SRS **SAVANNAH RIVER SITE**
Aiken, SC 29808 • www.srs.gov

September 13, 2007

SRS-REG-2007-00021

Mr. B.S. Mullinax, P.E.
SCDHEC Industrial, Agricultural and Stormwater
Permitting Division
South Carolina Department of Health and
Environmental Control
2600 Bull Street
Columbia, South Carolina 29201-1208

Update on Changes to Saltstone Flush Water Operation (U)

References:

1. SCDHEC Industrial Wastewater Construction and Operating Permit #18,801-IW, last amended 1/29/2007
2. Letter, Changes to Saltstone Flush Water Operation, ESH-WPG-2007-00066, Campbell/Liner (WSRC) to Mullinax (SCDHEC), 8/1/07
3. Letter, Additional Information - Changes to Saltstone Flush Water Operation, SRS-REG-2007-00013, Campbell/Liner (WSRC) to Mullinax (SCDHEC), 8/24/07

This letter is to update the South Carolina Department of Health and Environmental Control (hereafter referred to as the Department) with regard to the changes in Saltstone Production Facility (SPF) flush water operation that were previously discussed. (See References 2 and 3)

As observed by the Department during the SPF inspection on 9/11/07, the removable portion of pipe (spool piece) that allows the Clean Cap Batch Tank (CCBT) to supply process water, inhibited with sodium hydroxide, to the saltstone production process has been installed. (See Reference 2) Work is also complete on the existing salt solution and process water control valves which provide the ability to better control liquid flow to the mixer. The CCBT is now capable and will be used to supply process water, inhibited with sodium hydroxide, to the saltstone production process during initial facility startup, recovery from system upsets, and shutdown flushes. (See References 2 and 3)

In an effort to expedite SPF start-up and operations, the work required to install the sodium hydroxide addition line to the CCBT shown in Reference 2 will be completed in parallel with SPF operations per the SPF Industrial Wastewater Treatment Facility Operating Permit #18,801-IW. (See Reference 1) The sodium hydroxide addition line work is expected to be completed by December 19, 2007.

In the interim, as required, sodium hydroxide will be added to the CCBT using a normally blank-flanged opening on the CCBT tank top per the arrangement shown on Attachment 1.

WSRC will notify the Department once the CCBT sodium hydroxide addition line work is complete and will request a final inspection of the installation. At that time WSRC understands that SCDHEC will issue a formal letter recognizing completion of the SPF flush water modifications.

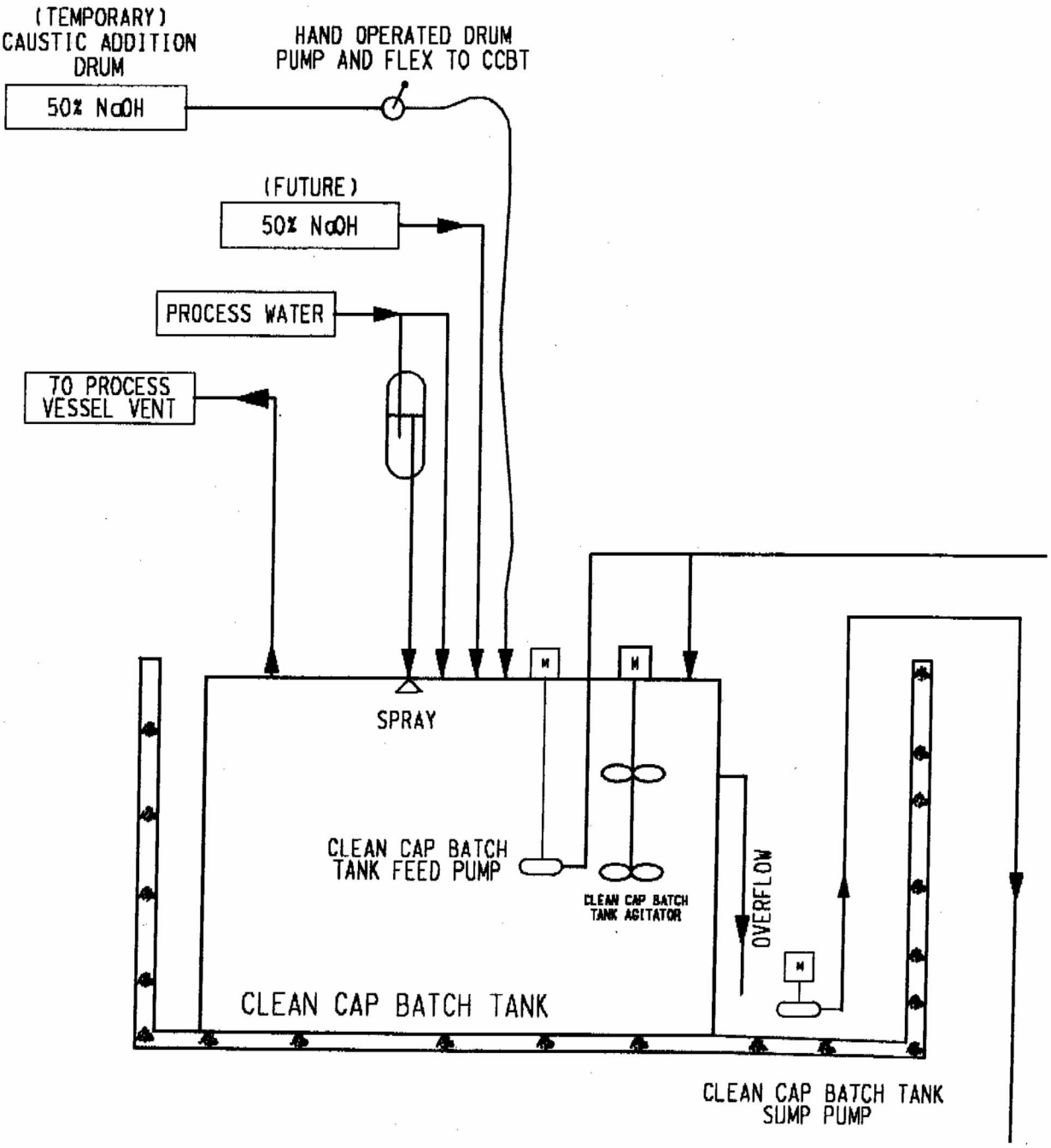
If you have any questions, please contact Ron Campbell (803) 952-7382 or Keith Liner (803) 208-6466.

Yours very truly,

Ron Campbell
Environmental Services Section
Washington Savannah River Company, LLC

Keith Liner
Site Regulatory Interface and Planning
Washington Savannah River Company, LLC

Attachment 1



cc: R.T. Caldwell II, SCDHEC, Aiken SC
V.E. Millings III, SCHEC, Aiken SC
J. McCain Jr., SCHEC, Columbia SC
J. Yon, SCDHEC, Aiken, SC

bc: V.G. Dickert, WSRC, 730-1B, Rm. 343
S.A. Thomas, WSRC, 766-H, Rm. 2312
R.K. Cauthen, WSRC, 766-H, Rm. 2307
L.B. Romanowski, WSRC, 766-H, Rm. 1066B
H.J. Stafford III, WSRC, 730-1B, Rm. 215
J.D. Heffner, WSRC, 735-B, Rm. 132
S.K. Nicodemus, WSRC, 704-S, Rm. 22
M.A. Lindholm, WSRC, 704-S, Rm. 11
E. Patten, WSRC, 704-Z, Rm. 6
I.W. Lewis III, WSRC, 766-H, Rm. 2012
S.D. Burke, WSRC, 704-S, Rm. 17
D.C. Sherburne, WSRC, 704-S, Rm. 18
P.W. Norris, WSRC, 704-Z Rm. 4
B.P. Enevoldsen, WSRC, 704-5Z Rm. 7
K.J. Bumpus, WSRC, 704-5Z, Rm.5
M. E. Howard, WSRC, 704-72S, Rm.167
T.F. England, WSRC, 705-1C, Rm. 17
M.C. Wright, WSRC, 705-1C, Rm. 16
T.J. Spears, DOE, 704-S, Rm. 29
L.T. Ling, DOE, 766-H, Rm. 2015
C.H. Pang, DOE, 766-H, Rm. 2435
D.F. Hoel, DOE, 730-B, Rm. 3463
S.A. Danker, DOE, 730-B, Rm. 3480
G.S. Hoover, DOE, 730-B, Rm. 3478

File Info:

SCDHEC, Saltstone
10666, DOE/ADM
16-1.5(a) Permanent

D H E C

PROMOTE PROTECT PROSPER

Promoting and protecting the health of the public and the environment

August 27, 2007

Mr. Ron Campbell
Washington Savannah River Company
Environmental Services Section
Bldg. 735-B
Aiken, SC 29808

RE: (1) Changes to Saltstone Flush Operation dated August 1, 2007
(2) Additional Information – Changes to Saltstone Flush Operation dated August 24, 2007
Savannah River Site
Aiken County

Dear Mr. Campbell:

This Office has reviewed the request in Reference 1 to modify the Saltstone Production Facility (SPF) permitted under Construction Permit No. 18,801-IW as well as the information in Reference 2. This request involves: adding the capability to add process water inhibited with sodium hydroxide; the installation of a spool piece in the Clean Cap Batch Tank (CCBT) transfer line; and placing the CCBT on-line. This letter hereby approves the modification of the SPF construction permit that is the sixth modification of Construction Permit No. 18,801-IW. This change is necessary to achieve a more effective flush operation for the SPF transfer line going to the Saltstone Industrial Solid Waste Landfill.

Construction Permit History

The permit history is included here to provide clarification regarding what modifications have been made to this construction permit beginning with the most recent modification and going back to the original permit.

The fifth modification of this construction permit involved modifying the permit to revise Table 1 in Special Condition #8 to reflect the approximate chemical constituent concentrations for the salt solution feed for Deliquification, Dissolution, and Adjustment waste material. This modification was issued on January 29, 2007.

The fourth modification to this construction permit involved replacing the existing Table 1 with a revised Table 1 to address the approximate chemical constituent concentrations for the salt solution feed for Batch Zero waste. This modification was issued on November 21, 2006.

The third modification to the Saltstone construction permit involved the construction of the Mixer At Vault Road Concept (MAVRC). Note that the Special Conditions remain unchanged by this modification. Not all of the changes approved for this modification were implemented. Note that an as-built drawing that reflected the final design for this modification was submitted in a letter dated October 6, 2005 from Andrew R. Redwood (SRS) to Scott Simons, District Engineer. A Permit-to-Operate was requested by SRS and the District Engineer performed an inspection of the facility. However, a formal Permit-to-Operate was not issued at that time.

A second construction permit modification had been approved by Byron Amick in a letter dated February 2, 2004 and it involved changing Table 1 which resulted in a different chemical composition for the salt solution feed table.

The first construction permit modification to this construction permit had been approved by Adrienne Wright in a letter dated September 10, 2003. Special conditions number 2, 3, 7, 8, and 9 were modified. The requirement to manually sample the grout density was also removed due to recent SPF modifications.

Adrienne Wright issued the original construction permit for the Saltstone Production Facility on May 15, 2003.

If you have any questions, please contact me at (803) 898-4012.

Sincerely,

Barry S. Mullinax

Barry S. Mullinax, P.E.
Environmental Engineer
Industrial Wastewater Permitting Section
Bureau of Water

cc (w/enclosure): John McCain, Solid Waste Permitting, BLWM
Ted Millings, Region 5 EQC, Aiken District Office
Josh Yon, Region 5 EQC, Aiken District Office
Shelly Sherritt, Federal Facilities Liaison, EQC Admin

SRS **SAVANNAH RIVER SITE**
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August 24, 2007

RECEIVED
AUG 27 2007
WATER FACILITIES
PERMITTING DIVISION

SRS-REG-2007-00013

Mr. B.S. Mullinax, P.E.
SCDHEC Industrial, Agricultural and Stormwater
Permitting Division
South Carolina Department of Health and
Environmental Control
2600 Bull Street
Columbia, South Carolina 29201-1208

Addition Information - Changes to Saltstone Flush Water Operation (U)

References:

1. SCDHEC Industrial Wastewater Construction and Operating Permit #18,801-IW, last amended 1/29/2007
2. Letter, Professional Engineer's Certification of SCDHEC Construction Permit # 18,801-IW, Changes to Saltstone Process Low Curie Modifications (U), PDCS-MOC-05-002, 10/6/2005
3. Letter, Changes to Saltstone Flush Water Operation, ESH-WPG-2007-00066, Campbell/Liner (WSRC) to Mullinax (SCDHEC), 8/1/07

As discussed during our conference call on 8/23/07 this letter is intended to provide additional information to the Department with respect to the changes in the Saltstone Production Facility (SPF) flush water operation.

The Washington Savannah River Company (WSRC) plans to install the approximately 2 foot long section of 3 inch diameter removable pipe shown as a spool piece in the Clean Cap Batch Tank (CCBT) transfer line on drawing M-M5-Z-003, Revision 3. (See Reference 2) WSRC also plans to install the ability to add sodium hydroxide to the CCBT via a ¾ inch diameter pipe line and to modify the existing salt solution and process water control valves to allow the ability to better control liquid flow to the mixer. (See Reference 3)

The CCBT will be used to supply process water, inhibited with sodium hydroxide, to the saltstone production process during initial facility startup, recovery from system upsets, and shutdown flushes.

The CCBT will be used to establish the necessary liquid feed flow during initial system start-up. After the initiation of liquid feed flow, dry material flow will be established to the mixer. Once the mixer is in steady-state operations, the flow of liquid will be sequenced from inhibited water to salt solution to begin waste treatment.

On system shutdown dry and liquid feed to the mixer are stopped and shutdown flushes are conducted with inhibited water. Inhibited water flushes at the end of the process run are desirable because it aids in dissolving the grout residue found inside of the grout transfer piping.

If you have any questions, please contact Ron Campbell (803) 952-7382 or Keith Liner (803) 208-6466.

Yours very truly,

Ron Campbell
Environmental Services Section
Washington Savannah River Company, LLC

Keith Liner
Site Regulatory Interface and Planning
Washington Savannah River Company, LLC

cc: R.T. Caldwell II, SCDHEC, Aiken SC
V.E. Millings III, SCHEC, Aiken SC
J. McCain Jr., SCHEC, Columbia SC
J. Yon, SCDHEC, Aiken, SC

bc: V.G. Dickert, WSRC, 730-1B, Rm. 343
S.A. Thomas, WSRC, 766-H, Rm. 2312
R.K. Cauthen, WSRC, 766-H, Rm. 2307
L.B. Romanowski, WSRC, 766-H, Rm. 1066B
H.J. Stafford III, WSRC, 730-1B, Rm. 215
J.D. Heffner, WSRC, 735-B, Rm. 132
S.K. Nicodemus, WSRC, 704-S, Rm. 22
M.A. Lindholm, WSRC, 704-S, Rm. 11
E. Patten, WSRC, 704-Z, Rm. 6
S.D. Burke, WSRC, 704-S, Rm. 17
D.C. Sherburne, WSRC, 704-S, Rm. 18
P.W. Norris, WSRC, 704-Z Rm. 4
B.P. Enevoldsen, WSRC, 704-5Z Rm. 7
K.J. Bumpus, WSRC, 704-5Z, Rm.5
M. E. Howard, WSRC, 704-72S, Rm.167
T.F. England, WSRC, 705-1C, Rm. 17
M.C. Wright, WSRC, 705-1C, Rm. 16
T.J. Spears, DOE, 704-S, Rm. 29
L.T. Ling, DOE, 766-H, Rm. 2015
C.H. Pang, DOE, 766-H, Rm. 2435
D.F. Hoel, DOE, 730-B, Rm. 3463
S.A. Danker, DOE, 730-B, Rm. 3480
G.S. Hoover, DOE, 730-B, Rm. 3478

File Info:

SCDHEC, Saltstone
10666, DOE/ADM
16-1.5(a) Permanent

SRS **SAVANNAH RIVER SITE**
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August 1, 2007

ESH-WPG-2007-00066

Mr. B.S. Mullinax, P.E.
SCDHEC Industrial, Agricultural and Stormwater
Permitting Division
South Carolina Department of Health and
Environmental Control
2600 Bull Street
Columbia, South Carolina 29201-1208

Changes to Saltstone Flush Water Operation (U)

References:

1. SCDHEC Industrial Wastewater Construction and Operating Permit #18,801-IW, last amended 1/29/2007
2. Professional Engineer's Certification of SCDHEC Construction Permit # 18,801-IW, Changes to Saltstone Process Low Curie Modifications (U), PDCS-MOC-05-002, 10/6/2005

This letter is to update the South Carolina Department of Health and Environmental Control with regards to Saltstone Production Facility (SPF) operation. As is shown in Reference 2, the Washington Savannah River Company (WSRC) plans to install the spool piece, previously shown for future use, in the Clean Cap Batch Tank (CCBT) transfer line and place the CCBT on-line.

The CCBT will be used to supply process water, inhibited with sodium hydroxide, to the saltstone production process during initial facility startup, recovery from system upsets, and shutdown flushes. The saltstone production process will be modified by installation of the CCBT spoolpiece and modification of existing control valves that will allow the flow of inhibited water (see Attachment 1) to be established through the saltstone mixer prior to the initiation of dry feeds. Once dry feed flow is established and the mixer is in steady-state operations, the flow of liquid will be sequenced from inhibited water to salt solution to begin waste treatment. During saltstone production process shutdown, the liquid flow to the mixer will again be transitioned from salt solution to inhibited water to facilitate final system flushes.

If you have any questions, please contact Ron Campbell (803) 952-7382 or Keith Liner (803) 208-6466.

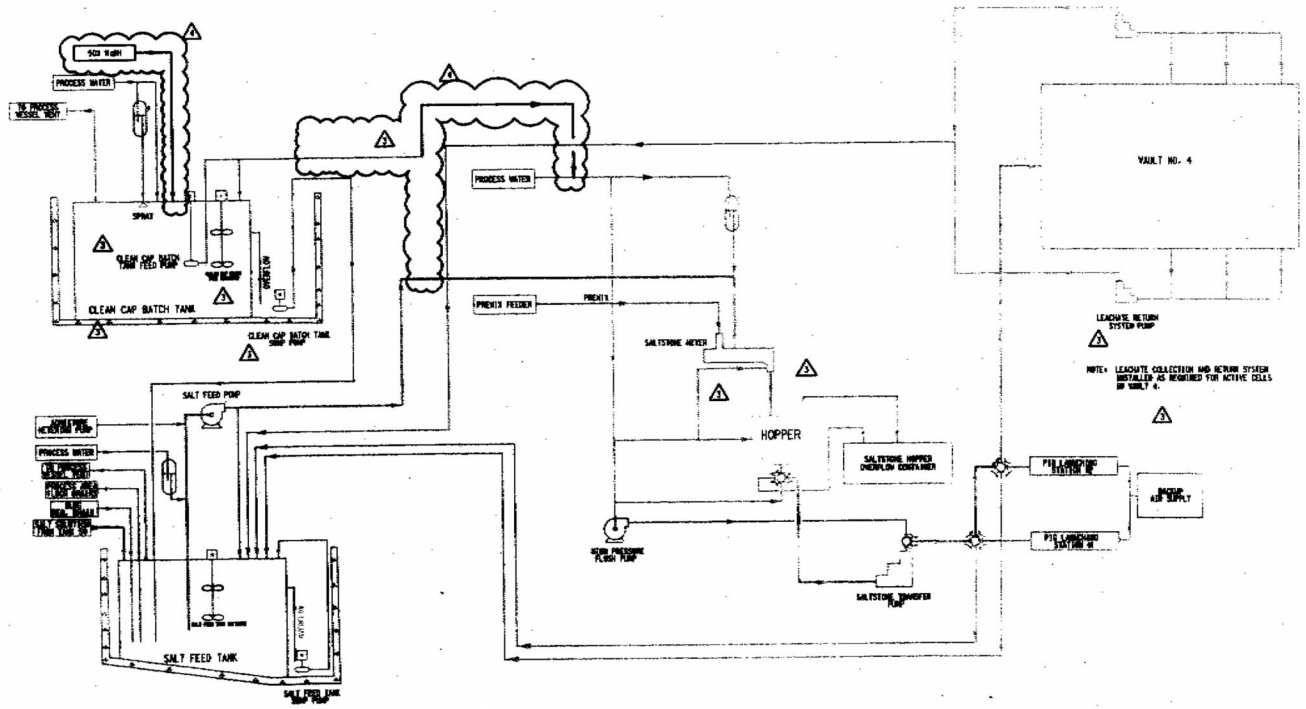
Yours very truly,

Ron Campbell
Environmental Services Section
Washington Savannah River Company, LLC

Keith Liner
Regulatory Interface and Planning
Washington Savannah River Company, LLC

Attachment #1

Process Flow Diagram



Modification approved by letter dated Aug. 27, 2007
Barry Mullinax to Ron Campbell - Same Subject

THIS DOCUMENT HAS BEEN SUBMITTED AS PART OF A PERMIT PACKAGE TO SC DHEC INDUSTRIAL WASTE WATER TREATMENT PERMIT # 18,801-IW. CONTACT ENVIRONMENTAL COORDINATOR PRIOR TO REVISION ISSUE.

NOTES

LEGEND

COLOR DRAWING KEY

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
No. 20412
WILLIAM N. KENNEDY
William N Kennedy
8/2/07

M M5 Z 0003 4

UNITED STATES DEPARTMENT OF ENERGY
SAVANNAH RIVER SITE

DEFENSE WASTE PROCESSING FACILITY
SALTSTONE PROCESS
LOW CURIE SALT DISPOSITION PROJECT
PREVIOUS ARRANGEMENT
PROCESS FLOW DIAGRAM
(U)

N/A N/A 4

cc: R.T. Caldwell II, SCDHEC, Aiken SC
V.E. Millings III, SCHEC, Aiken SC
J. McCain Jr., SCDHEC, Columbia SC

bc: H.J. Stafford III, WSRC, 730-1B, Rm. 215
J.D. Heffner, WSRC, 735-B, Rm. 132
C.J. Ward, WSRC, 705-H, Rm. 13
S.K. Nicodemus, WSRC, 704-S, Rm. 22
M.A. Lindholm, WSRC, 704-S, Rm. 11
E. Patten, WSRC, 704-Z, Rm. 6
S.D. Burke, WSRC, 704-S, Rm. 17
D.C. Sherburne, WSRC, 704-S, Rm. 18
P.W. Norris, WSRC, 704-Z Rm. 4
B.P. Enevoldsen, WSRC, 704-5Z Rm. 7
K.J. Bumpus, WSRC, 704-5Z, Rm.5
M. E. Howard, WSRC, 704-72S, Rm.167
L.B. Romanowski, WSRC, 766-H, Rm. 1066B
V.G. Dickert, WSRC, 730-1B, Rm. 343
S.A. Thomas, WSRC, 766-H, Rm. 2312
R.K. Cauthen, WSRC, 766-H, Rm. 2307
T.F. England, WSRC, 705-1C, Rm. 17
M.C. Wright, WSRC, 705-1C, Rm. 16
T.J. Spears, DOE, 704-S, Rm. 29
L.T. Ling, DOE, 766-H, Rm. 2015
C.H. Pang, DOE, 766-H, Rm. 2435
D.F. Hoel, DOE, 730-B, Rm. 3463

File Info:

SCDHEC, Saltstone
10666, DOE/ADM
16-1.5(a) Permanent

D H E C
PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment

*Revised November 21, 2006

FINAL APPROVAL TO PLACE IN OPERATION

Issued To: USDOE/Washington Savannah River Company
Building 735-B
Aiken, SC 29808

for the operation of the following system in accordance with Construction Permit No. 18,801-IW dated May 15, 2003 and subsequent construction permit modification letters issued by the Industrial Wastewater Permitting Section of the Bureau of Water.

Project Name: Saltstone Production Facility Modification
County: Aiken

Project Description: Modification and/or installation of treatment facility components in accordance with SCDHEC construction permit 18,801-IW and subsequent construction permit modification letters issued by the Industrial Wastewater Permitting Section of the Bureau of Water.

The wastewater will be discharged to the Saltstone Disposal Facility treatment facility at a design flow rate of 140,000 gpd. The effluent concentrations of those constituents for which the wastewater treatment system is designed to remove or reduce are contained in Industrial Solid Waste Landfill Permit No. 025500-1603.

Special Conditions: Special conditions shall be adhered to as outlined in the most recent revision of the construction permit and subsequent construction permit modification letters issued by the Industrial Wastewater Permitting Section of the Bureau of Water.

This operational approval is based on the Engineer's letter of certification dated September 03, 2003 and signed by Joseph Carroll, P.E., S.C. Registration No.: 14028; a subsequent Engineer's letter of certification of changes dated October 06, 2005 and signed by Andrew R. Redwood, P.E., S.C. Registration No.: 20525; correspondence from Campbell and Liner (SRS) to Mullinax (SCDHEC) dated December 01, 2005; and inspections performed by personnel of the Department on September 03, 2003 and October 26, 2005.

Victor E. Millings, III
Regional Hydrogeologist
Aiken EQC Office

Date Issued: November 21, 2006

*Revision to Final Approval originally issued on September 11, 2003

cc: Joseph Carroll, P.E.
Ron Campbell, WSRC
Barry Mullinax, SCDHEC – BOW
Shelly Sherritt, SCDHEC – EQC Admin
Trey Reed, SCDHEC – Aiken Public Health Office
Andrew R. Redwood, P.E.
Keith Liner, WSRC
John McCain, Jr., SCDHEC - BLWM
Rick T. Caldwell, II, SCDHEC – Aiken EQC Office

SAVANNAH RIVER SITE
Aiken, SC 29808 • www.srs.gov

PDCS-MOC-05-002

RECEIVED
OCT 11 2005
Industrial, Agricultural &
Stormwater Permitting Division

October 6, 2005

Mr. Scott L. Simons
District Engineer
South Carolina Department of Health and
Environmental Control
Region 5 Aiken EQC
206 Beaufort Street, NE
Aiken, SC 29801

Dear Mr. Simons,

PROFESSIONAL ENGINEER'S CERTIFICATION OF SCDHEC CONSTRUCTION PERMIT #18,801-IW, CHANGES TO SALTSTONE PROCESS LOW CURIE MODIFICATIONS (U)

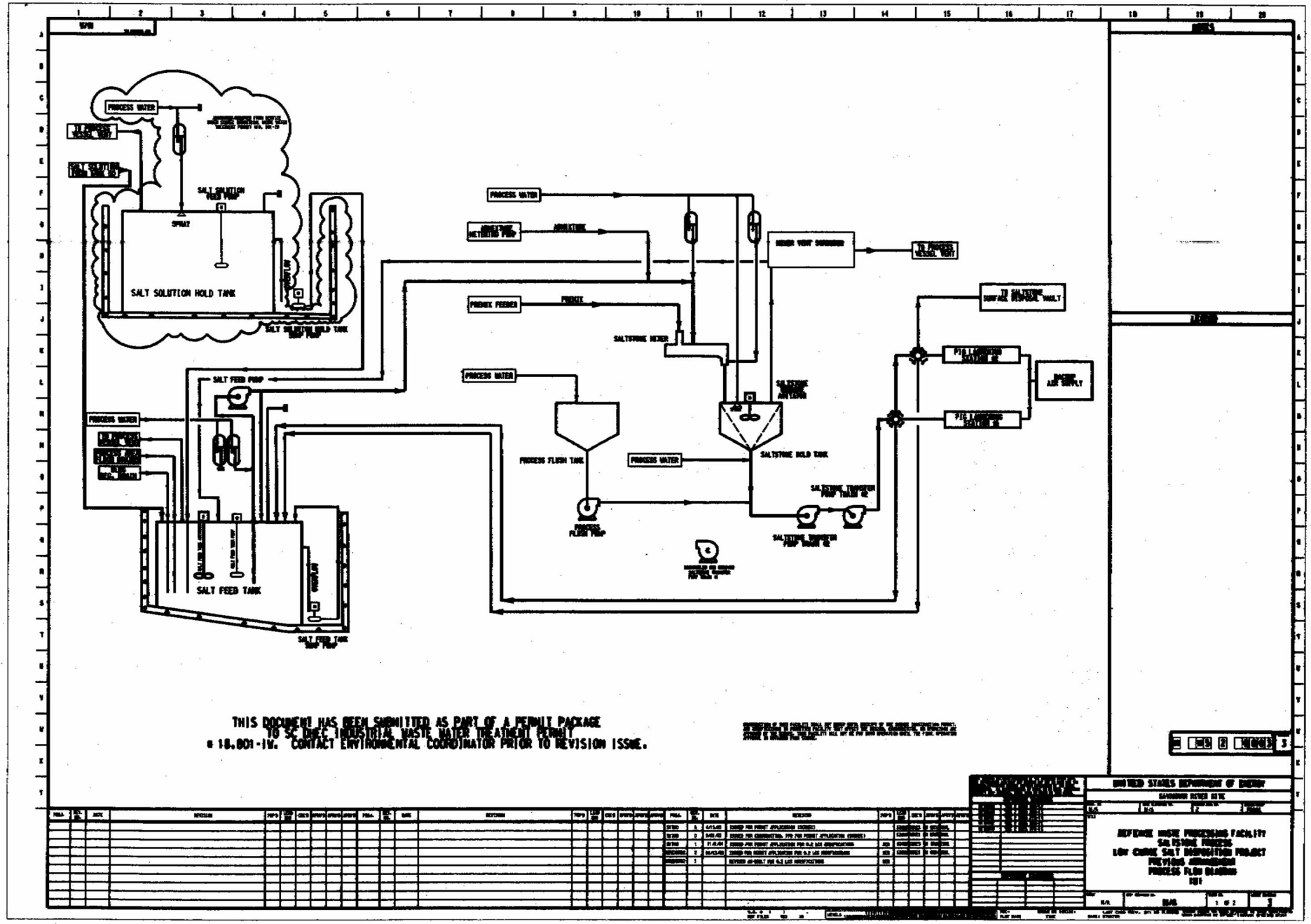
I have inspected the construction modifications for the Saltstone Process Low Curie project as described in the SCDHEC Construction Permit #18,801-IW approved on January 31, 2005. The modifications were found to be, to the best of my knowledge, built in accordance with the approved documents. An "As-Built" drawing is attached. Leak testing has been performed to demonstrate that installations completed under the permit modification are leak tight. Remaining work includes the completion of punchlist items that do not affect the operability of the facility and the performance of an in-service leak test at the tie-in locations.

Please contact me if you have any questions of comments. I can be reached at (803) 952-2079.

Andrew R. Redwood

Andrew R. Redwood, PE
South Carolina #20525

cc: R. M. Campbell, 735-B
B. P. Enevoldsen, 704-Z
A. B. Gould, Jr., 730-B
G. S. Hoover, 730-B
W. N. Kennedy, 730-1B
K. R. Liner, 704-S
C. H. Pang, 766-H
D. G. Thompson, 704-Z
B. S. Mullinax, SCDHEC, Industrial, Agricultural, and Stormwater Permitting Division, Columbia, SC
J. M. Gilbo, SCDHEC, Bureau of Land and Waste Management, Columbia, SC

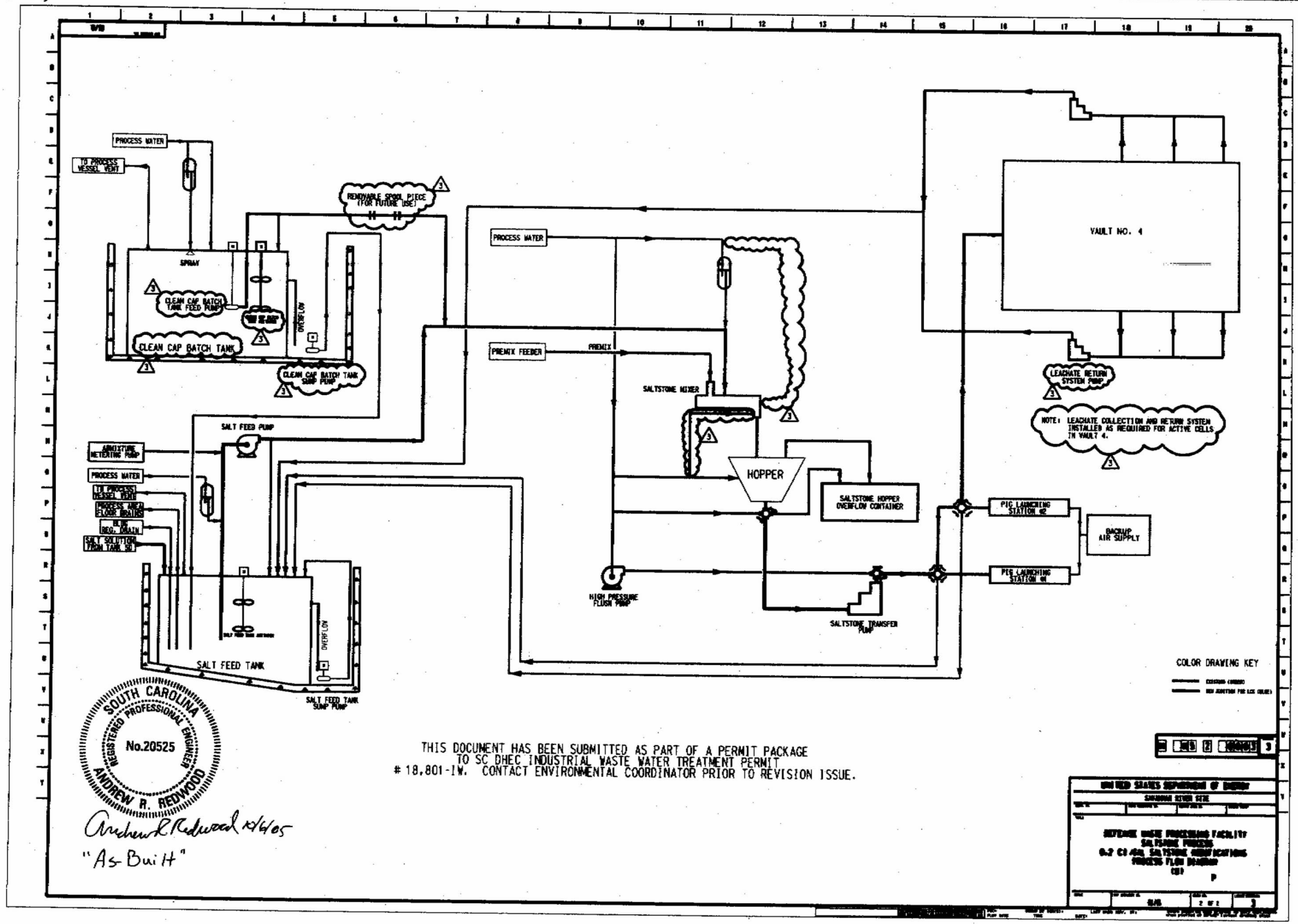


THIS DOCUMENT HAS BEEN SUBMITTED AS PART OF A PERMIT PACKAGE TO SC DHEC INDUSTRIAL WASTE WATER TREATMENT PERMIT # 18,801-IW. CONTACT ENVIRONMENTAL COORDINATOR PRIOR TO REVISION ISSUE.

UNITED STATES DEPARTMENT OF ENERGY

SAVANNAH RIVER SITE

DEFENSE WASTE PROCESSING FACILITY
SALTSTONE PROCESS
LOW CURIE SALT DISPOSITION PROJECT
PREVIOUS MODIFICATION
PROCESS FLOW DIAGRAM
101



SOUTH CAROLINA
REGISTERED PROFESSIONAL ENGINEER
No.20525
ANDREW R. REDWOOD

Andrew R. Redwood 12/6/05
"As Built"

THIS DOCUMENT HAS BEEN SUBMITTED AS PART OF A PERMIT PACKAGE
TO SC DHEC INDUSTRIAL WASTE WATER TREATMENT PERMIT
18,801-IW. CONTACT ENVIRONMENTAL COORDINATOR PRIOR TO REVISION ISSUE.

UNITED STATES DEPARTMENT OF ENERGY
SAVANNAH RIVER SITE

DEFENSE WASTE PROCESSING FACILITY
SALTSTONE PROCESS
0.2 CU.M/HR SALTSTONE MODIFICATIONS
PROCESS FLOW DIAGRAM
(U)

2 OF 2

D H E C

PROMOTE PROTECT PROSPER

Promoting and protecting the health of the public and the environment.

January 31, 2005

Mr. Gene H. Laska
Westinghouse Savannah River Company
Environmental Services Section
Bldg. 742-A
Aiken, SC 29808

RE: Saltstone Production Facility Modification (U) Dated November 17, 2004 to Barry Mullinax (SCDHEC) from G. Laska (WSRC)
Construction Permit Number 18,801-IW (Issued May 15, 2003)
Savannah River Site – Aiken County

Dear Mr. Laska:

This Office has reviewed the above referenced request to modify the Saltstone Facility permitted under Construction Permit No. 18,801-IW (issued May 15, 2003). The first modification to this construction permit was approved by Adrienne Wright in a letter dated September 10, 2003. Special conditions number 2, 3, 7, 8, and 9 were modified. The requirement to manually sample the grout density was also removed due to recent Saltstone modifications. The second modification was approved by Byron Amick in a letter dated February 2, 2004 and it involved changing Table 1 which resulted in a different chemical composition for the salt solution feed table.

This modification will be the third modification to the saltstone construction permit and it involves the construction of the Mixer At Vault Road Concept (MAVRC). *Note that the Special Conditions remain unchanged by this modification.*

The following project description reflects the approved changes associated with the MAVRC modification to the Saltstone Production Facility (Construction Permit No. 18,801-IW):

Relocation of the mixer to an area near the Saltstone Disposal Facility;
Elimination of the currently installed dry materials system;
Construction of a new dry materials system at the new mixer location;
Installation of a salt solution waste transfer line from the 210-Z building to the new mixer location;
Installation of grout pumping equipment and pig launching systems to transfer the saltstone grout from the new mixer location to the SDF – Vault #4;
Installation or ancillary support systems at the new mixer location; and
Installation of a SDF vault drain water return system.

If you have any questions, please contact me at (803) 898-4012.

Sincerely,

Barry S. Mullinax

Barry S. Mullinax, P.E.
Environmental Engineer
Federal, Energy, Pre-Treatment Permitting Section
Bureau of Water
mullinbs@dhec.sc.gov

/bsm

Enclosure

cc: Jenny Mowbray, Solid Waste, BLWM (w/enclosure)
Scott Simons, Lower Savannah EQC District Office (w/enclosure)
Shelley Sherritt, Federal Facilities Liaison, EQC Admin
Melissa J. King, Manager, FEP

November 18, 2004

TO: RICK CALDWELL
EDISTO SAVANNAH District Office

FROM: Federal, Energy, & Pretreatment Section
Industrial, Agricultural, & Storm Water Permitting Division

RE: SRS SALTSTONE FACILITY/MIXER
AIKEN COUNTY

Attached is a project submitted to this Division for permitting. Please review and comment within fifteen (15) days. Should you desire additional time or have questions please call Melissa King at (803) 898-3236. Thank you.

DISTRICT COMMENTS:

No specific concerns

Scott L. Simons

FILE COPY

November 18, 2004

TO: RICK CALDWELL
EDISTO SAVANNAH District Office

FROM: Federal, Energy, & Pretreatment Section
Industrial, Agricultural, & Storm Water Permitting Division

RE: SRS SALTSTONE FACILITY/MIXER
AIKEN COUNTY

Attached is a project submitted to this Division for permitting. Please review and comment within fifteen (15) days. Should you desire additional time or have questions please call Melissa King at (803) 898-3236. Thank you.

DISTRICT COMMENTS:

FILE COPY

November 18, 2004

MEMORANDUM

TO: Charleen Smith
EQC Administration (FAX # 896-8941)

FROM: Melissa J. King
Federal, Energy, and Pretreatment Section
Industrial, Agricultural, & Stormwater Permitting Division
Bureau of Water

The following project has been submitted to the Bureau of Water for permitting. This is a fee project. The fee has been sent to finance. A copy of the payment information is attached and the following information is provided:

Project Name: SRS SALTSTONE FACILITY/MIXER
AIKEN County
Project ID: 121834
Project Owner/Company: WESTINGHOUSE SAV RIVER CO
BLDG 742-A
AIKEN, SC 29808
Person who signed application: JAMES W FRENCH
Check Amount: $400
Check number: 182215

Please deposit the fee into the Bureau's account for construction application fees.

FILE COPY

THIS IS WATERMARKED PAPER - DO NOT ACCEPT WITHOUT NOTING WATERMARK - HOLD TO LIGHT TO VERIFY WATERMARK

WESTINGHOUSE
SAVANNAH RIVER COMPANY

Bank of America
Asheville, N.C.

66-798
531

S 182215

RECEIVED
NOV 16 2004
Industrial, Agricultural &
Stormwater Permitting Division

RECEIVED
NOV 1 2004
Industrial, Agricultural &
Stormwater Permitting Division

VOID

MO	DAY	YR
11/12/04		

$400.00

NOT GOOD AFTER 6 MONTHS
WESTINGHOUSE SAVANNAH RIVER COMPANY

PAY

TO THE ORDER OF:
SOUTH CAROLINA DEPARTMENT OF
HEALTH & ENVIRONMENT CONTROL
2600 BULL STREET
COLUMBIA, SC 29201

⑈182215⑈ ⑆053107989⑆ 000480107798⑈

OSR 14-393# (5-11-2001)

Regulatory Document Preparation Summary and Approval

A. Document Requirements

Document Title and No.
Application for Modification, Z-Area Industrial Wastewater Treatment Permit # 18,801-IW

Regulatory Agency Due Date
11/19/2004

B. Document Preparation

Division and Department Preparing Document
Closure Business Unit

SRS Procedures/ Regulatory Driven Used in Preparation (procedures summarize document preparation and quality assurance)
Z-Area Industrial Wastewater Permit #18,801-IW

For Organizations Other than EPD (see instructions)
N/A

Preparer and Title	Preparer's Signature	Date
K.R. Liner	K Liner	10/25/04

C. EPD Review

Date Document Received

Review Actions

EPD Coordinator and Title (qualifications on file at EPD)	Coodinator's Signature	Date
G.H. Laska	See Attached	N/A

D. General Counsel Office (GCO) Review

Date Document Received — ☐ Comments Resolved (If any)

Review Actions

GCO Reviewer and Title	Signature	Date
M.P. Cottemond	See Attached	N/A

E. M&O Approvals

Document approvals, as required: Document Classification (attach OSR 14-357, Document Approval Sheet)

	Signature	Date
EPD Section Manager (L-3) Print Name		
EPD Manager (L-2)		
~~Other Manager (L-2)~~ [initials] 10/25/04 A.W. Knox	[signature]	11/3/04
~~VP Approval and Division~~ [initials] 10/25/04 D.G. Thompson	[signature]	11/4/04
~~VP Approval and Division~~ [initials] 11/3/04 [initials] J.W. Brown	J.L. BARNES / [signature]	11-11-04

F. DOE-SR Concurrence

Concurrence required? ☒ Yes ☐ No

DOE Signing Official's name and title (Print name)	Division	Approval Initials	Date
C.H. Pang/M.H. Franklin	SPD	See Attached	
D.F. Hoel	EQMD		
T.J. Spears	SPD		

G. Transmittal and Document Control

Date received from DOE-SR	Date received from DOE-SR	Date executed copies to DOE-SR	Date sent to Records Administration

OSR 14-3934 (5-11-2001)

Regulatory Document Preparation Summary and Approval

A. Document Requirements

Document Title and No.
Application for Modification, Z-Area Industrial Wastewater Treatment Permit # 18,801-IW

Regulatory Agency Due Date
11/19/2004

B. Document Preparation

Division and Department Preparing Document
Closure Business Unit

SRS Procedures/ Regulatory Driven Used in Preparation (procedures summarize document preparation and quality assurance)
Z-Area Industrial Wastewater Permit #18,801-IW

For Organizations Other than EPD (see instructions)
N/A

Preparer and Title	Preparer's Signature	Date
K.R. Liner	K R Liner	10/25/04

C. EPD Review

Date Document Received

Review Actions

EPD Coordinator and Title (qualifications on file at EPD)	Coodinator's Signature	Date
G.H. Laska	See Attached	N/A

D. General Counsel Office (GCO) Review

Date Document Received 10/29/04

☐ Comments Resolved (if any)

Review Actions
Reviewed for legal sufficiency

GCO Reviewer and Title	Signature	Date
M.P. Cottemond, Counsel	M.P. Cottemond	10/29/04

E. M&O Approvals

Document approvals, as required: Document Classification (attach OSR 14-357, Document Approval Sheet)

EPD Section Manager (L-3) Print Name	Signature	Date
EPD Manager (L-2)	Signature	Date
~~Other Manager (L-2)~~ A.W. Knox ~~10/25/04~~	Signature	Date
~~VP Approval and Division~~ D.G. Thompson ~~10/25/04~~	Signature See Attached	Date
~~VP Approval and Division~~ ~~11/3/04~~	Signature	Date

F. DOE-SR Concurrence

Concurrence required? ☒ Yes ☐ No

DOE Signing Official's name and title (Print name)	Division	Approval Initials	Date
C.H. Pang/M.H. Franklin	SPD	See Attached	
D.F. Hoel	EQMD		
T.J. Spears	SPD		

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N/A

Preparer and Title	Preparer's Signature	Date
K.R. Liner		10/25/04

C. EPD Review

Date Document Received

Review Actions

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G.H. Laska		

D. General Counsel Office (GCO) Review

Date Document Received

☐ Comments Resolved (if any)

Review Actions

GCO Reviewer and Title	Signature	Date
M.P. Cottemond	SEE ATTACHED	

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~~VP Approval and Division~~ D.G. Thompson 10/25/04	Signature SEE ATTACHED	Date
~~VP Approval and Division~~ 11/3/04	Signature	Date

F. DOE-SR Concurrence

Concurrence required? ☒ Yes ☐ No

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D.F. Hoel	EQMD		
T.J. Spears	SPD		

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☐ Comments Resolved (if any)

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M.P. Cottemond	SEE ATTACHED	N/A

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~~VP Approval and Division~~ D.G. Thompson		
VP Approval and Division		

F. DOE-SR Concurrence

Concurrence required? ☒ Yes ☐ No

DOE Signing Official's name and title (Print name)	Division	Approval Initials	Date
C.H. Pang/M.H. Franklin	SPD	SEE ATTACHED	
D.F. Hoel	EQMD		
T.J. Spears	SPD		

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For Organizations Other than EPD (see instructions) N/A		
Preparer and Title K.R. Liner	Preparer's Signature K.R. Liner	Date 10/25/04
C. EPD Review		
Date Document Received		
Review Actions		
EPD Coordinator and Title (qualifications on file at EPD) G.H. Laska	Coodinator's Signature SEE ATTACHED	Date N/A
D. General Counsel Office (GCO) Review		
Date Document Received	☐ Comments Resolved (if any)	
Review Actions		
GCO Reviewer and Title M.P. Cottemond	Signature SEE ATTACHED	Date N/A
E. M&O Approvals		
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~~Other Manager (L-2)~~ A.W. Knox	Signature SEE ATTACHED	Date N/A
~~VP Approval and Division~~ D.G. Thompson	Signature	Date
VP Approval and Division	Signature	Date

F. DOE-SR Concurrence			
Concurrence required? ☒ Yes ☐ No			
DOE Signing Official's name and title (Print name)	Division	Approval Initials	Date
C.H. Pang/M.H. Franklin	SPD	CHP MHF	11-2-04
D.F. Hoel	EQMD	DFH	11/2/04
T.J. Spears	SPD	TJS	11-15-04

G. Transmittal and Document Control			
Date received from DOE-SR	Date received from DOE-SR	Date executed copies to DOE-SR	Date sent to Records Administration

Application for Modification

Z-Area Industrial Wastewater Treatment
Permit # 18,801-IW

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

SAFETY • RESPONSIBILITY • SECURITY
SRS
SAVANNAH RIVER SITE

Table of Content

Transmittal Letter

2 **Application for Construction Permit**

3 **Engineering Report for Saltstone Production Facility Modifications**

4

5

SRS **SAVANNAH RIVER SITE**
Aiken, SC 29808 • www.srs.gov

November 17, 2004

ESH-EPG-2004-00289

Mr. Barry Mullinax, Engineer
Industrial, Agricultural and Stormwater
Permitting Division
South Carolina Department of Health and
Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

SALTSTONE PRODUCTION FACILITY MODIFICATION (U)

Ref: Industrial Wastewater Permit No. 18,801-IW

The Westinghouse Savannah River Company is planning modifications to the Saltstone Production Facility. The enclosed modification package (three copies) is being submitted to the South Carolina Department of Health and Environmental Control for your review. This package includes an Engineering Report, drawings, equipment descriptions, Permit Application and fee.

Your prompt review and approval by January 20, 2005 is requested. Please call me if you have any questions on this proposed modification.

Yours very truly,

g Laska

Gene Laska
Environmental Programs Group
Environmental Support Section
Westinghouse Savannah River Company, LLC

Concurrence:

T.J. Spears, Director
Salt Processing Division
Department of Energy
Savannah River Operations Office

ghl
Att.
c: (w/o Attachment)
R. T. Caldwell II, SCDHEC, Edisto Savannah District
S. Simons, SCDHEC, Edisto Savannah District
D. E. Wilson, SCDHEC, Bureau of Land and Waste Management, Columbia, SC
R. L. Gill, SCDHEC, Bureau of Land and Waste Management, Columbia, SC
J. M. Gilbo, SCDHEC, Bureau of Land and Waste Management, Columbia, SC
A. B. Gould, 730-B

bc: G. S. Hoover, 730-B
M. P. Cottemond, 705-1C
T. F. England, 705-1C
D. G. Thompson, 704-Z
B. P. Enevoldsen, 704-Z
M. E. Howard, 704-72S
A. W. Knox, 704-Z
K. R. Liner, 704-S
J. M. Sutherland, 704-S
C. H. Pang, DOE, 766-H
M. H. Franklin, DOE, 707-H
S. L. Goff, DOE, 724-35E
D. F. Hoel, DOE, 730-B
J. T. Carter, 766-H
V. G. Dickert, 766-H
M. C. Chandler, 742-A
M. B. Hughes, 742-A
P. M. Allen, 742-A
W. L. Payne, 742-A
ERP File, 742-A
Records Processing, 773-52A

File Info:
SCDHEC, Saltstone
10854
NI-434-98-28-5.a
75 years

Construction Permit Application Water/Wastewater Facilities

BUREAU OF WATER

DRP SUBMITTAL: No [X] Yes [ ]

SELECT ONE ➧ [ ] Water Facilities [X] Wastewater Facilities [ ] Water & Wastewater Facilities

I. **Project Name:** Saltstone Facility **County:** Aiken

II. **Project Location** (street names, etc.):

Savannah River Site, Aiken SC

III. **Project Description(s):** *Water System:*

Wastewater System:

Modification of Saltstone Facility, IWT permit #18,801-IW, to construct Mixer At Vault Road Concept (MAVRC).

Project Type (A-Z): Water: Wastewater: E

IV. ***Initial* Owner:** [Time of Application] Name/Organization: U.S. DOE/Owner; Westinghouse Savannah River Co./Operator

Address: Bldg.742-A (Attn. M.Hughes) City: Aiken State: South Carolina Zip: 29808 Phone: (803) 725-3887

V. ***Final* Owner:** [After Construction] Name/Organization: U.S. DOE/Owner; Westinghouse Savannah River Co./Operator

Address: Bldg.742-A (Attn. M.Hughes) City: Aiken State: South Carolina Zip: 29808 Phone: (803) 725-3887

VI. **Entity Responsible for Final Operation & Maintenance of System:**

Water System: Name: Address:

City: State: South Carolina Zip: Phone: Fax:

Wastewater System: Name: U.S. DOE/Owner; WSRC/Operator Address:

City: Aiken State: South Carolina Zip: 29808 Phone: (803) 725-3887 Fax: (803) 725-4676

VII. **Engineering Firm:** Name: Address:

City: State: South Carolina Zip: Phone: Fax:

VIII. **Is this project:** A) Part of a phased project? No[X] Yes[ ]. If Yes, Phase _____ of _____

B) A revision to a previously permitted project? No[ ] Yes[X]. If Yes, Permit # 18,801-IW

Date Approved: 09/11/2003 *(MM/DD/YYYY)* Project name (if different): Saltstone Facility

C) Submitted based on a Schedule of Compliance or Order issued by DHEC? No[X] Yes[ ]. Order # _____

D) Anticipating funding by the State Revolving Fund (SRF)? No[X] Yes[ ].

E) Crossing a water body? (e.g., river, creek) No[X] Yes[ ]. If Yes, Name of water body _____

IX. **Are Standard Specifications approved by DHEC being used on this project?** No[X] Yes[ ]. If Yes:

Water: Date Approved: _____ *(MM/DD/YYYY)* Approved for whom: _____

Wastewater: Date Approved: _____ *(MM/DD/YYYY)* Approved for whom: _____

X. **Wastewater Systems:** A) Type: Domestic [ ] Process *(Industrial)* [X] Combined *(Domestic & Process)* [ ]

B) Total average design flow of the project not to exceed 160,000 GPD

C) *Sewers or Pretreatment* 1. Name of facility (e.g., POTW) treating the wastewater: _____

2. NPDES/ND Number of facility in Item #1: _____

Treatment Systems 3. Date Preliminary Engineering Report (PER) approved: _____ *(MM/DD/YYYY)*

4. NPDES/ND application submitted? No[ ] Yes[ ]. If Yes, Date: _____ *(MM/DD/YYYY)*

Disposal Sites 5. Effluent Disposal Site (Description): _____

6. Sludge Disposal Site (Description): _____

XI. **Water Systems:** Project located within city limits? No[X] Yes[ ].

Public water system providing water (Name & System ID No.): _____ No.: _____

New water system (including master meter)? No[X] Yes[ ]. If Yes, System name: _____

XII. **Type of Submittal:** Complete **Section A (Standard)** *or* **Section B (Delegated Review Program - DRP).**

A) Standard Submittal *must* include the following, where applicable:

- ☒ 1. A transmittal letter outlining the submittal package.
- ☒ 2. The **original** construction permit application, properly completed, with three (3) copies.
- ☒ 3. Three (3) sets of signed and sealed plans and specifications. Specifications may be omitted if approved standard specifications are on file with DHEC.
- ☐ 4. One (1) additional overall plan sheet showing the proposed and existing (only in the area of proposed construction) water and wastewater lines (highlighted for identification) and their sizes.
- ☐ 5. Three (3) sets of the appropriate design calculations. WASTEWATER: Design flow (based on R.61-67, Appendix A), pump station calc's. and pump curve. WATER: Recent flow test from a location near the tie-on site, design calc's. indicating pressure maintained in the distribution system during max. instantaneous demand, fire flow and flushing velocities achieved. Number/types of service connections, well record form, pumping test results, etc.
- ☐ 6. Three (3) copies of a detailed 8½" x 11" location map, separate from the plans.
- ☐ 7. Three (3) copies of construction easements unless the project owner has the right of eminent domain.
- ☐ 8. A letter(s) from the entity supplying water and/or providing wastewater treatment stating their willingness and ability to serve the project, including pretreatment permits, if applicable. The letter should include the specific flow and, when applicable, the specific number of lots being served.
- ☐ 9. A letter(s) from the entity agreeing to be responsible for the O&M of the water and/or wastewater system.
- ☒ 10. Application fee enclosed $ 400.00 . (Refer to Instructions).
- ☐ 11. WATER SYSTEMS: a) A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating project consistency with water supply service plan for area.
  b) For wells, four (4) copies of a wellhead protection area inventory.
  c) For new wells, a viability demonstration is required in accordance with Regulation 61-58.1.B.(4).

Note: Other approvals may include 208 and OCRM certification, and navigable waterway permitting.

B) DRP submittal (treatment plants are not covered) *must* include the following, where applicable:

- ☐ 1. A transmittal letter, signed by the professional engineer representing the DRP entity, noting this is a DRP submittal. The letter should state that the project has been reviewed and complies with R.61-58 and/or R.61-67.
- ☐ 2. The **original** construction permit application, properly completed, with two (2) copies.
- ☐ 3. Two (2) sets of the signed and sealed plans.
- ☐ 4. One (1) additional plan sheet with water and wastewater lines highlighted, as required under Sec. XII.A.4. above.
- ☐ 5. Two (2) sets of the appropriate design calculations. WASTEWATER: Same information as required under Section XII.A.5. above. WATER: Same information as required under Section XII.A.5. above.
- ☐ 6. Two (2) copies of a detailed 8½" x 11" location map, separate from the plans.
- ☐ 7. Two (2) copies of construction easements, unless the project owner has the right of eminent domain.
- ☐ 8. DHEC's Ocean and Coastal Resource Management certification (for projects in applicable counties).
- ☐ 9. DHEC's Water Quality permit or conditions for placement in navigable waters, and other Agency approvals.
- ☐ 10. WASTEWATER SYSTEMS: a) A letter of acceptance from the entity providing the treatment of the wastewater that includes the specific flow and, when applicable, the specific number of lots being accepted.
  b) A letter from the organization agreeing to be responsible for the O&M of the sewer system.
  c) The 208 Plan certification from the appropriate Council of Governments (designated 208 areas), or from DHEC on the non-designated 208 areas.
- ☐ 11. WATER SYSTEMS: A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating project consistency with water supply service plan for area.
- ☐ 12. Fee of $75 for water and $75 for sewer ($150 if combined).

Note: The DRP entity should ensure that a copy of the final approved plans are returned to the design engineer.

XIII. Construction plans, material and construction specifications, the engineering report including supporting design data and calculations are herewith submitted and made a part of this application. I have placed my signature and seal on the engineering documents submitted, signifying that I accept responsibility for the design of this system, and that I have submitted a complete administrative package.

Engineer's Name (Printed): William N. Kennedy Signature: William N Kennedy 11-05-04

S.C. Registration Number: 20412 Registered Professional Engineer

XIV. Prior to final approval, I will submit a statement certifying that construction is complete and in accordance with the approved plans and specifications, to the best of my knowledge, information and belief. This certification will be based upon periodic observations of construction and a final inspection for design compliance by me or a representative of this office who is under my supervision.

Engineer's Name (Printed): Andrew R. Redwood Signature: Andrew R. Redwood 11/8/04

S.C. Registration Number: 20525 Registered Professional Engineer

XV. I hereby make application for a permit to construct the project as described above. I have read this application and agree to the requirements and conditions and agree to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

Owner's Name (Printed): James W. French Signature: J. L. BARNES

Owner's Title: Mgr. Waste Solidification Area Projects, CBU Date: 11-11-04 (MM/DD/YYYY)

DHEC 1970 (06/2003)

WSP-SSF-2004-0038
Revision 0

Application for Modification

Z-Area Industrial Wastewater Treatment
Permit # 18,801-IW

Engineering Report for Saltstone Facility Mixer At Vault Road Concept (MAVRC) Modifications

UNCLASSIFIED
DOES NOT CONTAIN UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION

ADC/RO [signature] **Date:** November 3, 2004

Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

SAFETY • RESPONSIBILITY • SECURITY
SRS
SAVANNAH RIVER SITE

DISCLAIMER

APPROVAL PAGE

Prepared By: _____ 10/29/04

Keith R. Liner — **Date**
Environmental Engineer, Environmental Support Services,
Facility Support Services Business Unit

Reviewed By: _____ 11/3/04

Anthony W. Knox — **Date**
Saltstone Engineering, Waste Solidification, Closure Business Unit

Approved By: _____ 11/3/04

Dennis G. Thompson — **Date**
Saltstone Facility Manager, Waste Solidification, Closure Business Unit

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
No. 20412
WILLIAM N. KENNEDY

William N. Kennedy
11-05-04

TABLE OF CONTENTS

1.0 LIST OF ACRONYMS

Acronyms	Definition
ALARA	As Low As Reasonably Achievable
BMP	Best Management Practices
DOE	Department of Energy
ISWLF	Industrial Solid Waste Landfill
MAVRC	Mixer At Vault Road Concept
SCDHEC	South Carolina Department of Health and Environmental Control
SDF	Saltstone Disposal Facility – (Solid Waste Landfill)
SFT	Salt Feed Tank
SPF	Saltstone Production Facility – (Industrial Wastewater Treatment Facility)
SRS	US Department of Energy - Savannah River Site
WSRC	Westinghouse Savannah River Company

2.0 INTRODUCTION

This information is being submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) in support of a request for modification of the Saltstone Production Facility (SPF) Industrial Wastewater Permit #18,801-IW.

The Saltstone Production Facility is being modified to meet the following objectives:

1. To simplify the process and increase facility reliability.
2. To reduce the radiation exposure associated with operation and maintenance of the process.

The SPF was initially constructed in accordance with the Z-Area Industrial Wastewater Treatment Facility Construction Permit #12,683 and was modified in accordance with Construction Permit # 18,801 in September of 2003. The facility consists of equipment to blend and transfer the three dry materials (flyash, slag, and cement), to receive and transfer the salt solution waste, to mix the salt solution waste with the dry materials, to pump the mixed grout to the Saltstone Disposal Facility (SDF) vaults, and to clean (pig or flush) all equipment exposed to grout once process operation is complete.

The proposed modifications to the process, which are described in Section 4.0, include:

- Relocation of the mixer to area near the SDF - Vault #4.
- Elimination of the currently installed dry materials system and construction of a new dry materials system at the new mixer location.
- Installation of a salt solution waste transfer line from the 210-Z building to the new mixer location.
- Installation of grout pumping equipment and pig launching systems to transfer the saltstone grout from the new mixer location to the SDF - Vault #4.
- Installation of ancillary support systems at the new mixer location.
- Installation of a SDF vault drain water return system.

Also included in Section 4.0 is a revised waste stream sample strategy to allow for sampling higher activity salt solution influent to the SPF.

3.0 SALTSTONE FACILITY PROCESS SUMMARY

The SPF immobilizes salt solution by blending it with a dry material mixture (premix) consisting of cement, slag, and flyash to form a liquid grout. The grout is pumped to the SDF vaults where it is allowed to harden into a concrete-like solid waste form called saltstone.

The SPF process modifications will be as follows: The mixer and associated piping, which are now located in Building 210-Z, will be relocated to an area near the SDF vaults. The current dry material system will be abandoned in place and replaced with a smaller system located adjacent to the mixer. The mixer, dry material equipment, and other ancillary equipment is to be movable so that it can be repositioned to other empty vaults or vault cells once filling operations are complete. This process arrangement is called the Mixer At Vault Road Concept (MAVRC) (see attachment #1). The repositioning of the MAVRC to empty vaults or vault cells, within the Z-Area boundary, will be administratively controlled by the SPF. Additional waste transfer and support equipment lines will be routed as needed. Additional Industrial Wastewater Permit modifications will not be submitted to the Department for these activities.

The salt solution will be pumped from the Salt Feed Tank (SFT) to the relocated mixer. Dry material (premix) will be mixed with the salt solution within the mixer and the grout will be pumped to the SDF.

The MAVRC equipment arrangement increases system reliability and reduces personnel exposure since there are minimal pumps, valves, etc., for process and maintenance activities. The MAVRC will allow the SPF to treat and dispose of higher activity salt solution in a manner which will provide acceptable personnel radiation exposure levels during normal operation and maintenance activities.

4.0 PROPOSED MODIFICATIONS

The following modifications will be required to the SPF:

4.1 Relocation of the Mixer and Pumping Equipment

The existing saltstone process mixer will be moved to an area near the SDF vaults. The mixer will be located in a weather protection enclosure equipped with a dike for spill containment. A separate enclosure within the mixer weather enclosure will house the necessary pumps and valves to direct the grout from the mixer to SDF vaults. The mixer and pump assemblies will be movable so that they can be relocated to future SDF vaults or in the event of equipment failure. The mixer will perform an identical function to that in the current saltstone process by mixing salt solution waste and dry materials. The grout produced will be pumped to the SDF vaults using a pump and manifold system. The pump enclosure will be designed such that the pump and valves can be replaced without replacing the mixer if pump failure occurs. The pump enclosure will share the mixer spill containment area. Connections will be installed on the mixer and pumping equipment to flush the system at the end of each operating day with either salt solution or process water. Flushing the system at the end of the day is required to remove the grout, which will harden in the equipment, when the mixer is shutdown at the end of each process day. Salt solution may be used for flushing as a waste minimization technique, unless maintenance is required, at which time process water may be used to reduce radiation levels adjacent to the mixing and pumping equipment to maintain personnel exposure As Low as Reasonably Achievable (ALARA). The amount of flush water required is expected to be less than 100 gallons. The mixer enclosure will have a connection for portable ventilation equipment to be installed for maintenance, if required. (see attachment #2)

4.2 Dry Materials

The existing premix feed bin, weigh hopper, and dry material silos will be abandoned in place or removed. The new dry material equipment will be located adjacent to the mixer enclosure. The new dry material system will be smaller in size and will consist (in concept) of three silos, a conveyor, weigh hopper, blender, and dust collectors. The actual equipment may vary, but it will perform the same function as in the current process. (see attachment #3) The dry materials system will be movable so that it can be relocated to future SDF vaults.

4.3 Routing of Salt Solution Waste to Vault

The current routing of the salt solution waste is from Tank 241-950H (50H) to the Salt Feed Tank (SFT) and then from the SFT to the mixer in the 210-Z process room. The modified routing will be from the SFT to the MAVRC. The transfer line will be constructed of a jacketed hard pipe for secondary containment. Leak detection capabilities will be installed on the transfer pipe to indicate a failure of the primary containment. The transfer line will be sloped such that it will drain back to the SFT when the SPF is not operating. The transfer line will consist of below and above ground sections. Appropriate radiation shielding will be installed on the transfer line.

4.4 Vault Drain Water Return

The SDF vaults are constructed with a vertical sheet drain installed on the vault walls which connect to a pipe on the vault floor. A smaller connecting pipe extends through the SDF vault wall and is equipped with a valve to allow draining. The vertical sheet drain collects bleed and process flush water that collects in a narrow gap formed between the saltstone waste form and the vault wall. Draining of the bleed and process water eliminates the hydrostatic head of the water on the vault walls and reduces the probability of vault wall cracking. Currently, the bleed and process water is drained into portable carboys and is returned to the SFT. Based on historical data, the bleed and process water is not characteristically hazardous, however, it does contain radioactivity and is managed as a low-level liquid waste. Due to the higher radioactivity levels of the salt solution which may be treated as a result of the proposed SPF modifications, the bleed and process water cannot be handled using the current techniques. Handling using the current methods will create unnecessary personnel exposure.

In order to maintain personnel exposure ALARA, the bleed and process water will be pumped back to the SPF through a hard piped transfer line from the SDF – Vault#4 to the Salt Feed Tank. The bleed and process water will be added to the salt solution and will be processed into grout. The bleed and process water drain pump will be housed in a dedicated dike.

4.5 Ancillary Equipment

Utilities such as air, electric power, water, etc. will be provided to the MAVRC as required. The utilities will be movable to allow relocation to future SDF vaults. A system will be installed to allow cleaning (pig or flush) of the grout transfer line at the end of each process day. An admixture metering pump and associated equipment will be installed for admixture addition. The MAVRC and associated equipment will be controlled remotely using a Distributed Control System from the current Central Control Room in Building 210-Z.

4.6 Salt Solution Characterization Tables

The SPF will initially treat and dispose of salt solution waste in accordance with letter dated August 18, 2004,"Notification of Changes to Waste Influent Concentrations at the Z-Area Saltstone Industrial Wastewater Treatment Facility and Solid Waste Landfill," to B. Mullinax (SCDHEC) and J. Gilbo (SCDHEC) from G. Laska (WSRC). Thereafter, treatment will be in accordance with the salt solution composition described in the original SPF industrial wastewater permit #12,683, as amended on April 26, 1988, September 18, 2003 and February 2, 2004. Low curie salt solution treatment in accordance with letter dated September 12, 2002, "Revise Waste Composition Tables Industrial Solid Waste Landfill Permit (ISWLF) #025500-1603 (Low Curie Salt Disposal)" to J. Mowbray (SCDHEC) from L. Haney (WSRC) will occur in accordance

with Special Condition #8 of the Saltstone Industrial Wastewater Operating and Construction Permit # 18,801-IW which states that the SCDHEC Bureau of Land and Waste Management must approve the disposal of the low curie salt waste stream in the Saltstone Solid Waste Landfill before treatment at the SPF can occur.

4.7 Waste Stream Sample Strategy

The existing Z-Area permit includes sampling of salt solution and saltstone grout. The salt solution is analyzed for chemical and radiological constituents to assure waste feed limits are met prior to transfer to the SPF. The grout is analyzed for density, compressive strength, and hazardous waste constituents via TCLP methods.

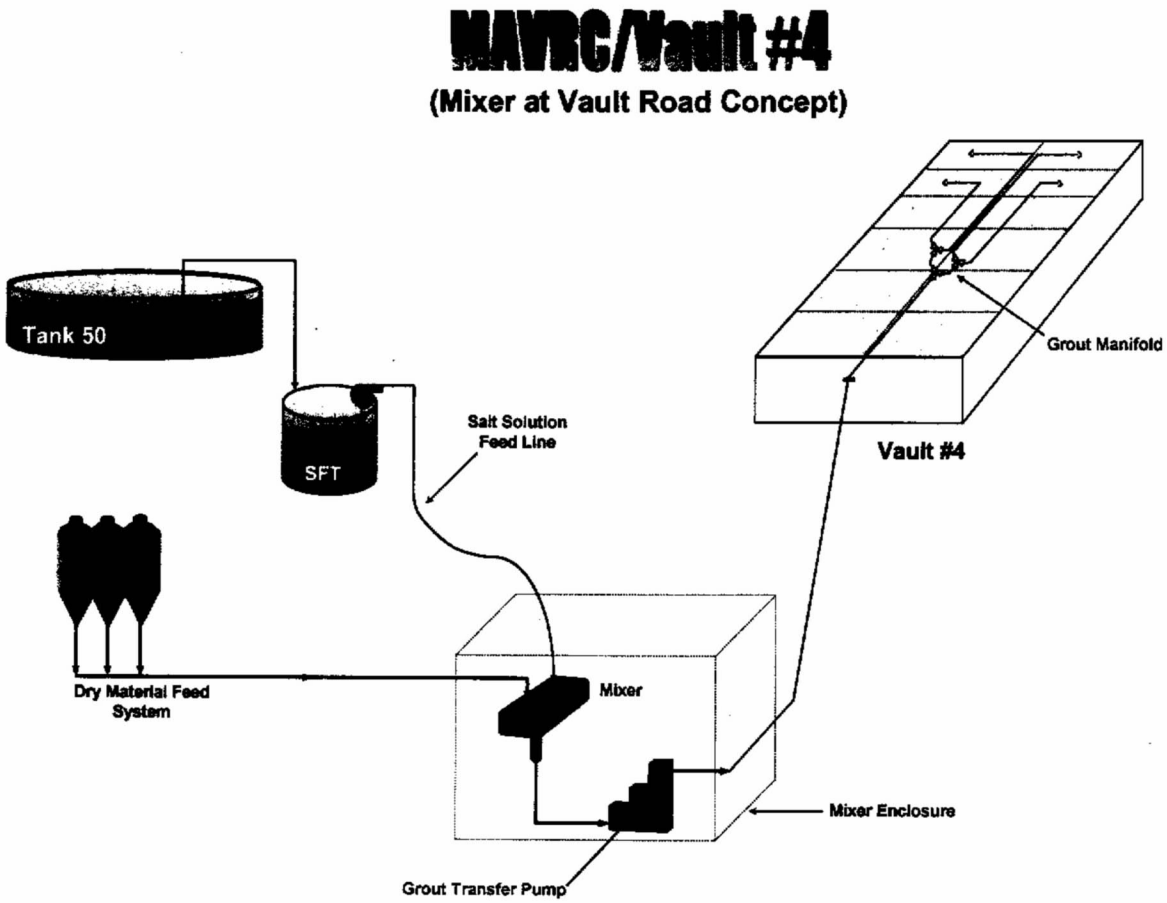
The sampling strategy will be modified based on historical data results, process knowledge, and radiological ALARA personnel protection protocol. The elimination of requirement to manually sample the grout daily has been previously approved by the Department within SPF Industrial Wastewater Permit #18,801-IW. A table summarizing the sampling strategy modification is presented in attachment #4. A separate request for approval of the sample strategy will be sent to the SCDHEC Bureau of Land and Waste Management for the SDF.

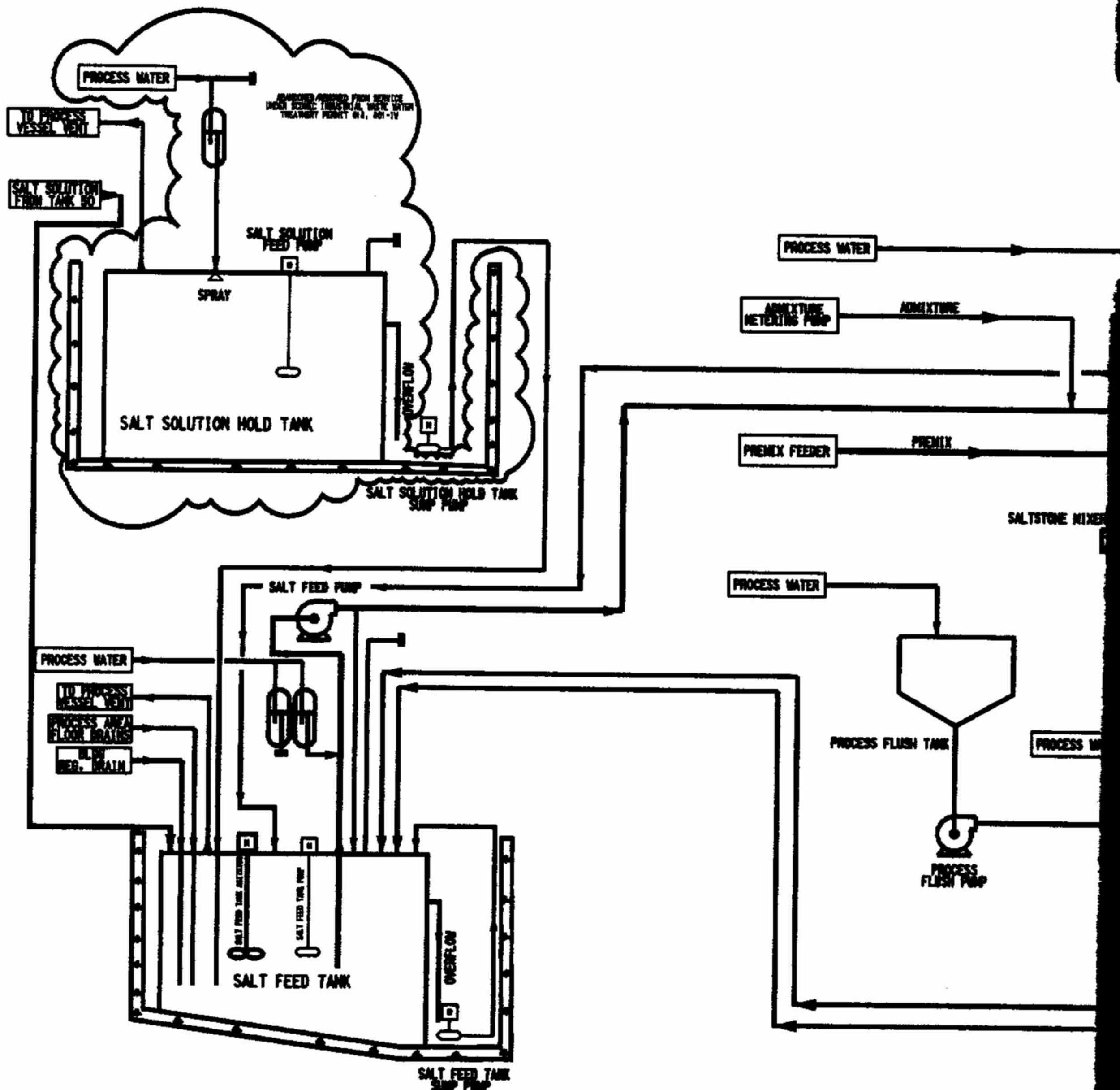
5.0 ATTACHMENTS

Attachment 1: Mixer at Vault Road Concept (MAVRC)
Attachment 2: Saltstone Process Flow Diagram (Before and After)
Attachment 3: Saltstone Dry Materials Process Flow Diagram
Attachment 4: Sample Strategy

Table of Contents

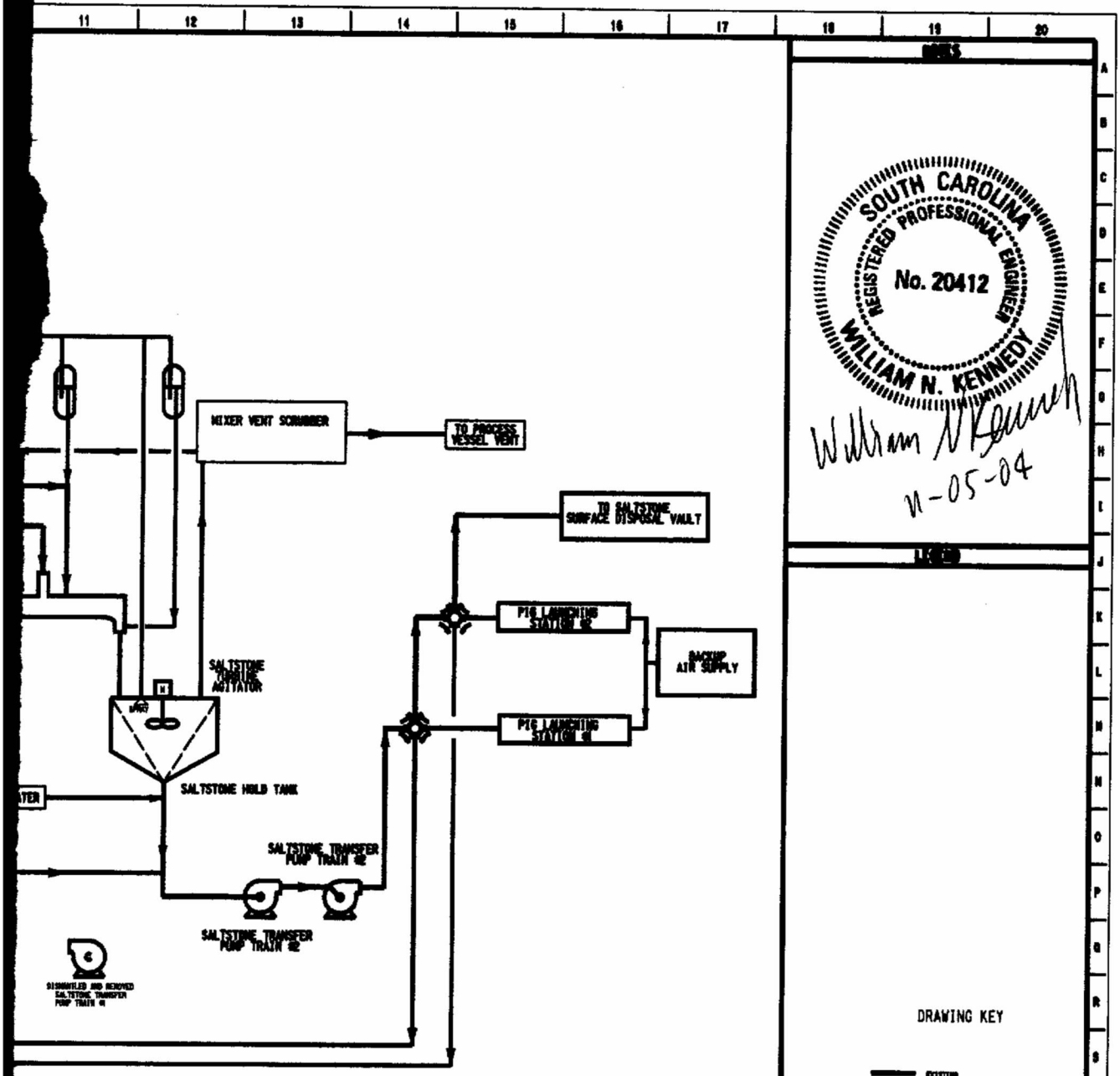
Attachment #1





THIS DOCUMENT HAS BEEN SUBMITTED AS PART OF A PERMIT PACKAGE TO SC DHEC INDUSTRIAL WASTE WATER TREATMENT PERMIT # 18,801-IV. CONTACT ENVIRONMENTAL COORDINATOR PRIOR TO REVISION ISSUE.

PROJ.	REV. NO.	DATE	REVISION	PRP'D	LEAD DSN	CHK'D	APPR'D	APPR'D	APPR'D	PROJ.	REV. NO.	DATE	REVISION	PRP'D	LEAD DSN	CHK'D	APPR'D	APPR'D	APPR'D



SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
No. 20412
WILLIAM N. KENNEDY

11-05-04

DRAWING KEY

- EXISTING
- CAPPED, ABANDONED OR REMOVED
- NEW ADDITION FOR LCS

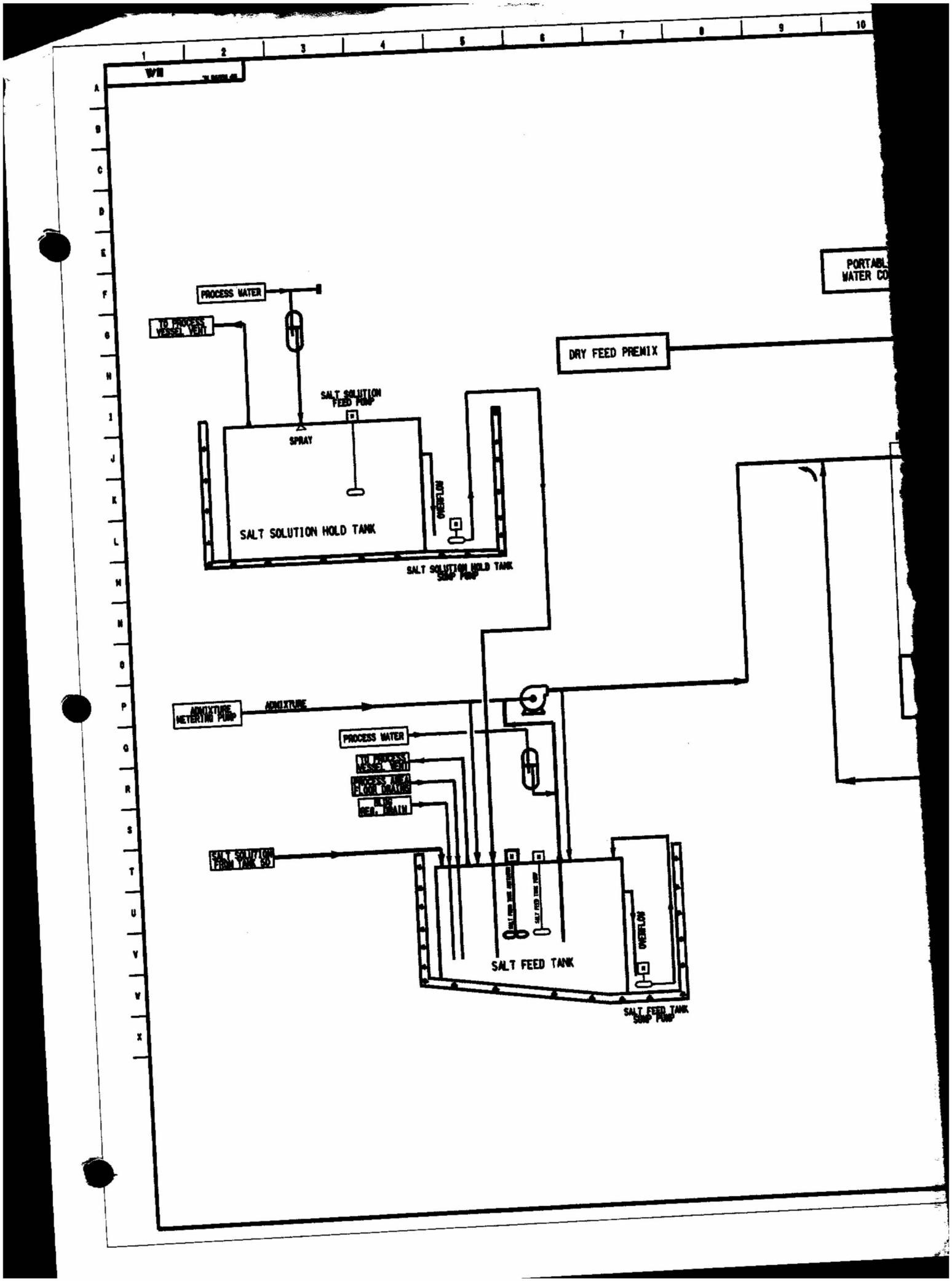
CONSTRUCTION OF THIS FACILITY SHALL NOT BEGIN UNTIL RECEIPT OF THE SCDHEC CONSTRUCTION PERMIT. ANY MODIFICATIONS TO PERMITTED FACILITY THAT AFFECT THE SCDHEC CONSTRUCTION OR OPERATION ARE APPROVED BY THE SCDHEC. THIS FACILITY SHALL NOT BE PUT INTO OPERATION UNTIL THE FINAL OPERATING APPROVAL IS OBTAINED FROM SCDHEC.

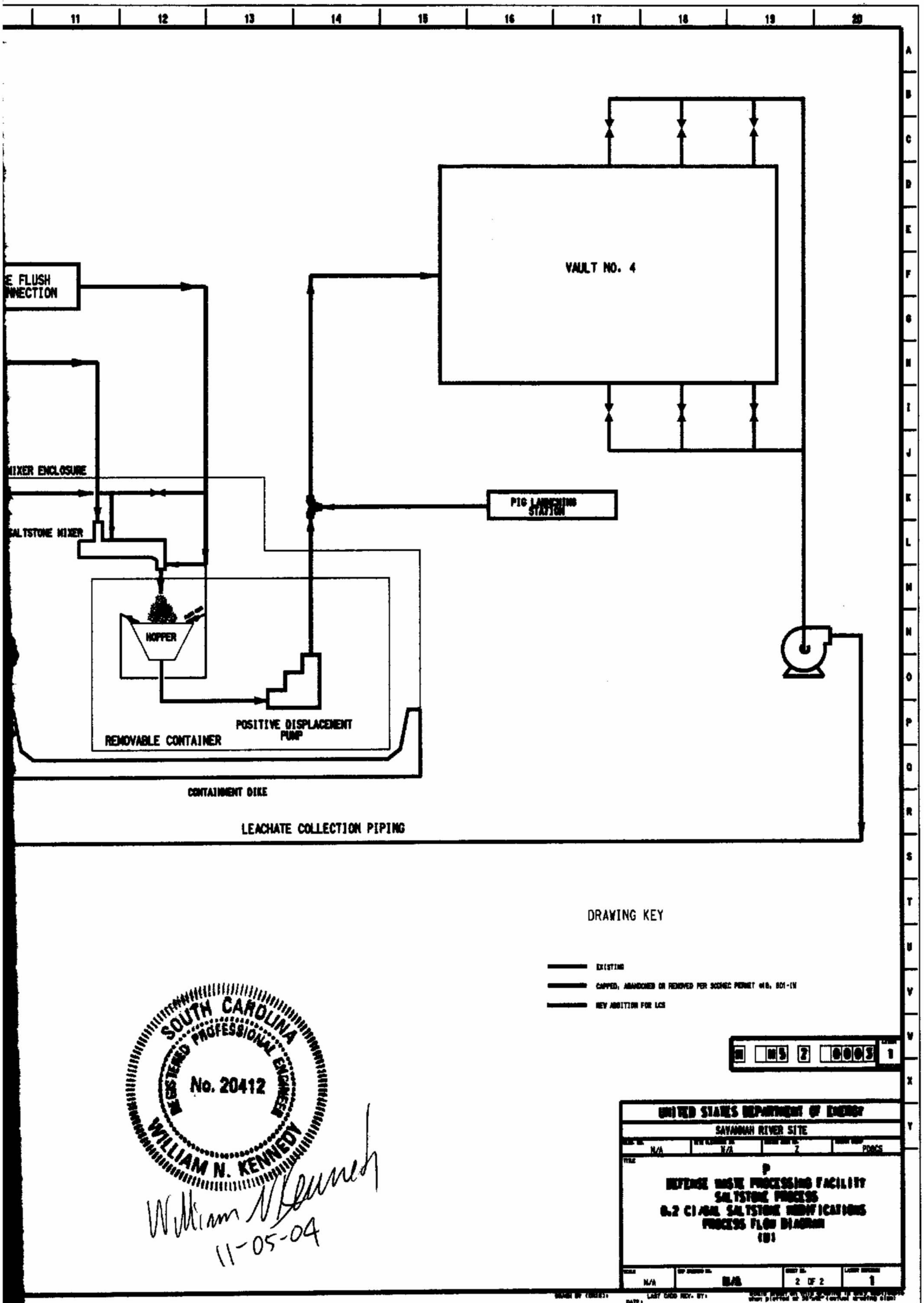
PROJ.	REV. NO.	DATE	REVISION	PREPD	LEAD DES	CHK'D	APP'D	APP'D	APP'D
01760	A	4/15/03	ISSUED FOR PERMIT APPLICATION (SCDHEC)		SIGNATURES ON ORIGINAL				
01760	0	9/02/03	ISSUED FOR CONSTRUCTION, PFD FOR PERMIT APPLICATION (SCDHEC)		SIGNATURES ON ORIGINAL				
01760	1	10/13/04	ISSUED FOR PERMIT APPLICATION FOR 6.0 LCS MODIFICATIONS	MSR					

UNITED STATES DEPARTMENT OF ENERGY
SAVANNAH RIVER SITE

DEFENSE WASTE PROCESSING FACILITY
SALTSTONE PROCESS
LOW CURIE SALT DISPOSITION PROJECT
EXISTING ARRANGEMENT
PROCESS FLOW DIAGRAM
(U)

N/A | H-2 | 1 OF 2 | 1


PROCESS WATER
TO PROCESS VESSEL VENT
SALT SOLUTION FEED PUMP
SPRAY
OVERFLOW
SALT SOLUTION HOLD TANK
SALT SOLUTION HOLD TANK SUMP PUMP
DRY FEED PREMIX
ADMIXTURE METERING PUMP
ADMIXTURE
PROCESS WATER
SALT SOLUTION FROM TANK 501
SALT FEED TANK
OVERFLOW
SALT FEED TANK SUMP PUMP



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NNECTION
MIXER ENCLOSURE
ALTSTONE MIXER
PIG LAUNCHING STATION
HOPPER
POSITIVE DISPLACEMENT PUMP
REMOVABLE CONTAINER
CONTAINMENT DIKE
LEACHATE COLLECTION PIPING
DRAWING KEY
SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER No. 20412 WILLIAM N. KENNEDY
William N Kennedy
11-05-04
UNITED STATES DEPARTMENT OF ENERGY
SAVANNAH RIVER SITE
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DEFENSE WASTE PROCESSING FACILITY
SALTSTONE PROCESS
0.2 Ci/GAL SALTSTONE MODIFICATIONS
PROCESS FLOW DIAGRAM
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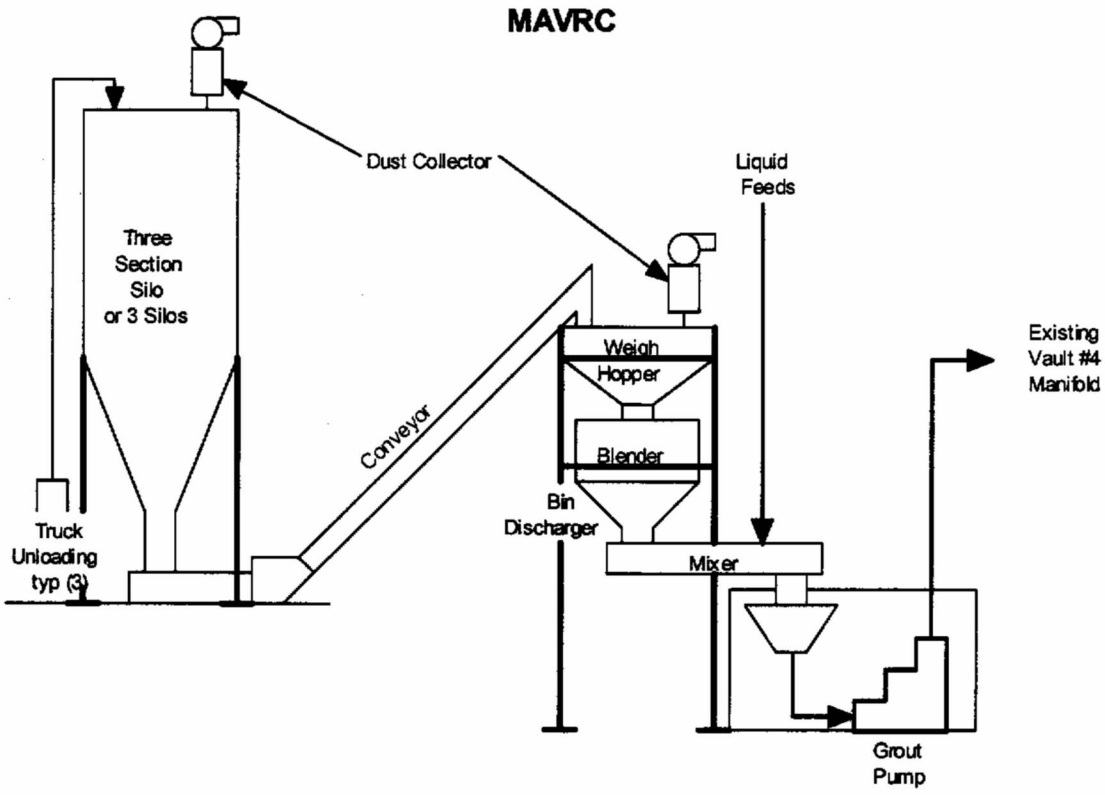
Attachment #3

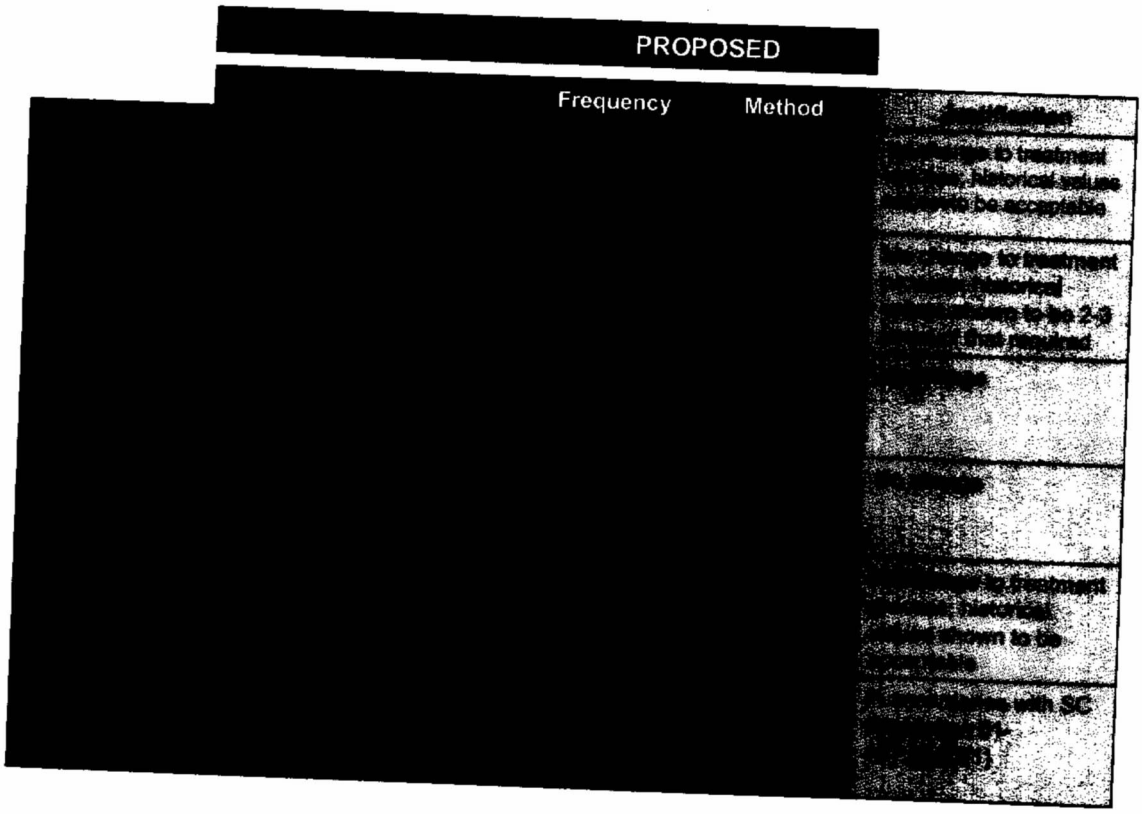
Saltstone Dry Materials Process Flow Diagram

Note: General concept diagram. Actual installation may vary with same function.



Attachment #4

Sample Strategy



D H E C
PROMOTE PROTECT PROSPER

C. Earl Hunter, Commissioner

Promoting and protecting the health of the public and the environment.

February 2, 2004

Mr. Gene H. Laska
Westinghouse Savannah River Company
Environmental Services Section
Bldg. 742-A
Aiken, SC 29808

RE: Correction to changes to permit special conditions
Jan. 8, 2004 e-mail to M. King (SCDHEC) from G. Laska (SRS)
Construction Permit Number 18,801-IW (Issued May 15, 2003)
Savannah River Site

Dear Mr. Laska:

This Office has reviewed the above referenced request to correct the tables associated with the special conditions in Saltstone Facility construction permit number 18,801-IW issued May 15, 2003. The Sept. 10, 2003 letter modified the above referenced construction permit so that Table 1 was the original table that was in permit number 12,683 issued Oct. 31, 1986. As noted in your e-mail and the attachments permit 12,683 was modified on April 26, 1988 with a different approximate chemical composition of salt solution feed table. Since the intent of the Sept. 10 modification was to return to the previously approved table in permit 12, 683 the permit will be modified to replace Table 1. The new Table 1 is attached and should be kept with the original permit for Departmental review upon request.

If you have any questions or need more information, please feel free to contact me at the above address or to give me a call at (803) 898-4236.

Sincerely,

Byron M. Amick
Environmental Engineer Associate
Industrial, Agricultural and Storm Water Permitting Division
amickbm@dhec.sc.gov

Cc: Jenny Mowbray, Solid Waste, BLWM (w/enclosure)
Scott Simons, Lower Savannah EQC District Office (w/enclosure)

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Attachment 1
Construction Permit Number 18,801-IW
Revised 02/02/04

TABLE 1

Approximate Chemical Composition of Salt Solution Feed
(Blend Ratio 8 million gallons DWPF to 1 million gallons ETF)

Component	Weight Percent			
	DWPF	ETF	Nominal Blend	
H_2O	71.8	79.9	72.7	
$NaNO_3$	13.3	16.0	13.6	
$NaNO_2$	4.1	0.03	3.6	
NaOH	4.2	-	3.7	
Na_2CO_3	1.4	2.2	1.5	
$NaAl(OH)_4$	2.9	0.0002	2.6	
Na_2SO_4	1.6	0.02	1.4	
NaF	0.05	0.003	0.04	
NaCl	0.11	0.7	0.2	
Na_2SiO_3	0.04	0.2	0.06	
Na_2CrO_4	0.04	8×10^{-6}	0.04	(Cr-114 ppm)
NaHgO(OH)	4×10^{-6}	-	4×10^{-6}	(Hg-0.03 ppm)
$NaAg(OH)_2$	1.3×10^{-7}	-	1.2×10^{-7}	(Ag-0.0008 ppm)
Na_2MoO_4	0.007	-	0.006	
KNO_3	8×10^{-6}	0.02	0.002	
$CaSO_4$	2×10^{-4}	0.02	0.002	
$Na_2C_2O_4$	0.16	-	0.14	
Na_3PO_4	0.11	0.03	0.10	
NH_4NO_3	6×10^{-6}	0.8	0.09	
$NaB(C_6H_5)_4$	0.07	-	0.06	
Other Salts[2]	0.007	0.05	0.012	
Total Organics	0.10	-	0.09	

[2] Other Salts Include:

Component	Weight Percent			
	DWPF	ETF	Nominal Blend	
As	3×10^{-8}	-	3×10^{-8}	(As-0.0003 ppm)
Ba	1.9×10^{-8}	0.0004	4×10^{-5}	(Ba-0.4 ppm)
Cd	5×10^{-6}	-	4×10^{-6}	(Cd-0.04 ppm)
Se	8×10^{-5}	-	7×10^{-5}	(Se-0.7 ppm)
Pb	2×10^{-12}	8×10^{-7}	9×10^{-8}	(Pd-0.0009 ppm)

Byron Amick - IWT Permit #18,801-IW - Modification

From: <gene.laska@srs.gov>
To: <kingmj@dhec.sc.gov>
Date: 1/8/04 9:52 AM
Subject: IWT Permit #18,801-IW - Modification

Melissa,

Last fall SRS requested a revision to the Special Conditions in Saltstone Construction Permit #18,801-IW to reference the latest approved waste characterization tables due to the delay in Low Curie Salt processing. As noted in a letter from SCDHEC to SRS dated, September 10, 2003, two tables were included as attachments to the letter including the original table (Table 1) issued with the permit in 1986 and the new table (Table 2) for processing Low Curie Salt. The original table (Table 1) was subsequently revised in 1988 (see attached letter, SRS to SCDHEC dated February 26, 1988).

Please amend the September 10, 2003 letter, SCDHEC to SRS, to make reference to the 1988 table since it includes the ETF waste stream for treatment at Saltstone. Please note that Table 2 remains applicable and can only be used when permission from SCDHEC has been received for disposal of Low Curie Salt waste stream in the Saltstone Solid Waste Landfill.

If additional information is required, please call me.

Thanks for your help on this matter.

Gene Laska
(803) 725-8838
Fax (803) 725-4676

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

BUREAU OF WATER
Permit to Construct

Permission is hereby granted to: USDOE/Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

for the construction of a collection and wastewater treatment system in accordance with the construction plans, specifications, engineering report and Construction Permit Application signed by William N. Kennedy, Registered Professional Engineer, SC Registration Number 20412.

Project Name: Saltstone Facility Modification **County:** Aiken

Project Description: See Page 2.

The effluent will be discharged to Saltstone Disposal Facility (SDF) (Industrial Solid Waste Permit No. 025500-1603) at a daily rate not to exceed 140,000 gallons per day.

Treatment Plant Classification: NA

Special Conditions: See Page 3.

Permit Number: 18,801-IW **Date of Issue:** May 15, 2003

Expiration Dates: Unless construction begins prior to May 15, 2004 and construction is completed prior to May 15, 2005 this permit will expire.

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

THIS IS A PERMIT FOR CONSTRUCTION ONLY AND DOES NOT CONSTITUTE STATE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL APPROVAL, TEMPORARY OR OTHERWISE, TO PLACE THIS SYSTEM IN OPERATION.

Bureau of Water

MFS/afw

PROJECT DESCRIPTION

Saltstone facility is a wastewater treatment facility for the solidification of decontaminated salt solution in a cement matrix. The components of this facility are:

- Cement/flyash storage silos
- 25 gpm Salt solution hold tank sump pump
- 6,500 gallon Salt feed tank
- Flush water agitator
- 125 gpm Salt feed pump
- 25 gallon Flush water sump pump
- Admixture metering pump
- Premix feeder
- 180 gpm Saltstone mixer
- 300 gallon Process flush tank
- 180 gpm Process flush pump
- Saltstone transfer pump train
- 3000 psi Air bottles with rack
- Air manifold with 3000 psi to 325 psi reducer
- Salt solution transfer pipelines
- Process water pipe lines
- Flush water pipelines
- Saltstone grout pipelines
- All associated appurtenances.

SPECIAL CONDITIONS

1. The permittee shall maintain at the permitted facility a complete Operations and Maintenance (O&M) Manual for the wastewater treatment system. The manual shall be made available for on-site review during normal working hours. The manual shall contain operation and maintenance instructions for all equipment and appurtenances associated with the waste water treatment system. The manual shall contain a general description of the treatment process(es), operating characteristics that will produce maximum treatment efficiency and corrective action to be taken should operating difficulties be encountered.

2. If the salt solution influent concentrations to the wastewater solidification facility changes appreciably from those outlined in the approved final engineering report, SCDHEC must be notified immediately with a follow up report within 30 days addressing the change in the salt solution characteristics and its effect on the saltstone disposal area.

3. The saltstone solution pipeline from tank 50 in H-Area to the Z-Area wastewater solidification facility and tank 50 are not covered by this construction permit.

4. This permit supersedes construction permit number 12,683.

5. In order to be assured that the salt solution feed remains consistent, the chemical composition of the salt solution as outlined in the final engineering report on page 12, table 2 (Attachment 1 of this permit) must be sampled one per quarter and the data maintained on site. The data shall be made available to the Department for review upon request.

6. The amount of salt solution used each day, the amount of saltstone produced each day, and the monthly average and daily maximum shall be recorded and the data maintained on site. The data shall be made available to the Department for review upon request.

7. The salt solution feed must be sampled semi-annually for radionuclides and the analysis maintained on site. The data shall be made available to the Department for review upon request.

8. The Saltstone facility shall be operated in accordance with the approximate chemical composition of the salt solution feed as outlined in Table 1 (Attachment 1) of this permit. Table 2 (Attachment 2) of this permit shall be used only after Saltstone Facility has received approval from the Bureau of Land and Waste Management for disposal of low curie salt waste stream in the Saltstone Solid Waste Landfill.

D H E C
PROMOTE PROTECT PROSPER
2600 Bull Street
Columbia, SC 29201-1708

September 10, 2003

Mr. Gene H. Laska
Westinghouse Savannah River Company
Environmental Services Section
Bldg. 742-A
Aiken, SC 29808

RE: Changes to permit special conditions and removal of grout density sampling requirement
Sept. 4, 2003 facsimile to A. Wright (SCDHEC) from G. Laska (SRS)
Construction Permit Number 18,801-IW (Issued May 15, 2003)
Savannah River Site

Dear Mr. Laska:

This Office has reviewed the above referenced request to change the special conditions in Saltstone Facility construction permit number 18,801-IW issued May 15, 2003. Special conditions number 2, 3, 7, 8, and 9 have been modified per the information received in a facsimile on September 4. The previously listed special conditions have been modified since the original permit (12,683) was issued on October 31, 1986. Those changes were not incorporated into permit number 18,801-IW. The requested changes have been incorporated into the permit and a revised copy is enclosed.

Two tables are included as attachments to the permit. Table 1 is the original table that was in permit number 12,683. It outlines the approximate chemical composition of the salt solution feed which Saltstone facility is currently permitted to process. Table 2 is outlines the approximate chemical composition of the salt solution feed for Saltstone facility for processing low curie salt waste. Table 2 will become effective only after approval is received from the Bureau of Land & Waste Management to disposal of low curie salt waste in the Saltstone Solid Waste Landfill.

A request has been made to eliminate the manual sampling of grout on a daily basis because of radiation exposure associated with daily sampling. The requirement to perform a density sample of grout on a daily basis was proposed by SRS in the original Engineering summary report dated February 1986 and approved by the Department. The recently completed Saltstone treatment facility modifications included upgrading the installed independent density instrumentation in the grout discharge line and the addition of redundant pressure sensors and density indication in the Saltstone Hold Tank. Because of the modifications to the treatment facility, the Department approves eliminating the requirement to manually sample the grout for density at the Saltstone facility. If you have any questions, please contact me at (803) 898-4238.

Sincerely,

Adrienne F. Wright
Environmental Engineer Associate
Federal, Energy, Pre-Treatment Permitting Section
Bureau of Water
wrightaf@dhec.sc.gov

/afw

Enclosure

Cc: Jenny Mowbray, Solid Waste, BLWM (w/enclosure)
Scott Simons, Lower Savannah EQC District Office (w/enclosure)

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D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

BUREAU OF WATER
Permit to Construct

Permission is hereby granted to: USDOE/Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

for the construction of a collection and wastewater treatment system in accordance with the construction plans, specifications, engineering report and Construction Permit Application signed by William N. Kennedy, Registered Professional Engineer, SC Registration Number 20412.

Project Name: Saltstone Facility Modification **County:** Aiken

Project Description: See Page 2.

The effluent will be discharged to Saltstone Disposal Facility (SDF) (Industrial Solid Waste Permit No. 025500-1603) at a daily rate not to exceed 140,000 gallons per day.

Treatment Plant Classification: NA

Special Conditions: See Page 3.

Permit Number: 18,801-IW **Date of Issue:** May 15, 2003

Expiration Dates: Unless construction begins prior to May 15, 2004 and construction is completed prior to May 15, 2005 this permit will expire.

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

THIS IS A PERMIT FOR CONSTRUCTION ONLY AND DOES NOT CONSTITUTE STATE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL APPROVAL, TEMPORARY OR OTHERWISE, TO PLACE THIS SYSTEM IN OPERATION.

Bureau of Water

MFS/afw

PROJECT DESCRIPTION

Saltstone facility is a wastewater treatment facility for the solidification of decontaminated salt solution in a cement matrix. The components of this facility are:

- Cement/flyash storage silos
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- Premix feeder
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- 300 gallon Process flush tank
- 180 gpm Process flush pump
- Saltstone transfer pump train
- 3000 psi Air bottles with rack
- Air manifold with 3000 psi to 325 psi reducer
- Salt solution transfer pipelines
- Process water pipe lines
- Flush water pipelines
- Saltstone grout pipelines
- All associated appurtenances.

SPECIAL CONDITIONS

1. The permittee shall maintain at the permitted facility a complete Operations and Maintenance (O&M) Manual for the wastewater treatment system. The manual shall be made available for on-site review during normal working hours. The manual shall contain operation and maintenance instructions for all equipment and appurtenances associated with the waste water treatment system. The manual shall contain a general description of the treatment process(es), operating characteristics that will produce maximum treatment efficiency and corrective action to be taken should operating difficulties be encountered.

2. If the salt solution influent concentrations to the wastewater solidification facility changes appreciably from those outlined in the approved final engineering report, SCDHEC must be notified immediately with a follow up report within 30 days addressing the change in the salt solution characteristics and its effect on the saltstone disposal area.

3. The saltstone solution pipeline from tank 50 in H-Area to the Z-Area wastewater solidification facility and tank 50 are not covered by this construction permit.

4. This permit supersedes construction permit number 12,683.

5. In order to be assured that the salt solution feed remains consistent, the chemical composition of the salt solution as outlined in the final engineering report on page 12, table 2 (Attachment 1 of this permit) must be sampled one per quarter and the data maintained on site. The data shall be made available to the Department for review upon request.

6. The amount of salt solution used each day, the amount of saltstone produced each day, and the monthly average and daily maximum shall be recorded and the data maintained on site. The data shall be made available to the Department for review upon request.

7. The salt solution feed must be sampled semi-annually for radionuclides and the analysis maintained on site. The data shall be made available to the Department for review upon request.

8. The Saltstone facility shall be operated in accordance with the approximate chemical composition of the salt solution feed as outlined in Table 1 (Attachment 1) of this permit. Table 2 (Attachment 2) of this permit shall be used only after Saltstone Facility has received approval from the Bureau of Land and Waste Management for disposal of low curie salt waste stream in the Saltstone Solid Waste Landfill.

Attachment 1
Construction Permit Number 18,801-IW
Revised 09/08/03

TABLE 1

Approximate Chemical Composition of Salt Solution Feed

Component	Weight Percent
H_2O	71
$NaNO_3$	14.1
$NaNO_2$	3.5
NaOH	3.8
Na_2CO_3	1.5
$NaAl(OH)_4$	3.3
Na_2SO_4	1.7
NaF	0.05
NaCl	0.11
Na_2SiO_3	0.04
Na_2CrO_4	0.05 (Cr-161 ppm)
NaHgO(OH)	1.5×10^{-6} (Hg-0.012 ppm)
$NaAg(OH)_2$	1.3×10^{-7} (Ag-0.00085 ppm)
Na_2MoO_4	0.007
KNO_3	7.8×10^{-6}
$CaSO_4$	2.3×10^{-4}
$Na_2C_2O_4$	0.28
Na_3PO_4	0.12
NH_4NO_3	6.1×10^{-6}
$NaB(C_6H_5)_4$	0.05
Other Salts[2]	0.20

[2] Other Salts Include:

Component	Weight Percent
As	3×10^{-8} (As – 0.0003 ppm)
Ba	1.1×10^{-3} (Ba – 11 ppm)
Cd	5×10^{-6} (Cd – 0.05 ppm)
Pb	2×10^{-12} (Pb – 2×10^{-8} ppm)
Se	7.9×10^{-5} (Se – 0.79 ppm)

(Table 1 is reproduced from the final engineering report (FER) for the Saltstone Facility. In the FER, the above table was designated Table 2.

Attachment 2
Construction Permit Number 18,801-IW
Revised 09/08/03

TABLE 2

Approximate Chemical Composition of Salt Solution Feed for Saltstone
(Blend Ratio varies 100% Low Curie Salt feed to 100% Effluent Treatment Facility feed)

Component	Weight Percent	
	Low Curie Salt[1]	Effluent Treatment Facility[1]
H_2O	48	68
$NaNO_3$	25	18
$NaNO_2$	6.6	0.03
NaOH	9.5	6.4
Na_2CO_3	1.8	1.4
$NaAl(OH)_4$	5.2	1.5
Na_2SO_4	2.9	0.2
NaF	0.2	0.02
NaCl	0.2	0.2
Na_2SiO_3	0.1	1.2
Na_2CrO_4	0.1	1×10^{-3}
NaHgO(OH)	7×10^{-4}	1×10^{-3}
$NaAg(OH)_2$	1×10^{-7}	2×10^{-5}
Na_2MoO_4	7×10^{-3}	---
KNO_3	0.1	1
$CaSO_4$	0.1	0.2
$Na_2C_2O_4$	0.2	0.4
Na_3PO_4	0.3	0.02
NH_4NO_3	1×10^{-4}	---
$NaB(C_6H_5)_4$	N/A	N/A
Other Salts[2]	0.2	1.6
Total Organics	N/A	N/A

[1] Value is representative of the maximum expected concentration (except for water which is a minimum), components other than water will range as low as 67% of the listed value.

N/A – Organic reagents are not used in the Low Curie Process

[2] Other Salts Include:

Component	Weight Percent	
	Low Curie	Effluent Treatment Facility
As	9×10^{-3}	9×10^{-3}
Ba	---	3×10^{-4}
Cd	1×10^{-4}	7×10^{-5}
Se	---	1×10^{-4}
Pb	---	1×10^{-3}

D H E C
PROMOTE PROTECT PROSPER
South Carolina Department of Health and Environmental Control
206 Beaufort Street, NE, Aiken, SC 29801
(803) 641-7670 Fax (803) 641-7675

Edisto Savannah
Environmental Quality Control District
Serving: Aiken, Allendale, Bamberg, Barnwell, Calhoun, and Orangeburg Counties

Promoting Health, Protecting the Environment

FINAL APPROVAL TO PLACE IN OPERATION

Issued To: USDOE/Westinghouse Savannah River Company
Building 742-A
Aiken, SC 29808

for the operation of the following system in accordance with Construction Permit No. 18,801-IW dated May 15, 2003.

Project Name: Saltstone Facility Modification
County: Aiken

Project Description: Modification and/or installation of treatment facility components in accordance with SCDHEC construction permit 18,801-IW.

The wastewater will be discharged to the Saltstone Disposal Facility treatment facility at a design flow rate of 140,000 gpd. The effluent concentrations of those constituents the wastewater treatment system is designed to remove or reduce are contained in Industrial Solid Waste Permit No. 025500-1603.

Special Conditions: Special conditions shall be adhered to as outlined in the most recent revision of the construction permit.

This operational approval is based on the Engineer's letter of certification signed by Joseph Carroll, P.E., S.C. Registration No.: 14028 and inspections performed by personnel of the Department on September 3, 2003.

Scott L. Simons
District Engineer
Lower Savannah EQC District

Date Issued: 09/11/2003

cc: Joseph Carrol, P.E.
Gene Laska, WSRC
M. B. Hughes, WSRC
Marion Sadler, Industrial, Agriculture & Storm Water Permitting Division
Tanya Strickland, Lower Savannah EQC
Mike Chappell, Environmental Health

D H E C
PROMOTE PROTECT PROSPER
2600 Bull Street
Columbia, SC 29201-1708

June 13, 2003

Mr. Gene H. Laska
Westinghouse Savannah River Company
Environmental Protection Department
Bldg. 742-A
Aiken, SC 29808

RE: Changes to Saltstone Process Low Curie Modifications
May 29, 2003 letter to A. Wright (SCDHEC) from G. Laska (SRS)
Construction Permit Number 18,801-IW (Issued May 15, 2003)
Savannah River Site

Dear Mr. Laska:

This Office has reviewed the above notification concerning additional changes to the originally permitted design in construction permit number 18,801-IW for Saltstone modifications for processing low curie waste. Please find enclosed a stamped process flow diagram, which illustrates the change in design for the Saltstone Hold Tank. As agreed to in a phone conversation on June 11, 2003, the Department has determined that any further changes to the Saltstone design modifications will be conducted through as-built specifications during the inspection conducted by the Lower Savannah EQC District Engineer, Scott Simons. If you have any questions, please contact me at (803) 898-4238.

Sincerely,

Adrienne F. Wright
Environmental Engineer Associate
Federal, Energy, Pre-Treatment Permitting Section
Bureau of Water
wrightaf@dhec.sc.gov

/afw

Enclosure

Cc: Scott Simons, Lower Savannah EQC District Office (w/enclosure)

f:\users\wrightaf\documents\srs\constr\18801-IW-Additional Changes to Saltstone June 12, 2003.doc

Westinghouse
Savannah River Company
Aiken, SC 29808

May 29, 2003

ESS-ERP-2003-00167

Ms. Adrienne F. Wright, Engineer
Industrial, Agricultural and
Stormwater Permitting Division
South Carolina Department of Health and
Environmental Control
2600 Bull Street
Columbia, South Carolina 29201-1708

Dear Ms. Wright:

CHANGES TO SALTSTONE PROCESS LOW CURIE MODIFICATIONS

Ref: WSP-SSF-2003-00013, Saltstone Production Facility (SCDHEC Permit #12,683) Engineering Report for Wastewater Treatment Facility Permit Modifications dated April 14, 2003.

The submittal referenced above addressed modifications to the Saltstone Production Facility to prepare the facility for low curie salt waste. The modifications were intended to protect workers from higher radiation doses during operational and maintenance activities and to improve system reliability, flexibility, and safety. One of the primary considerations in development of the modified design was to minimize or eliminate "wide-spots" in the system, such as the Salt Solution and Saltstone Hold Tanks. This minimizes the radioactive source present and, where grout is present, minimizes the chances of accumulation of hardening grout in the system due to stagnant areas.

The basis for eliminating the Saltstone Hold Tank was a concept where the saltstone mixer would be used to pump the grout to the pump inlet and the pump speed would be varied to control pressure between the mixer and pumps. Recently completed computer modeling of the system has indicated that for some cases of mixer performance, the pressure may not be controllable. For this reason the proposed design has been modified to reinsert the Saltstone Hold Tank. This tank will be vented by the original mixer vent scrubber system and, since the tank is vented, the high pressure flush will enter the system downstream of the hold tank. In keeping with the original design objectives, the Saltstone Hold Tank will be modified to limit its inventory and provide a shape that is much less likely to result in the accumulation of hardening grout during operation. These changes to the original proposal are shown in blue on the attached process flow diagram.

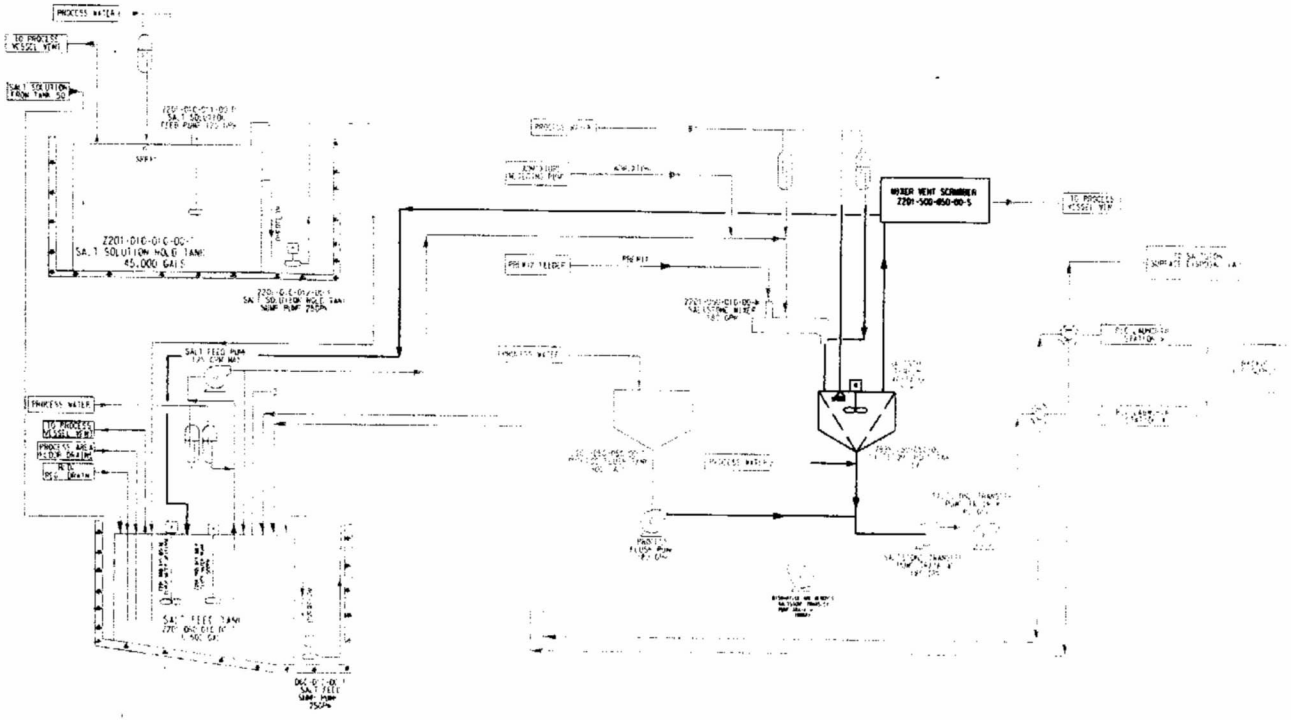
A Professional Engineer has reviewed and approved this submittal by stamping the attachment. If additional information is needed, please contact me at (803) 725-8838.

Sincerely,

gLaska

Gene Laska
Environmental Regulatory Policy Group
Environmental Services Section
Westinghouse Savannah River Company, LLC

ghl/aeo
Att.
c: M. C. Reece, SCDHEC, Lower Savannah District
S. Simons, SCDHEC, Lower Savannah District
A. B. Gould, 703-A, USDOE, Savannah River Operations



SOUTH CAROLINA
DEPT OF HEALTH AND ENVIRONMENTAL CONTROL
INDUSTRIAL AGRICULTURAL &
STORMWATER PERMITTING DIVISION
APPROVED - FOR CONSTRUCTION ONLY

DHEC PERMIT # 18,801-IW

DATE ISSUED: 5/15/03

BY: Marcia T. Sadler Jr.

NOTES

LEGEND

SOUTH CAROLINA REGISTERED PROFESSIONAL ENGINEER
No. 20412
WILLIAM N. KENNEDY
5-27-03

DRAWING KEY

EXISTING

CHANGE FROM REVISION A TO REVISION B

UNITED STATES DEPARTMENT OF ENERGY

DEFENSE WASTE PROCESSING FACILITY
SALTSTONE PROCESS
LOW CURIE SALT DISPOSITION PROJECT
PROPOSED ARRANGEMENT
PROCESS FLOW DIAGRAM
101

H 03 2 0003

N/A B

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D H E C
PROMOTE PROTECT PROSPER
2600 Bull Street
Columbia, SC 29201-1708

May 15, 2003

Mr. M. B. Hughes
USDOE/Westinghouse Savannah River Company
Building 742-A
Aiken, SC 29808

Re: **Construction Permit Number 18,801-IW**
Saltstone Facility
Savannah River Site
Aiken County

Dear Mr. Hughes,

Enclosed is a State Construction Permit for the above referenced wastewater collection and treatment system. Construction is to be performed in accordance with this permit and the supporting engineering report, plans, and specifications approved by this Office.

Your facility will be required to have an operator in charge who has been certified by the Environmental Certification Board of the South Carolina Department of Labor, Licensing and Regulation. Your facility has been classified in **Group II-P/C**, necessitating an operator holding a **Grade C-P/C** or higher certificate. Questions regarding operator certifications should be directed to Ms. Dona J. Caldwell, Board Coordinator, Environmental Certification Board, P.O. Box 11409 Columbia, SC 29211, (803) 896-4430.

This system cannot be placed into operation until final approval is granted by the appropriate Environmental Quality Control (EQC) District office. Your District contact is Mr. Scott Simons, District Engineer, Lower Savannah EQC District, 206 Beaufort Street, NE, Aiken, SC 29801, (803) 641-7670. . The EQC District Office should be notified when construction begins.

Upon completion of construction, a letter must be submitted to the EQC District office from a registered engineer certifying that the construction has been completed in accordance with the approved plans and specifications. A final inspection may then be scheduled. A properly qualified operator(s) must be obtained prior to receiving approval to operate. The EQC District office will approve the system for operation upon successful completion of the project.

Sincerely,

Marion F. Sadler, Jr., Director
Industrial, Agricultural, & Storm
Water Permitting Division
Bureau of Water

MFS/afw

WW-1159-5

cc: Lower Savannah EQC
Gene Laska (Westinghouse Savannah River Co,, Building 742-A, Aiken, SC 29808)

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

BUREAU OF WATER
Permit to Construct

Permission is hereby granted to: USDOE/Westinghouse Savannah River Company
Savannah River Site
Aiken, SC 29808

for the construction of a collection and wastewater treatment system in accordance with the construction plans, specifications, engineering report and Construction Permit Application signed by William N. Kennedy, Registered Professional Engineer, SC Registration Number 20412.

Project Name: Saltstone Facility Modification **County:** Aiken

Project Description: See Page 2.

The effluent will be discharged to Saltstone Disposal Facility (SDF) (Industrial Solid Waste Permit No. 025500-1603) at a daily rate not to exceed 140,000 gallons per day.

Treatment Plant Classification: Group II-P/C

Special Conditions: See Pages 3 and 4.

Permit Number: 18,801-IW **Date of Issue:** May 15, 2003

Expiration Dates: Unless construction begins prior to May 15, 2004
and construction is completed prior to May 15, 2005 this permit will expire.

In accepting this permit, the owner agrees to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

THIS IS A PERMIT FOR CONSTRUCTION ONLY AND DOES NOT CONSTITUTE STATE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL APPROVAL, TEMPORARY OR OTHERWISE, TO PLACE THIS SYSTEM IN OPERATION.

Bureau of Water

MFS/afw

PROJECT DESCRIPTION

Saltstone facility is a wastewater treatment facility for the solidification of decontaminated salt solution in a cement matrix. The components of this facility are:

- Cement/flyash storage silos
- 25 gpm Salt solution hold tank sump pump
- 6,500 gallon Salt feed tank
- Flush water agitator
- 125 gpm Salt feed pump
- 25 gallon Flush water sump pump
- Admixture metering pump
- Premix feeder
- 180 gpm Saltstone mixer
- 300 gallon Process flush tank
- 180 gpm Process flush pump
- Saltstone transfer pump train
- 3000 psi Air bottles with rack
- Air manifold with 3000 psi to 325 psi reducer
- Salt solution transfer pipelines
- Process water pipe lines
- Flush water pipelines
- Saltstone grout pipelines
- All associated appurtenances.

SPECIAL CONDITIONS

1. The permittee shall maintain at the permitted facility a complete Operations and Maintenance (O&M) Manual for the wastewater treatment system. The manual shall be made available for on-site review during normal working hours. The manual shall contain operation and maintenance instructions for all equipment and appurtenances associated with the waste water treatment system. The manual shall contain a general description of the treatment process(es), operating characteristics that will produce maximum treatment efficiency and corrective action to be taken should operating difficulties be encountered.

2. The permittee shall provide for the performance of routine daily treatment system inspections by a certified operator of the appropriate grade, when the treatment system is in operation. Weekend and holiday inspections may be performed by an operator with a minimum certification of one grade lower than the certified operator required by the Rules and Regulations of the Environmental Certification Board based on the treatment plant classification designated in this Permit to Construct. The inspections shall include, but are not limited to, areas which require a visual observation to determine efficient operations and for which immediate corrective measures can be taken using the O&M Manual as a guide. All inspections shall be recorded and shall include the date, time, and name of the person making the inspection, corrective measures taken, and routine equipment maintenance, repair or replacement performed. The certified operator shall review and validate all inspection sheets generated by the weekend and holiday operator. Any unusual or significant problems encountered by the weekend and holiday operator shall be reported immediately to the certified operator who shall initiate corrective action. The permittee shall maintain records of inspections at the permitted facility, where possible. The records shall be made available for on-site review during normal working hours.

3. The wastewater treatment plant has been assigned a classification of Group II-P/C. The operator of the plant must hold a valid C-P/C license, or higher.

4. If the salt solution influent concentrations to the wastewater solidification facility changes appreciably from those outlined in the approved final engineering report, SCDHEC must be notified immediately with a follow up report within 30 days addressing the change in the salt solution characteristics and its effect on the saltstone disposal area.

5. The saltstone solution pipeline from tank 50 in H-Area to the Z-Area wastewater solidification facility and tank 50 are not covered by this construction permit.

6. This permit supersedes construction permit number 12,683.

7. In order to be assured that the salt solution feed remains consistent, the chemical composition of the salt solution as outlined in the Table 1 of the September 12, 2002 letter to J. Mowbray (SCDHEC) from L. Haney (SRS). Table 1 is attached to this permit. This information was originally presented in the final engineering report for the Saltstone facility in Table 2 on page 12. The salt solution must be sampled once per quarter and submitted with the Savannah River Site's Discharge Monitoring Reports.

8. The amount of salt solution used each day and the saltstone produced each day must be recorded; and the monthly average and daily maximum should be submitted along with the Discharge monitoring data.

9. The salt solution feed must be sampled semi-annually for radionuclides and the analysis should be submitted to SCDHEC's Bureau of Radiological Health.

Attachment 1
Construction Permit Number 18,801-IW
5/15/2003

TABLE 1

Approximate Chemical Composition of Salt Solution Feed for Saltstone
(Blend Ratio varies 100% Low Curie Salt feed to 100% Effluent Treatment Facility feed)

Component	Weight Percent	
	Low Curie Salt[1]	Effluent Treatment Facility
H_2O	48	68
$NaNO_3$	25	18
$NaNO_2$	6.6	0.03
NaOH	9.5	6.4
Na_2CO_3	1.8	1.4
$NaAl(OH)_4$	5.2	1.5
Na_2SO_4	2.9	0.2
NaF	0.2	0.02
NaCl	0.2	0.2
Na_2SiO_3	0.1	1.2
Na_2CrO_4	0.1	1×10^{-3}
NaHgO(OH)	7×10^{-4}	1×10^{-3}
$NaAg(OH)_2$	1×10^{-7}	2×10^{-5}
Na_2MoO_4	7×10^{-3}	---
KNO_3	0.1	1
$CaSO_4$	0.1	0.2
$Na_2C_2O_4$	0.2	0.4
Na_3PO_4	0.3	0.02
NH_4NO_3	1×10^{-4}	---
$NaB(C_6H_5)_4$	N/A	N/A
Other Salts[2]	0.2	1.6
Total Organics	N/A	N/A

[1] Value is representative of the maximum expected concentration (except for water which is a minimum), components other than water will range as low as 67% of the listed value.
N/A – Organic reagents are not used in the Low Curie Process

[2] Other Salts Include:		
As	9×10^{-5}	9×10^{-5}
Ba	---	3×10^{-4}
Cd	1×10^{-4}	7×10^{-5}
Se	---	1×10^{-4}
Pb	---	1×10^{-3}

DHEC
PROMOTE PROTECT PROSPER

CONSTRUCTION PERMIT APPLICATION
Water and/or Wastewater Facilities

BUREAU OF WATER

DRP SUBMITTAL: ☒ No ☐ Yes

SELECT ONE ➧ ☐ Water Facilities ☒ Wastewater Facilities ☐ Water & Wastewater Facilities

RECEIVED
APR 22 2003
Industrial, Agricultural & Stormwater Permitting Division

I. **Project Name:** Saltstone Facility **County:** Aiken

II. **Project Location** (street names, etc.): Savannah River Site, Aiken SC

III. **Project Description(s):** *Water System:*

Wastewater System:
Modification of Saltstone Facility, IWT Permit #12,683-IW to allow processing of Low Curie Salt.

Project Type (A - Z): Water: ___ Wastewater: E. *(See instructions for the appropriate project code)*

IV. ***Initial* Owner:** [Time of Application] Name/Organization: U.S. Dept. of Energy, Owner/Westinghouse Savannah River Co., Operator
Address: Bldg. 742-A (Attn.: M. B. Hughes) City: Aiken State: SC Zip: 29808 Phone #: (803) 725-3887

V. ***Final* Owner:** [After Construction] Name/Organization: U.S. DOE, Owner/Westinghouse Savannah River Co., Operator
Address: Bldg. 742-A (Attn.: M. B. Hughes) City: Aiken State: SC Zip: 29808 Phone #: (803) 725-3887

VI. **Entity Responsible for Final Operation & Maintenance of System:**
Water System: Name: ___ Address: ___
City: ___ State: ___ Zip: ___ Phone #: ___ Fax #: ___
Wastewater System: Name: U.S. DOE, Owner/WSRC, Operator Address: ___
City: Aiken State: SC Zip: 29808 Phone #: ___ Fax #: ___

VII. **Engineering Firm:** Name: ___ Address: ___
City: ___ State: ___ Zip: ___ Phone #: ___ Fax #: ___

VIII. **Is this project:** A) Part of a phased project? ☒ No ☐ Yes If Yes, Phase ___ of ___
B) A revision to a previously permitted project? ☐ No ☒ Yes If Yes, Permit # 12,683-IW
Date Approved: 7/18/1988 Project Name (if different): Saltstone Facility
C) Submitted based on a Schedule of Compliance or Order issued by DHEC? ☒ No ☐ Yes Order # ___
D) Anticipate funding by the State Revolving Fund (SRF)? ☒ No ☐ Yes
E) Crossing a water body? (e.g., river, creek) ☒ No ☐ Yes If Yes, Name of water body ___

IX. **Are Standard Specifications approved by DHEC being used on this project?** No Yes If Yes:
Water: Date Approved: ___ Approved for whom: ___
Wastewater: Date Approved: ___ Approved for whom: ___

X. **Wastewater Systems:** A) Type: ☐ Domestic ☒ Process (Industrial) ☐ Combined (Domestic & Process)
B) Total average design flow of the project not to exceed 140,000 GPD.
C) *Sewers or Pretreatment* 1. Name of facility (e.g., POTW) treating the wastewater: ___
2. NPDES/ND Number of facility in Item #1: ___
Treatment Systems 3. Date Preliminary Engineering Report (PER) approved: ___
4. NPDES/ND application submitted? ☐ No ☐ Yes If Yes, Date ___
Disposal Sites 5. Effluent Disposal Site (Description): ___
6. Sludge Disposal Site (Description): ___

XI. **Water Systems:** Project located within city limits? ☒ No ☐ Yes
Public water system providing water (Name & System ID No.): ___ No.: ___
New water system (including master meter)? ☒ No ☐ Yes If Yes, System Name: ___

XII. **Type of Submittal:** Complete **Section A (Standard)** *or* **Section B (Delegated Review Program - DRP).**

A) Standard Submittal *must* include the following, where applicable:

- ☒ 1. A transmittal letter outlining the submittal package.
- ☒ 2. The **original** construction permit application, properly completed, with three (3) copies.
- ☒ 3. Three (3) sets of signed and sealed plans and specifications. Specifications may be omitted if approved standard specifications are on file with DHEC.
- ☐ 4. One (1) additional overall plan sheet showing the proposed and existing (only in the area of proposed construction) water and wastewater lines (highlighted for identification) and their sizes.
- ☐ 5. Three (3) sets of the appropriate design calculations. WASTEWATER: Design flow (based on R.61-67, Appendix A), pump station calcs. and pump curve. WATER indicating pressure maintained in the distribution system during max. instantaneous demand, fire flow and flushing velocities achieved. Number/types of service connections, well record form, pumping test results, etc.
- ☐ 6. Three (3) copies of a detailed 8½" x 11" location map, separate from the plans.
- ☐ 7. Three (3) copies of construction easements unless the project owner has the right of eminent domain.
- ☐ 8. A letter(s) from the entity supplying water and/or providing wastewater treatment stating their willingness and ability to serve the project, including pretreatment permits, if applicable. The letter should include the specific flow and, when applicable, the specific number of lots being served.
- ☐ 9. A letter(s) from the entity agreeing to be responsible for the O&M of the water and/or wastewater system.
- ☒ 10. WASTEWATER SYSTEMS: Application fee enclosed $ N/A . (Refer to R.61-30, Fee Schedule).
- ☐ 11. WATER SYSTEMS: a) A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating the consistency with water supply service plan for area.
  b) For wells, four (4) copies of a wellhead protection area inventory.
  c) For new wells, a viability demonstration is required in accordance with Regulation 61-58.1.B.(4).

Note: Other approvals may include 208 and OCRM certification, and navigable waterway permitting.

B) DRP Submittal (treatment plants are not covered) *must* include the following, where applicable:

- ☐ 1. A transmittal letter, signed by the professional engineer representing the DRP entity, noting this is a DRP submittal. The letter should state that the project has been reviewed and complies with R.61-58 and/ or R.61-67.
- ☐ 2. The **original**
- ☐ 3. Two (2) sets of signed and sealed plans.
- ☐ 4. One (1) plan sheet with water and wastewater lines highlighted, as required under Sec. XII.A.4. above.
- ☐ 5. Two (2) sets of the appropriate design calculations. WASTEWATER: Same information as required under Section XII.A.5. above. WATER: Same information as required under Section XII.A.5. above.
- ☐ 6. Two (2) copies of a detailed 8½" x 11" location map, separate from the plans.
- ☐ 7. Two (2) copies of construction easements, unless the project owner has the right of eminent domain.
- ☐ 8. DHEC's Ocean and Coastal Resource Management certification (for projects in applicable counties).
- ☐ 9. DHEC's Water Quality permit or conditions for placement in navigable waters, and other Agency approvals.
- ☐ 10. WASTEWATER SYSTEMS: a) A letter of acceptance from the entity providing the treatment of the wastewater that includes the specific flow and, when applicable, the specific number of lots being accepted.
  b) A letter from the organization agreeing to be responsible for the O&M of the sewer system.
  c) The 208 Plan certification from the appropriate Council of Governments (designated 208 areas), or from DHEC on the non-designated 208 areas.
  d) Application Fee of $75 for a collection/transmission system submitted as a DRP project.
- ☐ 11. WATER SYSTEMS: A letter from the local government which has potable water planning authority over the area, if applicable, in which the project is located, stating project consistency with water supply service plan for area.

Note: The DRP entity should ensure that a copy of the final approved plans are returned to the design engineer.

XIII. Construction plans, material and construction specifications, the engineering report including supporting design data and calculations are herewith submitted and made a part of this application. I have placed my signature and seal on the engineering documents submitted, signifying that I accept responsibility for the design of this system, and that I have submitted a complete administrative package.

Engineer's Name (Printed): William N. Kennedy Signature: William N Kennedy
Registered Professional Engineer

S. C. Registration Number: 20412

XIV. Prior to final approval, I will submit a statement certifying that construction is complete and in accordance with the approved plans and specifications, to the best of my knowledge, information and belief. This certification will be based upon periodic observations of construction and a final inspection for design compliance by me or a representative of this office who is under my supervision.

Engineer's Name (Printed): William N. Kennedy Signature: William N Kennedy
Registered Professional Engineer

S. C. Registration Number: 20412

XV. I hereby make application for a permit to construct the project as described above. I have read this application and agree to the requirements and conditions and agree to the admission of properly authorized persons at all reasonable hours for the purpose of sampling and inspection.

Owner's Name (Printed): James W. French (authorized representative of DOE) Signature: James W French (authorized representative of DOE)

Owner's Title Mgr. Waste Solidification Area Projects, CBU Date: 4/17/03

April 23, 2003

TO: MYRA REECE
LOWER SAVANNAH District Office

FROM: Federal, Energy, & Pretreatment Section
Industrial, Agricultural, & Storm Water Permitting Division

RE: SRS SALTSTONE/MOD 12683-LOW CURIE SALT
AIKEN COUNTY

Attached is a project submitted to this Division for permitting. Please review and comment within fifteen (15) days. Should you desire additional time or have questions please call Melissa King at (803) 898-3236. Thank you.

DISTRICT COMMENTS:

No specific concerns.

Scott

May 13, 2003

FILE COPY

MEMORANDUM

TO: Hope V. Ramsey
Bureau of Finance

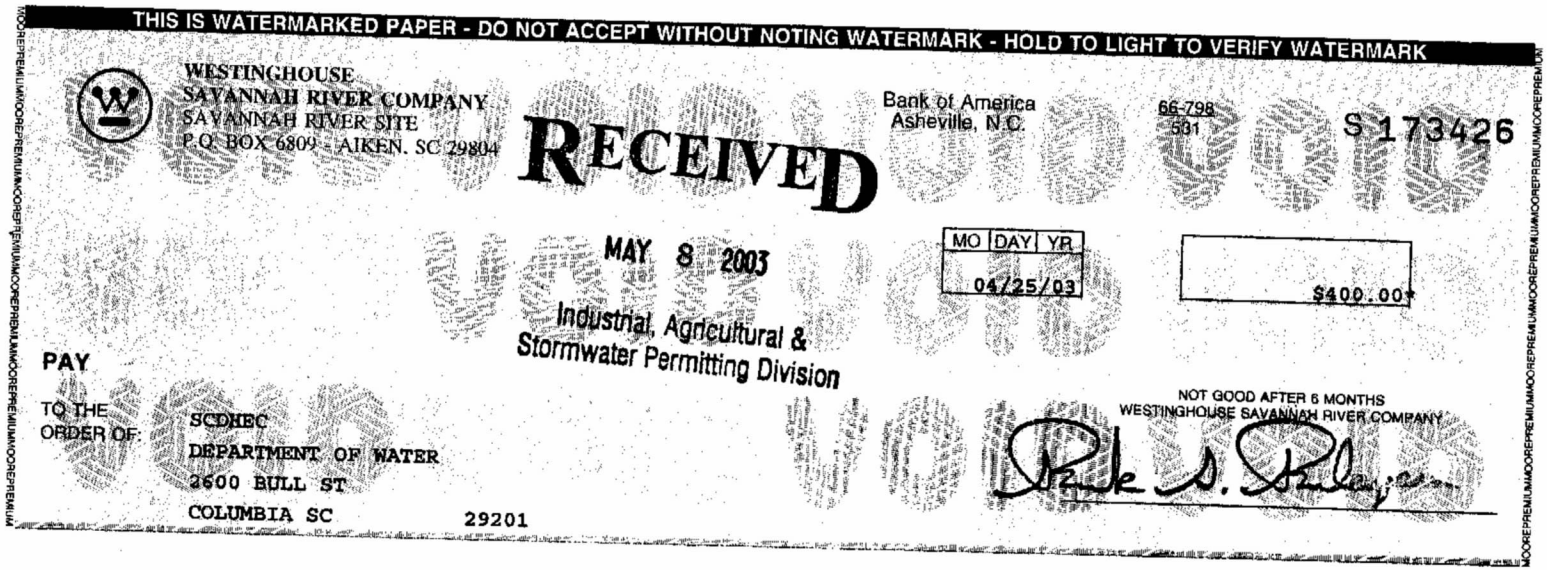
FROM: Melissa J. King
Federal, Energy, and Pretreatment Section
Industrial, Agricultural, & Stormwater Permitting Division
Bureau of Water

The following project has been submitted to the Bureau of Water for permitting. This is a fee project. Therefore, a check for payment of the application fee is attached and the following information is provided:

Project Name: SRS/SALTSTONE/MOD 12683-LOW CURIE SALT
AIKEN County
Project ID: 112267
Project Owner/Company: SRS WESTINGHOUSE SAV RIVER CO
BLDG 742-A (ATTN. M B HUGHES)
AIKEN, SC 29808
Person who signed application: JAMES W FRENCH
Check Amount: $400
Check number: 173426

Please deposit the check into the Bureau's account for construction application fees.

cc: Charleen Smith, EQC Administration (FAX # 896-8941)



THIS IS WATERMARKED PAPER - DO NOT ACCEPT WITHOUT NOTING WATERMARK - HOLD TO LIGHT TO VERIFY WATERMARK

WESTINGHOUSE
SAVANNAH RIVER COMPANY
SAVANNAH RIVER SITE
P.O. BOX 6809 - AIKEN, SC 29804

RECEIVED
MAY 8 2003
Industrial, Agricultural &
Stormwater Permitting Division

Bank of America
Asheville, N.C.

66-798
531

S 173426

MO | DAY | YR
04/25/03

$400.00*

PAY

TO THE ORDER OF:
SCDHEC
DEPARTMENT OF WATER
2600 BULL ST
COLUMBIA SC 29201

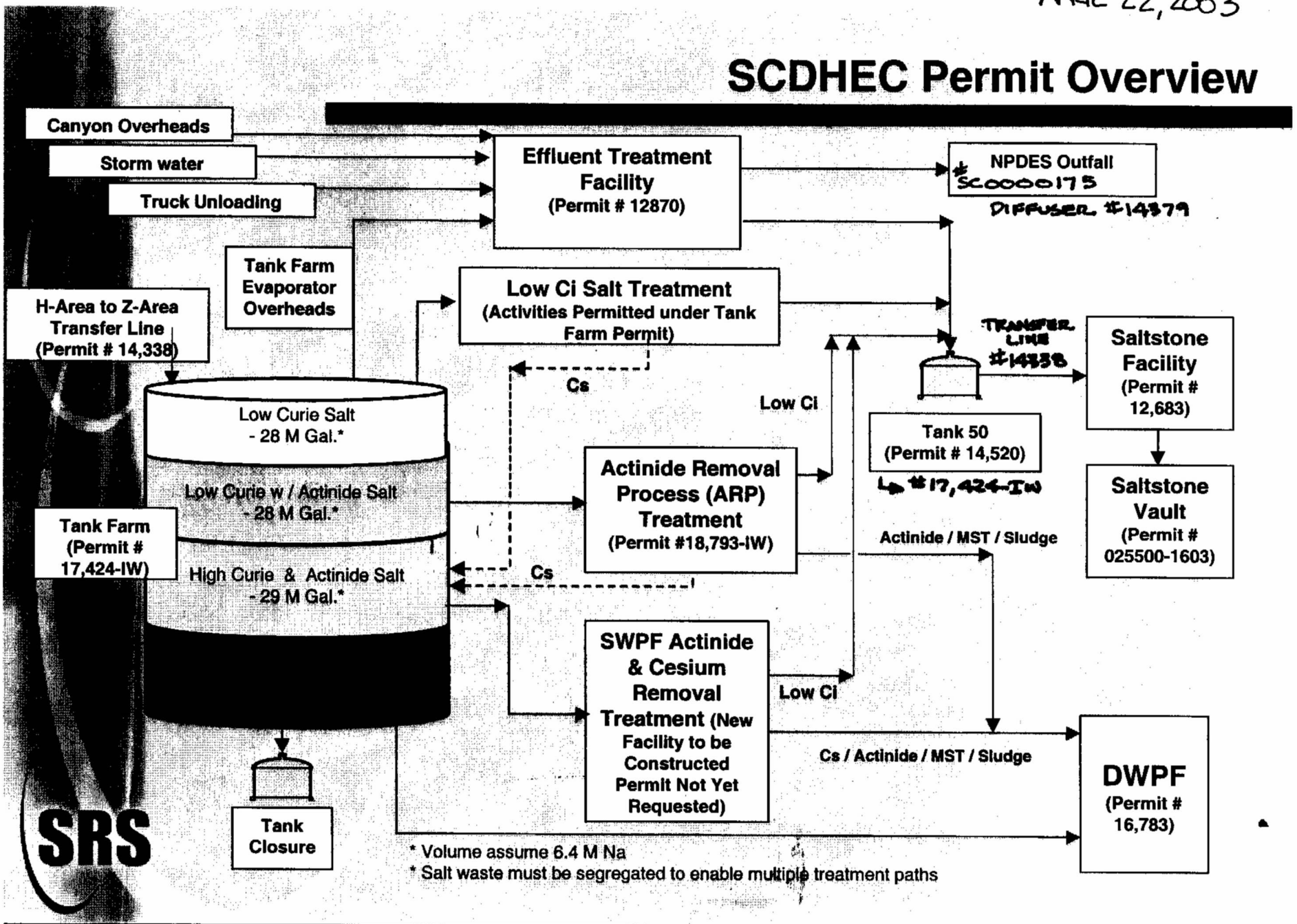
NOT GOOD AFTER 6 MONTHS
WESTINGHOUSE SAVANNAH RIVER COMPANY

⑈173426⑈ ⑆053107989⑆ 0004801077 98⑈

FILE COPY

APRIL 22, 2003

SCDHEC Permit Overview



Westinghouse
Savannah River Company
Aiken, SC 29808

April 21, 2003

ESH-ERP-2003-00125

Ms. Adrienne Wright, Engineer
Industrial, Agricultural and Stormwater
Permitting Division
South Carolina Department of Health and
Environmental Control
2600 Bull Street
Columbia, South Carolina 29201

Dear Ms. Wright:

SALTSTONE PRODUCTION FACILITY MODIFICATION

Reference – IWT Permit #12,683

The attached modification package for the Saltstone Production Facility is provided for your review. The modifications will support the processing of low-curie, low actinide salt through the facility. This package includes an Engineering Report, drawings, equipment descriptions and a permit application.

SRS requests SCDHEC approval to implement this activity. If any additional information is required, please contact me at (803) 725-8838.

Yours very truly,

glaska

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Revision 0

SALTSTONE PRODUCTION FACILITY
(SPF)
(SCDHEC Permit # 12,683 MODIFICATION)

SALTSTONE FACILITY

ENGINEERING REPORT FOR WASTEWATER TREATMENT FACILITY PERMIT MODIFICATIONS

UNCLASSIFIED
DOES NOT CONTAIN UNCLASSIFIED CONTROLLED NUCLEAR INFORMATION

ADC/RO Gregory M. Stephens SR. TECH. ADV. **Date:** 4/14/2003

Westinghouse Savannah River Company
Savannah River Site
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SAFETY • RESPONSIBILITY • SECURITY
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SAVANNAH RIVER SITE

DISCLAIMER

APPROVAL PAGE

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TABLE OF CONTENTS

LIST OF ACRONYMS

Acronyms	Definition
ASME	American Society of Mechanical Engineers
ARP	Actinide Removal Process
DOE	Department of Energy
ETF	Effluent Treatment Facility
FWRT	Flush Water Receipt Tank
ITP	In-Tank Precipitation
LCS	Low Curie Salt
NPSH	Net Positive Suction Head
SCDHEC	South Carolina Department of Health and Environmental Control
SDF	Saltstone Disposal Facility
SPF	Saltstone Production Facility
SRS	Savannah River Site
SHT	Saltstone Hold Tank
SSHT	Salt Solution Hold Tank
SWPF	Salt Waste Processing Facility
WSRC	Westinghouse Savannah River Company

INTRODUCTION

The Saltstone Facility is designed, permitted and operated to immobilize and dispose of low-activity radioactive and hazardous liquid waste (referred to as salt solution) remaining from the processing of radioactive material at the Savannah River Site (SRS). This low-activity waste, which is stored in Tank 50H prior to processing, consisted of "decontaminated" salt solution from the In-Tank Precipitation (ITP) process and evaporator bottoms from the Effluent Treatment Facility (ETF).

The Saltstone Facility consists of two separate facilities: the Saltstone Production Facility (SPF), and the Saltstone Disposal Facility (SDF). The Saltstone Production Facility (SPF) is a permitted wastewater treatment facility (permit #12,683) that processes the salt solution into grout. The Saltstone Disposal Facility (SDF) is a permitted industrial solid-waste landfill (permit #025500-1603) that consists of large concrete vaults used for the disposal of the grout.

Operation of the Saltstone Facility is an integral part of the Savannah River Site's plans to move wastes from an unstabilized condition in storage to a stabilized, environmentally protective condition. SRS plans on using the Saltstone Facility to treat and safely dispose of a significant fraction of the salt waste that is currently stored in the high-level waste tanks at SRS. The salt waste will be treated and sampled prior to being transferred to the Saltstone Facility to ensure that it meets the requirements to be managed as low-activity radioactive waste.

In 1998, WSRC determined that the ITP Facility could not meet both safety and production requirements, and as a result, the DOE directed WSRC to cease operation of the ITP Facility. Due to the lack of feed resulting from the operational issues with ITP, operation of the Saltstone Facility was temporarily suspended in 1998. SCDHEC approved the restart of the facility in April 2002 to process the material that was present in Tank 50H from continued operations of the ETF.

With in-tank precipitation no longer a viable method, WSRC and the DOE have determined that the most prudent way of processing the salt waste at SRS is to develop three different parallel methods, with each method tailored to address the different attributes/characteristics of the salt waste. The salt waste currently stored in the high-level waste tanks at SRS can be placed into one of three categories:

1. Low curie (low Cs-137 content) and low actinide waste (28 million gallons)
2. Low curie and high actinide waste (28 million gallons)
3. High curie and high actinide waste (29 million gallons)

The low curie/low actinide waste will be treated using the Low Curie Salt (LCS) process. The LCS process will remove the majority of the Cs-137 ions from the salt waste. The low curie/high actinide waste will be treated using the Actinide Removal Process (ARP), and the high curie/high actinide waste will be treated using the Salt Waste Processing

Facility (SWPF). All three of these salt treatment processes will generate a low-activity radioactive and hazardous liquid waste stream that will be sent to the Saltstone Facility for final treatment and storage.

Although the majority of the high-activity radionuclides will have been removed prior to the waste being sent to the Saltstone Facility, the salt solution will contain higher levels of radioactive contaminants than was assumed in the original design for the Saltstone Facility. In order to protect the workers from higher doses due to operational and maintenance activities, several equipment modifications that are needed to improve the reliability, flexibility, and safety of the SPF have been proposed. This permit modification focuses on these proposed equipment modifications. The overall plant operations and chemical processes will remain unchanged.

Attachment 1 describes the existing SPF Process. Attachment 2 depicts the SPF with the proposed equipment modifications.

SALTSTONE FACILITY PROCESS SUMMARY:

The Saltstone Facility immobilizes the salt solution by blending it with a dry material mixture consisting of cement, slag, and flyash to form a non-hazardous liquid grout. The grout is pumped to large storage vaults where it is allowed to harden into a concrete-like solid waste form called saltstone. Both the grout and the solid saltstone are non-hazardous.

PROPOSED MODIFICATIONS:

The following equipment modifications will be required for the SPF.

1.1 Backup Air Supply to Pig Launchers:

Bottled air cylinders and two air manifolds (one manifold for each pig air accumulator) will be installed outside the Building 210-Z compressor room. This will allow the pig air accumulators to be charged and pigs to be launched during a loss of the pig air compressor.

1.2 Mixer Inlet Modifications:

The Mixer liquid feeds (salt solution, flush water, mixer vent scrubber), admixture, and process water, will be manifolded to a single injection point that will be moved from the existing locations on the side to the top of the Mixer. Along with some minimal piping changes, an air-operated valve will be installed that replaces the existing ram valves, and a check valve will be installed to prevent backflow into the process water header.

1.3 SSHT Bypass and Admixture Modification:

The necessary piping modifications will be made that will allow the use of the Flush Water Receipt Tank (FWRT) in place of the existing Salt Solution Hold Tank (SSHT) to receive waste solutions from Tank 50H and transfer the waste to the Mixer for processing. The FWRT will be renamed as the Salt Feed Tank (SFT). All instrumentation that is currently used on the SSHT will be moved to the FWRT, unless comparable equipment already exists in the FWRT. A new transfer pump will be installed in the FWRT. A portable admixture metering pump and associated valves will be connected to the transfer pump discharge line. The existing SSHT, transfer pump, and associated equipment will be abandoned in place. The existing FWRT transfer pump will be removed, and its associated instrumentation and control equipment will also be removed or abandoned in place.

1.4 Saltstone Grout Pumping System:

To improve NPSH to the grout pumps, the Mixer will be modified to operate at a slight pressure, and the Saltstone Hold Tank (SHT) will be bypassed. The Mixer will be hard-piped to the suction of the grout pumps. Removing the SHT from the grout flowpath reduces the radiological dose to the operators by limiting how much radioactive material is present in the Process Room at any given moment. Reducing the system volume also minimizes the amount of flush water sent to the FWRT.

To eliminate complexity and to minimize the number of components that require hands-on maintenance, one of the existing pump trains (two grout pumps in

series) and its associated instrumentation and controls will be removed, and the remaining set of series grout pumps will be used for all grout-pumping operations.

To provide a reliable means for clearing grout from the system in the event of a grout pump failure, a High Pressure Flush Pump and High Pressure Flush Tank will be installed. One of the deactivated grout pumps will be reused as the High Pressure Flush Pump. The SHT and its associated equipment will be reused as the High Pressure Flush Tank. The associated Mixer Vent Scrubber and associated equipment will be removed or abandoned in place. The Mixer will no longer be vented to the Mixer Vent Scrubber, and therefore it will not be routed to the facility's emission point. The scrubber control efficiency was not used to estimate potential air emissions from the 210-Z process. Potential air emissions, without considering the scrubber, were calculated to be below the de-minimis criteria, which qualified the 210-Z process to be listed as an Insignificant Activity in the SRS Part 70 Air Quality Permit (TV-0080-0041). No further air permitting actions will be required.

SUMMARY OF NEW EQUIPMENT:

Equipment	Size	Material of Construction	Codes / Standards
3000 psi air bottles with rack	Twelve 9"x 51" bottles	Carbon Steel	DOT
Air manifold with 3000 psi to 325 psi reducer	½"	ASTM A106 SCH 160	P167* or Mfrs equivalent
Piping from manifold to pig air accumulator	1"– 2"	ASTM A106 SCH 40	PS103C*
Mixer Feed Air-operated ball valve	3"	316 Stainless Steel	ANSI 150#
Mixer feed inlet piping	3"	ASTM A106 SCH 160	P258*
FWRT transfer pump	Goulds model 3796, 5 hp	316 Stainless Steel	ASME
Piping from inter-area transfer line to FWRT	4"	ASTM A106 SCH 160	P258*
Piping from FWRT to mixer	3"	ASTM A106 SCH 80	P255*

* All P-Codes per ASME B31.3

ATTACHMENTS:

Attachment 1: Saltstone Facility Existing Arrangement Process Flow Diagram (M-M5-Z-0003)

Attachment 2: Saltstone Facility Proposed Arrangement Process Flow Diagram (M-M5-Z-0003)