SOFTWARE RELEASE NOTICE

1. SRN Number: GHGC-SRN-202	
2. Project Title: General use package for high-level waste (primarily USFIC and TEF KTIs), WFO, low-level waste, and decommissiong projects	Project No. General use
3. SRN Title: HYDRUS2D, version 2.01	
4. Originator/Requestor: Randy Fedors	Date: September 8, 1999

5. Summary of Actions

- ☑ Release of new software
- ☐ Release of modified software:
  - ☐ Enhancements made
  - ☐ Corrections made
- ☐ Change of access software
- ☐ Software Retirement

6. Persons Authorized Access

Name	Read Only/Read-Write	Addition/Change/Delete
Randy Fedors	RO	A
Ron Green	RO	A
Melissa Hill	RO	A
Dewayne Halbardier	RO	A
James Winterle	RO	A

7. Element Manager Approval: English Pearcy E. C. Pearcy Date: 9/16/99

8. Remarks:

SOFTWARE RELEASE NOTICE

1. SRN Number: GHGC-SRN-202

2. Project Title: General use package for high-level waste, WFO low-level waste, and decommissioning projects	Project No. General Use
3. SRN Title: HYDRUS2D V.2.01	
4. Originator/Requestor: Randy Fedors	Date: 10/18/2001

5. Summary of Actions

- ☐ Release of new software
- ☐ Change of access software
- ☐ Release of modified software:
- ■ Software Retirement
  - ☐ Enhancements made
  - ☐ Corrections made

6. Validation Status

- ☐ Validated
- ☐ Limited Validation
- ☐ Not Validated Explain: _____

7. Persons Authorized Access

Name	Read Only/Read-Write	Addition/Change/Delete

8. Element Manager Approval: English Pearcy EP Date: 10/22/01

9. Remarks:

CNWRA Form TOP-6 (09/01)

SOFTWARE SUMMARY FORM

01. Summary Date: September 8, 1999	02. Summary prepared by (Name and phone) Randy Fedors (210)522-6818	03. Summary Action: New
04. Software Date: April 1999	05. Short Title: HYDRUS2D	
06. Software Title: HYDRUS2D/MESHGEN2D, version 2.01		07. Internal Software ID: None

08. Software Type:	09. Processing Mode:	10. Application Area
☐ Automated Data System ✔ Computer Program ☐ Subroutine/Module	✔Interactive ☐ Batch ☐ Combination	a. General: ✔ Scientific/Engineering ☐ Auxiliary Analyses ☐ Total System PA ☐ Subsystem PA ☐ Other b. Specific: Non-isothermal Unsaturated Flow and Transport

11. Submitting Organization and Address:	12. Technical Contact(s) and Phone:
CNWRA/SwRI 6220 Culebra Road San Antonio, TX 78228	Randy Fedors (CNWRA) (210)522-6818

13. Software Application:
HYDRUS2D is a modeling environment controlled by a graphical user interface for simulating the movement of water, heat, and solutes in two dimensions (or axisymmetric in three dimensions). It uses finite element discretization and includes hysteresis and temperature dependence of constitutive relations, scaling of parameters, and transpiration. Transport is modeled by the Fickian-based advection-dispersion equation and allows for nonlinear nonequilibrium reactions, linear equilbrium reactions, two different first-order degradation reactions, and gas-phase diffusion.

14. Computer Platform: Windows-based personal computer	15. Computer Operating System: WindowsNT, Windows95 or later	16. Programming Language(s): N/A	17. Number of Source Program Statements: N/A
18. Computer Memory Requirements: Minimum 4 MBytes, Recommended 8 MBytes	19. Tape Drives: N/A	20. Disk Units: Minimum 10 Mbytes	21. Graphics: Windows-based Minimum VGA graphics card

22. Other Operational Requirements

None

23. Software Availability:	24. Documentation Availability:
✔ Available ☐ Limited ☐ In-House ONLY	✔ Available ☐ Preliminary ☐ In-House ONLY

25.

Software Custodian: Bruce Mabrito Date: September 8, 1999

TO: Bruce Mabrito
FROM: R. Fedors
SUBJECT: TOP-018 for HYDRUS2D
DATE: September 7, 1999

HYDRUS2D version 2.01 is a widely distributed, off-the-shelf program for two-dimensional, variably saturated water, heat, and solute transport model. It is sold through the International Ground Water Modeling Center in Golden, Colorado (http://www.mines.edu/igwmc/). The HYDRUS2D package contains a pre-processor (including a mesh generator called MESHGEN2D), a simulator called SWMS-2D, and a post-processor. The package was developed by staff of the U.S. Salinity Laboratory of the Agriculture Research Service of the U.S. Department of Agriculture. Other tools from the U.S. Salinity Laboratory packaged with HYDRUS2D are the UNSODA database (associated retention and relative permeability measurements), RETC (fitting routine for constitutive relations), CHAIN and CHAIN_2D (one- and two-dimensional simulators for water, heat, and solute transport in sequential first-order decay reactions), CXFIT (fitting program for estimating one-dimensional solute transport parameters), 3DADE and N3DADE (analytical solutions for two- and three-dimensional equilibrium and non-equilibrium solute transport), and SWMS-3D (three-dimensional water and solute transport for variably saturated media).

A copy of the HYDRUS2D documentation is included in the TOP-018 folder: Simunek, J., M. Sejna, and M.Th. van Genuchten, *HYDRUS-2D/MESHGEN-2D, Simulating Water Flow and Solute Transport in Two-Dimensional Variably Saturated Media, version 2.0,* April 1999. The documentation is also used for version 2.01 of HYDRUS2D. Installation of HYDRUS2D on WindowsNT systems is accomplished by executing the file *setup.exe* from the provided cdrom and then installing in the HYDRUS2D directory the file pcpinfor.sys from the 3½ inch floppy diskette. The cdrom and floppy diskette are included in the HYDRUS2D TOP-018 folder. The program can be started either from the desktop icon created during installation or from the START- PROGRAM Windows menu selection box. Only the compiled (executable) version of the code was provided, hence no modifications are possible.

Installation test examples were installed automatically as part of the setup and may be found by starting the project manager after starting HYDRUS2D. The examples are also described in the documentation by Simunek et al. (1999). Test 7 was chosen as the installation check for TOP-018 purposes since it includes a range of features similar to the type of problems that HYDRUS2D will be used for at the center. Test 7 is an axisymmetric 3D infiltration, heat, and solute transport simulation in a layered soil. The example was run on the WindowNT machine named bubo, which has a 400 MHz pentium with 128 MBytes of RAM. The output files from the installation test [seepage out the bottom (V_mean.out) and solute concentrations (Solute3.out)] were visually compared with the original output files distributed on the cdrom and found to match exactly. The installation test was considered successful.