Montana Class II Data Submission to the National UIC Database
Introduction

• RBDMS overview
  – UIC tables
  – Forms used for data entry
• 7520 creation
• Electronic submittal to EPA
• Issues and challenges 🎉
• Status
• Project made possible by the node grant.

• Development was done by ALL Consulting.

• EPA headquarters and Region VIII have been involved in data and report analysis.
UIC Permit

- Contains all basic permit information including dates.
- Permit does not require an associated well to be entered or counted as a permit for the existing 7520 report.
UIC Master

- Includes well class and other well-specific information.
- Wells may be included on multiple permits.
- Dates that a well is subject to or associated with a UIC permit are tracked somewhat independently of UIC permit dates.
Modifications

- Tracks modifications to existing permits.
- Modifications include adding new wells to area permits.
Permit-Wells

- Identifies the well or wells associated with an injection permit.
Permitted Formation

- Tracks formations that comprise the permitted injection interval.
Well Zones

- Includes completed zones, confining zones, and zone properties.
- Completed zone does not necessarily match the permitted zone.
- Well can have multiple injection zones over its life.
Well History

• Well history table is used for all well types.

• Pre-regulatory, post-regulatory and pre-primacy wells are problematic.
  – injection well since 1940 or a well authorized by the state in 1970, both of which were subsequently permitted by EPA during 1986
Compliance

- Violations are identified as UIC or non-UIC to simplify data extraction for compliance monitoring.
- UIC permit not required for a UIC violation.
  - Unauthorized injection
<table>
<thead>
<tr>
<th>Date Effect</th>
<th>Code</th>
<th>Type Work:</th>
<th>Dr_RptReq</th>
<th>Comments</th>
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<td>12/22/2003</td>
<td>SCTI</td>
<td>Subsequent, Conversion to Injector</td>
<td>12/23/2003</td>
<td>Convert Red River EOR to Minnelusa SWD.</td>
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<td>12/4/2003</td>
<td>ICTI</td>
<td>Intent to Convert to Injection</td>
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<tr>
<td>9/2/2003</td>
<td>IPERF</td>
<td>Intent to Perforate</td>
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<td></td>
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<tr>
<td>6/18/2003</td>
<td>IABDN</td>
<td>Intent to Abandon</td>
<td></td>
<td></td>
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<td>9/25/1998</td>
<td>SMIT</td>
<td>Subsequent, Mechanical Integrity Test</td>
<td></td>
<td></td>
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<tr>
<td>10/17/1995</td>
<td>SOTH</td>
<td>Other</td>
<td></td>
<td></td>
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<tr>
<td>5/17/1989</td>
<td>SHEME</td>
<td>Subsequent, Acidize or Treat</td>
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<td>SCLT</td>
<td>Subsequent, Conversion to Injector</td>
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<td>SCLT</td>
<td>Subsequent, Conversion to Injector</td>
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<td></td>
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<tr>
<td>5/19/1988</td>
<td>ICTI</td>
<td>Intent to Convert to Injection</td>
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<td>2/28/1986</td>
<td>DTCMP</td>
<td>Date Well Complated</td>
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<tr>
<td>1/9/1986</td>
<td>DTSIP</td>
<td>Date Well Spudded</td>
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<tr>
<td>11/20/1985</td>
<td>APD</td>
<td>Date Well Permit Approved</td>
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</tr>
</tbody>
</table>
## UIC Well Data

### Company
- 5000 Burlington Resources Oil & Gas Company LP

### API Well No.
- 25-025-21404-00-00

### Location
- 7N-60E-35 NE SE

### Well Data

<table>
<thead>
<tr>
<th>Tp MI</th>
<th>Bt MI</th>
<th>Bt TI</th>
<th>Dt Per</th>
<th>Thn</th>
<th>Sh</th>
<th># Per</th>
<th>Type</th>
<th>Amt</th>
<th>Pipe</th>
<th>Cor</th>
<th>Squezd</th>
<th>Notes</th>
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<tr>
<td>6190</td>
<td>6225</td>
<td></td>
<td>12/04/2003</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td>CIBP 8,870' and 6,325'</td>
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<td>8880</td>
<td>8890</td>
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<td>02/28/1986</td>
<td>4</td>
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### Type of Zone

<table>
<thead>
<tr>
<th>Inject. Interval</th>
<th>Code</th>
<th>Status</th>
<th>Top</th>
<th>Bot</th>
<th>TDS</th>
<th>Source</th>
<th>E</th>
<th>ExTyp</th>
<th>Por</th>
<th>Frac</th>
<th>Mh</th>
<th>Frc P</th>
<th>Zone CIBP 8,870'</th>
<th>Zone CIBP 6,325'</th>
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</thead>
<tbody>
<tr>
<td>Production Zone</td>
<td>RR</td>
<td>SUSP</td>
<td>8.880</td>
<td>8.928</td>
<td></td>
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<td>CIBP 8,870'</td>
<td></td>
</tr>
<tr>
<td>Injection Interval</td>
<td>RR</td>
<td>SUSP</td>
<td>8.880</td>
<td>8.928</td>
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<td></td>
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<tr>
<td>Injection Interval</td>
<td>MNL</td>
<td>ACT</td>
<td>5.190</td>
<td>6.225</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CIBP 6,325': Work done</td>
<td></td>
</tr>
</tbody>
</table>
Compliance Master

Well Name: Unit 44-12A
County: Fallon
Permittee: 244 Incore Operating LP

General Compliance Information

Dt Viol: 03/16/2007
Notification: 03/16/2007 Operator Reported
Enf. Action: 03/16/2007 Shut-In
Compliance: Required

Penalty Data

Assessed
Collected
Date:
Amount:

Violation Type(s) Identified
UIC - Mechanical Integrity

Appeal Dates
Date:
Filed
Canceled
Affirmed

Action Dates
Date:
Final
Withdrawn

Notes
Operator reported loss of MI and shut well in. Passed MIT 4-25-06.
7520 Reporting

- Developed prior to 1997 using published requirements and discussions with Region VIII.
- Uses Microsoft Access reports.
- Relatively simple methodology
  - count injection permits, count UIC violations, and determine which wells are injection wells to extract well-based statistics for the period being reported.
7520 Report Selection

Start Date: 10/01/2007
End Date: 09/30/2008

Part I  Part IIa  Part IIb
Part IIIa  Part IIIb  Part IV

First enter the period (Start And End Dates) that the report is to cover, then select the report page you wish to generate.

Note: For calculations of numbers based on a specific year's quarter, the quarter date will be based on the quarter of the year in which the End Date resides.
United States Environmental Protection Agency  
Office of Ground Water and Drinking Water  
Washington, DC 20460  
UIC Federal Reporting System  

II. Date Prepared (mo, day, yr)  
09/07/09  

III. State Contact (Name, Telephone No.)  
Thomas P. Richmond  

IV. Recording Period (Month/Year)  
From: 10/1/2007 To: 9/30/2008

### Part III: Inspections
#### Mechanical Integrity Testing
(This information is solicited under the authority of the Safe Drinking Water Act)

<table>
<thead>
<tr>
<th>Item</th>
<th>Class and Type of Injection Well</th>
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<tbody>
<tr>
<td></td>
<td>SWD</td>
</tr>
<tr>
<td>Total Wells</td>
<td>A</td>
</tr>
<tr>
<td>Total Inspections</td>
<td>B</td>
</tr>
<tr>
<td>1. No. of Mechanical Integrity Tests (MITs) Witnessed</td>
<td></td>
</tr>
<tr>
<td>2. No. of Emergency or Complaint Response Inspections</td>
<td></td>
</tr>
<tr>
<td>3. No. of Well Constructions Witnessed</td>
<td></td>
</tr>
<tr>
<td>4. No. of Well Pluggings Witnessed</td>
<td></td>
</tr>
<tr>
<td>5. No. of Routine/Periodic Inspections</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>V. Summary of Inspections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Wells</td>
<td>A</td>
</tr>
<tr>
<td>No. of Wells Tested or Evaluated for Mechanical Integrity (MIT)</td>
<td></td>
</tr>
<tr>
<td>No. of Permitted Wells Tested/Evaluated for MI</td>
<td>B</td>
</tr>
<tr>
<td>Failed 2-part test (IMI and EMI)</td>
<td></td>
</tr>
<tr>
<td>No. of Rule-Authorized Wells Tested/Evaluated for MI</td>
<td></td>
</tr>
<tr>
<td>Failed 2-part test (IMI and EMI)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Item</th>
<th>VI. Summary of Mechanical Integrity (MI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>For Significant Leak</td>
<td>C</td>
</tr>
<tr>
<td>1. No. of Annulus Pressure Monitoring Record Evaluations</td>
<td></td>
</tr>
<tr>
<td>2. Number of Casing/Tubing Pressure Tests</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
National Database Submission

• Process developed under the EPA grant by Mark Layne and Tony Shaiebly of ALL Consulting.
  – Extract data from state database and populate tables for transfer, primarily with SQL stored procedures operating on views.
  – Translate codes for well status & type, permit status, inspection, and MIT type & results, etc.
  – Submit to validation.
  – Submit to EPA through GWPC node.
Please enter your user information below.

User Information

NASS ID: __________________________
NASS Password: ______________________
Email Address: _______________________

Notice

Please note that this information is needed in order to send data to EPA.

Your NASS account information will be used to log this application onto the system.

Your email will be used in the data validation process. You will receive a validation email to this address.

Continue

Submission Log-in
Reporting Period Selection
<table>
<thead>
<tr>
<th>ID</th>
<th>Description</th>
<th>Function</th>
<th>Date/Time</th>
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<tbody>
<tr>
<td>40406</td>
<td>Initial IMIT, No Well Authorization Date</td>
<td>uspValidateUICPermitStatus</td>
<td>109-05122 (MT15052)</td>
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<td>109-05120 (MT5052)</td>
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<td>109-05141 (MT5052)</td>
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<td>109-05146 (MT5052)</td>
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<td>109-21179 (MT5052)</td>
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<tr>
<td>40411</td>
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<td>uspValidateUICPermitStatus</td>
<td>041-23524 (MT5243)</td>
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<td>MT0032, 10/29/1984</td>
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<tr>
<td>40414</td>
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<td>uspValidateUICNewExist</td>
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</table>

Database Error Report

File Tools About...

Quarter: 1st 2nd 3rd 4th Year: 2008

Pull Validation Filter Results

Column: Filter Out

Filter Now! Clear

Print Report

Data Import Review and Authorize Validation & Transmission
<table>
<thead>
<tr>
<th>Permit ID</th>
<th>Old Send Status</th>
<th>Current Send Status</th>
<th>ADR Well</th>
<th>Aut Status</th>
<th>Ownership Type</th>
<th>P State</th>
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<tbody>
<tr>
<td>MTOG2500050360000</td>
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<td>MT0053</td>
</tr>
</tbody>
</table>
Submission Screen

Final Task List

Task #1

Well Data needs to be validated before transmission.

Notice!
Due to current server configurations this step may take a while.

Validate Now!

Task #2

Transaction ID:
Date/Time:
Validation Status:
Document Status:

Messages
No Messages at this time.

Task #3

Submit Report
Transaction ID:
Submit Status:
Available Files:

View Files
Choose One

Download File

Data Import → Review and Authorize → Validation & Transmission

<< Back  Next >>
<table>
<thead>
<tr>
<th>By permit type and permit authorization type? (7520-1)</th>
<th>0 AP permit</th>
<th>1 Hanson 2-18 +2 IONFIN10 &amp; ONFINJU 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 A. How many violations occurred during:</td>
<td>FY08 7520-2A</td>
<td>Small differences are in the DB and paper report. Is the DB more accurate?</td>
</tr>
<tr>
<td>a. FY 08?</td>
<td></td>
<td>- Different in # of violations - database is higher. DB:</td>
</tr>
<tr>
<td>b. End FY Submission date?</td>
<td></td>
<td>- UI=1 12D &amp; 12R</td>
</tr>
<tr>
<td>c. History?</td>
<td></td>
<td>- MI=11 2D &amp; 61 2R</td>
</tr>
<tr>
<td>3 B. How many WELLS had violations during:</td>
<td></td>
<td>- IP=8 2D &amp; 2R</td>
</tr>
<tr>
<td>a. FY 08?</td>
<td></td>
<td>- MI=12 (2D) &amp; 61 (2R)</td>
</tr>
<tr>
<td>b. End FY Submission date?</td>
<td></td>
<td>- IP=3 (2D) &amp; 2 (2R)</td>
</tr>
<tr>
<td>c. History?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6106</td>
<td></td>
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</tr>
<tr>
<td>3 C. How well type and by violation type? (7520-2A)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 A. How enforcement actions in:</td>
<td>14 2D &amp; 59 2R</td>
<td>DISTINCT # enforcement actions, DB is higher than 6</td>
</tr>
<tr>
<td>a. FY 08?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. End FY Submission date?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. History?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 B. How many WELLS had enforcement actions in:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. FY 08?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. End FY Submission date?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. History?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 C. By well type, by type of enforcement action? (7520-2A)</td>
<td># wells with ent action: 1/2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Submission Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comparison with 7520</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>June 2008 submission does not include permit for Hanson 2-18. includes 2 additional permits that were added to the MT database after Oct 2008 submission.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 12D MI violation added to MT database after the Oct 2008 submission for Transel 25-77  
8 2R MI violations added to MT database after Oct 2008 submission  
1. CSTSU A115  
2. CSTSU C315  
3. HFU 28-4  
4. SCCBSU 23-1X  
5. SCCBSU 49-9  
6. SCCBSU 22-6 |
|                                                   |             | |
### UIC Federal Reporting System

#### Part III. Inspections Mechanical Integrity

This report contains information from 7520-3
(This information is collected under the authority of the Safe Drinking Water Act)

<table>
<thead>
<tr>
<th>V. Total Wells</th>
<th>A1. Number of Facilities Inspected</th>
<th>A2. Number of Wells Inspected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Facilities</th>
<th>A1. Number of Facilities Inspected</th>
<th>A2. Number of Wells Inspected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Wells</th>
<th>A. Number of Wells Tested for Mechanical Integrity</th>
<th>B. Number of Rule-Authorized Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>Passed</td>
</tr>
<tr>
<td></td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Class and Type of Injection Wells</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. Name and Address of Reporting Agency</td>
</tr>
<tr>
<td>Montana Board of Oil and Gas Conservation</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct 01, 2007</td>
<td>Sep 30, 2008</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I. Name and Address of Reporting Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States Environmental Protection Agency</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>II. Data Prepared (month, day, year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 07, 2009</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>III. Submitter (name, e-mail)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jim Halvorson</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IV. Reporting Period (month, day, year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>From</td>
</tr>
<tr>
<td>Oct 01, 2007</td>
</tr>
<tr>
<td>To</td>
</tr>
<tr>
<td>Sep 30, 2008</td>
</tr>
</tbody>
</table>
Issues and Challenges

• Periodic snapshot of Class II data would be simple, but extraction of data to facilitate a complete historical analysis is more difficult.

• Historical 7520 numbers, although consistent and “correct”, do not necessarily match those derived from the electronic submittal primarily because of varying database rules.
• 7520
  – Count and report injection permits, inspections performed on UIC wells, MIT’s on UIC wells, and UIC violations.

• National Database Submission
  – Database and analysis “rules” allow one injection permit per well, require that all permits have wells (and v.v.) and permit status dates and well status dates are used to validate the statistical extraction.
Examples

• Injection permits can be issued with no existing well;
  – Injection permit may not be counted during reporting period it was issued if the drilling permit does not exist.

• A well can be on multiple injection permits over its life (and have different injection / confining zones);
  – Well history or status must include dates prior to current injection permit dates to have inspections, MITs, and compliance records counted.
  – Wells fall off active well inventory if they are associated with a new permit but were not authorized to inject under the new permit within the reporting period.

• UIC violation on non-UIC well
  – requires a false permit.
Closing Thoughts

• The required permit-well relationship and the use of permit dates to further qualify data may hinder the extraction of a complete and correct activity history and can lead to potential errors in well inventory.
  – Consider allowing multiple permits per well.
  – Something to watch during data analysis.

• Geology table may have similar issues.
  – Consider allowing multiple entries per well.

• Submission step has occasionally been frustrating.
  – Validation and production steps, user authentication.
Project Status

• A number of test submissions have been made and known issues have been addressed.
• With tweaks and twists applied to the underlying data during extraction we have come reasonably close in well inventory and statistical counts.
• Trading partner agreement is awaiting signature.