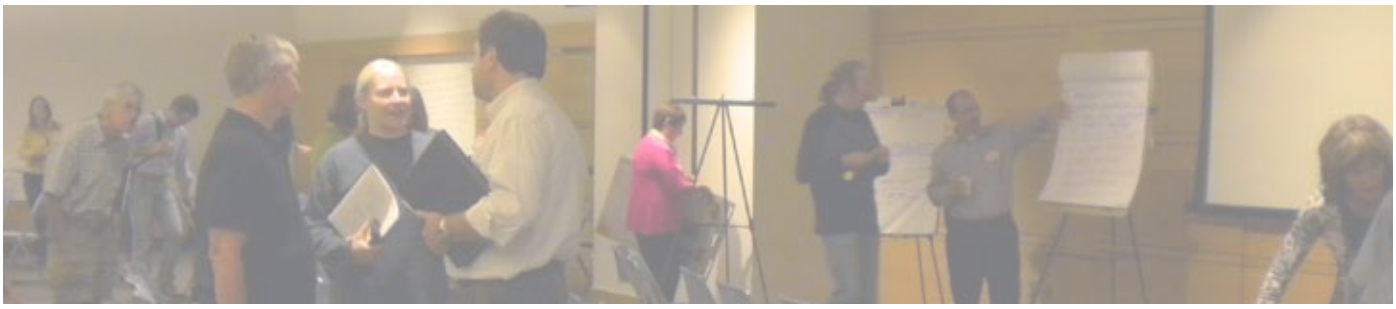
Salt Lake City, Utah
Mayor Ralph Becker

Red Butte Creek Oil Spill Work Group

2010 Final Report



Report prepared by Carbaugh Associates, Inc. with VODA Landscape + Planning

Red Butte Creek Oil Spill Work Group

2010 Final Report

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Please cite this report as the ***Salt Lake City 2010 Red Butte Oil Spill Work Group Report***

TABLE OF CONTENTS

Acknowledgements

This report is made possible because of the hard work and commitment of Mayor Ralph Becker, the Mayor's staff, and all of the Red Butte Creek Oil Spill Work Group participants, and the reports author extends sincere appreciation to those individuals.

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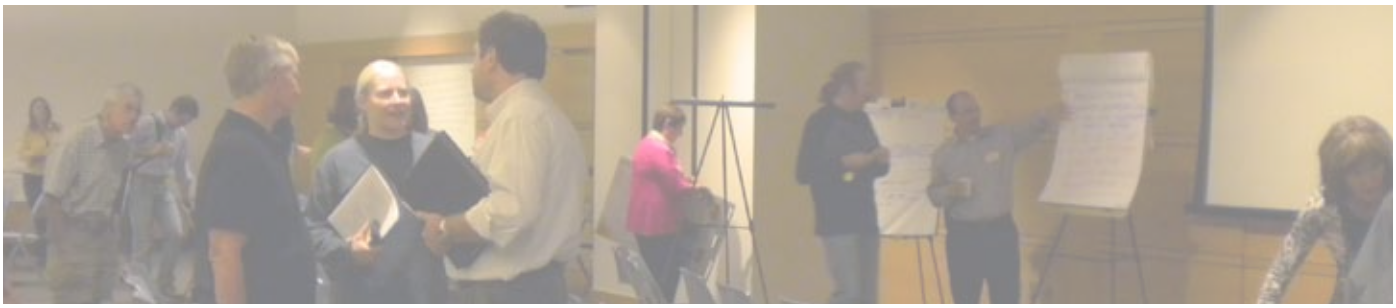
Preface

This report presents the results of Salt Lake City Mayor Ralph Becker's Red Butte Creek Oil Spill Work Group. As such, it represents the efforts, and opinions of individuals, and organizations that actively volunteered their time in order to improve outcomes for the Salt Lake community affected by the June 11-12, 2010 Chevron Pipeline oil spill into the Red Butte Creek. The Oil Spill Work Group Report contains, inquiry, evaluation, and recommended action steps for helping Salt Lake City work toward resolving outstanding problems arising from the Red Butte Creek-Chevron Pipeline Oil Spill.

Executive Summary



Introduction

The purpose of the Oil Spill Work Group was to assess and address the health, welfare, and future safety of individual residents, the broader Salt Lake City community, and, the Red Butte Creek natural environment following the June 11-12, 2010 Chevron pipeline breach. Because of the complex nature of the oil spill recovery and remediation effort, the Oil Spill Work Group members offered a vital role in contributing broader knowledge, and experiential context which would serve to assist Mayor Becker, City staff, as well as present and future community leaders in decision making related to the spill. To define their charge, the following purpose statement aided in the undertakings of the Red Butte Creek Oil Spill Work Group:

> *For the health, welfare, and future safety of individuals, the Salt Lake City community, and the Red Butte Creek environment;*
>
> *The Red Butte Creek Oil Spill Work Group will contribute questions, ideas and recommendations that serve to help Mayor Becker, City staff, as well as, present and future community leaders to work successfully together throughout the Red Butte Creek oil spill cleanup, and Chevron Pipeline, remediation, and restoration process.*

Red Butte Creek Oil Spill, 11 June 2010. Image credit: City Weekly

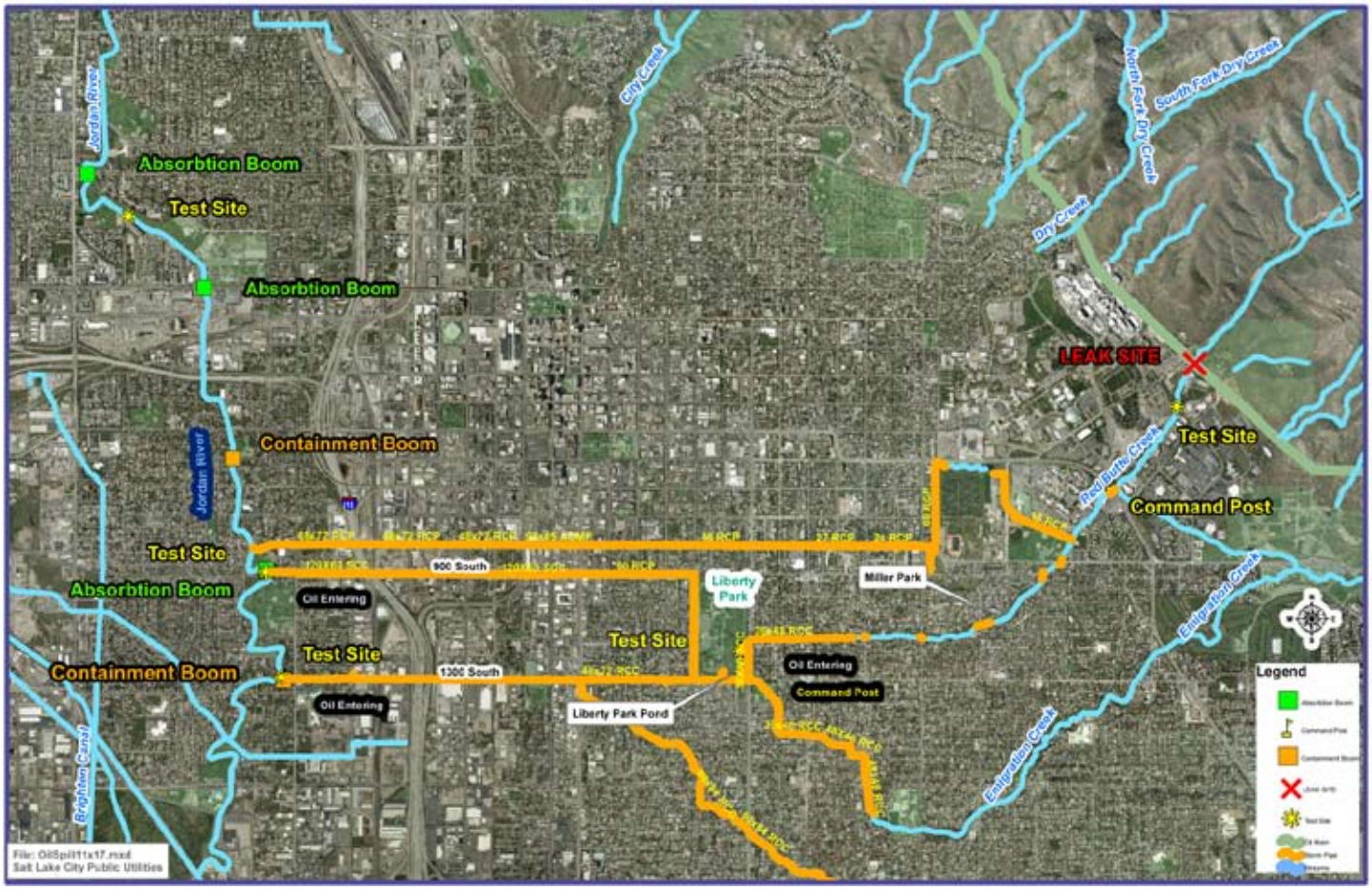
Background

During the late evening of June 11, and throughout the night of June 12, 2010, the Chevron Petroleum Pipeline crossing the Red Butte Creek in Salt Lake City leaked more than 30,000 gallons of medium grade crude. Throughout the period of the spill, crude oil flowed into the Red Butte Creek from the pipeline at a point near Utah's Red Butte Gardens, crossing the Bonneville Shoreline Trail, on the University of Utah campus.

The Red Butte Creek originates from the Red Butte Creek drainage basin, which is located on the northeastern edge of Salt Lake City. The Creek flows in a southwesterly, and then in a westerly direction, through a highly populated urban area. From the spill origination point, both public and private lands adjoin its banks, with property adjacent to the oil affected creek falling principally into four land uses: 1) institutional, 2) research/business park, 3) public park, and 4) residential. A 24-hour population lives, and works in most locations along the oil-impacted creek, and includes institutional facilities, small business, and neighborhood residential communities, that are occupied day and night. Creek water runs through the Salt Lake City public parks of Sunnyside Park, Miller Bird Refuge, and Liberty Park, and these parks are open from dawn until dusk.

When the Oil Spill Work Group first convened on August 30, 2010, the spill recovery and remediation effort had been underway for two and one half months. By the end of August 2010, the Red Butte Creek was still undergoing continuous active clean up, emergent individual and community oil spill problems remained, and regulatory actions by the Environmental Protection Agency, (EPA), the Pipeline Hazardous Materials Safety Administration, (PHMSA), and, the Utah State Department of Environmental Quality (UT DEQ/DWQ) had been initiated against Chevron Pipeline Corporation.

Of significant importance to city leaders, and others concerned with directing the evolving recovery and remediation effort, was a desire to gain

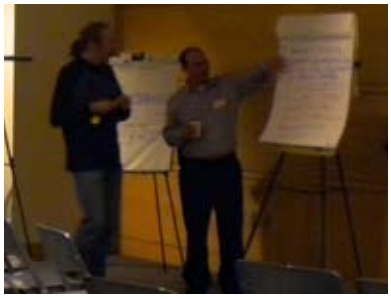


Map source: Salt Lake City Public Utilities; GIS, Nick Kryger

a better understanding of the range of questions, considerations, and final recommendations of the Oil Spill Work Group. Simultaneous to the City's interest in broad community insight, and sound recommendation, were the pressing demands of continued oil spill clean up, community effects, and remediation planning. In short, a lengthy oil spill work group meeting process would not effectively inform clean up or policy decision making. Timeliness was paramount, and urgency dictated that the Oil Spill Work Group would need to do its work in an intensive, and collectively proficient way.

To accomplish the Work Group goals in a well timed manner, Carbaugh Associates, Inc. organized, and guided three, three and one half hour intensive work sessions that utilized a combined format incorporating an educational briefing on three oil spill interagency elements, including: 1) initial call out response, 2) unified command structure and operations, and 3) the creek environment, along with, focused team round table forums and cross pollination sessions convened with the entire Work Group.

Oil Spill Work Group participants came into the process with a wide range experience, or ways of knowing about the oil spill. For some, the oil spill had disrupted and impacted personal and family life, others knew of the oil spill through their work as professionals, and for a share of the group, oil spill knowledge came from a perspective of being a concerned citizen of Salt Lake, or as a representative of organizations focused on human health and environmental concerns.



With the assistance of facilitators, the Work Group forum aimed to provide an opportunity for appreciating and utilizing different ways of understanding the oil spill. In order to make thorough recommendations, fundamental to the Oil Spill Work Group success would be the willingness of participants to afford opportunities for increased knowledge sharing with each other. In the end, Work Group teams created their own oil spill action, and policy relevant recommendations for the near, mid, and long term, which would be given to Salt Lake City's Mayor Ralph Becker. This was done by initially bringing to light recommended improvements, offering acknowledgements, and then stating inquiry. The questions generated from within each Work Group team would then establish the basis for:

- Articulating individual perspectives
- Understanding divergent ideas
- Building co-learning opportunity
- Creating a framework for generating discussion
- Forming final team recommendations for addressing Human Health, Natural Environment, Property and Economy, and Future Prevention issues related to the Chevron oil spill into Salt Lake City's Red Butte Creek.

Oil Spill Emergency Call Out Overview

While the majority of the Work Group effort was focused on future recommendations, it was also important to Salt Lake City's continued interest in evaluating and improving its hazardous response and recovery preparedness, for participants to provide an appraisal of the oil spill response's successes, as well as offer recommended improvements related to the initial call out to the oil spill event. Additionally, individuals were asked to provide an assessment of the previous two months of interagency oil spill recovery work. To make certain that Work Group members could be confident in offering an assessment of emergency call out actions, Incident Command operations, as well as, environmental actions undertaken with interagency cooperation up to August 30, 2011, the Work Group began with a general briefing session.

Image credit: Department of Enviromental Quality

Presenters in the briefing session included:

Cory Lyman, Director of Emergency Management, Salt Lake City Emergency Management

Jeff Niermeyer, Director of Public Utilities, Salt Lake City

Renee Zollinger, Environmental Programs Manager, Salt Lake City,

John Whitehead, Assistant Director, Utah State Department of Water Quality,

Hilary Arens, Jordan River Basin Coordinator, Utah State Department of Water Quality,

Red Butte Creek cleanup, 2010. Image credit: University of Utah.

June 11, 2010

Salt Lake City Director of Emergency Management, Cory Lyman, and Public Utility Department Director, Jeff Niermeyer led the presentation by giving on overview of the Oil Spill Emergency Response mobilization chronology. Cory explained that at 6:17a.m on June 12, 2010 the Salt Lake City Fire Department received its first call on a "Chemical Smell in the area of the Veterans Administration Hospital", with responding Firefighters determining that the odor was coming from Red Butte Creek.

The objectives of oil spill emergency response were to:

- Preserve life and health
- Stabilize incident
- Protect property and the environment

Jeff went on to explain that in order to support these objectives, and to prevent the oil spill from traveling into both the Jordan River, and the Great Salt Lake, City officials decided quickly to use the Liberty Park Pond as a containment basin for all oil flowing from Red Butte Creek. Key elements of the first response included:

- Establishing the Salt Lake Coordination Center, housing decision-making by the Mayor, City Attorney and Department Heads
- Joint Information Services
- Organizing Intergovernmental partners, including US DHS, State of Utah and Salt Lake County officials

At 6:00 p.m. on June 13, 2010, emergency response was de-activated, and control was passed off to the Mayor's Cabinet

Unified Command

Renee Zollinger, Salt Lake City Environmental Programs Manager, presented next. In this section, she explained how the immediate transition from emergency response to recovery action was developed, as well as why a Unified Command was in place, along with which entities, and people comprised the Unified Command. As explained, the Red Butte Creek Oil Spill Unified Command, was initially lead by the U.S. Environmental Protection Agency (EPA) and also included specific representatives from Salt Lake City, Salt Lake County/Valley Health Department, the State of Utah Health Department and Department of Environmental Water Quality, as well as, Chevron Pipeline officials.

With regard to the Unified Command, an important, and fundamental understanding about role distinctions must be noted here. For the Red Butte Creek oil spill, the Unified Command structure clearly assigned Chevron Pipeline Company, as the party responsible for the oil spill, the job of accepting the financial and staffing obligation for oil spill clean up and recovery. The balance of the Unified Command team, including the EPA, Utah State agencies, Valley Health Department, and Salt Lake City officials efforts focus on making certain that federal, and state laws continue to be followed by Chevron, reviewing Chevron's proposed clean up plans, and/or critiquing, and advising on the appropriateness of clean up and recovery when considering the effects on human and environmental health and welfare.

The Unified Command's around the clock operation, and its direct working authority for addressing, and approving all aspects of the ongoing oil spill recovery and response effort were further explained by Renee as she rounded out her information session.

To illustrate the point on how the Unified Command functions, and to help create a better understanding of the types of situations, and decisions designated to the Command, Renee shared the story of Chevron's proposed use of a chemical cleaner for scrubbing out oil in the Red Butte Creek. This proposal initiated thorough joint evaluation, review, and decision making by the Unified Command, with a final determination that any chemical cleaner could pose a serious

Work group participants were organized into four teams (Health, Economic Impact, Environment, and Future Prevention) , to address issues related to the oil spill.

potential risk to people in the community, the creek environment, and riparian animals. Consequently Chevron was directed to abandon the idea of using any chemical agents in the recovery.

Red Butte Creek Water and Biologic Quality

The next presenters, John Whitehead, Assistant Director, Utah State Division of Water Quality and Hilary Arens, Jordan River Basin Coordinator, Utah State Division of Water Quality, completed the education session by describing the Division of Water Quality's working plan related to post oil spill clean up.

As the agency responsible for assuring that all conditions relating to the Clean Water Act, as well as the safe return of environmental integrity of the Creek, the Utah State Division of Water Quality was initiating a multi dimensional response in evaluating the environmental impacts on Red Butte Creek following the oil spill. As explained by Mr. Whitehead and Ms. Arens, the focused methodologies for the continuing evaluation of the Red Butte Creek Ecology include three elements as outlined below.

Visual Tests:

SCAT: Shoreline Cleanup Assessment Technique

The SCAT process uses eight steps:

- Conduct reconnaissance survey
- Segment the shoreline
- Assign teams and conduct shoreline surveys
- Develop cleanup guidelines and endpoints
- Submit reports and sketches
- Monitor effectiveness of cleanup
- Post cleanup inspections
- Do final evaluation of cleanup activities

Chemical Tests:

Focus on assessing potential residual hydrocarbons (benzene, toluene, ethyl benzene, xylenes and naphthalene (BTEXN), Residual Petroleum Hydrocarbons and Polycyclic Aromatic Hydrocarbons (PAHs).

- Collect and fingerprint source oil
- Collect water and sediment samples
- Analyze water and sediment samples for total and specific hydrocarbon content

Assess results to toxic effect ratios, as established by Division of Water Quality. Toxic Effects Ratios are:

Site Concentration / Safe Concentration

Biological Tests:

Focus on assessing macro invertebrate, diatom, fish and vegetation populations to determine overall biological health of Creek.

General examples of using biota to assess water quality:

- Upstream vs. downstream comparisons

  Comparisons are made between the biota found upstream (control) and downstream (treatment) of a suspected stressor.

- Before-After-Control-Impact (BACI)

  Requires data collected before a potential stressor enters the environment

- The reference condition approach

  Sites are compared to appropriate reference sites

  Emigration and Parley's Creeks as possible reference sites

- Good, but not perfect reference sites

Furthermore, it was explained that as the oil spill clean up work had proceeded throughout the summer months, a transition from the United States Environmental Protection Agency's role as the lead authority under the Oil Pollution Act (OPA), to the State of Utah, as the lead authority in the clean up of this significant water pollution event had occurred. The Utah State Division of Water Quality now held the primary responsibility of requiring clean up of oil pollution in the Creek, and also held responsibility for assessing, and collecting on water pollution penalties associated with the Chevron oil spill into Red Butte Creek.

Subsequent to the lead agency transition, and in accordance with its legal authority, on July 13, 2010, the State of Utah had issued a Notice of Violation (NOV) of the State Water Pollution Control Act (19-5-107) against Chevron Pipeline Company. This NOV serves as a formal means for the State to require Chevron to act on clean up responses, provides a description of the oil pollution event, documents Chevron's clean up actions to date, as well as, reporting the long term clean up plan for the Red Butte Creek.

At the time of this presentation, Mr. Whitehead stated that Chevron Pipeline Company had filed a formal response to the State Notice of Violation, and the Division of Water Quality was currently reviewing the response, and would direct

any further modification, or enhancements of the clean up plan subsequent to review.

In closing, Mr. Whitehead and Ms. Arens stated that pursuant to the Notice of Violation, the Division of Water Quality might pursue a penalty of up to $10,000 (ten thousand dollars) per day of violation of the act.

Work Group Teams

After the briefing session, Oil Spill Work Group attendees divided into one of four, where they would spend the remainder of their time joined by others in focusing attention on a specific impact area resulting from the Chevron pipeline leak. The four focus teams, **Health Team, Property Valuation and Economy Team, Future Prevention Team,** and **Environment Team,** convened a total of three times to work in a facilitated progressive roundtable format. There were differences in how each team worked through its assessment, discovery phase, and final approach. It should be noted that at the end the first meeting, some individuals expressed dissatisfaction with the length and substance of the presentation session, while others believed that the presentation was helpful and informative. Within the context of the entire Work Group session, this was the only openly expressed dissatisfaction.

The balance of this report is divided into four team sections that summarize the thoughts, and recommendations generated by the Oil Spill Work Group Teams from meetings held on August 30th, September 13, and October 13, 2010. Each Team section is formatted to follow the progression of ideas, which evolved throughout the three meeting process. Outlined below is the Work Group teams' progressive three state work path, including Improvements & Appreciations, Foundational Discovery Questions, and Developing Ideas & Final Recommendations.

Improvements and Appreciations

The first Work Group meeting was held August 30, 2010 at the Salt Lake City Main Public Library. Working in the Team forum, each person was asked to engage this assessment and analysis process by providing an opinions on improvements and/or appreciations related to the following to date oil spill response:

- Assessment of Call Out and Recovery Process,
- Incident Command Unit parties,
- Environmental Testing and Analysis
- Any other oil spill relevant issue that they felt needed Improvement, or that they Appreciated.

Foundational Discovery Questions

Each team began their round table forum with a multi-dimensional discovery through inquiry process that initiated forward movement from individual perspectives toward informed and robust round table discussion. The Inquiry Framework set in motion the direction of each Oil Spill Work Group Team by:

- Allowing each person to present individual concerns and interests to the entire team without interruption, debate, or personal evaluation
- Creating opportunity to reflect upon, and understand different experiences and knowledge about the oil spill
- Focusing individuals on the boundaries of specific questions, which might inform action for future recommendations
- Supporting the discovery of information through listening
- Fostering Team relationships
- Helping each team move from information sharing to information learning, and on to final decision making

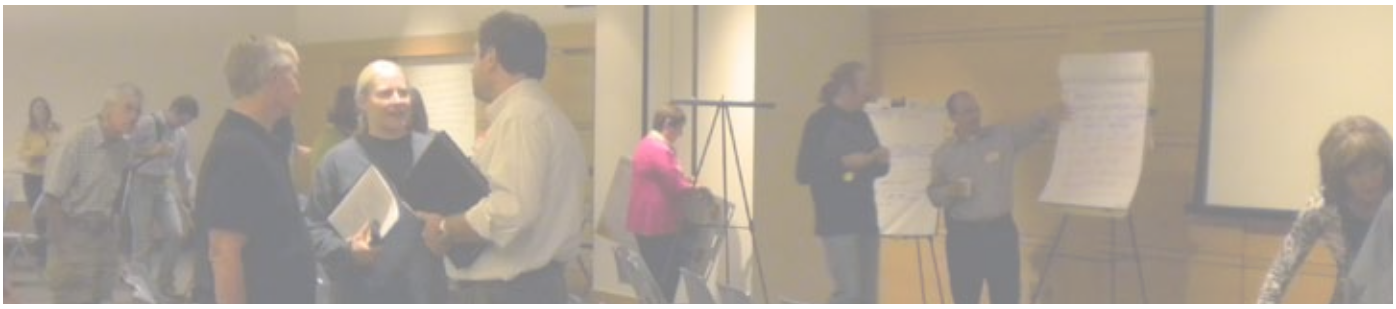
Developing Ideas and Final Recommendations

By the second meeting, held on September 13, 2010, at the Salt Lake City Main Public Library, each team began to move in the direction of answering questions brought forth in the first meeting. While more questions continued to be raised, ideas for recommended action began to be shared, and documented. At approximately 2/3rds of the way through the second meeting, the entire Work Group reconvened to work in cross pollination session. While reconvened, each Team reported out on going questions, as well as emerging recommendations. During cross pollination, Work Group members asked questions of each other, and offered additional ideas to Teams other than their own, for consideration to another groups final recommendation list.

The final meeting, held at the Salt Lake City Public Safety Building on October 13, 2010, transitioned from the previous meeting with each Team reviewing previous work, and reviewing the agenda for proposed focused discussion. Each Team used this last work session to concentrate their effort on final recommendations. At the end of the final meeting, each Team reported out the outcome of their group process, offering closing remarks, and sharing a list of final recommendations to present to Mayor Becker.

The following pages summarize the outcomes of the above outlined process, and final recommendations of the Oil Spill Work Group Health, Property Valuation and Economy, Future Prevention, and Environment Teams.

Oil Spill Work Group
Recommendations



"The Mayor's office has developed good will in the community. The Mayor and his team should continue to work closely with the oil spill affected community, and lead all coordinating efforts with other government agencies and organizations."

Alyssa Kay, Health Team

Final Recommendations Summary

Health Team

- Develop a longitudinal health study that focuses on health effects with long term health care a consideration. Establish baseline health data from Utah Cancer Registry.
- Request Chevron funding for portions of the study.
- Write for federal grants to fund a portion of the health study analysis. Utilize resources of ATSDR, NIH, NIEHS, CDC, etc.
- Ask survey respondents if they would like to talk with a physician about any physical or mental health related matters.
- Monitor water in public drinking supply.
- Establish baseline health data from Utah Cancer Registry.
- The Mayor and his team should continue to work closely with the oil spill affected community, and lead all coordinating efforts with other government agencies and organizations.
- Agencies should work directly with community and neighborhood organizations, using all types of media to disseminate information.
- Create ongoing health education programs for oil spill affected people.
- Develop an oil spill health education process in collaboration with local community and public agencies.

Property Valuation and Economic Team

- Chevron should provide a fund to compensate property owners for immediate loss of property value. Salt Lake City should evaluate all losses then have Chevron create fund for community losses.
- Property taxes should be adjusted to reflect lowered property values for properties that have been negatively affected by the oil spill.
- An independent consultant should review private properties valuation.
- Investigate bank requirements that will affect current and long term financing.
- Provide an educational forum where residents can talk with bankers.
- Continue long term monitoring of crude residuals in creek.
- Identify the specific types of damages that have occurred. City to inform all property owners of their rights and the proper procedures to seek compensation.
- City should work with community in identifying types of issues they need to be concerned about, such as: Long term health concerns, long term property damages, property value loss, community asset losses, future homeowner disclosure upon sale of home.
- City and state lawmakers need to prevent state law changes that may make private property owners responsible for oil pollution clean up in the future.

Future Prevention Team

- Pipeline Hazardous Material Safety Administration (PHMSA)/US Department Of Transportation to perform a detailed inspection of the pipeline.
- An in depth Risk Assessment process to be completed, led by Salt Lake City, with involvement of Salt Lake County, Utah State, and federal agencies, citizens, organizations, institutions, as well as the private sector.
- Financing should come jointly from several federal agencies.
- Permanently move or remove this pipeline from Salt Lake City.
- Salt Lake City needs to challenge State and Federal laws and oversight of this pipeline, codes need to be updated, and best practices evaluated.
- In the event of another oil spill there is a need for notification improvements
- Initiate a PA evacuation notice, and door-to-door canvassing system. Reverse 911 does not work.
- Greater effort, and coordination, from Salt Lake City and oil spill affected people to organize involvement in emergency response training.
- Low and high technology improvements: Bio retention systems, Cement encasement of pipeline, shut off valves, higher level of computerized monitoring, SCADA system.

Environment Team

- Set aside funding for restoration of Red Butte Creek should be secured from Chevron.
- Create policy to require bonding from current, and future pipeline companies operating in Salt Lake City. Establish a Red Butte Creek Fund.
- Assure that no oil spill fine money should go into the State's General Fund.
- Bio-remediate petroleum with compost and other passive treatments. See bioremediation expert Harry Allan, PhD, EPA Environmental Response Team.
- Engage professional help in determining what complete Creek restoration looks like at all scales.
- Establish an Adopt a Stream program for the Red Butte Creek.
- Involve local teachers and students to become biologists of Red Butte Creek.
- Create a Salt Lake City River Master program for adults who would like to be observers, and reporters, of biologic characteristics, and other notable events along specific Creek sections.
- Involve river organizations, along with organizations such as the Bennion Center in creating Red Butte Creek curriculum and stewardship programs.
- Create constructed wetlands or bio-filtration systems upstream from Sunnyside Avenue to serve as a catchment in the event of any future oil spill releases.
- Evaluate and inventory bird, fish, raccoon, and other wild animal population losses due to oil spill.

Health Team

I. Appreciations & Improvements

The Health Team submitted the following Appreciations and Improvements assessment to with regard to the Emergency Response Call Out on the Petroleum Leak, Incident Command Unit, and Environmental actions briefing, and other oil spill issues they considered valuable.

Appreciations	Improvements
Glad that they're holding the Work Group	Nothing presented about health especially the air quality monitoring
Continuation of process and breaking down into small groups with experienced people- different kinds of knowledge	Need to include community stories about impacted individuals experience(s)
	SLC should have evacuated residents-especially children and pregnant women
	Community needs data about health impacts

II. Foundational Discovery Questions

In thinking about the physical and mental health of those who are geographically close to the oil spill event, what questions come to mind about future health related effects?

Q. I'm wondering why there were no "emergency responders" that were concerned about current air quality. Because there was no one who discussed it in the recap presentation.

Q. Why hasn't anyone filed a Clean Air Act charge against Chevron? What good is a law if no one charges anyone?

Q. I'm wondering if there is a long-term study being done on the people whose health was affected by the oil spill? Because my son was so ill he could not live at the home for weeks and I'm concerned about his future health issues.

Q. I want to know what is planned on being done to assess health effects for people exposed to the spill? Because there are community concerns about health effects, and I want to know they are being addressed.

Q. I would like to know whether knowledge from other oil exposures can be included in designing a health study? Because only so much information is available from this site on exposures and health effects, and considerable federal and state health efforts are ongoing at other locations like Enbridge, Michigan.

Q. I am wondering if others have similar experiences such as anxiety, fears depression, and if services are available to respond to us? Because a number of people have not been vocal-services, assess, process.

Q. I'm wondering if there is someone at this group who will listen to my health concerns? Because it feels like not many agencies care. –Ongoing support would be helpful.

Q. What kind of fund will be set up for future health care for residents affected by the oil spill? Because, many residents were made sick in the first few days and there are little studies that exist about long term health effects.

Q. I'm wondering if I will pay for health care issues that arise? Costly

Q. What are the other compounds, beside the BETEX talked about, in the crude? Because I'm concerned that no one can evaluate all of the potential health effects without knowing about all the chemicals in the oil.

Q. I'm wondering why concerns residents had about long term health effects seem to be minimized at the public meetings that were held initially? Because there seems to be a difference of medical opinions in our medical community.

Q. How many are experiencing anxiety, fear, and other mental health impacts? Some people are more quiet about this event, and may not be getting heard or may need attention.

Q. How are we going to distinguish and address the adverse health effects of children as distinguished from adults? Because children have different exposure pathways, and different physiology which may require different decontamination and treatment from adults.

Q. I'm wondering why after the spill was discovered that information regarding immediate health concern was practically non-existent? Because after I learned of the spill, I tried to find additional information, like evacuation, or should my family be doing something (closing

windows, staying away from creek, etc.) but no information was available.

Q. What could someone with exposure during the first hours of the event possibly experience in terms of long-term health effects? Why, important for individuals to know and for the long- term health of the neighborhood.

Q. How are we going to quantify and address the adverse health effects of two very different groups? 1. people with short-term health effects, and, 2. People with long-term health effects? Because short term and long term health effects may be very different in nature, and require different treatment and support.

Q. Is a long-term health study being contemplated, and are discussions being held with Chevron to fund that study? Because there is enough medical/toxicology science to suggest that exposed residents are at increased health risks long term

Q. I want to know the testing that has been done of levels of potential toxins in the environment (air, water, soil) and the results of that testing in relation to populations of people exposed to them. Because the exposures people have had will be an important determinant of potential health effects and help guide what, if any, studies should be done.

Q. What chemicals were released into the air that my son and I were breathing during the first twelve hours of the oil spill? Because my son got very sick and I have asked for MSDS and air testing data. I have not received what I asked for. I am concerned about the future health ramifications of the chemical we were exposed to.

Q. Why was there no info for public health officials, and will this be different in the future? Because pipelines cross the State, and no redundancy in their alarm system means this could happen again.

Q. How will the future health crises be reported to the community, and health care professionals? Because we were not made aware of the oil spill at our residence, and when we took our son to the hospital, they did not believe us that it had happened, and didn't do any testing related to chemical poisoning.

Q. Who made the decision, or discussed the issue, of whether residents should be evacuated on the first day of the spill? There is enough medical data to support that health impacts were likely among children and pregnant women especially.

Q. What do we need to do to prepare for the future? Why- we need to learn for the future.

Additional Health Team Questions that were raised during round table discussion:

- What overall health issues should we be concerned about?
- What is planned, or being done, to assess health effects of those exposed?

  1. Exactly what chemicals were released into air initially?

  2. Where were chemical exposure tests taken, when, and who was exposed?

  3. What were the results?
- Would an ongoing support group be helpful? Who would run it?
- How will communication to health pros and community be improved?
- How will info get to the community about health problem?
- What funding will be available for affected resident

III. Final Recommendations: Health Team

The Health Team recommends four key areas of response related to both the physical and mental health of the community impacted by the oil spill. Additional ideas are raised about how people interested in talking about, or assisting with health related matters work together with local, county and state officials.

Health Effects Analysis

- Engage University of Utah, Valley Health and State Health Department in developing a longitudinal health study that focuses on health effects with long term health care a consideration.
- Request Chevron funding for portions of the study.
- Write for grants to fund a portion of the health study analysis.
- Data gathering methodology should include:

  8 hour sampling.

  Day and night sampling, with varying weather conditions.

  In person interviews, to be performed by trained volunteer's. Valley Health Department, and State Health Department will do training to guard against interviewer bias.
- Ask survey respondents if they would like to talk with a physician about any physical or mental health related matters. It is highly recommended that physicians should inquire about mental health issues such as PTSD, anger, anxiety, and be prepared to provide health referrals.

- Monitor of Water in public drinking from times at 700 East Street, 1300 South Street and 800 South and 500 East Streets
- Establish baseline health data from Utah Cancer Registry.

Public Information Related to Health Survey

- The Mayor's office has developed good will in the community. The mayor and his team should continue to work closely with the oil spill affected community, and lead all coordinating efforts with other government agencies and organizations.
- Working with the City and County, State agencies should work directly with community and neighborhood organizations
- For neighborhood level dissemination - use door-to-door contact or door hangers
- Utilize earned media and website, phone survey, and mailings to provide health survey information
- Utilize direct mail to share information on the availability of a Crisis Response Team, or an Emergency Response Team that includes medical and mental health professionals.
- Create ongoing health education programs for oil spill affected people.
- After health study is complete, host community meetings, and panels to explain results and answer questions.
- A document of potential health issues to for in those exposed, should be made publically available through internet websites, library, and government offices.

Mental Health

- Support groups are needed-Salt Lake City should spearhead creating support groups with contracted counselors.
- Ask in health survey if people would like to join a support group to explore and process feeling about the oil spill event-MSW needed with experience in process groups.
- Ask if residents know of anyone with health or anxiety concerns.
- At end of survey or interview, ask for recommendations, concerns, or opinions of resident.
- Survey with the question: "Are crisis workers a resource that will help you or other people you know who are near the oil spill?

Role of Community

- A Health Survey will drive the path of focus for a public educational process. The development of an oil spill, health education process should be done in collaboration with Salt Lake City, Valley and State Health Departments, the Oil

Spill Work Group Health Team, and community organizers.

- Working with community organizatons, health assessment results should be presented to the broader community through neighborhood meetings. (survey results). Information can be shared by a panel of "experts" after which time the community can ask questions for clarification, and to gain greater understanding about potential health impacts.
- Because the community also shares a role and responsibility for informing residents about health concerns, it is important that accurate public information, as well as resources related to disaster and potential crisis be made readily available. The Health Team believes this will help us, the affected community, process our feelings, and better prepare in dealing with this disaster.
- It could be helpful to the community to hear from residents sharing their experiences affected by the disaster. Information should be balanced between positive and negative information.
- Stories sharing experiences, growth, information, humor, support hope and planning. Stories sharing unresolved issues, and negative experiences can assist in better planning, compassion, and resource building.
- Fund, develop, and implement a longitudinal health study that focuses on oil spill health effects. Request funding for a portion of this study come from Chevron Pipeline Company. Additional funding sources can be gathered from grants.
- Establish baseline health data from Utah Cancer Registry
- On-going health support is needed. It is highly recommended that oil spill affected individuals have referral access to well-qualified physical and mental health support services.
- Individuals need to be asked if they would like to join a support group to explore and process feelings about the oil spill.

Property Valuation & Economic Team

I. Appreciations & Improvements

The Property Valuation and Economic Team offered the below Appreciations and Improvements assessment regarding Emergency Response Call Out on the Petroleum Leak, Incident Command Unit, and Environmental actions briefing, and other oil spill issues they considered valuable.

Appreciations	Improvements
Good Communication provided to residents and citizens	Should have shut down the pipeline faster
Professional polite response	We need better infrastructure on the pipeline
Positive City response	Need to increase property owner awareness of where these pipelines are located- more signs are needed
Good job protecting wildlife	Lack of forthcoming answers about caused the spill

II. Foundational Discovery Questions

In thinking about how community, and individual property contributes to the welfare of Salt Lake City's neighborhoods and its economy, what questions come to mind about changes that could result from the oil spill?

Q. How are property owners going to be educated on disclosure responsibilities?

Q. Have business and community assets been negatively impacted in terms of the future?

Q. What are the possibilities of refinancing affected homes today?

Q. Does a declaration of cleanliness rise to a level 1 environmental?

Q. Could there be a taking of the land by the city?

Q. Is my property worth less today?

Q. Whose standards of clean affect the property owner? Do the FDIC and EPA have the same definition of clean, or a clear? Because this affects property as an asset, home equity refinancing, or new owner financing will be a problem. Home loans must be secured by a responsible party, who is responsible for a loan if oil is found in the future - what will banks require?

Q. Will a future health issue be linked to this spill because of the effect on property values?

Q. How have public losses been evaluated? Because public lost use of parks- lost recreation, and community pleasures/enjoyment of using our parks have been affected all summer long and will go on for a long time.

Q. When will park return to pre-sill state? Birds return? It affects vibrancy/ quality of community.

Q. If the cost to clean up is less than the cost to fix the problem, is there no incentive for Chevron to improve preventative systems? This can happen again.

Q. I'm wondering about how Chevron, or, the City, will mitigate decline in property values? Because potential buyers may be leery of purchasing contaminated property.

Q. I am wondering as a property owner on the creek how long-months/ years for the full impact of the oil spill to be determined?

Q. What is going to happen to these neighborhoods that have been affected by the oil spill? Are they going to be less desirable now? Because these are stable, and valuable neighborhoods in terms of taxes, community beauty, and an economic base.

Q. What do I do if I want to refinance or sell my home today? Interest rates are at record lows, and I'm worried if I go to refinance my property will be flagged as a "hazardous area".

Q. How will Chevron be motivated to install better safety and detection systems if the costs of those systems are more than the cost of the cleanup? Is it our responsibility to insure that the costs to Chevron are high enough to motivate them to improve their safety system.

Q. I'm worried about the loss of use of our neighborhood parks; these areas are an asset to us. Because I just miss walking through the parks. I miss just sitting in the Park, seeing the birds, and kids playing, those are the kind of things that bring pleasure in a community.

Q. How will this impact the ability of the current homeowner, or future buyer to get a loan on their property? Homeowners may not be able to get traditional financing on their property until the clean up is completed and someone is liable for future issues.

Q. I'm worried about property loss, because in order to not have impacted property, the city may reclaim the impacted property.

Q. Stigmatization to property? Future home and property value for years to come.

Q. Years from now, when I sell my home must I disclose the 2010 oil spill? Because this could negatively effect my success in selling my house for the best price in the future.

Q. I'm wondering about how property owners will be advised of their responsibilities upon sale? Because they will be required to disclose that a hazardous substance has been on their property.

Q. I'm wondering about the future liability to property owners as a result of the oil spill.

Q. Will a future health issue be linked to the oil spill? If a long-term illness is linked to the spill then property values may drop years from now.

Q. Who will be responsible if additional problems/issues are found in the future? Like oil in the ground, or a change in environmental laws, because what is considered "clean" today may change.

Q. Does the City-County-State declaration that the creek is clean rise to the point of a level 1 environmental on a commercial property? Because this could directly relate to my property value.

Q. Will future state laws require homeowners to become responsible for clean up of their own property if there is oil found on site. Can laws change to make a property owner responsible for clean up of Chevron oil in my soil, what if oil spill contaminants on my land migrates to an adjacent property, could I become responsible for future clean up?

III. Final Recommendations: Property Valuation and Economic Team

Funding for Loss of Value

- Chevron should provide a fund to compensate property owners for immediate loss of property value, as well as, provide a long term escrow fund to insure against long term losses for both property value and/or health concerns that are yet unknown.
- Salt Lake City should evaluate all losses then have Chevron fund for community losses including, quality of life losses, historic property tax losses, and losses against future economic gain to business operators such as, real estate agents, restaurants, contractors, etc.

Property Tax Re-Evaluation

- Salt Lake County and Salt Lake City should adjust property taxes to reflect lowered property values both along the creek and other surrounding properties that have been negatively affected by the oil spill.
- Chevron fund, and City hire an independent consultant to review private properties for both environmental and actual property valuation/damage.

Address Future Financing Impacts

- Investigate bank requirements that will affect current and long term financing as well as future ability for property owners to sell their home, and new home owners being able to obtain financing
- Provide an educational forum where residents can talk with bankers and mortgage companies to find out what surety they will want for home, or business mortgages now that properties must be declared as being impacted by hazardous material.

Communication of Rights Related to Property Value Impacts

- City and state lawmakers need to prevent state law changes that may make private property owners responsible for oil pollution clean up in the future.
- Continue long term monitoring of crude residuals in creek. Continuing oil in and along creek banks pose broad individual, and community impacts.
- City and community should work together to identify the specific types of damages that have occurred, and jointly communicate the legal statute of limitations for property owners to file suite against Chevron for damages.
- City to inform all property owners of their rights and the proper procedures to seek compensation.
- City work with community in identifying types of issues they need to be concerned about, such as: Long term health concerns, long term property damages, property value loss, community asset losses, future homeowner disclosure upon sale of home.

Future Prevention Team

I. Appreciations & Improvements

The Future Prevention Team offered the below Appreciations and Improvements assessment regarding Emergency Response Call Out on the Petroleum Leak, Incident Command Unit, and Environmental actions briefing, and other oil spill issues that they considered valuable.

Appreciations	Improvements
Quick response by City to report of chemical	Better public information, especially on public health threats from oil
Personal notification by JT Martin	More robust prevention plan is needed
Quick action by public and Big D	Retrofit of aging pipe
Bird cleanup of oil soaked birds	Immediate notification to hospitals was needed
Salt Lake City and Utility Departments riparian assessment	Evacuation plans need to be addressed
	Oil collection/oil sample should have been collected
	Air quality measures were needed as spill was occurring
	Response down stream was poor
	Public awareness-public information was slow.
	Need instant response plan for community safety

II. Foundational Discovery Question

In thinking about the future safety and life concerns of people, businesses and institutions along the Red Butte Creek corridor, what questions can you raise that will lead your team to evaluate techniques, or policies that can help prevent another oil spill?

Q. What is the age, condition, what are the safety shut off features of all pipelines carrying hazardous materials, both in SL Valley and along length? We need a full risk assessment of all pipelines to be able to understand necessary prevention measures.

Q. Why does the City tolerate an aged (50+ years) pipeline that moves dangerous chemicals to exist on streams that enter heavily populated areas?

Q. What are the risks due to fault lines/earthquake, are there safety valves in place? One of the biggest hazards is an earthquake

Q. What can we do to improve the policy to include more appropriate fees for pipeline violations? Why? Because I think the punishment should fit the crime. Chevron was fined 64 in 2007 for the same violation that caused the spill

Q. What technologies currently exist to actively monitor pipelines? I believe people are unrealistic and unaware of

Q. What can be done to draw in expertise to do oversight of prevention facilities and operations? Get help from U of U experts and in oil transport experts?

Q. How do we aggressively transition our transportation network etc off petroleum? Peak oil and climate change are real and this crisis is a good opportunity to address this-mobilize.

Q. What human problems are involved here? We don't know, I think the city should insist, by laws, that Chevron construct passive (no human or electricity needed) robust diversion and containment system between the pipeline and every creek it travel

Q. What was the cause of the break? Really? Because it would really be helpful info going forward the current technologies and capabilities available to monitor pipeline

Q. Does or does not Chevron (or other pipeline owners) have sureties for financial accountability

Q. What state and federal regulations need to be changed that would act to prevent something like this from happening again? Why this question? It's my experience in working within the framework of environmental laws & regulations that industries have worked very hard over the years to weaken such regulations in order to maximize profits. These external costs of doing business are being borne by society.

Q. Why weren't the hospitals/citizens in proximity notified immediately? Because I live next to Liberty, my son was hospitalized by the spill. No one

knocked on my door. The hospital had no idea the spill had happened

Q. Why was the creek not evacuated on the morning of the spill? Crude oil is toxic, carcinogenic, AND flammable! If the creek had caught fire it would have swiftly overwhelmed the Q. Why can't the pipeline and refinery be systematically relocated and upgraded to accommodate new and future economic and environmental concerns? With the air quality in SLC and the other environmental impacts, is it economically feasible to consider better locations (economic/environ)-what is the lifecycle of the refinery?

Q. What is the only way to prevent re-occurrence? Given SL City has grown, contains a large% UT citizens, and a sizable proportion of real estate value, there is no justification for an oil pipeline to surround the city. Chevron needs to relocate the pipeline(s) and the refineries need to be closed/relocated to areas away from pop. Areas. Chevron and refineries can afford to

Q. Why is the pipeline underground? i.e. are there regulations to keep the pipeline buried?-Cold war tactics

Q. Why is it hard to monitor the pipeline? Because it is underground-why is it underground?

Q. What can be done to obtain instantaneous response by Chevron (etc) in Texas, Colorado and Utah and by City emergency organizations in the event of another oil spill on this pipeline? Get help from U of U to develop multi-sensor and adequate responses. Legislate strong governmental intervention into any future occurrence

Q. How well does weekly or bi-weekly patrolling help prevent future issues? I want to understand how well the patrolling helps prevent accidents and how effective patrolling finds and eliminates issues?

Q. Why aren't cutoff valves required on both sides of the pipeline crossing waterway

Q. What can be imposed on the Company that would so seriously impact that it will be glad to insure that another spill does not occur? Because we need legislation that will not allow the company to pass the penalty on to the price of the product consumer

Additional Future Prevention Team Questions that were raised during round table discussion:

- What can be done about initiating a total risk assessment on this pipeline?
- How are we prepared for an earthquake with this old pipeline?

- How does regulation allow this? Regulations need to change?
- What technologies are available to monitor pipeline?
- What is the low hanging fruit to address the issue of future pipeline breaks?
- How do we change the pipeline design? Should it be above ground?
- How does Salt Lake City utilize contracts to regulate pipelines?
- Why not tax for prevention, or improvement for pipeline safety?
- What control does local government have over Chevron pipeline?
- What are means to enforce existing legislation?
- How does this oil spill affect pollution credits?
- Do Chevron/University partner in the way pipelines runs in the city?
- How does this partnership between the U of U. and Chevron impact stream restoration?
- How do we fund pilot projects to reduce oil needs?
- What is the impact on aquifer quality?
- Who should be at the table to advance future prevention ideas? Why?
- How could policy changes happen? What are the steps to policy change?
- How does current monitoring policy help prevent future oil spill events?
- What policies need to change?
- What do we know about existing pipeline engineering prevention systems? Such as:

    1. Future low tech to high tech prevention ideas?
    2. Engineered Design
    3. Wiz Bang Technology Systems
    4. Bio-remediation in place.

III. Summary Considerations: Future Prevention Team

1. Greater transparency is needed. While there is a tension between security and public disclosure, given this pipeline failure, and the oil spill consequences, the Future Prevention team is uncomfortable with restrictions of Home Land Security, and recommend full transparency with regard to citizens right to know that they live and work near pipelines.

2. It is recommended that all appropriate agencies provide pipeline maps, GIS publications, and public education about risks associated with living/working near hazardous pipelines.

3. Focus on assessment, impacts, and reporting within the public domain. A fundamental question for this team centers on, "Are there mandatory Risk Assessment processes in place? And, Does Chevron, or anyone have a risk assessment plan that includes the evaluation of the conflict between pipeline placement, and urban development changes, earthquakes, public health, safe drinking water, ecological and economic impacts.

4. A Risk Assessment process is recommended. Mayor Becker should lead on this matter. Mayor Becker shares Risk Assessment outcomes with citizens/community wide. Risk assessment efforts need to be placed in community context, with a series of public education and reporting meetings. The team encourages the involvement of the Public Utilities Commission in helping with community investment in safe infrastructure.

5. Decisions, actions and coordinated planning steps taken during the first year subsequent to the Chevron/Red Butte Creek Oil Spill, will impact the future. Simply localizing recommendations, decisions and actions cannot address present or future

IV. Final Recommendations: Future Prevention Team

Risk Assessment

- Pipeline Hazardous Material Safety Administration (PHMSA)/US Department Of Transportation to perform a detailed inspection of the pipeline.
- An in depth Risk Assessment process is the key to addressing future prevention strategies of this pipeline in Salt Lake City. A model process includes the organization, and activation, of a Pipeline Evaluation and Risk Assessment, or Safe Pipelines Commission-Pipeline Safety Trust model.
- Risk Assessment led by Salt Lake City, and includes the active support and involvement of Salt Lake County, Utah State, and federal agencies, citizens, organizations, institutions, as well as the private sector.
- Financing of this commission should come jointly from several federal agencies including PHMSA and FEMA
- Permanently move or remove this pipeline from Salt Lake City.

Public Policy

- Salt Lake City needs to challenge State and Federal laws and oversight of this pipeline.
- Pipeline codes need to be updated. Among other policies, an evaluation of the 2005 Energy Policy Act is needed by Salt Lake City.
- Start an evaluation of best practices for regulation, siting, and other policy standards related to pipeline safety

Emergency Response

- Mayor needs to sit down with a safety pipeline people to understand how to get response started with fire, police, hospital to make sure communication problems don't happen again
- In the event of another oil spill there is a high need for greater notification improvements
- A joint standard operating procedures oil spill team needs to include City and County citizens in process.
- Provide an meeting opportunity for lessons learned and an opportunity for in depth discussion of key issues relevant to the ongoing oil spill remediation process
- In the event of another oil spill, real time data, including air monitoring, water and petro-chemical materials sampling
- Initiate a PA evacuation notice, and door-to-door canvassing system. Reverse 911 does not work
- Greater effort, and coordination, from Salt Lake City and oil spill affected people to organize involvement in emergency response training.

Technology

- Overall sense of the team was that technology could not adequately address future prevention needs of the community, and the team concluded that they could not appropriately go into a detailed analysis of possible technology related solutions, the following ideas were raised related to low and high technology improvements
- Bio retention systems close to spill
- Cement encasement of pipeline
- More shut off valves
- Higher level of computerized monitoring
- SCADA system to be deployed

Environment Team

I. Appreciations & Improvements

The Environment Team offered the below Appreciations and Improvements assessment regarding Emergency Response Call Out on the Petroleum Leak, Incident Command Unit, and Environmental actions briefing, and other oil spill issues that they considered valuable.

Appreciations	Improvements
Chevron put together great response to initial H2O quality monitoring	Improve adapting to clean up more efficiently
Providing important opportunity for learning	Cleanup technology inappropriate/too aggressive
	Seems like many staff/crew were serving image purpose

II. Foundational Discovery Questions

In thinking about what might lie ahead for Salt Lake City while the oil spill recovery is still ongoing, what questions come to mind about oil spill effects on the future of the environment?

Q. How to develop the best clean up strategy that optimizes clean up and minimizes any added impacts from the cleaning. This is important to secure the best approach to clean up. Doing enough yet not overdoing it and damaging the creek further

Q. How do we know how much Chevron oil is still sequestered in the stream system? Is the initial clean up really done? What measures are needed to capture last % of oil? Wouldn't rapid cleaning be better than going back and disturbing stream over a longer time? When is clean, clean?

Q. What would stream restoration look like at all scales: microbiological, macro, floral, and faunal, hydrological patterns (meanders, flood event velocities, etc.) place of wetlands vegetation (willows, bulrush) and animals that populate riparian systems, It feels as though we don't really know how to conceptualize this.

Q. How to distinguish ecological impacts to the creek from the Chevron oil spill from the ongoing urban impacts that have been ongoing to Red Butte Creek before and after the oil spill event? This is important because the ultimate clean up criteria must be established for Chevrons impacts and not hold them responsible for impacts that are not from their doing.

Q. Can measures be implemented to prevent catastrophic oil flows from entering stream? Can we have better responses that focus on protecting natural system? Are methods used appropriate for cleaning, sending more oil downstream, cleaning over again?

Q. What are the chronic impacts of urban activity relative to the acute impacts from the spill?, e.g. effects from urban runoff, atmospheric deposition of urban derived, effects from channel straightening etc. How does the city mobilize community support for restoring riparian buffer? Installing bio retention basins for urban runoff, restoring meanders, etc.

Q. Enhancement of growing medium, specifically sediments between cobble of imported rip-rap following civil engineering. Modification has been a very slow process. Is removal of these sediments to expiate all the oil worth the set back in this process? An effort to reinstate detention, general reduction in velocity and create micro and macro environments for plant communities

Q. The modification of Red Butte Creek historically by civil engineering was not based on an understanding of natural systems, but rather upon the efficient transmission of stream water along with watershed evacuation. What can be accomplished to reverse such decisions by reinstating configurations based on natural systems? 1983 flooding provided funding, possibly guilt based, to reconfigure Red Butte Creek to a harmful extent that caused a significant lowering of flow line and increase in stream velocity-this significantly impacts capability of reinstating organisms that would otherwise enhance the stream.

Q. How can the City and State refine and extend inquiry into urban runoff from asphalt, autos, etc, to enable "chronic" urban containments accurately to be distinguished from "incident" contaminants? Background: I have the sense that we're not doing background studies to the extent or in the detail required.

Q. How will institutional controls be implemented to keep kids and those most vulnerable out of creek? Why isn't an ectobiologist involved (if there isn't)

Q. How are we going to determine when the stream is back to what it was before the spill? Because we need to come up with broadly agreed upon criteria.

Q. What if the biological criteria for the creek are not met for many, many years? How will Chevron, the City, and the State remain involved actively to ensure that the ecology and integrity of the creek get back to pre-oil spill levels? Also, how can we get the University of Utah involved in long-term research projects? This is important because while there is a lot of attention on Red Butte now, how will the community face this issue in 1, 2, 5, or 10 years? It is important because we don't understand how long we can expect full ecological recovery.

Q. Could this be an opportunity to restore the stream back to something resembling its original coarse. A natural meandering stream has more capacity to cleanse itself

III. Summary Considerations: Environment Team

1. Disturbance from cleaning and pollutants have created a very unhealthy environment for the stream ecology. Approaches to on-going clean up will greatly impact the near, mid and long term recovery for the Creek.

2. This oil spill event is an opportunity of sorts, because it gives the City, and its citizens a chance to really evaluate all sources of pollution that affect Red Butte Creek, including those from urban run off. In discussion, the importance of knowing if this crude has a finger print was talked about in relationship to identifying, and focusing attention on the City's and community's joint stewardship of Red Butte Creek.

3. There is a great deal of uncertainty about the recovery of the biota of Red Butte Creek. Testing the biota and fish as a measure of stream health will be a place to start.

4. Public sections as well as private sections need equal attention. The distinction, or characteristics in various public locations, such as Miller Bird Refuge, Sunnyside Park, and Liberty Pond will require different types of restorative and remedial analysis in order to help each section, as well as the entire ecosystem.

5. Fundamental to Creek restoration is funding. The direct advice of team members is that the City should aggressively seek complete compensatory funding to assure that all resources, including future professional staffing resources, for long term remediation and restoration could occur for the future benefit of the stream ecology, as well as for current, and, all future generations.

6. With regard to the current and future installation of hazardous materials pipelines in Salt Lake City, recommendation is made to require all companies to post a Salt Lake City security bond before being allowed to pursue installation.

IV. Final Recommendations: Environment Team

Funding

- Set aside funding for restoration of Red Butte Creek should be secured from Chevron. Funding resources must cover current, as well as future resource costs for Salt Lake City related to the Creek recovery.
- Create policy to require bonding from current, and future pipeline companies operating in Salt Lake City. This serves as security against future harm, as well as, an incentive to due no harm.
- Establish a Red Butte Creek Fund. Mayor Becker must make certain that Clean Water Act, and other compensation for damages, remediation, and restoration of Red Butte Creek will go directly to a Red Butte Creek fund.
- Assure that no oil spill fine money should go into the State's General Fund. The City must safe guard all fines issued by the State against Chevron because of the spill, and make certain that such fines are directed to the Creek restoration effort.

Stewardship

- Engage professional help in determining what complete Creek restoration looks like at all scales. Natural system restoration will be key to Creek recovery. Use biologic restoration for all clean up. Consult with an ectobiologist, and others to restore stream bank to original course.
- Establish an Adopt a Stream program for the Red Butte Creek Work with local schools, neighborhood, and other organizations to engage the public in Creek education and restoration efforts
- Involve, and invite elementary, junior high, and high school teachers and students to become biologists of Red Butte Creek. Students can perform sampling tests, become champions of sections of the Creek, and provide restorative stewardship.
- Create a Salt Lake City River Master program for adults who would like to be observers, and reporters, of biologic characteristics, and other notable events along specific Creek sections. Each River Master will compile data on the Creek, and will provide an annual report of the Red Butte Creek to the Mayor, and other public officials.
- Involve river organizations, along with organizations such as the Bennion Center in creating Red Butte Creek curriculum and stewardship programs. Engage Repertory Dance Theater's "Salt Lake Green Mapping" program in advancing community education, knowledge, and curiosity for Red Butte Creek.
- Create constructed wetlands or bio-filtration systems upstream from Sunnyside Avenue to serve as a catchment in the event of any future oil releases.
- Bio-remediate petroleum with compost and other passive treatments. See bioremediation expert Harry Allan, PhD, EPA Environmental Response Team.

Conclusions

This report elucidates the entirety of the undertakings of the Red Butte Creek Oil Spill Work Group. All responses and recommendations produced help articulate solution oriented options, and opportunities for Salt Lake City, fellow cooperating agencies, NGO's, other institutions, along with many individuals who wish to move forward together in responding to outstanding concerns related to the June 11, 2010 oil spill.

A great deal of thought and commitment has gone into creating the final recommendations from each Work Group team, and at this time a complete evaluation and prioritization of each of the Oil Spill Work Group Team recommendations by the Mayor, and his staff is warranted. Consideration of each team's suggestions is bound to reveal important detail, and knowledge about the oil spill impacts, as well as provide a more complete understanding of the unique personal, and community complexities associated with this oil spill. Ultimately, the recommendations contained within this report should greatly enhance Salt Lake City's ability to plan, articulate, and implement comprehensive progress toward healing the community, evaluating oil spill economic impacts, protecting against future oil spill hazard, and restoring the Red Butte Creek environment.

Postscript

During the evening of December 1, 2010, a second pipeline spill releasing more than 500 barrels of crude oil from the same pipeline (owned by Chevron Pipeline Company) occurred in Salt Lake City at the University of Utah campus. The location of this spill was approximately 500 feet from Chevron Pipeline Company's June 11/12, 2010 oil spill.

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Environment Work Group

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