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COMPUTER INPUT AND OUTPUT FILES ASSOCIATED WITH GROUND-WATER-FLOW SIMULATIONS OF THE ALBUQUERQUE BASIN, CENTRAL NEW MEXICO, 1901-95, WITH PROJECTIONS TO 2020

(SUPPLEMENT THREE TO U.S. GEOLOGICAL SURVEY WATER-RESOURCES INVESTIGATIONS REPORT 94-4251)

U.S. GEOLOGICAL SURVEY

Open-File Report 96–210

Prepared in cooperation with the

CITY OF ALBUQUERQUE PUBLIC WORKS DEPARTMENT

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1998

U.S. DEPARTMENT OF THE INTERIOR
BRUCE BABBITT, Secretary

U.S. GEOLOGICAL SURVEY
Thomas J. Casadevall, Acting Director

For additional information write to:

District Chief
U.S. Geological Survey
Water Resources Division
4501 Indian School Road NE, Suite 200
Albuquerque, NM 87110-3929

Copies of this report can be purchased from:

U.S. Geological Survey
Branch of Information Services
Box 25286
Denver, CO 80225-0286

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Abstract

This report presents the computer input files required to run the three-dimensional ground-water-flow model of the Albuquerque Basin, central New Mexico, documented in Kernodle and others (Kernodle, J.M., McAda, D.P., and Thorn, C.R., 1995, Simulation of ground-water flow in the Albuquerque Basin, central New Mexico, 1901-1994, with projections to 2020: U.S. Geological Survey Water-Resources Investigations Report 94-4251, 114 p.) and revised by Kernodle (Kernodle, J.M., 1998, Simulation of ground-water flow in the Albuquerque Basin, 1901-95, with projections to 2020 (Supplement two to U.S. Geological Survey Water-Resources Investigations Report 94-4251): U.S. Geological Survey Open-File Report 96-209, 54 p.). Output files resulting from the computer simulations are included for reference.

INTRODUCTION

This report presents the computer input files required to run the three-dimensional ground-water-flow model of the Albuquerque Basin, central New Mexico, documented in Kernodle and others (1995) and revised by Kernodle (1998). Output files resulting from the computer simulations are included for reference. This report was prepared in cooperation with the City of Albuquerque Public Works Department.

COMPUTER INPUT AND OUTPUT FILES

The accompanying 8-millimeter, 2.2-gigabyte-format, magnetic tape contains the input and output files, computer programs, and macro-language scripts necessary to run the ground-water-flow model documented in Kernodle and others (1995) and revised by Kernodle (1998). The information was written to the tape (and can be read from the tape) with the UNIX tar command. The actual command syntax will depend on the particular system. The information has been retrieved from tape and the model has been successfully run on a variety of workstations using the UNIX operating system.

When the information is restored from the tape, the directory and file structure reflect the sequence of predevelopment, historical transient, and projected future model runs documented in Kernodle and others (1995) and revised by Kernodle (1998). There is one directory each for the predevelopment simulation; the historical simulations to 1960, 1979, and spring 1995; and the various projections to 2020; and a directory for simulations without City of Albuquerque pumpage (for superposition comparisons). The nine directories should be loaded into a common area. The total space needed to load the directories is slightly less than 1 gigabyte. The directory names, their approximate individual sizes, in megabytes, and brief descriptions are:

modflow	1.8	Source codes and scripts
pre2_new	30.0	Predevelopment simulation
tran1_new	60.0	Historical simulation for 1901-60
tran2_new	93.0	Historical simulation for 1961-79
tran3_new	169.9	Historical simulation for 1980-95
new_line	88.9	Projected current growth for 1995-2020
new_mid	91.6	Projected medium growth for 1995-2020
new_cons	103.7	Projected medium growth with conservation for 1995-2020
new_nocity	324.2	Historical and projected simulations without Albuquerque pumpage
	963.2	Total on tape

Table 1 is a detailed listing of the files contained in each directory.

The scripts to run the simulations contain the character string "run" and are in each of the directories. Each directory contains an output file that may be used for reference. A final directory contains the model source code (McDonald and Harbaugh, 1988) and ancillary support programs and macro-language scripts. Two Arc Macro Language scripts, "modelgrid.aml" and "modarray.aml," are included for the convenience of the user (the proprietary software ARC/INFO is required to run these macros). All computer programs are written in ANSI 77 Fortran. The scripts are either standard AT&T Unix System 5 or Arc Macro Language.

Source codes probably will have to be recompiled on the host computer system. A minimum x-array dimension (McDonald and Harbaugh, 1988, p. 3-22 and 3-23) of about 10 million is required to run the simulations. The size of the x-array dimension dictates the need for a minimum of about 64 megabytes of random access memory. A free space of about 2 gigabytes of output media provides a reasonable margin for storing input and writing output files.

REFERENCES CITED

Kernodle, J.M., 1998, Simulation of ground-water flow in the Albuquerque Basin, 1901-95, with projections to 2020 (Supplement two to U.S. Geological Survey Water-Resources Investigations Report 94-4251): U.S. Geological Survey Open-File Report 96-209, 54 p.

Kernodle, J.M., McAda, D.P., and Thorn, C.R., 1995, Simulation of ground-water flow in the Albuquerque Basin, central New Mexico, 1901-1994, with projections to 2020: U.S. Geological Survey Water-Resources Investigations Report 94-4251, 114 p.

McDonald, M.G., and Harbaugh, A.W., 1988, A modular three-dimensional finite-difference ground-water flow model: Techniques of Water-Resources Investigations of the U.S. Geological Survey, book 6, chap. A1, variously paged.

Table 1.--Description of files included on tape

Directory	File name	File size, in bytes	Description
modflow	sourcepcg10	439,996	Model executable code
modflow	amls_tar	540,672	Tar file of AML's
modflow/help/arc	modelgrid	1,716	Modelgrid help file
modflow/help/arc	smartpoly	698	Smartpoly help file
modflow/help/arc	modarray	1,168	Modarray help file
modflow	grid_specs	163	Grid-specification file
modflow/atool/arc	modelgrid.aml	7,556	Modelgrid AML
modflow/atool/arc/modelgrid	gridder.f	11,493	Grid-generator source code
modflow/atool/arc/modelgrid	modelgrid.aml	7,556	Modelgrid AML
modflow/atool/arc/modelgrid	modelgrid	1,716	Modelgrid help file
modflow/atool/arc/modelgrid	gridder	95,704	Grid-generator executable code
modflow/atool/arc/modelgrid	gridder_200	95,704	Grid-generator executable code
modflow/atool/arc	smartpoly.aml	6,846	Smartpoly AML
modflow/atool/arc/smartpoly	smartpoly.aml	6,846	Smartpoly AML
modflow/atool/arc/smartpoly	smartpoly	698	Smartpoly help file
modflow/atool/arc	modarray.aml	9,806	Modarray AML
modflow/atool/arc/modarray	wavrg	160,808	Weighted average executable code
modflow atool/arc/modarray	o.wavrg.f	29,996	Weighted average source code
modflow/atool/arc/modarray	wavrg.f	31,961	Weighted average source code
modflow/atool/arc/modarray	modarray	1,168	Modarray help file
modflow/atool/arc/modarray	modarray.aml	9,806	Modarray AML
modflow/atool/arc/modarray	modarray.bak	9,469	Modarray AML backup
modflow	readme.text	8,267	Read file
modflow	sourcepcg10.f	275,901	Modflow source code
pre2_new	steady_state.run	385	Script to run predevelopment model
pre2_new	outctrl.22	153	Output control file
pre2_new	run_log	15,375	Log of model execution
pre2_new	output	8,333,292	Output file
pre2_new	outint	10,509	Disregard
pre2_new	svheads.52	1,911,668	Binary computed heads
pre2_new	basin.1	5,016,729	Basic input file
pre2_new	evtin.15	880,039	Evapotranspiration input file
pre2_new	pcgin.23	72	Preconditioned-conjugent gradient input file
pre2_new	rchin.18	440,015	Recharge input file
pre2_new	rivin.14	39,377	River input file
pre2_new	sipin.19	52	Strongly implicit input file (not used)
pre2_new	welin.12	74,857	Well input file
pre2_new	bcfin.11	13,203,032	Block-centered flow input file
tran1_new	bas	152	Basic input header
tran1_new	bcf	3,542	Block-centered flow header

Table 1.--Description of files included on tape--Continued

Directory	File name	File size, in bytes	Description
tran1_new	outctrl.22	14,334	Output-control file
tran1_new	pcgin.23	72	Preconditioned-conjugent gradient input file
tran1_new	perlen	372	Stress-period lengths
tran1_new	drnin.13	94,071	Drain input file
tran1_new	basin.1	970,581	Basic input file
tran1_new	baslist	48	Basic input script
tran1_new	rchin.18	5,279,850	Recharge input file
tran1_new	welin.12	973,538	Well input file
tran1_new	rivin.14	415,669	River input file
tran1_new	bcfin.11	14,523,383	Block-centered flow input file
tran1_new	transient1_run	398	Run script
tran1_new	bcflist	1,197	Block-centered flow script
tran1_new	evtin.15	880,907	Evapotranspiration input file
tran1_new	run_log	226,408	Model-run log
tran1_new	rdhead53	561	Binary computed heads
tran1_new	IBND	969,485	Ibound array
tran1_new	hnoflow	11	Head-no-flow value
tran1_new	output	33,670,098	Output file
tran1_new	svheads.52	1,911,668	Binary computed heads
tran2_new	basin.1	971,170	Basic input file
tran2_new	transient2_run	425	Run script
tran2_new	output	62,303,420	Output file
tran2_new	welin.12	17,943,431	Well input file
tran2_new	svheads.52	1,911,668	Binary computed heads
tran2_new	rchin.18	8,359,745	Recharge input file
tran2_new	rivin.14	405,236	River input file
tran2_new	drnin.13	116,764	Drain input file
tran2_new	evtin.15	880,907	Evapotranspiration input file
tran2_new	outctrl.22	19,816	Output-control file
tran2_new	pcgin.23	72	Preconditioned-conjugent gradient input file
tran3_new	drnin.13	254,173	Drain input file
tran3_new	evtin.15	7,481,081	Evapotranspiration input file
tran3_new	file_list	1315	List of files
tran3_new	outctrl.22	29,220	Output-control file
tran3_new	basin.1	971,139	Basic input file
tran3_new	svheads.52	1,911,668	Binary computed heads
tran3_new	rchin.18	1,319,980	Recharge input file
tran3_new	rivin.14	4,007,976	River input file
tran3_new	bcfin.11	14,523,383	Block-centered flow input file
tran3_new	output	103,381,174	Output file

Table 1.--Description of files included on tape--Concluded

Directory	File name	File size, in bytes	Description
tran3_new	transient3_run	399	Run script
tran3_new	pcgin.23	72	Preconditioned-conjugent gradient input file
tran3_new	welin.12	24,017,985	Well input file
new_cons	bcfin.11	14,963,417	Block-centered flow input file
new_cons	output	66,962,784	Output file
new_cons	pcgin.23	72	Preconditioned-conjugent gradient input file
new_cons	svheads.52	1,911,668	Binary computed heads
new_cons	conservation_run	478	Run script
new_cons	welin.12	19,804,877	Well input file
new_line	welin.12	19,804,877	Well input file
new_line	output	67,139,746	Output file
new_line	svheads.52	1,911,668	Binary computed heads
new_line	continued_run	507	Run script
new_mid	basin.1	971,074	Basic input file
new_mid	drnin.13	137,694	Drain input file
new_mid	evtin.15	880,969	Evapotranspiration input file
new_mid	outctrl.22	26,815	Output-control file
new_mid	output	67,105,219	Output file
new_mid	medium_run	447	Run script
new_mid	rchin.18	440,345	Recharge input file
new_mid	rivin.14	269,825	River input file
new_mid	svheads.52	1,911,668	Binary computed heads
new_mid	welin.12	19,810,709	Well input file
new_nocity	baslist	83	Basic input script
new_nocity	output2020	65,332,282	Output file
new_nocity	welin61-79.12	17,510,081	Well input file
new_nocity	output61-79	61,642,571	Output file
new_nocity	output80-94	101,989,935	Output file
new_nocity	output01-60	33,609,882	Output file
new_nocity	nocity_2020_run	502	Run script
new_nocity	nocity_61-79_run	513	Run script
new_nocity	novity_80-94_run	518	Run script
new_nocity	welin2020.12	18,927,971	Well input file
new_nocity	welin80-94.12	23,186,925	Well input file
new_nocity	nocity_01-60_run	521	Run script
new_nocity	welin01-60.12	1,792,197	Well input file