Appendix Tables

Appendix 1—Basin and sink counties included in the Chesapeake Bay regional model

Model	FIPS	State	County	Edge County
Basin counties:				
C001	10001	DE	KENT	y
C002	10003	DE	NEW CASTLE	y
C003	10005	DE	SUSSEX	y
C004	24001	MD	ALLEGANY	
C005	24003	MD	ANNE ARUNDEL	
C006	24005	MD	BALTIMORE	
C007	24009	MD	CALVERT	
C008	24011	MD	CAROLINE	
C009	24013	MD	CARROLL	
C010	24015	MD	CECIL	y
C011	24017	MD	CHARLES	
C012	24019	MD	DORCHESTER	
C013	24021	MD	FREDERICK	
C014	24023	MD	GARRETT	y
C015	24025	MD	HARFORD	
C016	24027	MD	HOWARD	
C017	24029	MD	KENT	
C018	24031	MD	MONTGOMERY	
C019	24033	MD	PRINCE GEORGE'S	
C020	24035	MD	QUEEN ANNE'S	
C021	24037	MD	ST. MARY'S	
C022	24039	MD	SOMERSET	
C023	24041	MD	TALBOT	
C024	24043	MD	WASHINGTON	
C025	24045	MD	WICOMICO	
C026	24047	MD	WORCESTER	y
C027	36003	NY	ALLEGANY	y
C028	36007	NY	BROOME	y
C029	36015	NY	CHEMUNG	y
C030	36017	NY	CHENANGO	
C031	36023	NY	CORTLAND	y
C032	36025	NY	DELAWARE	y
C033	36043	NY	HERKIMER	y
C034	36053	NY	MADISON	y
C035	36067	NY	ONONDAGA	y
C036	36077	NY	OTSEGO	y
C037	36095	NY	SCHOHARIE	y
C038	36097	NY	SCHUYLER	y
C039	36101	NY	STEUBEN	y
C040	36107	NY	TIOGA	
C041	36109	NY	TOMPKINS	y
C042	42001	PA	ADAMS	
C043	42009	PA	BEDFORD	
C044	42011	PA	BERKS	y
C045	42013	PA	BLAIR	
C046	42015	PA	BRADFORD	
C047	42021	PA	CAMBRIA	y
C048	42023	PA	CAMERON	
C049	42027	PA	CENTRE	
C050	42029	PA	CHESTER	y

Model	FIPS	State	County	Edge County
C051	42033	PA	CLEARFIELD	y
C052	42035	PA	CLINTON	
C053	42037	PA	COLUMBIA	
C054	42041	PA	CUMBERLAND	
C055	42043	PA	DAUPHIN	
C056	42047	PA	ELK	y
C057	42055	PA	FRANKLIN	
C058	42057	PA	FULTON	
C059	42061	PA	HUNTINGDON	
C060	42063	PA	INDIANA	y
C061	42067	PA	JUNIATA	
C062	42069	PA	LACKAWANNA	y
C063	42071	PA	LANCASTER	
C064	42075	PA	LEBANON	y
C065	42079	PA	LUZERNE	y
C066	42081	PA	LYCOMING	
C067	42087	PA	MIFFLIN	
C068	42093	PA	MONTOUR	
C069	42097	PA	NORTHUMBERLAND	
C070	42099	PA	PERRY	
C071	42105	PA	POTTER	y
C072	42107	PA	SCHUYLKILL	y
C073	42109	PA	SNYDER	
C074	42111	PA	SOMERSET	y
C075	42113	PA	SULLIVAN	
C076	42115	PA	SUSQUEHANNA	
C077	42117	PA	TIOGA	
C078	42119	PA	UNION	
C079	42127	PA	WAYNE	y
C080	42131	PA	WYOMING	
C081	42133	PA	YORK	
C082	51001	VA	ACCOMACK	y
C083	51003	VA	ALBEMARLE	
C084	51005	VA	ALLEGHANY	
C085	51007	VA	AMELIA	
C086	51009	VA	AMHERST	
C087	51011	VA	APPOMATTOX	y
C088	51015	VA	AUGUSTA	
C089	51017	VA	BATH	
C090	51019	VA	BEDFORD	y
C091	51023	VA	BOTETOURT	y
C092	51029	VA	BUCKINGHAM	
C093	51031	VA	CAMPBELL	y
C094	51033	VA	CAROLINE	
C095	51036	VA	CHARLES CITY	
C096	51041	VA	CHESTERFIELD	
C097	51043	VA	CLARKE	
C098	51045	VA	CRAIG	y
C099	51047	VA	CULPEPER	
C100	51049	VA	CUMBERLAND	
C101	51053	VA	DINWIDDIE	y
C102	51057	VA	ESSEX	
C103	51059	VA	FAIRFAX	
C104	51061	VA	FAUQUIER	
C105	51065	VA	FLUVANNA	

Appendix 1—Basin and sink counties included in the Chesapeake Bay regional model—Continued

Model	FIPS	State	County	Edge County
C106	51069	VA	FREDERICK	
C107	51071	VA	GILES	y
C108	51073	VA	GLOUCESTER	
C109	51075	VA	GOOCHLAND	
C110	51079	VA	GREENE	
C111	51085	VA	HANOVER	
C112	51087	VA	HENRICO	
C113	51091	VA	HIGHLAND	
C114	51093	VA	ISLE OF WIGHT	y
C115	51095	VA	JAMES CITY	
C116	51097	VA	KING AND QUEEN	
C117	51099	VA	KING GEORGE	
C118	51101	VA	KING WILLIAM	
C119	51103	VA	LANCASTER	
C120	51107	VA	LOUDOUN	
C121	51109	VA	LOUISA	
C122	51113	VA	MADISON	
C123	51115	VA	MATHEWS	
C124	51119	VA	MIDDLESEX	
C125	51121	VA	MONTGOMERY	y
C126	51125	VA	NELSON	
C127	51127	VA	NEW KENT	
C128	51131	VA	NORTHAMPTON	y
C129	51133	VA	NORTHUMBERLAND	
C130	51135	VA	NOTTOWAY	y
C131	51137	VA	ORANGE	
C132	51139	VA	PAGE	
C133	51145	VA	POWHATAN	
C134	51147	VA	PRINCE EDWARD	y
C135	51149	VA	PRINCE GEORGE	y
C136	51153	VA	PRINCE WILLIAM	
C137	51157	VA	RAPPAHANNOCK	
C138	51159	VA	RICHMOND	
C139	51161	VA	ROANOKE	y
C140	51163	VA	ROCKBRIDGE	
C141	51165	VA	ROCKINGHAM	
C142	51171	VA	SHENANDOAH	
C143	51177	VA	SPOTSYLVANIA	
C144	51179	VA	STAFFORD	
C145	51181	VA	SURRY	y
C146	51187	VA	WARREN	
C147	51193	VA	WESTMORELAND	
C148	51199	VA	YORK	
C149	51550	VA	CHESAPEAKE	y
C150	51800	VA	SUFFOLK	y
C151	51810	VA	VIRGINIA BEACH	y
C152	54003	WV	BERKELEY	
C153	54023	WV	GRANT	
C154	54027	WV	HAMPSHIRE	
C155	54031	WV	HARDY	
C156	54037	WV	JEFFERSON	
C157	54057	WV	MINERAL	
C158	54063	WV	MONROE	
C159	54065	WV	MORGAN	
C160	54071	WV	PENDLETON	

Appendix 1—Basin and sink counties included in the Chesapeake Bay regional model—Continued

Model	FIPS	State	County	Edge County
Sink counties:				
C167	34011	NJ	CUMBERLAND	
C168	34015	NJ	GLOUCESTER	
C169	34033	NJ	SALEM	
C170	36001	NY	ALBANY	
C173	36011	NY	CAYUGA	
C177	36035	NY	FULTON	
C178	36039	NY	GREENE	
C180	36051	NY	LIVINGSTON	
C182	36055	NY	MONROE	
C183	36057	NY	MONTGOMERY	
C184	36065	NY	ONEIDA	
C186	36069	NY	ONTARIO	
C188	36093	NY	SCHENECTADY	
C191	36099	NY	SENECA	
C193	36105	NY	SULLIVAN	
C195	36121	NY	WYOMING	
C196	36123	NY	YATES	
C197	42005	PA	ARMSTRONG	
C200	42025	PA	CARBON	
C202	42031	PA	CLARION	
C204	42045	PA	DELAWARE	
C206	42051	PA	FAYETTE	
C207	42053	PA	FOREST	
C209	42065	PA	JEFFERSON	
C212	42077	PA	LEHIGH	
C214	42083	PA	MCKEAN	
C215	42089	PA	MONROE	
C216	42091	PA	MONTGOMERY	
C217	42095	PA	NORTHAMPTON	
C218	42103	PA	PIKE	
C223	42129	PA	WESTMORELAND	
C227	51021	VA	BLAND	
C229	51025	VA	BRUNSWICK	
C231	51037	VA	CHARLOTTE	
C234	51063	VA	FLOYD	
C235	51067	VA	FRANKLIN	
C237	51081	VA	GREENSVILLE	
C238	51083	VA	HALIFAX	
C240	51111	VA	LUNENBURG	
C241	51117	VA	MECKLENBURG	
C245	51143	VA	PITTSYLVANIA	
C248	51155	VA	PULASKI	
C250	51175	VA	SOUTHAMPTON	
C252	51183	VA	SUSSEX	
C256	54001	WV	BARBOUR	
C257	54025	WV	GREENBRIER	
C258	54055	WV	MERCER	
C260	54075	WV	POCAHONTAS	
C261	54077	WV	PRESTON	
C262	54083	WV	RANDOLPH	
C263	54089	WV	SUMMERS	
C264	54091	WV	TAYLOR	
C265	54093	WV	TUCKER	
C266	54097	WV	UPSHUR	
C267	54101	WV	WEBSTER	

Note: y denotes counties with a portion of cropland area outside the basin.

Appendix 2—Model variables

TOTCOST	TOTAL COST - MANURE USE AND DISPOSAL	($MIL)
D_IN(CT,CT2)	AVE DIST FOR M IN-CNTY HAUL - WITHOUT INTERCEPT	(KMS)
D_EX(CT,CT2)	AVE DIST FOR M EXPT-CT HAUL - WITHOUT INTERCEPT	(KMS)
DIST_IN(CT,CT2)	AVE DIST FOR M IN-CNTY HAUL - WITH INTERCEPT	(KMS)
DIST_EX(CT,GR,CT2)	AVE DIST FOR M EXPT-CT HAUL - WITH GRID INTERCEPT	(KMS)
DST_IN(CT,CT2,SYS,DST)	AVE DIST HAULED - FROM AC CALC - IN-COUNTY	(KMS)
DST_EX(CT,GR,CT2,SYS,DST)	AVE DIST HAULED - FROM AC CALC - EXPORTS	(KMS)
HCST_ON(CT,CT2,SYS)	HAULING & APPL COST - ONFARM - NON-EXCESS	($MIL)
HCST_IN(CT,CT2,SYS,DST)	HAULING & APPL COST - IN-COUNTY	($MIL)
HCST_EX(CT,GR,CT2,SYS,DST)	HAULING & APPL COST - EXPORTS	($MIL)
HC_ON(CT,CT2)	HAULING & APPL COST - ONFARM - NON-EXCESS	($MIL)
HC_IN(CT,CT2)	HAULING & APPL COST - IN-COUNTY	($MIL)
HC_EX(CT,GR,CT2)	HAULING & APPL COST - EXPORTS	($MIL)
HC1(CT)	HAULING & APPL COST BY SOURCE CNTY - IN-COUNTY	($MIL)
HC2(CT)	HAULING & APPL COST BY SOURCE CNTY - EXPORTS	($MIL)
HCOST(CT)	TOTAL MANURE HAULING & APPL COST BY SOURCE COUNTY	($MIL)
HCST	TOTAL MANURE HAULING & APPL COST ACROSS SOURCE CNTS	($MIL)
HLC1(CT2)	HAULING & APPL COST BY DESTINATION CNTY - IN-COUNTY	($MIL)
HLC2(CT2)	HAULING & APPL COST BY DESTINATION CNTY - EXPORTS	($MIL)
HLCOST(CT2)	TOTAL MANURE HAULING & APPL COST BY DEST COUNTY	($MIL)
HLCST	TOTAL MANURE HAULING & APPL COST ACROSS DEST CNTS	($MIL)
COST_SHR(CT)	COST-SHARE PAYMENTS - MANURE HAULING	($MIL)
CST_SHR	COST-SHARE PAYMENTS - MANURE HAULING	($MIL)
HAULCST	TOTAL MANURE HAULING & APPL COST	($MIL)
M_PURCH(CT2)	MANURE PURCHASE COST - BY DESTINATION COUNTY	($MIL)
M_REVN(CT)	MANURE REVENUES - BY SOURCE COUNTY	($MIL)
M_PRCH	MANURE PURCHASE COST	($MIL)
M_REV	MANURE REVENUES	($MIL)
STORCOST(CT)	MANURE STORAGE COST BY COUNTY	($MIL)
STORCST	MANURE STORAGE COST	($MIL)
INCORP(CT2)	MANURE INCORPORATION COST	($MIL)
INCRP	MANURE INCORPORATION COST	($MIL)
NMP_SRCE(CT	NUTRIENT MNGMT PLAN CHARGE - SOURCE COUNTIES	($MIL)
NMP_SRC	NUTRIENT MNGMT PLAN CHARGE - SOURCE COUNTIES	($MIL)
NMP_DEST(CT2)	NUTRIENT MNGMT PLAN CHARGE - DESTINATION COUNTIES	($MIL)
NMP_DST	NUTRIENT MNGMT PLAN CHARGE - DESTINATION COUNTIES	($MIL)
CHMSAV_N(CT2)	SAVINGS IN CHEMICAL APPLICATIONS - N STANDARD	($MIL)
CHMSAV_P(CT2)	SAVINGS IN CHEMICAL APPLICATIONS - P STANDARD	($MIL)
CHMSAV	SAVINGS IN CHEMICAL NUTRIENT APPLICATIONS	($MIL)
AU_RED(CT)	REDUCTION IN ANIMAL-UNITS	(AU)
AU_VAL(CT)	VALUE OF A REDUCTION IN ANIMAL-UNITS	($MIL)
AU_VL	VALUE OF A REDUCTION IN ANIMAL-UNITS	($MIL)
AC_SPR1(CT,CT2)	SPREAD ACS FOR EXCESS M - INTRA-COUNTY	(1000 ACS)
AC_SPR2(CT,CT2)	SPREAD ACS FOR EXCESS M - INTER-COUNTY EXPORTS	(1000 ACS)
AC_SPR(CT2)	TOTAL SPREAD ACS FOR EXCESS M - BY DEST COUNTY	(1000 ACS)
AC_ON_SY(CT,CT2,SYS)	ONFARM SPREAD ACS - BY SYSTEM	(1000 ACS)

M_PROD(CT)	TOTAL MANURE PRODUCTION - REG AND NON-REG	(1000 TONS)
M_ONFRM_R(CT,CT2)	MANURE PRODUCED & USED ONFARM ON REGULATED AFOS	(1000 TONS)
M_TRAN(CT,CT2)	EXCESS MANURE TRANSFERS BY COUNTY	(1000 TONS)
M_TRAN1(CT)	EXCESS MANURE TRANSFERRED - BY SOURCE COUNTY	(1000 TONS)
M_TRAN2(CT2)	EXCESS MANURE TRANSFERRED - BY DESTINATION COUNTY	(1000 TONS)
M_TRANCT(CT2)	EXCESS MANURE TRANSFERRED WITHIN COUNTY	(1000 TONS)
M_EXPRT(CT)	EXCESS MANURE EXPORTED - BY SOURCE COUNTY	(1000 TONS)
M_IMPRT(CT2)	EXCESS MANURE IMPORTED - BY DESTINATION COUNTY	(1000 TONS)
M_SINK(CT2)	EXCESS MANURE EXPORTED TO SINK	(1000 TONS)
M_STOR(CT)	EXCESS MANURE STORAGE - NOT LAND APPLIED	(1000 TONS)
M_USE(CT2)	MANURE USE ON ALL FARMLAND - ONFARM AND EXCESS	(1000 TONS)
M_TRAN_G(CT,GR,CT2)	EXCESS M TRANSFERS BY COUNTY AND GRID	(1000 TONS)
M_TRN_G(CT,GR)	EXCESS M TRANSFERS BY COUNTY AND GRID	(1000 TONS)
M_PRD_SY(CT,SYS)	MANURE PRODUCTION BY WASTE SYSTEM	(1000 TONS)
M_REG_SY(CT,SYS)	REGULATED M BY WASTE SYSTEM	(1000 TONS)
M_SY(CT,SYS)	REGULATED EXCESS M HAULED & USED BY SYSTEM	(1000 TONS)
M_ONF_SY(CT,CT2,SYS)	NON-EXCESS M USED ON REGULATED FARMS - BY TECHNOLOGY	(1000 TONS)
M_SYS_IN(CT,CT2,SYS)	EXCESS M TRANSFER - INCOUNTY - BY SYSTEM	(1000 TONS)
M_SYS_G(CT,GR,CT2,SYS)	EXCESS M TRANSFER - EXPORTS - BY SYSTEM	(1000 TONS)
M_SYS_EX(CT,CT2,SYS)	EXCESS M TRANSFER - EXPORTS - BY SYSTEM	(1000 TONS)
M_SYS2(CT,CT2,SYS,DST)	M TRANSFER - BY WASTE TECH AND DST SEG	(1000 TONS)
M_SYS2_G(CT,GR,CT2,SYS,DST)	M TRANSFER - BY TECHNOLOGY AND DST SEG	(1000 TONS)
M_STR_SY(CT,SYS)	MANURE STORAGE - BY WASTE-SYSTEM TECHNOLOGY	(1000 TONS)
N_PROD(CT)	TOTAL MANURE-N PRODUCTION	(MIL LBS)
N_TRAN(CT,CT2)	EXCESS MANURE-N TRANSFERS BY COUNTY	(MIL LBS)
N_TRAN1(CT)	EXCESS MANURE-N USED - BY SOURCE COUNTY	(MIL LBS)
N_TRAN2(CT2)	EXCESS MANURE-N USED - BY DESTINATION COUNTY	(MIL LBS)
N_M_ONF(CT2)	MANURE-N USED ON ANIMAL OPERATIONS	(MIL LBS)
P_PROD(CT)	TOTAL MANURE-P PRODUCTION	(MIL LBS)
P_TRAN(CT,CT2)	EXCESS MANURE-P TRANSFERS BY COUNTY	(MIL LBS)
P_TRAN1(CT)	EXCESS MANURE-P USED - BY SOURCE COUNTY	(MIL LBS)
P_TRAN2(CT2)	EXCESS MANURE-P USED - BY DESTINATION COUNTY	(MIL LBS)
P_M_ONF(CT2)	MANURE-P USED ON ANIMAL OPERATIONS	(MIL LBS)

Appendix 3—Variables used in equation listing (text), with names of corresponding GAMS model variables (Appendix 2) and model report variables (Appendix 4)[1]

Item	Description	GAMS model linkage—data parameter or model variable (See Appendix 2)	GAMS model linkage— aggregate output variable (See Appendix 4)
Subscripts:			
ct	Counties in the watershed that produce manure	CT	CT
ct2	Counties that receive manure	CT2	CT2
sy	Manure system (lagoon, slurry, and dry)	SYS	SYS
ds	Hauling distance interval (onfarm and 0.5-2 miles, 2-10 miles, >10 miles for off-farm)	DST	DST
gr	County grid location	GR	GR
N*	Nitrogen standard in effect	--	--
P*	Phosphorus standard in effect	--	--
np	Nutrient under consideration	--	--
Variables:			
OBJ	Objective function value	TOTCOST	--
HAC	Manure hauling and application costs	HCOST	HAULCSTB
INC	Manure incorporation costs	INCORP	INCRPB
NM1	Source-county nutrient management plan costs	NMP_SRCE	NMP_SRCB
NM2	Destination county nutrient management plan costs	MVP_DEST	NMP_DSTB
ELA	Penalty cost applied to manure levels exceeding land application capacity	STORCOST	STORCSTB
FS	Savings from reduced purchase and application costs for chemical fertilizers	CHMSAV_N CHMSAV_P	CHMSVB_N CHMSVB_P
M_TRAN	Dry manure tons transferred from sources to destinations	M_TRAN M_TRAN_G	M_TRAN1B M_TRAN2B
M_AP	Manure application rate	M_APPL	AVEAPPL
SH_N	Share of acreage under an N standard	N_SHR_C N_SHR_P	--
AC_SPR	Acres receiving manure in the destination county	AC_SPR	AC_SPRB
Amax	Total acreage potentially available in the destination county	ACSPR_MX	--
WTAM	Land operator willingness to accept manure	ACCEPT_C ACCEPT_P	--
M_TRN	Manure transfers by source-county grid location, system type and distance interval	M_SYS2 M_SYS2_G	M_TRAN1B M_TRAN2B
M_PROD	Total manure production in each source county	M_PROD	M_PRODB
SH_M	Share of manure produced in each source-county grid location by system type	M_SYS2_G	--
M_SRP	Surplus manure to be moved off the farm	M_EXC	M_EXCB
M_ONFRM	Manure used on the farm of production	M_ONFRM	M_ONFRMB
M_USE	On-farm manure use plus manure obtained from all off-farm sources in the destination county	M_USE	M_USEB
M_ELA	Manure produced that exceeds land application capacity	M_STOR	M_STORB
M_IND	Manure used in industrial uses	M_OTHUSE	M_INDSTB

Appendix 3—Variables used in equation listing (text), with names of corresponding GAMS model variables (Appendix 2) and model report variables (Appendix 4)[1]—Continued

Item	Description	GAMS model linkage—data parameter or model variable (See Appendix 2)	GAMS model linkage— aggregate output variable (See Appendix 4)
Variables:—continued			
M_ELA	Manure produced that exceeds land application capacity	M_STOR	M_STORB
M_IND	Manure used in industrial uses	M_OTHUSE	M_INDSTB
DS	Average hauling distance	DIST_IN DIST_EX	AVDS_INM AVDS_EXM
α	Intercept of the estimated area to distance relationship	GRD_DIST	--
δ^1	Adjustment to selected county-to-county transfers to reflect significant natural barriers (e.g., large bodies of water)	BARRIER	--
β	Slope of the estimated area to distance relationship	D_COEF1 D_COEF2	--
AC_ONF	Acreage on manure source farms used to apply on-farm produced manure	AC_ONFRM	AC_ONFMB
δ^2	Circuity parameter used to convert linear distance to road miles	CRC_FCT	--
DST	Hauling distance by manure system and distance interval	DST_IN DST_EX	--
D_MN	Minimum distance for distance interval *ds*, based on system type and technology	MNHAUL_S MNHAUL_M MNHAUL_L	--
D_MX	Maximum distance for distance interval *ds*, based on system type and technology	MXHAUL_S MXHAUL_M	--
NP_EXC	Total excess manure nutrients in the county	N_EXC P_EXC	N_EXCB P_EXCB
NP_M	County-average nutrient content per dry ton of manure	N_TON_M P_TON_M	--
NP_ONF	Onfarm manure nutrients	N_M_ONF P_M_ONF	N_M_ONFB P_M_ONFB
NP_TRN	Manure nutrients transfers off the farm	N_TRAN P_TRAN	--
C1	Manure loading, unloading, and application costs per ton hauled	CST_TN	HC_WTN
C2	Manure hauling cost per ton-mile	CST_ML	--
MS	Manure moisture content	MOIST	--
BED	Manure bedding content	BED_SYS	--
C3	Per-acre charge for manure incorporation	AP_CST	--
SH_I	Share of manured cropland using incorporation	INCRP_SHR	--
SH_C	Cropland acres share	CRPL_SHR	--
FS_N	Savings in commercial fertilizer purchases and application under an N standard	CHMSAV_N	CHMSVB_N
PR	Commercial fertilizer price	N_PRICE P_PRICE	--

Appendix 3—Variables used in equation listing (text), with names of corresponding GAMS model variables (Appendix 2) and model report variables (Appendix 4)[1]—Continued

Item	Description	GAMS model linkage—data parameter or model variable (See Appendix 2)	GAMS model linkage— aggregate output variable (See Appendix 4)
Variables:—continued			
N_ONF	Manure-N applied on source farms	N_M_ONF	N_M_ONFB
N_TRN	Manure-N transferred off source farms for land application	N_TRAN	N_TRAN1B
P_ONF	Manure-P applied on source farms	P_M_ONF	P_M_ONFB
P_TRN	Manure-P transferred off source farms for land application	P_TRAN	P_TRAN1B
P_PCT	Portion of P beneficially used by the crop	PN_RATIO2	--
C_AP	Per-acre cost of applying commercial fertilizer under an N standard	CHMAP_SV	--
FS_P	Savings in commercial fertilizer purchases under a P standard	CHMSAV_P	CHMSVB_P

[1] GAMS is the General Algebraic Modeling System.

Appendix 4—Model report variables

Costs:

* TOTCOST	TOTAL COST - MANURE USE AND DISPOSAL	($ MIL)
TOTCOSTB	TOTAL COST - MANURE USE AND DISPOSAL - CH.BASIN	($ MIL)
TOTCST2	TOTAL COST - WITH STORCST NETTED OUT	($ MIL)
TOTCST2B	TOTAL COST - WITH STORCST NETTED OUT - CH.BASIN	($ MIL)
* CST_SHR	COST-SHARE PAYMENTS - MANURE HAULING	($ MIL)
* HAULCST	TOTAL MANURE HAULING COST	($ MIL)
HAULCSTB	TOTAL MANURE HAULING & APPL COST - CH.BASIN	($ MIL)
HCOST_ON	TOTAL MNR HAULING & APPL COST - ON-FARM	($ MIL)
HCST_ONB	TOTAL MNR HAULING & APPL COST - ON-FARM - CH.BASIN	($ MIL)
HCOST_IN	TOTAL MNR HAULING & APPL COST - OFF-FARM IN-CNTY	($ MIL)
HCST_INB	TOTAL MNR HAULING & APPL COST - OFF-FARM IN-CNTY - CHB	($ MIL)
HCOST_EX	TOTAL MNR HAULING & APPL COST - OFF-FARM OUT-OF-CNTY	($ MIL)
HCSTEXB1	TOTAL MNR HAULING & APPL COST - OFF-FARM OUT-OF-CNTY - SOURCE	($ MIL)
HCSTEXB2	TOTAL MNR HAULING & APPL COST - OFF-FARM OUT-OF-CNTY - DEST	($ MIL)
* STORCST	MANURE STORAGE COST	($ MIL)
STORCSTB	MANURE STORAGE COST - CH.BASIN	($ MIL)
* INCRP	MANURE INCORPORATION COST	($ MIL)
INCRPB	MANURE INCORPORATION COST - CH.BASIN	($ MIL)
* NMP_SRC	NUTRIENT MNGMT PLAN CHARGE - SOURCE COUNTIES	($ MIL)
NMP_SRCB	NUTRIENT MNGMT PLAN CHARGE - SOURCE COUNTIES	($ MIL)
* NMP_DST	NUTRIENT MNGMT PLAN CHARGE - DESTINATION COUNTIES	($ MIL)
NMP_DSTB	NUTR MNGMT PLAN CHARGE - DEST COUNTIES - CH.BASIN	($ MIL)
* CHMSAV	SAVINGS IN CHEMICAL NUTRIENT APPLICATIONS	($ MIL)
CHMSV_N	SAVINGS IN CHEMICAL APPLICATIONS - N-STANDARD	($ MIL)
CHMSV_P	SAVINGS IN CHEMICAL APPLICATIONS - P-STANDARD	($ MIL)
CHMSVB_N	SAVINGS IN CHEMICAL APPL - N-STANDARD - CH.BASIN	($ MIL)
CHMSVB_P	SAVINGS IN CHEMICAL APPL - P-STANDARD - CH.BASIN	($ MIL)
MNR_TSTB	TOTAL ANNUAL COST - MANURE TESTING	($ MIL)
REC_RPTB	TOTAL ANN COST - RECORD KEEPING AND REPORTING	($ MIL)
VIS_INSB	TOTAL ANNUAL COST - VISUAL INSPECTION	($ MIL)
CRT_APPB	TOTAL COST - TRAINING & CERTIFICATION FOR M APPL	($ MIL)
NMP_DEVB	TOTAL COST - DEVELOPMENT OF NMP	($ MIL)
SL_TSTB	TOTAL COST - ONFARM SOIL TESTING	($ MIL)
CAL_SPRB	TOTAL COST - CALIBRATION OF MANURE SPREADER	($ MIL)

Acres:

AC_SPR1_	TOTAL SPREAD ACS - EXCESS M - WITHIN COUNTY	(1000 ACS)
AC_SPR1B	TOTAL SPREAD ACS - EXCESS M - WITHIN COUNTY - CH.BASIN	(1000 ACS)
AC_SPR2_	TOTAL SPREAD ACS - EXCESS M - OUT-OF-COUNTY	(1000 ACS)
AC_SPR2B	TOTAL SPREAD ACS - EXCESS M - OUT-OF-COUNTY - CH.BASIN	(1000 ACS)
AC_SPR_	TOTAL SPREAD ACS - EXCESS M - BY DEST COUNTY	(1000 ACS)
AC_SPRB	TOTAL SPREAD ACS - EXCESS M - BY DEST COUNTY - CH.BASIN	(1000 ACS)
AC_ONFM	ONFARM ACRES - APPLIED MANURE	(1000 ACS)
AC_ONFMB	ONFARM ACRES - APPLIED MANURE - CH.BASIN	(1000 ACS)

Manure quantity (dry):

M_PROD_	TOTAL MANURE PRODUCTION	(1000 TONS)
M_PRODB	TOTAL MANURE PRODUCTION - CH.BASIN	(1000 TONS)
M_EXC_	EXCESS MANURE ON ANIMAL FARMS	(1000 TONS)
M_EXCB	EXCESS MANURE ON ANIMAL FARMS - CH.BASIN	(1000 TONS)
M_INDUST	EXCESS MANURE IN INDUSTRIAL USES	(1000 TONS)
M_INDSTB	EXCESS MANURE IN INDUSTRIAL USES - CH.BASIN	(1000 TONS)

Manure quantity (dry):—continued

M_STOR_	TOTAL MANURE STORAGE - NONCLEARING	(1000 TONS)
M_STORB	TOTAL MANURE STORAGE - NONCLEARING - CH.BASIN	(1000 TONS)
M_ONFRM_	MANURE PRODUCED AND USED ON OWN LVSTK FARM	(1000 TONS)
M_ONFRMB	MANURE PRODUCED AND USED ON OWN LVSTK FARM - CH.BASIN	(1000 TONS)
M_TRAN1_	EXCESS MANURE TRANSFERRED - BY SOURCE CTY	(1000 TONS)
M_TRAN1B	EXCESS MANURE TRANSFERRED - BY SOURCE CTY - CH.BASIN	(1000 TONS)
M_TRAN2_	EXCESS MANURE TRANSFERRED - BY DEST CTY	(1000 TONS)
M_TRAN2B	EXCESS MANURE TRANSFERRED - BY DEST CTY - CH.BASIN	(1000 TONS)
M_TRNCT_	EXCESS MANURE TRANSFERRED WITHIN COUNTY	(1000 TONS)
M_TRNCTB	EXCESS MANURE TRANSFERRED WITHIN COUNTY - CH.BASIN	(1000 TONS)
M_EXPRT	EXCESS MANURE EXPORTED - BY SOURCE COUNTY	(1000 TONS)
M_EXPRTB	EXCESS MANURE EXPORTED - BY SOURCE COUNTY - CH.BASIN	(1000 TONS)
M_IMPRT_	EXCESS MANURE IMPORTED - BY DEST COUNTY	(1000 TONS)
M_IMPRTB	EXCESS MANURE IMPORTED - BY DEST COUNTY - CH.BASIN	(1000 TONS)
* M_SINK_	EXCESS MANURE EXPORTED TO SINK	(1000 TONS)
* M_SINKB	EXCESS MANURE EXPORTED TO SINK - CH.BASIN	(1000 TONS)
M_USE_	MANURE USE ON ALL FARMLAND - ONFARM & EXCESS	(1000 TONS)
M_USEB	MANURE USE ON ALL FARMLAND - ONFARM & EXCESS - CH.BASIN	(1000 TONS)
M_PR_SY_(SYS)	MANURE PRODUCTION BY WASTE SYSTEM	(1000 TONS)
M_PR_S_1	MANURE PRODUCTION FOR LAGOON WASTE SYSTEM	(1000 TONS)
M_PR_S_2	MANURE PRODUCTION FOR SLURRY WASTE SYSTEM	(1000 TONS)
M_PR_S_3	MANURE PRODUCTION FOR DRY WASTE SYSTEM	(1000 TONS)
M_PR_SYB(SYS)	MANURE PRODUCTION BY WASTE SYSTEM - CH.BASIN	(1000 TONS)
M_PR_S1B	MANURE PRODUCTION FOR LAGOON WASTE SYSTEM - CH.BASIN	(1000 TONS)
M_PR_S2B	MANURE PRODUCTION FOR SLURRY WASTE SYSTEM - CH.BASIN	(1000 TONS)
M_PR_S3B	MANURE PRODUCTION FOR DRY WASTE SYSTEM - CH.BASIN	(1000 TONS)
M_IND_(SYS)	EXCESS MANURE IN INDUSTRIAL USES BY SYSTEM	(1000 TONS)
M_IND_1	EXCESS LAGOON MANURE IN INDUSTRIAL USES BY SYSTEM	(1000 TONS)
M_IND_2	EXCESS SLURRY MANURE IN INDUSTRIAL USES BY SYSTEM	(1000 TONS)
M_IND_3	EXCESS DRY MANURE IN INDUSTRIAL USES BY SYSTEM	(1000 TONS)
M_INDB(SYS)	EXCESS MANURE IN INDUSTRIAL USES BY SYSTEM - CH.BASIN	(1000 TONS)
M_IND1B	EXCESS LAGOON MANURE IN INDUSTRIAL USES BY SYSTEM - CH.BASIN	(1000 TONS)
M_IND2B	EXCESS SLURRY MANURE IN INDUSTRIAL USES BY SYSTEM - CH.BASIN	(1000 TONS)
M_IND3B	EXCESS DRY MANURE IN INDUSTRIAL USES BY SYSTEM - CH.BASIN	(1000 TONS)
M_SY_(SYS)	EXCESS MANURE TRANSFERRED BY SYSTEM	(1000 TONS)
M_SY_1	EXCESS MANURE TRANSFERRED BY LAGOON SYSTEM	(1000 TONS)
M_SY_2	EXCESS MANURE TRANSFERRED BY SLURRY SYSTEM	(1000 TONS)
M_SY_3	EXCESS MANURE TRANSFERRED BY DRY SYSTEM	(1000 TONS)
M_SYB(SYS)	EXCESS MANURE TRANSFERRED BY SYSTEM - CH.BASIN	(1000 TONS)
M_SY1B	EXCESS MANURE TRANSFERRED BY LAGOON SYSTEM - CH.BASIN	(1000 TONS)
M_SY2B	EXCESS MANURE TRANSFERRED BY SLURRY SYSTEM - CH.BASIN	(1000 TONS)
M_SY3B	EXCESS MANURE TRANSFERRED BY DRY SYSTEM - CH.BASIN	(1000 TONS)
M_ON_SY_(SYS)	MANURE USED ONFARM BY SYSTEM	(1000 TONS)
M_ON_S_1	MANURE USED ONFARM FROM LAGOON SYSTEM	(1000 TONS)
M_ON_S_2	MANURE USED ONFARM FROM SLURRY SYSTEM	(1000 TONS)
M_ON_S_3	MANURE USED ONFARM FROM DRY SYSTEM	(1000 TONS)
M_ON_SYB(SYS)	MANURE USED ONFARM BY SYSTEM - CH.BASIN	(1000 TONS)
M_ON_S1B	MANURE USED ONFARM FROM LAGOON SYSTEM - CH.BASIN	(1000 TONS)
M_ON_S2B	MANURE USED ONFARM FROM SLURRY SYSTEM - CH.BASIN	(1000 TONS)
M_ON_S3B	MANURE USED ONFARM FROM DRY SYSTEM - CH.BASIN	(1000 TONS)

Manure quantity (dry):—continued

M_SY_IN_(SYS)	EXCESS M TRANSFERRED IN-COUNTY BY SYSTEM	(1000 TONS)
M_SY_I_1	EXCESS M TRANSFERRED IN-COUNTY LAGOON SYSTEM	(1000 TONS)
M_SY_I_2	EXCESS M TRANSFERRED IN-COUNTY SLURRY SYSTEM	(1000 TONS)
M_SY_I_3	EXCESS M TRANSFERRED IN-COUNTY DRY SYSTEM	(1000 TONS)
M_SY_INB(SYS)	EXCESS M TRANSFERRED IN-COUNTY BY SYSTEM - CH.BASIN	(1000 TONS)
M_SY_I1B	EXCESS M TRANSFERRED IN-COUNTY LAGOON SYSTEM - CH.BASIN	(1000 TONS)
M_SY_I2B	EXCESS M TRANSFERRED IN-COUNTY SLURRY SYSTEM - CH.BASIN	(1000 TONS)
M_SY_I3B	EXCESS M TRANSFERRED IN-COUNTY DRY SYSTEM - CH.BASIN	(1000 TONS)
M_SY_EX_(SYS)	EXCESS MANURE EXPORTED BY SYSTEM	(1000 TONS)
M_SY_E_1	EXCESS MANURE EXPORTED BY LAGOON SYSTEM	(1000 TONS)
M_SY_E_2	EXCESS MANURE EXPORTED BY SLURRY SYSTEM	(1000 TONS)
M_SY_E_3	EXCESS MANURE EXPORTED BY DRY SYSTEM	(1000 TONS)
M_SYEXB1(SYS)	EXCESS M EXPORTED BY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
M_SYE1B1	EXCESS M EXPORTED BY LAGOON SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
M_SYE2B1	EXCESS M EXPORTED BY SLURRY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
M_SYE3B1	EXCESS M EXPORTED BY DRY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
M_SYEXB2(SYS)	EXCESS M EXPORTED BY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
M_SYE1B2	EXCESS M EXPORTED BY LAGOON SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
M_SYE2B2	EXCESS M EXPORTED BY SLURRY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
M_SYE3B2	EXCESS M EXPORTED BY DRY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
M_STR_(SYS)	EXCESS M STORED -NOT CLEARING- BY SYSTEM	(1000 TONS)
M_STR_1	EXCESS M STORED -NOT CLEARING- LAGOON SYSTEM	(1000 TONS)
M_STR_2	EXCESS M STORED -NOT CLEARING- SLURRY SYSTEM	(1000 TONS)
M_STR_3	EXCESS M STORED -NOT CLEARING- DRY SYSTEM	(1000 TONS)
M_STRB(SYS)	EXCESS M STORED -NOT CLEARING- BY SYSTEM - CH.BASIN	(1000 TONS)
M_STR1B	EXCESS M STORED -NOT CLEARING- LAGOON SYSTEM - CH.BASIN	(1000 TONS)
M_STR2B	EXCESS M STORED -NOT CLEARING- SLURRY SYSTEM - CH.BASIN	(1000 TONS)
M_STR3B	EXCESS M STORED -NOT CLEARING- DRY SYSTEM - CH.BASIN	(1000 TONS)

Manure quantity (wet):

WMPR_SY_(SYS)	WET MANURE PRODUCTION BY WASTE SYSTEM	(1000 TONS)
WMPR_S_1	WET MANURE PRODUCTION LAGOON WASTE SYSTEM	(1000 TONS)
WMPR_S_2	WET MANURE PRODUCTION SLURRY WASTE SYSTEM	(1000 TONS)
WMPR_S_3	WET MANURE PRODUCTION DRY WASTE SYSTEM	(1000 TONS)
WMPR_SYB(SYS)	WET MANURE PRODUCTION BY WASTE SYSTEM - CH.BASIN	(1000 TONS)
WMPR_S1B	WET MANURE PRODUCTION LAGOON WASTE SYSTEM - CH.BASIN	(1000 TONS)
WMPR_S2B	WET MANURE PRODUCTION SLURRY WASTE SYSTEM - CH.BASIN	(1000 TONS)
WMPR_S3B	WET MANURE PRODUCTION DRY WASTE SYSTEM - CH.BASIN	(1000 TONS)
WMIND_(SYS)	EXCESS WET MANURE IN INDUSTRIAL USES BY SYSTEM	(1000 TONS)
WMIND_1	EXCESS WET MANURE IN INDUSTRIAL USES LAGOON SYSTEM	(1000 TONS)
WMIND_2	EXCESS WET MANURE IN INDUSTRIAL USES SLURRY SYSTEM	(1000 TONS)
WMIND_3	EXCESS WET MANURE IN INDUSTRIAL USES DRY SYSTEM	(1000 TONS)
WMINDB(SYS)	EXCESS WET MANURE IN INDUSTRIAL USES BY SYSTEM - CH.BASIN	(1000 TONS)
WMIND1B	EXCESS WET MANURE IN INDUSTRIAL USES LAGOON SYSTEM - CH.BASIN	(1000 TONS)
WMIND2B	EXCESS WET MANURE IN INDUSTRIAL USES SLURRY SYSTEM - CH.BASIN	(1000 TONS)
WMIND3B	EXCESS WET MANURE IN INDUSTRIAL USES DRY SYSTEM - CH.BASIN	(1000 TONS)
WMSY_(SYS)	EXCESS WET MANURE TRANSFERRED BY SYSTEM	(1000 TONS)
WMSY_1	EXCESS WET MANURE TRANSFERRED LAGOON SYSTEM	(1000 TONS)
WMSY_2	EXCESS WET MANURE TRANSFERRED SLURRY SYSTEM	(1000 TONS)
WMSY_3	EXCESS WET MANURE TRANSFERRED DRY SYSTEM	(1000 TONS)
WMSYB(SYS)	EXCESS WET MANURE TRANSFERRED BY SYSTEM - CH.BASIN	(1000 TONS)

Manure quantity (wet):—continued

WMSY1B	EXCESS WET MANURE TRANSFERRED LAGOON SYSTEM - CH.BASIN	(1000 TONS)
WMSY2B	EXCESS WET MANURE TRANSFERRED SLURRY SYSTEM - CH.BASIN	(1000 TONS)
WMSY3B	EXCESS WET MANURE TRANSFERRED DRY SYSTEM - CH.BASIN	(1000 TONS)
WMON_SY_(SYS)	WET MANURE USED ONFARM BY SYSTEM	(1000 TONS)
WMON_S_1	WET MANURE USED ONFARM LAGOON SYSTEM	(1000 TONS)
WMON_S_2	WET MANURE USED ONFARM SLURRY SYSTEM	(1000 TONS)
WMON_S_3	WET MANURE USED ONFARM DRY SYSTEM	(1000 TONS)
WMON_SYB(SYS)	WET MANURE USED ONFARM BY SYSTEM - CH.BASIN	(1000 TONS)
WMON_S1B	WET MANURE USED ONFARM LAGOON SYSTEM - CH.BASIN	(1000 TONS)
WMON_S2B	WET MANURE USED ONFARM SLURRY SYSTEM - CH.BASIN	(1000 TONS)
WMON_S3B	WET MANURE USED ONFARM DRY SYSTEM - CH.BASIN	(1000 TONS)
WMSY_IN_(SYS)	EXCESS WET M TRANSFERRED IN-COUNTY BY SYSTEM	(1000 TONS)
WMSY_I_1	EXCESS WET M TRANSFERRED IN-COUNTY LAGOON SYSTEM	(1000 TONS)
WMSY_I_2	EXCESS WET M TRANSFERRED IN-COUNTY SLURRY SYSTEM	(1000 TONS)
WMSY_I_3	EXCESS WET M TRANSFERRED IN-COUNTY DRY SYSTEM	(1000 TONS)
WMSYINB1(SYS)	EXCESS WET M - INTRA-COUNTY BY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYI1B1	EXCESS WET M - INTRA-COUNTY LAGOON SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYI2B1	EXCESS WET M - INTRA-COUNTY SLURRY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYI3B1	EXCESS WET M - INTRA-COUNTY DRY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYINB2(SYS)	EXCESS WET M - INTRA-COUNTY BY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSYI1B2	EXCESS WET M - INTRA-COUNTY LAGOON SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSYI2B2	EXCESS WET M - INTRA-COUNTY SLURRY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSYI3B2	EXCESS WET M - INTRA-COUNTY DRY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSY_EX_(SYS)	EXCESS WET MANURE EXPORTED BY SYSTEM	(1000 TONS)
WMSY_E_1	EXCESS WET MANURE EXPORTED LAGOON SYSTEM	(1000 TONS)
WMSY_E_2	EXCESS WET MANURE EXPORTED SLURRY SYSTEM	(1000 TONS)
WMSY_E_3	EXCESS WET MANURE EXPORTED DRY SYSTEM	(1000 TONS)
WMSYEXB1(SYS)	EXCESS WET M EXPORTED BY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYE1B1	EXCESS WET M EXPORTED LAGOON SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYE2B1	EXCESS WET M EXPORTED SLURRY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYE3B1	EXCESS WET M EXPORTED DRY SYSTEM - CH.BASIN - ADJ ON CT	(1000 TONS)
WMSYEXB2(SYS)	EXCESS WET M EXPORTED BY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSYE1B2	EXCESS WET M EXPORTED LAGOON SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSYE2B2	EXCESS WET M EXPORTED SLURRY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSYE3B2	EXCESS WET M EXPORTED DRY SYSTEM - CH.BASIN - ADJ ON CT2	(1000 TONS)
WMSTR_(SYS)	EXCESS WET M STORED -NOT CLEARING- BY SYSTEM	(1000 TONS)
WMSTR_1	EXCESS WET M STORED -NOT CLEARING- LAGOON SYSTEM	(1000 TONS)
WMSTR_2	EXCESS WET M STORED -NOT CLEARING- SLURRY SYSTEM	(1000 TONS)
WMSTR_3	EXCESS WET M STORED -NOT CLEARING- DRY SYSTEM	(1000 TONS)
WMSTRB(SYS)	EXCESS WET M STORED -NOT CLEARING- BY SYSTEM - CH.BASIN	(1000 TONS)
WMSTRB_1	EXCESS WET M STORED -NOT CLEARING- LAGOON SYSTEM - CH.BASIN	(1000 TONS)
WMSTRB_2	EXCESS WET M STORED -NOT CLEARING- SLURRY SYSTEM - CH.BASIN	(1000 TONS)
WMSTRB_3	EXCESS WET M STORED -NOT CLEARING- DRY SYSTEM - CH.BASIN	(1000 TONS)
WMUS_SY_(SYS)	TOTAL WET MANURE USED - ONFARM AND OFF-FARM - ALL SYSTEMS	(1000 TONS)
WMUS_S_1	TOTAL WET MANURE USED - ONFARM AND OFF-FARM - LAGOON SYSTEM	(1000 TONS)
WMUS_S_2	TOTAL WET MANURE USED - ONFARM AND OFF-FARM - SLURRY SYSTEM	(1000 TONS)
WMUS_S_3	TOTAL WET MANURE USED - ONFARM AND OFF-FARM - DRY SYSTEM	(1000 TONS)
WMUS_SYB(SYS)	TOTAL WET MANURE USED - ONFARM AND OFF-FARM- CH.BASIN- ALL SYSTEMS	(1000 TONS)

Manure quantity (wet):—continued

WMUS_S1B	TOTAL WET MANURE USED - ONFARM AND OFF-FARM- CH.BASIN- LAGOON SYSTEM	(1000 TONS)
WMUS_S2B	TOTAL WET MANURE USED - ONFARM AND OFF-FARM- CH.BASIN- SLURRY SYSTEM	(1000 TONS)
WMUS_S3B	TOTAL WET MANURE USED - ONFARM AND OFF-FARM- CH.BASIN- DRY SYSTEM	(1000 TONS)
WMPROD_	TOTAL WET MANURE PRODUCTION	(1000 TONS)
WMPRODB	TOTAL WET MANURE PRODUCTION - CH.BASIN	(1000 TONS)
WMINDUST	EXCESS WET MANURE IN INDUSTRIAL USES	(1000 TONS)
WMINDSTB	EXCESS WET MANURE IN INDUSTRIAL USES - CH.BASIN	(1000 TONS)
WMONFRM	WET MANURE PRODUCED AND USED ON OWN LVSTK FARM	(1000 TONS)
WMONFRMB	WET MANURE PRODUCED AND USED ON OWN LVSTK FARM - CH.BASIN	(1000 TONS)
WMTRNCT_	EXCESS WET MANURE TRANSFERRED WITHIN COUNTY	(1000 TONS)
WMTRNCTB	EXCESS WET MANURE TRANSFERRED WITHIN COUNTY - CH.BASIN	(1000 TONS)
WMEXPRT_	EXCESS WET MANURE EXPORTED - BY SOURCE COUNTY	(1000 TONS)
WMEXPRTB	EXCESS WET MANURE EXPORTED - BY SOURCE COUNTY - CH.BASIN	(1000 TONS)
WMIMPRT_	EXCESS WET MANURE IMPORTED - BY DEST COUNTY	(1000 TONS)
WMIMPRTB	EXCESS WET MANURE IMPORTED - BY DEST COUNTY - CH.BASIN	(1000 TONS)
WMTRAN1_	EXCESS WET MANURE TRANSFERRED - BY SOURCE CTY	(1000 TONS)
WMTRAN1B	EXCESS WET MANURE TRANSFERRED - BY SOURCE CTY - CH.BASIN	(1000 TONS)
WMTRAN2_	EXCESS WET MANURE TRANSFERRED - BY DEST CTY	(1000 TONS)
WMTRAN2B	EXCESS WET MANURE TRANSFERRED - BY DEST CTY - CH.BASIN	(1000 TONS)
WMEXC_	EXCESS WET MANURE ON ANIMAL FARMS	(1000 TONS)
WMEXCB	EXCESS WET MANURE ON ANIMAL FARMS - CH.BASIN	(1000 TONS)
WMUSE_	WET MANURE USE ON ALL FARMLAND - ONFARM & EXCESS	(1000 TONS)
WMUSEB	WET MANURE USE ON ALL FARMLAND - ONFARM & EXCESS - CH.BASIN	(1000 TONS)
WMSTOR_	TOTAL WET MANURE STORAGE - NONCLEARING	(1000 TONS)
WMSTORB	TOTAL WET MANURE STORAGE - NONCLEARING - CH.BASIN	(1000 TONS)

Manure nutrients:

N_PROD_	TOTAL MANURE-N PRODUCTION	(MIL LBS)
N_PRODB	TOTAL MANURE-N PRODUCTION - CH.BASIN	(MIL LBS)
N_EXC_	EXCESS MANURE-N ON ANIMAL FARMS	(MIL LBS)
N_EXCB	EXCESS MANURE-N ON ANIMAL FARMS - CH.BASIN	(MIL LBS)
N_TRAN1_	EXCESS MANURE-N TRANSFERRED - BY SOURCE CTY	(MIL LBS)
N_TRAN1B	EXCESS MANURE-N TRANSFERRED - BY SOURCE CTY - CH.BASIN	(MIL LBS)
N_TRAN2_	EXCESS MANURE-N TRANSFERRED - BY DEST COUNTY	(MIL LBS)
N_TRAN2B	EXCESS MANURE-N TRANSFERRED - BY DEST COUNTY - CH.BASIN	(MIL LBS)
N_M_ONF_	ONFARM MANURE-N USED ON ANIMAL FARMS	(MIL LBS)
N_M_ONFB	ONFARM MANURE-N USED ON ANIMAL FARMS - CH.BASIN	(MIL LBS)
P_PROD_	TOTAL MANURE-P PRODUCTION	(MIL LBS)
P_PRODB	TOTAL MANURE-P PRODUCTION - CH.BASIN	(MIL LBS)
P_EXC_	EXCESS MANURE-P ON ANIMAL FARMS	(MIL LBS)
P_EXCB	EXCESS MANURE-P ON ANIMAL FARMS - CH.BASIN	(MIL LBS)
P_TRAN1_	EXCESS MANURE-P TRANSFERRED - BY SOURCE CTY	(MIL LBS)
P_TRAN1B	EXCESS MANURE-P TRANSFERRED - BY SOURCE CTY - CH.BASIN	(MIL LBS)
P_TRAN2_	EXCESS MANURE-P TRANSFERRED - BY DEST COUNTY	(MIL LBS)
P_TRAN2B	EXCESS MANURE-P TRANSFERRED - BY DEST COUNTY - CH.BASIN	(MIL LBS)
P_M_ONF_	ONFARM MANURE-P USED ON ANIMAL FARMS	(MIL LBS)
P_M_ONFB	ONFARM MANURE-P USED ON ANIMAL FARMS - CH.BASIN	(MIL LBS)

Appendix 4—Model report variables—Continued

Hauling distance:

AVDST_ON	AVE HAULING DISTANCE - ON-FARM	(KMS)
AVDST_IN	AVE HAULING DISTANCE - EXCESS M - WITHIN COUNTY	(KMS)
AVDST_EX	AVE HAULING DISTANCE - EXCESS M - OUT-OF-COUNTY	(KMS)
AVDS_ONM	AVE HAULING DISTANCE - ON-FARM	(MILES)
AVDS_INM	AVE HAULING DISTANCE - EXCESS M - WITHIN COUNTY	(MILES)
AVDS_EXM	AVE HAULING DISTANCE - EXCESS M - OUT-OF-COUNTY	(MILES)

Application rate:

AVAP_OFF	AVE MANURE APPLICATION RATE - OFF-FARM	(DRY TONS-AC)
AVAP_ON	AVE MANURE APPLICATION RATE - ON-FARM	(DRY TONS-AC)
AVEAPPL	AVE MANURE APPLICATION RATE - ALL	(DRY TONS-AC)

Hauling cost per ton:

HC_ON_TN	HAULING & APPL COST PER TON HAULED - ONFARM	($-DRY TON)
HC_IN_TN	HAULING & APPL COST PER TON HAULED - INCOUNTY	($-DRY TON)
HC_EX_TN	HAULING & APPL COST PER TON HAULED - OUT-OF-COUNTY	($-DRY TON)
HC_TN	HAULING & APPL COST PER TON HAULED - TOTAL	($-DRY TON)
TC_TN	TOTAL COST PER TON HAULED	($-DRY TON)
HCON_WTN	HAULING & APPL COST PER TON HAULED - ONFARM	($-WET TON)
HCIN_WTN	HAULING & APPL COST PER TON HAULED - INCOUNTY	($-WET TON)
HCEX_WTN	HAULING & APPL COST PER TON HAULED - OUT-OF-COUNTY	($-WET TON)
HC_WTN	HAULING & APPL COST PER TON HAULED - TOTAL	($-WET TON)
TC_WTN	TOTAL COST PER TON HAULED	($-WET TON)

Application costs:

APPL_ON(CT,CT2,SYS)	MANURE APPLICATION COST - ONFARM	($ MIL)
APPL_IN(CT,CT2,SYS,DST)	MANURE APPLICATION COST - INCOUNTY	($ MIL)
APPL_EX(CT,GR,CT2,SYS,DST)	MANURE APPLICATION COST - OUT-OF-CNTY	($ MIL)
AP_ON(CT,CT2)	TOTAL M APPL COST - ONFARM	($ MIL)
AP_IN(CT,CT2)	TOTAL M APPL COST - INCOUNTY	($ MIL)
AP_EX(CT,GR,CT2)	M APPL COST - OUT-OF-COUNTY GRID	($ MIL)
AP1(CT)	APPL COST BY SOURCE CNTY - INCOUNTY	($ MIL)
AP2(CT)	APPL COST BY SOURCE CNTY - EXPORTS	($ MIL)
APCOST(CT)	TOTAL APPL COST BY SOURCE COUNTY	($ MIL)
APCST_	APPL COST ACROSS SOURCE COUNTIES	($ MIL)
APCSTB	APPL COST ACROSS SOURCE CNTIES - CH.BASIN	($ MIL)
APL1(CT2)	APPL COST BY DEST CNTY - INCOUNTY	($ MIL)
APL2(CT2)	APPL COST BY DEST CNTY - EXPORTS	($ MIL)
APLCOST(CT2)	TOTAL APPL COST BY DEST COUNTY	($ MIL)
APLCST_	APPL COST ACROSS DEST COUNTIES	($ MIL)
APLCSTB	APPL COST ACROSS DEST COUNTIES - CH.BASIN	($ MIL)
AC_SHARE(CT2)	ACREAGE MANURED AS A SHARE OF TOTAL AVAILABLE	(.XX)

* Asterisks denote endogenously specified variables in the model; all others are derived from the model solution based on levels of endogenous variables.