

# **Accufacts Inc.**

**"Clear Knowledge in the Over Information Age"**

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**January 30, 2011**

**To: Mr. Jeffrey T. Niermeyer, P.E., Director  
Salt Lake City Public Utilities  
1530 So. West Temple  
Salt Lake City, Utah 84115**

**Re: Accufacts' Independent Observations on the Chevron No. 2 Crude Oil Pipeline**

Following two recent releases, Accufacts Inc. was commissioned by the City of Salt Lake ("City") to perform an independent analysis of the Chevron operated 10-inch No. 2 crude oil pipeline segment from Parley's Pass to the Salt Lake City Terminal. Accufacts' observations are based on our extensive background concerning pipeline operations in sensitive areas. Such areas include high population density as well as sensitive water zones, where a pipeline release could have serious consequences. In developing our conclusions, highly sensitive information was provided by Chevron to Accufacts under a Confidential Agreement, in response to various submitted Accufacts questions concerning the pipeline. Accufacts is prohibited from disclosing certain Chevron information in provided responses to these questions, unless specifically approved by Chevron. Accufacts will not release, nor has retained, such "sensitive" detailed information but, nevertheless, is making specific key observations based on certain findings and conclusions. These specific observations are summarized as follows.

## **Accufacts' Summary of Observations:**

1. The SCADA leak detection should undergo immediate modification to eliminate false alarms.<sup>1</sup>
2. More mainline valves need to be remotely operated via SCADA.
3. Chevron needs to demonstrate improvements in their right-of-way ("ROW") monitoring that go well beyond aerial patrolling and Utah one-call. The City should also press the legislature for two critical improvements in the state's one-call regulation.
4. Key City/Operator emergency response contacts need updating and verification.
5. Integrity Management ("IM") assessment methods appear to be appropriate.

Additional information for the above observations is provided in more detail below under each related observation. In making these recommendations Accufacts is guided by a core principle based on many decades of experience: The illusion of an ineffective safety can be much more dangerous than no safety as system risks are substantially increased when decision makers take unwarranted risks assuming such illusionary safeties will actually work.

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<sup>1</sup> SCADA stands for Supervisory Control and Data Acquisition, the computer system that helps operators in a centralized control room remotely monitor, operate, and control a pipeline system.

Illusionary safeties can cause decision makers to take unwise actions, actually driving a system to failure. No “safety” should increase the risk of pipeline failure! This principle has saved many lives on more than one occasion, including large segments of cities.

Accufacts would describe Chevron’s answers to our questions as responsive and professional, in line with the serious nature of this analysis. It is Accufacts’ opinion that the pipeline should not be prevented from returning to service as long as all parties have agreed to a reasonable timeline for completion of each recommendation before restart.

### **Observation One - Leak Detection Modifications Are Required**

The internal (SCADA based) leak detection system on this segment is not mandated under 49CFR§195.444 (Computer Leak Detection). Nevertheless, this leak detection system should undergo immediate software modification to eliminate false alarms. After modification of the internal leak detection system, Control Room procedures should be instituted that require the SCADA Control Room operator, upon a leak alarm, to immediately shut down, close remotely operated block valves, and institute ROW inspection of the Parley’s Pass to SLC segment to check for possible pipeline releases before the pipeline can be restarted (see Observation Two).

Once the SCADA leak detection system has been modified, a one-month shakedown/test period should be sufficient to verify that the internal leak detection alarm system modifications are sufficient to eliminate false alarms and to establish confidence in this leak alarm system. Once the one-month shakedown period has occurred, any leak alarm should trigger the shutdown, valve closure, and ROW inspection. Leak detection modifications should focus on the rapid detection of a pipeline rupture (a high rate release caused by pipe fracture).

There has been extensive frank technical discussion among Accufacts, the City, PHMSA, and Chevron concerning various suggested internal and external leak detection enhancements. Accufacts again stresses the point that any such improvements should be carefully analyzed as to their ability to actually work, while not decreasing the safety of the system. Accufacts understands some of the focus on external leak detection at certain sites, but Murphy’s Law and our experience suggests such systems will not be very effective at detecting many types of leaks. Accufacts has thus focused on improving the internal leak detection, starting with the recommendation to eliminate false alarms in SCADA. We also understand that the above recommendations are not intended to discourage possible further improvements in the SCADA leak detection but caution that such improvements should not generate false alarms nor markedly decrease the level of safety for the pipeline segment. Accufacts has an obligation to report that the detection of certain leaks via SCADA on this pipeline segment is extremely challenging. Public expectations and understandable desires are setting standards beyond technical capabilities, and caution is warranted to not overstate the capabilities of leak detection for this segment.

**Observation Two – More mainline valves need to be operated by SCADA (the Control Room)**

A review of the pipeline system from Parley's Pass to the City Terminal indicates that Chevron needs to increase SCADA commanded control of mainline valves to permit remotely operated isolation of smaller segments of this pipeline. Many existing manual block valves should be converted to remote operation via SCADA. Installation of additional new block valves with SCADA remote actuation/control may also be warranted, pending the completion of a more detailed valve effectiveness study written report required by PHMSA within 120 days.<sup>2</sup> Accufacts advises that all mainline valves on the Parley's Pass to the City Terminal be modified for remote operation via SCADA. **Retrofitting of an existing pipeline system with additional valves, especially remotely operated mainline valves, should never occur without a proper surge analysis to verify additional pipeline system modifications are also incorporated so that such valve operation cannot put a pipeline in an overpressure event (exceeding 110% MOP).** Inadvertent pressure surge resulting from a remotely operated valve closing on its own is an all too common problem on pipelines. A proper surge analysis for this pipeline should uncover system modifications needed to avoid such overpressure.

Given the elevation profile of the pipeline and the location of current mainline valves, Accufacts also believes there is a high probability that additional new mainline valves will be identified on the Parley's Pass to the Salt Lake City Terminal pipeline segment and these new valves should also be remotely operated via SCADA. In arriving at the above valve recommendations, Accufacts had to weigh the significant safety advantages gained by having more SCADA control of these pipeline valves against the increased risk of possible pipeline release from pipeline overpressure or increased exposure to leakage from valves. The PHMSA required valve study, relevant surge analysis, and remote valve actuator/new valve installation should all be completed within six months of the pipeline restart.

**Observation Three - Improvements are needed in Chevron's right-of-way ("ROW") management processes for this pipeline, especially given the gaps in Utah's one-call regulation**

Based on certain Integrity Management information provided by Chevron, as well as our understanding of the two release events that occurred in 2010, Accufacts reviewed in detail sections of Chevron's updated Operating and Maintenance Procedures ("O&M") Manuals and the Utah one-call regulations (aka Blue Stakes Laws). Based on this review, Accufacts advises that Chevron incorporate a more aggressive and more effective ROW management program than goes well beyond the minimums established for the state's one-call regulation, while insuring that additional vehicle and on foot ROW

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<sup>2</sup> PHMSA, Pipeline and Hazardous Material Safety Administration - the federal agency responsible for administering regulations governing pipeline safety of this pipeline, Corrected Action Order Regarding CPF No. 5-2010-5032H, Item 9 of Required Corrective Actions, dated December 8, 2010.

monitoring (patrolling) processes are incorporated into their operation. Several weaknesses in the Utah one-call regulation place the pipeline operator, excavators, and the public at a higher level of risk from ROW encroachment threats that can cause pipeline failure. We do not wish to imply that Utah is any better or worse in applying one-call, as there is wide variation in state one-call enforcement and effectiveness across the U.S. Congress recognized this problem and attempted to improve pipeline safety in this area in the PIPES Act of 2006.<sup>3</sup>

Regarding the Chevron ROW encroachment/patrolling plans, improvements are warranted that prudently incorporate vehicle and on foot inspections that provide closer scrutiny, going well beyond aerial inspections, especially in this particular pipeline segment with its many highly unique risks. Accufacts has closely inspected this segment's ROW and other records and concurs with PHMSA's CAO finding that overreliance on aerial inspections for this segment is inappropriate. Additional process improvements are warranted to assure that the pipeline operator complies with their recently updated O & M manuals addressing pipeline patrolling and increases the level of vehicle and on foot inspections of the ROW in highly sensitive areas.<sup>4</sup> **Accufacts advises that the City and PHMSA be given monthly ROW inspection reports covering the segment from Parley's Pass to the Salt Lake City ("SLC") Terminal, over the next year** to demonstrate and instill confidence that sufficient vehicle and on foot pipeline patrolling is occurring, and the company is not overly relying on aerial surveys.

Accufacts further recommends that the City of Salt Lake encourage the Utah State Legislature to make improvements to the state's one-call law regulation, Utah Code Title 54 Chapter 08a Damage to Underground Utility Facilities.<sup>5</sup> Accufacts believes at least two areas in Utah's one-call regulation are inappropriate, placing the pipeline operator, the regulators, excavators, and the public at greater risks than warranted:

- 1) Section 54-8a-5 "Marking of underground facilities," subsection (2)(a)(i)(B) exempts the marking of underground facilities "located in a remote area" within 48 hours but requires the pipeline operator to notify the excavator to request a meeting at the proposed excavation site or some other mutually agreed upon location."<sup>6</sup> Accufacts cannot find a specific definition of remote area within the regulation. Much of the No. 2 pipeline segment evaluated by Accufacts is located in what we believe are remote areas that can be damaged by third parties which can affect High Consequences Areas, including people or sensitive watersheds. Accufacts believes that a clear definition of remote area should be included in the one-call regulations to clarify which systems must be marked within the 48 hours. It is Accufacts' opinion,

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<sup>3</sup> See Pipeline Inspection, Protection, Enforcement, and Safety (PIPES) Act of 2006, Section 2 Pipeline Safety and Damage Prevention.

<sup>4</sup> PHMSA "Notice of Probable Violation Proposed Civil Penalty and Proposed Compliance Order," dated November 1, 2010, identified probable violation No 1.

<sup>5</sup> [http://www.le.state.ut.us/~code/TITLE54/54\\_08a.htm](http://www.le.state.ut.us/~code/TITLE54/54_08a.htm)

<sup>6</sup> Ibid section 54-8a-5(2)(b).

however, that the exclusion to avoid marking within 48 hours for remote areas may be unwarranted and introduces an opportunity for error that could result in failure to properly identify pipelines before threatening work that could damage a pipeline commences.

- 2) Section 54-8a-5.5 “Determining the precise location of marked underground facilities,” places the identification of the exact location of a facility such as a pipeline on the “excavator” rather than the pipeline operator, even though it requires such excavator location determination by hand digging. Accufacts is not intending to place blame on excavators, but only the pipeline operator should be involved in ascertaining the exact pipeline location **when necessary**, as the history of pipeline failures is fraught with excavators making very unwise decisions around pipelines when given the option to determine pipeline location, with very tragic results. In addition, an excavator does not have to hit a pipeline to cause damage to a pipeline system that can result in a pipeline failure at a later date. **Therefore, pipeline operators need to be very aware of certain activities in close proximity to a pipeline, and when merited, the pipeline operator should be required to determine the exact location of their pipelines.** The federal pipeline safety regulations, setting minimum pipeline safety standards, are very clear on this matter. The pipeline operators are responsible for protecting their pipeline from damage associated with excavation activities, and merely satisfying a state’s one-call requirements provides only a **minimum** level of damage prevention to pipelines.<sup>7</sup>

Traditionally, Accufacts has met with considerable defensiveness when suggesting improvements in various one-call state regulations across the country. The fact remains that, based on evidence provided to Accufacts, the Chevron pipeline segment reviewed is exhibiting an unusually high amount of “third party damage.” While under federal pipeline safety regulations the pipeline operator bears the primary responsibility for protecting their infrastructure from such damage, and we have indicated improvements in Chevron’s performance in this area are merited, the evidence reviewed indicates further advancements in Utah’s one-call regulation and enforcement are also warranted to improve one-call effectiveness.<sup>8</sup> It is worth mentioning that after more than ten years since the Bellingham, Washington tragedy, and many legislative attempts to improve that state’s one-call regulation, Washington state still has a very weak one-call law. There are many forces and special interests in play at state levels hindering bona fide needed improvements in various state one-call regulations. While one-call plays an important and effective role in preventing countless possible damage to pipelines, no prudent pipeline operator should rely solely on one-call to avoid very real damage to a pipeline. There are very wide variations in the effectiveness of state one-call laws across the U.S.

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<sup>7</sup> 49CFR§195.442 “Damage prevention program.”

<sup>8</sup> Richard B. Kuprewicz, Preventing Pipeline Releases,” “Encroachment Management,” prepared for the Washington City and County Pipeline Safety Consortium, July 22, 2003, page 13.

#### **Observation Four – Key Emergency Response current contacts need to be verified**

In reviewing the emergency response plans, several adjustments are warranted regarding critical contact numbers that will enhance coordination between the pipeline operator and emergency responders. Key response personnel within the city should have at least the 24-hour contact number of the SCADA Control Center, now located in Texas, that is operating, monitoring and controlling this pipeline 24/7. The City should also be kept aware of the pipeline company's primary local contact and their alternate's phone number. In today's environment, frequent changes, both within the city as well as with the pipeline operator, can make these important primary contact numbers obsolete, causing critical delays in shutting down the pipeline and in emergency response when most needed.

A recent advisory bulletin issued by PHMSA should serve to insure that the pipeline operator's oil spill response plans are up to date and effective. More importantly, this Advisory Bulletin, issued after several recent pipeline failures failed to keep first responders properly in the loop, requires a pipeline operator "to maintain the necessary liaison with emergency responders and other appropriate public officials."<sup>9</sup> Accufacts advises that following startup city representatives, emergency responders, and Chevron pipeline personnel triage the last two recent leak releases as to what could be improved in communication and response, including spill response equipment staging.

#### **Observation Five - Integrity Management assessment methods appear to be appropriate for this pipeline segment's risks**

Recent pipeline ruptures have raised public concerns about inspection assessment methods used by pipeline operators in their IM programs. A review of the pipeline system assessment methods and identified repairs from Parley's Pass to the Salt Lake City Terminal indicates that the operator appears to be in compliance and, more importantly, embraces the important concepts codified in the IM federal pipeline safety regulations for liquid pipelines.<sup>10</sup> IM plays an important role in helping to avoid failures in pipelines that can have very serious consequences. No pipeline, even new pipeline, is free of imperfections in pipe or welds (anomalies). The purpose of an IM assessment is to maintain control of particular anomalies before they can go or grow to failure. IM assessments on their own, however, cannot avoid certain types of releases, such as those experienced in 2010 on this system.

IM assessments will not prevent releases if other management processes or programs that are a necessary part of an IM overall program are deficient or ineffective. It is worth mentioning that the IM assessment identified repairs implemented by Chevron on the segment reviewed were provided in a recommended format following Accufacts' July 15,

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<sup>9</sup> PHMSA Advisory Bulletin ADB-10-05, "Updating Facility Response Plans in Light of Deepwater Horizon Oil Spill, dated June 23, 2010, page 6.

<sup>10</sup> 49CFR§195.452, "Pipeline integrity management in high consequence areas."

2010 testimony to Congress and this format can indicate much about the operator's seriousness in complying with IM's intent.<sup>11</sup> While Accufacts would judge the IM assessment program as appropriate, such a program must be complemented by other management programs such as effective ROW monitoring, corrosion control, and maintenance programs that are part of an overall IM program required in federal integrity management pipeline safety rules to prevent pipeline releases. **There is no doubt, however, that for pipeline operator's who have embraced the IM approach intended in federal regulation, that IM has substantially reduced the likelihood of pipeline failure and improved pipeline safety.**

Accufacts was also asked by community representatives and elected officials to comment on pipeline age-related issues. These questions have understandably been raised based on serious deficiencies identified in recent documents now readily available in the public domain concerning the San Bruno natural gas pipeline rupture. The Chevron crude oil pipeline is of a similar age as the 30-inch natural gas transmission pipeline that ruptured in San Bruno, CA. Pipeline steel, whether for crude oil or natural gas service, does not age and prudent testing, maintenance, inspection, and management practices can extend the life of such steel pipelines, even pipelines constructed in the 1940s and 1950s, indefinitely. While Accufacts cannot release specific information related to testing, assessment methods, and inspection findings without the approval of Chevron, **I can comment that Chevron was able to produce enough appropriate records concerning very specific Accufacts questions pertaining to the 10-inch crude oil pipeline that clearly suggest that Chevron has not "lost or can't find" very important records that readily demonstrate many appropriate practices are in play.**

Accufacts needs to be very clear that the IM assessment methods would not prevent the failures that occurred in 2010 (i.e. a lightning strike). Having reviewed the latest updated O & M Manuals recently provided to PHMSA, it is Accufacts' opinion that Chevron should be also be able to meet the deadline established to address the factors contributing to the June 11, 2010 and December 1, 2010 releases; some of these factors have also been independently identified by Accufacts in this letter.<sup>12</sup>

Lastly, Chevron has indicated that they are tracking various sensitive areas (such as landslide sensitive sites) of the pipeline segment. Since no pipeline can reliably handle a massive landslide, it may be beneficial for the city to request a Pipeline Relocation Study from Chevron to identify or develop a longer-term solution that might include a reroute of portions or a major reroute from many of the more sensitive pipeline segments that Accufacts has reviewed. We must caution that the pipeline operator cannot be easily

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<sup>11</sup> Written Testimony of Richard B. Kuprewicz, "The Safety of Hazardous Liquid Pipelines (Part 2): Integrity Management," Before the Committee on Transportation and Infrastructure Subcommittee on Railroads, Pipeline, and Hazardous Materials U.S. House of Representatives, July 15, 2010 at: <http://transportation.house.gov/hearings/Testimony.aspx?TID=6434>.

<sup>12</sup> PHMSA CAO, "CPF No. 5-2010-5032H," dated December 8, 2010, Required Corrective Action No 6.

compelled to move an existing pipeline. Such a study could assist all parties in identifying and jointly planning, not only future development and activity around the pipeline, but assists in identifying when strategic relocation of at-risk segments, or a major reroute, may be warranted that would benefit all parties.

### **Conclusion**

It is Accufacts' opinion that none of the above findings technically warrant the prevention of the startup of this pipeline, provided that a completion date for each of the action items identified above, under Chevron's control, is mutually agreed upon and that a reasonable period of time to implement each recommendation is properly communicated to the public.

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