

# Database Dictionary for the Water Quantity Geodatabase Version 2 – November 8, 2011

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Technical Guidance	Data Populating Guidance	Data Dictionary Details						
<b>GWB_SPA</b>								
<p>The Clean Water Act requires source protection committees to prepare an assessment report for each source protection area. This is in accordance with Ontario Regulation 287/07 (General Regulation) and the Technical Rules for the Assessment Report, issued under the Clean Water Act 2006.</p>	<p>Polygon feature class describing Source Protection Area established by O.Reg. 284/07 made under the Clean Water Act, 2006. Table is pre-populated, and serves as a reference for the rest of the database. When populating the geodatabase, use the pre-assigned SPA ID for your area.</p>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		PK	SPA_ID	Long Integer	True	True		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
			SPR_ID	Long Integer	True	True		Unique identifier for a Source Protection Region (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
			SPAName	Text	True	False	250	Name of the source protection area as it is stated in the Source Protection Areas and Regions regulation O.Reg. 284/07.
			LeadSPA	Yes/No	True	False		Indicates if source protection area is lead authority for the region as it is stated in the Source Protection Areas and Regions regulation O.Reg. 284/07.
			Website	Text	False	False	250	URL site location where terms of reference will be posted for consultation.
<b>GWB_WBSubwatersheds</b>								
<p>The Tier One and Tier Two Water Budgets are developed at a subwatershed scale, where the watershed area is subdivided based on rivers, streams, and tributaries. At this scale, water budget processes are analyzed for each subwatershed, giving a better understanding of how these processes vary across a watershed based on changes in land use, soils and geology. The size of the subwatersheds may vary from as small as 10 km<sup>2</sup> to several hundred square kilometres depending on the characterization of surface water drainage areas and aquifer conditions. Based on knowledge gained from the Conceptual and Tier 1 Water Budgets, subwatershed delineation may be reviewed and altered in Tier Two to better represent the hydrologic system.</p> <p>In some instances, surface watershed or subwatershed boundaries may not correspond to groundwater flow divides. Watershed or sub-watershed studies must be large enough so that cross-boundary flow is not an issue or the transboundary flux must be quantified.</p> <p>Provincial Quaternary subwatershed mapping can be used for the stress assessment calculations; alternatively subwatershed delineations completed by local conservation authorities could</p>	<p>Polygon feature class for subwatersheds used for water budget and stress assessment process.</p>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA. It is important that all subwatersheds have a unique ID to maintain the integrity of the geodatabase.
			AssessmentTier	Text	True	False	20	A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. Entries are enforced using a validation rule and can include one of the following: Valid Values: '1' Or '2' Or '3' Or '1,2' Or '1,2,3' Or '2,3'
			WaterBudgetType	Text	True	False	20	Indicates water budget type, which can be Groundwater, Surface Water, or 'Groundwater and Surface Water'. 'Groundwater and Surface Water' should be used most of the time as most SPAs have used Surface Water boundaries for that are the same for both groundwater and surface water assessments. If there are unique Surface Water and Groundwater subwatershed boundaries, they can be identified separately using this field. Entries are enforced using a validation rule.

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be used.							Valid Values: 'GW' Or 'SW' Or 'GW and SW' (GW = GroundWater, SW = Surface Water, GW and SW = Groundwater and Surface Water)	
		SubwatershedName	Text	True	False	250	Standard name for the subwatershed as identified by the SPA.	
		MunicipalWaterSystemPresent	YesNo	True	False		Yes/No indicator specifying whether there is one or more municipal drinking water system(s) present within the subwatershed.	
		SubwatershedDescription	Text	False	False	250	Comment field to describe any details, unique characteristics or methods used for the subwatershed boundary delineation.	
		SubwatershedStatus	YesNo	False	False		Status field that indicates if the subwatershed boundaries are the most current boundaries or an archived/historical version. A value of Yes indicates the boundaries are the current version. It is anticipated that this field would be used for future iterations/planning cycles of water budgeting where subwatershed boundaries could change.	
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.	
		SubWSArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values. Using the SPA_ID and WBSubwatershedID, the syntax should equal "00-000".	

**WBStudyDocuments**

As part of the Assessment Report, Source Protection Committees must develop water budgets and assess the risks to water quantity within a tiered framework. The first two tiers of this framework evaluate hydrological stresses within the watershed; the third tier assesses risks to water quantity and evaluates the ability of the water supply to meet the community's drinking water needs. Significant groundwater recharge areas are also delineated across the landscape as part of each Tier. The Water Quantity Risk Assessment identifies drinking water threats in local areas where the reliability of the drinking water sources is deemed to be at risk. These results are captured by the Source Protection Committees in the water budget component of the Assessment Report as detailed in the Clean Water Act and the Assessment Report Technical Rules.	A table for providing information on the Water Budget and Stress Assessment technical report documents including authors, date, year, and peer review status. This table is important for background understanding of the water budget components and stress assessment results.	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	DOC_ID	Long Integer	True	False		This ID is unique for each water budget technical report/document for a respective SPA. Document IDs are referenced in the WaterBudget, StressAssessment, RiskAssessment and ModelBoundary tables.
			DocTitle	Text	True	False	250	Title of Document. E.g. "Grand River Tier 2 Water Budget Report".
			PublishDate	Text	True	False	10	Date the document was published, in the format YYYY-MM-DD. If no specific day is known then format is YYYY-MM. If no day or month are known then format is YYYY.
			DocAuthor	Text	True	False	250	Author(s) of the Document or Report including both the Organization (e.g. Quinte Conservation) and if applicable the Consulting Company who prepared the document (e.g. AquaResource). Individual personal names should not be entered in this field.

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
			PeerReviewed	YesNo	True	False		Confirmation of formal provincial acceptance of the document through the Water Budget Peer Review process. Yes indicates the report has been peer reviewed and accepted.
			PeerReviewComment	Text	False	False	250	Comment field to describe any additional details of the Peer Review, Peer Review Status or Peer Review Record if required.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
<b>GWB_ModelBoundary</b>								
An outline boundary that illustrates the extent of the computation area in the computer model used for producing water budget results. This refers to either a calibrated continuous surface water flow model and/or a three-dimensional groundwater flow model and is relevant in Tier 1, 2, or 3.	Polygon feature class for the model boundary or outline that illustrates the extent of the computation area in the computer model used for producing water budget results. A model boundary should be uploaded for each Tier of Assessment that has been completed, with a unique Model Boundary ID and appropriate Tier identified in the Assessment Tier field.	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	ModelBoundaryID	Long Integer	True	False		Unique identifier for a model boundary.
			WaterBudgetType	Text	True	False	20	Indicates the hydrologic domain for which the model boundary was developed; Surface Water, Groundwater or both Groundwater and Surface Water. Specifying the value of 'Groundwater and Surface Water' would indicate the use of an integrated model or two models that have the same boundary for groundwater and surface water.  Valid Values: 'GW' Or 'SW' Or 'GW and SW'  (GW = GroundWater, SW = Surface Water, GW and SW = Groundwater and Surface Water)
			AssessmentTier	Text	True	False	20	A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. Entries are enforced using a validation rule and can include one of the following:  Valid Values: '1' Or '2' Or '3' Or '1,2' Or '1,2,3' Or '2,3'
		FK	DOC_ID	Long Integer	True	False		Reference to the Unique ID assigned to a water budget technical report/document that is the source of the Model Boundary delineation. Links to the WBStudyDocuments table.
			ModelBoundaryComment	Text	False	False	250	Comment field to describe any additional details of the Computer Model Boundary, describe unique values or differentiate model boundaries.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
	ModelArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.		

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<b>WaterBudget</b>								
<p>A Tier One Water Budget is completed for every subwatershed in each Source Protection Area in the Province. Additionally, water supply volumes are estimated and compared to consumptive water demands within a Tier One Subwatershed Stress Assessment.</p> <p>The Tier One Water Budget relies on simple models (e.g. spreadsheet, GIS, streamflow separation, etc.) to quantify the surface water and the groundwater flow through the subwatershed. Where more complex water budget tools already exist (e.g. groundwater and surface water flow models), then output from these models should be used for the Tier One assessment.</p> <p>Where required to be completed, a Tier Two analysis requires additional data to improve the representation of surface and subsurface conditions throughout the subwatershed. This data will include information on all aspects of the Conceptual Water Budget and may include additional streamflow measurements, hydraulic conductivity estimates from historic pumping tests, more detailed pumping rates, improved climate data, and other data as required. The Tier Two Water Budget also builds upon the analysis of hydrological data completed in the Tier One Water Budget.</p> <p>Building upon the mapping and reporting completed for the Conceptual and Tier One Water Budgets, Tier Two should include revised estimates of all water budget components, including discussion of groundwater / surface water interaction at both the subwatershed and watershed scale. Figures are often used to illustrate inputs and outputs for each subwatershed and flow from recharge to discharge areas in local and regional groundwater flow systems.</p>	<p>Table for water budget study information and meta-data for both surface water and groundwater components.</p>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
		PK	WaterBudgetID	Long Integer	True	False		A unique identifier for each set of water budget calculations. This identifier can be used to distinguish, capture and maintain multiple iterations of unique water budget assessments. The water budget results supporting the water quantity stress assessment can be related to the StressAssessmentScenario table using this ID.
		FK	ModelBoundaryID	Long Integer	False	False		Unique identifier for a model boundary.
			AssessmentTier	Text	True	False	20	A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. Entries are enforced using a validation rule and can include one of the following:  Valid Values: '1' Or '2' Or '3' Or '1,2' Or '1,2,3' Or '2,3'
			WBYear	Integer	True	False		The year in which the assessment/computation of water budget components for surface water and/or groundwater were undertaken. This field will generally match with the year of the associated Water Budget Study Document but is not required to do so in cases where the components were estimated in a different year than the water budget study was published.  Valid Values: format YYYY between 1900 and 2100
			NumericModel	YesNo	True	False		This field indicates whether or not a Numeric Model was used for the computation and determination of the water budget components in the SWParameters or GWParameters table for a given WaterBudgetID. Provide any additional important details in regard to the assessment of water budget components in the WBCComment field.
		FK	ModelName	Text	False	False	50	Name of the numeric computer model used to generate final results. Links to LUT ModelName table (see table for values). If the NumericModel field is specified as 'Yes' please provide the name of the model in this field.
			Modeller	Text	False	False	250	Name of the organization (e.g. Conservation Authority) and consultant (e.g. Company Name) and the individual person/people, and their title(s) that were professionally responsible for conducting and completing the water budget modelling.
			PeriodOfRecord	Text	True	False	250	Period(s) of record from which the water budget components have been derived. If all water budget components are based on the same

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
							period of record then one single entry will be sufficient (e.g. 1971-2000). If individual components of the water budget have different periods of record they should be entered separately, for example: Precipitation (1971-2000), Evapotranspiration (1980-1999), SW Supply Stream Flow (1965-2008), etc.	
			WBComment	Text	False	False	250	General comment field used to explain any methods, limitations or constraints associated with the overall water budget component assessment (e.g. data availability, etc.)
		FK	DOC_ID	Long Integer	True	False		Unique identifier for the water budget, stress assessment, or risk assessment technical report/document associated with the estimation of the water budget components. Links to the WBStudyDocuments table.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

### SWParameters

As part of the water budget analysis, the Technical Rules define monthly surface water supply as the monthly median flow ( $Q_{P50}$ ) of a surface water body. Where median flow conditions cannot be determined, best available monthly baseflow measurements or estimates should be used. The available drinking water supply in a river or a stream is limited to the instantaneous flow rate. The recommended approach for surface water supply is to estimate median monthly flow. Where continuous data is not available for Tier One, median monthly streamflow may be estimated from spot flows, prorating of streamflow from nearby subwatersheds, or using a continuous surface water flow model, if one is available. Refer to the technical guidance for recommended methods to estimate monthly surface water supply. The method chosen should be based on an assessment which provides the highest level of confidence. Multiple methods may be used to support estimates. Flow measurements from a calibrated continuous surface water model are not required at Tier One but should be used if available.

The Technical Rules define surface water reserve as the lower decile stream flow ( $Q_{P90}$ ) on a monthly basis. The lower decile stream flow is the stream flow value that is exceeded 90% of the time. Where measured or modelled stream flow data is not available, an equivalent may be used. The Tier One Water Budget estimates water reserve as a portion of water that is needed to meet other ecological or anthropogenic water requirements. The water reserve quantity is subtracted from the total water source supply prior to evaluating the Percent Water Demand. The water reserve estimate for a surface water system in Tier One is based on the maximum of a statistical measure of low flow or a known anthropogenic need (i.e. wastewater effluent assimilation). Refer to the technical guidance for recommended statistical methods to estimate water reserve for

Table for water budget surface water components including supply and reserve terms. Some specific data considerations related to this table include:

- All units must be recorded in cubic meters per day ( $m^3/d$ ) for all months for all WB subwatersheds.
- The SWIn / SWOut fields can be used to indicate SW diversions.
- The Precipitation, ET, Runoff, SWIn and SWOut fields are required to be Not Null in either the monthly entries (1-12) or annual entry (0) or both (0 and 1-12). These fields are not allowed to be null for both the months and the annual value at the same time.

Key	Name	Type	Not Null	Unique	Len	Notes
FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
FK/PK	WaterBudgetID	Long Integer	True	False		A unique identifier for each set of water budget calculations. This identifier can be used to distinguish, capture and maintain multiple iterations of unique water budget assessments.
PK	SWMonth	Long Integer	True	False		Month of the observed value (e.g. January through December). Numeric values must be entered. If only annual data is available a '0' should be entered as a value in this field. Valid Values: 0 for annual; 1 - 12 for month (1=January, 2=February...)
	Precipitation	Long Integer	True	False		The amount of monthly discharge of water out of the atmosphere on to a subwatershed or study area and includes rainfall, snow, hail and sleet. Precipitation is naturally divided into surface water runoff, evapotranspiration and groundwater recharge.
	ET	Long Integer	True	False		The total amount of water evaporating from water surfaces and transpiring from vegetation.
	Runoff	Long Integer	True	False		The proportion of precipitation that does not infiltrate into soil or evapotranspire.
	SWIn	Long Integer	True	False		The amount of mean monthly flow entering a subwatershed through a stream, river, channel or other anthropogenic inputs (e.g. diversion, treated waste water, pipeline).
	SWOut	Long	True	False		The amount of mean monthly flow leaving the subwatershed through a stream, river, or channel or other anthropogenic removal (e.g.

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<p>the surface water stress assessment.</p> <p>A continuously calibrated surface water model simulating daily streamflows is required for the Tier Two surface water analysis. This surface water model should incorporate hourly climate data; estimate partitioning of precipitation into depression and interception storage, runoff, infiltration, and evapotranspiration (ET); and route runoff and streamflow through the watershed.</p>			Integer				diversion, treated waste water, pipeline)	
			SWSupply	Long Integer	True	False		Surface water supply is calculated as a total of all inputs to surface water.
		FK	SWSupplyMethod	Text	True	False	50	Method used to calculate surface water supply. Field refers to LUT SWSupplyMethod (see table for values).
			SWReserve	Long Integer	True	False		Surface water reserve is calculated using the monthly $Q_{p90}$ statistic which represents the surface water flow that is exceeded 90 percent of the time. Other methods can be used when the $Q_{p90}$ statistic is not able to be calculated or the required reserve flow is known to be greater than $Q_{p90}$ .
		FK	SWReserveMethod	Text	True	False	50	Method used to calculate surface water reserve. Field refers to LUT SWReserveMethod (see table for values).
			SWComment	Text	False	False	250	General comment field used to explain any limitations or constraints associated with individual instances of the surface water component assessment (e.g. data availability, etc.).
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

### GWParameters

<p>As part of the water budget analysis, the Technical Rules define groundwater supply as the estimated annual groundwater recharge rate plus the annual estimated groundwater inflow into a subwatershed. For the Tier One Water Budget, groundwater inflow should be estimated only where sufficient confidence in monitoring data and analysis techniques exist. For Tier One groundwater supplies, aquifer storage is not considered; as such the subwatershed's water supply terms are assumed to be average steady-state values and the applied recharge estimation methods should determine recharge estimates in average annual rates. Refer to the technical guidance for recommended methods to estimate groundwater recharge (<math>Q_n</math>).</p> <p>The Technical Rules define groundwater reserve as 10% of the estimated average annual groundwater discharge rate, if the groundwater discharge rate is available; or, if such information is not available then the groundwater reserve is estimated at 10% of the estimated annual groundwater supply (recharge plus inflow). While it is recognized that groundwater discharge to streams must be maintained to sustain baseflow throughout a watershed, the required water reserve along any individual stream segment is difficult to estimate. The discharge can be determined either through a groundwater flow model (if available), a baseflow separation exercise (if gauged data is available), or from spot flow measurements (if there is no other data available). The available groundwater supply should always be greater than the water reserve for any given subwatershed and should be a realistic proportion of the water supply. For the future demand scenario, the water</p>	<p>Table for water budget groundwater components including supply and reserve terms. Some specific data considerations related to this table include:</p> <ul style="list-style-type: none"> <li>All units must be recorded in cubic meters per day (<math>m^3/d</math>) for all months for all WB subwatersheds.</li> <li>FlowIn and FlowOut fields represent cross boundary flow.</li> <li>All numbers should be recorded as positive integers.</li> </ul>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
		FK/PK	WaterBudgetID	Long Integer	True	False		A unique identifier for each set of water budget calculations. This identifier can be used to distinguish, capture and maintain multiple iterations of unique water budget assessments.
			GWFlowOut	Long Integer	True	False		The amount of groundwater that flows laterally out of a subwatershed into an adjacent subwatershed.
			GWFlowIn	Long Integer	True	False		The amount of groundwater that flows laterally into a subwatershed from an adjacent subwatershed or is an anthropogenic input (e.g. artificial groundwater recharge).
			GWRecharge	Long Integer	True	False		The amount of water that percolates downwards from the ground surface through soils and reaches the water table.
			GWDischarge	Long Integer	True	False		The amount of water that flows to surface water bodies (i.e. streams, wetlands, lakes) from groundwater.
			GWSupply	Long Integer	True	False		Groundwater supply is calculated as the recharge plus flow in to a subwatershed and is expressed as an average annual rate. The average annual rate is also used for every month as a simple method of representing groundwater storage.

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<p>reserve may remain constant because the water supply may not change due to minimal changes in land development.</p> <p>A calibrated groundwater flow model is required for the Tier Two groundwater analysis. The groundwater flow model will simulate both the groundwater flow through discrete aquifer units and the interaction with the surface water flow system. The model must simulate saturated groundwater flow at a watershed scale and calculate water levels throughout the subsurface. The simulations should be performed in steady-state; however, a transient simulation will be required to address drought scenarios. Particle tracking capabilities are also advised, since particle traces can be used to better understand groundwater flow paths from recharge to discharge areas.</p>			GWReserve	Long Integer	True	False	Groundwater reserve is calculated as 10% of the Groundwater Discharge if groundwater discharge has been calculated; or 10% of the Groundwater Supply (recharge plus flow in) if groundwater discharge has not been calculated.	
		FK	GWReserveMethod	Text	True	False	50	Method used to calculate groundwater reserve. Field references LUT GWReserveMethod table. (see table for values).
			GWComment	Text	False	False	250	General comment field used to explain any limitations or constraints associated with individual instances of the groundwater component assessment (e.g. data availability, etc.).
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

### ConsumptiveDemandInfo

<p>Consumptive water demand is a key component of the water budget framework; it is estimated in both Tier One and Tier Two Water Budgets. Consumptive Water Demand is the net amount of water that is taken from a water source and not returned locally to the same source of water within a reasonable amount of time. For example, an aggregate resources operator may be permitted to pump large quantities of water from a pond for washing aggregate, but may return the same quantity of water to the pond after the aggregate washing process. In this case, the consumptive water demand may equate only to the evaporation from the constructed pond surface and the water removed with the aggregate. Conversely, all water pumped from a municipal well is considered to be consumptive because the water is not returned to the aquifer within a short period of time.</p>	<p>Table containing information about consumptive water demand estimates contained in ConsumptiveDemand table.</p>	Key	Name	Type	Not Null	Unique	Len	Notes
		PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	ConsumptiveDemandID	Long Integer	True	False		<p>Unique ID for the type of Consumptive Demand as it relates to individual water demand scenarios (e.g. Existing, Future, Planned), the consumptive source (e.g. surface water, groundwater, both) and the tier of assessment (e.g. 1 or 2 or 3 or 1,2 or 1,2,3 or 2,3).</p> <p>Surface water and groundwater consumptive demand can be entered using the same ConsumptiveDemandID if they have been estimated for the same scenario and the same tier.</p>
			DataSource	Text	False	False	250	Data Source of Consumptive Demand Estimate. For example, Provincial PTTW database, Water Taking Reporting System, de Loë.
			DemandYear	Integer	True	False		<p>The single year up to which the consumptive demand estimates are current or the year up to which demand estimates are deemed to be representative of the scenario.</p> <p>Valid Values: format YYYY between 1900 and 2100</p>
			StudyPeriod	Text	False	False	10	<p>This field is intended to capture the "Study Period" as defined in the Technical Rules, which means "the period during which data is available in relation to the representative water demand of an existing drinking water system". For example, in some instances it may be necessary to determine the "DemandYear" field based on a range of years for which data is available/representative. If a single year of data is <u>not</u> available to populate the "DemandYear" field then the representative demand may be based on a range of several previous years of information (e.g. 2006-2008) and determined to be the "representative" period for determining the "DemandYear" field. It should be noted that the StudyPeriod field only pertains to the</p>

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
							Existing demand scenario and will therefore not be populated for other scenarios (e.g. Future or Planned). Format YYYY-YYYY
		DemandType	Text	True	False	20	The type of consumptive demand estimate, based on the water budget scenarios. Valid Values: Existing or Future or Planned.
		DemandSource	Text	True	False	20	Indicates if the source water being consumed is either Surface Water or Groundwater or Groundwater and Surface Water. A field entry of 'Groundwater and Surface Water' can be used when the ConsumptiveDemand table contains information in both the GWConsumptiveDemand field and SWConsumptiveDemand field. Valid values: 'GW' Or 'SW' Or 'GW and SW' (GW = GroundWater, SW = Surface Water, GW and SW = Groundwater and Surface Water)
		DemandComment	Text	False	False	250	Comment field for consumptive demand methodology and to describe any limitations or constraints associated with the assessment of the consumptive demand.
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

### ConsumptiveDemand

Whenever possible, observed or reported pumping rates should be used when estimating consumptive demand; however, when reported rates are not available consumptive water demands must be estimated. Estimating consumptive water demand requires consideration of the point of discharge and consideration of the physical water taking operation. Refer to the technical guidance for specific instructions on how to estimate consumptive demand.

Table for subwatershed-based summary of reported monthly consumptive water demand values for SW and GW.

- All units must be recorded in cubic meters per day (m<sup>3</sup>/d) for all months for all WB subwatersheds.
- The SWConsumptiveDemand field or the GWConsumptiveDemand field or both are required to be Not Null. These fields are not allowed to be null for both SWConsumptiveDemand and the GWConsumptiveDemand at the same time.

Key	Name	Type	Not Null	Unique	Len	Notes
FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
FK/PK	ConsumptiveDemandID	Long Integer	True	False		Unique ID for the type of Consumptive Demand as it relates to individual water demand scenarios (e.g. Existing, Future, Planned), the consumptive source (e.g. surface water, groundwater, both) and the tier of assessment (e.g. 1 or 2 or 3 or 1,2 or 1,2,3 or 2,3). Surface water and groundwater consumptive demand can be entered using the same ConsumptiveDemandID if they have been estimated for the same scenario and the same tier.
PK	DemandMonth	Long Integer	True	False		Month of the observed value (e.g. January through December). Numeric values must be entered. If only annual data is available a '0' should be entered as a value in this field. Valid Values: 0 for annual; 1 - 12 for month (1=January, 2=February...)

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
		AssessmentTier	Text	True	False	20	A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. Entries are enforced using a validation rule and can include one of the following:  Valid Values: '1' Or '2' Or '3' Or '1,2' Or '1,2,3' Or '2,3'
		SWConsumptiveDemand	Long Integer	True	False		The total rate of consumptive surface water demand. This value varies by subwatershed, tier, demand type and demand year.
		GWConsumptiveDemand	Long Integer	True	False		The total rate of consumptive groundwater demand. This value varies by subwatershed, tier, demand type and demand year.
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

### StressAssessment

<p>Subwatershed stress assessments identify subwatersheds where there is a potential for hydrologic stress. A subwatershed stress assessment is completed following the comparison of consumptive water demand to water supply for both Tier One and Tier Two water budgets; these assessments estimate the cumulative hydrologic stresses placed on a subwatershed. Tier One and Tier Two stress assessments are designed to ensure that source protection committees complete studies with the necessary complexity as they progress through the higher tiers of the Water Budget Framework to identify municipalities that have potential water supply issues.</p> <p>Tier One subwatershed stress assessments are completed for each subwatershed in a source protection area unless a Tier Two water budget has already been completed for that subwatershed. As part of the Tier One stress assessment, the percent water demand, or the percentage of water supply demanded by water users, is estimated. Subwatersheds where the percent water demand is above a prescribed threshold value are identified as moderately or significantly stressed and require more detailed study in Tier Two. Subwatersheds calculated as having a low percent water demand are termed 'low stress watersheds' and do not require additional water budget assessment.</p> <p>Tier Two water budgets are completed in subwatersheds that have a type I, II, or III system and were assigned a <i>Significant</i> or a <i>Moderate</i> surface water or groundwater stress level in the Tier One subwatershed stress assessment. The goal of a Tier Two water budget is to confirm the stress assignment established in Tier One using computer based continuous surface water models and additionally for groundwater assessments a three-dimensional groundwater flow model. Additional data will be required to improve the representation of surface and subsurface conditions; some of this data may not be available and may need to be collected. This data will include information on all aspects of the conceptual water budget and may include additional streamflow</p>	<p>This table applies to Tier 1 and Tier 2 only and provides stress assessment information and the maximum reported stress assessment value based on the highest stress determined from all scenarios for each subwatershed</p> <p>A different StressAssessmentID should be assigned for each assessment tier or version of stress assessment.</p>	Key	Name	Type	Not Null	Unique	Len	Notes
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
		PK	SourceWater	Text	True	False	20	Indicates if the source water is either Surface Water or Groundwater but <u>can not</u> be specified as both.  Valid Values: 'GW' Or 'SW'  (GW = GroundWater, SW = Surface Water)
		PK	StressAssessmentID	Long Integer	True	False		A unique identifier for each stress assessment (use the same ID for all records in the same study). This ID can be used to distinguish between stress assessment tiers, generations, iterations, planning cycles or other versions of stress assessments.
			AssessmentTier	Text	True	False	1	Record only one specific assessment tier at a time. Entries are enforced using a validation rule and can include one three options.  Valid Values: '1' or '2' or '3'
			MaxStressLevel	Text	True	False	20	The single maximum reported subwatershed stress level value calculated from all scenarios, for all time periods, for either Groundwater or Surface Water as contained within the StressAssessmentScenario table or Historical table (where a historical issue exists, a moderate stress level should be recorded as per the Technical Rules).  Valid Values: 'Low' OR 'Moderate' OR 'Significant'
			MaxStressLevelComments	Text	False	False	250	Summary of stress level results. Comment field to document any additional information or detail about the maximum stress level

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
measurements, hydraulic conductivity estimates from historic pumping tests, more detailed pumping rates, improved climate data, or other data as required.							assignment.
		FK	ModelBoundaryID	Long Integer	False	False	Unique identifier for the Computer Model Boundary if a model was used to undertake the stress assessment. This field is related to a specific <code>GWB_ModelBoundary</code> spatial feature.
		FK	HistoricalID	Long Integer	False	False	Unique identifier for each historical issue. For further reference see the <code>HistoricalQuantityIssue</code> field in the Historical table.
			HistoricalQuantityIssue	YesNo	True	False	The Yes/No field indicates whether or not an historical issue exists (yes) or does not (no) within each <u>subwatershed</u> . If "Yes", see Historical table for additional information on the issue(s).
		FK	DOC_ID	Long Integer	True	False	Reference to the Unique ID assigned to a water budget technical report/document that is the source of the Stress Assessment results. Links to the <code>WBStudyDocuments</code> table.
			AutoDateStamp	DateTime	False	False	An automatic date stamp for when the record was created.

StressAssessmentScenario								
		Key	Name	Type	Not Null	Unique	Len	Notes
<p>Part III.3 Subwatershed Stress Levels - Tier One Water Budget of the MOE Technical Rules issued under the Clean Water Act (2006) outlines the stress assessment requirements and the circumstances in which a subwatershed will be classified as having a <i>Moderate</i> or <i>Significant</i> water quantity stress. Technical Rules No.32 and No. 33, detail the requirements for the Tier One stress assessment including the stress thresholds and the scenarios required for both surface water and groundwater.</p> <p>Tier Two subwatershed stress assessments are undertaken in subwatersheds assigned a <i>Significant</i> or <i>Moderate</i> degree of hydrologic stress in Tier One and contain municipal drinking water wells or surface water intakes. The goal of the Tier Two subwatershed stress assessment is to re-evaluate the stress level assigned in Tier One by using detailed and calibrated models. Tier Two stress assessments rely on the use of consumptive water demand estimates that reflect actual reported pumping rates. Where reported pumping rates are not available, consumptive use estimates should be based on reasonable estimates of pumping rates, a review of the PTTW, and professional judgement.</p> <p>Part III.4 Subwatershed Stress Levels – Tier Two Water Budgets of the Technical Rules details the requirements for the Tier Two subwatershed stress assessment including the stress thresholds, the required scenarios for both surface water and groundwater, and the associated uncertainty analysis.</p>	This table applies to Tier 1 and Tier 2 only. For each subwatershed, links to <code>ConsumptiveDemandInfo</code> and <code>WaterBudget</code> tables and captures reported maximum percent water use, sensitivity analysis, uncertainty, and stress level for each scenario. All units are cubic meters per day (m <sup>3</sup> /d).	FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
		PK	SourceWater	Text	True	False	20	Indicates if the source water is either Surface Water or Groundwater but <u>can not</u> be specified as both.  Valid Values: 'GW' Or 'SW'  (GW = GroundWater, SW = Surface Water)
		FK/PK	StressAssessmentID	Long Integer	True	False		A unique identifier for each stress assessment (use the same ID for all records in the same study). This ID can be used to distinguish between stress assessment tiers, generations, iterations, planning cycles or other versions of stress assessments.
		FK/PK	Scenario	Text	True	False	10	Unique identifier for Stress Assessment Scenario. This field references the LUT Scenario table (see table for values), which is based on the technical rules.
			AssessmentTier	Text	True	False	1	Record only one specific assessment tier at a time. Entries are enforced using a validation rule and can include one three options.  Valid Values: '1' or '2' or '3'
		FK	WaterBudgetID	Long Integer	True	False		A unique identifier for each set of water budget calculations. This identifier can be used to distinguish, capture and maintain multiple iterations of unique water budget assessments. The stress assessment results based on the water budget calculations

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
								can be related to the WaterBudget table using this ID.
		FK	ConsumptiveDemandID	Long Integer	True	False		Unique ID for the type of Consumptive Demand as it relates to individual water demand scenarios (e.g. Existing, Future, Planned), the consumptive source (e.g. surface water, groundwater, both) and the tier of assessment (e.g. 1 or 2 or 3 or 1,2 or 1,2,3 or 2,3). Relates to the ConsumptiveDemandInfo table.
			ReportedPercentAnnual	Long Integer	True	False		Maximum reported annual percent water demand. This value must be manually entered as reported in the stress assessment report. This value is <u>not</u> auto-calculated based on information from related tables. No annual value will be reported for Surface Water.
			ReportedPercentMonthly	Long Integer	True	False		Maximum reported monthly percent water demand. This value must be manually entered as reported in the stress assessment report. This value is <u>not</u> auto-calculated based on information from related tables.
			Sensitivity	Text	True	False	20	Findings from a sensitivity analysis for the stress level assignment in a subwatershed. A comment should also be provided in the Stress Level Comment field to discuss the sensitivity analysis.  Valid Values: 'Sensitive' Or 'Not Sensitive' Or 'Not Completed' Or 'Not Required'
			Uncertainty	Text	True	False	20	Findings from an uncertainty analysis for the stress level assignment in a subwatershed. A comment should also be provided in the Stress Level Comment field to discuss the uncertainty analysis.  Valid Values: 'Low' Or 'High' Or 'Not Completed' Or 'Not Required'
			StressLevel	Text	True	False	20	Reported stress level based on reported percent water demand values from various scenarios. This value must be manually entered as reported in the stress assessment report. This value is <u>not</u> auto-calculated based on information from related fields or tables.  Valid Values: 'Low' OR 'Moderate' OR 'Significant'
			StressLevelComment	Text	False	False	250	Comment field for stress level assignment, which can be used to explain refinement of the stress level assigned.
			DroughtIssue	YesNo	True	False		Indicates if there is a drought issue identified that results in a moderate stress level assignment.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
<b>Historical</b>								
Where the water source has had historical issues meeting municipal water demand a subwatershed stress assessment estimate can be refined to have a <i>Moderate</i> hydrologic stress.	Table summarizes any historical water issues for the subwatershed. Table links to Stress Assessment.	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	WSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
		PK	SourceWater	Text	True	False	20	Indicates if the source water is either Surface Water or Groundwater but <u>can not</u> be specified as both.  Valid values: 'GW' Or 'SW'  (GW = GroundWater, SW = Surface Water)
		FK/PK	StressAssessmentID	Long Integer	True	False		A unique identifier for each stress assessment (use the same ID for all records in the same study). This ID can be used to distinguish between stress assessment tiers, generations, iterations, planning cycles or other versions of stress assessments.
		PK	HistoricalID	Long Integer	True	False		Unique identifier for each historical issue.
			WaterSystemID	Long Integer	False	False		Unique identifier for water systems (if applicable).
		FK	Well_ID	Long Integer	False	False		A unique identifier for a municipal well. Relates to the GWB_Wells feature class.
		FK	IntakeID	Long Integer	False	False		A unique identifier for a municipal surface water intake. Relates to the GWB_Intakes feature class.
			HistoricalQuantityIssue	YesNo	True	False		The Yes/No field indicates whether or not an historical issue exists (yes) or does not (no) for each <u>municipal well or intake</u> within a subwatershed.
			HistoricalComment	Text	False	False	250	Comment field to document historical issue (if applicable). Where HistoricalQuantityIssue is Yes, provide details describing the issue.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

### Drought

Tier Two assessments use complex modelling tools to re-evaluate the water supply in additional scenarios that include planned systems and drought conditions.

Scenarios D, E, F, G, H and I are drought scenarios. These scenarios evaluate the potential for surface water intakes and groundwater wells to experience problems meeting demand during these drought periods. Percent water demand is not calculated for these scenarios; rather, an estimate of the decrease in the water level is made at each municipal groundwater well or surface water intake. For municipal wells, potential drought issues are identified by comparing the predicted drop in water levels to the estimated depth to well screen or pump intake. For surface water intakes, predicted drops in streamflow or lake levels are compared to minimum conditions

Table that contains both groundwater and surface water drought scenario results, linking to the Stress Assessment. Units of measure are cubic meters per day (m<sup>3</sup>/d).

Key	Name	Type	Not Null	Unique	Len	Notes
FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
FK/PK	WSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
PK	SourceWater	Text	True	False	20	Indicates if the source water is either Surface Water or Groundwater but <u>can not</u> be specified as both.  Valid values: 'GW' Or 'SW'  (GW = GroundWater, SW = Surface Water)

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
<p>required to sustain the municipal water supply.</p> <p>Subwatersheds assigned a <i>Moderate</i> stress under the drought scenario will be subject to a Tier Three water budget and local area risk assessment.</p>		FK/PK	StressAssessmentID	Long Integer	True	False		A unique identifier for each stress assessment (use the same ID for all records in the same study). This ID can be used to distinguish between stress assessment tiers, generations, iterations, planning cycles or other versions of stress assessments.
		FK/PK	Scenario	Text	True	False	10	Unique identifier for Stress Assessment Scenario. This field references the LUT Scenario table (see table for values), which is based on the technical rules.
		FK/PK	WellID	Long Integer	True	False		A unique identifier for a municipal well. Relates to the <i>GWB_Wells</i> feature class.
		FK/PK	IntakeID	Long Integer	True	False		A unique identifier for a municipal surface water intake. Relates to the <i>GWB_Intakes</i> feature class.
			WaterSystemID	Long Integer	False	False		Unique identifier for Water systems (if applicable).
			PumpingRate	Long Integer	False	False		Pumping Rate (m <sup>3</sup> /day) for the municipal well or intake.
			DroughtImpact	YesNo	True	False		Yes/No field indicating if there is drought impact on the municipal well or intake.
			DroughtImpactComment	Text	False	False	250	Comment field for Drought Impact. Where DroughtImpact is Yes, provide details describing the nature of the impact.
			DroughtUncertainty	Text	False	False	25	Level of uncertainty in drought impact, indicating either Low or High. Where historical observations of drought are documented the uncertainty could be assigned as Low.  Valid Values: 'Low' OR 'High'
	AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.		

### GWB\_SGRAs

<p>The Technical Rules require that significant groundwater recharge areas (SGRAs) be delineated for each source protection area. SGRAs are one of four types of vulnerable areas; the other vulnerable areas include wellhead protection areas, intake protection zones, and highly vulnerable aquifers. Refer to the technical guidance for specifics on how to delineate SGRAs. The Province requires SGRAs be delineated as part of Tier One, Tier Two and Tier Three Water Budgets.</p>	<p>Polygon feature class containing SGRA results for Tier 1, 2, and 3 SGRAs. Some specific data considerations related to this table include:</p> <ul style="list-style-type: none"> <li>Both significant (yes) and not-significant (no) polygons should be identified using the SignificantRechargeArea field. In cases where the <i>GWB_SGRAs</i> feature class only contains polygons that <u>are</u> SGRAs (and does not include surrounding not-significant polygons) all records would be marked as 'Yes' in the SignificantRechargeArea field.</li> </ul>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	SGRA_ID	Long Integer	True	False		Unique identifier for Significant Groundwater Recharge Area in a source water protection area.
			ChosenFactor	Text	True	False	20	SGRA chosen factor should equal either 1.15 or 55%.  Valid Values: "1.15" or "55%"
			AssessmentTier	Text	True	False	20	A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. Entries are enforced using a validation rule and can include one of the following:  Valid Values: '1' Or '2' Or '3' Or '1,2' Or '1,2,3' Or '2,3'

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
			SignificantRechargeArea	YesNo	True	False		Significant Recharge Area Yes/No field differentiates SGRA polygons from not-SGRA polygons. In cases where the GWB_SGRAs feature class only contains polygons that are SGRAs (and does not include surrounding not-significant polygons) all records would be marked as 'Yes'.
			SGRAComment	Text	False	False	250	SGRA comment field allows for additional information to be included about each SGRA, the methods of delineation and its linkage to a drinking water system.
			MunicipalSystemPresent	YesNo	False	False		A 'YesNo' field to allow an easy query to determine if there is a Municipal Drinking Water System within each polygon of the GWB_SGRAs feature class. Note that this field is specific to Municipal Drinking Water Systems and is not related to the SGRA requirement for delineation based more broadly on all Drinking Water Systems.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
			SGRAARCID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

### GWB\_RefinedWaterTaking

Rules 19(8) and 19(10) relate to the information needed for the permitted and non-permitted water demand within a watershed. Rule 19(10.1) indicates that with respect to the water takings described in the Rules 19(8) and 19(10), the actual amounts of water taken annually and the projected annual takings of water should be used where they are available.

Non-municipal permitted water demand includes commercial, industrial, agricultural, institutional, and recreational water uses. Most of the non-municipal consumptive demand for a subwatershed can be estimated using information provided by the PTTW program. The Province must issue a PTTW for any user wanting to pump more than 50,000 L/day.

To determine consumptive water demand, all permitted uses within the PTTW database must be reviewed. Data includes permitted pumping rates, reported (measured) pumping rates, estimates of consumptive water demand, and monitoring programs. The data provided by the PTTW database, however, may not include details relating to a permit holder's site-specific operations; these details may be needed to increase the confidence of consumptive water demand estimates. For example, a PTTW may identify two water taking sources, when in practice only one source is used and the other source is maintained as a backup. For the Tier Two Water Budget, copies of the permits should be obtained, particularly for the larger permit holders that could influence the results of the Subwatershed Stress Assessment.

Point feature class containing refined water taking data, based on available information from MOE Client, Source, Monthly Pumping. Some specific data considerations related to this table include:

- Unique RefinedWaterTakingID per permit or record for each SPA.
- Unless specified, units of measure are cubic meters per day (m<sup>3</sup>/d).
- Non-point source water use is totalled by subwatershed in the NonPoint tables. However, if there is also a permit recorded in this table (e.g. agriculture permit), to avoid double counting then un-check "UseInAnalysis" field.

Key	Name	Type	Not Null	Unique	Len	Notes
FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
PK	RefinedWaterTakingID	Long Integer	True	False		Unique identifier for each refined water taking. Value is unique for each record or permitted taking.
FK	Permit_Number	Text	True	False	50	Permit Number from the Permit to Take Water database.
FK	SourceName	Text	True	False	50	Name of the source for the permit, such as a well name, intake name, lake, river, pond, aquifer or other identifier.
	WaterTakingSiteID	Long Integer	False	False		Unique ID for each water taking site (if available).
	GeneralPurpose	Text	False	False	100	General purpose of the permitted water taking.
	SpecificPurpose	Text	False	False	100	Specific purpose of the permitted water taking.
	ClientName	Text	False	False	250	Name on the permit to take water (if available).
	PermittedSource	Text	True	False	20	Indicates if the permitted source is either Surface Water or Groundwater or Groundwater and Surface Water or Unknown. Valid values: 'GW' Or 'SW' Or 'GW and SW' Or 'Unknown'

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
Information provided by the Province relating to the Permits-to-Take-Water can be used to estimate consumptive water demand, further described in Appendix B of the technical guidance.								(GW = GroundWater, SW = Surface Water, GW and SW = Groundwater and Surface Water)
			WaterUseNotes	Text	False	False	250	Includes details on consumptive use estimate, source of actual rates, and other information.
			TakingActiveDate	DateTime	False	False		Date that pumping was initiated. Date format is YYYY-MM-DD
			TakingInactiveDate	DateTime	False	False		Date that pumping stopped, if applicable. Date format is YYYY-MM-DD
		FK	IntakeID	Long Integer	False	False		A unique identifier for a municipal surface water intakes (Type A and B should be included).
		FK	WellID	Long Integer	False	False		A unique identifier for a municipal water well.
			WaterWellRecordNumber	Text	False	False	50	Link to water well record number/code (if available).
			UseInAnalysis	YesNo	True	False		Simple flag to indicate if permit was used in the water demand analysis. Yes indicates it was used. Additional comments about the permit can be included in WaterUseNotes field.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
			RefinedArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

### MonthlyPumping

Records of permitted or reported water taking may not reflect the amount of water that is consumptively removed from the hydrologic source. The permitted water taking rate is generally recorded as a maximum pumping rate and frequency over a period of time; however, it is typically much higher than what is normally pumped or consumed. Consequently, initial estimates of water demand using data provided from the PTTW database are conservatively high and are typically reduced after accounting for reported pumping rates and other site-specific operations.	A PTTW-based consumptive water use table for recording monthly consumptive water takings. Unless specified, units of measure are cubic meters per day (m <sup>3</sup> /d). 12 monthly values need to be input for each permit. An annual value for groundwater permits should also be recorded.	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.
		FK/PK	RefinedWaterTakingID	Long Integer	True	False		Unique identifier for refined water takings. Value is unique for each record.
		PK	PumpingMonth	Long Integer	True	False		Month of the observed value (e.g. January through December). Numeric values must be entered. If only an annual rate is available a '0' should be entered as a value in this field.  Valid Values: 0 for annual; 1 - 12 for month (1=January, 2=February...)
			AssessmentTier	Text	True	False	20	A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. Entries are enforced using a validation rule and can include one of the following:

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
								Valid Values: '1' Or '2' Or '3' Or '1,2' Or '1,2,3' Or '2,3'
		PermittedPumpingRate	Long Integer	False	False			Maximum permitted pumping rate as allowed by the permit during the month (m <sup>3</sup> /day). This value will have not considered the consumptive nature of the permitted taking.
		ReportedPumpingRate	Long Integer	False	False			Reported pumping rate for the permit (m <sup>3</sup> /day). This value may be obtained through the MOE Water Taking Reporting System or from other various methods including direct permit-holder surveys or contact. This value will have not likely considered the consumptive nature of the reported taking.
		FinalPumpingRate	Long Integer	True	False			Final pumping rate for the permit (m <sup>3</sup> /day). This field represents the final pumping rate that has been determined (through various analyses) for use in the Assessment Report for the water quantity stress assessment. The final pumping rate <u>will</u> be representative of the consumptive nature of the taking with respect to its source water and will be related to the ConsumptiveFactor field. Depending on the level of effort expended and availability of data, the final pumping rate determined for the water quantity stress assessment may be based on permitted rates, reported rates or rates estimated using other various methods of analysis. Regardless, the final pumping rate will be representative of the information used in the development of the Assessment Report.
		PermittedSource	Text	True	False	50		Water source information for pumping operation. Values can equal Surface Water, Groundwater, Surface Water and Groundwater, or Unknown.  Valid Values: 'GW' Or 'SW' Or 'GW and SW' Or 'Unknown' (GW = GroundWater, SW = Surface Water, GW and SW = Groundwater and Surface Water)
		ConsumptiveFactor	Double	True	False			Decimal in the range between 0-1. The "specific purpose factors" outlined in the Technical Guidance should be used to determine the consumptive factor. Where appropriate local knowledge can be used to provide rationale for modified consumptive use factors.  Valid Values: between 0 and 1 using two decimal places
		ConsumptiveUseComment	Text	False	False	250		Comment field to document consumptive use calculation. Important to remember to annotate notes by month and/or tier if necessary.
		AutoDateStamp	DateTime	False	False			An automatic date stamp for when the record was created.
<b>MOEClient</b>								
Replica of MOE PTTW Client table and does not need to be populated in this database.	Replica of MOE PTTW Client table and does not need to be populated in this database.	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		PK	PERMIT_NUMBER	Text	True	False	50	

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
			MAJOR_CATEGORY	Text	False	False	100	
			SPECIFIC_PURPOSE	Text	False	False	100	
			TAKING_TYPE	Text	False	False	100	
			EXPIRY_DATE	DateTime	False	False		
			DATE_ISSUED	DateTime	False	False		
			CLIENT_NAME	Text	False	False	250	
			MUNICIPALITY	Text	False	False	100	
<b>MOESource</b>								
Replica of MOE PTTW Source table and does not need to be populated in this database.	Replica of MOE PTTW Source table and does not need to be populated in this database.	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	PERMIT_NUMBER	Text	True	False	50	
		PK	SOURCE	Text	True	False	50	
			TAKING_TYPE	Text	False	False	100	
			EASTING	Long Integer	False	False		
			NORTHING	Long Integer	False	False		
			UTMZONE	Long Integer	False	False		
			MAX_LITRES_PER_DAY	Long Integer	False	False		
			MAX_DAYS_PER_YEAR	Long Integer	False	False		
			MAX_HRS_PER_DAY	Long Integer	False	False		
			MAX_LITRES_PER_MINUTE	Long Integer	False	False		
<b>ReportedPumping</b>								
Replica structure of MOE reported pumping table and does not need to be populated in this database.	Replica structure of MOE reported pumping table and does not need to be populated in this database.	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	ISSUED_PERMIT_NUMBER	Text	True	False	50	
		FK	IDS_SOURCE_NAME	Text	False	False	50	
			REGION_NAME	Text	False	False	250	
			EFFECTIVE_DATE	DateTime	False	False		
			EXPIRY_DATE	DateTime	False	False		
			CATEGORY_DESC	Text	False	False	100	
			PURPOSE_DESC	Text	False	False	100	
			TAKING_DATE	DateTime	False	False		
			AMOUNT_TAKEN_IN_LITRES	Long Integer	False	False		

Technical Guidance	Data Populating Guidance	Data Dictionary Details																																																																													
<b>NonPoint</b>																																																																															
<p>Technical Rule 19(10) requires the estimation of non-permitted water demand (e.g. takings not requiring a permit under the OWRA and O.Reg 387/04) including the existing and projected uses of water, including drinking water, wastewater treatment, agriculture, livestock, domestic use, industrial use and commercial use.</p>	<p>Primary table containing information about water takings that are compiled in a non-point source format (e.g. over an area). Some specific data considerations related to this table include:</p> <ul style="list-style-type: none"> <li>There is potential for double counting water taking estimates compiled in a non-point source format (e.g. de Loë method). For this reason the permitted takings contained within the RefinedWaterTaking table may optionally be excluded from analysis if the duplication is known or can be confirmed. This can be done by un-checking the UseInAnalysis field in the RefinedWaterTaking table.</li> </ul>	<table border="1"> <thead> <tr> <th>Key</th> <th>Name</th> <th>Type</th> <th>Not Null</th> <th>Unique</th> <th>Len</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>FK/PK</td> <td>SPA_ID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).</td> </tr> <tr> <td>FK/PK</td> <td>WBSubwatershedID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>Unique identifier for each subwatershed as defined by the SPA.</td> </tr> <tr> <td>PK</td> <td>NonPointID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>An identifier for each unique combination of non-point source water taking.</td> </tr> <tr> <td></td> <td>AssessmentTier</td> <td>Text</td> <td>True</td> <td>False</td> <td>20</td> <td>A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. 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Valid Values: format YYYY between 1900 and 2100</td> </tr> <tr> <td></td> <td>AutoDateStamp</td> <td>DateTime</td> <td>False</td> <td>False</td> <td></td> <td>An automatic date stamp for when the record was created.</td> </tr> </tbody> </table>	Key	Name	Type	Not Null	Unique	Len	Notes	FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).	FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.	PK	NonPointID	Long Integer	True	False		An identifier for each unique combination of non-point source water taking.		AssessmentTier	Text	True	False	20	A text field that indicates the water budget tier(s) of the assessment and which allows the specification of multiple tiers in the field entry. 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<b>NonPointPumping</b>																																																																															
<p>Consumptive Water Demand from non-permitted water use sectors should be estimated for each subwatershed. These include livestock, agricultural irrigation and rural domestic water uses. Appendix B in the technical guidance provides some examples of how to complete these estimates. De Loë (2002) also provides guidance on how to estimate non-permitted agricultural water demand.</p>	<p>Monthly pumping values for non-point source water takings. Links to the NonPoint table.</p> <p>Unless specified, units of measure are cubic meters per day (m<sup>3</sup>/d).</p> <p>Data for all 12 months should be included for each subwatershed.</p>	<table border="1"> <thead> <tr> <th>Key</th> <th>Name</th> <th>Type</th> <th>Not Null</th> <th>Unique</th> <th>Len</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>FK/PK</td> <td>SPA_ID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).</td> </tr> <tr> <td>FK/PK</td> <td>WBSubwatershedID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>Unique identifier for each subwatershed as defined by the SPA.</td> </tr> </tbody> </table>	Key	Name	Type	Not Null	Unique	Len	Notes	FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).	FK/PK	WBSubwatershedID	Long Integer	True	False		Unique identifier for each subwatershed as defined by the SPA.																																																								
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Technical Guidance	Data Populating Guidance	Data Dictionary Details					
		FK/PK	NonPointID	Long Integer	True	False	An identifier for each unique combination of non-point source water taking.
		PK	NonPointMonth	Integer	True	False	Month of the observed value (e.g. January through December). Numeric values must be entered. If only annual data is available a '0' should be entered as a value in this field.  Valid Values: 0 for annual; 1 - 12 for month (1=January, 2=February...)
			ConsumptiveRate	Long integer	True	False	The total rate of consumptive water taking by a non-point source category. This value varies by subwatershed, general category, source water, tier and month/year.
			NonPointSourceComment	Text	False	False	250 Comment field for consumptive non-point rate.
			AutoDateStamp	DateTime	False	False	An automatic date stamp for when the record was created.

### GWB\_Intakes

<p>An accurate inventory of municipal wells and surface water intakes is required for the water budget stress assessment and risk assessment.</p>	<p>Point feature class that identifies the location and characteristics of the structure through which surface water is drawn for the purpose of providing municipal drinking water. Some specific data considerations related to this table include:</p> <ul style="list-style-type: none"> <li>• Similar to water quality tables, except for SPA_ID.</li> <li>• Populate with as much available data as possible.</li> </ul>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	IntakeID	Long Integer	True	False		A unique identifier for surface water intakes (Type A and B should be included).
			WaterSystemName	Text	False	False	250	Water system name, which must be unique within the Source Protection Area.
			DWIS_NO	Long Integer	False	False		The unique identifier for the water treatment plant as assigned by the Drinking Water Information System (optional, if applicable).
			DWIS_Name	Text	False	False	250	The name of the water treatment plant as stored in the Drinking Water Information System. If no name exists in the DWIS, a new name can be assigned to the drinking water system.
			WaterSystem_TYPE	Text	False	False	10	Type of Drinking Water System as defined in Part I.1 Technical Rules.  Valid Values: "i" Or "ii" Or "iii" or uppercase i, (I, II, III)
			FacilityStatus	Text	False	False	20	Indicator that a facility exists or is being planned. Valid values: Existing or Planned.  Valid Values: 'Existing' Or 'Planned'
			IntakeClassification	Text	False	False	10	A classification of the analysis scenario for the intake based on where the intake is drawing water. Valid values include A, B, C or D. See Technical Rules for definitions.  Valid Values: 'A' Or 'B' Or 'C' Or 'D'
			ResponseTime	Long	False	False		The minimum amount of time in decimal hours the water treatment plant operator needs to respond to adverse conditions

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
				Integer			or an emergency. Minimum response time is two hours.
		AvgAnnualPumpingRate		Long Integer	False	False	The average annual pumping rate of the intake. To be reported in cubic meters per day.
		PipeDepth		Double	False	False	The depth of the intake below the water surface in meters.
		PipeInfrastructureID		Text	False	False	50 An optional link to engineering data.
		PipeDiameter		Double	False	False	The diameter of the intake pipe in metres. This is an optional field.
		PipeMaterial		Text	False	False	50 The material type of the intake pipe. This is an optional field.
		IntakeComment		Text	False	False	250 Additional comment field for surface water intake. This may include a brief description of related features (lake, river or shoreline features related to the intake), or other pertinent intake information.
		AutoDateStamp		DateTime	False	False	An automatic date stamp for when the record was created.
		IntakeArcID		Text	True	True	50 A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

GWB_Wells		Key	Name	Type	Not Null	Unique	Len	Notes
<p>An accurate inventory of municipal wells and surface water intakes is required for the water budget stress assessment and risk assessment.</p>	<p>Point feature class that identifies the location and characteristics of the structure through which groundwater is drawn for the purpose of providing municipal drinking water. Some specific data considerations related to this table include:</p> <ul style="list-style-type: none"> <li>• Similar to water quality tables, except for SPA_ID.</li> <li>• Populate with as much available data as possible.</li> </ul>	FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	WellID	Long Integer	True	False		A unique identifier for a municipal water well.
			WaterSystemName	Text	False	False	250	The water system name, which must be unique within the Source Protection Area.
			WaterSystem_TYPE	Text	False	False	10	Type of Drinking Water System as defined in Part I.1 Technical Rules. Valid Values: "i" Or "ii" Or "iii" or uppercase i, (I, II, III)
			DWIS_NO	Long Integer	False	False		The unique identifier for the water treatment plant as assigned by the Drinking Water Information System. May not exist.
			DWIS_Name	Text	False	False	250	The name of the water treatment plant as stored in the Drinking Water Information System. If no name exists in the DWIS, a new name can be assigned to the drinking water system.
			FacilityStatus	Text	False	False	20	Indicator that a facility exists or is being planned. Valid Values: 'Existing' Or 'Planned'
			WellIdentifier	Text	False	False	50	A unique identifier for the well or wellfield. This could be a WWIS identifier or a Non-WWIS Well identifier.

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
		WellIdentifierType	Text	False	False	50	The type of identifier. Not all wells are recorded in the Water Well Information Sytem (WWIS). Examples: "WWIS", "Non-WWIS".
		WellDepth	Double	False	False		Depth of the well in meters.
		GUDI_flag	YesNo	False	False		Indicator that this is a well under the influence of surface water and must therefore have a surface protection zone as well as a wellhead protection zone.
		AvgAnnualPumpingRate	Long Integer	False	False		The average annual pumping rate of the well. To be reported in cubic meters per day.
		MonitoringWell	YesNo	False	False		Indicates whether or not the well is a monitoring well.
		WellfieldIndicator	YesNo	False	False		Set to 'Yes' if the WHPA is for a wellfield; set to 'No' if the WHPA is for a single well.
		WellfieldID	Long Integer	False	False		Unique identifier for the wellfield.
		WellComment	Text	False	False	250	Additional comment field for groundwater wells. This may include a brief description of related features (aquifer, confinement, etc.), or other pertinent well information.
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
		WellArcID	Text	True	True	50	Unique Arc ID based on concatenated primary keys with hyphen delimiter. Built in Access using a query.

RiskAssessment		Key	Name	Type	Not Null	Unique	Len	Notes
<p>A Tier Three water budget and local area risk assessment (Tier Three) is completed to estimate the likelihood that a municipality's drinking water source will be able to supply their allocated pumping rates considering increased municipal water demand, future land development, drought conditions, and other water uses.</p> <p>According to the Technical Rules (Part III.2) a Tier Three assessment must be completed for all type I, II and III drinking water systems where:</p> <ol style="list-style-type: none"> <li>There have been historical issues with water sources meeting demand, or</li> <li>The Tier Two subwatershed stress level is <i>Moderate</i> or <i>Significant</i>.</li> </ol> <p>A Tier Three water budget uses detailed groundwater and/or surface water numerical models on a more local scale. These models should be developed with the accuracy and refinement needed to evaluate hydrologic or hydrogeologic conditions directly at a water supply well or surface water intake and, whenever possible, should be refined from the Tier Two models. These refined conceptual hydrologic or</p>	<p>Primary risk assessment table. Some specific data considerations related to this table include:</p> <ul style="list-style-type: none"> <li>ModelBoundaryID references ModelBoundary table.</li> <li>A record will be added for each unique LocalAreaID evaluated as part of a risk assessment (i.e. there might be multiple local areas for a municipality)</li> <li>WHPA Q1 and Q2 IDs reference respective WHPA tables.</li> <li>Data Constraints: SourceWater can equal either Surface Water, Groundwater or Both. <ul style="list-style-type: none"> <li>If surface water boundary is used for both surface and groundwater subwatersheds, then indicate 'Both'. Otherwise, indicate boundaries as either Surface Water or Groundwater respectively.</li> </ul> </li> <li>Data Constraints: RiskLevel can equal Low, Moderate, or Significant.</li> </ul>	FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	LocalAreaID	Long Integer	True	False		A unique identifier for each local area.
		FK/PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment version.
			SourceWater	Text	True	False	20	Indicates if the source is either Surface Water or Groundwater. Valid values: 'GW' Or 'SW' (GW = GroundWater, SW = Surface Water)
		FK	ModelBoundaryID	Long Integer	False	False		Identifier that relates to the GWB_ModelBoundary table.
		FK	WHPA_Q1_ID	Long Integer	False	False		Unique identifier for WHPA Q1.
		FK	WHPA_Q2_ID	Long	False	False		Unique identifier for WHPA Q2.

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
<p>hydrogeologic models should be developed at the appropriate scale to evaluate the potential impacts of future water demands on other water uses (e.g., ecological requirements), and be calibrated to the best extent possible to represent average drought conditions.</p>			Integer					
		FK	IPZQ_ID	Long Integer	False	False	Unique identifier for IPZQ.	
			FinalRiskLevel	Text	True	False	20	Final Risk level assigned for the Local Area. Valid Values: 'Low' or 'Moderate' or 'Significant'
			FinalRiskLevelUncertainty	Text	True	False	20	Final uncertainty for the risk assessment, as determined from the set of scenarios. The uncertainty relates to the final risk level assignment (e.g., there is 'Low' uncertainty relating to the risk assignment). Valid Values: 'Low' OR 'High'
			FinalRiskLevelUncertaintyComment	Text	False	False	250	Comment(s) relating to the final assignment of uncertainty for the risk assessment.
			RiskLevelComments	Text	False	False	250	Comment field for Final Risk Level, provides additional detail on how the risk level was assigned.
			RiskAssessmentYear	Integer	False	False		The year in which the final risk assessment was completed and a risk level assigned Valid Values: format YYYY between 1900 and 2100
		FK	DOC_ID	Long Integer	False	False		Reference to the Unique ID assigned to a water budget technical report/document that is the source of the Risk Assessment results. Links to the WBStudyDocuments table.
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.	

### GWB\_LocalArea

<p>The water budget numeric models are used to delineate the 'local area' for groundwater wells or surface water intakes which form the basis for the local area risk assessment.</p> <p>The term "local area", as defined by the MOE Assessment Report Technical Rules, is used to focus the water budget assessment around municipal drinking water wells or intakes. For a surface water intake, the local area corresponds to the drainage area that contributes surface water to the intake and the area that provides recharge to an aquifer that contributes groundwater discharge to the drainage area.</p> <p>The local area for a well is created by combining the following areas:</p> <p>(i) The cone of influence of the well;</p>	<p>Polygon feature class for local areas used in Tier 3 Water Budgets, required for all type I, II and III drinking water systems where: 1. There have been historical source water issues meeting demand, or 2. The Tier 2 subwatershed stress level is moderate or significant.</p>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		PK	LocalAreaID	Long Integer	True	False		A unique identifier for each local area.
		FK/PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment version.
			SourceWater	Text	False	False	20	Indicates if the source is either Surface Water or Groundwater. Valid values: 'GW' Or 'SW'

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
<p>(ii) The cones of influence resulting from other water takings where those cones of influence intersect that of the well; and</p> <p>(iii) The areas where a reduction in recharge would have a measurable impact on the cone of influence of the well.</p> <p>For one or more wells that draw water from an aquifer, the cone of influence is the area within the depression created in the water table or potentiometric surface when the wells are pumped at a rate equivalent to their allocated quantity of water.</p>							(GW = GroundWater, SW = Surface Water)
		LocalAreaName	Text	False	False	250	The standard name for the local area as set up by the Source Protection Area (e.g., John Street Wellfield).
		LocalAreaDescription	Text	False	False	250	Comment field describing the boundary delineation for the Tier 3 Local Area (e.g., The John Street Wellfield includes 3 pumping wells; PW-1, PW-2 and PW-3 and an area of recharge reduction at the Consumers Super Centre).
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
		LocalArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

WellIntakeTier3		Key	Name	Type	Not Null	Unique	Len	Notes
<p>A detailed inventory of the physical construction data, operations, and monitoring of the municipal intakes and/or wells should be completed. At a minimum, information must include the physical and operational constraints of the intakes with respect to the maximum amount of water they can supply as summarized below:</p> <ul style="list-style-type: none"> <li>Permit Details.</li> <li>Historical pumping records.</li> <li>Water level monitoring.</li> <li>Well completion details</li> <li>Maintenance records</li> <li>Surface water intake details</li> <li>Safe Water Level Definition.</li> <li>Maximum Yield or Sustainable Yield Estimate.</li> <li>Operational procedure and maintenance information.</li> </ul> <p>Much of the information may have already been compiled as part of the watershed characterization report, municipal water supply strategy, or vulnerability assessments; and coordination with these activities should be considered to ensure consistent use of data.</p>	<p>Well or Intake information table necessary for risk assessment and local area analysis. Building on the well and intake tables, this table captures additional attribute data necessary for Tier Three.</p>	FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment version.
		FK/PK	IntakeID	Long Integer	True	False		A unique identifier for an intake. For wells, a value of zero ('0') should be entered.
		FK/PK	WellID	Long Integer	True	False		A unique identifier for a municipal water well. For intakes, a value of zero ('0') should be entered.
		FK/PK	LocalAreaID	Long Integer	True	False		A unique identifier for the local area.
			DemandComment	Text	False	False	250	Comment field for well / intake demand attributes.
			PumpElevation	Double	False	False		For Wells. Elevation of the top of the pump within a well (mAMSL).
			IntakeElevation	Double	False	False		For Wells and Intakes. Elevation of the top of the screened interval or open hole of a well; or elevation at the obvert of an intake (mAMSL).
			PumpedWaterElevation	Double	False	False		For Wells and Intakes. Minimum Observed water elevation in the well under current pumping conditions; or observed water elevation in a lake under average pumping conditions (mAMSL).
			SafeWaterElevation	Double	True	False		For Wells and Intakes. Minimum operational water elevation (mAMSL). Water elevations below this level would trigger a response from the operator (e.g. shut off, reduce pumping, control structure modification).
	MinimumStreamflow	Long	False	False		For Intakes. Minimum streamflow (m <sup>3</sup> /day), if required by permit. Note: permit requirements may		

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
				Integer			be more complex (e.g., seasonal) and can't be represented in a single field.
			SafeAdditionalDrawdown	Double	False	False	For Wells and Intakes. Difference between pumped water elevation and safe water elevation. This is the maximum amount of additional drawdown that can occur and still pump.
			RepresentativeDate	Text	False	False	50 Date or date range associated with PumpedWaterElevation and AvailableDrawdown fields.
			AutoDateStamp	DateTime	False	False	An automatic date stamp for when the record was created.

### WellIntakePumping

<p>The scenarios evaluated for the Local Area Risk Assessment require that an Allocated Quantity of Water to be specified for each existing and planned well or intake. The Allocated Quantity of Water is estimated from the committed and/or planned water demand that is in addition to existing pumping rates.</p> <p>It is recognized that when dealing with a large integrated municipal system it might be difficult to estimate specific allocated rates for each well. There will be uncertainty when choosing the combinations, locations, and well yields required to meet Committed and Planned Demands. A series of optimization scenarios may be required to estimate the most appropriate distribution of demands across wells or intakes.</p> <p>The total allocated rate for all wells or intakes may be less than what the Municipality requires to meet its population growth plans. Where this is the case, the Local Area Risk Assessment should identify the situation where the Allocated Quantity of Water is not sufficient to meet the municipality's growth plans.</p>	<p>Captures demand information related to wells and intakes in local area.</p> <p>Unless specified, units of measure are cubic meters per day (m<sup>3</sup>/d)</p>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment.
		FK/PK	IntakeID	Long Integer	True	False		A unique identifier for a municipal intake. For the WellID field within this record a value of zero ('0') should be entered.
		FK/PK	WellID	Long Integer	True	False		A unique identifier for a municipal well. For the IntakeID field within this record a value of zero ('0') should be entered.
		FK/PK	LocalAreaID	Long Integer	True	False		A unique identifier for each local area.
		PK	WellIntakeMonth	Integer	True	False		Month of the observed value (e.g. January through December). Numeric values must be entered. If only annual data is available a '0' should be entered as a value in this field.  Valid Values: 0 for annual; 1 - 12 for month (1=January, 2=February...)
			ExistingRate	Long Integer	False	False		Existing pumping rate for well or intake.
			CommittedRate	Long Integer	False	False		Committed pumping rate for well or intake. This is an additional pumping rate separate from (and above) the ExistingRate that will typically be required to meet additional municipally-approved near-term development within the limits of existing PTTW and/or Water Treatment CofA.
			PlannedRate	Long Integer	False	False		Planned pumping rate for well or intake. This is an additional pumping rate separate from (and above) the ExistingRate and/or CommittedRate that would require an increase in the PTTW rate (for existing wells/intakes) or an EA approval and PTTW (for new

Technical Guidance	Data Populating Guidance	Data Dictionary Details						
							wells/intakes).	
			AllocatedRate	Long Integer	True	False	Is equal to the Existing + Committed + Planned pumping rates. This is the rate used during the Tier 3 scenarios E, F, G, H to evaluate risk to the local area. Note: Allocated rate could be less than existing.	
			PermittedRate	Long Integer	False	False	Permitted pumping rate for well or intake.	
			RateComment	Text	False	False	250 Comment field for additional well / intake pumping rate description, attributes and characteristics.	
			AutoDateStamp	DateTime	False	False	An automatic date stamp for when the record was created.	
<b>GWB_ConsumptiveThreats</b>								
<p>The estimated consumptive water demand for permitted and non-permitted users should be carefully reviewed and refined to ensure that that the Tier Three Assessment represents the best understanding of water use. Non-municipal water users may include permitted and non-permitted water users. Official plans must be used to identify future landuses that will require water. Where future landuses will require significant water, and this water is not represented in committed or planned rates, a new 'well' or 'intake' could be added as threat into the model. If a risk to the local area is identified, all consumptive water users, regardless of the amount of water used, will be identified as a water quantity threat for the Water Quantity Risk Assessment.</p> <p>For the Tier Three Assessment, the recommended approach will involve additional effort to collect and confirm water demand estimates. Additional effort may include:</p> <ul style="list-style-type: none"> <li>Review of the Ministry of Environment's Water Taking Reporting System (WTRS) to incorporate actual reported pumping rates for permit holders;</li> <li>Review of monitoring reports and discussions with permit holders to ensure that site conditions and operating practices are incorporated into the consumptive demand estimate, if possible; and</li> <li>Site visits if warranted to better estimate consumptive water use.</li> </ul> <p>Increases in future non-municipal water demand should be estimated where there is sufficient information available to do so.</p>	<p>Point feature class for water quantity drinking water threats related to water takings.</p>	<b>Key</b>	<b>Name</b>	<b>Type</b>	<b>Not Null</b>	<b>Unique</b>	<b>Len</b>	<b>Notes</b>
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	LocalAreaID	Long Integer	True	False		A unique identifier for each local area.
		FK/PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment version.
		FK/PK	RefinedWaterTakingID	Long Integer	True	False		Unique identifier for refined water takings. Value is unique for each record.
		FK	IntakeID	Long Integer	False	False		A unique identifier for an intake. Both municipal and non-municipal.
		FK	WellID	Long Integer	False	False		A unique identifier for a well. Both municipal and non-municipal.
			ThreatName	Text	False	False	200	Reference name of threat.
			ThreatLevel	Text	True	False	20	The level of threat based on the risk level assigned to the local area. Valid Values: 'Low' Or 'Moderate' Or 'Significant'
			ThreatComment	Text	False	False	250	Description of the consumptive water taking.
			ThreatRanking	Double	True	False		Threat ranking, as derived from the threat ranking process.
			ThreatRankingComment	Text	True	False	250	Description of the threat ranking.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
			ThreatArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

Technical Guidance	Data Populating Guidance	Data Dictionary Details																																																																																																									
<b>GWB_RechargeReductionThreat</b>																																																																																																											
<p>In addition to consumptive water uses, the Technical Rules identify reductions in groundwater recharge as being potential water quantity threats. The Tier Three Scenarios must consider the impact of existing and future land development on groundwater recharge and consequently the impact on water supplies (both wells and intakes).</p> <p>The following steps to characterize potential recharge reductions are recommended:</p> <ol style="list-style-type: none"> <li>1) Create a map of existing land use.</li> <li>2) Create a map of future land use (Official Plan).</li> <li>3) Identify areas of land use change by comparing future land use against existing land use.</li> <li>4) Estimate the future change in imperviousness for each of the areas of land use change. This will require making assumptions relating to the imperviousness of land use categories.</li> <li>5) Create a map of future imperviousness changes for areas of land use change.</li> </ol> <p>The potential impact of stormwater management measures and low impact developments should not be accounted for when estimating imperviousness changes for future land use.</p>	<p>Polygon feature class for Water quantity drinking water threats are activities within their respective vulnerable areas that reduce the recharge to an aquifer.</p>	<table border="1"> <thead> <tr> <th>Key</th> <th>Name</th> <th>Type</th> <th>Not Null</th> <th>Unique</th> <th>Len</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>FK/PK</td> <td>SPA_ID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).</td> </tr> <tr> <td>FK/PK</td> <td>LocalAreaID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>A unique identifier for each local area.</td> </tr> <tr> <td>FK/PK</td> <td>RiskAssessmentID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>Unique identifier for each risk assessment version.</td> </tr> <tr> <td>PK</td> <td>RechargeReductionThreatID</td> <td>Long Integer</td> <td>True</td> <td>False</td> <td></td> <td>Unique identifier for a recharge reduction threat.</td> </tr> <tr> <td></td> <td>ThreatLevel</td> <td>Text</td> <td>True</td> <td>False</td> <td>20</td> <td>The level of threat based on the risk level assigned to the local area. 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PlannedPercentImpervious	Long Integer	False	False		Percentage of the planned land use parcel or area that is estimated to be impervious thereby reducing recharge by this percentage.		ExistingPercentImpervious	Long Integer	False	False		Percentage of the existing land use parcel or area that is estimated to be impervious thereby reducing recharge by this percentage.		ExistingLanduse	Text	False	False	100	Description of the existing land use type for the land use parcel or area.		PlannedLanduse	Text	False	False	100	Description of the planned land use type for the land use parcel or area.		ThreatRanking	Double	True	False		Threat ranking, as derived from the threat ranking process.		ThreatRankingComment	Text	True	False	250	Description of the threat ranking.		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.		ReductionArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. 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<b>GWB_IPZQ</b>																																																																																																											
<p>The surface water quantity vulnerable area, IPZ-Q, includes both the drainage area that contributes surface water to the intake and the area that provides recharge to an aquifer that contributes</p>	<p>Polygon feature class for water quantity intake protection zones, IPZ-Q, which are vulnerable areas for surface water intakes.</p>	<table border="1"> <thead> <tr> <th>Key</th> <th>Name</th> <th>Type</th> <th>Not Null</th> <th>Unique</th> <th>Len</th> <th>Notes</th> </tr> </thead> <tbody> </tbody> </table>	Key	Name	Type	Not Null	Unique	Len	Notes																																																																																																		
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Technical Guidance	Data Populating Guidance	Data Dictionary Details						
groundwater discharge to the drainage area.		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	LocalAreaID	Long Integer	True	False		Unique identifier for each local area.
		PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment version.
		PK	IPZQ_ID	Long Integer	True	False		Unique identifier for each IPZ-Q.
			IPZQName	Text	False	False	50	Unique name for IPZ-Q.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
			IPZQArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

#### GWB\_WHPA\_Q1

The groundwater quantity vulnerable areas, WHPA-Q1 and WHPA-Q2, should be delineated using the Tier Three water budget numeric model. WHPA-Q1 is delineated by computing the cone of influence for the municipal wells with existing plus committed plus planned rates (e.g. the allocated rate). WHPA-Q2 includes all of WHPA-Q1 plus additional areas outside of WHPA-Q1, where recharge reductions in those areas results in a measurable impact to water levels at a municipal well.	Polygon feature class for the water quantity wellhead protection area. WHPA-Q1 is a vulnerable area that combines the cone of influence of the well and the whole of the cones of influence of all other wells that intersect that area.	Key	Name	Type	Not Null	Unique	Len	Notes
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	LocalAreaID	Long Integer	True	False		A unique identifier for each local area.
		PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment version.
		PK	WHPA_Q1_ID	Long Integer	True	False		Unique identifier for each WHPA-Q1 polygon.
			WHPAQ1Name	Text	False	False	50	Unique name for WHPA-Q1.
			AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.
			WHPAQ1ArcID	Text	True	True	50	A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

#### GWB\_WHPA\_Q2

The groundwater quantity vulnerable areas, WHPA-Q1 and WHPA-Q2, should be delineated using the Tier Three water budget numeric model. WHPA-Q1 is delineated by computing the cone of influence for the municipal wells with existing plus committed plus planned rates (e.g. the allocated rate). WHPA-Q2 includes all of WHPA-Q1 plus additional areas outside of WHPA-Q1, where recharge reductions in those areas results in a measurable impact to water levels at a municipal well.	Polygon feature class for the water quantity wellhead protection area. WHPA-Q2 is a vulnerable area that combines the area of WHPA-Q1 with any area where a future reduction in recharge would have a measureable impact to water levels at a municipal well.	Key	Name	Type	Not Null	Unique	Len	Notes
		FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	LocalAreaID	Long Integer	True	False		A unique identifier for the local area.
		PK	RiskAssessmentID	Long	True	False		Unique identifier for the risk assessment version.

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
				Integer			
		PK	WHPA_Q2_ID	Long Integer	True	False	Unique identifier for each WHPA-Q2 polygon.
			WHPAQ2Name	Text	False	False	50 Unique name for WHPA-Q2.
			AutoDateStamp	DateTime	False	False	An automatic date stamp for when the record was created.
			WHPAQ2ArcID	Text	True	True	50 A concatenated index field based on the primary keys that can be populated using a query. This field is used for creating query joins in ArcMap, is unique and is based on the primary key values.

RiskScenario		Key	Name	Type	Not Null	Unique	Len	Notes
<p>The Local Area Risk Assessment requires that a series of scenarios be evaluated to ensure that the water source can meet the Allocated pumping rate (existing plus committed plus planned) of a municipality and the water requirements of other uses and users under average and drought conditions. These scenarios are listed in the Technical Rules. Appendix A of the Technical Guidance contains a technical bulletin (Part IX Local Area Risk Level, April 2010) written to clarify the scenarios and provide additional guidance on how to evaluate them.</p>	<p>The numeric models developed for the Tier 3 Water Budget and Local Area Risk Assessment are used to run all of the required scenarios and assign a tolerance level to the municipal system and a risk level to the Local Area.</p>	FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
		FK/PK	LocalAreaID	Long Integer	True	False		Unique identifier for each local area.
		FK/PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment.
		FK/PK	RiskScenario	Text	True	False	10	Local area risk scenario, references from LUT Scenarios table (see table for values).
			ToleranceLevel	Text	False	False	20	Determination of whether there is enough capacity in the drinking water system to meet the community's needs during short-term peak use times. The tolerance level is either High or Low.  Valid Values: 'Low' OR 'High'
			RiskLevel	Text	False	False	20	The risk level assigned to the Local Area under the various required scenarios. If the local area has been assigned a significant risk level, then threats in their applicable vulnerable area are significant drinking water threats.  Valid Values: 'Low' OR 'Moderate' OR 'Significant'
			RiskLevelComment	Text	False	False	250	Description of the risk level assignment.
			RiskLevelUncertainty	Text	False	False	20	Factors to be considered in an analysis of uncertainty include the distribution, variability, quality and relevance of the available input data.  Valid Values: 'Low' OR 'High'
			SensitivityAnalysis	Text	False	False	20	When a sensitivity analysis of the data used to prepare the Local Area Water Budget suggests that the risk level for the Local Area could be significant the input parameters are deemed to be Sensitive.

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
							Valid Values: 'Sensitive' Or 'Not Sensitive' Or 'Not Completed' OR 'Not Required'
		SensitivityUncertaintyComment	Text	False	False	250	Description and comment field for the sensitivity and uncertainty analysis.
		PumpAllocatedRate	YesNo	True	False		Indicates whether or not the wells or intakes can pump the allocated rate after evaluating all scenarios, while accounting for the needs of other water uses and users.
		ImpactToOthers	YesNo	True	False		Indicator of an impact on other uses (Technical Rule 103) and/or other users (Permitted or Non-Permitted users). If there is an unacceptable impact to other uses or other users then the value entered is Yes.
		ImpactToOthersComment	Text	False	False	250	Description of the impacts to other uses and/or other users.
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

### RiskScenarioResults

The Local Area Risk Assessment requires that a series of scenarios be evaluated to ensure that the water source can meet the Allocated pumping rate (existing plus committed plus planned) of a municipality and the water requirements of other uses and users under average and drought conditions. These scenarios are listed in the Technical Rules. Appendix A of the Technical Guidance contains a technical bulletin (Part IX Local Area Risk Level, April 2010) written to clarify the scenarios and provide additional guidance on how to evaluate them.

Results table for risk scenario, capturing individual risk scenario results as well as simulated drawdown, available drawdown, and max pumped drawdown.

Key	Name	Type	Not Null	Unique	Len	Notes
FK/PK	SPA_ID	Long Integer	True	False		Unique identifier for a Source Protection Area (which may contain one or more spatial polygons, but there will be only one identifier per SPA).
FK/PK	LocalAreaID	Long Integer	True	False		Unique identifier for each local area.
FK/PK	RiskAssessmentID	Long Integer	True	False		Unique identifier for each risk assessment.
FK/PK	RiskScenario	Text	True	False	10	Local area risk scenario, references from LUT Scenarios table (see table for values).
FK/PK	WellID	Long Integer	True	False		A unique identifier for a municipal well. For the IntakeID field within this record a value of zero ('0') should be entered.
FK/PK	IntakeID	Long Integer	True	False		A unique identifier for a municipal intake. For the WellID field within this record a value of zero ('0') should be entered.
	PumpAllocatedRate	YesNo	True	False		Indicates whether or not the wells or intakes can pump the the allocated rate for each individual scenario, for each municipal well or intake, while accounting for the needs of other water uses and users.
	MaxSimulatedDrawdown	Long	False	False		For wells, maximum pumped drawdown calculated for the scenario as compared to

Technical Guidance	Data Populating Guidance	Data Dictionary Details					
			Integer				existing conditions. (metres) (includes well losses and convergent head loss.)
		MinSimulatedFlow	Long Integer	False	False		For Intake where flow is criteria, minimum simulated flow (m <sup>3</sup> /day) in period where intake could not meet its allocated rate.
		MinSimulatedElevation	Long Integer	False	False		For Intake where elevation is criteria, simulated elevation in period where intake could not meet its allocated rate (mAMSL).
		ResultComment	Text	False	False	250	Field should be completed for any wells or intakes that cannot meet allocated rate. Provide description of the situation and date range where well or intake could not meet allocated rate (i.e. simulated drawdown greater than safe available drawdown from July 1999 until August 1999.
		Sensitivity	Text	False	False	20	Findings from sensitivity analysis for Risk Scenarios. Values can be either Sensitive or Not Sensitive or Not Completed. A comment should also be provided in the UncertaintySensitivityComment field.  Valid Values: 'Sensitive' Or 'Not Sensitive' Or 'Not Completed' OR 'Not Required'
		Uncertainty	Text	False	False	20	Assessment uncertainty for subwatershed. Valid Values: 'Low' Or 'High'
		UncertaintySensitivityComment	Text	False	False	250	Uncertainty and sensitivity comment and description for risk scenario.
		AutoDateStamp	DateTime	False	False		An automatic date stamp for when the record was created.

## Lookup Tables

### LUT\_GWReserveMethod

Lookup table for groundwater reserve method.	Values: <ul style="list-style-type: none"> <li>• 10% of Estimated Discharge</li> <li>• 10% of Estimated Supply</li> <li>• Other</li> <li>• Spot Flow Measurement</li> </ul>	Key	Name	Type	Not Null	Unique	Len	Notes
		PK	ReserveMethod	Text	True	False	50	Method used to calculate GW reserve. Where a value of 'Other' is used additional comment should be provided in the GWComment field of the GWParameters table.
			ReserveDescription	Text	False	False	250	Description of GW reserve method.

### LUT\_ModelName

Lookup table for water budget model name.	Values: <ul style="list-style-type: none"> <li>• CANWET</li> <li>• FEFLOW</li> <li>• GAWSER</li> <li>• GSFLOW</li> <li>• HEC-HMS</li> <li>• HSP-F</li> <li>• HYDROGEOSPHERE</li> <li>• MIKE 11</li> <li>• MIKE SHE</li> <li>• MODFLOW</li> <li>• Other</li> <li>• PRMS</li> <li>• SCS</li> <li>• SWAT</li> </ul>	Key	Name	Type	Not Null	Unique	Len	Notes
		PK	ModelName	Text	True	False	50	Model used for undertaking the water budget assessment. If the model is not in the LUT list it can be added manually using capital letters or can be identified as 'Other' and documented in the WBComment field of the WaterBudget table.
			ModelComment	Text	False	False	250	Additional comment field for water budget models if required.

### LUT\_Month

Lookup table for months, which is referenced by several database tables.	Values: <ul style="list-style-type: none"> <li>• 0 (annual value)</li> <li>• 1</li> <li>• 2</li> <li>• 3</li> <li>• 4</li> <li>• 5</li> <li>• 6</li> <li>• 7</li> <li>• 8</li> <li>• 9</li> <li>• 10</li> <li>• 11</li> <li>• 12</li> </ul>	Key	Name	Type	Not Null	Unique	Len	Notes
		PK	Month	Long Integer	True	False		Integer representing each month of the year (January through December). 0=annual value; 1=January; 2=February; 3=March; 4=April; 5=May; 6=June; 7=July; 8=August; 9=September; 10=October; 11=November; 12=December
			MonthName	Text	True	False	50	Common name for each month.

### LUT\_SWReserveMethod

Lookup table for surface water reserve method.	Values: <ul style="list-style-type: none"> <li>• 90th Percentile</li> <li>• Other Instream Flow Statistic/Method</li> <li>• Spot Flow Measurement</li> </ul>	Key	Name	Type	Not Null	Unique	Len	Notes
		PK	SWReserveMethod	Text	True	False	50	Method used to calculate surface water reserve. Where a value of 'Other Instream Flow Statistic/Method' is used additional comment should be provided in the SWComment field of the SWParameters table.
			SWReserveDescription	Text	False	False	250	Comment field to further describe method used to calculate surface water reserve if required.

### LUT\_SWSupplyMethod

Lookup table for SW supply method.	Values: <ul style="list-style-type: none"> <li>• Median Monthly Flow</li> <li>• Other Estimates</li> <li>• Spot Flow Measurement</li> </ul>	Key	Name	Type	Not Null	Unique	Len	Notes
		PK	SupplyMethod	Text	True	False	50	Method used to calculate SW supply. (median monthly flow, spot flow measurement, other estimates). Where a value of 'Other Estimates' is used additional comment should be provided in the SWComment field of the SWParameters table.
			SupplyDescription	Text	False	False	250	Comment field for further description of method used to calculate SW supply. (median monthly flow, spot flow measurement, other estimates)

### LUT\_Scenario

Lookup table for stress assessment and risk assessment scenarios, based on the legislated technical rules. Scenario descriptions can be found in Table 1 (Stress Assessment), Table 4A and Table 4B (Risk Assessment) of the Technical Rules.	Values: <ul style="list-style-type: none"> <li>• A</li> <li>• B</li> <li>• C</li> <li>• D</li> <li>• E</li> <li>• E1</li> <li>• E2</li> <li>• E3</li> <li>• F</li> <li>• F1</li> <li>• F2</li> <li>• F3</li> <li>• G</li> <li>• G1</li> <li>• G2</li> <li>• G3</li> <li>• H</li> </ul>	Key	Name	Type	Not Null	Unique	Len	Notes
		PK	Scenario	Text	True	False	10	Identifier for the stress assessment or risk assessment scenario.
			ScenarioDescription	Text	False	False	250	Additional information describing the stress assessment or risk assessment as per the technical rules.

	<ul style="list-style-type: none"> <li>• H1</li> <li>• H2</li> <li>• H3</li> <li>• I</li> </ul>	
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## Primary Key Field Listing by Table

### Tables A → M

TableName	FieldName
ConsumptiveDemand	ConsumptiveDemandID
	DemandMonth
	SPA_ID
	WBSubwatershedID
ConsumptiveDemandInfo	ConsumptiveDemandID
	SPA_ID
Drought	IntakeID
	Scenario
	SourceWater
	SPA_ID
	StressAssessmentID
	WBSubwatershedID
	WellID
GWB_ConsumptiveThreats	LocalAreaID
	RefinedWaterTakingID
	RiskAssessmentID
	SPA_ID
GWB_Intakes	IntakeID
	SPA_ID
GWB_IPZQ	IPZQ_ID
	LocalAreaID
	RiskAssessmentID
	SPA_ID

TableName	FieldName
GWB_LocalArea	LocalAreaID
	RiskAssessmentID
	SPA_ID
GWB_ModelBoundary	ModelBoundaryID
	SPA_ID
GWB_RechargeReductionThreat	LocalAreaID
	RechargeReductionThreatID
	RiskAssessmentID
GWB_RefinedWaterTaking	RefinedWaterTakingID
	SPA_ID
	WBSubwatershedID
GWB_SGRAs	SGRA_ID
	SPA_ID
GWB_SPA	SPA_ID
GWB_WBSubwatersheds	SPA_ID
	WBSubwatershedID
GWB_Wells	SPA_ID
	WellID
GWB_WHPA_Q1	LocalAreaID
	RiskAssessmentID
	SPA_ID
	WHPA_Q1_ID

TableName	FieldName
GWB_WHPA_Q2	LocalAreaID
	RiskAssessmentID
	SPA_ID
	WHPA_Q2_ID
GWParameters	SPA_ID
	WaterBudgetID
	WBSubwatershedID
Historical	HistoricalID
	SourceWater
	SPA_ID
	StressAssessmentID
LUT_GWReserveMethod	ReserveMethod
	ModelName
LUT_ModelName	ModelName
LUT_Month	Month
LUT_Scenario	Scenario
LUT_SWReserveMethod	SWReserveMethod
LUT_SWSupplyMethod	SupplyMethod
MOEClient	PERMIT_NUMBER
MOESource	PERMIT_NUMBER
	SOURCE

## Primary Key Field Listing by Table

### Tables M → W

TableName	FieldName
MonthlyPumping	PumpingMonth
	RefinedWaterTakingID
	SPA_ID
	WSubwatershedID
NonPoint	NonPointID
	SPA_ID
	WSubwatershedID
NonPointPumping	NonPointID
	NonPointMonth
	SPA_ID
	WSubwatershedID
ReportedPumping	IDS_SOURCE_NAME
	ISSUED_PERMIT_NUMBER
RiskAssessment	LocalAreaID
	RiskAssessmentID
	SPA_ID
RiskScenario	LocalAreaID
	RiskAssessmentID
	RiskScenario
	SPA_ID

TableName	FieldName
RiskScenarioResults	IntakeID
	LocalAreaID
	RiskAssessmentID
	RiskScenario
	SPA_ID
	WellID
StressAssessment	SourceWater
	SPA_ID
	StressAssessmentID
	WSubwatershedID
StressAssessmentScenario	Scenario
	SourceWater
	SPA_ID
	StressAssessmentID
	WSubwatershedID
SWParameters	SPA_ID
	SWMonth
	WaterBudgetID
	WSubwatershedID

TableName	FieldName
WaterBudget	SPA_ID
	WaterBudgetID
	WSubwatershedID
WBStudyDocuments	DOC_ID
	SPA_ID
WellIntakePumping	IntakeID
	RiskAssessmentID
	SPA_ID
	WellID
	LocalAreaID
WellIntakeMonth	
WellIntakeTier3	IntakeID
	LocalAreaID
	RiskAssessmentID
	SPA_ID
	WellID