



October 21, 2015

Gordon Criswell  
Director of Environmental and Engineering Compliance  
Talen Energy  
PO Box 38  
Colstrip, Montana

Dear Mr. Criswell:

DEQ has reviewed the revised Plant Site Characterization Report submitted to DEQ on July 15, 2015. DEQ accepts the report as the final version. This acceptance includes the revised Plant Site Groundwater Conceptual Model and Numerical Model Update Report (Appendix A of the Plant Site Report). However, enclosed please find a list of discrepancies between the hard copies and the electronic copies. DEQ understands that Talen will correct the electronic versions of the documents for posting to DEQ's website. Please provide the corrected electronic copy no later than October 28, 2015.

DEQ will also post this letter of approval on the DEQ web site.

DEQ requests that a hard copy of the final version of this report be placed in the Colstrip Public Library for inspection by the public with the noted discrepancies corrected.

DEQ requests that the comments made by DEQ concerning the Water Resources Monitoring Plan (Appendix E of the Plant Site Report) during the process of revision of the Plant Site Report be addressed under separate cover so that the revised Water Resources Monitoring Plan can be used for future sampling events.

Please contact me if you have further questions.

Yours truly,

A handwritten signature in cursive script that reads "Jake Kandelin".

Jake Kandelin  
Remediation Division, DEQ

## **Table Numbering Issues Final Plant Site Groundwater Model Report July, 2015 (Appendix A of Plant Site Report)**

**(October 15, 2015)**

### **Summary of Table Numbering Issues**

1. Table numbering appears to be not consistent within the electronic copy. There are numbering errors between the table of contents and the texts. Seven tables are in the texts that are not found in the table of contents.
2. Table numbering is not consistent within the hard copy. There are numbering errors between the table of contents and in the text. Seven tables are in the texts that are not found in the table of contents.
3. Table 18 of the electronic copy (“Summary of Estimated and Simulated Water Balance for 2003”) has almost the same content as Table 19 of the hard copy (“Comparison of Estimated and Simulated Groundwater Flux for 2003”). The electronic Table 18 differs by having summed totals for each of the columns.
4. Table 22 of the electronic copy (“Summary of Estimated and Simulated Water Balance for 2014”) has almost the same content as Table 24 of the hard copy (“Comparison of Estimated and Simulated Groundwater Flux for 2014”). The electronic Table 22 differs by having summed totals for each of the columns.

<b>Table Issues in Hard Copy</b>						
Table In Hard Copy	<i>Page Number Table (printed number)</i>	Number of Table in Hard Copy Text	Number of Table in Hard Copy Table of Contents	Number of Table in Electronic Copy Text	Number of Table in Electronic Copy Table of Contents	<b>Correct Table Number in Hard Copy</b>
Comparison of the 2006, 2008n, and 2014 Numerical Groundwater Model Features	<b>8</b>	1	1	1	1	<b>1</b>
Summary of Aquifer Properties by Hydrostratigraphic Unit	<b>14</b>	2	2	2	2	<b>2</b>
Average Monthly Precipitation	<b>16</b>	3	3	3	3	<b>3</b>
Flow	<b>18</b>	4	4	4	4	<b>4</b>

Measurements for East Fork Armells Creek						
Summary of Background Screening Levels (BSLs)	<b>25</b>	5	5	5	5	<b>5</b>
Summary of Water Balance for 2014 and 2003	<b>31</b>	6	6	6	6	<b>6</b>
Primary Lithology and Hydraulic Characteristics along Underflow-In Boundary	<b>32</b>	7	7	7	7	<b>7</b>
Approximate Saturated Thickness, Gradient, and Length along Underflow-In Boundary	<b>33</b>	8	8	8	8	<b>8</b>
Pond Seepage Estimates	<b>34</b>	9	9	9	9	<b>9</b>
Precipitation and Estimated Background Recharge for Jan 2003-Dec 2003 and Feb 2014-Jan 2014	<b>36</b>	10	10	10	10	<b>10</b>

Primary Lithologies and Hydraulic Characteristics along Underflow Out Boundaries	<i>37</i>	11	11	11	11	<b>11</b>
Approximate Saturated Thicknesses, Gradients, and Lengths along Underflow Out Boundary	<i>37</i>	12	12	12	12	<b>12</b>
Summary of Estimated Groundwater Extraction Rates	<i>39</i>	13	13	13	13	<b>13</b>
Wells Installed Since 2007	<i>40</i>	14	14	14	14	<b>14</b>
Summary of Specific Yield and Effective Porosity Values from Literature	<i>49</i>	15	15	15	15	<b>15</b>
Final Calibrated and Measured Horizontal Hydraulic Conductivity Values	<i>55</i>	16	Not in Hard Copy Table of Contents	16	Not in Electronic Copy Table of Contents	<b>16</b>
Final Calibrated	<i>55</i>	16	16	16	17	<b>17</b>

Storage Parameter Values						
2003 Calibration Statistics by Layers	<b>57</b>	17	18	17	18	<b>18</b>
Comparison of Estimated and Simulated Groundwater Flux for 2003	<b>58</b>	19	Not in Hard Copy Table of Contents	19	Not in Electronic Copy Table of Contents	<b>19</b>
2003 Simulated Flow from the Groundwater System to East Fork Armells Creek	<b>58</b>	20	Not in Hard Copy Table of Contents	20	Not in Electronic Copy Table of Contents	<b>20</b>
2004-2005 Transient Model Statistics	<b>61</b>	18	21	18	21	<b>21</b>
2004-2005 Transient Model Statistics by Layer	<b>61</b>	22	Not in Hard Copy Table of Contents	22	Not in Electronic Table of Contents	<b>22</b>
2014 Calibration Statistics by Layer	<b>62</b>	23	Not in Hard Copy Table of Contents	23	Not in Electronic Table of Contents	<b>23</b>
Comparison of Estimated and Simulated Groundwater Flux	<b>63</b>	24	Not in Hard Copy Table of Contents	24	Not in Electronic Copy Table of Contents	<b>24</b>

for 2014						
2014 Simulated Flow from the Groundwater System to East Fork Armells Creek	<b>63</b>	19	25	19	25	<b>25</b>
Parameters Altered in the Sensitivity Analysis	<b>66</b>	20	26	20	26	<b>26</b>
Assigned Values of Effective Porosity	<b>69</b>	21	27	21	27	<b>27</b>
Summary of Uncaptured particles	<b>72</b>	22	28	22	28	<b>28</b>
Summary of Uncaptured Particles with Extraction Rates Reduced by a Factor of 0.75	<b>74</b>	23	29	23	29	<b>29</b>
Effective Porosity Values Applied to Uncertainty Simulations	<b>76</b>	30	Not in Table of Contents	30	Not in Electronic Table of Contents	<b>30</b>

### Table Issues in Electronic Copy

Table in Electronic Copy	<i>Page Number Table Electronic Copy (printed number)</i>	Number Table Electronic Copy Text	Number Table in Electronic Table of Contents	Number Table in Hard Copy Text	Number of Table in Hard Copy Table of Contents	Correct Number in Electronic Copy
Comparison of the 2006, 2008n, and 2014 Numerical Groundwater Model Features	8	1	1	1	1	<b>1</b>
Summary of Aquifer Properties by Hydrostratigraphic Units	14	2	2	2	2	<b>2</b>
Average Monthly Precipitation	16	3	3	3	3	<b>3</b>
Flow Measurements for East Fork Armells Creek	18	4	4	4	4	<b>4</b>
Summary of Background Screening Levels (BSLs)	25	5	5	5	5	<b>5</b>
Summary of Water Balance for	31	6	6	6	6	<b>6</b>

2014 and 2003						
Primary Lithology and Hydraulic Characteristics along Underflow-In Boundary	32	7	7	7	7	<b>7</b>
Approximate Saturated Thickness, Gradient, and Length along Underflow-In boundary	33	8	8	8	8	<b>8</b>
Pond Seepage Estimates	34	9	9	9	9	<b>9</b>
Precipitation and Estimated Background Recharge for Jan 2003-Dec 2003 and Feb 2013-Jan 2014	36	10	10	10	10	<b>10</b>
Primary Lithologies and Hydraulic Characteristics along Underflow Out Boundaries	37	11	11	11	11	<b>11</b>
Approximate Saturated Thicknesses,	37	12	12	12	12	<b>12</b>

Gradients, and Lengths along Underflow Out Boundary						
Summary of Estimated Groundwater Extraction Rates	39	13	13	13	13	<b>13</b>
Wells Installed Since 2007	40	14	14	14	14	<b>14</b>
Summary of Specific Yields and Effective Porosity Values from Literature	49	15	15	15	15	<b>15</b>
Final Calibrated and Measured Horizontal Conductivity Values	55	16	Not in Electronic Table of Contents	16	Not in hard copy Table of Contents	<b>16</b>
Final Calibrated Storage Parameter Values	55	16	17	16	17	<b>17</b>
2003 Calibration Statistics by Layer	57	17	18	17	18	<b>18</b>
Comparison of Estimated and Simulated Groundwater Flux for 2003	58	19	Not in Electronic Table of Contents	19	Not in hard copy Table of Contents	<b>19</b>
2003 Simulated	58	20	Not in Electronic	20	Not in hard copy	<b>20</b>

Flow from the Groundwater System to East Fork Armells Creek			Table of Contents		Table of Contents	
2004-2005 Transient Model Statistics	61	18	21	18	21	<b>21</b>
2004-2005 Transient Model Statistics by Layer	61	22	Not in Electronic Table of Contents	22	Not in hard copy Table of Contents	<b>22</b>
2014 Calibration Statistics by Layer	62	23	Not in Electronic Table of Contents	23	Not in hard copy Table of Contents	<b>23</b>
Comparison of Estimated and Simulated Groundwater Flux for 2014	63	24	Not in Electronic table of contents	24	Not in hard copy Table of Contents	<b>24</b>
2014 Simulated flow from the groundwater system to East Fork Armells Creek	62	19	25	19	25	<b>25</b>
Parameters Altered in the Sensitivity Analysis	66	20	26	20	26	<b>26</b>
Assigned Values of Effective Porosity	69	21	27	21	27	<b>27</b>

Summary of Uncaptured Particles	72	22	28	22	28	<b>28</b>
Summary of Uncaptured Particles with Extraction Rates Reduced by a Factor of 0.75	74	23	29	23	29	<b>29</b>
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