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# RiverWare Model Report Generation Demo

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This document describes a demonstration version of a model report generation capability in RiverWare 5.1 (Development). This is limited to reports for individual Simulation Objects and demonstrates only report *generation* (formatting and output) capabilities -- it does not demonstrate any report *configuration* features.

Two formats are supported: (1) Plain Text, and (2) HTML (with type icons and internal links).

The purposes of this demo are:

- To compare the relative benefits of Plain Text and HTML output for a RiverWare Model Report feature.
- To work out some of the technical challenges of presenting tabular data in those two formats.

### 0.1    Related Documents

This demo was created as part of a larger effort to develop a RiverWare Model Report capability provisionally described with these two documents:

- USACE Text Output: Functional Requirements (Draft, 2-12-2009, 8 pages)
  Authors: David Neumann and Edie Zagona (CADSWES), and John Daylor (USACE-Tulsa)
- RiverWare Model Report Generator: High Level Design (4-3-2009, 25 pages)
  Author: Phil Weinstein (CADSWES)

### 0.2    Document Status

3-30-2009: Ready for review.
3-31-2009: Confirmed that MS Visual Studio 2008 resolves a C++ ListSlot problem (See p. 4).
4-03-2009: Minor edit. (A minor question posed here was later addressed in the High Level Design doc).

**0.3     Contents**

**0.4     Links to a few sample reports:**

- http://cadswes2.colorado.edu/~philw/2009/ModelReportGen/demo/HeronReservoir.html
- http://cadswes2.colorado.edu/~philw/2009/ModelReportGen/demo/HeronReservoir.txt
- http://cadswes2.colorado.edu/~philw/2009/ModelReportGen/demo/VanBuren.html
- http://cadswes2.colorado.edu/~philw/2009/ModelReportGen/demo/VanBuren.txt

## 1.0 Operating the Simulation Object Demo Report Feature

If demo Simulation Object report generation is enabled in the RiverWare build, the feature can be operated from the **Open Object dialog,** with the **File Menu** operation: **Generate Object Report....**

Selecting that menu operation brings up a File Path Selection dialog for the generated report output file, titled "Select Report Output File". The initial path of the File Selection dialog is the model file directory (for the currently loaded RiverWare model file).

If the user enters or selects a file name with an extension of **".txt",** then a **Text report** is generated. Otherwise, an **HTML report** is generated.

Note that the currently implemented demo **does not support any configuration capabilities** for the report, i.e. specifying which SimObj features are shown in the report, and how they are shown.

After the report is generated, the user is given the option of showing the generated file in an external application (generally a web browser -- the one identified within the RiverWare **File Type Association Manager** for viewing HTML documents).

**Note:** It can take several seconds for the browser program to appear -- sometimes longer on Solaris, especially if running RiverWare over an external network connection.

Also, after a report is generated, the file path of the report file is copied to the system clipboard (for pasting into another application).

**Technical Note** [3-30-2009]: The Simulation Object Demo Report Feature is enabled in the RiverWare 5.1 Development build with the following symbol at the head of **Q3GUI/OpenObjectDlg.cpp** set to *true*.

```
static const bool ENA_GENERATE_OBJECT_REPORT (true);
```
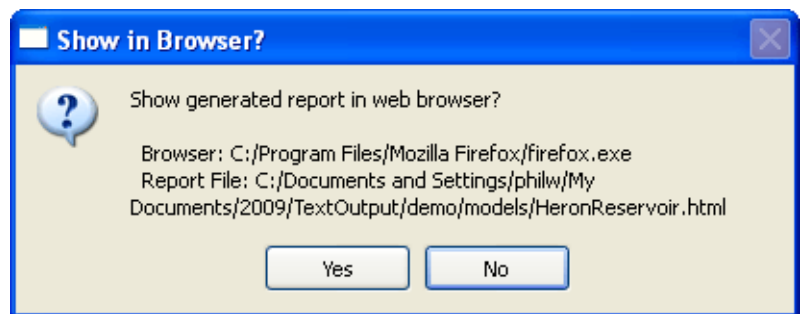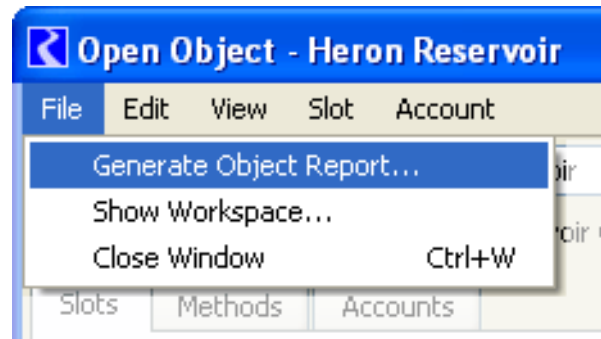
## 2.0 Overview of Simulation Object Demo Report Capabilities

Reports for both output formats, Text and HTML, show basically the same information. This includes the following sections for the RiverWare Simulation Object:

1. Method Category Method Selections (only non-default selections)
2. Slot List: Scalar Slots (and 1x1 Table Slots). Shows slot values.
3. Slot List: Other Non-Series Slots (Tables, Lists, Periodic Slots) -- with Links to Slot Details
4. Slot List: Series Slots
5. Slot Details Section (for only Table Slots, List Slots, and Periodic Slots).

These individual report sections are described in subsequent document sections.

**Icon images** are shown in the HTML report to indicate Simulation Object types and Slot types (and, in the future, Account types, where applicable). The Icon images are actually written out (as PNG image files) by the report generation function, to an automatically created **"reportImages"** subdirectory in the directory to which the report output file is written. When copying an HTML report file, the accompanying image subdirectory (folder) should also be copied.

The HTML report includes **named anchors** for all RiverWare objects (Simulation Objects and Slots) having "detailed" sections in the report. HTML links to those named anchors are generated in appropriate places, both on Icon images and on (textual) object names.

Slot Detail Capabilities:

- Support for only Table Slots, Periodic Slots and List Slots (see note).
- Numeric Column Maps (on Table Slots and Periodic Slots which have those).
- Limiting the display of Slot Data for Slots with many rows. If the Slot has over 300 rows, only the first and last several rows are shown.

**Note** [3-30-2009]: **Support for List Slots is currently limited on Windows.** The names of List Items are not shown because of a technical C++ problem.

> **Technical:** The Microsoft Visual Studio 2003 compiler-built code has a fatal runtime error -- RTTI C++ Template Error -- as a result of a required enhancement to the ListSlot templated class. This error occurs when calling ListSLotBase::itemStr (int): *EditObj<ListSlot<Reservoir \*> >::`RTTI Complete Object Locator'()*. The disabling of full support for ListSlots is in file: Sim/SlotGUIUtils.cpp, function: RWCString SlotGUIUtils::getValueUsrStr (const Slot\* ..); See also: http://cadswes2.colorado.edu/~philw/2009/SlotFeatures/ListSlot/2009mar24.txt

> **Update** [3-31-2009]: **Microsoft Visual Studio 2008 resolves this problem.** We're preparing to move to that newer development environment, but have not done so yet. [MS VS 2008, Version 9.0.21022.8 RTM (c) 2007; with Microsoft .Net Framework, version 3.5 SP1 (c) 2007].

## 3.0 SimObj Demo Report Sections

The following document sections describe the currently implemented SimObj Demo Report sections.

Currently, only the HTML report lists the sections, at the beginning of the report -- with HTML links to those sections:

RiverWare Model Report Demo
Model File: /home/staff/philw/public_html/2009/ModelReportGenerator/demo/models/accountingHeronIn
Report File: /home/staff/philw/public_html/2009/ModelReportGenerator/demo/HeronReservoir.html
Generated by: RiverWare 5.1 Development (http://cadswes.colorado.edu/)
Generated at: 17:15 March 29, 2009

 Heron Reservoir

- Method Selections
- Slot List: Scalar Slots
- Slot List: Other Non-Series Slots *(with links to slot details)*.
- Slot List: Series Slots
- Slot Details

Here is the header content for the Text report:

```
RiverWare Model Report Demo
Model File:   /home/staff/philw/public_html/2009/ModelReportGenerator/demo/models/accounti...
Report File:  /home/staff/philw/public_html/2009/ModelReportGenerator/demo/HeronReservoir.txt
Generated by: RiverWare 5.1 Development (http://cadswes.colorado.edu/)
Generated at: 17:14 March 29, 2009


******************************************************
***   Simulation Object: Heron Reservoir          ***
***   SimObj Type:       Storage Reservoir Object  ***
******************************************************
```

## 3.1    Method Category Method Selections (shows only non-default selections)

The Simulation Object's Method Categories with non-default Method Selections:

Heron Reservoir (Storage Reservoir Object) -- Method categories with
non-default method selections:

| Method Category | Selected Method |
|---|---|
| spillCalculationCategory | unregulatedSpillCalc |
| hydrologicInflowCalculationCategory | solveHydrologicInflow |
| Evaporation and Precipitation | PanAndIceEvaporation |
| Seepage Calculation | Linear Seepage Calc |
| Storage Account Gain Loss | Heron Gain Loss Calculation |
| Storage Account Slot Inflow | Heron Inflow Calculation |

Text Report output:

```
**********************************************************
***  Heron Reservoir -- Non-Default Method Selections  ***
**********************************************************

+------------------+------------------------------------+---------------------------+
| SimObj Type      | Method Category                    | Selected Method           |
|==================|====================================|===========================|
| StorageReservoir | spillCalculationCategory           | unregulatedSpillCalc      |
| StorageReservoir | hydrologicInflowCalculationCategory | solveHydrologicInflow     |
| StorageReservoir | Evaporation and Precipitation      | PanAndIceEvaporation      |
| StorageReservoir | Seepage Calculation                | Linear Seepage Calc       |
| StorageReservoir | Storage Account Gain Loss          | Heron Gain Loss Calculation |
| StorageReservoir | Storage Account Slot Inflow        | Heron Inflow Calculation  |
+------------------+------------------------------------+---------------------------+
```

**Note:** An enhancement to be considered is the enumeration of also the **Slots dependent on the each of the Selected Methods.** Values (and units) of Scalar Slots (and 1x1 Tables) would be shown -- and maybe also the values of single-column or single-row tables. Those types of values often represent *coefficients* for particular methods, and would be significant in the context of the method selections enumeration.

## 3.2 Slot List: Scalar Slots (and 1x1 Table Slots). Shows slot values.

| Scalar Slots | | | | Value | Units |
|---|---|---|---|---|---|
| ▲ | ⍵ | | Diversion Capacity | NaN | cms |
| ▲ | ⊞ | | Max Iterations | 30.00 | NONE |
| ▲ | ⊞ | | Convergence Percentage | 0.00 | NONE |
| ▲ | ⊞ | | Pan Evaporation Coefficient | 0.70 | decimal |

Text Report Output:

```
****************************************************************
***  Heron Reservoir (Storage Reservoir Object) Scalar Slots  ***
****************************************************************

+--------+-----------------------------+-------+---------+
| Type   | Slot Name                   | Value | Units   |
|========|=============================|=======|=========|
| Scalar | Diversion Capacity          |   NaN | cms     |
| Table  | Max Iterations              | 30.00 | NONE    |
| Table  | Convergence Percentage      |  0.00 | NONE    |
| Table  | Pan Evaporation Coefficient |  0.70 | decimal |
+--------+-----------------------------+-------+---------+
```

## 3.3 Slot List: Other Non-Series Slots (Tables, Lists, Periodic Slots) -- With Links to Slot Details

Two HTML examples -- for a particular Storage Reservoir and for a particular Key Control Point. In the current demo, only the Slot Names in this section implement **HTML links** to the respective Slot Detail sections.

| Other Non-Series Slots | | | Rows | Cols | Column Labels |
|---|---|---|---|---|---|
| ▲ | ⊞ | Elevation Volume Table | 22080 | 2 | Pool Elevation, Storage |
| ▲ | ⊞ | Max Release | 21 | 2 | Pool Elevation, Discharge |
| ▲ | ⊞ | Unregulated Spill Table | 47 | 2 | Pool Elevation, Unregulated Spill |
| ▲ | ⊞ | Elevation Area Table | 22080 | 2 | Pool Elevation, Surface Area |
| ▲ | ⊞ | Seepage Coefficients | 1 | 3 | Base Elevation, Slope, Intercept |

| Other Non-Series Slots | | | Rows | Cols | Column Labels |
|---|---|---|---|---|---|
| ● | ☰ | Upstream Reservoirs | 13 | 1 | |
| ● | ⊞ | Routing Coefficients | 16 | 13 | Pensacola, Hudson, Ft Gibson, Oologah, Hulah,... |
| ● | PⅢ | Percent Full Regulation Table | 10 | 8 | |
| ● | ☰ | Regulation Reservoirs | 13 | 1 | |
| ● | PⅢ | Stage Control Intervals | 1 | 1 | Lower Discharge Bound |
| ● | PⅢ | Variable Regulation Intervals | 10 | 3 | Lower Discharge Bound, Upper Discharge Bound,... |
| ● | PⅢ | Regulation Recession | 1 | 2 | |
| ● | ☰ | Key Control Point Reservoirs | 13 | 1 | |

Text Report Output (first example):

```
*****************************************************************************
***   Heron Reservoir (Storage Reservoir Object) Other Non-Series Slots   ***
*****************************************************************************


+-------+-------------------------+-------+------+----------------------------------+
| Type  | Slot Name               |  Rows | Cols | Column Labels                    |
|=======|=========================|=======|======|==================================|
| Table | Elevation Volume Table  | 22080 |    2 | Pool Elevation, Storage          |
| Table | Max Release             |    21 |    2 | Pool Elevation, Discharge        |
| Table | Unregulated Spill Table |    47 |    2 | Pool Elevation, Unregulated Spill |
| Table | Elevation Area Table    | 22080 |    2 | Pool Elevation, Surface Area     |
| Table | Seepage Coefficients    |     1 |    3 | Base Elevation, Slope, Intercept |
+-------+-------------------------+-------+------+----------------------------------+
```

## 3.4 Slot List: Series Slots

| Series Slots | | | Units | Rows | Cols | Step | Start | End |
|---|---|---|---|---|---|---|---|---|
| ▲ | 🔺 | Inflow | acre-ft/day | 275 | 2 | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| ▲ | 🔺 | Outflow | cfs | 275 | 1 | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| ▲ | 🔺 | Storage | acre-feet | 275 | 1 | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| ▲ | 🔺 | Previous Storage | acre-feet | 276 | 1 | 1 Day | Dec 31, 1995 | Oct 1, 1996 |
| ▲ | 🔺 | Pool Elevation | ft | 275 | 1 | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| ▲ | 🔺 | Flow FROM Pumped Storage | cfs | 1 | 1 | 1 Day | Dec 31, 1995 | Dec 31, 1995 |
| ▲ | 🔺 | Flow TO Pumped Storage | cfs | 1 | 1 | 1 Day | Dec 31, 1995 | Dec 31, 1995 |

Text Report Output:

```
********************************************************************
***  Heron Reservoir (Storage Reservoir Object) Series Slots  ***
********************************************************************

+-------------+--------------------------+--------------+------+------+-------+--------------+--------------+
| Type        | Slot Name                | Units        | Rows | Cols | Step  | Start        | End          |
|=============|==========================|==============|======|======|=======|==============|==============|
| SimObjMulti | Inflow                   | acre-ft/day  | 275  | 2    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Outflow                  | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Storage                  | acre-feet    | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Previous Storage         | acre-feet    | 276  | 1    | 1 Day | Dec 31, 1995 | Oct 1, 1996  |
| AggSeries   | Pool Elevation           | ft           | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Flow FROM Pumped Storage | cfs          | 1    | 1    | 1 Day | Dec 31, 1995 | Dec 31, 1995 |
| AggSeries   | Flow TO Pumped Storage   | cfs          | 1    | 1    | 1 Day | Dec 31, 1995 | Dec 31, 1995 |
| AggSeries   | Canal Flow               | cfs          | 1    | 1    | 1 Day | Dec 31, 1995 | Dec 31, 1995 |
| Series      | Total Inflows            | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Diversion                | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| SimObjMulti | Return Flow              | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Spill                    | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Release                  | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Unregulated Spill        | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Hydrologic Inflow        | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Hydrologic Inflow Adjust | acre-ft/day  | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Hydrologic Inflow Net    | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Evaporation              | acre-feet    | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Pan Evaporation          | in/day       | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Max Air Temperature      | C            | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Min Air Temperature      | C            | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | K Factor                 | in/F         | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Surface Ice Coverage     | decimal      | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Pan Ice Switch           | NONE         | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Precipitation Rate       | in/day       | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Precipitation Volume     | 1000 cfs-day | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| AggSeries   | Surface Area             | acre         | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
| Series      | Seepage                  | cfs          | 275  | 1    | 1 Day | Dec 31, 1995 | Sep 30, 1996 |
+-------------+--------------------------+--------------+------+------+-------+--------------+--------------+
```

### 3.5 Slot Details Section (for only Table Slots, List Slots, and Periodic Slots).

Not all Slots mentioned in the report will be shown in their entirety. The Demo unconditionally shows details for all (and only) (Non-Series-) Table Slots, Periodic Slots and List Slots.

Each Slot Detail section has three parts:

1. A Slot Section Title, showing the name and type of the Slot and its parent Simulation Object.
2. Misc. notes and information about the slot, in unformatted text -- only where needed.
3. Slot data, shown in a table.

The following sections show examples of various Slot Details.

## 4.0 Slot Details Examples

1. Table Slot, truncated due to an excessive number of rows.
2. Periodic Slot, with a Numeric column dimension.
3. List Slot

## 4.1 Slot Detail Example: Table Slot, truncated due to an excessive number of rows.

```
********************************************************************
***   Object:  Heron Reservoir        / Storage Reservoir Object  ***
***     Slot:  Elevation Volume Table  / Table Slot                ***
********************************************************************
```

The number of rows in this slot (22080) exceeds the maximum
number of slot rows for this report (300).  Only the first
and last several rows are shown.

```
+-------+----------------+-------------+
|       | Pool Elevation |     Storage |
|       |           [ft] | [acre-feet] |
|=======|================|=============|
|     0 |      6970.0100 |      0.0000 |
|     1 |      6970.0200 |      0.0000 |
|     2 |      6970.0300 |      0.0000 |
|     3 |      6970.0400 |      0.0000 |
|     4 |      6970.0500 |      0.0000 |
|   ... |            ... |         ... |
| 22076 |      7190.7700 | 429472.0000 |
| 22077 |      7190.7800 | 429532.0000 |
| 22078 |      7190.7900 | 429595.0000 |
| 22079 |      7190.8000 | 429657.0000 |
+-------+----------------+-------------+
```

Object: Heron Reservoir
  Slot: Elevation Volume Table
  Storage Reservoir Object   Table Slot

The number of rows in this slot (22080) exceeds the maximum
number of slot rows for this report (300). Only the first and last
several rows are shown.

|       | Pool Elevation [ft] | Storage [acre-feet] |
|-------|---------------------|---------------------|
| 0     | 6970.0100           | 0.0000              |
| 1     | 6970.0200           | 0.0000              |
| 2     | 6970.0300           | 0.0000              |
| 3     | 6970.0400           | 0.0000              |
| 4     | 6970.0500           | 0.0000              |
| ...   | ...                 | ...                 |
| 22076 | 7190.7700           | 429472.0000         |
| 22077 | 7190.7800           | 429532.0000         |
| 22078 | 7190.7900           | 429595.0000         |
| 22079 | 7190.8000           | 429657.0000         |

## 4.2 Slot Detail Example: Periodic Slot, with a Numeric column dimension.

Object: Van Buren
Slot: Percent Full Regulation Table
🔵 Key Control Point  📷 Periodic Slot

Numeric column header value entity: Discharge

|  | 20000.00 [cfs] | 40000.00 [cfs] | 75000.00 [cfs] | 75000.01 [cfs] | 125000.00 [cfs] |
|---|---|---|---|---|---|
|  | [NONE] | [NONE] | [NONE] | [NONE] | [NONE] |
| 0:00 January 2 | 0.00 | 0.07 | 0.09 | 0.18 | 0.19 |
| 0:00 February 16 | 0.00 | 0.07 | 0.09 | 0.18 | 0.19 |
| 0:00 March 2 | 0.00 | 0.03 | 0.05 | 0.10 | 0.11 |
| 0:00 May 16 | 0.00 | 0.03 | 0.05 | 0.10 | 0.11 |
| 0:00 June 16 | 0.00 | 0.11 | 0.13 | 0.18 | 0.19 |
| 0:00 September 16 | 0.00 | 0.11 | 0.13 | 0.18 | 0.19 |
| 0:00 October 2 | 0.00 | 0.07 | 0.09 | 0.18 | 0.19 |
| 0:00 November 2 | 0.00 | 0.07 | 0.09 | 0.18 | 0.19 |
| 0:00 December 2 | 0.00 | 0.07 | 0.09 | 0.18 | 0.19 |
| 0:00 December 16 | 0.00 | 0.07 | 0.09 | 0.18 | 0.19 |

```
    ********************************************************************
    ***  Object:  Van Buren                      / Key Control Point  ***
    ***    Slot:  Percent Full Regulation Table  / Periodic Slot      ***
    ********************************************************************

    Numeric column header value entity: Discharge

    +--------------------+----------+----------+----------+----------+-----------+
    |                    | 20000.00 | 40000.00 | 75000.00 | 75000.01 | 125000.00 |
    |                    |   [cfs]  |   [cfs]  |   [cfs]  |   [cfs]  |   [cfs]   |
    |--------------------|----------|----------|----------|----------|-----------|
    |                    |  [NONE]  |  [NONE]  |  [NONE]  |  [NONE]  |   [NONE]  |
    |====================|==========|==========|==========|==========|===========|
    |  0:00 January 2    |   0.00   |   0.07   |   0.09   |   0.18   |    0.19   |
    |  0:00 February 16  |   0.00   |   0.07   |   0.09   |   0.18   |    0.19   |
    |  0:00 March 2      |   0.00   |   0.03   |   0.05   |   0.10   |    0.11   |
    |  0:00 May 16       |   0.00   |   0.03   |   0.05   |   0.10   |    0.11   |
    |  0:00 June 16      |   0.00   |   0.11   |   0.13   |   0.18   |    0.19   |
    |  0:00 September 16 |   0.00   |   0.11   |   0.13   |   0.18   |    0.19   |
    |  0:00 October 2    |   0.00   |   0.07   |   0.09   |   0.18   |    0.19   |
    |  0:00 November 2   |   0.00   |   0.07   |   0.09   |   0.18   |    0.19   |
    |  0:00 December 2   |   0.00   |   0.07   |   0.09   |   0.18   |    0.19   |
    |  0:00 December 16  |   0.00   |   0.07   |   0.09   |   0.18   |    0.19   |
    +--------------------+----------+----------+----------+----------+-----------+
```

## 4.3 Slot Detail Example: List Slot

Object: Van Buren
Slot: Regulation Reservoirs
🔵 Key Control Point ▤ List Slot

| | | |
|---|---|---|
| 0 | 🔺 | Pensacola |
| 1 | 🔺 | Hudson |
| 2 | 🔺 | Ft Gibson |
| 3 | 🔺 | Oologah |
| 4 | 🔺 | Hulah |
| 5 | 🔺 | Copan |
| 6 | 🔺 | Birch |
| 7 | 🔺 | Skiatook |
| 8 | 🔺 | Kaw |
| 9 | 🔺 | Keystone |
| 10 | 🔺 | Tenkiller |
| 11 | 🔺 | Eufaula |
| 12 | 🔺 | Wister |

```
***********************************************************
***  Object:  Van Buren               / Key Control Point  ***
***    Slot:  Regulation Reservoirs  / List Slot          ***
***********************************************************

+----+----------------------+-----------+
|  0 | Level Power Reservoir | Pensacola |
|  1 | Level Power Reservoir | Hudson    |
|  2 | Level Power Reservoir | Ft Gibson |
|  3 | Storage Reservoir     | Oologah   |
|  4 | Storage Reservoir     | Hulah     |
|  5 | Storage Reservoir     | Copan     |
|  6 | Storage Reservoir     | Birch     |
|  7 | Storage Reservoir     | Skiatook  |
|  8 | Level Power Reservoir | Kaw       |
|  9 | Level Power Reservoir | Keystone  |
| 10 | Level Power Reservoir | Tenkiller |
| 11 | Level Power Reservoir | Eufaula   |
| 12 | Storage Reservoir     | Wister    |
+----+----------------------+-----------+
```

## 5.0  Benefit Comparison between Text and HTML Output Formats

### 5.1  Advantages of the Text Output Format

- The Text Output format is **more compact in the vertical dimension.**

... This is primarily because horizontal lines are drawn between every data row in the HTML format (which uses HTML Tables), but not in the Text format. It may be possible, using HTML Cascading Style Sheets (CSS) to refrain from drawing all horizontal dividers in the HTML report. (This would need some research).

### 5.2  Advantages of the HTML Output Format

- Ability to show **Icon Images** for Simulation Object types, Account types and Slot types.
    - •Note that Icon Images "survive" when copying from a browser and pasting into an MS Word Document.
- Ability to use **different text attributes** -- fonts, font sizes, colors, etc. -- for the different uses of text in the report.
- Ability to **navigate** to named objects in the report file (via **HTML links**) -- and potentially -- between different HTML files within the report, i.e. if the report is generated as a set of separate related HTML files.
- HTML is generally more "forgiving" when attempting to display the document in a narrower space than is needed.

## 6.0  New RiverWare C++ Source Files for the Simulation Object Demo Report

*Note that the QtUtils modules will probably be moved to a new RiverWare library directory.*

```
QtUtils/RwModelReport.cpp        QtUtils/RwModelReport.hpp
QtUtils/RepGenSimObj.cpp         QtUtils/RepGenSimObj.hpp
QtUtils/RepGenSimObjHtml.cpp     QtUtils/RepGenSimObjHtml.hpp
QtUtils/RepGenSimObjText.cpp     QtUtils/RepGenSimObjText.hpp
QtUtils/RepGenSlot.cpp           QtUtils/RepGenSlot.hpp
QtUtils/RepGenSlotHtml.cpp       QtUtils/RepGenSlotHtml.hpp
QtUtils/RepGenSlotText.cpp       QtUtils/RepGenSlotText.hpp
QtUtils/RepGenUtils.cpp          QtUtils/RepGenUtils.hpp
Sim/IconHandle.cpp               Sim/IconHandle.hpp
```

*Significant enhancements to support the demo report generation feature were made to:*

```
Sim/SlotGUIUtils.hpp, .cpp
Sim/ListSlot.hpp, .cxx
```

--- (end) ---