

## 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										
		City	Pawtucket	State	RI	Zip	02701					
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					
2	3	MSS1 Well 2	2	39								
Site ID	Resource ID	Resource Name	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							Site ID	Resource ID	Resource Name
1	5	Glacial-deposit aquifer										

**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

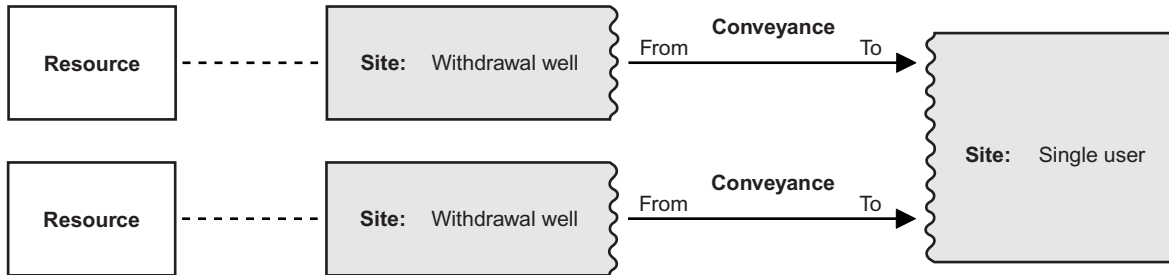
**Appendix 1\_Figure 34b.**Data for Case Study 1 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)

**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).

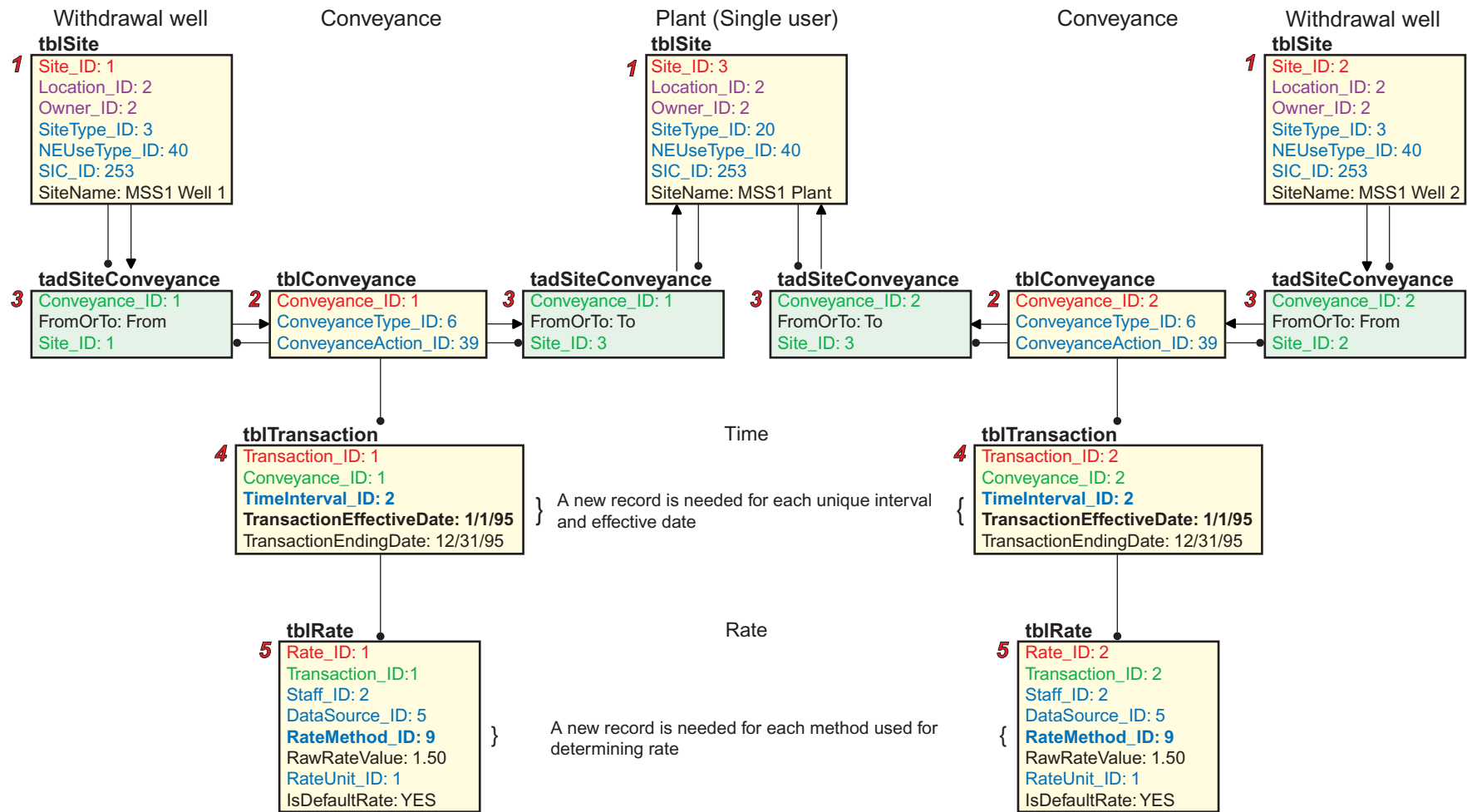
**Step 4:** Organize Site, Conveyance, Transaction, and Rate data as shown in Appendix 1\_figure 36.

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

Network 1 (Case Study 1)



**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.)



- 1** Number outside each table indicates table order for data entry
- tblSite** Table name
- Site\_ID** Automatically assigned number (primary key)
- Site\_ID** ID number from other data table in this figure (foreign key)
- Owner\_ID** ID number from data table based on data in figure 34 (foreign key)
- SiteName** Data value
- SIC\_ID** ID from domain table (foreign key)
- Direction of water movement
- Ball near table where ID is a foreign key

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
	SiteDetailValue	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		
tblConveyance	Resource_ID	5	tblResource	Glacial-deposit aquifer
	Conveyance_ID	1		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
tadSiteConveyance	ConveyanceAction_ID	39	tdsConveyanceAction	Well to single user
	Conveyance_ID	1		
	FromOrTo	From		
tblConveyance	Site_ID	1		
	Conveyance_ID	1		
	FromOrTo	To		
tblConveyance	Site_ID	3		
	Conveyance_ID	2		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
tadSiteConveyance	ConveyanceAction_ID	39	tdsConveyanceAction	Well to single user
	Conveyance_ID	2		
	FromOrTo	From		
tblConveyance	Site_ID	2		
	Conveyance_ID	2		
	FromOrTo	To		
tblConveyance	Site_ID	3		
	Conveyance_ID	2		
	FromOrTo	To		

**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<sup>1</sup> (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.

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<sup>1</sup>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
State	RI	County	Providence
State code	6	MCD	Pawtucket
		CO Code	2311
		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		1.3 Mgal/d 1995 crystalline-rock aquifers
	80	24	IND		
	1	24	IRR		
	81	24	LVS		
		24			

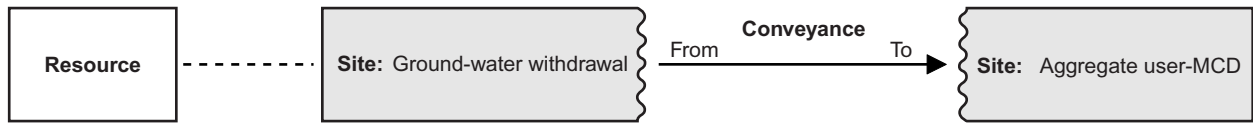
Site ID	Use	Site Type	Local Collection System
	61	14	
	61	14	
	61	14	

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.)

Network 2 (Case Study 2)

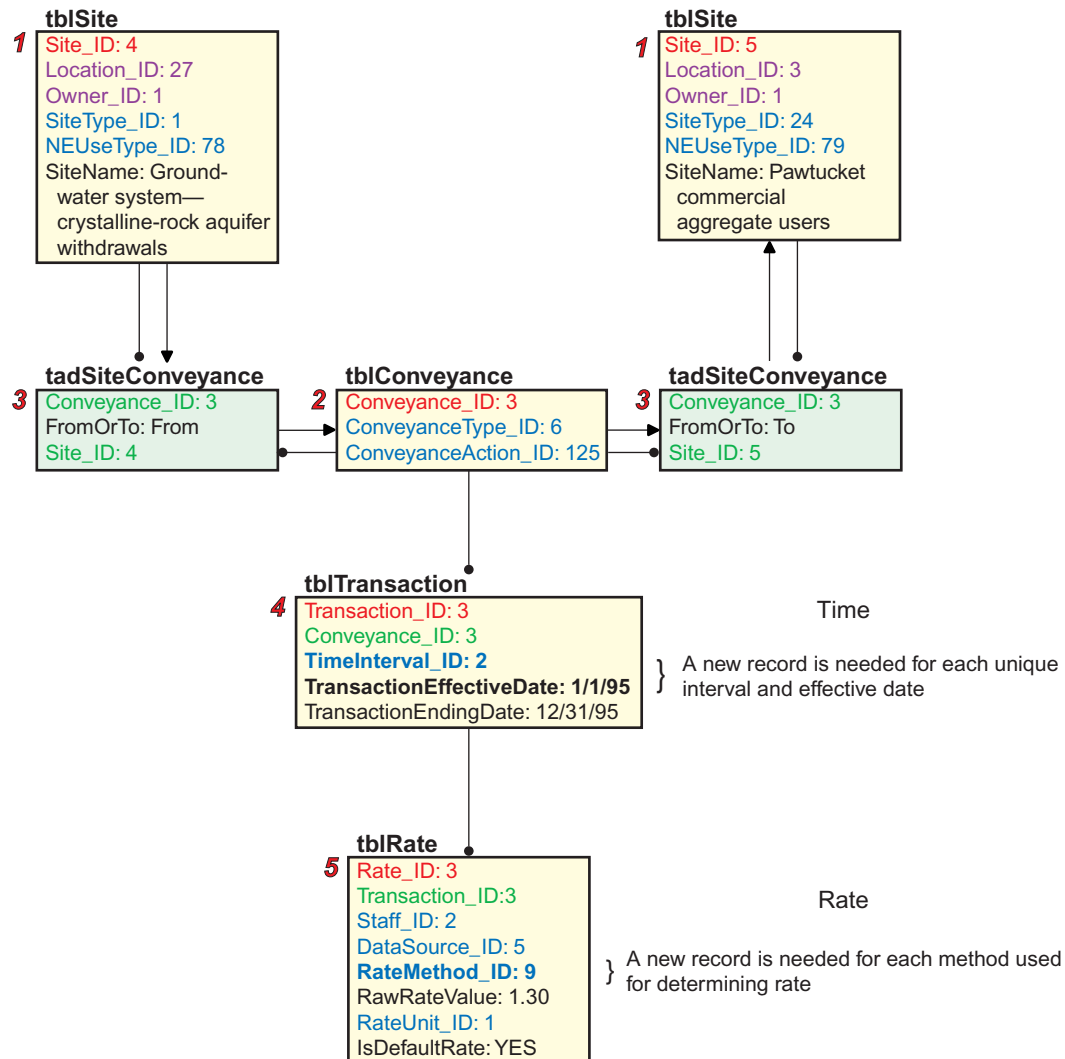


**Appendix 1 Figure 38.** Network 2: Diagram for Case Study 2: Withdrawal and use by an aggregate of users (Aggregate user-MCD). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)

Ground-water withdrawal

Conveyance

Commercial aggregate of users  
(Aggregate user-MCD)



EXPLANATION

- 1 Number outside each table indicates table order for data entry
- tblSite** Table name
- Site\_ID Automatically assigned number (primary key)
- Site\_ID ID number from other data table in this figure (foreign key)
- Owner\_ID ID number from data table based on data in figure 37 (foreign key)
- SiteName Data value
- SIC\_ID ID from domain table (foreign key)
- Direction of water movement
- Ball near table where ID is a foreign key

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

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
63	well	CWS1 Well #5	4	33	11	17	CWS1 TP	9	50			
73		CWS1 Well #6	5	33								
83		CWS1 Well #7	6	33								
93		CWS1 Well #8	7	33								
108	intake	Happy Hollow Res int	8	18								
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	--	--	--	--	--				

Site ID	Resource ID	Resource Name
6-95		Glacial-deposit aquifers
10 1		Happy Hollow Res

**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.)



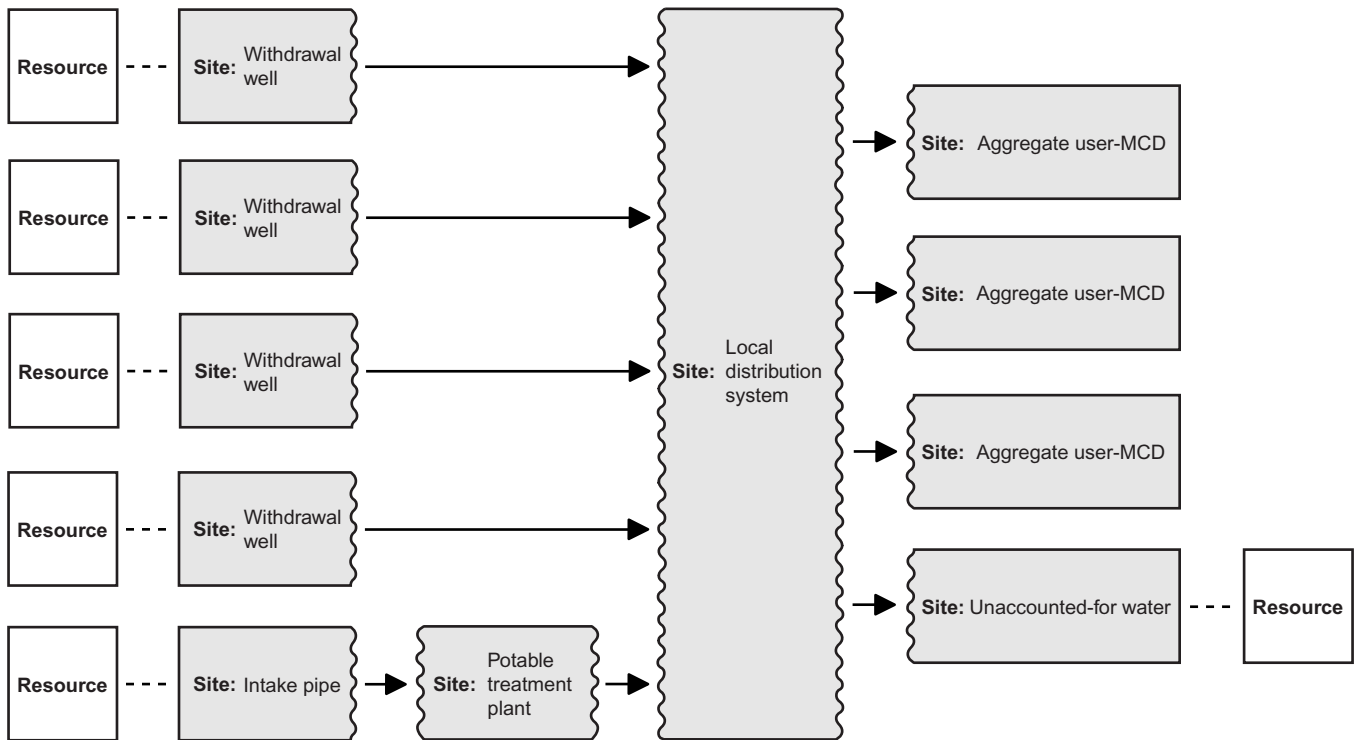


### Form 9. NEWUDS Transaction/Rate Data Input Form for System\_ID 2

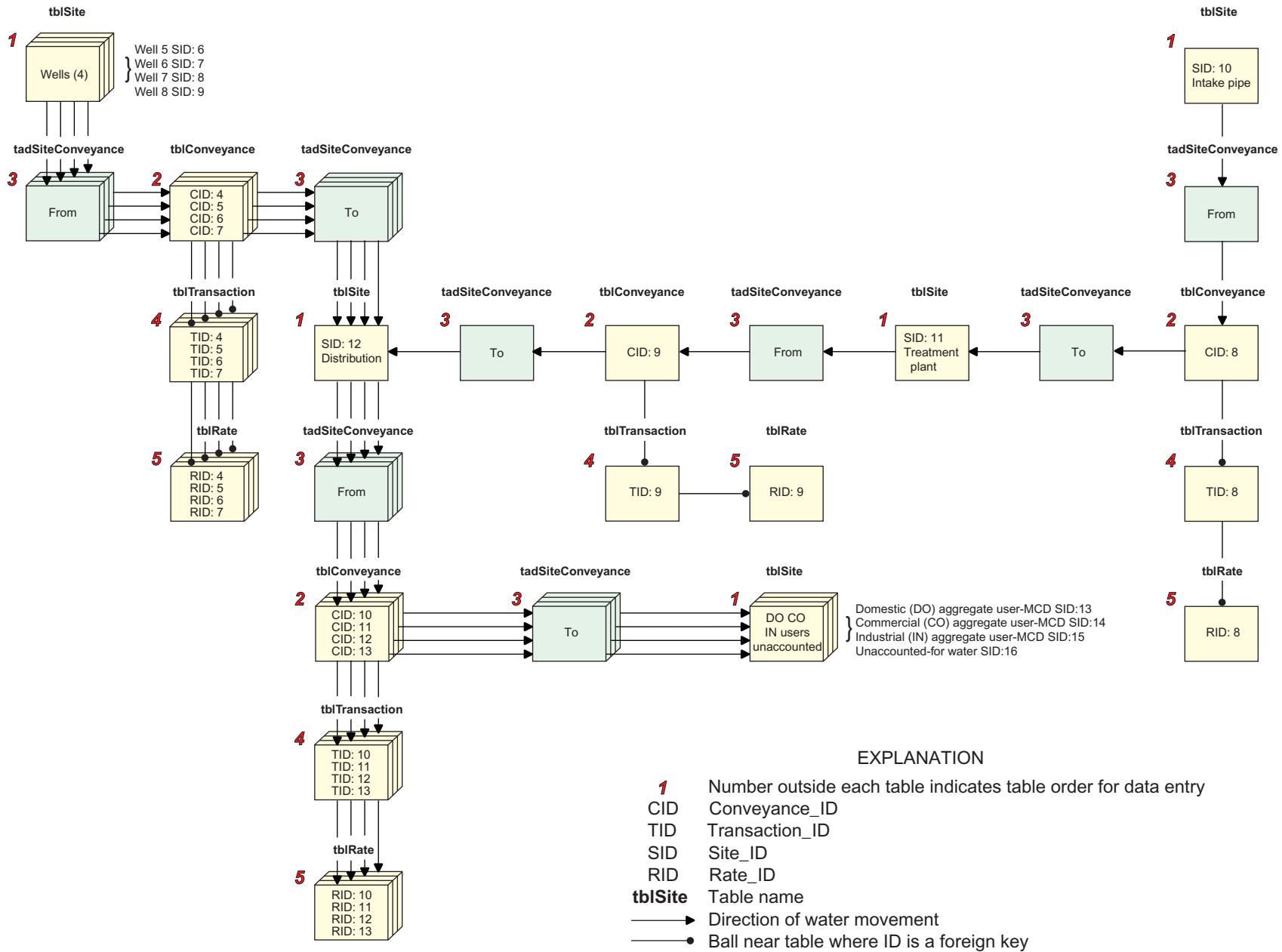
Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
4	6	12	4	2	1/1/95	12/31/95	4	2	41	1	3.00	1
5	7	12	5	2	1/1/95	12-31-95	5	2	41	1	3.00	1
6	8	12	6	2	1/1/95	12-31-95	6	2	41	1	3.00	1
7	9	12	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		
	StateAbbvr	RI		
	ZipCode	02701		
	CountryAbbvr	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	tdxDDataSource	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 ( $0.50 \times 2.0 \text{ Mgal} = 1.0 \text{ Mgal}$ ;  $2.0 \text{ Mgal/d use} - 1.0 \text{ Mgal/d consumptive use} = 1.0 \text{ Mgal/d returns}$ ).

**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  System Name  System Type  Use Type  NEUse Code   
 Owner ID  Owner Name  Owner Type  SIC Code  SIC Code code   
 Address ID  Mail Line1  Street Line1  Contact Name  Phone   
 Mail Line2  Street Line2  Address type code   
 City  State  Zip  City  State  Zip   
 Location ID  Location Name  Location Scale  Location Scale Code   
 State  County  MCD  HUC  State Basin   
 code  code  code  code  code   
 Latitude  Longitude  Location Det Method  LDM code

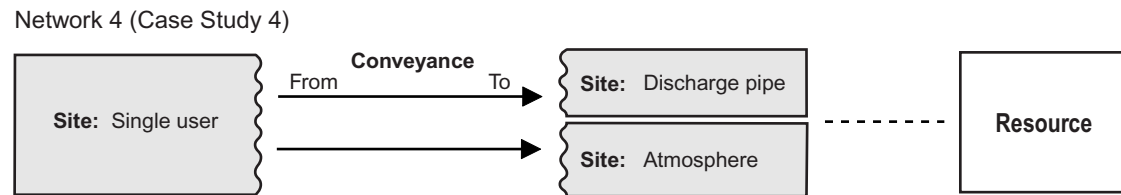
Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
					17	20	MSS2 Plant	14	62	18	9 outfall	MSS2 discharge pipe to Blackstone River
					25	22	CU (Loc_ID = 11)					
Site ID	Resource ID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

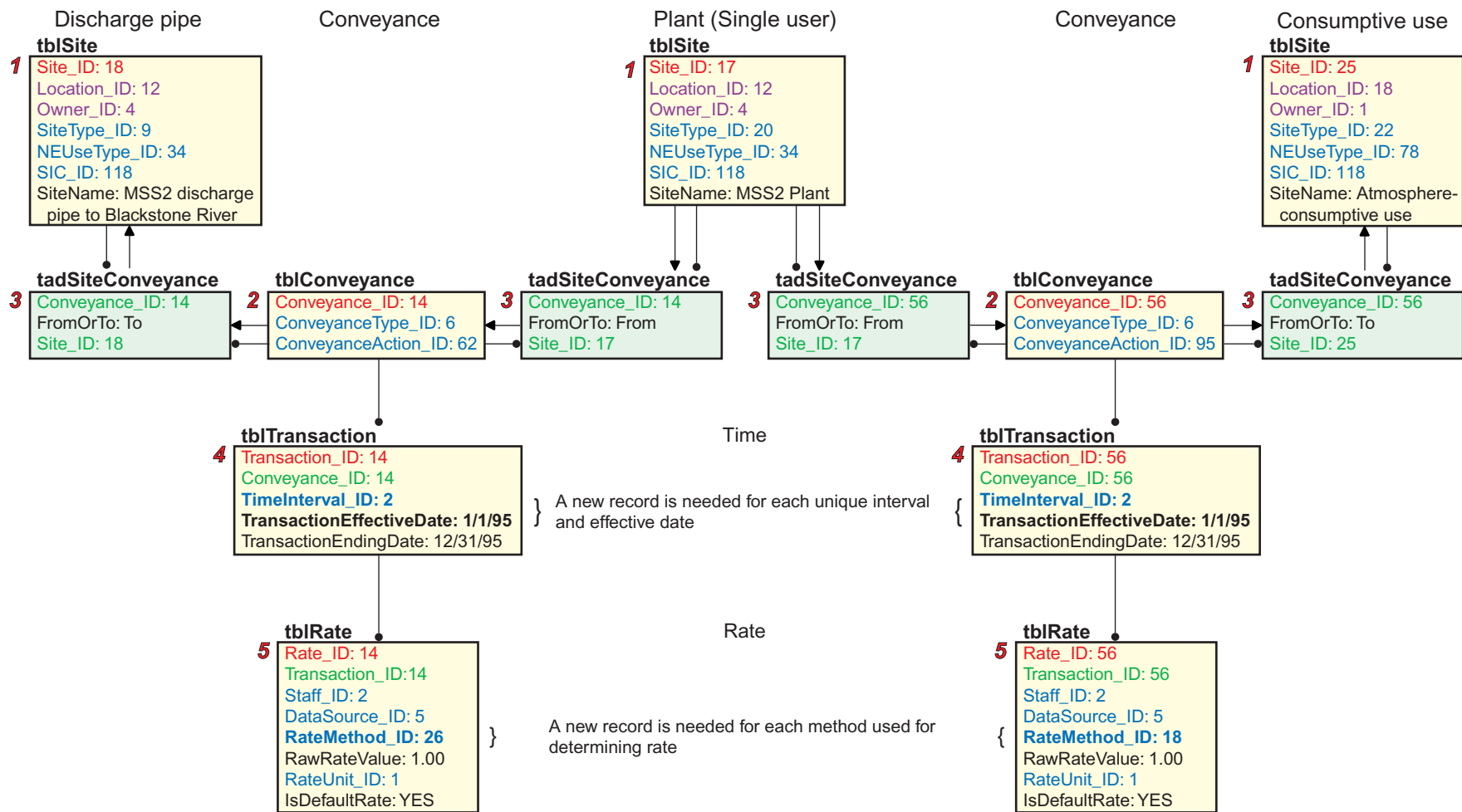
### Form 9. NEWUDS Transaction/Rate Input Data Form for System\_ID 3

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.)



**EXPLANATION**

- 1** Number outside each table indicates table order for data entry
- tblSite** Table name
- Site\_ID Automatically assigned number (primary key)
- Site\_ID ID number from other data table in this figure (foreign key)
- Owner\_ID ID number from data table based on data in figure 43 (foreign key)
- SiteName Data value
- SIC\_ID ID from domain table (foreign key)
- Direction of water movement
- Ball near table where ID is a foreign key

**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
	SiteDetailValue	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	tdxDDataSource	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	tdxDDataSource	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	tdxDDataSource	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	tdxDDataSource	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<sup>2</sup> (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.

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<sup>2</sup>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	
State	--	Location Determination Method Code	1	Location Scale Code
State code	--MCD			
		CO Code	--	
		MCD code	--	

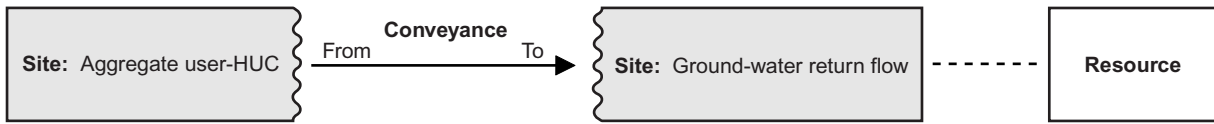
Site ID	Use Code	Site Type	Ground-water Withdrawal	Resource ID	Resource Name
	78	1			
	78	1			
	78	1			
Site ID	Use	Site Type	Local Distribution System		
	60	12			
	60	12			
	60	12			
	60	12			
Site ID	Use	Site Type	User	From Sites	To Sites
	67	24	DOM		
	79	24	COM		
19	80	24	IND		20
	1	24	IRR		
	81	24	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.)



Network 5 (Case Study 5)

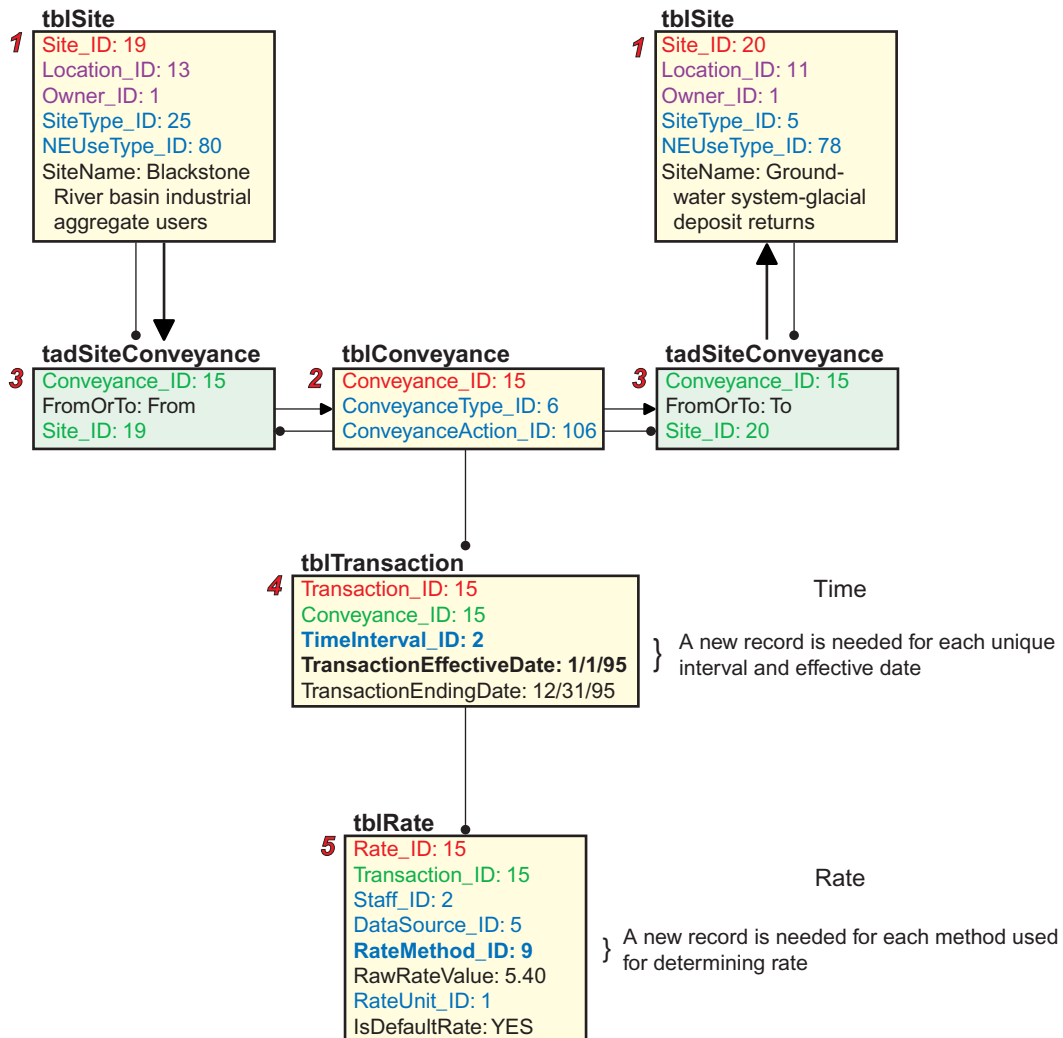


**Appendix 1\_Figure 47.**Network 5: Diagram for Case Study 5: Use and return by an aggregate of users (Aggregate user-HUC). (Dotted line represents a Site-Resource association, solid line represents a conveyance, and an arrowhead shows the direction of water movement.)

Industrial aggregate users  
(Aggregate user-HUC)

Conveyance

Ground-water return



EXPLANATION

- 1** Number outside each table indicates table order for data entry
- tblSite** Table name
- Site\_ID** Automatically assigned number (primary key)
- Site\_ID** ID number from other data table in this figure (foreign key)
- Owner\_ID** ID number from data table based on data in figure 46 (foreign key)
- SiteName** Data value
- SIC\_ID** ID from domain table (foreign key)
- Direction of water movement
- Ball near table where ID is a foreign key

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



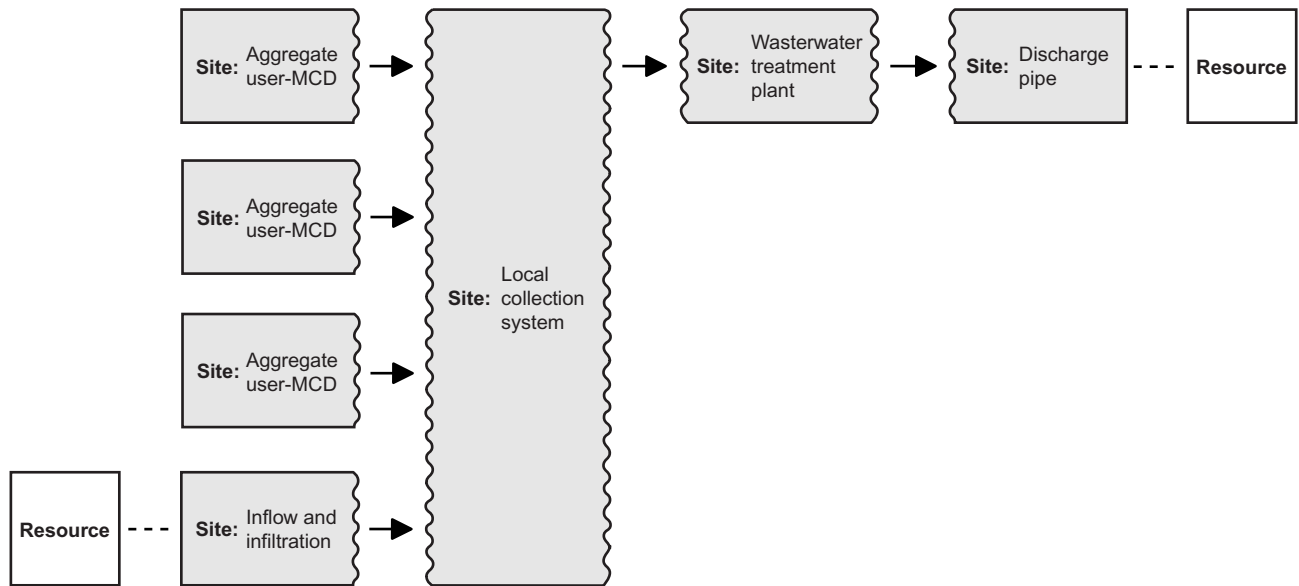
**Form 9. NEWUDS Transaction Input Form for System\_ID 4**

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

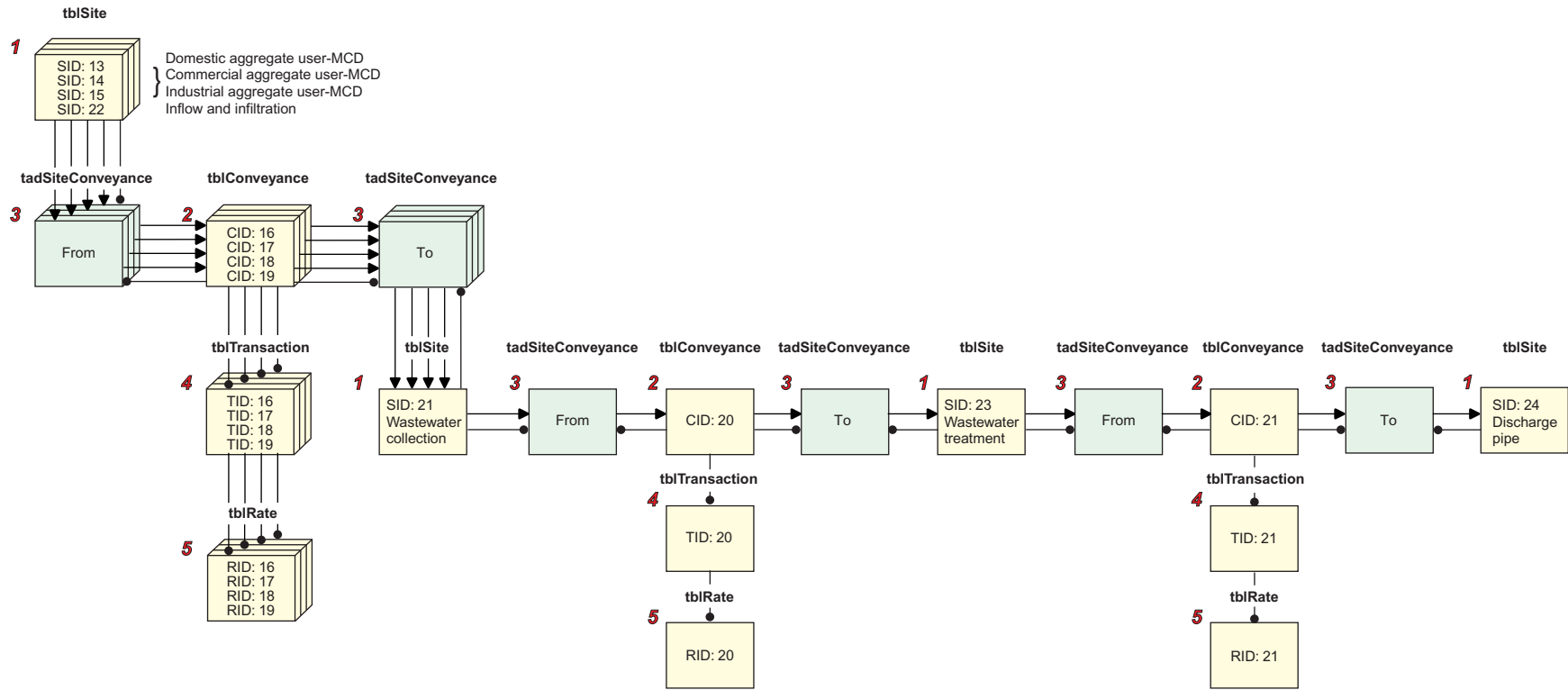
**Appendix 1\_Figure 49b.**Data for Case Study 6 on NEWUDS Transaction/Rate Data Input Form 9. (Form 9 is in Appendix 3.)



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		
	StateAbbrev	RI		
	ZipCode	02701		
	CountryAbbrev	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	tdxDDataSource	NPDES-EPA	
	TimeInterval_ID	1	tdsTimeInterval	5-year period	
	SiteDetailValue	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
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
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  System Name  System Type  Use Type  NEUse Code   
 Owner ID  Owner Name  Owner Type  SIC code  SIC Code code   
 Address ID  Mail Line1  Street Line1  Contact Name  Phone   
 Mail Line2  Street Line2  Address type code   
 City  State  Zip  City  State  Zip   
 Location ID  Location Name  Location Scale  Location Scale Code   
 State  County  MCD  HUC  State Basin   
 code  code  code  code  code   
 Latitude  Longitude  Location Det Method  LDM code

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	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
1	5	Glacial-deposit aquifer								26	5	Glacial-deposit aquifer

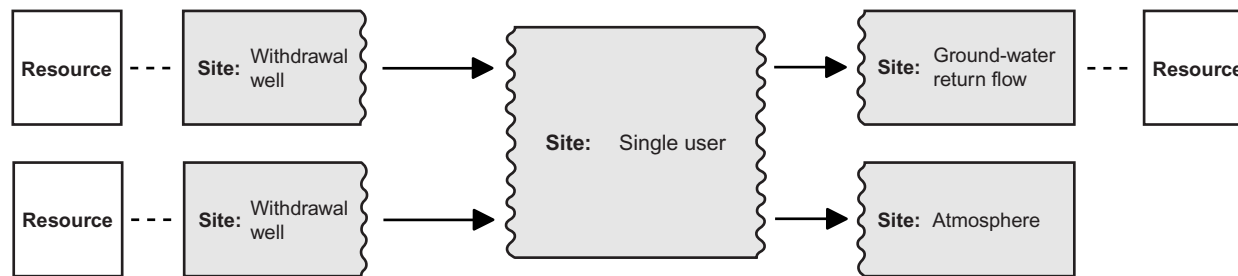
Appendix 1\_Figure 52a. Data for Case Study 7 on NEWUDS Single user Input Form 1. (Form 1 is in Appendix 3. Gray boxes need values from domain tables in Appendix 2.)

### Form 9. NEWUDS Transaction/Rate Data Input Form for System\_ID 1

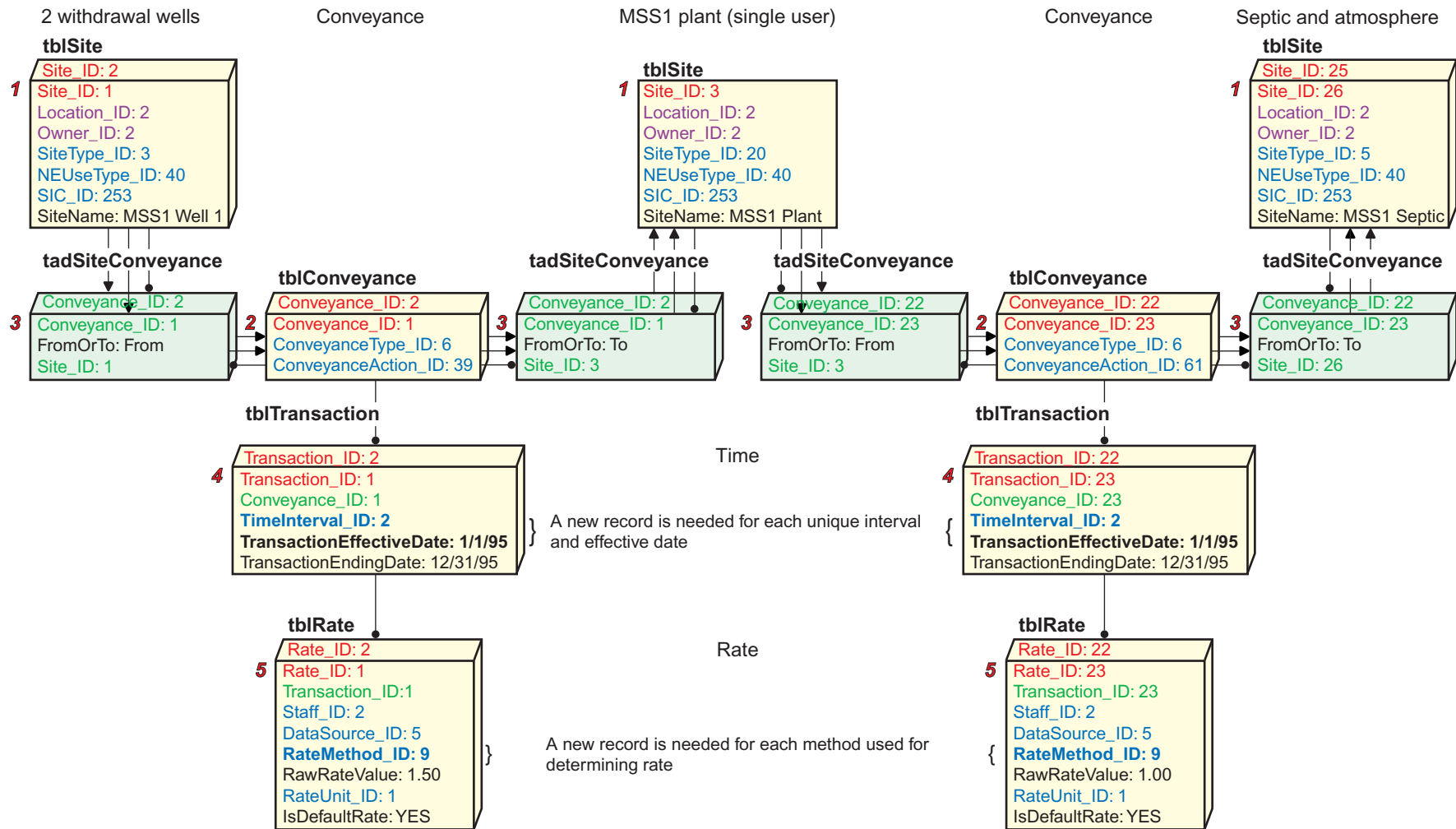
Conveyance ID	From Site_ID	To Site_ID	Transaction ID	Time Interval ID	Begin Date	End Date	Rate ID	Staff ID	Data Source ID	Rate Method ID	Raw Rate Value	Rate Unit ID
1	1	3	1	2	1/1/95	12/31/95	1	2	5	9	1.50	1
2	2	3	2	2	1/1/95	12/31/95	2	2	5	9	1.50	1
22	3	26	22	2	1/1/95	12/31/95	22	2	5	44	2.00	1
23	3	25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

Network 7 (Case Study 7)



**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
	SiteDetailValue	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  System Name  System Type  Use Type  NEUse Code   
 code  SIC code  SIC Code code   
 Owner ID  Owner Name  Owner Type  Contact Name   
 code  Phone   
 Address ID  Mail Line1  Street Line1  Address type code   
 2<sup>nd</sup> Address ID  Mail Line2  Street Line2  2<sup>nd</sup> Address type code   
 City  State  Zip  City  State  Zip   
 Location ID  Location Name  Location Scale  Location Scale Code   
 State  County  MCD  HUC  State Basin   
 code  code  code  code  code   
 Latitude  Longitude  Location Det Method  LDM code

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

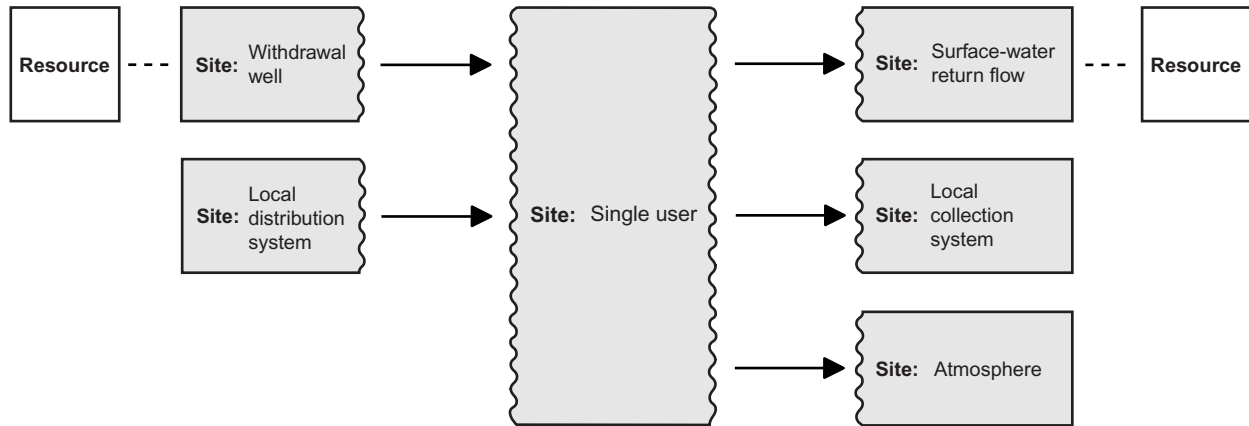
### Form 1. NEWUDS Input Form for Single Users

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

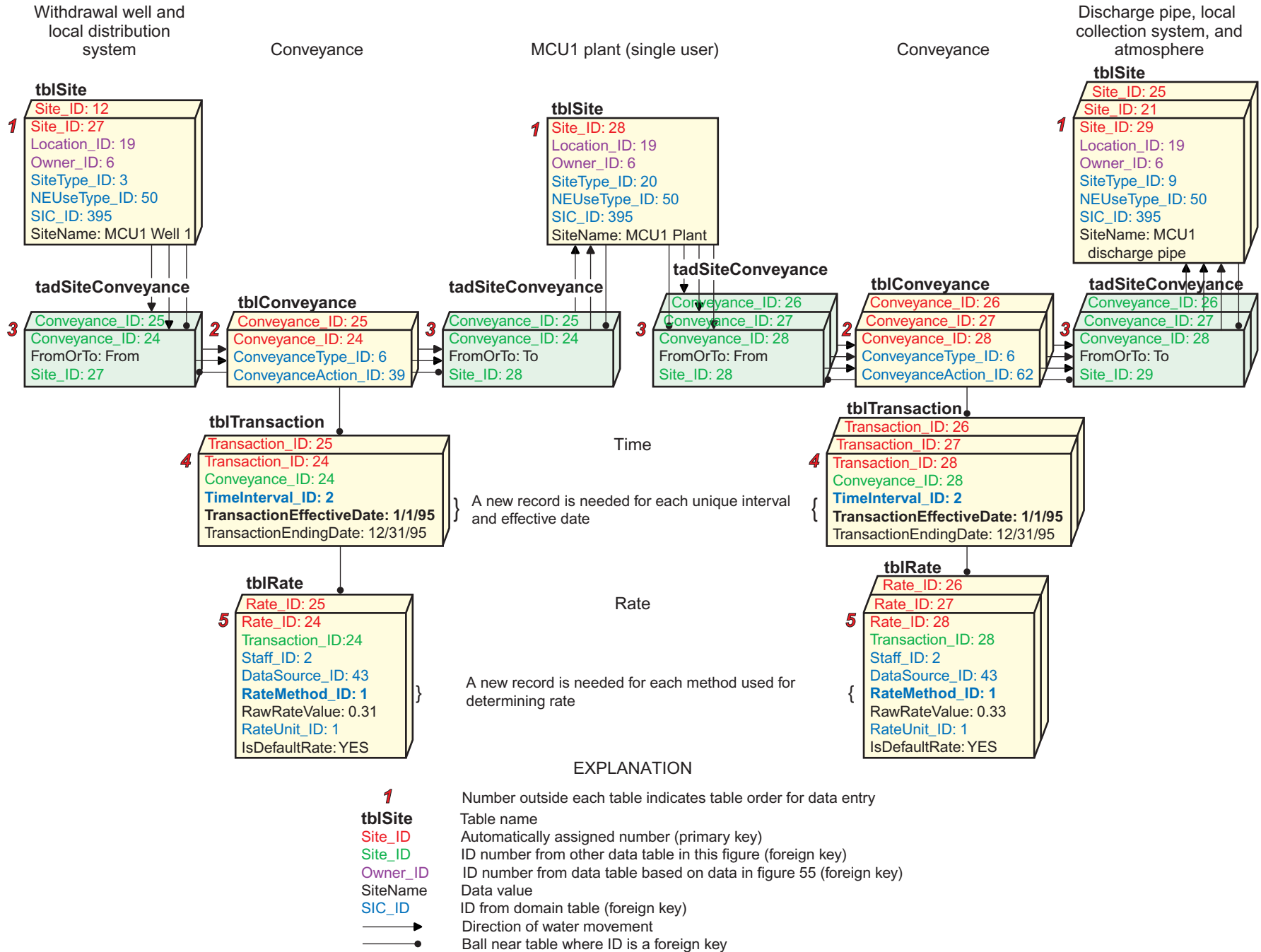
Site ID	Site Type	Withdrawal Site or Distribution Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Return Site or Collection Name
1	3 well	MSS1 Well 1	1	39	3	20	MSS1 Plant	22	95	26	5 Septic	MSS1 Septic
2	3	MSS1 Well 2	2	39	25	22	CU (Loc_ID = 11)	23	61			
Site ID	Resource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

Network 8 (Case Study 8)



**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

(Wastewater)												
Site ID	Site Type	Local Distribution System Site Name	Conv ID	Action	Site ID	Site Type	User Site Name	Conv ID	Action	Site ID	Site Type	Local Collection or Return Site Name
12	12	CWS1 LDS in MCD A	38	53	13	24	MCD A Dom Agg	34	51	21	14	WTP1 LCS
16	23	Unaccounted-for water	10	131	14	24	MCD A Com Agg					
32	12	CWS1 LDS in MCD B	11	131	15	24	MCD A Ind Agg					
16	23	Unaccounted-for water	12	131	34	24	MCD B Dom Agg					
			13	150	35	24	MCD B Com Agg					
31	12	CWS2 LDS in MCD C	35	152	36	24	MCD B Ind Agg					
16	23	Unaccounted-for water	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								

Site ID	Resource ID	Resource Name

Intake to Discharge 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

Site	Year	Population Served
30	1995	859,000

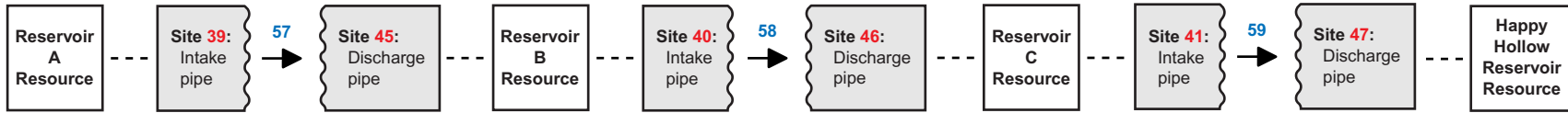
**Appendix 1\_Figure 58a.**Data for Case Study 9 on NEWUDS Community-Water System Input Form 6--Continued.

**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.)

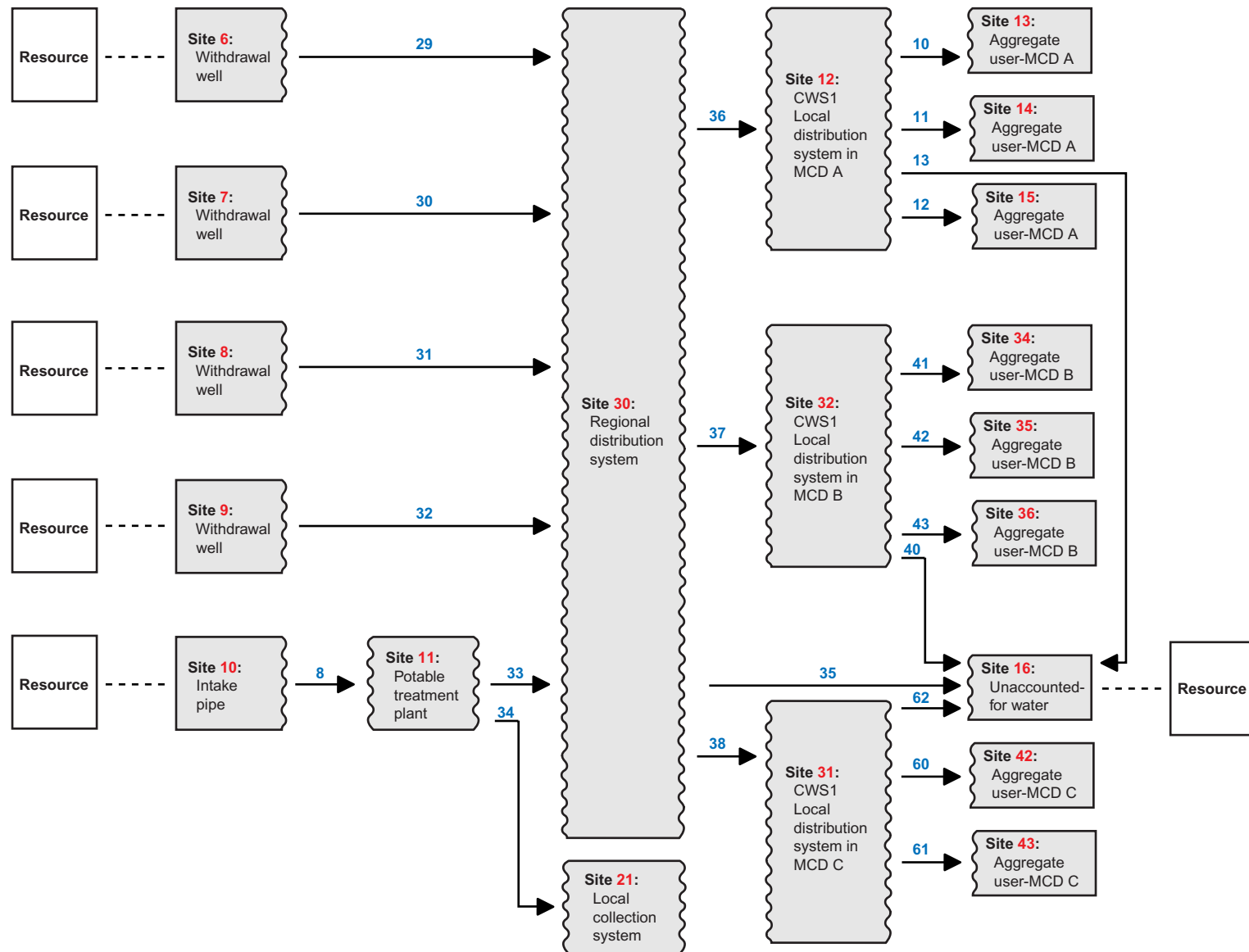
Network 9a (Case Study 9)



**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
	SiteDetailValue	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
	NEUUseType_ID	67	tdsNEUUseType	Domestic
	SiteName	Lincoln MCD domestic users		
tblSite	Site_ID	43		
	Location_ID	32		
	Owner_ID	1		
	SiteType_ID	24	tdsSiteType	Aggregate User – MCD
	NEUUseType_ID	79	tdsNEUUseType	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		
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		
tadSiteResource	Resource_ID	22		
	WaterBodyType_ID	3	tdsWaterBodyType	Reservoir
	ResourceName	Reservoir C		
	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		
tblConveyance	Conveyance_ID	29		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
	Conveyance_ID	29		
	FromOrTo	From		
tblConveyance	Conveyance_ID	30		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
	Conveyance_ID	29		
	FromOrTo	To		
tblConveyance	Conveyance_ID	30		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
	Conveyance_ID	29		
	FromOrTo	To		
tblConveyance	Conveyance_ID	31		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
	Conveyance_ID	30		
	FromOrTo	To		
tblConveyance	Conveyance_ID	31		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
	Conveyance_ID	31		
	FromOrTo	To		
tblConveyance	Conveyance_ID	32		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	27	tdsConveyanceAction	Well to regional distribution system
	Conveyance_ID	32		
	FromOrTo	To		
tblConveyance	Conveyance_ID	57		
	ConveyanceType_ID	6	tdsConveyanceType	Virtual
	ConveyanceAction_ID	12	tdsConveyanceAction	Intake pipe to discharge pipe
	Conveyance_ID	30		
	FromOrTo	To		

**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
tblRate	IsDefaultRate	Yes		
	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		
tblRate	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
	Rate_ID	13		
	Transaction_ID	13		
tblRate	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	6.25		
tblRate	RateUnit_ID	1	tdxRateUnit	Mgal/d
	IsDefaultRate	Yes		
	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
tblRate	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	<input type="text" value="4"/>	System Name	<input type="text" value="WTP1"/>	System Type	<input type="text" value="pub wstwtr"/>	Use	<input type="text"/>	Use code	<input type="text" value="61"/>
Owner ID	<input type="text" value="5"/>	Owner Name	<input type="text" value="WTP1"/>	ST code	<input type="text" value="2"/>	Owner Type	<input type="text" value="Municipal"/>	Contact Name	<input type="text" value="John Brown"/>
Address ID	<input type="text" value="5"/>	Mail Line1	<input type="text" value="123 Utility St"/>	OT code	<input type="text" value="2"/>	Street Line1	<input type="text"/>	Phone	<input type="text" value="8027615167"/>
		Mail Line2	<input type="text"/>	Street Line2	<input type="text"/>	Address type code	<input type="text" value="3"/>		
City	<input type="text" value="Pawtucket"/>	State	<input type="text" value="RI"/>	Zip	<input type="text" value="02701"/>	City	<input type="text"/>	State	<input type="text"/>
Location ID	<input type="text" value="26"/>	Location Name	<input type="text"/>	Location Scale	<input type="text" value="Irregular"/>	LS Code	<input type="text" value="6"/>	Zip	<input type="text"/>
State	<input type="text" value="Rhode Island"/>	County	<input type="text" value="Providence"/>	MCD	<input type="text" value="Pawtucket"/>	HUC	<input type="text" value="01090004"/>	State Basin	<input type="text"/>
ST code	<input type="text" value="6"/>	C code	<input type="text" value="2311"/>	MCD code	<input type="text" value="2348"/>	code	<input type="text" value="44"/>	SB code	<input type="text"/>
Latitude	<input type="text" value="--"/>	Longitude	<input type="text" value="--"/>	Location Determin Method	<input type="text" value="Unknown"/>	LDM Code	<input type="text" value="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	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th colspan="10">Location</th> </tr> <tr> <th>ID</th><th>Site</th><th>LDM</th><th>Scale</th><th>State</th><th>CO</th><th>MCD</th><th>Latitude</th><th>Longitude</th><th></th> </tr> </thead> <tbody> <tr> <td>3</td><td>13,14,15</td><td>2</td><td>2</td><td>6</td><td>2311</td><td>2348</td><td>415224</td><td>0712228</td><td></td> </tr> <tr> <td>14</td><td>21</td><td>1</td><td>6</td><td>6</td><td>2311</td><td>2348</td><td>--</td><td>--</td><td></td> </tr> <tr> <td>16</td><td>23</td><td>7</td><td>1</td><td>6</td><td>2311</td><td>2348</td><td>415100</td><td>0712013</td><td></td> </tr> <tr> <td>17</td><td>24</td><td>7</td><td>1</td><td>6</td><td>2311</td><td>2348</td><td>415105</td><td>0712910</td><td></td> </tr> <tr> <td>26</td><td>38</td><td>1</td><td>6</td><td>6</td><td>2311</td><td>2348</td><td>--</td><td>--</td><td></td> </tr> <tr> <td>15</td><td>22</td><td>1</td><td>7</td><td>--</td><td>--</td><td>--</td><td>--</td><td>--</td><td></td> </tr> <tr> <td>31</td><td>34, 35, 36</td><td>2</td><td>2</td><td>6</td><td>2311</td><td>2340</td><td>415753</td><td>0712519</td><td></td> </tr> <tr> <td>33</td><td>44</td><td>1</td><td>6</td><td>6</td><td>2311</td><td>2340</td><td>--</td><td>--</td><td></td> </tr> </tbody> </table>								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	--	--	
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			63	152																																																																																																												

**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.)

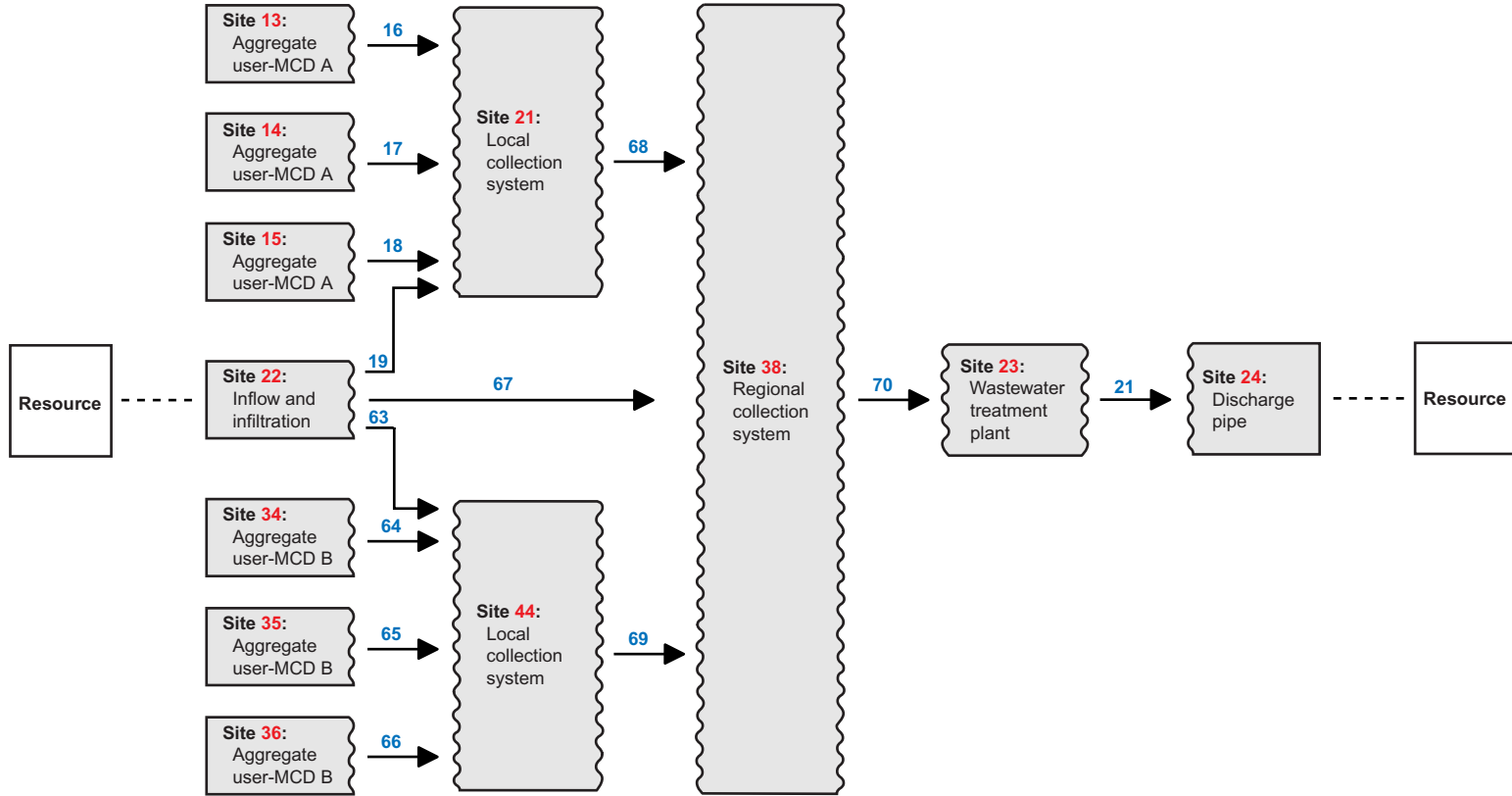


**Form 9. NEWUDS Transaction/Rate Data Input Form for System\_ID 4**

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.)

Network 10 (Case Study 10)



**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		
	StateAbbrev	RI		
	ZipCode	02701		
	CountryAbbrev	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
	SiteDetailValue	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
	SiteDetailValue	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
tblRate	IsDefaultRate	Yes		
	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	
tblRate	IsDefaultRate	Yes		
	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	
tblRate	IsDefaultRate	Yes		
	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	

**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/wastewater 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
	RateMethod_ID	43	tdxRateMethod	Difference between metered withdrawals/returns and estimated distribution/wastewater/collection
	RawRateValue	10.0		
	RateUnit_ID	1	tdxRateUnit	Mgal/d
tblRate	IsDefaultRate	Yes		
	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	
tblRate	IsDefaultRate	Yes		
	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	
tblRate	IsDefaultRate	Yes		