

From: "NXS@NRC.GOV" <nxs@nrc.gov> Nira Shah R11
To: "mlc@nrc.gov" <mlc@nrc.gov> Mahesh Chowla NRC
Date: 12/1/05 10:30AM
Subject: CW blowdown sys req

Release

V-7

BACKGROUND INFORMATION:

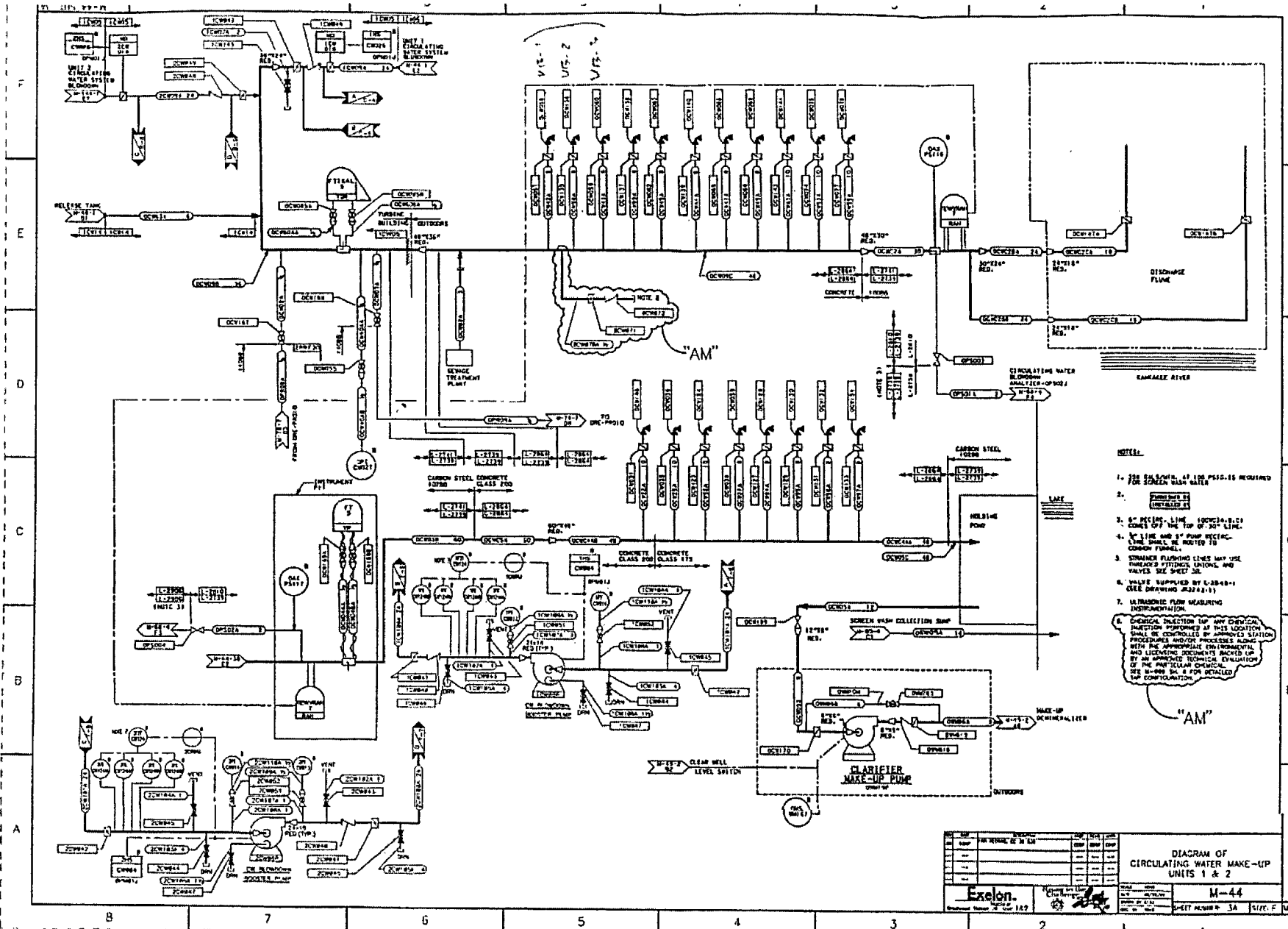
THE CIRC WATER BLOWDOWN SYSTEM
from the root cause report for the 2000 event

The primary function of the Circ Water Blowdown System is to provide for Lake turnover to prevent undesirable chemical buildup in Lake. The secondary function of the Circ Water Blowdown System is to provide dilution for liquid releases.

The Circ Water Blowdown System (Attachment 7) is designed to return Cooling Lake water back to the Kankakee River. Processed fluids from the Sewage Treatment System and the Radwaste Treatment Systems discharge directly to the Circ Water Blowdown system where dilution occurs prior to release to the Kankakee River. The Wastewater Treatment Plant and the Demineralizer Regenerant Waste systems along with various strainer/filter backwashes are returned to the Cooling Lake and thus are indirectly returned to the Kankakee River through the Blowdown line after dilution by the Cooling Lake.

The Circ Water Blowdown system begins at the Circ Water System supply to the condenser. Two 24" carbon steel pipes tap off the Circ Water supply piping (one from each unit) and combine into a 36" common header. Motor operated isolation valves, 1/2CW018, are provided on each 24" line. The 6" Radwaste Treatment System discharge pipe connects to the 36" Blowdown header. Downstream of the Radwaste connection, the Blowdown pipe is expanded to 48" prior to connection of the 3" Sewage Treatment Plant discharge pipe. The 48" diameter Blowdown pipe is reinforced concrete pipe (RCP) and runs along owner controlled property to the Blowdown River Screen House. Eleven vacuum breaker assemblies are incorporated at the high points along the 48" diameter RCP to prevent pipe implosion. The 48" RCP is eventually split and reduced to two 24" discharge pipes at the Kankakee River. Each 24" discharge pipe was originally equipped with a motor operated spray valve, 0CW018A/B. The entire piping network is approximately 29,000 ft long and is operated at about 12,000 gpm (~2.5 ft/s).

A typical vacuum breaker is shown on attachment 4. On system startup, the vacuum breaker exhausts air from the piping system until the float assembly rises with water level to close and seal for system operation. Upon system shutdown, the vacuum breaker is designed to open as water level decreases. The air release or 'pilot' valve provides two functions. The primary pilot valve function is to release entrained air that accumulates at the high points during normal system operation, air that would increase head loss and reduce process flow if not removed. The pilot valve also facilitates earlier opening of the vacuum breaker on system shutdown. On shutdowns, air pockets that develop at high points may be at positive pressure, tending to hold the vacuum breaker on its seat even though water level is below the float assembly. However, the pilot valve will release the air and allow the vacuum breaker to open as soon as level drops. Each vacuum breaker is provided with a butterfly isolation valve to facilitate vacuum breaker maintenance.



- NOTES:**
1. SEE SECTION 31 OF P&ID REQUIRED FOR SANGHVI DAM GATE
 2. DIMENSIONS UNITS ARE IN METERS
 3. 6" PIPING LINE (SCH40) IS 1.5" ABOVE THE TOP OF 30" LINE.
 4. 4" LINE AND 3" PUMP RECEIVING LINE SHALL BE ROUTED TO COMMON TUNNEL.
 5. STRAINER FLUSHING LINES MAY USE THREADED FITTINGS, UNIONS AND VALVES SIZE SHOWN.
 6. VALVES SUPPLIED BY C&S (SEE SPECIFICATIONS AND DRAWING 31-111)
 7. ULTRASONIC FLOW MEASURING INSTRUMENTATION.
 8. CHEMICAL INJECTION FOR ANY CHEMICAL TREATMENT PERFORMED AT THIS LOCATION SHALL BE CONTROLLED BY APPROVED OPERATION PROCEDURES AND/OR PROCESS LOGS WITH AN APPROPRIATE ENVIRONMENTAL AND LEAKAGE DOCUMENTS BACKED UP BY AN APPROPRIATE TECHNICAL EVALUATION OF THE PARTICULAR CHEMICAL. SEE SHEET 31-4 FOR DETAILED TOP CONFIGURATION.

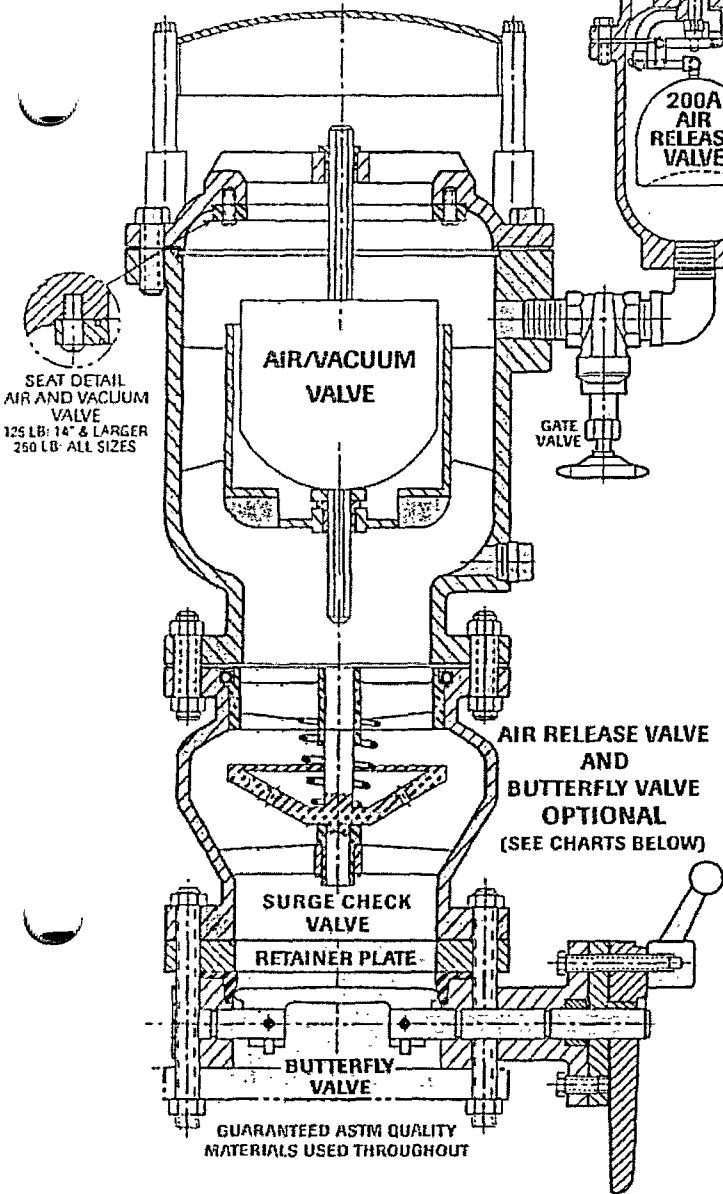
NO.	DATE	BY	DESCRIPTION

DIAGRAM OF
 CIRCULATING WATER MAKE-UP
 UNITS 1 & 2
 M-44
 SHEET NUMBER 3A SIZE: E UPS

THIS IS THE VACUUM VALVE.

HOW TO SELECT APCO SLOW CLOSING AIR/VACUUM VALVES

STEP ONE:
CHECK PUMP CURVE FOR G.P.M. CAPACITY AT NO HEAD CONDITION.
STEP TWO:
ENTER CHART WITH G.D.M. TO DETERMINE SIZE



← THIS THE "float" VALVE THAT SEALS THE VACUUM breaker THIS float failed causing the 2000 EVENT.

← THIS SURGE VALVE DID NOT EXIST PRIOR TO 2000. IT WAS ADDED AS A CORRECTIVE MEASURE AFTER THE 2000 EVENT TO PROTECT THE float VALVE.

' DISCHARGE VED OR ED ONLY.

PERIODS RELEASE

Installations. partment.

(IONAL) RELEASE (E NO.

200A
200A
200A
200
200
200
200

ontained already in ser-

- APCO AIR/VACUUM VALVE**
Stainless Steel float and trim, synthetic, non-destructible seat. Positively will not blow shut even at maximum discharge velocities. Regular 125 lb. or 250 lb. flange mates with similar flange on Surge Check Unit.
- APCO SURGE CHECK VALVE**
Bronze trim and Stainless Steel spring for ultimate in protection.

- APCO AIR RELEASE VALVE**
Will open while line is in operation against pressures up to 300 PSI to exhaust small pockets of entrained air. Stainless Steel Concave Float. (Higher pressure valves available.)
Simplicity of design - no delicate needle valves to fail or need adjustment. Positively will not blow shut.

- REPLACE SHUT-OFF VALVE with APCO BUTTERFLY VALVE**
Costs to excavate pipeline trenches can be greatly reduced by using APCO Butterfly Valves for isolation instead of gate valves. APCO Butterfly Valves are economical, reliable and much shorter, permitting a reduction in depth of the trench.

SERIES 1900

AIR/VACUUM VALVE & SURGE CHECK VALVE

VALVE SIZE	MODEL NO.	MAX. DIAM.	HEIGHT	
			125 LB	250 LB
4"	1904	11"	25"	25"
6"	1906	13"	30"	30"
8"	1908	17"	34"	35"
10"	1910	20"	38"	39"
12"	1912	29"	45"	45"
14"	1914	29"	46"	46"
16"	1916	32"	49"	49"

SIZES 3" & SMALLER, SEE BULLETIN 586

SERIES 1700

AIR/VACUUM VALVE, SURGE CHECK VALVE & AIR RELEASE VALVE

MODEL NO.	WIDTH	HEIGHT	
		125 LB	250 LB
1704	19"	27"	28"
1706	22"	31"	32"
1708	25"	34"	35"
1710	27"	38"	39"
1712	32"	45"	45"
1714	41"	45"	45"
1716	45"	49"	49"

LARGER SIZES READILY AVAILABLE - CONTACT FACTORY.

SERIES 1300

AIR/VACUUM VALVE, SURGE CHECK VALVE & BUTTERFLY VALVE

MODEL NO.	WIDTH	HEIGHT	
		125 LB	250 LB
1304	15"	28"	29"
1306	18"	34"	34"
1308	23"	40"	41"
1310	25"	45"	45"
1312	28"	54"	54"
1314	31"	55"	55"
1316	33"	60"	60"

SERIES 1200

AIR/VACUUM VALVE, SURGE CHECK VALVE, AIR RELEASE & BUTTERFLY VALVE

MODEL NO.	WIDTH	HEIGHT	
		125 LB	250 LB
1204	19"	30"	30"
1206	22"	35"	36"
1208	25"	41"	42"
1210	27"	45"	46"
1212	32"	50"	50"
1214	41"	52"	52"
1216	45"	55"	55"

SLOW CLOSING AIR/VACUUM VALVES

AIR VALVES

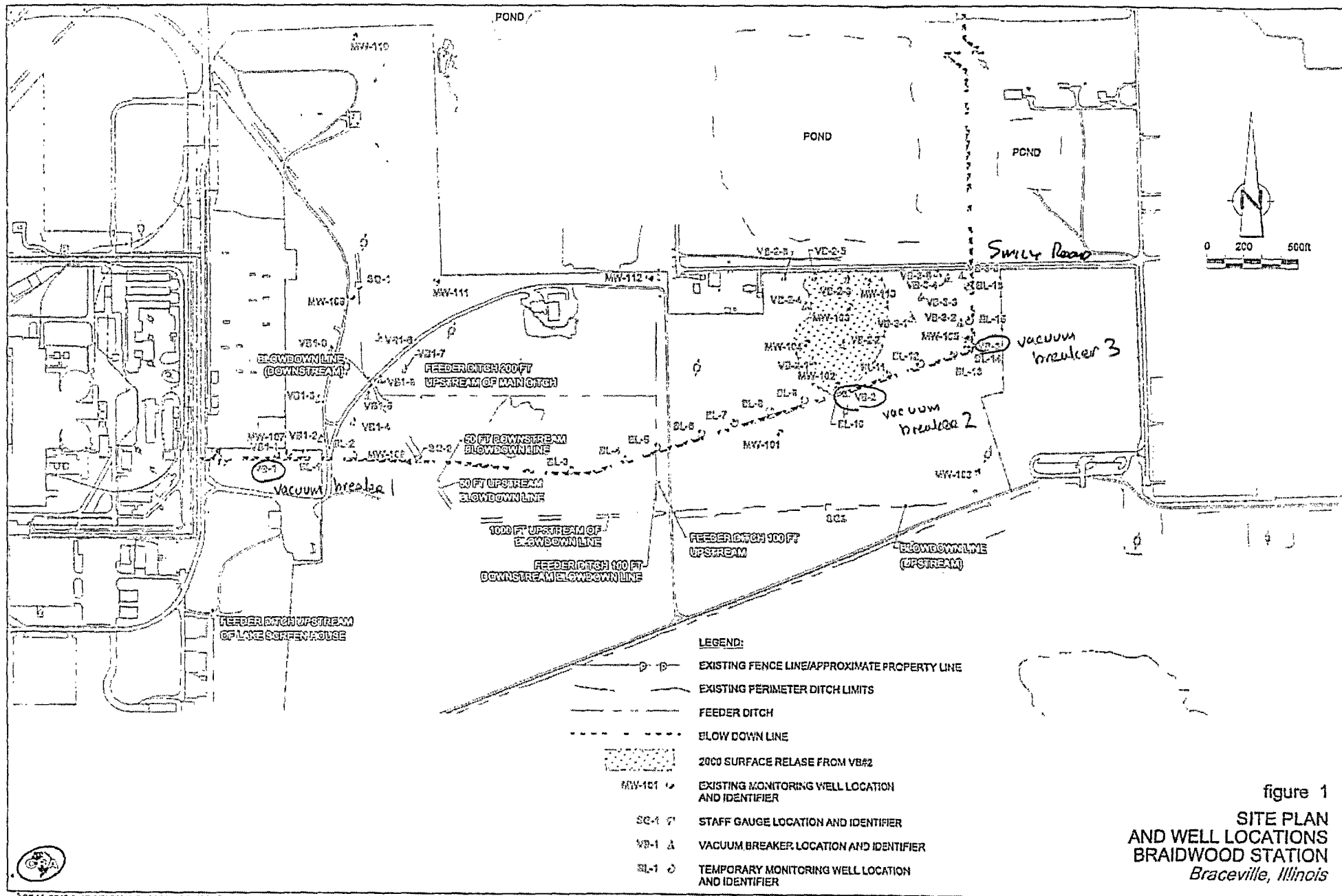


figure 1
 SITE PLAN
 AND WELL LOCATIONS
 BRAIDWOOD STATION
 Braceville, Illinois