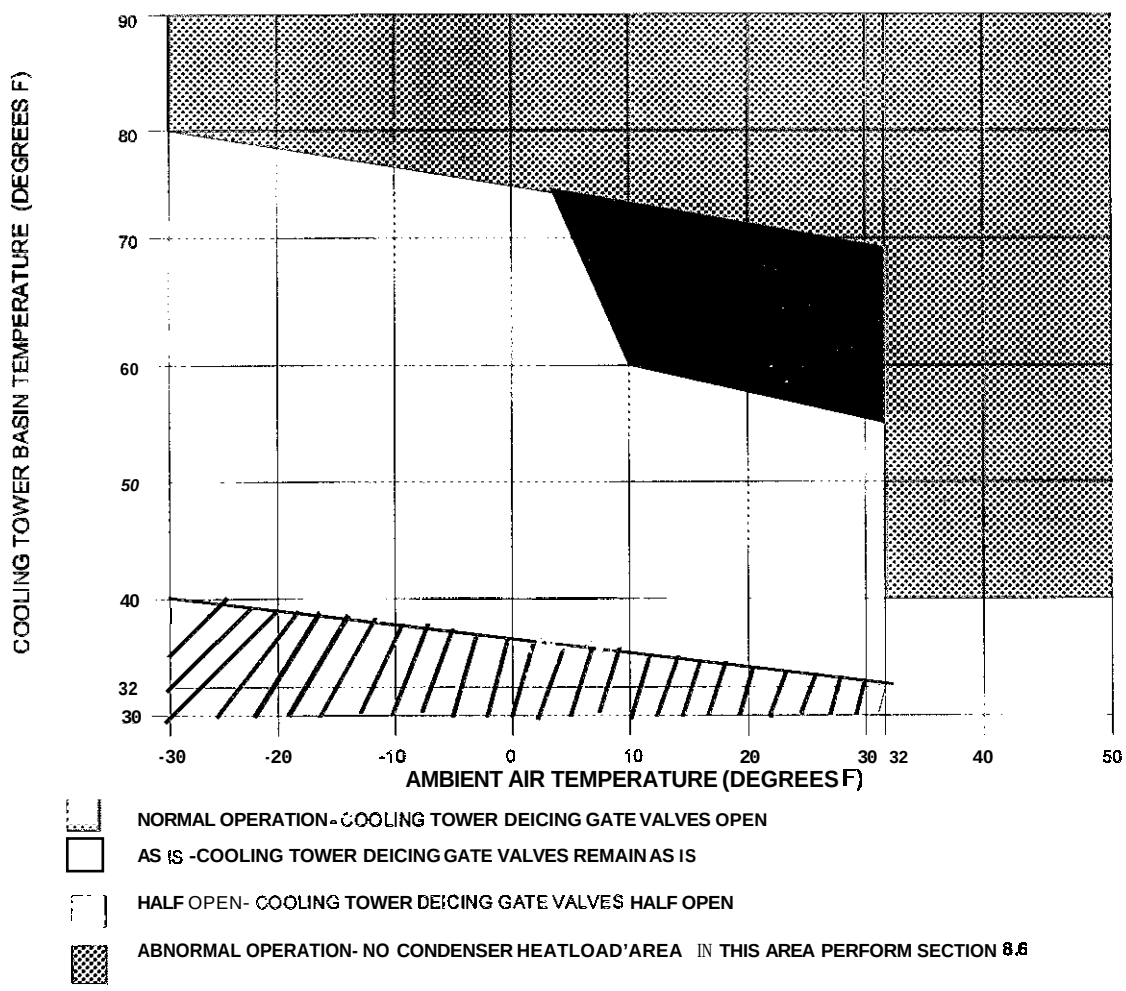
	ERFIS Points		
	RCP A	RCP B	RCP C
Motor Current	IRC0160	IRC0161	IRC0162

7. Loss of CCW to an RCP or RCP Motor when:

- An RCP has operated for IO minutes without CCW flow to either motor oil cooler **[A.2]**
- Isolation of CCW to an RCP is necessary to slop excessive CCW System leakage

-- END OF ATTACHMENT 1 --

Cooling Tower Cold Weather Operation

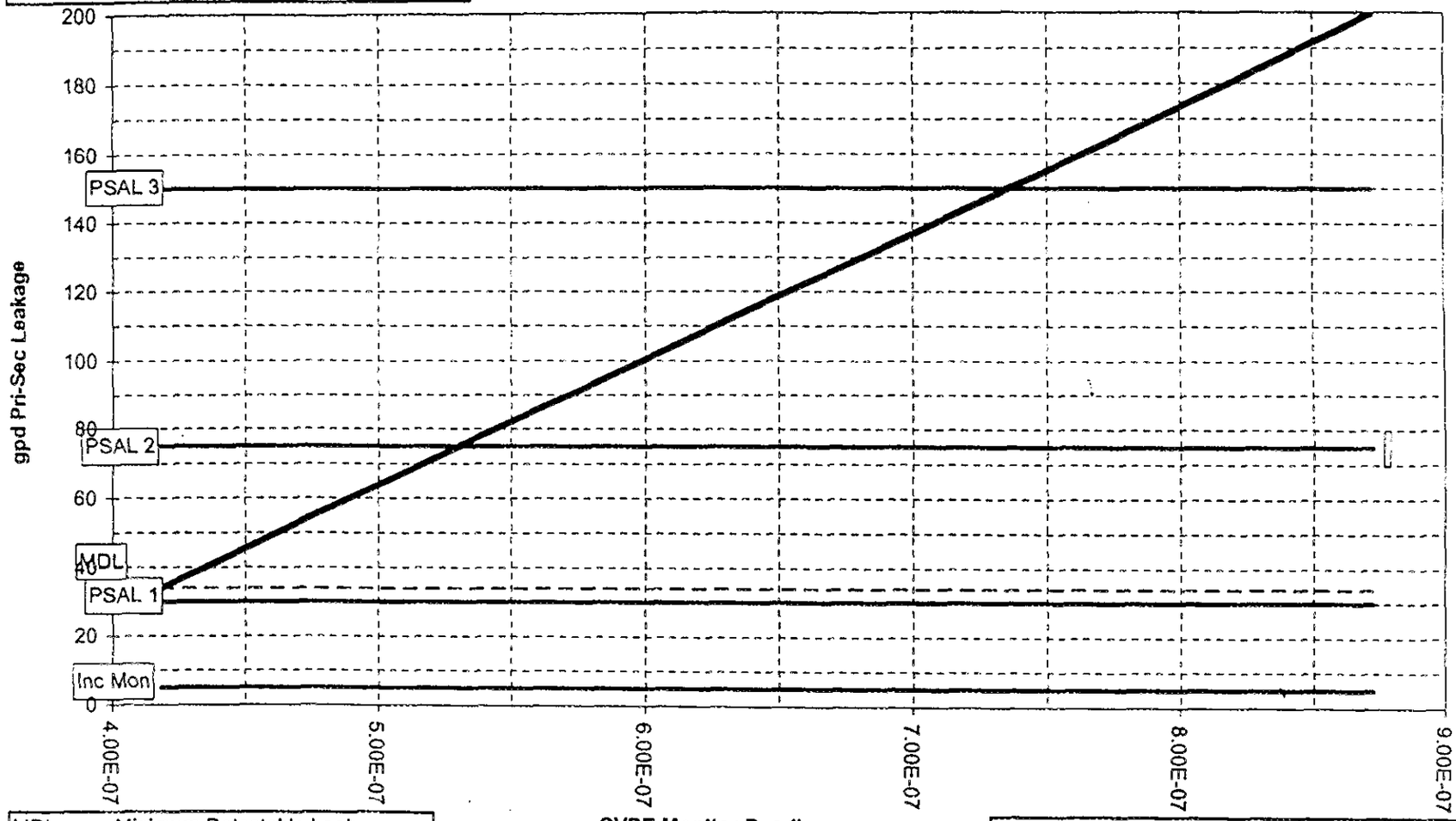


Curve H-X-15A Rev No. 19
Originator Jerry Boley Date 10/1/13
Supervisor [signature] Date 10/2/03
Superintendent-
Shift Operations [signature] Date 10-2-03

H-X-15 A CURVE (Monitor Correlation to Pri-Sec Leakage)
(Based on Xe-133 Monitor Equivalent)

Total CVPE dilution flow is 144 scfm

ALERT Alarm = 32.13 gpd
HIGH Alarm = 70.11 gpd



MDL	Minimum Detectable Leak
Inc Mon	Increased Monitoring
PSAL	Primary to Secondary Action Level

Note: Dilution flow is equal to Total Motivating Air flow + Nitrogen flow + Air In Leakage flow

Full Motivating Air = 144 scfm dilution flow
Intermediate Motivating Air = 110 scfm dilution flow
No motivating Air = 40 scfm dilution flow

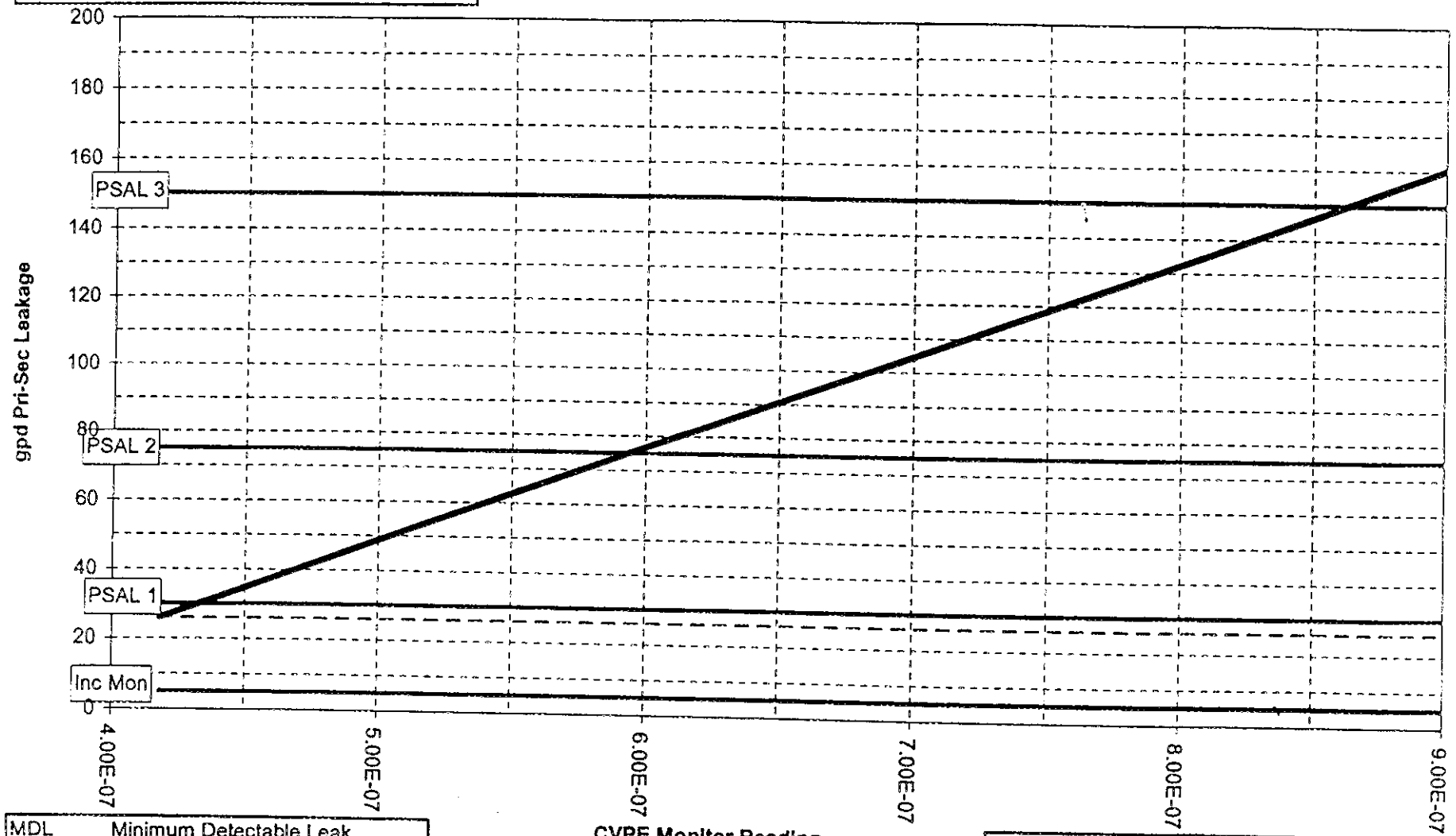
Curve H-X-15 b Rev No. 14
Originator Jerry Bailey Date 10.1.13
Supervisor [signature] Date 10/2/03
Superintendent-
Shift Operations [signature] Date 10-2-03

H-X-15 B CURVE (Monitor Correlation to Pri-Sec Leakage)
(Based on Xe-133 Monitor Equivalent)

Total CVPE dilution flow is 110 scfm

ALERT Alarm = 27.33 gpd

HIGH Alarm = 70.57 gpd



MDL	Minimum Detectable Leak
Inc Mon	Increased Monitoring
PSAL	Primary to Secondary Action Level

Note: Dilution flow is equal to Total Motivating Air flow + Nitrogen flow + Air In Leakage flow

Full Motivating Air = 144 scfm dilution flow
Intermediate Motivating Air = 110 scfm dilution flow
No motivating Air = 40 scfm dilution flow

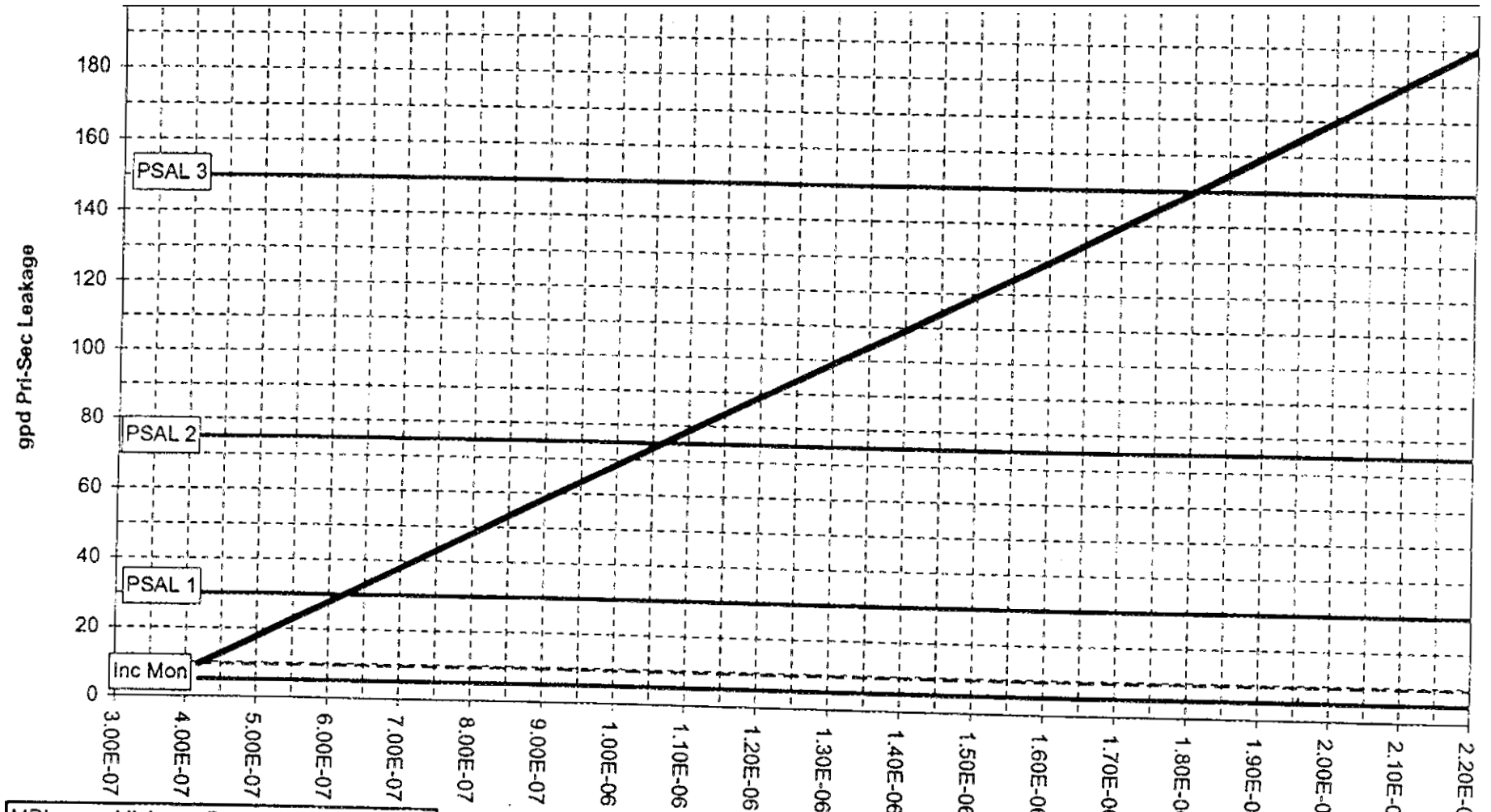
Curve H-X-15C	Rev No. 19
Originator [signature]	Date 10/1/13
Supervisor [signature]	Date 10/2/03
Superintendent	
Shift Operations [signature]	Date 10-2-03

H-X-15 C CURVE (Monitor Correlation to Pri-Sec Leakage)
(Based on Xe-133 Monitor Equivalent)

Total CVPE dilution flow is 40 scfm

ALERT Alarm = 28.3 gpd

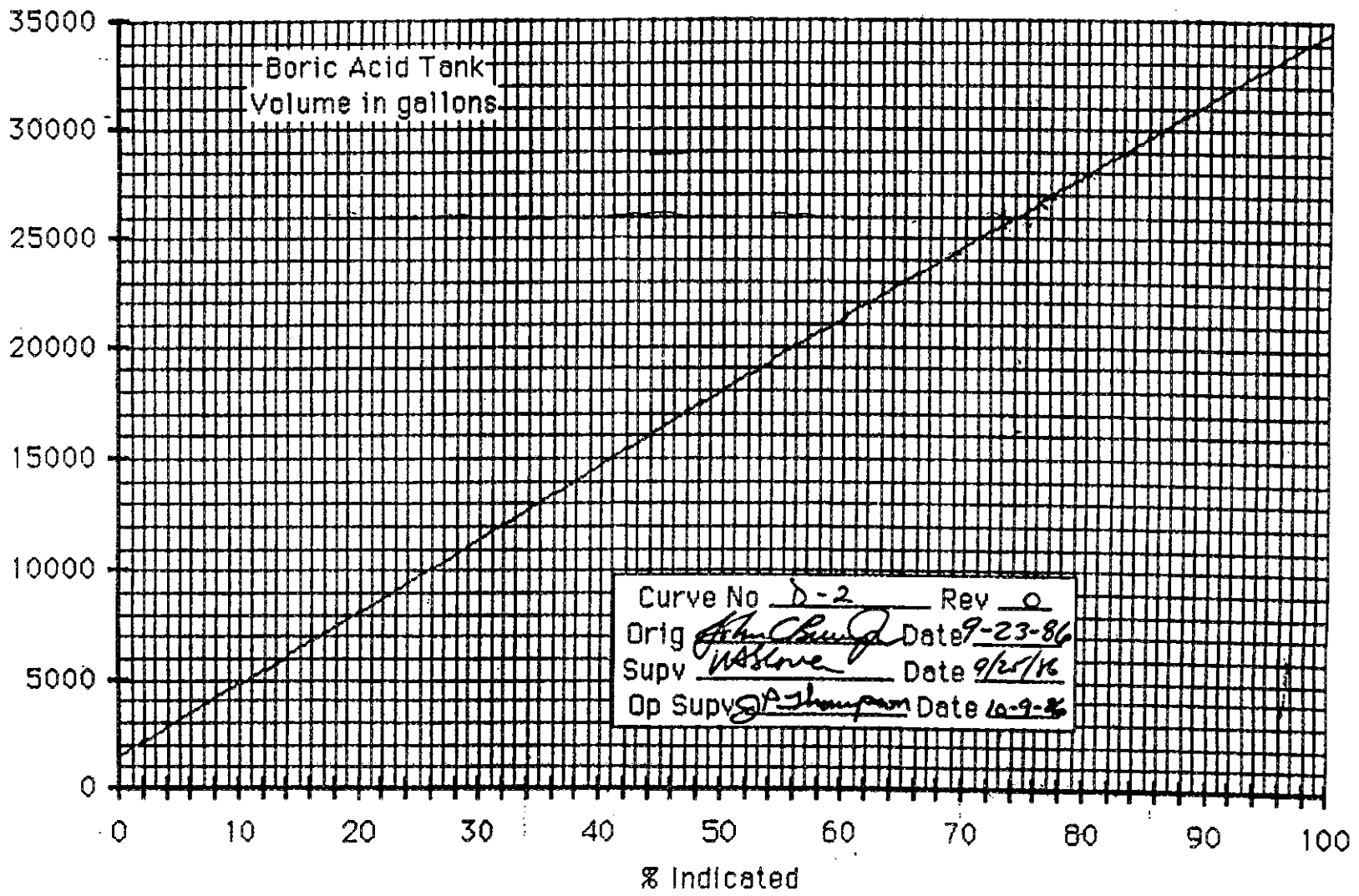
HIGH Alarm = 71.51 gpd



MDL	Minimum Detectable Leak
Inc Mon	Increased Monitoring
PSAL	Primary to Secondary Action Level

Note: Dilution flow is equal to Total Motivating Air flow + Nitrogen flow + Air In Leakage flow

Full Motivating Air = 144 scfm dilution flow
Intermediate Motivating Air = 110 scfm dilution flow
No motivating Air = 40 scfm dilution flow


Boric Acid Tank
Volume in gallons
35000
30000
25000
20000
15000
10000
5000
0
0
10
20
30
40
50
60
70
80
90
100
% Indicated
Curve No D-2 Rev 0
Orig [signature] Date 9-23-86
Supv WAStone Date 9/25/86
Op Supv [signature] Date 10-9-86