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VERIFICATION STUDIES ON SOLIDIFICATION OF BASIN F WASTES

BY

ENVIRONMENTAL LABORATORY
U.S. ARMY ENGINEER WATERWAYS EXPERIMENT STATION
VICKSBURG, MS 39180

FOR

U. S. ARMY TOXIC AND HAZARDOUS MATERIALS AGENCY
ABERDEEN PROVING GROUND, MD 21010

**Rocky Mountain Arsenal
Information Center
Commerce City, Colorado**

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OBJECTIVES

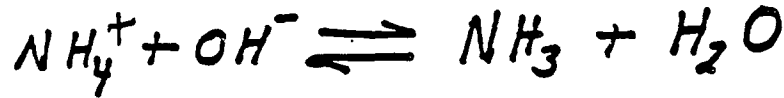
- VERIFY SOLIDIFICATION CONCEPTS DEVELOPED IN PREVIOUS STUDIES
- IDENTIFY TEST PROCEDURES NEEDED TO MONITOR SOLIDIFICATION PROCESSING
- DEVELOP PERFORMANCE CRITERIA FOR SOLIDIFIED BASIN F WASTES

RESULTS FROM PREVIOUS STUDY

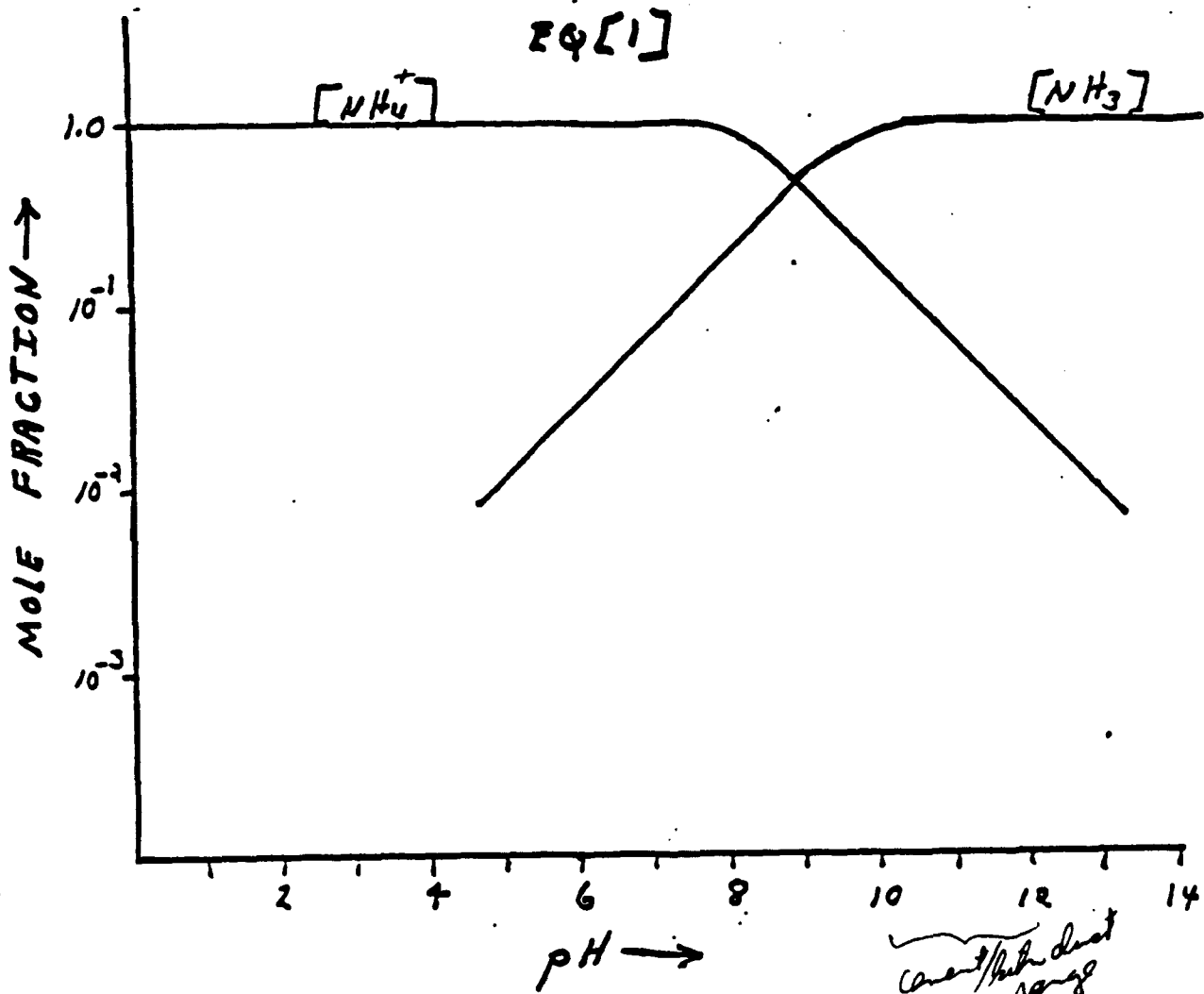
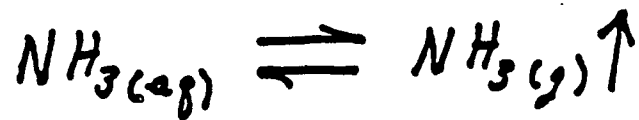
- SOLIDIFICATION IS A FEASIBLE TECHNIQUE FOR CONVERTING BASIN F LIQUID TO A SOLID FORM.
- LARGE QUANTITIES OF AMMONIA GAS ARE RELEASED WHEN VARIOUS SOLIDIFICATION REAGENTS ARE ADDED TO BASIN F LIQUID.

CHEMISTRY OF AMMONIA RELEASE

I. IONIZATION EQ

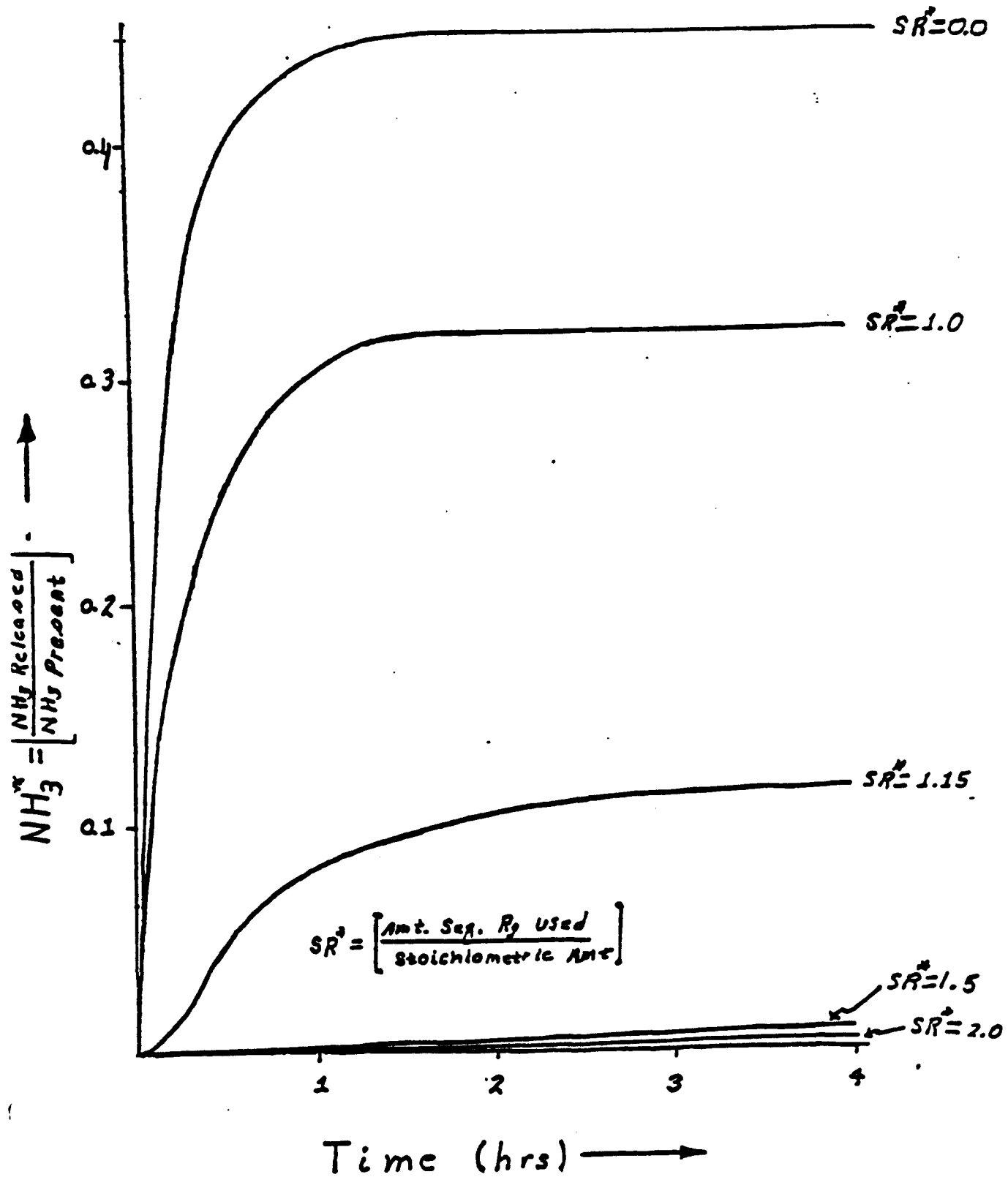


II. CHANGE OF PHASE EQ

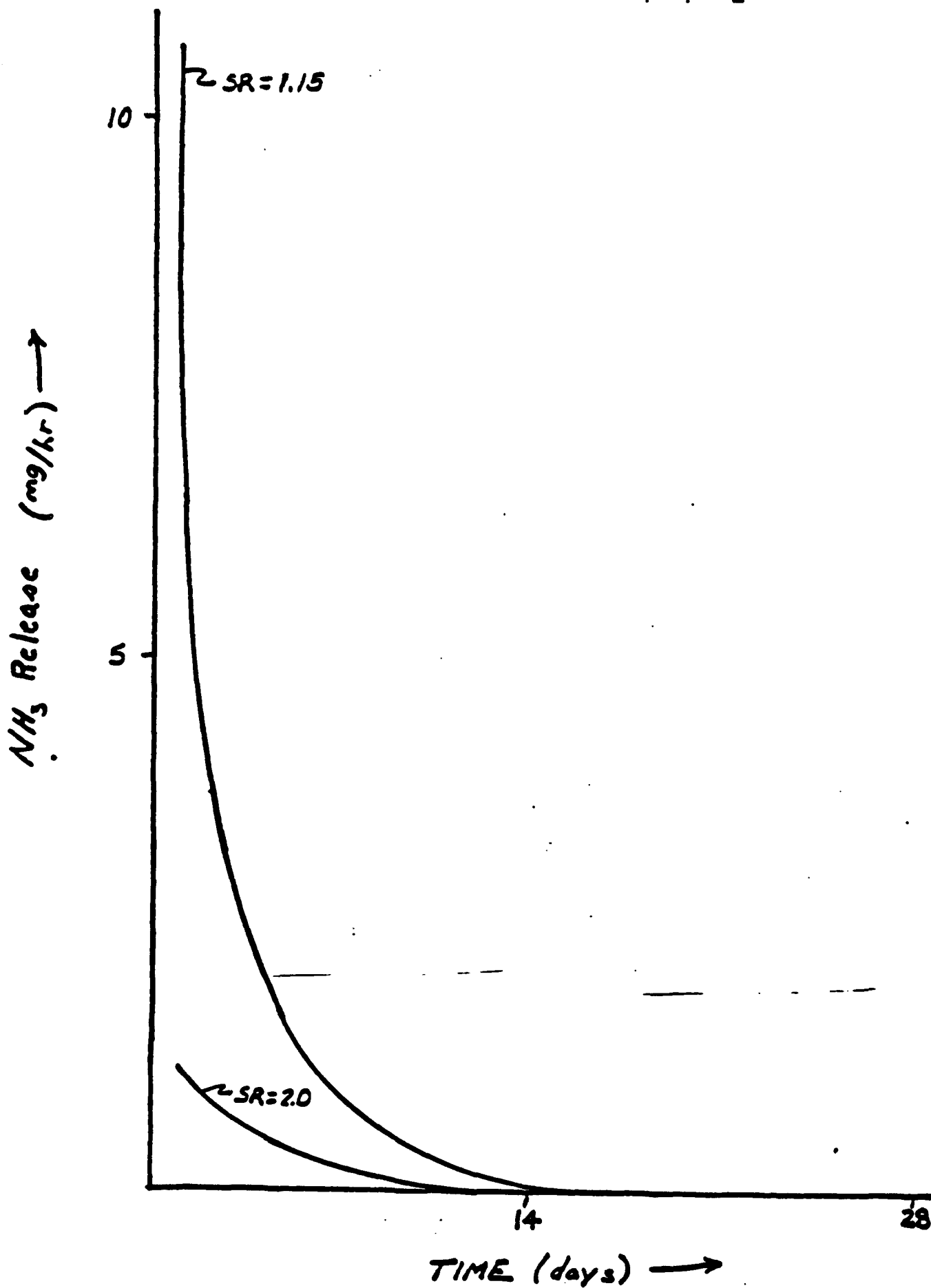


SEQUESTERING OF AMMONIA RELEASE BY $MgNH_4PO_4 \cdot 6H_2O$ PRECIPITATION

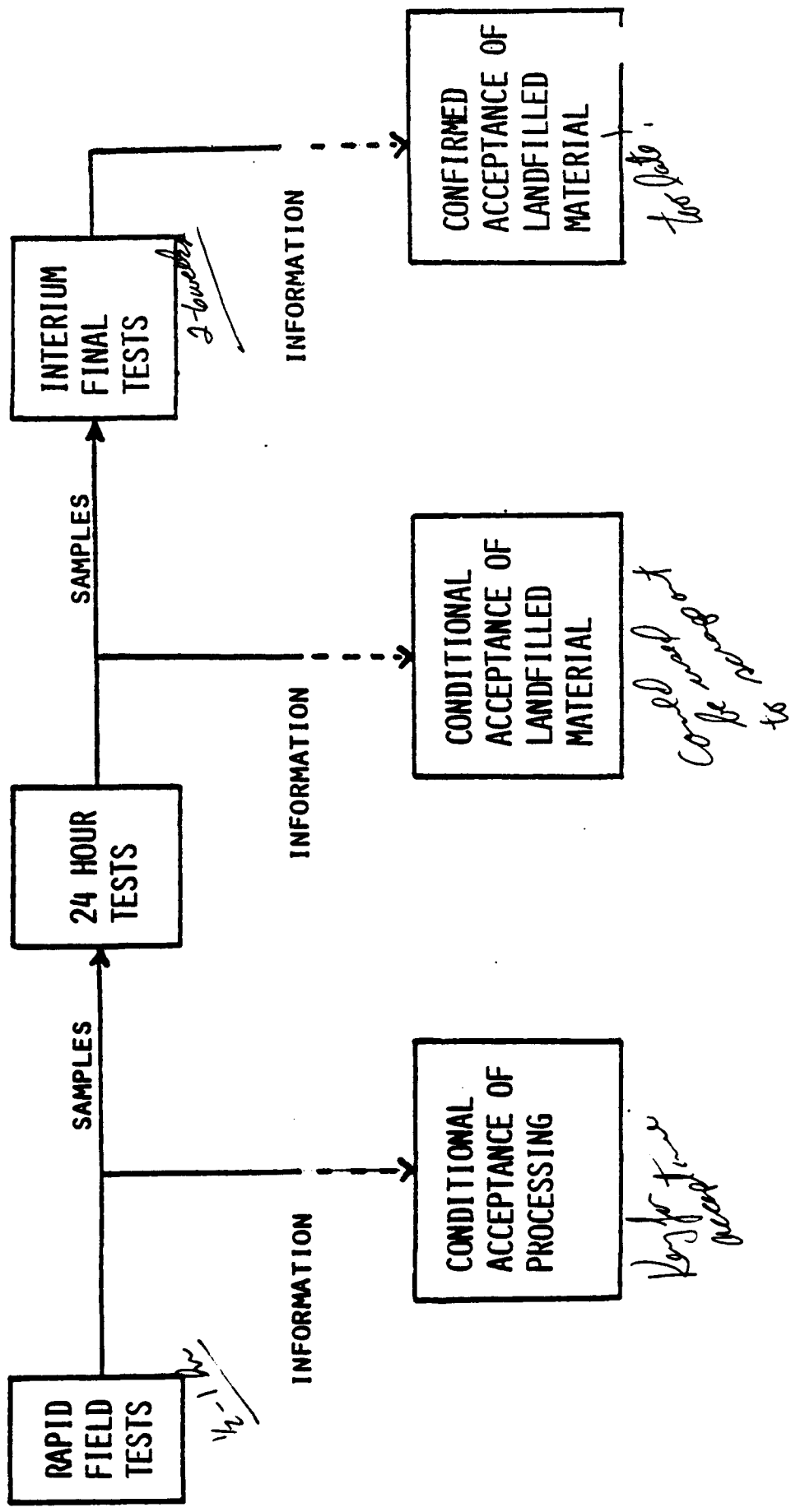
(MgSO₄ phosphoric acid)



SEQUESTERING OF AMM IA RELEASE RATE BY $MgNH_4F \cdot 6H_2O$ PRECIPITATION



ACCEPTANCE TESTING OF SOLIDIFIED WASTE



PERFORMANCE TESTING OF FRESH SOLIDIFIED WASTE

good device
works for 60-70 for CP
could not be used over it. solidif.

PROCESS	CURE TIME (HR)	NP (MM)	PP (PSI)	CP (PSI)	UCS (PSI)
WEAK X=0.5	1/4	>50	<60	8	-
	1	>50	<60	20	3.8
	24	<0.1	502	246	7.0
MEDIUM X=0.6	1/4	>50	<60	23	-
	1	37	107	67	5.5
	24	<0.1	653	310	9.4
STRONG X=0.7	1/4	32	-	213	-
	1	8.5	450	256	24
	24	<0.1	>700	503	21

- NP: NEEDLE PENETROMETER
- PP: POCKET PENETROMETER
- CP: CONE PENETROMETER
- UCS: UNCONFINED COMPRESSIVE STRENGTH

PROCESS:

SOIL	0.8
FLYASH	0.8
LIME	X (0.5-1.7)
SEQ REG	1.1
BF LIQ	1.0

4.2 = 4.4
generates waste
4.2 → 4.4 x weight of waste
weak → strong formulations

SCHEDULE

AND

STATUS



TASK

1. AMMONIA FLUX EXPERIMENTS



2. VERIFICATION OF ADDITIVE DOSAGE RATES



1. EVALUATION OF TEST PROCEDURES



DATA REDUCTION



REPORT PREPARATION

