APPENDIX 1: CASE STUDIES

Purpose

This Appendix presents case studies that provide examples on how to organize and enter data into NEWUDS. Suggestions are made for determining water-use values and location data if these are not supplied with the data.

Organization

Each case study has five steps to follow to organize data for entry into NEWUDS. The first step determines water-use and locational values. Water-use coefficients referenced in this step are from Planning and Management Consultants, Ltd. (1995), and Horn (2000). Step 2 is to record the information on a NEWUDS input form. An example of input data for each case study is presented on the correct form in Appendix 3. Data entered into the white boxes on the input form come from information received from another source plus any information derived from the received information. For example, if the address of a user was received, it was used to determine the latitude and longitude, which then was used to determine the Hydrologic Unit Code (HUC). After the white areas are filled in, the gray boxes are filled in using the domain tables in Appendix 2.

Step 3 involves choosing one of the Network models described in the "Modeling Water-Use Activities" section to identify the number of required Sites and their *SiteTypes*. Step 4 organizes the information on Sites, Conveyances, Transactions, and Rates into tables and includes a diagram to guide the data entry phase. Step 5 organizes tables, database fields, and data values in the order entered into NEWUDS.

Case 1: Withdrawal and Use by a Single User (MSS1)

Case 1: *A major privately owned self-supplied industrial user, MSS1, 123 Main St., Pawtucket, R.I., operated two glacial-deposit-aquifer wells during 1995. MSS1 has a Standard Industrial Classification (SIC) code of 2611 and employs 3,476 people. Contact is John Doe, 802-254-6789.*

Step 1: Determine water-use values and location information.

Use metered data in determining withdrawals by major users, if possible. If metered data cannot be obtained, withdrawals can be estimated based on user attributes using water-use coefficients. For example, MSS1 with a Standard Industrial Classification (SIC) Code of 2611, employs 3,476 people. Applying the median water-use coefficient of 863 gal/employee (Planning and Management Consultants, Ltd., 1995) for this SIC Code results in 3.0 Mgal/d. The water use is distributed among the user's wells for an average withdrawal of 1.5 Mgal/d from each.

The HUC can be determined from the latitude and longitude for each well and plant Site, if provided. If not provided, the address can be used to determine a latitude/longitude location using Atlas software. The hypothetical address yielded a latitude/longitude of 415400/-0712400 for which the HUC is 01090004.

Step 2: Fill in NEWUDS Single User Input Form 1 as shown in Appendix 1_figure 34a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 34b.

Data for the white boxes in Appendix 3_Form 1 come from received and derived information. For example, the address was received and was used to determine the latitude and longitude. The location data were used to determine the HUC. After the white areas are filled in, the gray boxes are filled in using the domain tables in Appendix 2.

Form 1. NEWUDS Input Form for Single Users

System ID	1	System Name	MSS1	System Type	User	Use Type	Industrial			NEUse Code	40
				code	4	SIC code	2611			SIC Code code	253
Owner ID	2	Owner Name	MSS1	Owner Type	Private	Contact Name	John Doe				
				code	1					Phone	8022546789
Address ID	2	Mail Line1	123 Main St	Street Line1						Address type code	1
		Mail Line2		Street Line2							
		City	Pawtucket	State	RI	Zip	02701	City		State		Zip	
Location ID	2	Location Name		Location Scale	Point					Location Scale Code	1
		State	RI	County	Providence	MCD	Pawtucket	HUC	01090004	State Basin	
		code	6	code	2311	code	2348	code	44	code	
		Latitude	415400	Longitude	0712400	Location Det Method	Atlas software			LDM code	7

Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
1	3 well	MSS1 Well 1	1	39	3	20	MSS1 Plant					
2	3	MSS1 Well 2	2	39								

Site ID	Resource ID	Resource Name		Site ID	Resource ID	Resource Name
1	5	Glacial-deposit aquifer	1995 1.5 Mgal/d each well. Estimated by USGS by employee/SIC water-use coefficient. All sites co-located. Number of employees: 3476. SIC Code: 2600			

Appendix 1_Figure 34a. Data for Case Study 1 on NEWUDS Single User Input Form 1. (Form 1 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

Form 9. NEWUDS Transaction/Rate Data Input Form for System_ID 1

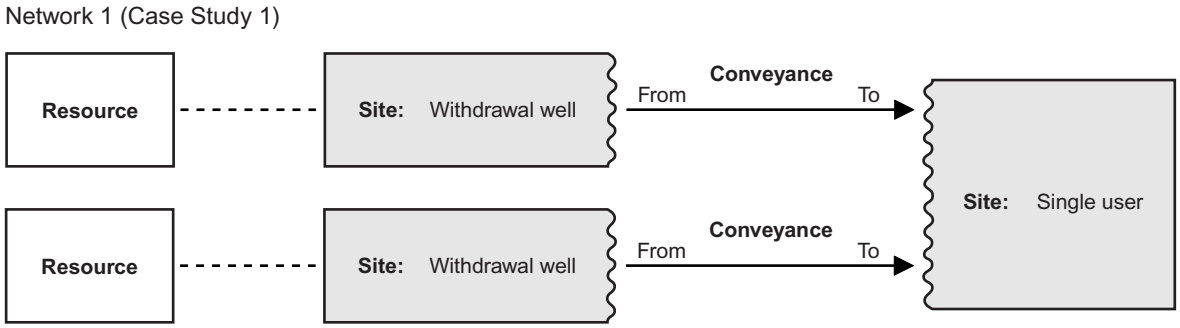
Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
1	1	3	1	2	1/1/95	12/31/95	1	2	5	9	1.50	1
2	2	3	2	2	1/1/95	12/31/95	2	2	5	9	1.50	1

Appendix 1_Figure 34b. Data for Case Study 1 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)

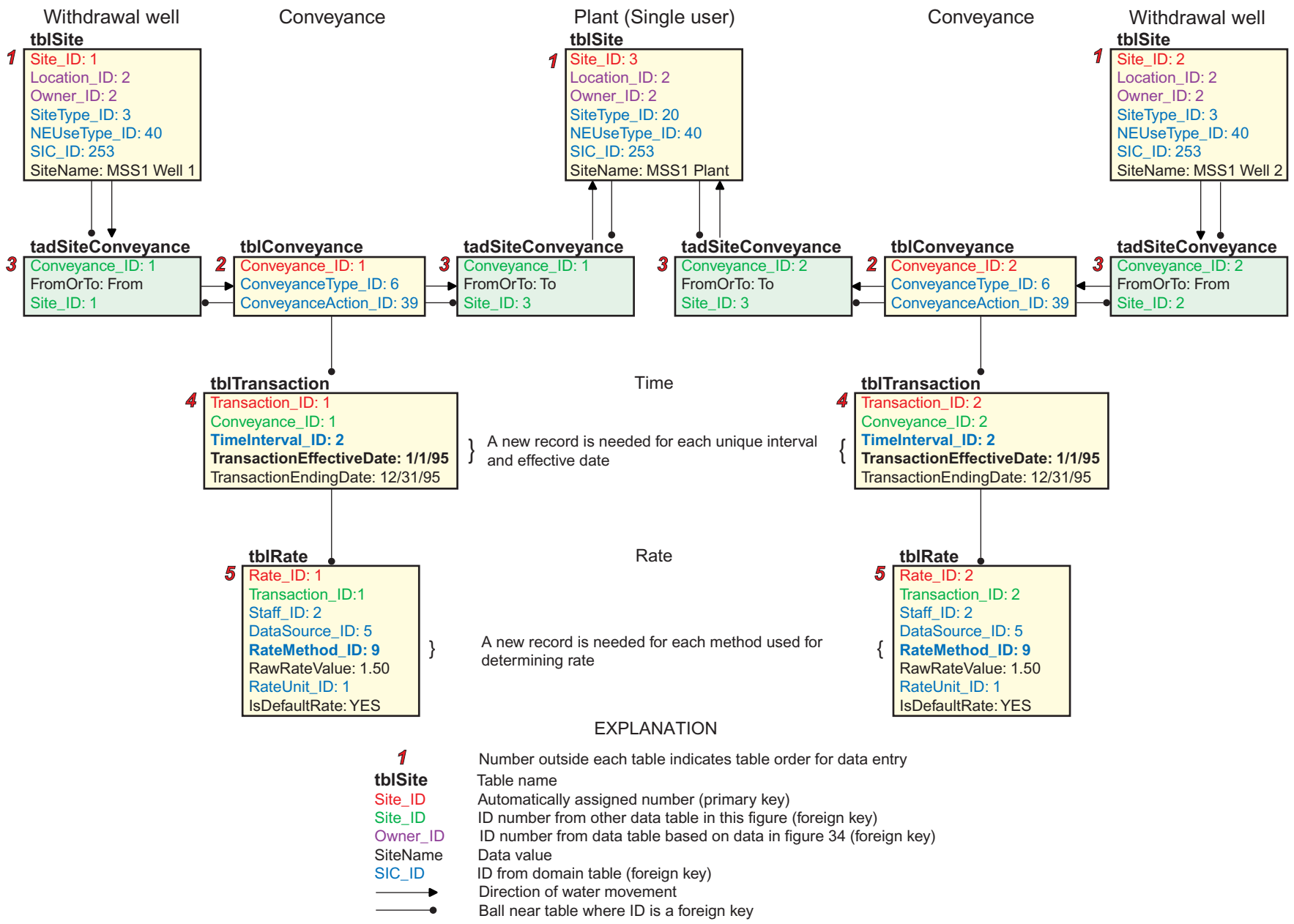
Step 3: Choose a Network 1 diagram to identify the number and type of required Sites and modify as needed. Two withdrawal well Sites and one single user Site are required (Appendix 1_fig. 35).

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 36.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 12.



Appendix 1_Figure 35. Network 1: Diagram for Case Study 1: Withdrawal and use by a single user (MSS1). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



Appendix 1_Figure 36. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 1: Withdrawal and use by a single user (MSS1). (See figure 18 for explanation of box color.)

Appendix 1_Table 12. Data entry into NEWUDS tables for Case Study 1: Withdrawal and use by a single user (MSS1)

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	1		
	SystemType_ID	4	tdxSystemType	User
	SystemName	MSS1		
tblOwner	Owner_ID	2		
	OwnerType_ID	1	tdsOwnerType	Private
	OwnerName	MSS1		
	OwnerContact	John Doe		
	OwnerPhone	802-254-6789		
tblAddress	Address_ID	2		
	AddressType_ID	1	tdsAddressType	Both Mailing and Street
	AddressLine1	123 Main St		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	2		
	Address_ID	2		
tblLocation	Location_ID	2		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415400		
	Location-Longitude	0712400		
tadLocationHUC	Location_ID	2		
	HUC_ID	44	tdsHUC	01090004
	IsPrimaryHUC	Yes		
tblSite	Site_ID	1		
	Location_ID	2		
	Owner_ID	2		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	40	tdsNEUseType	Paper Products
	SIC_ID	253	tdsSICUseType	2611 Pulp Mills
	SiteName	MSS1 well 1		
tblSite	Site_ID	2		
	Location_ID	2		
	Owner_ID	2		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	40	tdsNEUseType	Paper Products
	SIC_ID	253	tdsSICUseType	2611 Pulp Mills
	SiteName	MSS1 well 2		

Appendix 1_Table 12. Data entry into NEWUDS tables for Case Study 1: Withdrawal and use by a single user (MSS1)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	3		
	Location_ID	2		
	Owner_ID	2		
	SiteType_ID	20	tdsSiteType	SingleUser
	NEUseType_ID	40	tdsNEUseType	Paper Products
	SIC_ID	253	tdsSICUseType	2611 Pulp Mills
	SiteName	MSS1 plant		
tasSystemSite	System_ID	1		
	Site_ID	1		
	System_ID	1		
	Site_ID	2		
	System_ID	1		
	Site_ID	3		
tadSiteDetail	Site_ID	3		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	2	tdxSiteDetailLabel	Number of employees
	DataSource_ID	2	tdxDataSource	Dun & Bradstreet Information Service
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetaiValue	3476		
tblResource	Resource_ID	5		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer - freshwater
	ResourceName	Glacial-deposit aquifer		
tadSiteResource	Site_ID	1		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	2		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
tblConveyance	Conveyance_ID	1		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	39	tdsConveyanceAction	Well to single user
tadSiteConveyance	Conveyance_ID	1		
	FromOrTo	From		
	Site_ID	1		
tadSiteConveyance	Conveyance_ID	1		
	FromOrTo	To		
	Site_ID	3		
tblConveyance	Conveyance_ID	2		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	39	tdsConveyanceAction	Well to single user
tadSiteConveyance	Conveyance_ID	2		
	FromOrTo	From		
	Site_ID	2		
tadSiteConveyance	Conveyance_ID	2		
	FromOrTo	To		
	Site_ID	3		

Appendix 1_Table 12. Data entry into NEWUDS tables for Case Study 1: Withdrawal and use by a single user (MSS1)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	1		
	Conveyance_ID	1		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	2		
	Conveyance_ID	2		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	1		
	Transaction_ID	1		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	9	tdxRateMethod	IWR-MAIN coefficient with Dun & Bradstreet values
	RawRateValue	1.50		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	2		
	Transaction_ID	2		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	9	tdxRateMethod	IWR-MAIN coefficient with Dun & Bradstreet values
	RawRateValue	1.50		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 2: Withdrawal and Use by an Aggregate of Users (Aggregate Use-MCD)

Case 2: *Commercial users of self-supplied water in Pawtucket, R.I., were estimated by the USGS to withdraw an average of 1.3 Mgal/d from crystalline-rock aquifers during 1995.*

Step 1: Determine water-use values and location information.

A suggested method for estimating aggregated water use is presented here and can be followed using Form 2 in Appendix 3. A blank Form 2 and an explanatory Form 2 are provided. Detailed description of this method for estimating aggregated water use is in Horn (2000).

(1.) Estimate total commercial and industrial use for an area based on SIC code, employee number, and SIC code/employee coefficient[1] (or any other reliable method).

(2.) Estimate total domestic use for an area based on population and per capita coefficient (between 60 to 100 gal/d/person).

(3.) Estimate the percentage of population using water provided by community-water systems from either Census Bureau estimates or community-water system values for population served.

(4.) Estimate use by minor users by category by subtracting estimated water used/withdrawn by major user of self-supplied and community-supplied water from the area estimate (step 1).

(5.) Multiply the use by minor users by category (step 4) by percentage of users not supplied by community-water systems (step 3) to determine the withdrawal by aggregates of minor commercial, industrial, and domestic users.

Step 2: Fill in NEWUDS Input Form 3 for aggregate of users as shown in Appendix 1_figure 37.

Step 3: Choose Network Diagram to identify the number and type of required Sites (Appendix 1_fig. 38).

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 39.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 13.

[1]Planning and Management Consultants, Ltd., 1995.

Form 3. NEWUDS Input Form for Aggregate of Users

System ID		6	System Name	Pawtucket MCD Users	
Owner ID	1		System Type code	5	
Location ID		3	Location Name		Pawtucket MCD
			Location Determination Method Code	2	Location Scale Code
State	RI	County	Providence	CO Code	2311
State code	6	MCD	Pawtucket	MCD code	2348

Site ID	Use Code	Site Type	Ground-water Withdrawal	Resource ID	Resource Name
4	78	1		16	Crystalline-rock aquifer
	78	1			
	78	1			

Site ID	Use	Site Type	Local Distribution System
	60	12	
	60	12	
	60	12	
	60	12	

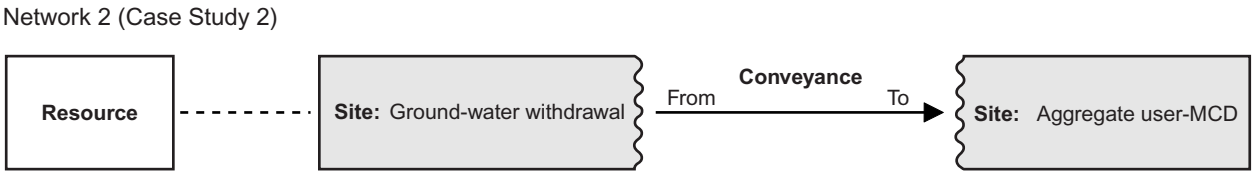
Site ID	Use	Site Type	User	From Sites	To Sites
	67	24	DOM		
5	79	24	COM	4	1.3 Mgal/d 1995 crystalline-rock aquifers
	80	24	IND		
	1	24	IRR		
	81	24	LVS		
		24			

Site ID	Use	Site Type	Local Collection System
	61	14	
	61	14	
	61	14	

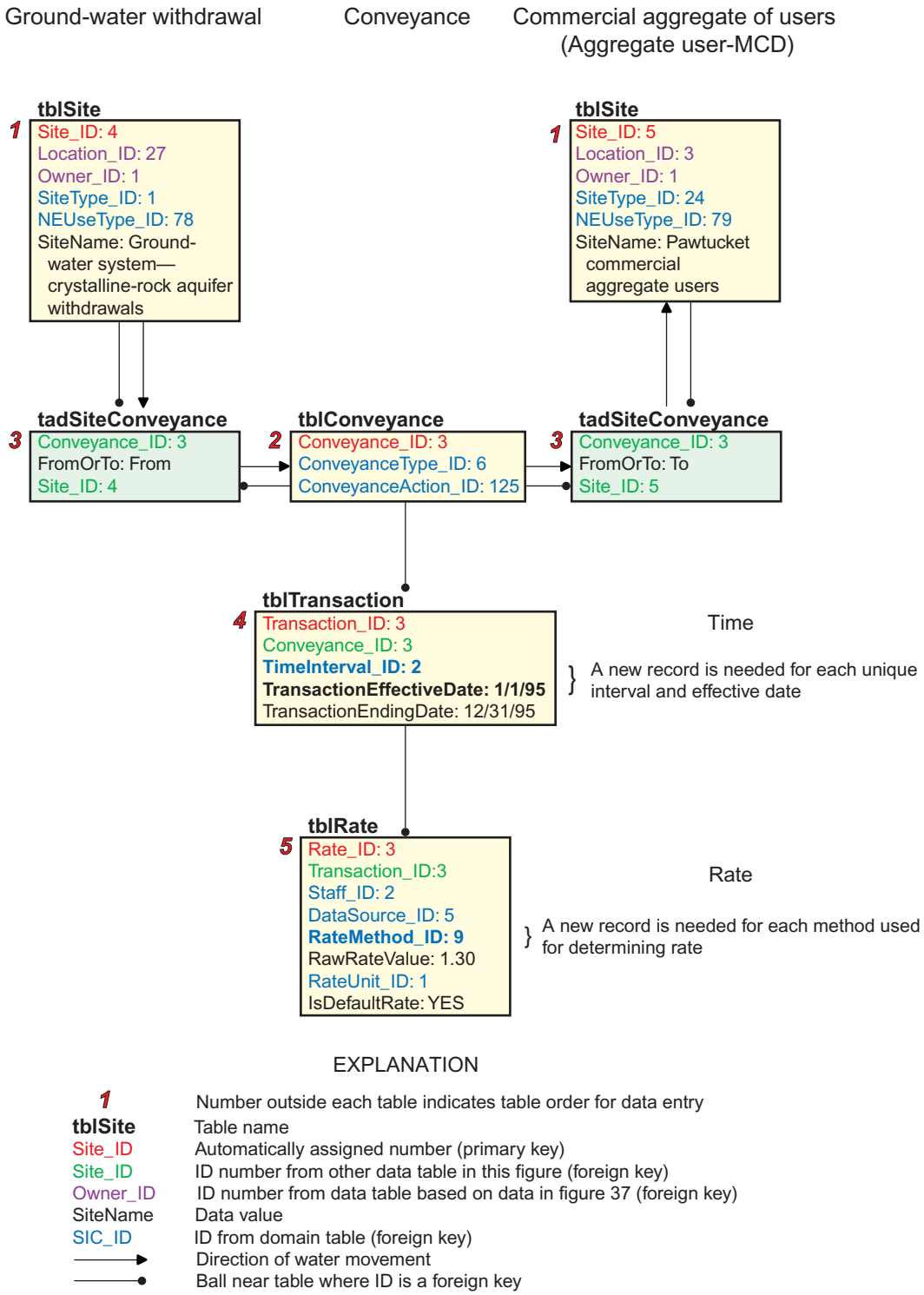
Site ID	Use	Site Type	Ground-water Return	Resource ID	Resource Name
	78	5			
	78	5			
	78	5			

From Site ID	To Site ID	Conveyance ID	Action	From Site ID	To Site ID	Conveyance ID	Action
4	5	3	125				

Appendix 1_Figure 37. Data for Case Study 2 on NEWUDS Aggregate of Users Input Form 3. (Form 3 is in Appendix 3.)



Appendix 1_Figure 38. Network 2: Diagram for Case Study 2: Withdrawal and use by an aggregate of users (Aggregate user-MCD). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



Appendix 1_Figure 39. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 2: Withdrawal and use by an aggregate of users (Aggregate user-MCD). (See figure 18 for explanation of box color.)

Appendix 1_Table 13. Data entry into NEWUDS tables for Case Study 2: Withdrawal and Use by an aggregate of users (Aggregate User-MCD)

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	6		
	SystemType_ID	5	tdxSystemType	Town
	SystemName	Pawtucket MCD users		
tblOwner	Owner_ID	1		
	OwnerType_ID	0	tdsOwnerType	None
tblLocation	Location_ID	11		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	7	tdsLocationScale	Undefined
tblLocation	Location_ID	3		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415224		
	Location-Longitude	0712228		
tadLocationHUC	Location_ID	3		
	HUC_ID	44	tdsHUC	01090004
	IsPrimaryHUC	Yes		
tblSite	Site_ID	4		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	1	tdsSiteType	Ground-water withdrawal
	NEUseType_ID	78	tdsNEUseType	Non Use
	SiteName	Ground-water system crystalline-rock aquifer withdrawals		
tblSite	Site_ID	5		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SiteName	Pawtucket Commercial Aggregated users		
tasSystemSite	System_ID	6		
	Site_ID	4		
	System_ID	6		
	Site_ID	5		
tblResource	Resource_ID	16		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer - freshwater
	ResourceName	Crystalline-rock aquifers		
tadSiteResource	Site_ID	4		
	Resource_ID	16	tblResource	Glacial-deposit aquifer
tblConveyance	Conveyance_ID	3		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	125	tdsConveyanceAction	Ground-water withdrawal to aggregate user - MCD

Appendix 1_Table 13. Data entry into NEWUDS tables for Case Study 2: Withdrawal and Use by an aggregate of users (Aggregate User-MCD)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	3		
	FromOrTo	From		
	Site_ID	4		
tadSiteConveyance	Conveyance_ID	3		
	FromOrTo	To		
	Site_ID	5		
tblTransaction	Transaction_ID	3		
	Conveyance_ID	3		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	3		
	Transaction_ID	3		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	9	tdxRateMethod	IWR-MAIN coefficient with Dun & Bradstreet values
	RawRateValue	1.30		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 3: Withdrawal and Distribution by a Simple Community-Water System (CWS1)

Case 3: *During 1995, a community water system, CWS1, 345 Central St., Pawtucket, R.I., had metered withdrawals of 3.00 Mgal/d from each of 3 wells, 2.00 Mgal/d from a fourth well (all completed in the glacial-deposit-aquifer) that entered the local distribution system and 69.00 Mgal/d from an intake pipe on Happy Hollow Reservoir that went to the treatment plant. Contact is John White, 802-725-9492. Population served is 739,220.*

Step 1: Determine water-use values and location information.

The information included in Case 3 is typical of information made available from community-water systems or State agencies. However, distribution to commercial, industrial, and domestic users and unaccounted for water are important water-use values that need to be determined. Case 2 provides guidance in estimating total commercial, industrial, and domestic use and the portion of this use that is self-supplied. Subtracting self-supplied use from total use yields the following: Distribution to aggregates of domestic users were 48.00 Mgal/d, to industrial users 16.00 Mgal/d, and to commercial users 5.20 Mgal/d. The next step is to identify major users and adjust estimates of use by aggregates of users. There are no major users supplied by community-water systems in this example. Finally, unaccounted-for use was estimated as the difference between withdrawals by the community-water system and the sum of distribution to commercial, industrial, and domestic users, or 10.80 Mgal/d.

Step 2: Fill in NEWUDS Input Form 6 as shown in Appendix 1_figure 40a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 40b.

Step 3: Choose Network 3 diagram to identify the number and type of required Sites (Appendix 1_fig. 41).

Four withdrawal well, one intake pipe, one potable treatment plant, one local distribution system, three aggregate user-MCD, and one unaccounted-for water Sites are required.

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 42.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 14.

Form 6. NEWUDS Input Form for Community-Water Systems

System ID	2	System Name	CWS1		System Type	Com water sys		Use		Use code	60
					ST code	1					
Owner ID	3	Owner Name	CWS1		Owner Type	Municipal			Contact Name	John White	
					OT code	2			Phone	8027259492	
Address ID	3	Mail Line1	456 Central St		Street Line1				Address type code	3	
		Mail Line2			Street Line2						
	City	Pawtucket	State	RI	Zip	02701	City		State		Zip	
Location ID	10	Location Name					Location Scale	Irregular Area		LS Code	6	
	State	Rhode Island	County	Providence	MCD	Pawtucket	HUC	01090005		State Basin		
	ST code	6	C code	2311	MCD code	2348	code	45		SB code		
	Latitude		Longitude				Location Determin Method			LDM Code		

Site ID	Site Type	Withdrawal Site Name	Conv ID	Action	Site ID	Site Type	Treatment Plant Site Name	Conv ID	Action	Site ID	Site Type	Regional Distribution System Site Name
6	3 well	CWS1 Well #5	4	33	11	17	CWS1 TP	9	50			
7	3	CWS1 Well #6	5	33								
8	3	CWS1 Well #7	6	33								
9	3	CWS1 Well #8	7	33								
10	8 intake	Happy Hollow Res int	8	18								

Site ID	Resource ID	Resource Name
6-9	5	Glacial-deposit aquifers
10	1	Happy Hollow Res

Location

ID	Site	LDM	Scale	State	CO	MCD	Latitude	Longitude
4	6	1	1	6	2311	2348	415437	0712302
5	7	1	1	6	2311	2348	415455	0712302
6	8	1	1	6	2311	2348	415504	0712300
7	9	1	1	6	2311	2348	415512	0712259
8	10	7	1	6	2311	2348	415700	0712500
9	11	7	1	6	2311	2348	415705	0712505
10	12	1	6	6	2311	2348	--	--
3	13,14,15	2	2	6	2311	2348	415224	0712228
11	16	1	7	--	--	--	--	--

Appendix 1_Figure 40a. Data for Case Study 3 on NEWUDS Community-Water System Input Form 6. (Form 6 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

Form 6. NEWUDS Input Form for Community-Water Systems

System ID: 2 System Name: CWS1

Site ID	Site Type	Local Distribution System Site Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action
12	12	CWS1 LDS	10	131	13	24	Pawt Dom Agg		
16	23	Unaccounted for Use	11	131	14	24	Pawt Com Agg		
			12	131	15	24	Pawt Ind Agg		
			13	150					

Site	Year	Population Served
12	1995	739,220

(Wastewater)

Site ID	Site Type	Local Collection or Return Site Name

Site ID	Resource ID	Resource Name

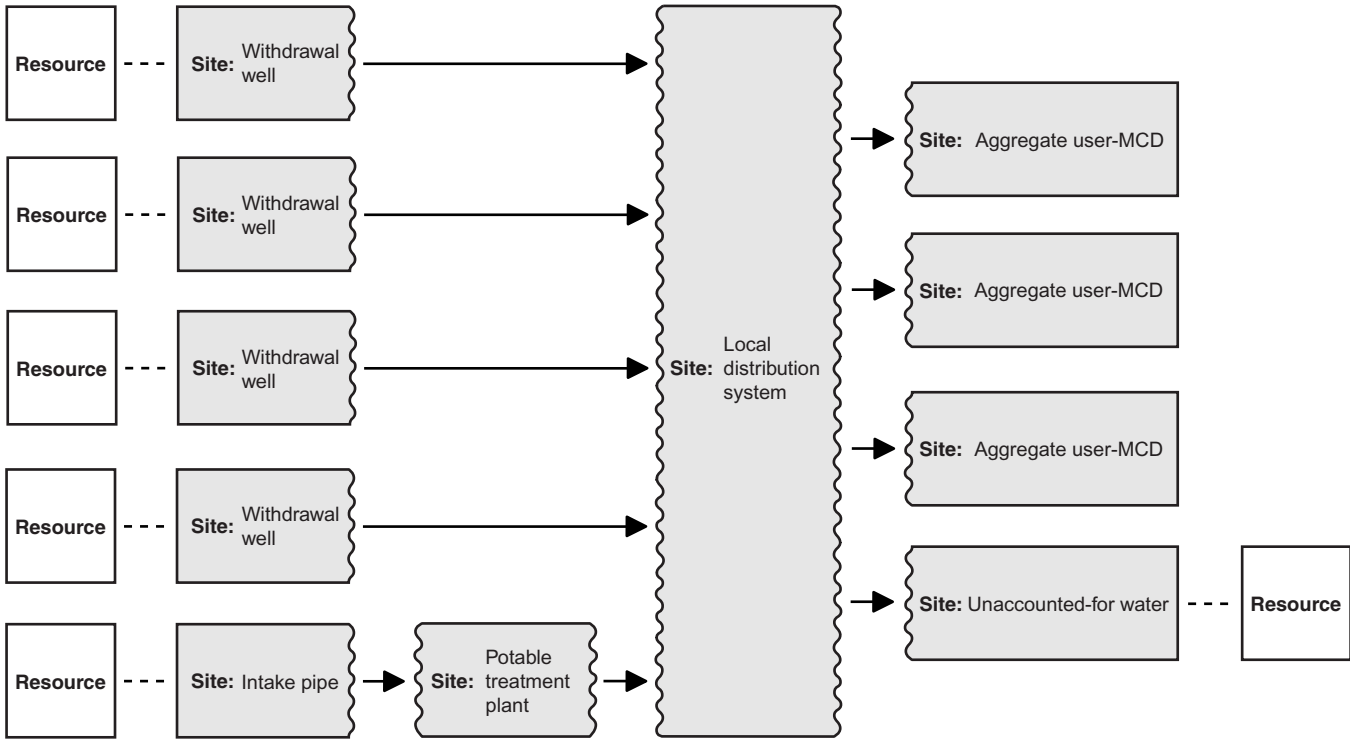
Appendix 1_Figure 40a. Data for Case Study 3 on NEWUDS Community-Water System Input Form 6--Continued.

Form 9. NEWUDS Transaction/Rate Data Input Form for System_ID 2

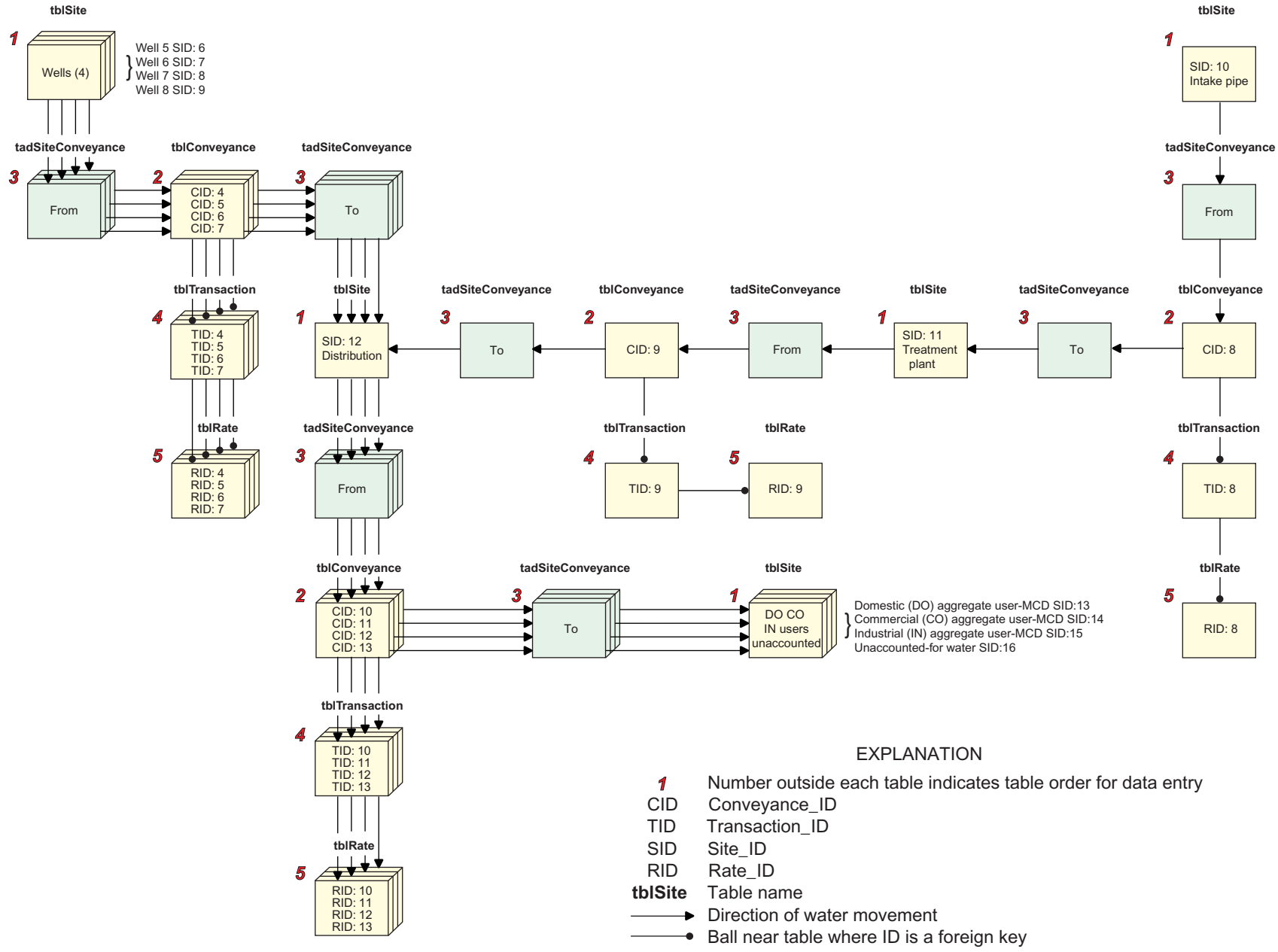
Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
4	6	12	4	2	1/1/95	12/31/95	4	2	41	1	3.00	1
5	7	12	5	2	1/1/95	12-31-95	5	2	41	1	3.00	1
6	8	12	6	2	1/1/95	12-31-95	6	2	41	1	3.00	1
7	9	12	7	2	1/1/95	12-31-95	7	2	41	1	2.00	1
8	10	11	8	2	1/1/95	12-31-95	8	2	41	1	69.00	1
9	11	12	9	2	1/1/95	12-31-95	9	2	41	40	69.00	1
10	12	13	10	2	1/1/95	12-31-95	10	2	5	20	48.00	1
11	12	14	11	2	1/1/95	12-31-95	11	2	5	20	5.20	1
12	12	15	12	2	1/1/95	12-31-95	12	2	5	20	16.00	1
13	12	16	13	2	1/1/95	12-31-95	13	2	5	43	10.80	1

Appendix 1_Figure 40b. Data for Case Study 3 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)

Network 3 (Case Study 3)



Appendix 1_Figure 41. Network 3: Diagram for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water. (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



Appendix 1_Figure 42. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water. (See figure 18 for explanation of box color.)

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value; WU Spec, water-use specialist]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	2		
	SystemType_ID	1	tdxSystemType	Community-water system
	SystemName	CWS1		
tblOwner	Owner_ID	3		
	OwnerType_ID	2	tdsOwnerType	Municipal
	OwnerName	CWS1		
	OwnerContact	John White		
	OwnerPhone	802-725-9492		
tblAddress	Address_ID	3		
	AddressType_ID	3	tdsAddressType	Mailing
	AddressLine1	456 Central Street		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	3		
	Address_ID	3		
tblLocation	Location_ID	4		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415437		
	Location-Longitude	0712302		
tadLocationHUC	Location_ID	4		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	6		
	Location_ID	4		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 5		
tblLocation	Location_ID	5		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415455		
	Location-Longitude	0712302		

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadLocationHUC	Location_ID	5		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	7		
	Location_ID	5		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 6		
tblLocation	Location_ID	6		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415504		
	Location-Longitude	0712300		
tadLocationHUC	Location_ID	6		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	8		
	Location_ID	6		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 7		
tblLocation	Location_ID	7		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415512		
	Location-Longitude	0712259		
tadLocationHUC	Location_ID	7		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	9		
	Location_ID	7		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 8		

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	8		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415700		
	Location-Longitude	0712500		
tadLocationHUC	Location_ID	8		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	10		
	Location_ID	8		
	Owner_ID	3		
	SiteType_ID	8	tdsSiteType	Intake pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Happy Hollow Reservoir Intake		
tblLocation	Location_ID	9		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415705		
	Location-Longitude	0712505		
tadLocationHUC	Location_ID	9		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	11		
	Location_ID	9		
	Owner_ID	3		
	SiteType_ID	17	tdsSiteType	Potable treatment plant
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 Treatment Plant		
tblLocation	Location_ID	10		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular Area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
tadLocationHUC	Location_ID	10		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	12		
	Location_ID	10		
	Owner_ID	3		
	SiteType_ID	12	tdsSiteType	Local distribution system
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 Local Distribution System		
tadSiteDetail	Site_ID	12		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	16	tdxDataSource	SDWIS-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetailValue	739220		
tblLocation	Location_ID	11		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	7	tdsLocationScale	Undefined
tadLocationHUC	Location_ID	11		
	HUC_ID	61	tdsHUC	99999999
	IsPrimaryHUC	Yes		
tblSite	Site_ID	16		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	23	tdsSiteType	Unaccounted-for-Water
	NEUseType_ID	78	tdsNEUseType	Non Use
	SIC_ID	1005	tdsSICUseType	0000 Unclassified
	SiteName	Unaccounted-for-Water		
tblLocation	Location_ID	3		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415224		
	Location-Longitude	0712228		
tadLocationHUC	Location_ID	3		
	HUC_ID	44	tdsHUC	01090004
	IsPrimaryHUC	Yes		
tblSite	Site_ID	13		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	67	tdsNEUseType	Domestic
	SIC_ID	MCD	tdsSICUseType	
	SiteName	Pawtucket MCD domestic users		

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	14		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SIC_ID	MCD	tdsSICUseType	
	SiteName	Pawtucket MCD commercial users		
tblSite	Site_ID	15		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	80	tdsNEUseType	Industrial
	SIC_ID	MCD	tdsSICUseType	
	SiteName	Pawtucket industrial users		
tasSystemSite	System_ID	2		
	Site_ID	6		
	System_ID	2		
	Site_ID	7		
	System_ID	2		
	Site_ID	8		
	System_ID	2		
	Site_ID	9		
	System_ID	2		
	Site_ID	10		
	System_ID	2		
	Site_ID	11		
	System_ID	2		
	Site_ID	12		
	System_ID	2		
	Site_ID	13		
	System_ID	2		
	Site_ID	14		
	System_ID	2		
	Site_ID	15		
tblResource	Resource_ID	5		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer - freshwater
	ResourceName	Glacial-deposit aquifer		
tblResource	Resource_ID	1		
	WaterBodyType_ID	3	tdsWaterBodyType	Reservoir
	ResourceName	Happy Hollow Reservoir		
tadSiteResource	Site_ID	6		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	7		
	Resource_ID	5	tblResource	Glacial-deposit aquifer

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteResource	Site_ID	8		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	9		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	10		
	Resource_ID	1	tblResource	Happy Hollow Reservoir
tblConveyance	Conveyance_ID	4		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	33	tdsConveyanceAction	Well to local distribution system
tadSiteConveyance	Conveyance_ID	4		
	FromOrTo	From		
	Site_ID	6		
	Conveyance_ID	4		
	FromOrTo	To		
	Site_ID	12		
tblConveyance	Conveyance_ID	5		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	33	tdsConveyanceAction	Well to local distribution system
tadSiteConveyance	Conveyance_ID	5		
	FromOrTo	From		
	Site_ID	7		
	Conveyance_ID	5		
	FromOrTo	To		
	Site_ID	12		
tblConveyance	Conveyance_ID	6		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	33	tdsConveyanceAction	Well to local distribution system
tadSiteConveyance	Conveyance_ID	6		
	FromOrTo	From		
	Site_ID	8		
	Conveyance_ID	6		
	FromOrTo	To		
	Site_ID	12		
tblConveyance	Conveyance_ID	7		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	33	tdsConveyanceAction	Well to local distribution system
tadSiteConveyance	Conveyance_ID	7		
	FromOrTo	From		
	Site_ID	9		
tadSiteConveyance	Conveyance_ID	7		
	FromOrTo	To		
	Site_ID	12		
tblConveyance	Conveyance_ID	8		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	18	tdsConveyanceAction	Intake pipe to Potable treatment plant

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	8		
	FromOrTo	From		
	Site_ID	10		
	Conveyance_ID	8		
	FromOrTo	To		
	Site_ID	11		
tblConveyance	Conveyance_ID	9		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	50	tdsConveyanceAction	Potable treatment plant to local distribution system
tadSiteConveyance	Conveyance_ID	9		
	FromOrTo	From		
	Site_ID	11		
	Conveyance_ID	9		
	FromOrTo	To		
	Site_ID	12		
tblConveyance	Conveyance_ID	10		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	10		
	FromOrTo	From		
	Site_ID	12		
	Conveyance_ID	10		
	FromOrTo	To		
	Site_ID	13		
tblConveyance	Conveyance_ID	11		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	11		
	FromOrTo	From		
	Site_ID	12		
	Conveyance_ID	11		
	FromOrTo	To		
	Site_ID	14		
tblConveyance	Conveyance_ID	12		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	12		
	FromOrTo	From		
	Site_ID	12		
	Conveyance_ID	12		
	FromOrTo	To		
	Site_ID	15		

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblConveyance	Conveyance_ID	13		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	150	tdsConveyanceAction	Local distribution system to Unaccounted-for use
tadSiteConveyance	Conveyance_ID	13		
	FromOrTo	From		
	Site_ID	12		
	Conveyance_ID	13		
	FromOrTo	To		
	Site_ID	16		
tblTransaction	Transaction_ID	4		
	Conveyance_ID	4		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	5		
	Conveyance_ID	5		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	6		
	Conveyance_ID	6		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	7		
	Conveyance_ID	7		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	8		
	Conveyance_ID	8		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	9		
	Conveyance_ID	9		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	10		
	Conveyance_ID	10		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	11		
	Conveyance_ID	11		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	12		
	Conveyance_ID	12		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	13		
	Conveyance_ID	13		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	4		
	Transaction_ID	4		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	3.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	5		
	Transaction_ID	5		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	3.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	6		
	Transaction_ID	6		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	3.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	7		
	Transaction_ID	7		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	2.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	8		
	Transaction_ID	8		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	69.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	9		
	Transaction_ID	9		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	40	tdxRateMethod	Estimated as same as metered rate
	RawRateValue	69.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	10		
	Transaction_ID	10		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	48.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	11		
	Transaction_ID	11		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	5.20		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	12		
	Transaction_ID	12		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec

Appendix 1_Table 14. Data entry into NEWUDS tables for Case Study 3: Withdrawal and distribution by a simple community-water system (CWS1) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	16.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	13		
	Transaction_ID	13		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawal/return and estimated distribution/collection
	RawRateValue	10.80		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 4: Use and Return by a Single User (MSS2)

Case 4: *A major privately-owned industrial user, MSS2, 789 Main St., Pawtucket, R.I., in the Blackstone River Basin had a discharge pipe into the Blackstone River during 1995. MSS2 has a Standard Industrial Classification (SIC) code of 2015 and employs 4,264 people. Contact is John Smith, 802-254-6789.*

Step 1: Determine water-use values and location information.

Use metered data in determining returns by major users, if possible. If metered data cannot be obtained, returns can be estimated based on user attributes using water-use coefficients. For example, MSS2 with a Standard Industrial Classification (SIC) Code of 2015, employs 4,264 people. Applying the median water-use coefficient of 469 gal/employee (Planning and Management Consultants, Ltd., 1995) for this SIC Code results in 2.0 Mgal/d. A default consumptive use coefficient of 10 percent is usually applied and subtracted from use. In this case, however, to make the numbers work out, a value of 50 percent was applied and subtracted from use (0.50 x 2.0 Mgal = 1.0 Mgal; 2.0 Mgal/d use – 1.0 Mgal/d consumptive use = 1.0 Mgal/d returns).

Step 2: Fill in NEWUDS Input Form 1 as shown in Appendix 1_figure 43a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 43b.

Data for the white boxes in Appendix 3_Form 1 come from received and derived information. For example, the address was received and used to determine the latitude and longitude. The location data were used to determine the HUC. After the white areas are filled in, the gray boxes are filled in using the domain tables in Appendix 2.

Step 3: Choose a Network 4 diagram to identify the number and type of required Sites and modify as needed. One single user Site, one discharge pipe Site, and one atmosphere Site are required (Appendix 1_fig. 44).

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 45.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 15.

Form 1. NEWUDS Input Form for Single Users

System ID	3	System Name	MSS2	System Type	User	Use Type	Industrial	NEUse Code	34		
				code		SIC Code	2015	SIC Code code	118		
Owner ID	4	Owner Name	MSS2	Owner Type	Private	Contact Name	John Smith				
				code	1	Phone	8022546789				
Address ID	4	Mail Line1	789 Main St	Street Line1		Address type code	1				
		Mail Line2		Street Line2							
	City	Pawtucket	State	RI	Zip	02701	City		State		Zip	
Location ID	12	Location Name		Location Scale	Point	Location Scale Code	1				
	State	RI	County	Providence	MCD	Pawtucket	HUC	01090005	State Basin		
	code	6	code	2311	code	2348	code	45	code		
	Latitude	415220	Longitude	0712200	Location Det Method	Atlas software	LDM code	7			

Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
					17	20	MSS2 Plant	14	62	18	9 outfall	MSS2 discharge pipe to Blackstone River
					25	22	CU (Loc_ID = 11)					

Site ID	Resource ID	Resource Name

1995 1.0 Mgal/d returned to Blackstone River. Estimated by USGS. All sites co-located. Consumptive use 1.0 Mgal/d (50%). Number of employees: 4264. SIC Code: 2015

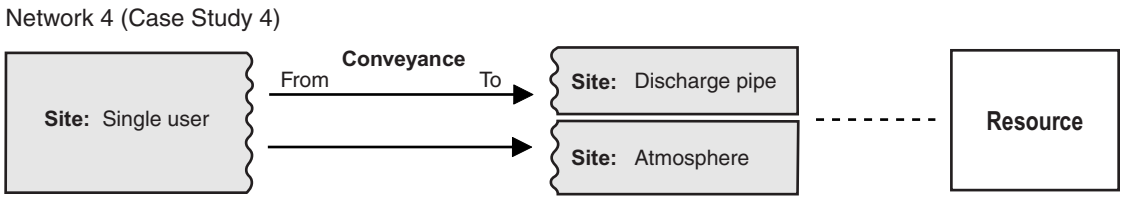
Site ID	Resource ID	Resource Name
18	19	Blackstone River

Appendix 1_Figure 43a. Data for Case Study 4 on NEWUDS Single User Input Form 1. (Form 1 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

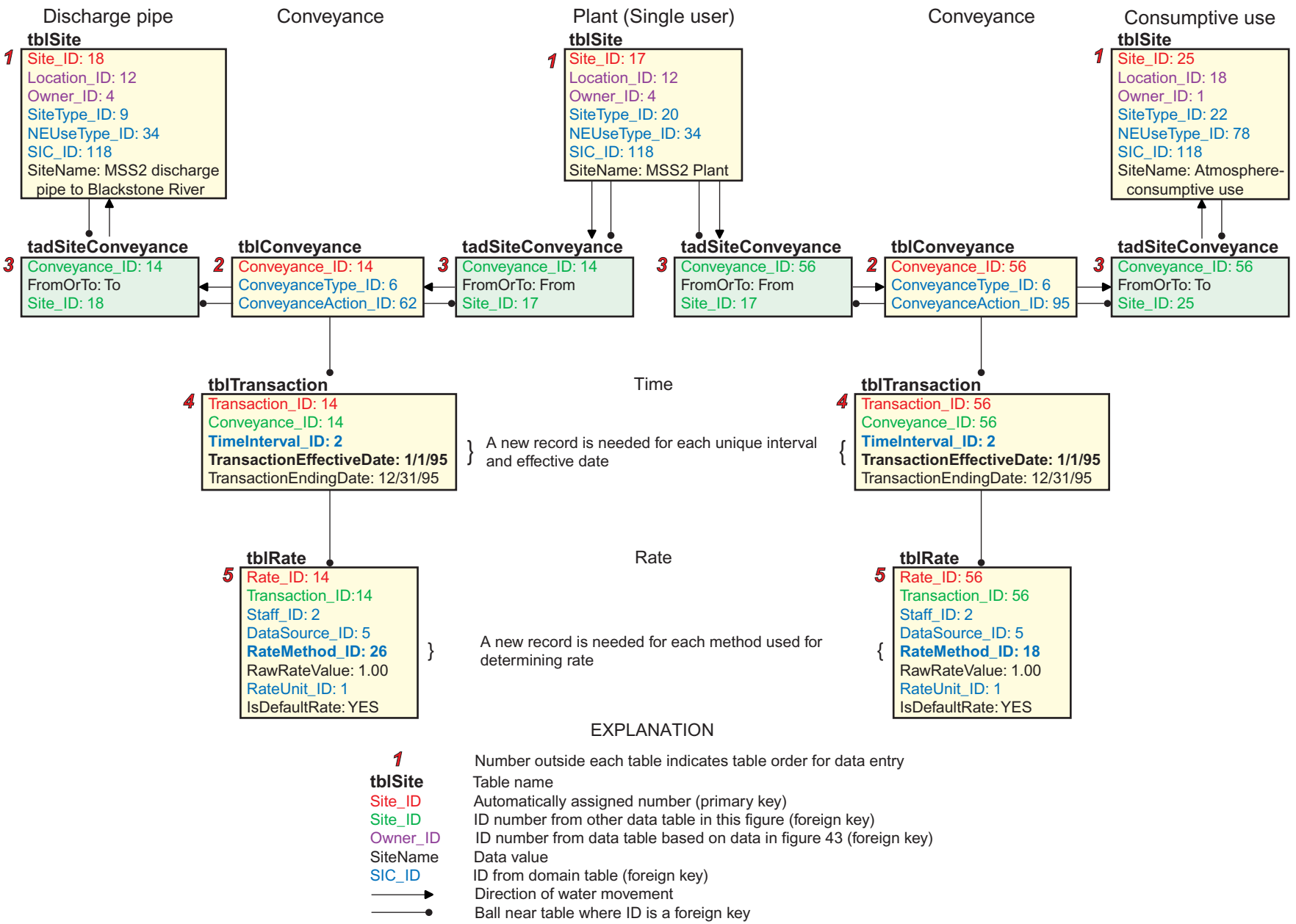
Form 9. NEWUDS Transaction/Rate Input Data Form for System_ID 3

Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
14	17	18	14	2	1/1/95	12/31/95	14	2	5	26	1.00	1
56	17	25	56	2	1/1/95	12/31/95	56	2	5	18	1.00	1

Appendix 1_Figure 43b. Data for Case Study 4 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)



Appendix 1_Figure 44. Network 4: Diagram for Case Study 4: Use, consumptive use, and return by a single user (MSS2). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



Appendix 1_Figure 45. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 4: Use, consumptive use, and return by a single user (MSS2). (See figure 18 for explanation of box color.)

Appendix 1_Table 15. Data entry into NEWUDS tables for Case Study 4: Use and return by a Single User (MSS2)

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	3		
	SystemType_ID	4	tdxSystemType	User
	SystemName	MSS2		
tblOwner	Owner_ID	4		
	OwnerType_ID	1	tdsOwnerType	Private
	OwnerName	MSS2		
	OwnerContact	John Smith		
	OwnerPhone	802-254-6789		
tblAddress	Address_ID	4		
	AddressType_ID	1	tdsAddressType	Both mailing and street
	AddressLine1	789 Main St		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	4		
	Address_ID	4		
tblLocation	Location_ID	11		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	7	tdsLocationScale	Undefined
tblLocation	Location_ID	12		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415220		
	Location-Longitude	0712200		
tadLocationHUC	Location_ID	12		
	HUC_ID	45	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	17		
	Location_ID	12		
	Owner_ID	4		
	SiteType_ID	20	tdsSiteType	Single User
	NEUseType_ID	34	tdsNEUseType	Food
	SIC_ID	118	tdsSICUseType	2015 Poultry Processing
	SiteName	MSS2 Plant		
tblSite	Site_ID	18		
	Location_ID	12		
	Owner_ID	4		
	SiteType_ID	9	tdsSiteType	Discharge pipe
	NEUseType_ID	34	tdsNEUseType	Food
	SIC_ID	118	tdsSICUseType	2015 Poultry Processing
	SiteName	MSS1 discharge pipe to Blackstone River		
	Site_ID	25		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	22	tdsSiteType	Atmosphere

Appendix 1_Table 15. Data entry into NEWUDS tables for Case Study 4: Use and return by a Single User (MSS2)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	NEUseType_ID	78	tdsNEUseType	Non Use
	SiteName	Atmosphere-Consumptive Use		
tasSystemSite	System_ID	3		
	Site_ID	17		
	System_ID	3		
	Site_ID	18		
tadSiteDetail	Site_ID	17		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	2	tdxSiteDetailLabel	Number of employees
	DataSource_ID	2	tdxDataSource	Dun & Bradstreet Information Service
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetaiValue	4264		
tblResource	Resource_ID	19		
	WaterBodyType_ID	1	tdsWaterBodyType	River/stream - freshwater
	ResourceName	Blackstone River		
tblConveyance	Conveyance_ID	14		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	62	tdsConveyanceAction	Single user to Discharge Pipe
tblConveyance	Conveyance_ID	56		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	95	tdsConveyanceAction	Single user to Atmosphere
tadSiteConveyance	Conveyance_ID	14		
	FromOrTo	From		
	Site_ID	17		
tadSiteConveyance	Conveyance_ID	14		
	FromOrTo	To		
	Site_ID	18		
tadSiteConveyance	Conveyance_ID	56		
	FromOrTo	From		
	Site_ID	17		
tadSiteConveyance	Conveyance_ID	56		
	FromOrTo	To		
	Site_ID	25		
tblTransaction	Transaction_ID	14		
	Conveyance_ID	14		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	56		
	Conveyance_ID	56		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	14		
	Transaction_ID	14		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	26	tdxRateMethod	Water-use value multiplied by consumptive-use percentage

Appendix 1_Table 15. Data entry into NEWUDS tables for Case Study 4: Use and return by a Single User (MSS2)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	RawRateValue	1.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	56		
	Transaction_ID	56		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	18	tdxRateMethod	Unknown method
	RawRateValue	1.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	19		
	Transaction_ID	19		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawal/return and estimated distribution/collection
	RawRateValue	56.30		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	20		
	Transaction_ID	20		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	42	tdxDataSource	WTP1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	110.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	21		
	Transaction_ID	21		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	42	tdxDataSource	WTP1
	RateMethod_ID	40	tdxRateMethod	Estimated as same as metered rate
	RawRateValue	110.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 5: Use and Return by an Aggregate of Users (Aggregate User-HUC)

Case 5: *Industrial Users in the Blackstone River Basin returned an average of 5.4 Mgal/d to ground water during 1995.*

Step 1: Determine water-use values and location information.

A suggested method for estimating aggregated water use is presented here and can be followed using Form 2 in Appendix 3. A blank Form 2 and an explanatory Form 2 are provided. Detailed description of this method for estimating aggregated return is in Horn (2000).

(1.) Estimate total commercial and industrial use for an area based on SIC code, employee number, and SIC code/employee coefficient[2] (or any other reliable method).

(2.) Estimate total domestic use for an area based on population and per capita coefficient (between 60 to 100 gal/d/person).

(3.) Estimate use by minor users by category by subtracting water used by major users from total water use by category.

(4.) Estimate the percentage of population using community-wastewater-collection systems (sewer systems) from either Census Bureau estimates or community-wastewater system values for population served.

(5.) Estimate consumptive use by minor users by category (default values may be 10 percent for commercial and industrial use and 15 percent of domestic use).

(6.) Multiply the use values for minor users by category (steps 3 and 5) by percentage of users not served by community-wastewater systems (step 4) to determine the direct return values for aggregates of minor commercial, industrial, and domestic users.

Step 2: Fill in NEWUDS Input Form 3 for aggregate of users as shown in Appendix 1_figure 46.

Step 3: Choose Network 5 diagram to identify the number and type of required Sites (Appendix 1_fig. 47). One aggregate user-HUC Site and one ground water return flow Site are required.

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 48.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 16.

[2]Planning and Management Consultants, Ltd., 1995.

Form 3. NEWUDS Input Form for Aggregate of Users

System ID		7	System Name	01090005 HUC Aggregated Users	
Owner ID	1		System Type code	5	
Location ID		13	Location Name	01090005 HUC	
			Location Determination Method Code	1	Location Scale Code
State	--		--	CO Code	--
State code	--	MCD	--	MCD code	--

Site ID	Use Code	Site Type	Ground-water Withdrawal	Resource ID	Resource Name
	78	1			
	78	1			
	78	1			

Site ID	Use	Site Type	Local Distribution System
	60	12	
	60	12	
	60	12	
	60	12	

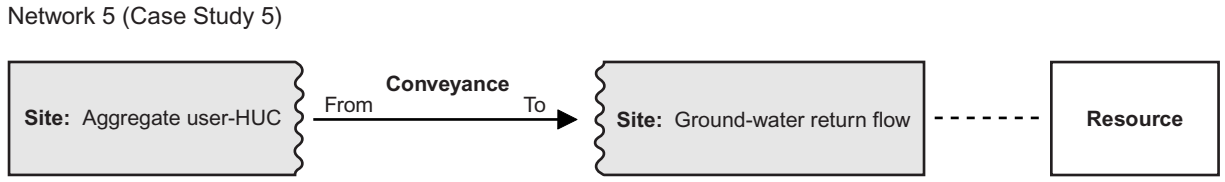
Site ID	Use	Site Type	User	From Sites	To Sites
	67	24	DOM		
	79	24	COM		
19	80	24	IND		20
	1	24	IRR		
	81	24	LVS		
		24			

Site ID	Use	Site Type	Local Collection System	
	61	14		
	61	14		
	61	14		

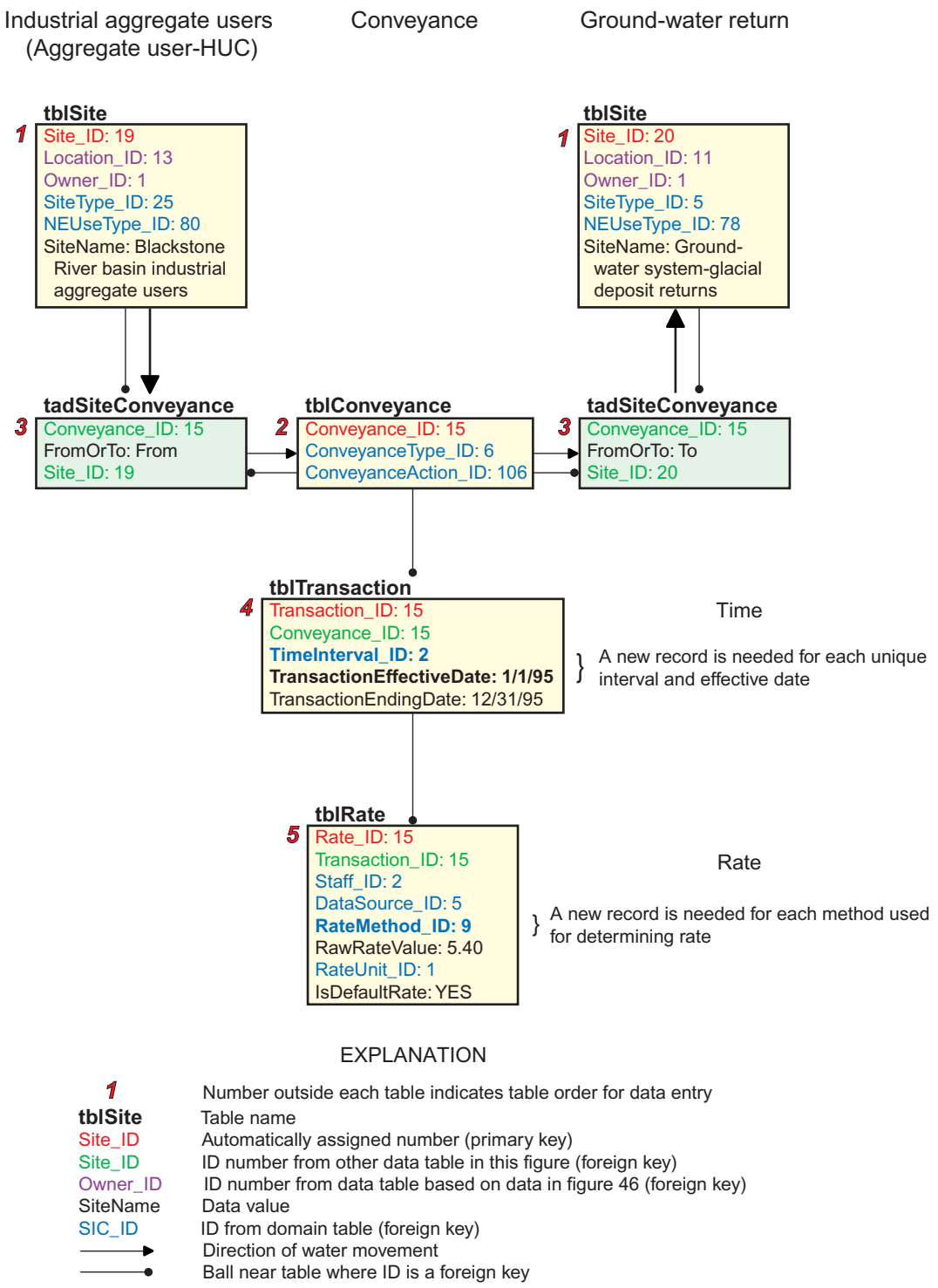
Site ID	Use	Site Type	Ground-water Return	Resource ID	Resource Name
20	78	5	5.4 Mgal/d 1995	5	Glacial-deposit aquifer
	78	5			
	78	5			

From Site ID	To Site ID	Conveyance ID	Action	From Site ID	To Site ID	Conveyance ID	Action
19	20	15	106				

Appendix 1_Figure 46. Data for Case Study 5 on NEWUDS Aggregate Users Input Form 3. (Form 3 is in Appendix 3.)



Appendix 1_Figure 47. Network 5: Diagram for Case Study 5: Use and return by an aggregate of users (Aggregate user-HUC). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



Appendix 1_Figure 48. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 5: Use and return by an aggregate of users (Aggregate User-HUC). (See figure 18 for explanation of box color.)

Appendix 1_Table 16. Data entry into NEWUDS tables for Case Study 5: Use and Return by an Aggregate of Users (Aggregate User-HUC)

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	7		
	SystemType_ID	8	tdxSystemType	HUC
	SystemName	Blackstone River Basin		
tblOwner	Owner_ID	1		
	OwnerType_ID	0	tdsOwnerType	None
tblLocation	Location_ID	11		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	7	tdsLocationScale	Undefined
tblLocation	Location_ID	13		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	5	tdsLocationScale	HUC
tadLocationHUC	Location_ID	13		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	19		
	Location_ID	13		
	Owner_ID	1		
	SiteType_ID	25	tdsSiteType	Aggregate User-HUC
	NEUseType_ID	80	tdsNEUseType	Industrial Use
	SiteName	Blackstone River basin Industrial aggregated users		
tblSite	Site_ID	20		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	5	tdsSiteType	Ground-water return
	NEUseType_ID	78	tdsNEUseType	Non Use
	SiteName	Ground-water system-glacial deposit returns		
tasSystemSite	System_ID	7		
	Site_ID	19		
tblResource	Resource_ID	5		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer - freshwater
	ResourceName	Glacial-deposit aquifer		
tadSiteResource	Site_ID	19		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
tblConveyance	Conveyance_ID	15		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	106	tdsConveyanceAction	Aggregate user – HUC to ground-water return flow
tadSiteConveyance	Conveyance_ID	15		
	FromOrTo	From		
	Site_ID	19		
tadSiteConveyance	Conveyance_ID	15		
	FromOrTo	To		
	Site_ID	20		

Appendix 1_Table 16. Data entry into NEWUDS tables for Case Study 5: Use and Return by an Aggregate of Users (Aggregate User-HUC)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	15		
	Conveyance_ID	15		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	15		
	Transaction_ID	15		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	9	tdxRateMethod	IWR-MAIN coefficient with Dun & Bradstreet values
	RawRateValue	5.40		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 6: Collection and Return by a Simple Community-Wastewater System (WTP1)

Case 6: *A wastewater-treatment plant, WTP1, 123 Utility St., Pawtucket, R.I., returned 110.0 Mgal/d of wastewater to the Blackstone River in 1991 according to monthly meter records at the wastewater-treatment plant.*

Step 1: Determine water-use values and location information.

The information included in Case 6 is typical of information made available from community-wastewater systems or State agencies. However, wastewater collection from commercial, industrial, and domestic users and inflow and infiltration are important water-use values that need to be determined. Case 5 provides guidance in estimating total commercial, industrial, and domestic use and the portion of this use that is returned directly to the resource. In Case 6, subtracting use returned directly to the resource from total use minus consumptive use yields the following: wastewater collection from domestic users were 35.7 Mgal/d, from industrial users 12.6 Mgal/d, and from commercial users 4.1 Mgal/d. Finally, inflow and infiltration was estimated as the difference between wastewater collection from users and the volume metered at the treatment plant, or 57.6 Mgal/d.

Step 2: Fill in NEWUDS Input Form 8 as shown in Appendix 1_figure 49a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 49b.

Step 3: Choose Network Diagram to identify the number and type of required Sites (Appendix 1_fig. 50).

Three aggregate user-MCD, one inflow and infiltration, one local collection system, one wastewater treatment plant, and one discharge pipe Sites are required.

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 51.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 17.

Form 8. NEWUDS Input Form for Community-Wastewater Systems

System ID	4	System Name	WTP1			System Type	com wstwtr	Use		Use code	61
						ST code	2				
Owner ID	5	Owner Name	WTP1			Owner Type	Municipal	Contact Name	John Brown		
						OT code	2	Phone	5087615167		
Address ID	5	Mail Line1	123 Utility St			Street Line1				Address type code	3
		Mail Line2				Street Line2					
	City	Pawtucket	State	RI	Zip 02701	City		State		Zip	
Location ID	13	Location Name	WTP1 LCS			Location Scale	Irregular		LS Code	6	
	State	Rhode Island	County	Providence	MCD Pawtucket		HUC	01090005	State Basin		
	ST code	6	C code	2311	MCD code 2348		code	45	SB code		
	Latitude	--	Longitude	--	Location Determin Method			Unknown	LDM Code	1	

Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Local Collection Site Name	Conv ID	Action	Site ID	Site Type	Regional Collection System Site Name
13	24	Pawt Dom Agg	16	103	21	14	WTP1	20	70			
14	24	Pawt Com Agg	17	103	22	27	Inflow & Infiltration					
15	24	Pawt Ind Agg	18	103								
			19	152								

Location

ID	Site	LDM	Scale	State	CO	MCD	Latitude	Longitude
3	13,14, 15	2	2	6	2311	2348	415224	0712228
14	21	1	6	6	2311	2348	--	--
15	22	7	1	--	--	--	--	--
16	23	7	1	6	2311	2348	415100	0712013
17	24	7	1	6	2311	2348	415105	0712910

Appendix 1_Figure 49a. Data for Case Study 6 on NEWUDS Community-Wastewater System Input Form 8. (Form 8 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

Form 8. NEWUDS Input Form for Community-Wastewater Systems

System ID: 4

System Name:

Site ID	Site Type	Treatment Plant Site Name	Conv ID	Action	Site ID	Site Type	Discharge Pipe Site Name	Conv ID	Action	Site ID	Site Type	Local Distribution or Withdrawal Site Name
23	19	WTP1 TP	21	85	24	9	WTP1 discharge pipe to					
							Blackstone River					

(Freshwater)

Site ID	Resource ID	Resource Name

Site ID	Resource ID	Resource Name
24	19	Blackstone River
22	18	General ground water

Site	Year	Population Served	
21	1995	646,800	

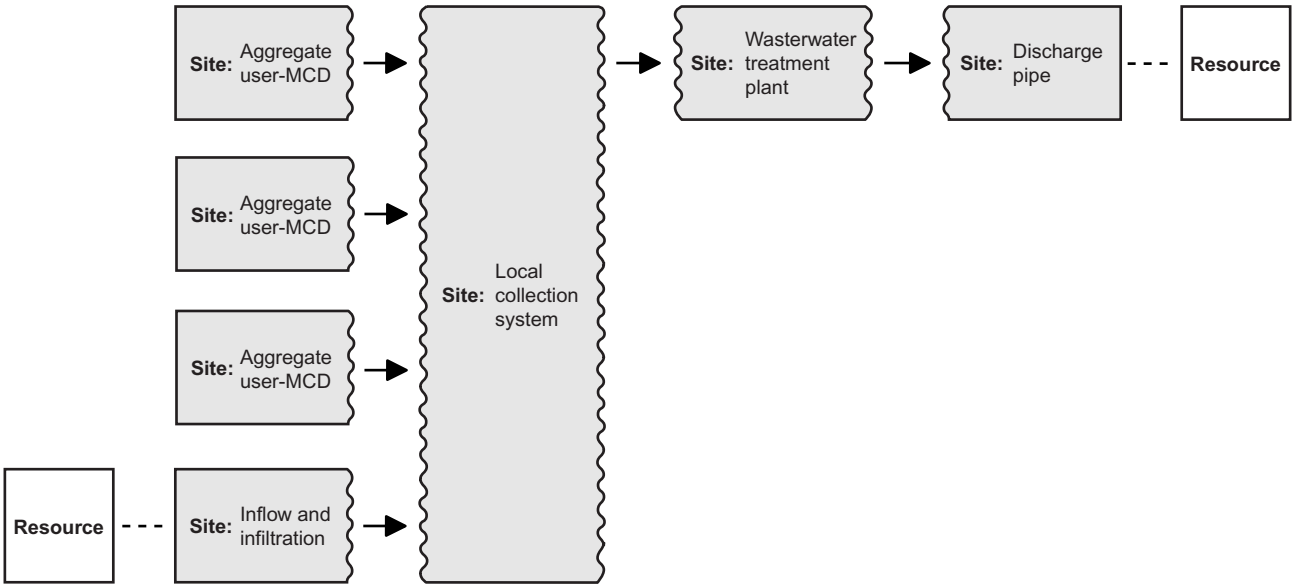
Appendix 1_Figure 49a. Data for Case Study 6 on NEWUDS Community-Wastewater System Input Form 8--Continued.

Form 9. NEWUDS Transaction Input Form for System_ID 4

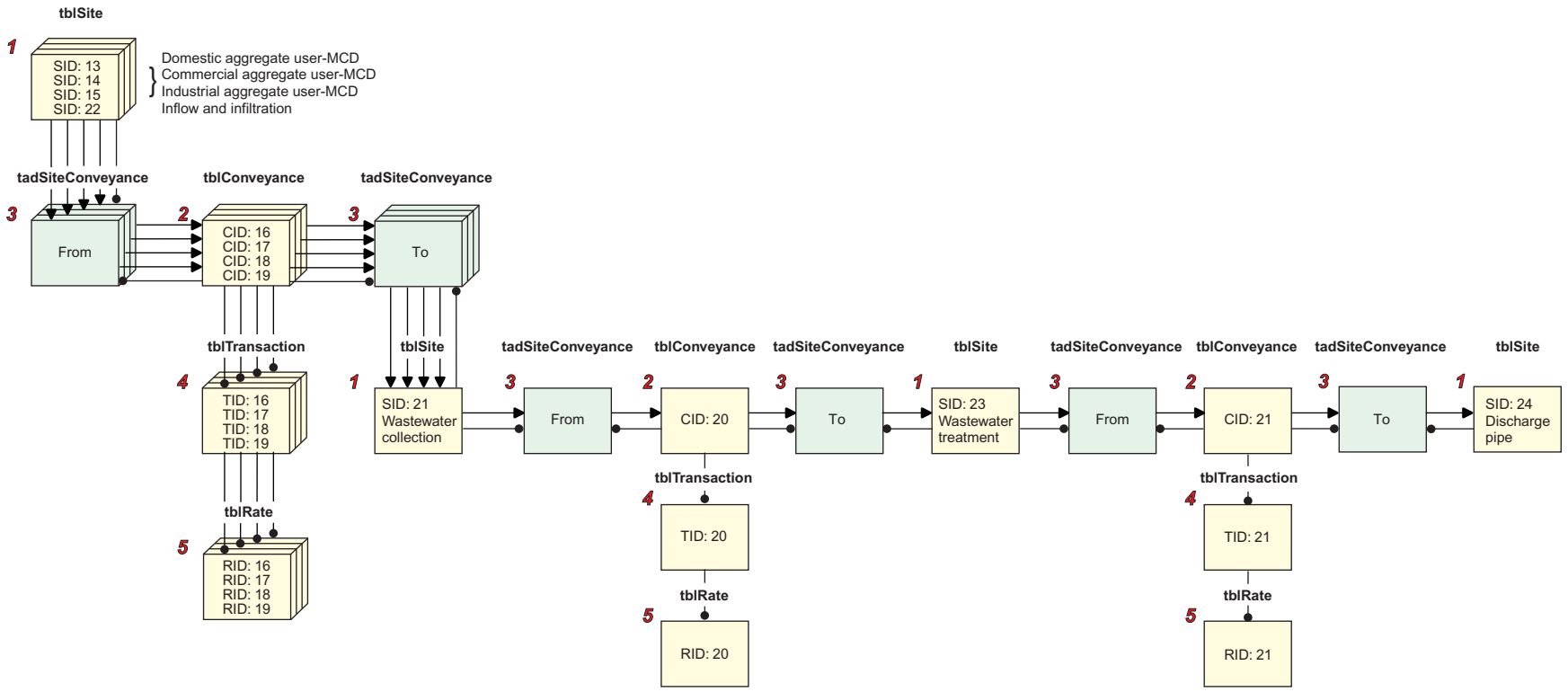
Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
16	13	21	16	2	1/1/95	12/31/95	16	2	5	20	35.70	1
17	14	21	17	2	1/1/95	12/31/95	17	2	5	20	4.10	1
18	15	21	18	2	1/1/95	12/31/95	18	2	5	20	12.60	1
19	22	21	19	2	1/1/95	12/31/95	19	2	5	43	57.60	1
20	21	23	20	2	1/1/95	12/31/95	20	2	42	1	110.00	1
21	23	24	21	2	1/1/95	12/31/95	21	2	42	40	110.00	1

Appendix 1_Figure 49b. Data for Case Study 6 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)

Network 6 (Case Study 6)



Appendix 1_Figure 50. Network 6: Diagram for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration. (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



EXPLANATION

1	Number outside each table indicates table order for data entry
SID	Site_ID
CID	Conveyance_ID
TID	Transaction_ID
RID	Rate_ID
tblSite	Table name
⟶	Direction of water movement
●⟶	Ball near table where ID is a foreign key

Appendix 1_Figure 51. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration. (See figure 18 for explanation of box color.)

Appendix 1_Table 17. Data entry into NEWUDS tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value; WU Spec, water-use specialist]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	4		
	SystemType_ID	2	tdxSystemType	Community Wastewater System
	SystemName	WTP1		
tblOwner	Owner_ID	5		
	OwnerType_ID	2	tdsOwnerType	Municipal
	OwnerName	WTP1		
	OwnerContact	John Brown		
	OwnerPhone	802-761-5167		
tblAddress	Address_ID	5		
	AddressType_ID	3	tdsAddressType	Mailing
	AddressLine1	123 Utility Street		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	5		
	Address_ID	5		
tblLocation	Location_ID	3		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415224		
	Location-Longitude	0712228		
tadLocationHUC	Location_ID	3		
	HUC_ID	44	tdsHUC	010900044
	IsPrimaryHUC	Yes		
tblSite	Site_ID	13		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User--MCD
	NEUseType_ID	67	tdsNEUseType	Domestic
	SiteName	Pawtucket MCD Domestic users		
tblSite	Site_ID	14		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User—MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SiteName	Pawtucket MCD Commercial users		

Appendix 1_Table 17. Data entry into NEWUDS tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	15		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User—MCD
	NEUseType_ID	80	tdsNEUseType	Industrial
	SiteName	Pawtucket MCD Industrial users		
tblLocation	Location_ID	11		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	7	tdsLocationScale	Undefined
tblSite	Site_ID	22		
	Location_ID	15		
	Owner_ID	1		
	SiteType_ID	27	tdsSiteType	Inflow and Infiltration
	NEUseType_ID	78	tdsNEUseType	Non Use
	SiteName	Inflow and Infiltration		
tblLocation	Location_ID	14		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
tadLocationHUC	Location_ID	14		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	21		
	Location_ID	14		
	Owner_ID	5		
	SiteType_ID	14	tdsSiteType	Local collection system
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 Local Collection System		
tblLocation	Location_ID	16		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415100		
	Location-Longitude	0712013		
tadLocationHUC	Location_ID	16		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		

Appendix 1_Table 17. Data entry into NEWUDS tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	23		
	Location_ID	16		
	Owner_ID	5		
	SiteType_ID	19	tdsSiteType	Wastewater Treatment Plant
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 Wastewater Treatment Plant		
tblLocation	Location_ID	17		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas Software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415105		
	Location-Longitude	0712010		
tadLocationHUC	Location_ID	17		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	24		
	Location_ID	17		
	Owner_ID	5		
	SiteType_ID	9	tdsSiteType	Discharge Pipe
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 discharge pipe to Blackstone River		
tadSiteDetail	Site_ID	21		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	16	tdxDataSource	NPDES-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetaiValue	646800		
tasSystemSite	System_ID	4		
	Site_ID	13		
	System_ID	4		
	Site_ID	14		
	System_ID	4		
	Site_ID	15		
	System_ID	4		
	Site_ID	21		
	System_ID	4		
	Site_ID	22		
tasSystemSite	System_ID	4		
	Site_ID	23		
	System_ID	4		
	Site_ID	24		

Appendix 1_Table 17. Data entry into NEWUDS tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
	Resource_ID	5		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer - freshwater
	ResourceName	Glacial-deposit aquifers		
tblResource	Resource_ID	19		
	WaterBodyType_ID	1	tdsWaterBodyType	River/stream
	ResourceName	Blackstone River		
tadSiteResource	Site_ID	22		
	Resource_ID	18	tblResource	Glacial-deposit aquifer
	Site_ID	24		
	Resource_ID	19	tblResource	Blackstone River
tblConveyance	Conveyance_ID	16		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	16		
	FromOrTo	From		
	Site_ID	13		
	Conveyance_ID	16		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	17		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	17		
	FromOrTo	From		
	Site_ID	14		
	Conveyance_ID	17		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	18		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	18		
	FromOrTo	From		
	Site_ID	15		
	Conveyance_ID	18		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	19		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	152	tdsConveyanceAction	Inflow and infiltration to local collection system
tadSiteConveyance	Conveyance_ID	19		
	FromOrTo	From		
	Site_ID	22		

Appendix 1_Table 17. Data entry into NEWUDS tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
	Conveyance_ID	19		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	20		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	70	tdsConveyanceAction	Local collection system to wastewater treatment plant
tadSiteConveyance	Conveyance_ID	20		
	FromOrTo	From		
	Site_ID	21		
	Conveyance_ID	20		
	FromOrTo	To		
	Site_ID	23		
tblConveyance	Conveyance_ID	21		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	85	tdsConveyanceAction	Wastewater treatment plant to discharge pipe
tadSiteConveyance	Conveyance_ID	21		
	FromOrTo	From		
	Site_ID	23		
	Conveyance_ID	21		
	FromOrTo	To		
	Site_ID	24		
tblTransaction	Transaction_ID	16		
	Conveyance_ID	16		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	17		
	Conveyance_ID	17		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	18		
	Conveyance_ID	18		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	19		
	Conveyance_ID	19		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 17. Data entry into NEWUDS tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	20		
	Conveyance_ID	20		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	21		
	Conveyance_ID	21		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	16		
	Transaction_ID	16		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	35.70		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	17		
	Transaction_ID	17		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	4.10		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	18		
	Transaction_ID	18		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	12.60		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 17. Data entry into NEWUDS tables for Case Study 6: Collection and return by a simple community-wastewater system (WTP1) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	19		
	Transaction_ID	19		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
tblRate	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawal/return and estimated distribution/collection
	RawRateValue	57.60		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	20		
	Transaction_ID	20		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	42	tdxDataSource	WTP1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	110.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	21		
	Transaction_ID	21		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	42	tdxDataSource	WTP1
	RateMethod_ID	40	tdxRateMethod	Estimated as same as metered rate
	RawRateValue	110.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 7: Withdrawal, Use, and Return by a Simple User (MSS1)

Case 7: *A major self-supplied water user, MSS1, in Pawtucket, R.I., was estimated by the USGS to withdraw an average of 1.5 Mgal/d from each of two glacial-deposit-aquifer wells during 1995, after which discharge was to the septic system.*

Step 1: Determine water-use values and location information.

Case Study 7 is a continuation of Case Study 1, in which MSS1 was estimated to withdraw a total of 3.00 Mgal/d from two glacial-deposit-aquifer wells during 1995. Consumptive use (evaporation) was determined to be 1.0 Mgal/d so that discharge to the septic system was 2.0 Mgal/d.

Step 2: Fill in NEWUDS Single user Input Form as shown in Appendix 1_figure 52a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 52b.

Step 3: Choose Network 7 diagram to identify the number and type of required Sites (Appendix 1_fig. 53).

Two withdrawal well, one single user, one ground water return flow, and one atmosphere Sites are required.

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 54.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 18.

Form 1. NEWUDS Input Form for Single Users

System ID	1	System Name	MSS1	System Type	User	Use Type	Industrial	NEUse Code	40
				code	4	SIC code	2611	SIC Code code	253
Owner ID	2	Owner Name	MSS1	Owner Type	Private	Contact Name	John Doe		
				code	1			Phone	8022546789
Address ID	2	Mail Line1	123 Main St	Street Line1				Address type code	1
		Mail Line2		Street Line2					
		City	Pawtucket	State	RI	Zip	02701	City	
		State		Zip					
Location ID	2	Location Name		Location Scale	Point			Location Scale Code	1
		State	RI	County	Providence	MCD	Pawtucket	HUC	01090004
		code	6	code	2311	code	2348	code	44
		Latitude	415400	Longitude	0712400	Location Det Method	Atlas software	LDM code	7

Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
1	3 well	MSS1 Well 1	1	39	3	20	MSS1 Plant	22	95	26	5 Septic	MSS1 Septic
2	3	MSS1 Well 2	2	39	25	22	CU (Loc_ID = 11)	23	61			

Site ID	Resource ID	Resource Name
1	5	Glacial-deposit aquifer

1995 1.5 Mgal/d each well. Estimated by USGS by employee/SIC water-use coefficient. All sites co-located.
Number of employees: 3476. SIC Code: 2611
Location_ID for Consumptive Use is “11”

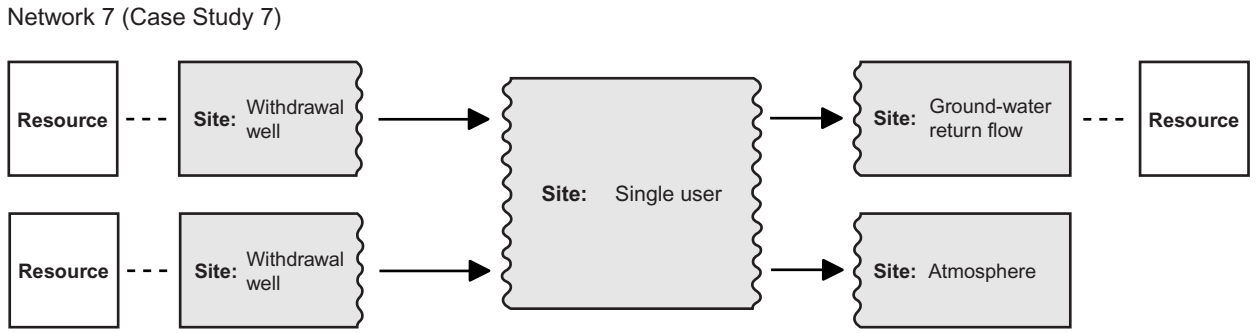
Site ID	Resource ID	Resource Name
26	5	Glacial-deposit aquifer

Appendix 1_Figure 52a. Data for Case Study 7 on NEWUDS Single user Input Form 1. (Form 1 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

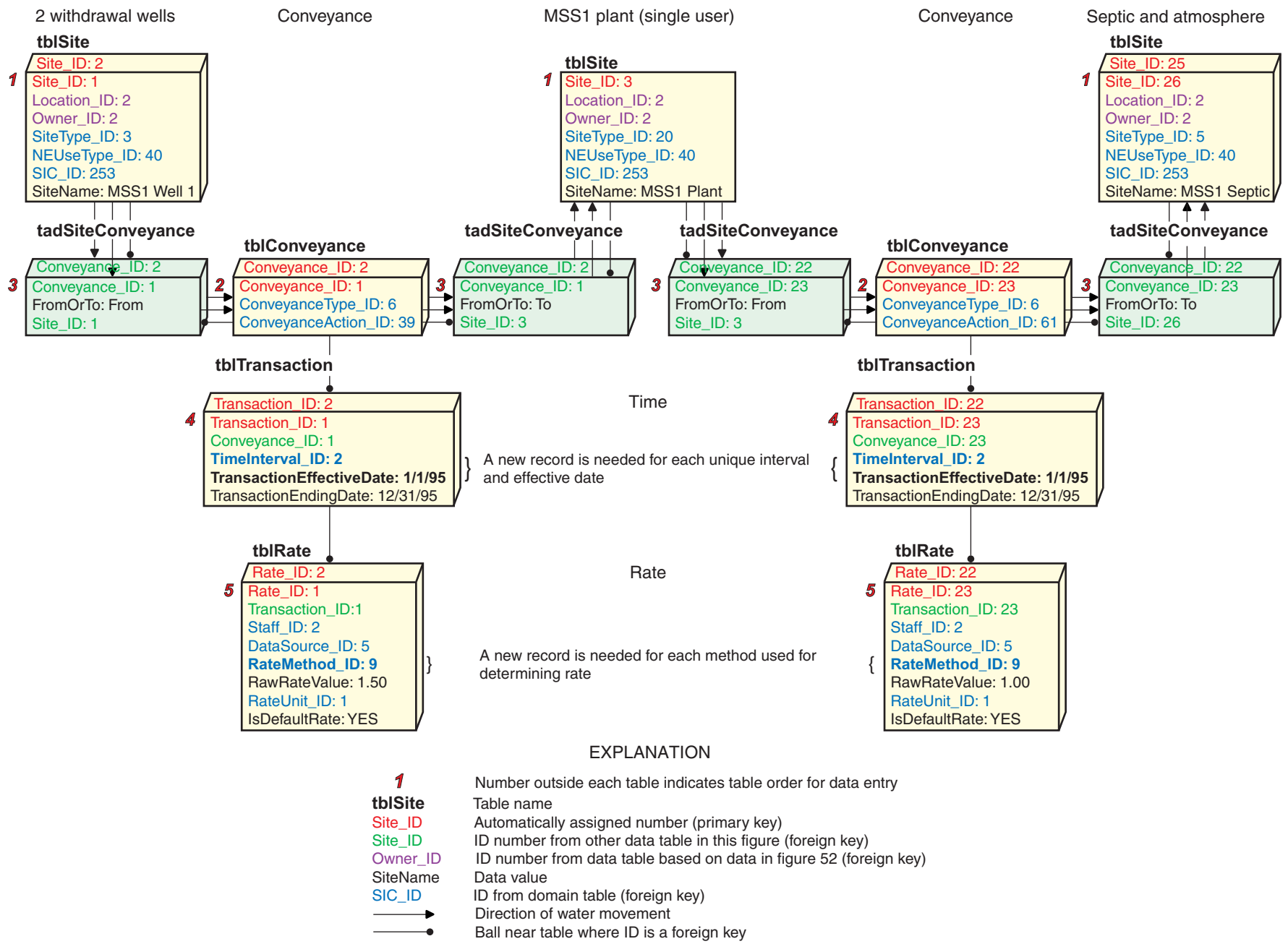
Form 9. NEWUDS Transaction/Rate Data Input Form for System_ID 1

Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
1	1	3	1	2	1/1/95	12/31/95	1	2	5	9	1.50	1
2	2	3	2	2	1/1/95	12/31/95	2	2	5	9	1.50	1
22	3	26	22	2	1/1/95	12/31/95	22	2	5	44	2.00	1
23	3	25	23	2	1/1/95	12/31/95	23	2	5	18	1.00	1

Appendix 1_Figure 52b. Data for Case Study 7 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)



Appendix 1_Figure 53. Network 7: Diagram for Case Study 7: Withdrawal, use, consumptive use, and return by a simple single user (MSS1). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



Appendix 1_Figure 54. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 7: Withdrawal, use, consumptive use, and return by a simple single user (MSS1). (See figure 18 for explanation of box color.)

Appendix 1_Table 18. Data entry into NEWUDS tables for Case Study 7: Withdrawal, Use, Consumptive Use, and Return by a Simple Single User (MSS1)

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	1		
	SystemType_ID	4	tdxSystemType	User
	SystemName	MSS1		
tblOwner	Owner_ID	2		
	OwnerType_ID	1	tdsOwnerType	Private
	OwnerName	MSS1		
	OwnerContact	John Doe		
	OwnerPhone	802-254-6789		
tblAddress	Address_ID	2		
	AddressType_ID	1	tdsAddressType	Both Mailing and Street
	AddressLine1	123 Main St		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	2		
	Address_ID	2		
tblLocation	Location_ID	2		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415400		
	Location-Longitude	0712400		
tadLocationHUC	Location_ID	2		
	HUC_ID	44	tdsHUC	01090004
	IsPrimaryHUC	Yes		
tblSite	Site_ID	1		
	Location_ID	2		
	Owner_ID	2		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	40	tdsNEUseType	Paper Products
	SIC_ID	253	tdsSICUseType	2611 Pulp Mills
	SiteName	MSS1 well 1		
tblSite	Site_ID	2		
	Location_ID	2		
	Owner_ID	2		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	40	tdsNEUseType	Paper Products
	SIC_ID	253	tdsSICUseType	2611 Pulp Mills
	SiteName	MSS1 well 2		

Appendix 1_Table 18. Data entry into NEWUDS tables for Case Study 7: Withdrawal, Use, Consumptive Use, and Return by a Simple Single User (MSS1) --Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	3		
	Location_ID	2		
	Owner_ID	2		
	SiteType_ID	20	tdsSiteType	SingleUser
	NEUseType_ID	40	tdsNEUseType	Paper Products
	SIC_ID	253	tdsSICUseType	2611 Pulp Mills
	SiteName	MSS1 plant		
tblSite	Site_ID	25		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	22	tdsSiteType	Atmosphere
	NEUseType_ID	78	tdsNEUseType	Non Use
	SiteName	Atmosphere-consumptive use		
tblSite	Site_ID	26		
	Location_ID	2		
	Owner_ID	2		
	SiteType_ID	5	tdsSiteType	Ground-water return (Septic)
	NEUseType_ID	40	tdsNEUseType	Paper Products
	SIC_ID	253	tdsSICUseType	2611 Pulp Mills
	SiteName	MSS1 septic system		
tasSystemSite	System_ID	1		
	Site_ID	1		
	System_ID	1		
	Site_ID	2		
tasSystemSite	System_ID	1		
	Site_ID	3		
	System_ID	1		
	Site_ID	25		
	System_ID	1		
	Site_ID	26		
tadSiteDetail	Site_ID	3		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	2	tdxSiteDetailLabel	Number of employees
	DataSource_ID	2	tdxDataSource	Dun & Bradstreet Information Service
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetaiValue	3476		
tblResource	Resource_ID	5		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer-freshwater
	ResourceName	Glacial-deposit aquifer		
tadSiteResource	Site_ID	1		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	2		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	26		
	Resource_ID	5	tblResource	Glacial-deposit aquifer

Appendix 1_Table 18. Data entry into NEWUDS tables for Case Study 7: Withdrawal, Use, Consumptive Use, and Return by a Simple Single User (MSS1) --Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblConveyance	Conveyance_ID	1		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	39	tdsConveyanceAction	Well to single user
tadSiteConveyance	Conveyance_ID	1		
	FromOrTo	From		
	Site_ID	1		
tadSiteConveyance	Conveyance_ID	1		
	FromOrTo	To		
	Site_ID	3		
tblConveyance	Conveyance_ID	2		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	39	tdsConveyanceAction	Well to single user
tadSiteConveyance	Conveyance_ID	2		
	FromOrTo	From		
	Site_ID	2		
tadSiteConveyance	Conveyance_ID	2		
	FromOrTo	To		
	Site_ID	3		
tblConveyance	Conveyance_ID	22		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	95	tdsConveyanceAction	Single user to ground-water return flow
tadSiteConveyance	Conveyance_ID	22		
	FromOrTo	From		
	Site_ID	3		
tadSiteConveyance	Conveyance_ID	22		
	FromOrTo	To		
	Site_ID	25		
tblConveyance	Conveyance_ID	23		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	61	tdsConveyanceAction	Single user to atmosphere
tadSiteConveyance	Conveyance_ID	23		
	FromOrTo	From		
	Site_ID	3		
tadSiteConveyance	Conveyance_ID	23		
	FromOrTo	To		
	Site_ID	26		
tblTransaction	Transaction_ID	1		
	Conveyance_ID	1		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	2		
	Conveyance_ID	2		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 18. Data entry into NEWUDS tables for Case Study 7: Withdrawal, Use, Consumptive Use, and Return by a Simple Single User (MSS1) --Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	22		
	Conveyance_ID	22		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	23		
	Conveyance_ID	23		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	1		
	Transaction_ID	1		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	9	tdxRateMethod	IWR-MAIN coefficient with Dun & Bradstreet values
	RawRateValue	1.50		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	2		
	Transaction_ID	2		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	9	tdxRateMethod	IWR-MAIN coefficient with Dun & Bradstreet values
	RawRateValue	1.50		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	22		
	Transaction_ID	22		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	44	tdxRateMethod	Difference between water-use values for withdrawals and consumptive use
	RawRateValue	2.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	23		
	Transaction_ID	23		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	18	tdxRateMethod	Unknown method
	RawRateValue	1.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 8: Withdrawal, Distribution from a Community-Water System, Use, Collection to a Community-Wastewater System, and Return by a Complex User (MCU1)

Case 8: *A major complex user, MCU1, 456 Forest St., Pawtucket R.I., during 1995 withdrew 0.31 Mgal/d from a well, received 0.27 Mgal/d from the CWS1 distribution system, consumed 0.06 Mgal/d, returned 0.33 Mgal/d to the Taunton River, and released 0.18 Mgal/d to the WTP1 wastewater-collection system. The contact is John Tower, 802-699-3800.*

Step 1: Determine water-use values and location information.

In Case 8, the withdrawals, distribution from community-water systems, returns, and collection to community-wastewater systems are all metered and that consumptive use is the difference between the sum of the withdrawals and distribution and the sum of the returns and collection.

Step 2: Fill in NEWUDS Single User Input Form 1 as shown in Appendix 1_figure 55a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 55b.

Step 3: Choose Network 8 diagram to identify the number and type of required Sites (Appendix 1_fig. 56).

One withdrawal well, one local distribution system, one single user, one ground water return flow, one local collection system, and one atmosphere Sites are required.

Step 4: Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1_figure 57.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 19.

Form 1. NEWUDS Input Form for Single Users

System ID	5	System Name	MCU1	System Type	User	Use Type	Industrial			NEUse Code	50
				code	4	SIC code	3399			SIC Code code	395
Owner ID	6	Owner Name	MCU1	Owner Type	Private	Contact Name	John Tower				
				code	1			Phone	5086993800		
Address ID	6	Mail Line1	PO Box 123	Street Line1	456 Forest St					Address type code	2
2nd Address ID	7	Mail Line2		Street Line2						2nd Address type code	3
City	Pawtucket	State	RI	Zip	02701	City	Pawtucket	State	RI	Zip	02701

Location ID	19	Location Name		Location Scale	Point	Location Scale Code	1

State	RI	County	Providence	MCD	Pawtucket	HUC	01090005	State Basin			
code	6	code	2311	code	2348	code	45			code	
Latitude	415500	Longitude	0712430	Location Det Method	Atlas software			LDM code	7		

Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
27	3 well	MCU1 Well	24	39	28	20	MCU1 Plant	26	95	29	9 discharge pipe	MCU1 discharge pipe
12	12 LDS	CWS1 LDS	25	54	25	22	CU (Loc_ID = 18)	27	58			Taunton River
								28	62	21	14 LCS	WTP1 LCS

Site ID	Resource ID	Resource Name		Site ID	Resource ID	Resource Name
27	5	Glacial-deposit aquifer	1995 1.0 Mgal/d returned to Blackstone River. Estimated by USGS. All sites co-located.	29	8	Taunton River

Appendix 1_Figure 55a. Data for Case Study 8 on NEWUDS Single User Input Form 1. (Form 1 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

Form 1. NEWUDS Input Form for Single Users

System ID	1	System Name	MSS1	System Type	User	Use Type	Industrial	NEUse Code	40		
				code	4	SIC code	2611	SIC Code code	253		
Owner ID	2	Owner Name	MSS1	Owner Type	Private	Contact Name	John Doe				
				code	1			Phone	8022546789		
Address ID	2	Mail Line1	123 Main St	Street Line1				Address type code	1		
		Mail Line2		Street Line2							
		City	Pawtucket	State	RI	Zip	02701	City		State		Zip	
Location ID	2	Location Name		Location Scale	Point			Location Scale Code	1		
		State	RI	County	Providence	MCD	Pawtucket	HUC	01090004	State Basin	
		code	6	code	2311	code	2348	code	44	code	
		Latitude	415400	Longitude	0712400	Location Det Method	Atlas software	LDM code	7		

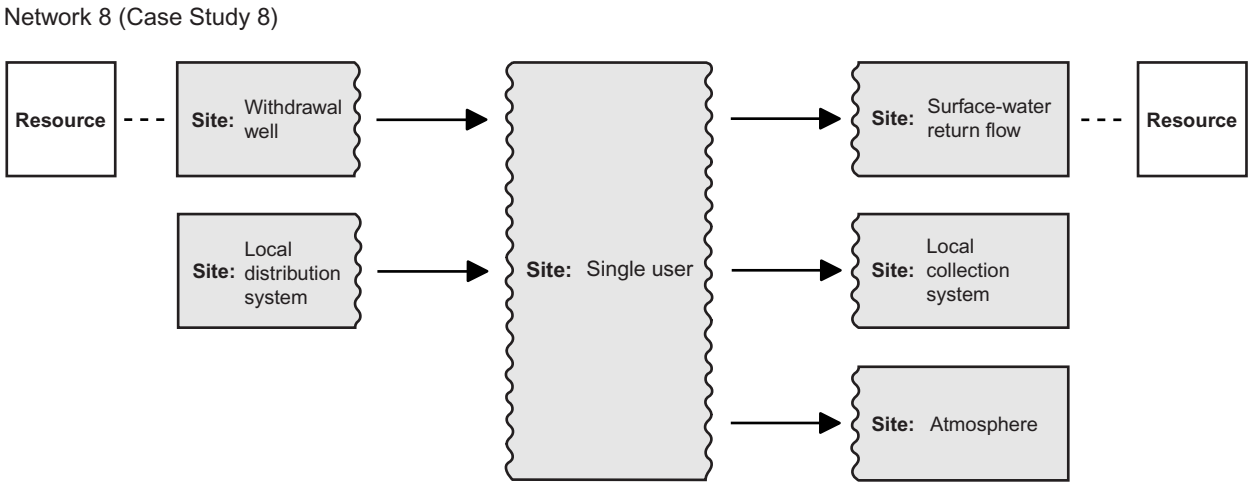
Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
1	3 well	MSS1 Well 1	1	39	3	20	MSS1 Plant	22	95	26	5 Septic	MSS1 Septic
2	3	MSS1 Well 2	2	39	25	22	CU (Loc_ID = 11)	23	61			

Site ID	Resource ID	Resource Name
1	5	Glacial-deposit aquifer

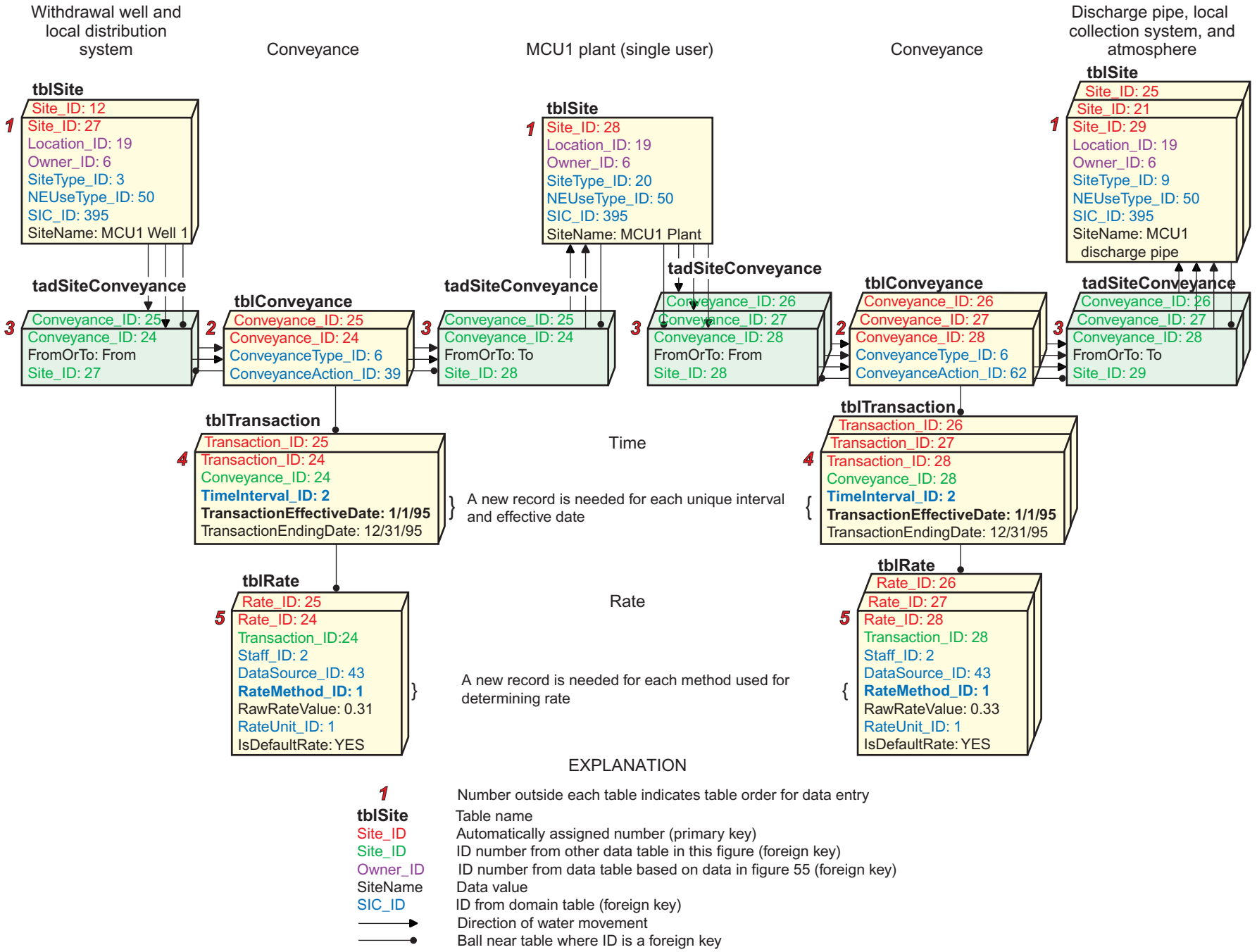
1995 1.5 Mgal/d each well. Estimated by USGS by employee/SIC water-use coefficient. All sites co-located.
Number of employees: 3476. SIC Code: 2611
Location_ID for Consumptive Use is "11"

Site ID	Resource ID	Resource Name
26	5	Glacial-deposit aquifer

Appendix 1_Figure 55b. Data for Case Study 8 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)



Appendix 1_Figure 56. Network 8: Diagram for Case Study 8: Withdrawal, distribution from a community-water system, use, consumptive use, collection to a community-wastewater system, and return by a complex single user (MCU1). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)



Appendix 1_Figure 57. Diagram showing link of Site and Conveyance tables to Transaction and Rate tables for Case Study 8: Withdrawal, distribution from a community-water system, use, consumptive use, collection to a community-wastewater system, and return by a complex single user (MCU1). (See figure 18 for explanation of box color.)

Appendix 1_Table 19. Data entry into NEWUDS tables for Case Study 8: Withdrawal and distribution from a community-water system, use, consumptive use, collection to a community-wastewater system, and return by a complex single user (MCU1)

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	5		
	SystemType_ID	4	tdxSystemType	User
	SystemName	MCU1		
tblOwner	Owner_ID	6		
	OwnerType_ID	1	tdsOwnerType	Private
	OwnerName	MCU1		
	OwnerContact	John Tower		
	OwnerPhone	802-699-3800		
tblAddress	Address_ID	6		
	AddressType_ID	2	tdsAddressType	Street
	AddressLine1	456 Forest St		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	6		
	Address_ID	6		
tblAddress	Address_ID	7		
	AddressType_ID	3	tdsAddressType	Mailing
	AddressLine1	PO Box 123		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	6		
	Address_ID	7		
tblLocation	Location_ID	19		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415500		
	Location-Longitude	0712430		
tadLocationHUC	Location_ID	2		
	HUC_ID	45	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	27		
	Location_ID	19		
	Owner_ID	6		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	50	tdsNEUseType	Electronic equipment
	SIC_ID	395	tdsSICUseType	3399 Primary Metals, NEC
	SiteName	MCU1 well 1		

Appendix 1_Table 19. Data entry into NEWUDS tables for Case Study 8: Withdrawal and distribution from a community-water system, use, consumptive use, collection to a community-wastewater system, and return by a complex single user (MCU1)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	12		
	Location_ID	10		
	Owner_ID	3		
	SiteType_ID	12	tdsSiteType	Local distribution system
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 Local distribution system		
tblSite	Site_ID	28		
	Location_ID	19		
	Owner_ID	6		
	SiteType_ID	20	tdsSiteType	SingleUser
	NEUseType_ID	50	tdsNEUseType	Electronic equipment
	SIC_ID	395	tdsSICUseType	3399 Primary Metals, NEC
	SiteName	MCU1 plant		
tblSite	Site_ID	25		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	22	tdsSiteType	Atmosphere
	NEUseType_ID	78	tdsNEUseType	Non Use
	SiteName	Atmosphere-consumptive use		
tblSite	Site_ID	29		
	Location_ID	19		
	Owner_ID	6		
	SiteType_ID	9	tdsSiteType	Discharge pipe
	NEUseType_ID	50	tdsNEUseType	Electronic Equipment
	SIC_ID	395	tdsSICUseType	3399 Primary Metals, NEC
	SiteName	MCU1 Discharge pipe to Taunton River		
tblSite	Site_ID	21		
	Location_ID	14		
	Owner_ID	5		
	SiteType_ID	14	tdsSiteType	Local collection system
	NEUseType_ID	61	tdsNEUseType	Community-wastewater system
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 Local collection system		
tasSystemSite	System_ID	5		
	Site_ID	27		
	System_ID	5		
	Site_ID	12		
	System_ID	5		
	Site_ID	28		
	System_ID	5		
	Site_ID	29		

Appendix 1_Table 19. Data entry into NEWUDS tables for Case Study 8: Withdrawal and distribution from a community-water system, use, consumptive use, collection to a community-wastewater system, and return by a complex single user (MCU1)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
	System_ID	5		
	Site_ID	21		
tblResource	Resource_ID	5		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer - freshwater
	ResourceName	Glacial-deposit aquifer		
	Resource_ID	8		
	WaterBodyType_ID	1	tdsWaterBodyType	River/stream
	ResourceName	Taunton River		
tadSiteResource	Site_ID	27		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	29		
	Resource_ID	8	tblResource	Taunton River
tblConveyance	Conveyance_ID	24		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	39	tdsConveyanceAction	Well to single user
tadSiteConveyance	Conveyance_ID	24		
	FromOrTo	From		
	Site_ID	27		
tadSiteConveyance	Conveyance_ID	24		
	FromOrTo	To		
	Site_ID	28		
tblConveyance	Conveyance_ID	25		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	54	tdsConveyanceAction	Local distribution system to single user
tadSiteConveyance	Conveyance_ID	25		
	FromOrTo	From		
	Site_ID	12		
tadSiteConveyance	Conveyance_ID	25		
	FromOrTo	To		
	Site_ID	28		
tblConveyance	Conveyance_ID	26		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	95	tdsConveyanceAction	Single user to atmosphere
tadSiteConveyance	Conveyance_ID	26		
	FromOrTo	From		
	Site_ID	28		
tadSiteConveyance	Conveyance_ID	26		
	FromOrTo	To		
	Site_ID	25		
tblConveyance	Conveyance_ID	27		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	58	tdsConveyanceAction	Single user to local collection system
tadSiteConveyance	Conveyance_ID	27		
	FromOrTo	From		
	Site_ID	28		

Appendix 1_Table 19. Data entry into NEWUDS tables for Case Study 8: Withdrawal and distribution from a community-water system, use, consumptive use, collection to a community-wastewater system, and return by a complex single user (MCU1)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	27		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	28		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	62	tdsConveyanceAction	Single user to discharge pipe
tadSiteConveyance	Conveyance_ID	28		
	FromOrTo	From		
	Site_ID	28		
tadSiteConveyance	Conveyance_ID	28		
	FromOrTo	To		
	Site_ID	29		
tblTransaction	Transaction_ID	24		
	Conveyance_ID	24		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	25		
	Conveyance_ID	25		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	26		
	Conveyance_ID	26		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	27		
	Conveyance_ID	27		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	28		
	Conveyance_ID	28		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	24		
	Transaction_ID	24		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	43	tdxDataSource	MCU1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	0.31		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 19. Data entry into NEWUDS tables for Case Study 8: Withdrawal and distribution from a community-water system, use, consumptive use, collection to a community-wastewater system, and return by a complex single user (MCU1)--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	25		
	Transaction_ID	25		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	43	tdxDataSource	MCU1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	0.27		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	26		
	Transaction_ID	26		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU spec
	RateMethod_ID	45	tdxRateMethod	Difference between water-use values for withdrawals/returns and returns/releases use
	RawRateValue	0.06		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	27		
	Transaction_ID	27		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	43	tdxDataSource	MCU1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	0.18		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	28		
	Transaction_ID	28		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	43	tdxDataSource	MCU1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	0.33		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 9: Withdrawal and Regional and Local Distribution by a Complex Community-Water System (CWS1, CWS2)

Case Study 9: *A complex community-water system, CWS1, 456 Central St., Pawtucket, R.I., had metered withdrawals of 3.00 Mgal/d from each of 3 wells and 2.00 Mgal/d from a fourth well (all completed in the glacial-deposit aquifer) released directly into a regional distribution system. Fifty Mgal/d was released from Reservoir A to Reservoir B, 55 Mgal/d was released from Reservoir B to Reservoir C, 60 Mgal/d was released from Reservoir C to Happy Hollow Reservoir. An additional 69.0 Mgal/d was withdrawn from an intake pipe on Happy Hollow Reservoir and released at the potable water-treatment plant. During treatment, 4.50 Mgal/d was released to the wastewater collection system as filter backwash and 64.50 Mgal/d was released into the CWS1 Regional Distribution system. Leakage from the Regional system was 1.50 Mgal/d. A total of 56.30 Mgal/d from the CWS1 Regional distribution system was supplied to the CWS1 local distribution system in MCD-A (35.00 Mgal/d to domestic deliveries, 2.80 to commercial deliveries, 12.25 to industrial deliveries, and 6.25 was unaccounted for). A total of 17.10 Mgal/d was supplied to the CWS1 local distribution system in MCD-B (10.0 Mgal/d to domestic deliveries, 1.65 to commercial deliveries, 3.75 to industrial deliveries and 1.70 was unaccounted for). Deliveries to the CWS2 local distribution system were 4.45 Mgal/d—3.0 to domestic users, 0.75 to commercial users, and 0.70 was unaccounted for.*

Step 1: Determine water-use values and location information.

Determining water-use values for Case Study 9 is based on the methods described for Case Study 3. The challenge is to track each community-water system's activity.

Step 2: Fill in NEWUDS Community-water system Input Form 6 as shown in Appendix 1_figure 58a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 58b.

Step 3: Choose Network Diagram to identify the number and type of required Sites as shown in Appendix 1_figures 59 and 60. The data available indicates that 50 Mgal/d was released from Reservoir A to Reservoir B. This is represented in NEWUDS by an intake pipe Site associated with Reservoir A linked to a discharge pipe associated with Reservoir B (Appendix 1_fig. 59).

Step 4: Organize Site and Conveyance data as shown on Appendix 1_figures 59 and 60.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 20.

Form 6. NEWUDS Input Form for Community-Water Systems

System ID	2	System Name	CWS1			System Type	Com Wtr Sys	Use		Use code	60
						ST code	1				
Owner ID	3	Owner Name	CWS1			Owner Type	Municipal			Contact Name	John White
						OT code	2			Phone	8027259492
Address ID	3	Mail Line1	456 Central St			Street Line1				Address type code	3
		Mail Line2				Street Line2					
	City	Pawtucket	State	RI	Zip	02701	City		State		Zip	
Location ID	4	Location Name					Location Scale	Irregular Area		LS Code	6	
	State	Rhode Island	County	Providence	MCD	Pawtucket	HUC	01090003		State Basin		
	ST code	6	C code	2311	MCD code	2348	code	43		SB code		
	Latitude		Longitude				Location Determin Method			LDM Code		

Site ID	Site Type	Withdrawal Site Name	Conv ID	Action
6	3 well	CWS1 Well #5	29	27
7	3	CWS1 Well #6	30	27
8	3	CWS1 Well #7	31	27
9	3	CWS1 Well #8	32	27
10/47	8 intake/ 9 discharge	Happy Hollow Res intake	8	18
39	8	Reservoir A intake	57	12
40/45	8/9	Reservoir B intake	58	12
41/46	8/9	Reservoir C intake	59	12

Site ID	Resource ID	Resource Name
6-9	5	Glacial-deposit aquifer
10/47	1	Happy Hollow Res
39	20	Reservoir A
40/45	21	Reservoir B
41/46	22	Reservoir C

Site ID	Site Type	Treatment Plant Site Name	Conv ID	Action
11	17	CWS1 TP	33	49
			35	149
			36	52
			37	53

Site ID	Site Type	Regional Distribution System Site Name
30	11	CWS1 RDS
16	23	Unaccounted for

Location

ID	Site	LDM	Scale	State	CO	MCD	Latitude	Longitude
4	6	1	1	6	2311	2348	415437	0712302
5	7	1	1	6	2311	2348	415455	0712302
6	8	1	1	6	2311	2348	415504	0712300
7	9	1	1	6	2311	2348	415512	0712259
8	10	7	1	6	2311	2348	415700	0712500
9	11	7	1	6	2311	2348	415705	0712505
10	12	1	6	6	2311	2348	--	--
3	13,14,15	2	2	6	2311	2348	415224	0712228
20	30	1	6	6	2311	2348	--	--
14	21	1	6	6	2311	2348	--	--
21	32	1	6	6	2311	2340	--	--

Appendix 1_Figure 58a. Data for Case Study 9 on NEWUDS Community-Water System Input Form 6. (Form 6 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

Form 6. NEWUDS Input Form for Community-Water Systems

System ID: 2 System Name: CWS1

Site ID	Site Type	Local Distribution System Site Name
12	12	CWS1 LDS in MCD A
16	23	Unaccounted-for water
32	12	CWS1 LDS in MCD B
16	23	Unaccounted-for water
31	12	CWS2 LDS in MCD C
16	23	Unaccounted-for water

Site	Year	Population Served
30	1995	859,000

Conv ID	Action	Site ID	Site Type	User Site Name
38	53	13	24	MCD A Dom Agg
10	131	14	24	MCD A Com Agg
11	131	15	24	MCD A Ind Agg
12	131	34	24	MCD B Dom Agg
13	150	35	24	MCD B Com Agg
35	152	36	24	MCD B Ind Agg
40	150	42	24	MCD C Dom Agg
41	131	43	24	MCD C Com Agg
42	131			
43	131			
60	131			
61	131			
62	150			

(Wastewater)

Conv ID	Action	Site ID	Site Type	Local Collection or Return Site Name
34	51	21	14	WTP1 LCS

Site ID	Resource ID	Resource Name

Intake to Dischage to Resource

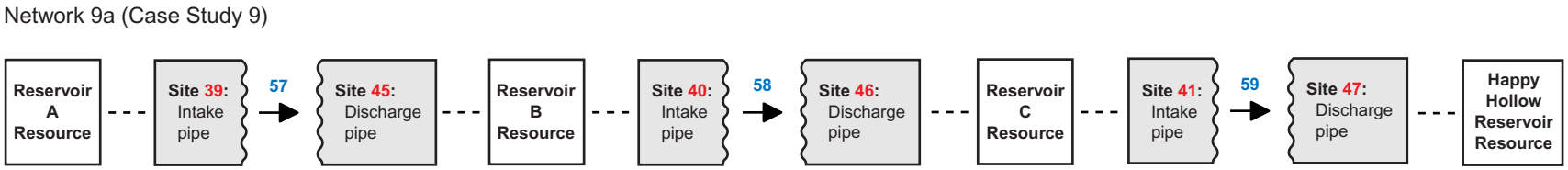
Site ID	Site Type	Return Site Name
45	9	Reservoir B discharge pipe
46	9	Reservoir C discharge pipe
47	9	Happy Hollow Reservoir discharge pipe

Appendix 1_Figure 58a. Data for Case Study 9 on NEWUDS Community-Water System Input Form 6--Continued.

Form 9. NEWUDS Transaction/Rate Data Input Form for System_ID 2

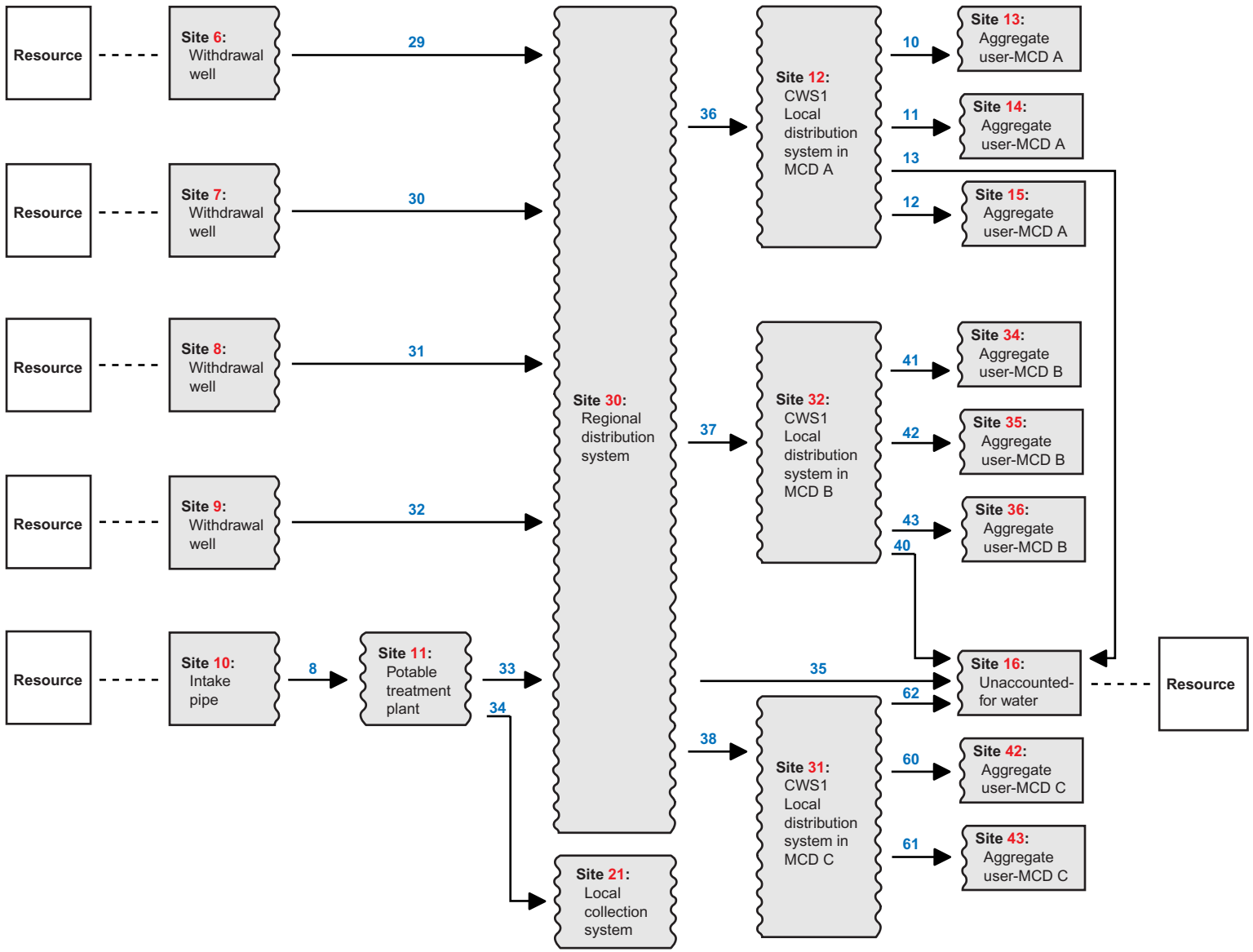
Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
29	6	30	29	2	1/1/95	12/31/95	29	2	41	1	3.00	1
30	7	30	30	2	1/1/95	12/31/95	30	2	41	1	3.00	1
31	8	30	31	2	1/1/95	12/31/95	31	2	41	1	3.00	1
32	9	30	32	2	1/1/95	12/31/95	32	2	41	1	2.00	1
8	10	11	8	2	1/1/95	12/31/95	8	2	41	1	69.00	1
57	39	45	57	2	1/1/95	12/31/95	57	2	41	1	50.00	1
58	40	46	58	2	1/1/95	12/31/95	58	2	41	1	55.00	1
59	41	47	59	2	1/1/95	12/31/95	59	2	41	1	60.00	1
33	11	30	33	2	1/1/95	12/31/95	33	2	41	1	64.50	1
35	30	16	35	2	1/1/95	12/31/95	35	2	41	31	1.50	1
36	30	12	36	2	1/1/95	12/31/95	36	2	41	1	56.30	1
37	30	32	37	2	1/1/95	12/31/95	37	2	41	1	17.10	1
38	30	31	38	2	1/1/95	12/31/95	38	2	41	1	4.45	1
34	11	21	34	2	1/1/95	12/31/95	34	2	41	1	4.50	1
10	12	13	10	2	1/1/95	12/31/95	10	2	5	20	35.00	1
11	12	14	11	2	1/1/95	12/31/95	11	2	5	20	2.80	1
12	12	15	12	2	1/1/95	12/31/95	12	2	5	20	12.25	1
13	12	16	13	2	1/1/95	12/31/95	13	2	5	43	6.25	1
41	32	34	41	2	1/1/95	12/31/95	41	2	5	20	10.00	1
42	32	35	42	2	1/1/95	12/31/95	42	2	5	20	1.65	1
43	32	36	43	2	1/1/95	12/31/95	43	2	5	20	3.75	1
40	32	16	40	2	1/1/95	12/31/95	40	2	5	43	1.70	1
60	31	42	60	2	1/1/95	12/31/95	60	2	5	20	3.00	1
61	31	43	61	2	1/1/95	12/31/95	61	2	5	20	0.75	1
62	31	16	62	2	1/1/95	12/31/95	63	2	5	43	0.70	1

Appendix 1_Figure 58b. Data for Case Study 9 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)



Appendix 1_Figure 59. Network 9a: Diagram for Case Study 9: Modeling transfer between reservoirs used by a complex community-water system (CWS1). (Dotted line represents a Site-Resource Association, solid line represents a conveyance, and an arrowhead shows the direction of water movement, red number is Site_ID, and blue number is Conveyance_ID.)

Network 9 (Case Study 9)



Appendix 1_Figure 60. Network 9: Diagram for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water. (Dotted line represents a Site-Resource Association, solid line represents a conveyance, and an arrowhead shows the direction of water movement, red number is Site_ID, and blue number is Conveyance_ID.)

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	2		
	SystemType_ID	1	tdxSystemType	Community-water system
	SystemName	CWS1		
tblOwner	Owner_ID	3		
	OwnerType_ID	2	tdsOwnerType	Municipal
	OwnerName	CWS1		
	OwnerContact	John White		
	OwnerPhone	802-725-9492		
tblAddress	Address_ID	3		
	AddressType_ID	3	tdsAddressType	Mailing
	AddressLine1	456 Central Street		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	3		
	Address_ID	3		
tblLocation	Location_ID	4		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415437		
	Location-Longitude	0712302		
tadLocationHUC	Location_ID	4		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	6		
	Location_ID	4		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 5		
tblLocation	Location_ID	5		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415455		
	Location-Longitude	0712302		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadLocationHUC	Location_ID	5		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	7		
	Location_ID	5		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 6		
tblLocation	Location_ID	6		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415504		
	Location-Longitude	0712300		
tadLocationHUC	Location_ID	6		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	8		
	Location_ID	6		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 7		
tblLocation	Location_ID	7		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415512		
	Location-Longitude	0712259		
tadLocationHUC	Location_ID	7		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	9		
	Location_ID	7		
	Owner_ID	3		
	SiteType_ID	3	tdsSiteType	Withdrawal well
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 well 8		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	8		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415700		
	Location-Longitude	0712500		
tadLocationHUC	Location_ID	8		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	47		
	Location_ID	8		
	Owner_ID	3		
	SiteType_ID	9	tdsSiteType	Discharge Pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Happy Hollow Reservoir Discharge pipe		
tblSite	Site_ID	10		
	Location_ID	8		
	Owner_ID	3		
	SiteType_ID	8	tdsSiteType	Intake Pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Happy Hollow Reservoir Intake pipe		
tblLocation	Location_ID	27		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415927		
	Location-Longitude	0712355		
tadLocationHUC	Location_ID	27		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	39		
	Location_ID	27		
	Owner_ID	3		
	SiteType_ID	8	tdsSiteType	Intake Pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Reservoir A Intake pipe		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	28		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415858		
	Location-Longitude	0712312		
tadLocationHUC	Location_ID	8		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	45		
	Location_ID	28		
	Owner_ID	3		
	SiteType_ID	9	tdsSiteType	Discharge Pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Reservoir B Discharge pipe		
tblSite	Site_ID	40		
	Location_ID	28		
	Owner_ID	3		
	SiteType_ID	8	tdsSiteType	Intake Pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Reservoir B Intake pipe		
tblLocation	Location_ID	29		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415757		
	Location-Longitude	0712316		
tadLocationHUC	Location_ID	29		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	46		
	Location_ID	29		
	Owner_ID	3		
	SiteType_ID	9	tdsSiteType	Discharge Pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Reservoir C Discharge pipe		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	41		
	Location_ID	29		
	Owner_ID	3		
	SiteType_ID	8	tdsSiteType	Intake Pipe
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	Reservoir C Intake pipe		
tblLocation	Location_ID	20		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular Area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
tadLocationHUC	Location_ID	20		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	30		
	Location_ID	20		
	Owner_ID	3		
	SiteType_ID	11	tdsSiteType	Regional Distribution System
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 Regional Distribution System		
tblLocation	Location_ID	9		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415705		
	Location-Longitude	0712505		
tadLocationHUC	Location_ID	9		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	11		
	Location_ID	9		
	Owner_ID	3		
	SiteType_ID	17	tdsSiteType	Potable Treatment Plant
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 Treatment Plant		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	10		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular Area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
tadLocationHUC	Location_ID	10		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	12		
	Location_ID	10		
	Owner_ID	3		
	SiteType_ID	12	tdsSiteType	Local Distribution System
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 Local Distribution System in MCD A		
tadSiteDetail	Site_ID	12		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	16	tdxDataSource	SDWIS-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetailValue	729000		
tblLocation	Location_ID	21		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular Area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2340	tdsMCD	Cumberland
tadLocationHUC	Location_ID	21		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	32		
	Location_ID	21		
	Owner_ID	3		
	SiteType_ID	12	tdsSiteType	Local Distribution System
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS1 Local Distribution System in MCD B		
tadSiteDetail	Site_ID	32		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	16	tdxDataSource	SDWIS-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetaiValue	100000		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	30		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular Area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2345	tdsMCD	Lincoln
tadLocationHUC	Location_ID	30		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	31		
	Location_ID	30		
	Owner_ID	7		
	SiteType_ID	12	tdsSiteType	Local Distribution System
	NEUseType_ID	60	tdsNEUseType	Community-water system
	SIC_ID	636	tdsSICUseType	4941 Water Supply
	SiteName	CWS2 Local Distribution System in MCD C		
tadSiteDetail	Site_ID	31		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	16	tdxDataSource	SDWIS-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetailValue	30000		
tblLocation	Location_ID	14		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular Area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
tadLocationHUC	Location_ID	14		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	21		
	Location_ID	14		
	Owner_ID	5		
	SiteType_ID	14	tdsSiteType	Local Collection System
	NEUseType_ID	61	tdsNEUseType	Community-wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 Local Collection System		
tadSiteDetail	Site_ID	21		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	16	tdxDataSource	NPDES-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetailValue	646800		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	11		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	7	tdsLocationScale	Undefined
tadLocationHUC	Location_ID	11		
	HUC_ID	43	tdsHUC	01090003
	IsPrimaryHUC	Yes		
tblSite	Site_ID	16		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	23	tdsSiteType	Unaccounted-for-Water
	NEUseType_ID	78	tdsNEUseType	Non Use
	SIC_ID	1005	tdsSICUseType	0000 Unclassified
	SiteName	Unaccounted-for-Water		
tblLocation	Location_ID	3		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415224		
	Location-Longitude	0712228		
tadLocationHUC	Location_ID	3		
	HUC_ID	33	tdsHUC	01080107
	IsPrimaryHUC	Yes		
tblSite	Site_ID	13		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	67	tdsNEUseType	Domestic
	SiteName	Pawtucket MCD domestic users		
tblSite	Site_ID	14		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SiteName	Pawtucket MCD commercial users		
tblSite	Site_ID	15		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	80	tdsNEUseType	Industrial
	SiteName	Pawtucket MCD industrial users		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	31		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2340	tdsMCD	Cumberland
	Location-Latitude	415753		
	Location-Longitude	0712519		
tadLocationHUC	Location_ID	31		
	HUC_ID	33	tdsHUC	01080107
	IsPrimaryHUC	Yes		
tblSite	Site_ID	34		
	Location_ID	31		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	67	tdsNEUseType	Domestic
	SiteName	Cumberland MCD domestic users		
tblSite	Site_ID	35		
	Location_ID	31		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SiteName	Cumberland MCD commercial users		
tblSite	Site_ID	36		
	Location_ID	31		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	80	tdsNEUseType	Industrial
	SiteName	Cumberland MCD industrial users		
tblLocation	Location_ID	32		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
tblLocation	MCD_ID	2345	tdsMCD	Lincoln
	Location-Latitude	415503		
	Location-Longitude	0712706		
tadLocationHUC	Location_ID	32		
	HUC_ID	33	tdsHUC	01080107
	IsPrimaryHUC	Yes		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	42		
	Location_ID	32		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	67	tdsNEUseType	Domestic
	SiteName	Lincoln MCD domestic users		
tblSite	Site_ID	43		
	Location_ID	32		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SiteName	Lincoln MCD commercial users		
tasSystemSite	System_ID	2		
	Site_ID	6		
	System_ID	2		
	Site_ID	7		
	System_ID	2		
	Site_ID	8		
	System_ID	2		
	Site_ID	9		
	System_ID	2		
	Site_ID	10		
	System_ID	2		
	Site_ID	11		
	System_ID	2		
	Site_ID	12		
	System_ID	2		
	Site_ID	13		
	System_ID	2		
	Site_ID	14		
	System_ID	2		
	Site_ID	15		
	System_ID	2		
	Site_ID	21		
	System_ID	2		
	Site_ID	30		
	System_ID	2		
	Site_ID	31		
	System_ID	2		
	Site_ID	32		
	System_ID	2		
	Site_ID	34		
	System_ID	2		
	Site_ID	35		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tasSystemSite	System_ID	2		
	Site_ID	36		
	System_ID	2		
	Site_ID	39		
	System_ID	2		
	Site_ID	40		
	System_ID	2		
	Site_ID	41		
	System_ID	2		
	Site_ID	42		
	System_ID	2		
	Site_ID	43		
	System_ID	2		
	Site_ID	45		
	System_ID	2		
	Site_ID	46		
	System_ID	2		
	Site_ID	47		
tblResource	Resource_ID	5		
	WaterBodyType_ID	6	tdsWaterBodyType	Aquifer - freshwater
	ResourceName	Glacial-deposit aquifer		
	Resource_ID	1		
	WaterBodyType_ID	3	tdsWaterBodyType	Reservoir
	ResourceName	Happy Hollow Reservoir		
	Resource_ID	20		
	WaterBodyType_ID	3	tdsWaterBodyType	Reservoir
	ResourceName	Reservoir A		
	Resource_ID	21		
	WaterBodyType_ID	3	tdsWaterBodyType	Reservoir
	ResourceName	Reservoir B		
	Resource_ID	22		
	WaterBodyType_ID	3	tdsWaterBodyType	Reservoir
	ResourceName	Reservoir C		
tadSiteResource	Site_ID	6		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	7		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	8		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	9		
	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Site_ID	10		
	Resource_ID	1	tblResource	Happy Hollow Reservoir
	Site_ID	39		
	Resource_ID	20	tblResource	Reservoir A
	Site_ID	45		
	Resource_ID	21	tblResource	Reservoir B

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteResource	Site_ID	40		
	Resource_ID	21	tblResource	Reservoir B
	Site_ID	46		
	Resource_ID	22	tblResource	Reservoir C
	Site_ID	41		
	Resource_ID	22	tblResource	Reservoir C
	Site_ID	47		
	Resource_ID	1	tblResource	Happy Hollow Reservoir
tblConveyance	Conveyance_ID	29		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
tadSiteConveyance	Conveyance_ID	29		
	FromOrTo	From		
	Site_ID	6		
	Conveyance_ID	29		
	FromOrTo	To		
	Site_ID	30		
tblConveyance	Conveyance_ID	30		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
tadSiteConveyance	Conveyance_ID	30		
	FromOrTo	From		
	Site_ID	7		
	Conveyance_ID	30		
	FromOrTo	To		
	Site_ID	30		
tblConveyance	Conveyance_ID	31		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
tadSiteConveyance	Conveyance_ID	31		
	FromOrTo	From		
	Site_ID	8		
	Conveyance_ID	31		
	FromOrTo	To		
	Site_ID	30		
tblConveyance	Conveyance_ID	32		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
tadSiteConveyance	Conveyance_ID	32		
	FromOrTo	From		
	Site_ID	9		
	Conveyance_ID	32		
	FromOrTo	To		
	Site_ID	30		
tblConveyance	Conveyance_ID	57		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	12	tdsConveyanceAction	Intake pipe to discharge pipe

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	57		
	FromOrTo	From		
	Site_ID	39		
	Conveyance_ID	57		
	FromOrTo	To		
	Site_ID	45		
tblConveyance	Conveyance_ID	58		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	12	tdsConveyanceAction	Intake pipe to discharge pipe
tadSiteConveyance	Conveyance_ID	58		
	FromOrTo	From		
	Site_ID	40		
	Conveyance_ID	58		
	FromOrTo	To		
	Site_ID	46		
tblConveyance	Conveyance_ID	59		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	12	tdsConveyanceAction	Intake pipe to discharge pipe
tadSiteConveyance	Conveyance_ID	59		
	FromOrTo	From		
	Site_ID	41		
	Conveyance_ID	59		
	FromOrTo	To		
	Site_ID	47		
tblConveyance	Conveyance_ID	8		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	18	tdsConveyanceAction	Intake pipe to Potable treatment plant
tadSiteConveyance	Conveyance_ID	8		
	FromOrTo	From		
	Site_ID	10		
	Conveyance_ID	8		
	FromOrTo	To		
	Site_ID	11		
tblConveyance	Conveyance_ID	33		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	49	tdsConveyanceAction	Potable treatment plant to regional distribution system
tadSiteConveyance	Conveyance_ID	33		
	FromOrTo	From		
	Site_ID	11		
	Conveyance_ID	33		
	FromOrTo	To		
	Site_ID	30		
tblConveyance	Conveyance_ID	34		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	51	tdsConveyanceAction	Potable treatment plant to local collection system

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	34		
	FromOrTo	From		
	Site_ID	11		
	Conveyance_ID	34		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	36		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	53	tdsConveyanceAction	Regional distribution system to local distribution system
tadSiteConveyance	Conveyance_ID	36		
	FromOrTo	From		
	Site_ID	30		
	Conveyance_ID	36		
	FromOrTo	To		
	Site_ID	12		
tblConveyance	Conveyance_ID	10		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	10		
	FromOrTo	From		
	Site_ID	12		
	Conveyance_ID	10		
	FromOrTo	To		
	Site_ID	13		
tblConveyance	Conveyance_ID	11		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	11		
	FromOrTo	From		
	Site_ID	12		
	Conveyance_ID	11		
	FromOrTo	To		
	Site_ID	14		
tblConveyance	Conveyance_ID	12		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	12		
	FromOrTo	From		
	Site_ID	12		
	Conveyance_ID	12		
	FromOrTo	To		
	Site_ID	15		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblConveyance	Conveyance_ID	13		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	150	tdsConveyanceAction	Local distribution system to Unaccounted-for water
tadSiteConveyance	Conveyance_ID	13		
	FromOrTo	From		
	Site_ID	12		
tadSiteConveyance	Conveyance_ID	13		
	FromOrTo	To		
	Site_ID	16		
tblConveyance	Conveyance_ID	37		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	53	tdsConveyanceAction	Regional distribution system to local distribution system
tadSiteConveyance	Conveyance_ID	37		
	FromOrTo	From		
	Site_ID	30		
	Conveyance_ID	37		
	FromOrTo	To		
	Site_ID	32		
tblConveyance	Conveyance_ID	41		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	41		
	FromOrTo	From		
	Site_ID	32		
	Conveyance_ID	41		
	FromOrTo	To		
	Site_ID	34		
tblConveyance	Conveyance_ID	42		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	42		
	FromOrTo	From		
	Site_ID	32		
	Conveyance_ID	42		
	FromOrTo	To		
	Site_ID	35		
tblConveyance	Conveyance_ID	43		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	43		
	FromOrTo	From		
	Site_ID	32		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	43		
	FromOrTo	To		
	Site_ID	36		
tblConveyance	Conveyance_ID	40		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	150	tdsConveyanceAction	Local distribution system to Unaccounted-for water
tadSiteConveyance	Conveyance_ID	40		
	FromOrTo	From		
	Site_ID	32		
	Conveyance_ID	40		
	FromOrTo	To		
	Site_ID	16		
tblConveyance	Conveyance_ID	35		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	149	tdsConveyanceAction	Regional distribution system to Unaccounted-for water
tadSiteConveyance	Conveyance_ID	35		
	FromOrTo	From		
	Site_ID	30		
	Conveyance_ID	35		
	FromOrTo	To		
	Site_ID	16		
tblConveyance	Conveyance_ID	38		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	53	tdsConveyanceAction	Regional distribution system to local distribution system
tadSiteConveyance	Conveyance_ID	38		
	FromOrTo	From		
	Site_ID	30		
tadSiteConveyance	Conveyance_ID	38		
	FromOrTo	To		
	Site_ID	31		
tblConveyance	Conveyance_ID	60		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD
tadSiteConveyance	Conveyance_ID	60		
	FromOrTo	From		
	Site_ID	31		
	Conveyance_ID	60		
	FromOrTo	To		
	Site_ID	42		
tblConveyance	Conveyance_ID	61		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	131	tdsConveyanceAction	Local distribution system to Aggregate user-MCD

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	61		
	FromOrTo	From		
	Site_ID	31		
	Conveyance_ID	61		
	FromOrTo	To		
	Site_ID	43		
tblConveyance	Conveyance_ID	62		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	150	tdsConveyanceAction	Local distribution system to Unaccounted-for water
tadSiteConveyance	Conveyance_ID	62		
	FromOrTo	From		
	Site_ID	31		
	Conveyance_ID	62		
	FromOrTo	To		
	Site_ID	16		
tblTransaction	Transaction_ID	29		
	Conveyance_ID	29		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	30		
	Conveyance_ID	30		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	31		
	Conveyance_ID	31		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	32		
	Conveyance_ID	32		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	57		
	Conveyance_ID	57		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	58		
	Conveyance_ID	58		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	59		
	Conveyance_ID	32		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	8		
	Conveyance_ID	8		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	33		
	Conveyance_ID	33		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	34		
	Conveyance_ID	34		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	36		
	Conveyance_ID	36		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	10		
	Conveyance_ID	10		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	11		
	Conveyance_ID	11		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	12		
	Conveyance_ID	12		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	13		
	Conveyance_ID	13		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	37		
	Conveyance_ID	37		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	41		
	Conveyance_ID	41		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	42		
	Conveyance_ID	42		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	43		
	Conveyance_ID	43		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	40		
	Conveyance_ID	40		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	35		
	Conveyance_ID	35		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	38		
	Conveyance_ID	38		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	60		
	Conveyance_ID	60		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	61		
	Conveyance_ID	61		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	62		
	Conveyance_ID	62		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	29		
	Transaction_ID	29		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	3.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	30		
	Transaction_ID	30		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
tblRate	RawRateValue	3.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	31		
	Transaction_ID	31		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	3.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	32		
	Transaction_ID	32		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
tblRate	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	2.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	57		
	Transaction_ID	57		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	50.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	58		
	Transaction_ID	58		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
tblRate	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	55.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	59		
	Transaction_ID	59		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	60.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	8		
	Transaction_ID	8		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	69.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	33		
	Transaction_ID	33		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	64.50		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	35		
	Transaction_ID	35		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	31	tdxRateMethod	Difference between metered withdrawals and billed consumption
	RawRateValue	1.50		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	36		
	Transaction_ID	36		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	56.30		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	37		
	Transaction_ID	37		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	41	tdxDataSource	CWS1
tblRate	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	17.10		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	38		
	Transaction_ID	38		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID		tdxDataSource	CWS1
	RateMethod_ID		tdxRateMethod	Calibrated cumulative meter
	RawRateValue	4.45		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	34		
	Transaction_ID	34		
	Staff_ID	2	tdxStaff	Horn
tblRate	DataSource_ID	41	tdxDataSource	CWS1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	4.50		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	10		
	Transaction_ID	10		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	35.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	11		
	Transaction_ID	11		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water systemCommunity-water systemCommunity-water system/disposal from self supply/disposal
	RawRateValue	2.80		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	12		
	Transaction_ID	12		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	12.25		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	13		
	Transaction_ID	13		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
tblRate	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawal/return and estimated distribution/collection
	RawRateValue	6.25		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	41		
	Transaction_ID	41		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	10.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	42		
	Transaction_ID	42		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
tblRate	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	1.65		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
tblRate	IsDefaultRate	Yes		
	Rate_ID	43		
	Transaction_ID	43		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
tblRate	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	3.75		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	40		
	Transaction_ID	40		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawal/return and estimated distribution/collection
	RawRateValue	1.70		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	60		
	Transaction_ID	60		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	3.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 20. Data entry into NEWUDS tables for Case Study 9: Withdrawal and regional and local distribution by a complex community-water system (CWS1, CWS2) with aggregates of users and unaccounted-for water--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	61		
	Transaction_ID	61		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	0.75		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	63		
	Transaction_ID	63		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawal/return and estimated distribution/collection
	RawRateValue	0.70		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Case 10: Regional and Local Collection and Return by a Complex Community-Wastewater System (WTP1, WTP2)

Case 10: *A regional water-treatment plant, WTP1, 123 Utility St., Pawtucket, R.I., received from WTP1 wastewater-collection system, 25.7 Mgal/d from domestic users, 7.6 Mgal/d from industrial users, 3.1 Mgal/d from commercial users, and 30.0 Mgal/d through inflow and infiltration. The wastewater treatment plant received from WTP2 (from Cumberland) 10.0 Mgal/d from domestic users, 5.0 Mgal/d from industrial users, 1.0 Mgal/d from commercial users, and 17.6 Mgal/d through inflow and infiltration. The Regional collection system received 10.0 Mgal/d inflow and infiltration. The regional collection system released 110.0 Mgal/d of wastewater to the treatment plant that was treated and released into the Ten Mile River in 1991 according to annual meter records at the treatment plant intake.*

Step 1: Determine water-use values and location information.

Determining water-use values for Case Study 10 is based on the methods described for Case Study 6. The challenge is to track each community-wastewater system's activity.

Step 2: Fill in NEWUDS Community-Wastewater System Input Form 8 as shown in Appendix 1_figure 61a and NEWUDS Transaction/Rate Data Input Form 9 in Appendix 1_figure 61b.

Step 3: Choose Network 10 diagram to identify the number and type of required Sites as shown in Appendix 1_figure 62.

Step 4: Organize Site and Conveyance as shown in Appendix 1_figure 62.

Step 5: Enter data into NEWUDS tables in the order shown in Appendix 1_table 21.

Form 8. NEWUDS Input Form for Community-Wastewater Systems

System ID	4	System Name	WTP1			System Type	pub wstwtr	Use		Use code	61
						ST code	2				
Owner ID	5	Owner Name	WTP1			Owner Type	Municipal	Contact Name	John Brown		
						OT code	2	Phone	8027615167		
Address ID	5	Mail Line1	123 Utility St			Street Line1		Address type code	3		
		Mail Line2				Street Line2					
	City	Pawtucket	State	RI	Zip 02701	City		State		Zip	
Location ID	26	Location Name				Location Scale	Irregular	LS Code	6		
	State	Rhode Island	County	Providence	MCD Pawtucket	HUC	01090004	State Basin			
	ST code	6	C code	2311	MCD code 2348	code	44	SB code			
	Latitude	--	Longitude	--	Location Determin Method		Unknown	LDM Code	1		

Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Local Collection Site Name	Conv ID	Action	Site ID	Site Type	Regional Collection System Site Name
13	24	Pawtucket Dom Agg	16	103	21	14	WTP1 LCS	48	68	38	13	WTP1 RCS
14	24	Pawtucket Com Agg	17	103	22	27	WTP1 LCS I&I	53	68	22	27	WTP1 RCS I&I
15	24	Pawtucket Ind Agg	18	103	44	14	WTP2 LCS	54	151			
			19	152	22	27	WTP2 LCS I&I					
34	24	Cumberland Dom Agg	64	103								
35	24	Cumberland Com Agg	65	103								
36	24	Cumberland Ind Agg	66	103								
			63	152								

Location

ID	Site	LDM	Scale	State	CO	MCD	Latitude	Longitude
3	13,14,15	2	2	6	2311	2348	415224	0712228
14	21	1	6	6	2311	2348	--	--
16	23	7	1	6	2311	2348	415100	0712013
17	24	7	1	6	2311	2348	415105	0712910
26	38	1	6	6	2311	2348	--	--
15	22	1	7	--	--	--	--	--
31	34, 35, 36	2	2	6	2311	2340	415753	0712519
33	44	1	6	6	2311	2340	--	--

Appendix 1_Figure 61a. Data for Case Study 10 on NEWUDS Community-Wastewater System Input Form 8. (Form 8 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

Form 8. NEWUDS Input Form for Community-Wastewater Systems

System ID 4 System Name

Site ID	Site Type	Treatment Plant Site Name	Conv ID	Action	Site ID	Site Type	Discharge Pipe Site Name
23	19	WTP1 TP	55	71	24	9	WTP1 discharge pipe to
			21	85			Blackstone River

Site	Year	Population Served
21	1995	646,800
44	1995	125,000

Site ID	Resource ID	Resource Name
24	19	Blackstone River
22	18	Unknown overland flow and surficial aquifer

(Freshwater)

Conv ID	Action	Site ID	Site Type	Local Distribution or Withdrawal Site Name

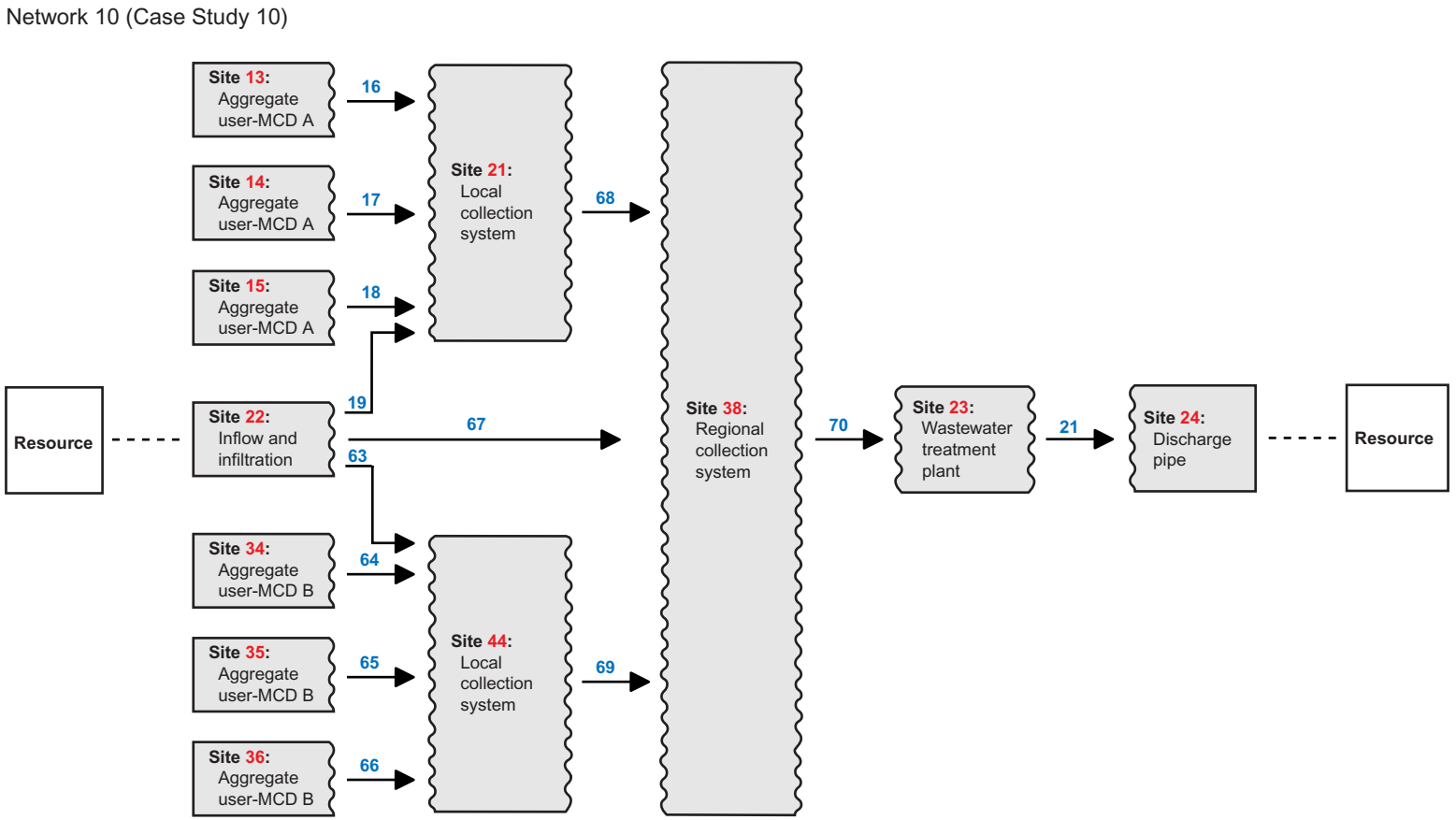
Site ID	Resource ID	Resource Name

Appendix 1_Figure 61a. Data for Case Study 10 on NEWUDS Community-Wastewater System Input Form 8--Continued.

Form 9. NEWUDS Transaction/Rate Data Input Form for System_ID 4

Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
16	13	21	16	2	1/1/95	12/31/95	16	2	5	20	25.70	1
17	14	21	17	2	1/1/95	12/31/95	17	2	5	20	3.10	1
18	15	21	18	2	1/1/95	12/31/95	18	2	5	20	7.6	1
19	22	21	19	2	1/1/95	12/31/95	19	2	5	43	30.00	1
70	38	23	70	2	1/1/95	12/31/95	70	2	42	1	110.00	1
21	23	24	21	2	1/1/95	12/31/95	21	2	42	40	110.00	1
63	22	44	63	2	1/1/95	12/31/95	63	2	5	43	17.6	1
64	34	44	64	2	1/1/95	12/31/95	64	2	5	20	10.00	1
65	35	44	65	2	1/1/95	12/31/95	65	2	5	20	1.00	1
66	36	44	66	2	1/1/95	12/31/95	66	2	5	20	5.00	1
67	22	38	67	2	1/1/95	12/31/95	67	2	5	43	10.00	1
68	21	38	68	2	1/1/95	12/31/95	68	2	5		67.7	1
69	44	38	69	2	1/1/95	12/31/95	69	2	5		32.3	1

Appendix 1_Figure 61b. Data for Case Study 10 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)



Appendix 1_Figure 62. Network 10: Diagram for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration. (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement, red number is Site_ID, and blue number is Conveyance_ID.)

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration

[1, Automatically assigned number (Primary key); 1, ID number from other table (Foreign key); 1, ID from domain table (Foreign key); 1, Date value]

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tdxSystem	System_ID	4		
	SystemType_ID	2	tdxSystemType	Community Wastewater System
	SystemName	WTP1		
tblOwner	Owner_ID	5		
	OwnerType_ID	2	tdsOwnerType	Municipal
	OwnerName	WTP1		
	OwnerContact	John Brown		
	OwnerPhone	802-761-5167		
tblAddress	Address_ID	5		
	AddressType_ID	3	tdsAddressType	Mailing
	AddressLine1	123 Utility Street		
	City	Pawtucket		
	StateAbbrv	RI		
	ZipCode	02701		
	CountryAbbrv	USA		
tasOwnerAddress	Owner_ID	5		
	Address_ID	5		
tblLocation	Location_ID	3		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415224		
	Location-Longitude	0712228		
tadLocationHUC	Location_ID	3		
	HUC_ID	44	tdsHUC	01090004
	IsPrimaryHUC	Yes		
tblSite	Site_ID	13		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User--MCD
	NEUseType_ID	67	tdsNEUseType	Domestic
	SiteName	Pawtucket MCD Domestic users		
tblSite	Site_ID	14		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User—MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SiteName	Pawtucket MCD Commercial users		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	15		
	Location_ID	3		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User—MCD
	NEUseType_ID	80	tdsNEUseType	Industrial
	SiteName	Pawtucket MCD Industrial users		
tblLocation	Location_ID	31		
	LocationDetMethod_ID	2	tdxLocationDetMethod	Centroid of MCD
	LocationScale_ID	2	tdsLocationScale	MCD
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2340	tdsMCD	Cumberland
	Location-Latitude	415753		
	Location-Longitude	0712228		
tadLocationHUC	Location_ID	3		
	HUC_ID	33	tdsHUC	01080107
	IsPrimaryHUC	Yes		
tblSite	Site_ID	34		
	Location_ID	31		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User--MCD
	NEUseType_ID	67	tdsNEUseType	Domestic
	SiteName	Cumberland MCD Domestic users		
tblSite	Site_ID	35		
	Location_ID	31		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User—MCD
	NEUseType_ID	79	tdsNEUseType	Commercial
	SiteName	Cumberland MCD Commercial users		
tblSite	Site_ID	36		
	Location_ID	31		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User—MCD
	NEUseType_ID	80	tdsNEUseType	Industrial
	SiteName	Cumberland MCD Industrial users		
tblLocation	Location_ID	11		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	7	tdsLocationScale	Undefined
tblSite	Site_ID	22		
	Location_ID	11		
	Owner_ID	1		
	SiteType_ID	27	tdsSiteType	Inflow and Infiltration
	NEUseType_ID	78	tdsNEUseType	Non Use
	SiteName	Inflow and Infiltration		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblLocation	Location_ID	14		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
tadLocationHUC	Location_ID	14		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	21		
	Location_ID	14		
	Owner_ID	5		
	SiteType_ID	14	tdsSiteType	Local collection system
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 Local Collection System		
tblLocation	Location_ID	33		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2340	tdsMCD	Cumberland
tadLocationHUC	Location_ID	33		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	44		
	Location_ID	33		
	Owner_ID	8		
	SiteType_ID	14	tdsSiteType	Local collection system
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP2 Local Collection System		
tblLocation	Location_ID	26		
	LocationDetMethod_ID	1	tdxLocationDetMethod	Unknown
	LocationScale_ID	6	tdsLocationScale	Irregular area
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
tadLocationHUC	Location_ID	14		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblSite	Site_ID	38		
	Location_ID	26		
	Owner_ID	5		
	SiteType_ID	13	tdsSiteType	Regional collection system
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 Regionaal Collection System		
tblLocation	Location_ID	16		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415100		
	Location-Longitude	0712013		
tadLocationHUC	Location_ID	16		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	23		
	Location_ID	16		
	Owner_ID	5		
	SiteType_ID	19	tdsSiteType	Wastewater Treatment Plant
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 Wastewater Treatment Plant		
tblLocation	Location_ID	17		
	LocationDetMethod_ID	7	tdxLocationDetMethod	Atlas Software
	LocationScale_ID	1	tdsLocationScale	Point
	State_ID	6	tdsState	RI
	County_ID	2311	tdsCounty	Providence
	MCD_ID	2348	tdsMCD	Pawtucket
	Location-Latitude	415105		
	Location-Longitude	0712010		
tadLocationHUC	Location_ID	17		
	HUC_ID	44	tdsHUC	01090005
	IsPrimaryHUC	Yes		
tblSite	Site_ID	24		
	Location_ID	17		
	Owner_ID	5		
	SiteType_ID	9	tdsSiteType	Discharge Pipe
	NEUseType_ID	61	tdsNEUseType	Community Wastewater System
	SIC_ID	637	tdsSICUseType	4952 Sewerage Systems
	SiteName	WTP1 discharge pipe to Blackstone River		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteDetail	Site_ID	21		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	6	tdxDataSource	NPDES-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetaiValue	646800		
tadSiteDetail	Site_ID	44		
	SiteDetailEffectiveDate	1/1/1995		
	SiteDetailLabel_ID	1	tdxSiteDetailLabel	Population Served
	DataSource_ID	6	tdxDataSource	NPDES-EPA
	TimeInterval_ID	1	tdsTimeInterval	5-year period
	SiteDetaiValue	125000		
tasSystemSite	System_ID	4		
	Site_ID	13		
	System_ID	4		
	Site_ID	14		
	System_ID	4		
	Site_ID	15		
tasSystemSite	System_ID	4		
	Site_ID	34		
	System_ID	4		
	Site_ID	35		
tasSystemSite	System_ID	4		
	Site_ID	36		
	System_ID	4		
	Site_ID	21		
	System_ID	4		
	Site_ID	23		
	System_ID	4		
	Site_ID	24		
	System_ID	4		
	Site_ID	38		
	System_ID	4		
	Site_ID	44		
tblResource	Resource_ID	18		
	WaterBodyType_ID	11	tdsWaterBodyType	Unknown ground and surface water
	ResourceName	Unknown overland flow and surficial aquifer		
tblResource	Resource_ID	19		
	WaterBodyType_ID	1	tdsWaterBodyType	River/stream
	ResourceName	Blackstone River		
tadSiteResource	Site_ID	22		
	Resource_ID	18	tblResource	General ground water
	Site_ID	24		
	Resource_ID	19	tblResource	Blackstone River

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblConveyance	Conveyance_ID	16		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	16		
	FromOrTo	From		
	Site_ID	13		
	Conveyance_ID	16		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	17		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	17		
	FromOrTo	From		
	Site_ID	14		
	Conveyance_ID	17		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	18		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	18		
	FromOrTo	From		
	Site_ID	15		
tadSiteConveyance	Conveyance_ID	18		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	19		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	152	tdsConveyanceAction	Inflow and infiltration to local collection system
tadSiteConveyance	Conveyance_ID	19		
	FromOrTo	From		
	Site_ID	22		
	Conveyance_ID	19		
	FromOrTo	To		
	Site_ID	21		
tblConveyance	Conveyance_ID	70		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	71	tdsConveyanceAction	Regional collection system to wastewater treatment plant

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tadSiteConveyance	Conveyance_ID	70		
	FromOrTo	From		
	Site_ID	38		
	Conveyance_ID	70		
	FromOrTo	To		
	Site_ID	23		
tblConveyance	Conveyance_ID	21		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	85	tdsConveyanceAction	Wastewater treatment plant to discharge pipe
tadSiteConveyance	Conveyance_ID	21		
	FromOrTo	From		
	Site_ID	23		
	Conveyance_ID	21		
	FromOrTo	To		
	Site_ID	24		
tblConveyance	Conveyance_ID	63		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	152	tdsConveyanceAction	Inflow and infiltration to local collection system
tadSiteConveyance	Conveyance_ID	63		
	FromOrTo	From		
	Site_ID	22		
	Conveyance_ID	63		
	FromOrTo	To		
	Site_ID	44		
tblConveyance	Conveyance_ID	64		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	64		
	FromOrTo	From		
	Site_ID	34		
	Conveyance_ID	64		
	FromOrTo	To		
	Site_ID	44		
tblConveyance	Conveyance_ID	65		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	65		
	FromOrTo	From		
	Site_ID	35		
	Conveyance_ID	65		
	FromOrTo	To		
	Site_ID	44		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblConveyance	Conveyance_ID	66		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	103	tdsConveyanceAction	Aggregate user—MCD to local collection system
tadSiteConveyance	Conveyance_ID	66		
	FromOrTo	From		
	Site_ID	36		
tadSiteConveyance	Conveyance_ID	66		
	FromOrTo	To		
	Site_ID	44		
tblConveyance	Conveyance_ID	68		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	68	tdsConveyanceAction	From local collection system To regional collection system
tadSiteConveyance	Conveyance_ID	68		
	FromOrTo	From		
	Site_ID	21		
tadSiteConveyance	Conveyance_ID	68		
	FromOrTo	To		
	Site_ID	38		
tblConveyance	Conveyance_ID	69		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	68	tdsConveyanceAction	From local collection system To regional collection system
tadSiteConveyance	Conveyance_ID	69		
	FromOrTo	From		
	Site_ID	44		
	Conveyance_ID	69		
	FromOrTo	To		
	Site_ID	38		
tblConveyance	Conveyance_ID	67		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	151	tdsConveyanceAction	From inflow and infiltration To regional collection system
tadSiteConveyance	Conveyance_ID	67		
	FromOrTo	From		
	Site_ID	22		
	Conveyance_ID	67		
	FromOrTo	To		
	Site_ID	38		
tblTransaction	Transaction_ID	16		
	Conveyance_ID	16		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	17		
	Conveyance_ID	17		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	18		
	Conveyance_ID	18		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	19		
	Conveyance_ID	19		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	70		
	Conveyance_ID	70		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	21		
	Conveyance_ID	21		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	63		
	Conveyance_ID	63		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	64		
	Conveyance_ID	64		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	65		
	Conveyance_ID	65		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	66		
	Conveyance_ID	66		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblTransaction	Transaction_ID	68		
	Conveyance_ID	68		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	69		
	Conveyance_ID	69		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblTransaction	Transaction_ID	67		
	Conveyance_ID	67		
	TimeInterval_ID	2	tdsTimeInterval	Year
	TransactionEffectiveDate	1/1/95		
	TransactionEndingDate	12/31/95		
tblRate	Rate_ID	16		
	Transaction_ID	16		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	25.70		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	17		
	Transaction_ID	17		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	3.10		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	18		
	Transaction_ID	18		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion Community-water system/disposal from self supply/disposal
	RawRateValue	7.6		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	19		
	Transaction_ID	19		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawals/returns and estimated distribution/wastewatera collection
	RawRateValue	30.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	70		
	Transaction_ID	70		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	42	tdxDataSource	WU Spec
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	110.0		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	21		
	Transaction_ID	21		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	42	tdxDataSource	WTP1
	RateMethod_ID	40	tdxRateMethod	Estimated as same as metered rate
	RawRateValue	110.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	63		
	Transaction_ID	63		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WTP1
	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawals/returns and estimated distribution/wastewatera collection
	RawRateValue	17.6		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	64		
	Transaction_ID	64		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	10.0		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	65		
	Transaction_ID	65		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WTP1
tblRate	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	1.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	66		
	Transaction_ID	66		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WTP1
	RateMethod_ID	20	tdxRateMethod	IWR-MAIN coefficient applied to Dun & Bradstreet values to determine water-use and use Census Bureau data to proportion public supply/disposal from self supply/disposal
	RawRateValue	5.00		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		

Appendix 1_Table 21. Data entry into NEWUDS tables for Case Study 10: Regional and local collection and return by a complex community-wastewater system (WTP1, WTP2) with aggregates of users and inflow and infiltration--Continued

Table name	Field name	DataValue or ID	Domain table	Domain table value for ID
tblRate	Rate_ID	67		
	Transaction_ID	67		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WU Spec
tblRate	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawals/returns and estimated distribution/wastewater/collection
	RawRateValue	10.0		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	68		
	Transaction_ID	68		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WTP1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	67.70		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
tblRate	Rate_ID	69		
	Transaction_ID	69		
	Staff_ID	2	tdxStaff	Horn
	DataSource_ID	5	tdxDataSource	WTP1
	RateMethod_ID	1	tdxRateMethod	Calibrated cumulative meter
	RawRateValue	32.30		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		