

Information Report **More Than Just Pressure Transient Analysis!**



Mission Statement

Welltest Excellence Provide the Oil & Gas industry with knowledgeable, comprehensive, welltest interpretation and reporting products. Offer old-fashioned, personal service, while embracing modern initiatives, with honest, reliable and accountable ethics.



Core Values

Customers **Provide** leading edge quality and outstanding service with technical integrity.

Employees **Mentor** employees in exemplary performance, proficiency and responsibility.

Shareholders **Nurture** a productive and profitable infrastructure to maximize market share.

Public **Contribute** to the community at large, encouraging environmentally progressive concepts.



Beyond the Basics



Welltest Specialists goes beyond the basics for business success—yours and ours! We provide personalized service to expedite your needs. We believe in green reporting to reduce waste. We offer quality products, checked for accuracy and clarity. We add value with extra items and thorough evaluations, highlighting anomalies that might be inhibiting your well's economics.



 **Personalized Service**

- Accessible Our service excels in providing personalized attention. We are accessible to discuss your needs, solve problems and consult on well testing issues. Our advice is always free! We are available to drop by your office to preview test data or review analytical results.
- Individual All of our reports are individually written up. We are concise and clear about test objectives and analytical results, providing meaningful observations and recommendations specific to your well. We enhance communication with thumbnail plots for visual literacy. Our goal is always your understanding a practical, intelligible, real-world discussion.

 **Environmentally Friendly Business**

- Reducing Waste We promote streamlining the business process where service companies (wireline, flow test, labs) e-mail data and Adobe.pdf reports directly in to us. In other words, no need to produce four printed reports (they just get recycled anyway) and a diskette (1 in 10 is bad).
- Electronic Format All technical reports are integrated into our comprehensive eREPORT, which is in Adobe.pdf format. You can read and search it on your computer, as designed, or have a printed copy. All data, plus the eREPORT, are provided on CD for permanent record.

 **Quality Control**

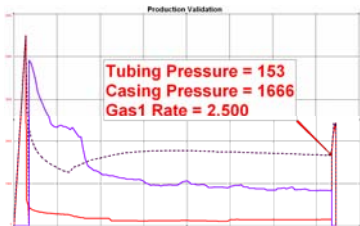
- Validation Data validation initiates the quality control process. Production, pressure, temperature and differential data are all reviewed diagnostically before analysis or interpretation. Data are qualified before they are quantified.
- Supervision Technical reporting services are supervised by an Engineering Technologist with 29+ years experience. Quality control and troubleshooting services are provided at no charge.

 **Clarity**

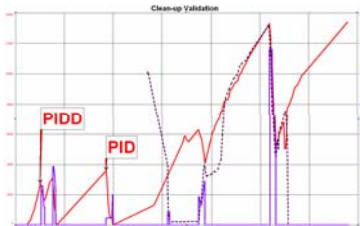
- Real World All eREPORTS are written up, test-by-test, in a clear, concise, intelligible style with real-world practicality in mind. Plots are annotated with anything noteworthy. Quantitative results must be reasonable in terms of geological prognosis.



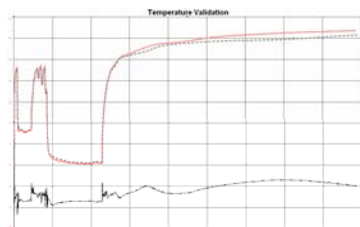
Checking differentials provides added value. Note this case where an unusual reversal was exhibited by the tubing/casing differential *after flowing the well!* This suggested there may have been an air column trapped in the annulus. Subsequent review of completion reports revealed that the well had, indeed, been blown dry with air before installing coiled tubing! This situation was reported immediately. An air/methane mixture is volatile and could have proven catastrophic during tie-in or start-up operations. The author is aware of at least one compressor being blown up due to a similar situation!



This operator was ready to walk away from this well due to uneconomically low gas rates. However, note the huge tubing/casing differential! A check of operations reports revealed that wireline encountered an obstruction and could not install recorders, hence the need to use surface data acquisition equipment. Casing pressures indicated a sandface AOF *ten-times greater* than the wellhead TOF. In reality this well had a crimp in the coiled tubing string. After repair the well flowed an economic 20 e³m³/d compared to the test gas rate of only 2.5 e³m³/d.



While PID and PIDD tests have their place as stand-alone assessment tools, this example of added value wasn't planned that way! To make a long, complicated story short, two zones were perforated before installing an isolation packer. The upper zone bled off to TSTM during evaluation and was going to be bypassed for tie-in. Analysis of PIDD and PID (blowdown) response suggested the upper zone actually had *better permeability* than the lower zone but was highly damaged. Acting upon the author's recommendation, the zone was frac'd and came in at a flow rate three-times greater than the 'economic' lower zone!



Temperature validation with differential helps with qualitative assessment and adds value. This sample illustrates liquid influx (the well was *not* shut-in during that thermal spike) and wellbore hydrodynamics throughout the buildup period. Thermal diagnostics have saved economic wells by illustrating unexpected liquid problems (once after the driller dumped water on the formation to secretly dispose of it). Sometimes liquid problems don't manifest at surface or on subsurface pressure patterns...but always show on the temperature trace! Temperatures can also identify hidden cleanup effects, especially on frac'd wells.



Added Value—Technical Reporting

Comprehensive Technical reports are thoroughly checked for validity and accuracy. Meters are zeroed for correct cumulative flow times. Sampled gas properties are input for precision. Fluid levels are calculated for partial gradients. Tables and plots are annotated at critical events. Not only are AEUB.pas files certified but BC-OGC or SIR compliance forms are provided for British Columbia or Saskatchewan wells. Supplemental data are included (oil, water, schematics).



Diverse Product Offering

Welltest Analysis Of course we do pressure transient analyses (PTA)...as part of our comprehensive welltest analyses! But we also do decline curve analyses, rate transient analyses (RTA), rate-time modeling, rate typecurve analyses, and flowing material balance analyses based on your production history data. We do perforation inflow diagnostic or distribution analyses (PID). We do conventional material balance analyses. And tubing performance curves. We do deliverability analyses (AOF, LIT, IPR) and forecasts. We do test design and supervision.

Technical Reporting Our team prepares technical reports for production, wireline and surface tests. We provide an eREPORT on CD plus digital data in FLD, FKT, CSV and AEUB.pas file formats for the ultimate in end-user choice.

Government Submissions We can build, certify and submit all AEUB.pas files (PRD, TRG, AWS, GRD, AOF). We also provide completed BC-OGC forms and an approved SIR deliverability test form for submission.



Welltest Specialists—Welltest Excellence

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