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SOAH DOCKET NO. 473-10-4398
PUC DOCKET NO. 38230

APPLICATION OF LONE STAR	§	BEFORE THE STATE OFFICE
TRANSMISSION, LLC FOR A	§	
CERTIFICATE OF CONVENIENCE	§	
AND NECESSITY FOR THE	§	OF
CENTRAL A TO CENTRAL C TO SAM	§	
SWITCH/ NAVARRO PROPOSED	§	
CREZ TRANSMISSION LINE	§	ADMINISTRATIVE HEARINGS

DIRECT TESTIMONY OF

MARK TURNBOUGH, PhD

ON BEHALF OF

IONI CREEK CONSERVATION GROUP ("ICCG")
On Segment C, Link HH

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August 16, 2010

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Exhibits

Exhibit MT-1 Affidavit of Mark Turnbough, PhD

Exhibit MT-2 Summary of Recent Experience

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Exhibit MT-4 Map of contiguous four ICCG Ranches: Link Ranch, Stuart Ranch,
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**DIRECT TESTIMONY OF
MARK TURNBOUGH, PhD**

I. INTRODUCTION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Mark Turnbough. My business address is Post Office Box 64353,
Lubbock, Texas, 79464-4353.

Q. WHAT IS YOUR OCCUPATION?

A. I am an environmental consultant.

**Q. PLEASE DESCRIBE THE DISCIPLINARY AREAS IN WHICH YOU PROVIDE
CONSULTING SERVICES.**

A. Much of my work can be characterized as regulatory permitting and compliance,
land use analysis, socioeconomic impact assessment, statistical analysis,
regulatory impact assessment, policy analysis, water resource development and

1 multi-disciplinary project management. (Exhibit MT-2 contains a summary of my
2 consulting work and Exhibit MT-3 contains my resume.)

3 **Q. HOW LONG HAVE YOU WORKED AS AN ENVIRONMENTAL**
4 **CONSULTANT?**

5 A. Thirty years.

6 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL AND PROFESSIONAL**
7 **QUALIFICATIONS AS WELL AS YOUR CONSULTING EXPERIENCE.**

8 A. I received a PhD from Texas Tech University in 1985 in Systems Theory and
9 Environmental Policy. My dissertation focused on environmental resources
10 management. I have undergraduate and masters degrees from Texas Tech in
11 Anthropology and Sociology with a specialization in the quantitative analysis of
12 social and economic indicators.

13 I have taught a number of graduate and undergraduate courses in Land Use
14 Planning, Anthropology, Social and Economic Assessment and Environmental
15 Policy.

16 As a consultant, I have had significant participation in over 100 projects. During
17 the past 30 years, I have participated in the preparation of over 100 technical
18 papers and reports for clients in the public and private sectors. I am a senior
19 adviser to the Environmental Management Division of the U.S. Department of
20 Energy (DOE) Headquarters in Washington, D.C., where I am retained as a

1 nationally recognized expert (according to DOE criteria) in regulatory analysis
2 and compliance management. In that role, I am working with DOE's Pantex
3 Facility to develop a 115 MW Wind Energy Park. In addition, I am also the senior
4 compliance consultant to DOE's Los Alamos National Laboratory and Waste
5 Isolation Pilot Plant both located in New Mexico.

6 In the mid-1980's I participated in several transmission line projects as a
7 consultant with Espey, Huston & Associates in Austin, Texas. Much of that work
8 was done with Tom Van Zandt and Sandy Hicks, who are the principal partners
9 at Hicks & Company.

10 In 2004, I was retained by the law firm of Carroll, Gross & Reeder on behalf of
11 Lawrence and Carolyn Biedenharn in Re: a 138-KV transmission line proposed
12 by LCRA Transmission Services in Kendall and Bexar Counties (SOAH Docket
13 No. 473-04-7609 / PUC Docket No. 29684 Public Utility Commission of Texas).
14 In that case, I was a consultant to Chris Reeder, who is now representing Lone
15 Star in this case.

16 In December 2009, I was retained by the law firm of Locke, Lord, Bissell, and
17 Lydell on behalf of CJ Ranch in re: 345-KV Transmission Line proposed by
18 LCRA Transmission Services Corporation in Gillespie, Llano, San Saba, Burnet,
19 and Lampasas Counties, Texas, PUC Docket No. 37448. In that case, my direct
20 testimony critiqued the preferred alternative advanced by LCRA and proposed
21 that an alternative route be selected as the preferred alternative. The ALJ in the

1 case recommended that the LCRA preferred alternative be de-selected and
2 replaced by the alternative proposed in my direct testimony.

3 Then in May of 2010, I was retained by the law firm of Herrera and Boyle, PLLC
4 on behalf of the Clear Creek Preservation Coalition in regard to the Oncor Riley-
5 Krum CCN (SOAH Docket No. 473-10-4109, PUC Docket No. 38140). That case
6 is pending with a non-unanimous settlement agreement in place.

7 Prior to, and since then, I have been very active in site selection, site suitability
8 analysis and related land use analyses for more complex non-linear facility siting
9 efforts. For example, in 2006 I was selected by AREVA and the Washington
10 Group to manage the characterization of and selection of a site for DOE's Global
11 Nuclear Energy Partnership ("GNEP") for the next generation nuclear reactor. A
12 suitable "greenfield" site was selected and fully characterized for the GNEP in
13 southeastern New Mexico. It received the highest level of DOE funding for site
14 suitability analyses of any of the alternative sites at existing DOE facilities.
15 Beginning in March of this year, I have been active as the senior regulatory
16 consultant in the re-permitting of the U.S. Department of Energy's Waste
17 Isolation Pilot Plant, the only deep geologic repository for transuranic waste in
18 the world.

19 From 1991 to the present, I have managed or participated in the permitting of
20 over 70 percent of the total disposal capacity of Sub-Title D facilities in the state
21 of New Mexico. In that context, my work consists of assisting applicants secure

1 regulatory approval of their projects and then helping them to maintain
2 compliance with applicable regulatory frameworks. Only occasionally do I work
3 for intervening parties, and I do that only if the available fact pattern suggests
4 that an applicant has made an unjustifiable decision from a regulatory
5 perspective.

6 II. PURPOSE OF TESTIMONY

7 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

8 A. The purpose of my testimony is to provide an evaluation of selected aspects of
9 the methodology and findings of the "Environmental Assessment and Routing
10 Study" prepared by Burns & McDonnell for Lone Star. Unlike the scope of work
11 in the Gillespie to Newton Application, the scope of my work in this case focuses
12 primarily on the validity of a single link (HH) on the preferred route. Link HH is
13 evaluated against Section 37.056(c)(4)(A)-(D) of the Texas Utilities Code and the
14 Public Utility Commission Substantive Rule 25.101. For the sake of consistency,
15 my analysis of Link HH utilizes the same criteria in the Burns & McDonnell study.

16 My testimony identifies concerns about the decision by Lone Star and its
17 contractors to designate Link HH as a suitable segment of the preferred route.
18 More specifically, the analysis summarized in my testimony indicates that Burns
19 & McDonnell did not recognize or identify significant data in the evaluation of this
20 link.

1 Ultimately, the conclusion reached in my testimony is that Lone Star and its
2 contractors designated an unsuitable link, Link HH, as part of the preferred route,
3 and represented that the link met the requirements outlined in Section 37.056(c)
4 of the Texas Utilities Code and Commission Substantive Rule 25.101. To that
5 end, the balance of this testimony illustrates the basis of my statement that Lone
6 Star's Llink HH is not suitable, much less preferable, where it crosses the
7 Crawford, Robinson, Stuart, and Link Ranches on Lone Star's predetermined
8 preferred route.

9 **Q. WAS YOUR TESTIMONY AND SUPPORTING DOCUMENTATION PREPARED**
10 **BY YOU OR UNDER YOUR SUPERVISION?**

11 **A. Yes.**

12 **Q. IS THE INFORMATION CONTAINED IN YOUR TESTIMONY AND THE**
13 **SUPPORTING DOCUMENTATION TRUE AND CORRECT TO THE BEST OF**
14 **YOUR KNOWLEDGE AND BELIEF?**

15 **A. Yes.**

1 **III. EVALUATION OF FINDINGS REGARDING LINK HH**
2 **OF THE PREFERRED ROUTE**

3 **Q. WHY DID YOU PREPARE AN EVALUATION OF THE BURNS & McDONNELL**
4 **STUDY AND THE LONE STAR DECISION TO SELECT LINK HH AS A**
5 **VIABLE AND PREFERRED LINK OF THE PROPOSED TRANSMISSION LINE**
6 **ROUTE?**

7 A. The firm of Herrera and Boyle, PLLC, on behalf of the landowners collectively
8 referred to in this proceeding as the IONI CREEK CONSERVATION GROUP
9 ("ICCG") retained me to evaluate the process and work product used by Lone
10 Star to designate Link HH as a viable and preferable link of its proposed
11 transmission line route for its filing with the PUC for a CCN. Herrera & Boyle
12 represents ICCG landowners whose properties are located on or adjacent to Link
13 HH.

14 **Q. PLEASE LIST THE INTERVENOR LAND OWNERS WHO ARE MEMBERS OF**
15 **THE ICCG.**

16 A. The ICCG includes the following intervenor landowners whose properties are
17 located on and adjacent to Link HH:

- 18 ▪ Crawford Ranch;
- 19 ▪ Robinson Ranch;
- 20 ▪ Stuart Ranch; and
- 21 ▪ Link Ranch.

1 **Q. CAN YOU PLEASE PROVIDE A BRIEF DESCRIPTION OF THE LAYOUT OF**
2 **THE FOUR ICCG RANCHES IN RELATION TO THE ALIGNMENT OF LINK**
3 **HH?**

4 A. The Crawford Ranch, Robinson Ranch, Stuart Ranch and Link Ranch are
5 contiguous ranches that are bi-sected by proposed Link HH. A map showing the
6 entirety of these contiguous four ranches is attached to my testimony as MT-4.

7 **Q. PLEASE DESCRIBE THE PURPOSE OF YOUR EVALUATION OF THE ICCG**
8 **RANCHES.**

9 A. The purpose of my evaluation was to determine if the Burns & McDonnell study
10 and Lone Star's use of that information led to the identification of a suitable link
11 (HH) of Lone Star's pre-determined preferred route.

12 **Q. WHO PARTICIPATED IN THE PREPARATION OF YOUR EVALUATION?**

13 A. I prepared the evaluation.

14 **Q. PLEASE DESCRIBE THE STEPS TAKEN TO PREPARE THE EVALUATION.**

15 A. The steps I took to prepare my evaluation include:

16 ▪ Reviewing applicable statutory and regulatory requirements for selection
17 of a preferred route;

18 ▪ Reviewing the Lone Star Application including the Burns & McDonnell
19 study;

- 1 ▪ Reviewing other information that would help in the evaluation of the Lone
- 2 Star's routing decisions;
- 3 ▪ Evaluating the validity of selected aspects of the Burns & McDonnell study
- 4 and Lone Star's routing decisions; and
- 5 ▪ Performing a field reconnaissance of the properties that would be affected
- 6 by the construction of the preferred route along link HH.

7 **Q. WHAT DOCUMENTS IN ADDITION TO THE BURNS & McDONNELL STUDY**
8 **AND LONE STAR APPLICATION DID YOU REVIEW?**

9 **A. I reviewed the following documents:**

- 10 ▪ Chapter 25. Substantive Rules Applicable to Electric Service Providers,
- 11 Subchapter E. Certification, Licensing and Registration (P.U.C. SUBST. R.
- 12 § 25.101);
- 13 ▪ PURA § 37.056(c);
- 14 ▪ Direct Testimony of Michael Grable, witness for Lone Star Transmission,
- 15 LLC;
- 16 ▪ Direct Testimony of Dan Mayers, witness for Lone Star Transmission,
- 17 LLC;

- 1 ▪ Direct Testimony of Aldo Portales, witness for Lone Star Transmission,
2 LLC;
- 3 ▪ Direct Testimony of David Turner, witness for Lone Star Transmission,
4 LLC;
- 5 ▪ Direct Testimony of Mark VanDyne, witness for Lone Star Transmission,
6 LLC;
- 7 ▪ Texas Parks and Wildlife Department ("TPWD") comments; and
- 8 ▪ Information provided in responses to requests for information.

9 **Q. PLEASE DESCRIBE THE BASIS FOR AND METHODOLOGY DEVELOPED**
10 **FOR CONDUCTING THE EVALUATION OF THE BURNS & McDONNELL**
11 **ROUTE STUDY.**

12 **A.** The key to understanding the Burns & McDonnell route study, and ultimately
13 Lone Star's decision to designate Link HH as viable and preferable link of its
14 proposed transmission line route is the environmental data for the 34 routing
15 criteria that are included in Table 2-1 of the EA and route study. This same
16 environmental data was provided for the links in each route during discovery.
17 Inspection of values assigned to the 34 criteria by link in each route provides a
18 good point of departure for further analysis.

1 Initially, I assumed that the range of alternatives identified by Burns & McDonnell
2 including Link HH represented a reasonable set of options for consideration in
3 the study area. For the most part, inspection of aerial photography and
4 topographic maps included (Sheets 22 and 23 of Lone Star Alternative Routes)
5 of the Burns & McDonnell study supports that assumption.

6 **Q. WHAT IS THE BASIS OF THE 34 CRITERIA USED IN THE BURNS &**
7 **McDONNELL STUDY?**

8 A. The 34 criteria represent an approach developed by Burns & McDonnell to
9 establish a measurable set of variables that reflect or “operationalize” the broader
10 requirements of Chapter 25, Subchapter E, P.U.C. SUBST. R. § 25.101(b)(3)(B)
11 and PURA § 37.056(c).

12 **Q. DO YOU THINK THAT THE 34 CRITERIA REPRESENT A REASONABLE**
13 **APPROACH TO EVALUATING ALTERNATIVE ROUTES AND LINKS FOR**
14 **TRANSMISSION LINES?**

15 A. In general, the criteria are useful as a preliminary framework, but they are limited
16 by the fact that their relative importance, as individual criterion, have never been
17 made explicit. For the most part, the values for each criterion are easy enough to
18 replicate, verify or correct, but there is no standard for a “reasonable third party”
19 to follow in determining what criterion is most or least important in assessing a
20 given set of routes. Ultimately it comes back to the collective judgment of the
21 Burns & McDonnell project team, and the input from its customer, which in this
22 case is Lone Star. As a consequence, the actual analysis has limited

1 transparency, irrespective of the public meeting process used to communicate
2 proposed decisions.

3 **Q. CAN YOU GIVE EXAMPLES OF SYSTEMATIC LIMITATIONS EMBEDDED IN**
4 **THE BURNS & McDONNELL APPROACH, INCLUDING THE CRITERIA?**

5 A. Yes. As an extension of concerns expressed in the previous answer regarding
6 the absence of a hierarchy of values in Table 2-1, the approach has the potential
7 to pit important land use criteria against each other.

8 Moreover, virtually all of the data and the analysis provided in the Burns &
9 McDonnell study is limited to information collected from remote sensing
10 methodologies and searches of data bases maintained by state and local political
11 subdivisions. The study is essentially a desk-top exercise using a straight-edge
12 and aerial photographs. In fact, Mr. Van Dyne, the project manager of the EA
13 and route study, indicates in his testimony at page 16, lines 11 through 17, that
14 his team did not do any "on-the-ground" reconnaissance on links proposed in
15 their study. According to Mr. Van Dyne, such on-the-ground surveys were not
16 feasible for Burns & McDonnell. However, Burns & McDonnell's limited
17 reconnaissance does not justify the proposal, recommendation or approval of a
18 link (HH) that fails to comply with Commission routing criteria.

19 Given the previous concerns stated in my testimony about potential over-reliance
20 on remote sensing methodologies and secondary data searches of city and
21 county records, an unintended consequence is the unjustified fragmentation of

1 properties without consideration for localized land-use impacts. However,
2 through my on-the-ground reconnaissance of the four ICCG ranches, information
3 that Burns & McDonnell's did not consider in its routing analysis that does not
4 support Link HH as a viable or preferable link is now available to the Commission
5 in this testimony.

6 **Q. WHAT IS THE PURPOSE OF YOUR PROVIDING ADDITIONAL**
7 **INFORMATION FOR THE COMMISSION'S CONSIDERATION?**

8 A. Typically, one of the purposes of a third party environmental assessment is to
9 identify and evaluate cumulative effects associated with proposed alternatives for
10 a given project. One of the more significant cumulative effects of constructing
11 large-scale linear facilities such as electric transmission lines that run across
12 rural settings is the fragmentation of habitat and land-use. In many instances,
13 the concomitant reduction in value for wildlife and for a number of historically
14 established human activities associated with economic and esthetic uses of the
15 land is potentially significant. With that in mind, however, the Burns & McDonnell
16 study looks more like a high altitude conceptual plan than an actual route
17 designation. It lacks the rigor normally associated with an assessment of
18 discrete and cumulative effects and their potential to cause significant negative
19 change in the human and natural environment.

1 **Q. WHAT DID YOU LEARN FROM YOUR ON-THE-GROUND**
2 **RECONNAISSANCE OF THE ICCG RANCHES?**

3 The apparent rationale for placing part of proposed Link HH across the
4 contiguous properties of the Crawford, Robinson, Stuart, and Link Ranches
5 (ICCG) is to run parallel to a narrow, aging, poorly maintained and over-grown
6 natural gas pipeline (Enbridge Gathering LP Pipeline) right-of-way ("ROW"). As
7 part of the data collection effort for my evaluation of a portion of Link HH, I drove
8 over virtually the entire gas pipeline ROW for all four ranches in an all-terrain
9 vehicle ("ATV"). Extreme changes in terrain periodically interrupted our
10 reconnaissance of the ROW. There were also places along the ROW where
11 large rocks and overlapping tree lines made following the exact centerline
12 impossible in a vehicle.

13 What is apparent from an actual "on-the-ground survey" of properties crossed by
14 Link HH, which Burns & McDonnell admit they did not do, is that the condition of
15 the pipeline ROW is so neglected for the vast majority of its run across the ICCG
16 properties that it does not really meet the intent of substantive Commission rules
17 regarding utilization of existing compatible ROWs. The intent under Section
18 25.101(b)(3)(B) is to moderate the impact on the affected community and
19 landowners. This principle is misused in this case because the low visibility of
20 most of the gas pipeline ROW (which is used as the route alignment for Link HH)
21 has no residual impact on the ICCG landowners.

1 More specifically, the following observations were made with regard to the impact
2 of Link HH on each of the ranches in my reconnaissance of the ICCG ranches.

3 **CRAWFORD RANCH:**

4 Link HH will cut across the southwest corner of the Crawford ranch following the
5 obscured pipeline ROW discussed above. It would dominate the view from all
6 three habitable structures located on the Crawford Ranch, including the
7 headquarters property. Link HH would cross one active stream along the
8 southern boundary of the Crawford Ranch, and would then follow very steep
9 terrain across the southwestern part of the ranch as it follows the old gas pipeline
10 ROW, and for no reason other than the existence of the aging pipeline ROW, it
11 would bi-sect and isolate property on the southwest corner from the rest of the
12 ranch. At the higher elevations of the Crawford Ranch, Link HH would traverse
13 an area on the ranch that is dedicated to ranching, hunting, and recreational use.
14 Although there are small local distribution lines on the property, they are
15 discretely located and provide electrical service to the habitable structures and to
16 relatively well concealed oil and gas operations.

17 There is a concern by owners of the Crawford Ranch that the primary purposes
18 of the ranch, which are ranching, hunting, and recreation, would be irreparably
19 damaged by the placement of a 345-KV line across some of the most scenic
20 areas. The Crawford Ranch has been in operation since 1880.

1 **ROBINSON RANCH:**

2 After crossing the southwest corner of the Crawford Ranch, Link HH would run
3 on a southeast to northwest diagonal across the south central portion of the
4 historic Robinson Ranch. The Robinson Ranch has been in operation for 97
5 years. The primary purpose of the Robinson Ranch is cattle ranching and the
6 preservation of native range and wildlife habitat associated with the area.

7 The proposed link would cross one active stream on the southeast corner of the
8 property and run sub-parallel to two others that feed into Ioni Creek where it runs
9 through the Stuart Ranch. The proposed link would pass within a mile of the
10 three habitable structures on the ranch, including the ranch headquarters, and
11 would dominate the view from all three structures. The proposed link would also
12 come in close proximity to three windmill wells that pump water for ranch use.
13 Although there are discretely located local distribution lines that serve the
14 headquarters and the other habitable structures of the ranch, they do not notably
15 detract from the natural quality of the landscape. The terrain on the Robinson
16 Ranch is less severe than it is on the Crawford Ranch, but it has other values
17 associated with the rolling terrain and would be more easily dominated by the
18 placement of the proposed link in terms of view shed concerns.

19 **STUART RANCH:**

20 The Stuart Ranch has been operated under the same family ownership for over
21 100 years. Proposed Link HH cuts diagonally from southeast to northwest

1 across the central portion of the ranch and runs across relatively steep terrain
2 that is associated with Ioni Creek and numerous seeps and springs. The
3 proposed route crosses an area through which Ioni Creek flows that is
4 characterized by a steep limestone cliff that is vertically 80 feet above the water
5 surface of the creek. At that same location, there is a large cascade of seeps
6 and springs that feed a pool that is roughly 30 yards in diameter. At this location
7 five years ago, a hunter drove off the eastside of the embankment and fell 80 feet
8 to his death in Ioni Creek. However, without the benefit of an on-the-ground
9 survey, the Burns & McDonnell EA and route study characterize the terrain on
10 this property as "moderate."

11 The primary purpose of the Stuart Ranch over its 100-year life is cattle ranching
12 and wildlife management. Hunting is a major economic activity of the Stuart
13 Ranch because of its spectacular visual resources. Placement of the proposed
14 Link HH across the Stuart Ranch would irreparably damage those values.
15 Owners of the Stuart Ranch believe that the placement of the line will
16 irretrievably change the character of the ranch that has been in the family for
17 over a century, and they are concerned that the transmission line will impact the
18 seeps on their ranch that they rely upon for their domestic water supply.

19 **LINK RANCH:**

20 After leaving the Stuart Ranch property, the proposed Link HH continues towards
21 the Central C Substation diagonally from southeast to northwest across the heart

1 of the Link Ranch. Similar to the Stuart Ranch, the Link Ranch has been
2 operational for 112 years. The proposed Link HH runs in close proximity to the
3 ranch headquarters and several other habitable structures that support the ranch
4 operation. It runs within 1,450 feet of the historic Ben Kat Airfield, which has
5 been re-designated by the FAA as a heliport. It crosses five active streams as it
6 traverses the property. The proposed link also crosses directly over one windmill
7 and within 300 feet of a second windmill, both of which are integral to the water
8 supply for the ranch headquarters and supporting structures.

9 Ultimately, proposed Link HH intersects the northern property line of the Link
10 Ranch and runs parallel to it to the western boundary of the property. The only
11 definition of that boundary on the ground is a five-strand barbed wire fence.
12 There is not even a two-track road separating the Link Ranch from the Belson
13 and Coody properties. Consequently, placement of a 345-kV transmission line
14 along that stretch of Link HH damages the view shed for all three properties
15 equally.

16 The terrain on the Link Ranch is less extreme than that associated with the
17 Stuart or Crawford Ranches, but it is typical of high quality rolling topography that
18 is associated with the north-central Texas region. It is an award winning, very
19 active cattle ranching operation and is the base for an extensive hunting
20 economy. Placement of Link HH at the proposed location would irretrievably
21 damage the aesthetic resources associated with the hunting activities. It would
22 also bi-sect the eastern portion of the cattle ranch for no justifiable regulatory

1 reason. The owners of the Link Ranch express similar concerns to the other
2 ICCG members about the potential impact on their property. The historic
3 qualities of a ranch that was started by the Link Family in 1898 will be changed
4 by the inappropriate placement of a 345-KV electric transmission line across their
5 property.

6 **IV. CONCLUSIONS**

7 **Q. IN COMPLETING YOUR EVALUATION OF FINDINGS REGARDING THE**
8 **PROPOSED PLACEMENT OF LINK HH ACROSS THE ICCG RANCHES,**
9 **WHAT CONCLUSIONS HAVE YOU REACHED?**

10 **A.** In sum, the primary rationale for placing Link HH across these four ranches
11 appears to be, as indicated above, the existence of an aging and un-maintained,
12 small gas pipeline ROW. If that feature did not occur on these four ranches, the
13 proposed placement of Link HH would stand in total contradiction of PUC rules.
14 Secondly, it appears that the placement of Link HH along the northern property
15 line of the Link Ranch follows similar logic, in which an unobtrusive boundary is
16 over-utilized as an appropriate basis for an alignment of a large transmission line.
17 And, consequently, if the intent of Commission rules regarding parallel
18 "compatible corridors" is to be considered, proposed Link HH may not be
19 considered a suitable, much less preferable, link of Lone Star's proposed
20 transmission line.

1 **V. RECOMMENDATIONS**

2 **Q. BASED ON YOUR EVALUATION AND CONCLUSIONS, WHAT ARE YOUR**
3 **RECOMMENDATIONS TO THE COMMISSION?**

4 **A.** Given the singular nature of the fatal flaw associated with the proposed
5 placement of Link HH across the ICCG Ranches, as described in this testimony,
6 it is recommended that Lone Star not use Link HH.

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AFFIDAVIT OF MARK TURNBOUGH, PH.D.

STATE OF TEXAS §
§
COUNTY OF LUBBOCK §

Before me, the undersigned authority on this day personally appeared the person known by me to be Mark Turnbough, who, after being sworn by me, stated as follows:

1. My name is Mark Turnbough. I am over eighteen years of age, am of sound mind and competent to make this Affidavit. I have personal knowledge of every statement contained in this Affidavit, and every statement contained herein is true and correct and based on my personal knowledge.
2. I make this Affidavit in support of my direct testimony in the above-captioned proceeding. Attached hereto and made a part hereof for all purposes is my Direct Testimony and Exhibits, which have been prepared in written form for introduction into evidence in SOAH Docket No. 473-10-4398 and Public Utility Commission of Texas Docket No. 38230.
3. I hereby swear and affirm that my answers contained in the testimony are true and correct.


Mark Turnbough

SUBSCRIBED AND SWORN BEFORE ME, the undersigned notary on this the 12th day of
~~July~~ 2010.
August


Kendra Green
Notary Public in and for
The State of Texas



Mark Turnbough, PhD
Environmental Consulting/Permitting
Compliance Management
and
Systems Analysis
January 2010

SUMMMARY OF QUALIFICATIONS

INTRODUCTION

Mark Turnbough has provided technical/regulatory consulting and work product on several multi-disciplinary site selection, characterization, environmental assessment and permitting projects.

Those projects range from controversial, high-visibility, large-scale water resource development and management programs along the U.S./Mexico boundary in El Paso, Starr, Willacy and Hidalgo Counties to the permitting and licensing of critical environmental facilities, e.g. nuclear power plants (HL&P South Texas Project and Texas Utilities Comanche Peak), major transmission line rights of way (ROW), hazardous/infectious waste treatment systems, waste disposal facilities, experimental energy storage systems at White Sands Missile Range, RCRA consulting to the U.S. Department of Energy (DOE) WIPP facility near Carlsbad, New Mexico, the settlement of a large and complex compliance order between Los Alamos National Laboratory and the State of New Mexico, and oversight (for DOE and WTS) of negotiations between the U.S. Department of Energy, the State of New Mexico and several advocacy groups expressing concern over the DOE proposal to bring remote handled mixed Transuranic Waste to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, N.M.

In addition he has served as a volunteer advisor to state government. For example, in late 2002 and early 2003 he served as Chairman (Tri-Chair) of New Mexico Governor Bill Richardson's Transition Team for the New Mexico Environment Department (NMED).

During most of 2004 and early 2005 he served as a member of the NMED Environmental Justice Planning Committee. During the first four months of 2006, he worked on sub-committees with NMED staff and other interested parties in an attempt to reach consensus on provisions of the New Mexico Solid Waste Plan and the Solid Waste Management Regulations. In May of 2006, he provided technical support and draft language to the New Mexico Environmental Improvement Board regarding the addition of environmental justice parameters to the New Mexico Solid Waste Management Regulations, 20.9.1 NMAC. Currently, he is providing input to the NMED Draft Dairy Regulation Advisory Committee.

EDUCATION

PhD Texas Tech University, 1985

Major Fields: Systems Theory, Quantitative Analysis, Environmental Policy

M.A. Texas Tech University, 1971

Major Fields: Anthropology, Quantitative Sociology, Public Policy Analysis

B.A. Texas Tech University, 1969

Major Fields: Anthropology, Biology, Journalism

SELECTED PROJECT SUMMARIES

In 1987 he managed the third party environmental assessment that was used by the U.S. Bureau of Reclamation to assess the re-assignment of agricultural water rights in the Rio Grande Valley of El Paso County, Texas to municipal and industrial uses. The model he developed for making water resource re-allocation decisions in El Paso County (USBR Rio Grande Project) was subsequently utilized to provide a basis for converting agricultural water diversions in the Lower Rio Grande Valley (south Texas). The value of the approach is that it eliminates the need for lengthy and expensive Environmental Impact Statements (EIS) to re-distribute water appropriations within existing water projects. Ultimately, Mr. Turnbough was asked to describe the approach to the Committee on Energy and Natural Resources of the United States Senate (May 10, 1994).

During the same general time frame (1986 to 1994) he prepared the initial environmental information documents required for the opening of the Santa Teresa International Border Crossing (New Mexico / Mexico). Concurrently, he worked with the owners (Charlie Crowder and Tim Lewis) to master plan the original Santa Teresa industrial and residential complex (26,000 acres).

On behalf of El Paso and Hudspeth Counties, from 1988 to 1991 he recruited and managed a technical team of nationally recognized experts to evaluate the proposed Texas Low Level Radioactive Waste Disposal site at Ft Hancock, Texas. The results of that evaluation were used in District Court to prevent the state of Texas from designating an unsuitable site.

In 1997 and 1998 Mr. Turnbough provided consulting expertise to Phillips Petroleum Company in federal litigation regarding pipeline leaks near Borger, Texas. Phillips was able to negotiate mutually acceptable settlements with neighboring landowners.

Also in 1997 and 1998, he provided expertise to the Richey Oil Company which was opposed to the development of a 27,000 acre sludge application project adjacent to the historic Eagle Mountain Ranch in Hudspeth County, Texas. The Texas Natural Resources Conservation Commission (later re-named Texas Commission on Environmental Quality) subsequently withdrew its prior approval of the project.

From 1992 to the present, Mr. Turnbough has coordinated the permitting and re-permitting of the controversial Camino Real Landfill in Sunland Park (the largest facility of its kind in New Mexico). Under Mr. Turnbough's guidance, Camino Real ultimately received the Solid Waste Association of North America (SWANA) Landfill Excellence Award for the best landfill in North America (1997).

From 1994 through 1999, Mr. Turnbough also coordinated the site selection, characterization, design, permitting, construction and regulatory compliance for two additional regional landfills in New Mexico; Sand Point (Carlsbad) and Lea County Regional Landfill. In the process of permitting the Lea County facility, Mr. Turnbough was able to secure a ground water monitoring exemption based on the geologic qualities of the site selected for Lea County. He also participated in the regulatory rehabilitation of the permit for Tri-Sect Landfill in Valencia County. Since 1991, Mr. Turnbough has participated in the permitting of over half of the total solid waste disposal capacity in the state of New Mexico.

From 1995 to 2000, Mr. Turnbough served as a regulatory and environmental consultant to the Waste Control Specialists facility in Andrews County, Texas. It was the first hazardous (RCRA)/ toxic (TSCA) and radioactive waste management facility of its kind in the United States (permitted under post LDR regulations).

From 1999 to 2003 he was also a consultant for Chandler and Associates in the assessment of a large and complex set of oilfield contamination cases in Johnson and Lawrence Counties, Kentucky.

Intermittently, during the past ten years Mr. Turnbough has worked with the law firm of Kemp-Smith and its clients, e.g. (Hunt Development Corp.) as a water resource development consultant for projects in the El Paso, Texas/Santa Teresa, New Mexico region.

From September of 2000 to December 2001, he was retained as a consultant for Westinghouse and Westinghouse Safety Management Solutions (WSMS) to provide regulatory guidance to the U.S. Department of Energy (DOE) regarding the modification of the RCRA permit (issued by the state of New Mexico) under which the DOE Waste Isolation Pilot Plant (WIPP) operates.

During the same time frame, he was retained as a consultant to (CRI), an oilfield waste recycling and disposal facility. On behalf of CRI, Mr. Turnbough provided expert testimony and coordinated technical input in opposition to an established New Mexico Environment Department (NMED) policy regarding oilfield waste disposition. The NMED hearing officer ruled against the Department's policy position (the only instance of that ever happening in the history of NMED). Subsequently, he supported CRI efforts as an intervener in New Mexico Oil Conservation Division (OCD) proceedings regarding the Division's attempts to improperly permit solid waste disposal facilities in the CRI service area. Ultimately, his efforts lead to major regulatory changes in OCD regulations for permitting solid waste disposal facilities.

From February, 2000 to 2006, he was retained by Kemp Smith through Hicks & Co. to provide regulatory impact assessments (RIA) for the Edwards Aquifer Authority in San Antonio, Texas.

In August 2001, he was retained by Moncrief Oil Co. to provide specialized regulatory consulting regarding the disposition of large volumes (1500 tons per day) of molten sulfur generated by the Lost Cabin natural gas processing plant located in the Madden Field (Wind River Basin) of central Wyoming.

Beginning in January 2002, the work done under contract to WSMS was shifted to CTAC, the technical assistance arm of DOE at WIPP, and expanded to include selected regulatory issues associated with the U.S. EPA jurisdiction over WIPP. In 2004, this work continued under contract to Washington TRU Solutions which is now a subsidiary of URS.

In February 2002, he was retained by American 3CI, to do permitting and compliance work for infectious waste management facilities.

In September 2002, he was retained by Cogema, Inc. to conduct regulatory and technical feasibility studies for a range of North American projects.

In June 2003, he was retained by the New Mexico State Land Office to prepare policy guidelines for oil and gas leases/rights of way permits to enhance the protection of surface resources on land owned/managed by the State of New Mexico.

In July 2003, he was retained by Aquila/Canberra to produce specialized regulatory and policy analyses for ongoing North American projects.

In January 2004, he was retained by The National Enrichment Facility (LES) to assist in the acquisition of state permits for its proposed Eunice, New Mexico uranium enrichment facility.

In, April 2004, he was retained by Advanced Technologies and Laboratories, Inc. (ATL) in Germantown, Maryland to fill a request by U.S. Department of Energy Headquarters for nationally recognized expertise to work on selected RCRA compliance problems with state regulators in New Mexico, Washington, Idaho, Texas and Ohio.

In June 2004, he was retained to prepare the Siting and Land Use Component of the Sandoval County Landfill Application for a Solid Waste Permit under contract to Gordon Environmental, Bernalillo, New Mexico. The permit was approved without opposition in July of 2005.

In July 2004, he was retained by Carroll, Gross, Reeder & Drews, LLP to evaluate alternative electric transmission line routes in a contested case before the Texas Public Utility Commission in Austin, Texas.

Early in 2005 he provided quality assurance review of the Camino Real Landfill (CRLF) Title V Operating Permit renewal application. It was submitted to the NMED Air Quality Bureau on April 29, 2005.

From late 2005 through early 2007, he managed the data collection and development of the first Community Impact Assessments (CIA) conducted in New Mexico for the specific purpose of supporting documentation in a solid waste facility application. The CIAs were prepared as part of the re-permitting of CRLF in Sunland Park and Chaparral.

During the same time-frame he drafted sections in the CRLF permit application and provided quality assurance review of the entire submission. The application package was submitted to the NMED Solid Waste Bureau on March 6, 2006.

In January 2006, he was retained by Las Uvas Dairies (one of the largest family owned dairy operations in the United States) to provide site characterization and guidance regarding the completion of two discharge permits pending before the state of New Mexico.

In April 2006, he was retained by a private consortium representing Lea and Eddy Counties, N.M. to assist in the response to a DOE request for proposals to identify a suitable site for a proposed spent nuclear fuel recycling facility.

In May 2006, he and Gordon Environmental were retained by the City of Clayton, New Mexico find and permit a suitable site for a regional solid waste landfill for northeast New Mexico and northwest Texas.

In the fall of 2006 he was selected as Principal Site Investigator for the Eddy-Lea Energy Alliance/AREVA/Washington Group project to characterize a southeastern New Mexico site for co-location of the U.S. Department of Energy's proposed Global Nuclear Energy Partnership (GNEP) facilities. The 1000 acre site was characterized for suitability to support the construction and operation of the Consolidated Fuel Treatment Facility and the Advanced Burner Reactor.

In August of 2007 he was selected as Principal Investigator for the Lea County Economic Development Corporation initiative to characterize sites for location of a second uranium enrichment facility in Lea County.

In January 2008 he was retained by Los Alamos National Security (LANS) to provide regulatory and environmental expertise to LANS and the National Nuclear Security Administration regarding the implementation of the RCRA Order on Consent for the cleanup of Los Alamos National Laboratory.

In July 2009, he was retained by Hicks & Co. to evaluate alternative routes for a major electric transmission line that would run through Kimball County, Texas.

ECONOMIC DEVELOPMENT

He has coordinated the implementation of significant energy/environmental/economic development strategies. In 1999, for example, he coordinated the passage of a \$500,000,000.00 incentive package in the New Mexico Legislature to help recruit uranium enrichment industries

to a site located in eastern Lea County, New Mexico. That legislative initiative created circumstances which ultimately led to the (unlikely) licensing, permitting and construction of the multi-billion dollar LES Uranium Enrichment Facility near Eunice, N.M.

SUMMARY

Essentially, Mr. Turnbough provides technical support, task definition, management, and regulatory/political interface for clients whose projects require multi-disciplinary expertise. The interface fills a gap for law firms and other clients with complex task requirements in that it provides technical support that ranges well beyond "traditional" engineering and planning functions

RESUMÉ
MARK W. TURNBOUGH, PhD

August 2010

General Background: Includes advanced multi-disciplinary education, training and experience in the analysis and synthesis of complex systems, environmental policy, technology assessment, statistical research, land-use analysis/socio-economics/demography, legislative analysis/bill drafting, drafting of regulatory language and preparation of complex permit applications for critical facilities.

Consulting Experience: Primary areas of activity include regulatory permitting/compliance monitoring, management of technical negotiations for legal/regulatory settlements, environmental impact assessment, site suitability analysis, site selection, site characterization, analysis of land uses, site remediation/restoration analysis, statistical research and computer applications, including Geographic Information Systems and Predictive Models.

Synopsis of Selected Consulting Activity (1984-2009):

(For complete work history, see Page 7, **Experience** section).

In May of 2010, was retained by Law Firm of Herrera & Boyle on behalf of Clear Creek Preservation Coalition to evaluate selected links in the Oncor Riley-Krum 345-kV CCN Route Study and Environmental Assessment (SOAH Docket No.473-10-4109, PUC Docket No. 38140).

In December of 2009, was retained by Law Firm of Locke, Lord, Bissell and Lydell on behalf of CJ Ranch, Garrett Ranch, Point Peak Resort and Jean Mueller to evaluate alternatives to LCRA's proposed 345-kV transmission line from Gillespie –Newton (PUC Docket No. 37448).In July of 2009, was retained by Hicks & Co. to evaluate the environmental impacts of alternative routes for a Lower Colorado River Authority (LCRA) electric transmission line that would run from Dallas to Kendall County, Texas.

In July of 2009, was retained by Hicks & Co. to evaluate the environmental impacts of alternative routes for a Lower Colorado River Authority (LCRA) electric transmission line that would run from Dallas to Kendall County, Texas.

In August of 2008, was retained by Waste Connections, Inc. to characterize and acquire land from the New Mexico Commissioner of Public Lands that would be suitable for permitting under 20.9.1 NMAC for a Subtitle D solid waste disposal facility in Otero County, New Mexico.

In August of 2008, was retained by The Urlacher Group (Big Bear Disposal, Inc.) to site, characterize, permit and oversee construction of an Oilfield disposal system under Rule 36 of the Oil Conservation Commission Regulations.

In February of 2008, was retained by Project Enhancement Corporation (PEC) to provide regulatory expertise to the Environmental Management Division of DOE re: Cross-cutting issues with the potential to affect multiple sites in the complex.

In January 2008, was retained by Los Alamos National Security (LANS) to provide regulatory guidance to LANS and NNSA re: implementation of the Los Alamos RCRA Order on Consent signed by the state of New Mexico, DOE and LANS.

In December 2007, coordinated the legal/technical case and testified for the applicant in the New Mexico Environment Department's adjudicatory permit hearing for Camino Real Landfill in Sunland Park, New Mexico.

In August 2007, was retained by the Lea County Energy Committee / Lea County Economic Development Corporation to characterize the suitability of selected sites for construction and operation of a Uranium Enrichment Facility. International Isotopes has selected one of those sites for a deconversion plant.

In January 2007, was retained by the Eddy-Lea Energy Alliance, LLC (ELEA) as Principal Site Investigator for the proposed ELEA Global Nuclear Energy Partnership (GNEP) Site Characterization effort for a Consolidated Fuel Reprocessing Facility and a n Advanced Burner Reactor.

In December 2006, was retained by Sundance Oilfield Services, LLC to develop an application under new Oil Conservation Division regulations for solid waste disposal facilities near Eunice, New Mexico.

In October 2006, was retained by Ben Barnes & Associates to evaluate RCRA compliance issues for the Lea Land Industrial Waste Disposal Facility in Lea County, New Mexico.

In May 2006, was retained by the City of Clayton, New Mexico to locate, characterize, acquire and permit a suitable site for a regional landfill for northeast New Mexico and northwest Texas.

In April 2006, was retained by Gordon Environmental, Inc. for Southwest Landfill to evaluate the relationship between the existing facility and land uses in the surrounding area.

In April 2006, was retained by a private consortium representing Lea and Eddy Counties (ELEA), New Mexico to manage the preparation of a site proposal to the DOE (Global Nuclear Energy Partnership-GNEP) request for proposals to identify a suitable site for a proposed spent nuclear fuel

recycling facility. After GNEP the ELEA has purchased the proposed site for other economic development purposes.

In January 2006, was retained as a consultant by Las Uvas Dairies (the largest family owned dairy company in the United States) to provide regulatory assistance to its facility engineers regarding the completion of a proposed consolidated discharge permit pending before the state of New Mexico.

From March 2005 to March 2006, drafted sections for the Camino Real Solid Waste permit application and provided quality assurance review of the entire submission. The application package was submitted to the New Mexico Environment Department Solid Waste Bureau on March 6, 2006.

From October 2005 to March 2006, coordinated independent third party preparation of Community Impact Assessments (CIA) for Camino Real Landfill (Sunland Park, N.M.) and the proposed Rhino Landfill (Chaparral, N.M.). The studies were prepared as part of the permitting process for both facilities.

As consultant to Camino Real Landfill in Sunland Park, New Mexico, participated in the preparation and submission of the Title V Operating Permit renewal application. The application was submitted to the New Mexico Environment Department (NMED) on April 29, 2005 and was subsequently approved and the permit was re-issued.

As consultant to Sandoval County (New Mexico), participated in the preparation of a RCRA Subtitle D Application for a major expansion of regional landfill and recycling facility. (April 2004-June 2005). Facility permitted on July 17, 2005.

As consultant to Controlled Recovery, Inc. (CRI), provided regulatory expertise to large scale oil recycling operation in Lea County New Mexico (April, 2005-January 2007).

As consultant to WCI, Inc., negotiated settlement of NMED Administrative Order against El Paso Disposal, Inc. (a subsidiary of WCI, Inc.) (October-December, 2004).

As consultant to Carroll, Gross, Reeder & Drews, LLP provided expertise for the evaluation of electric transmission line routes in central Texas (July, 2004-July, 2005).

As consultant to CH2M HILL, provides specialized regulatory and project development expertise (August 2004-present).

As contractor to Advanced Technologies and Laboratories International, Inc. (ATL) provides specialized regulatory expertise to U. S. Department of Energy Headquarters Environmental Management Division (EM3) for the definition and resolution of major regulatory problems for DOE facilities, e.g. LANL Consent Order, Hanford TRU Tank Waste and Fernald Silos Waste (April 2004-2007).

As consultant to Washington TRU Solutions (WTS) provides specialized regulatory consulting for the Washington Group at the U.S. Department of Energy WIPP facility in the state of New Mexico (January 2004-present).

As consultant to the National Enrichment Facility (NEF), provides specialized regulatory consulting for the acquisition of environmental permits from the state of New Mexico (January 2004-present).

As consultant to Aquila / Canberra, Inc. provided specialized regulatory and policy analyses for ongoing North American projects (July 2003-2006).

As consultant to the New Mexico State Land Office provided policy guidance for enhancing the protection of surface resources on land owned by the State of New Mexico (June 2003-July 2004).

As consultant to Cogema (AREVA), Inc. conducted regulatory and technical feasibility studies for a range of potential North American projects (September 2002-2003).

As consultant to American 3CI, provided regulatory expertise on the preparation of permits for infectious waste management facilities (February 2002-March 2006).

As consultant to CTAC, provided regulatory expertise on the modification of the U.S. Department of Energy (DOE) /WIPP hazardous waste permit issued by the State of New Mexico (January 2002-January, 2004).

As consultant to Moncrief Oil Company, provided specialized regulatory guidance on the disposition of sulfur and related by-products of natural gas processing facilities in the Wind River Basin of central Wyoming (August 2001-August 2002).

As consultant to Westinghouse/TRU Solutions and Westinghouse Safety Management Solutions, provided regulatory expertise on the modification of the U.S. DOE/WIPP hazardous waste permit issued by the state of New Mexico (September 2000-December 2001).

As consultant to the Edwards Aquifer Authority (contracted through Kemp Smith, P.C. and Hicks and Co.) provides regulatory analysis for the development of and impact assessment for new aquifer management rules (June 2000-present).

As environmental consultant to CRI, Inc. provided regulatory expertise; client was in opposition to a proposal by the state of New Mexico to co-mingle oilfield wastes with solid waste (sub-title D) in disposal cells permitted for sub-title D wastes (Jan.-Nov., 2000). NMED hearing officer adopted Mr. Turnbough's interpretation of the regulatory framework. It was the first time an NMED hearing officer has ever ruled against an established NMED policy.

As consultant to the Washington Group assisted in the development of a community interface plan to improve the company's relationship with Lea County, New Mexico (July-September, 2000).

As consultant to the Washington Group, provided permit and license data regarding WCS capabilities to store and characterize TRU waste in support of the WIPP project (February- April, 2000).

As environmental consultant to Lea County, New Mexico provided interface with U.S. Department of Energy (DOE) in preliminary discussions regarding economic development associated with the operation of the DOE Waste Isolation Pilot Plant (WIPP) (1999-2000).

As environmental consultant to Raymond G. Sanchez and Robert Desiderio, attorneys at law, provided project management and coordination for site assessments on Maloof properties in New Mexico (January 2000-December 2001).

As environmental consultant to the El Paso, Texas based law firm of Kemp Smith, provided expertise for the selection and development of water resources for use by the City of El Paso (2000-2005).

As environmental consultant to Chandler and Associates, provided expertise on the assessment of a large and complex oilfield contamination case in Johnson and Lawrence Counties, Kentucky (1999-2003).

As lead consultant on the Lea County Landfill project managed site selection studies and permit document preparation for submission to the New Mexico Environment Department (Permit granted 1999).

As environmental consultant to WCS, LLC, provided regulatory guidance for the development of permits and licenses for additional waste streams on the facility's New Mexico properties. Also provided systems support and compliance monitoring at permitted facility in Texas (June 1995-January 2000).

As environmental consultant to Harlan Richey (President of Richey Oil Co.), provided expertise and expert testimony; client was in opposition to a proposed 27,000 acre sludge application project adjacent to the historic Eagle Mountain Ranch in Hudspeth County, Texas. The Texas Natural Resources Conservation Commission (TNRCC) subsequently withdrew its prior approval of the project (1997-1998).

As environmental consultant to Phillips Petroleum, Inc., provided expertise and expert witness testimony (deposition only—case was settled in favor of Phillips) on a complex land use/groundwater contamination case (1997-1998).

As environmental consultant/project manager to Camino Real Environmental Center (CREC), managed the development of three solid waste permit applications for boundary modification, recycling center and landfill permit renewal for the solid waste facility at Sunland Park, (Doña Ana

County) New Mexico. (Permits granted 1997). Coordinated Title V and NSPS permitting and related compliance issues at the all of the subsidiary facilities in New Mexico (1990-2006). Provides regulatory guidance for early phases of solid waste permit application preparation for 2007 hearing (2004-present).

As environmental consultant/project manager for USA/UNITED WASTE, coordinated the rehabilitation of a permit (solid waste) application for Tri-Sect Landfill in Valencia County, New Mexico. (1998)

As environmental consultant/project manager for CREC, managed the acquisition of a discharge permit for a sludge land application site at the CREC Sunland Park, New Mexico site. (1994)

As environmental consultant/project manager for CREC, managed the site selection and development of a permit application for the Eddy County, New Mexico regional landfill (Sand Point Regional Landfill). (Permit granted 1994)

As environmental consultant/project manager for Med-Compliance Services (MCS), managed the development of a permit application for a bio-medical waste transfer and processing facility in Albuquerque (Bernalillo County) New Mexico. (Permit granted 1994).

Project required the development of a new processing technology that could meet new state standards.

As environmental consultant to Lower Valley Water District (El Paso County), prepared environmental assessments for Las Azaleas constructed wetlands project. (1993).

As permit consultant to R.R.I., acquired landfill and recycling permits for R.R.I. (NUMEX Landfill) facilities at Sunland Park, New Mexico. (1991).

As project manager for El Paso County, (El Paso County versus State of Texas), coordinated 4 year review of Ft. Hancock site suitability for radioactive waste disposal. Developed technical case for plaintiffs. Plaintiffs prevailed on all 25 factual issues. District court decision upheld plaintiffs. State did not appeal. (1988-1991).

As Director of Special Projects (consulting position) at the Rio Grande Council of Governments, El Paso, Texas responsibilities included development and management of multi-disciplinary projects that focused primarily on land use and site planning issues in the region, e.g., site selection for landfills, industrial parks, experimental energy storage systems, etc., (1989).

As Principal Planner at Sub-Land, Inc. El Paso, Texas responsibilities included management of environmental and economic feasibility studies for large-scale land use projects. (1986-1987).

As a Senior Staff Policy Analyst/Planner at EH & A Environmental Consultants, Austin, Texas was responsible for the design and implementation of land use, environmental/economic baseline and impact studies and other assessments. Also was responsible for various types of specialized studies (regulatory, budgeting and forecasting). Developed and managed computer-based models for environmental planning, e.g. riverine flow impacts on bays and estuaries, predictive models for archeological resources in large scale surveys. (1984-1987).

Expert Witness Experience: Federal and State Court; Regulatory Hearings. (Primary areas – permitting, environmental assessment, environmental remediation/restoration, land use analysis, solid waste facility regulations, municipal services assessment and redistricting). Expert testimony in Administrative/Regulatory Hearings on environmental/land use issues, e.g. RCRA permits, air quality permits, routing of electric transmission lines and water plans.

Academic Experience: Taught courses in site planning, land use management, environmental policy, alternative energy resource investigations, organization theory, industrial expansion analysis, policy typology assessment, public budgeting fiscal planning, anthropology and quantitative sociology.

Experience/Work History:

(Note: Several activities have overlapping/ concurring time frames)

Environmental Consultant/

Utility CCN Review:	Herrera & Boyle, PLLC
	Austin, Texas
	May 2010 to the present

Environmental Consultant/

Utility CCN Review:	Locke, Lord, Bissell and Lydell, PLLC
	Austin, Texas
	December 2009 to March 2010

Environmental Consultant:	Hicks & Co.
	Austin, Texas
	July 2009

Land Acquisition/ Permitting Consultant:	Waste Connections, Inc.
	Folsom, California
	August 2008 to the present

Permitting Consultant:	The Urlacher Group Chicago, Ill August 2008 to the present
Regulatory Consultant:	Project Enhancement Consultants Germantown, Maryland February 2008 to the present
Regulatory Consultant:	Los Alamos National Security, LLC Los Alamos National Laboratory January 2008 to the present
Project Manager:	Waste Connections, Inc. Folsom, CA Adjudicatory Permit Hearing for Camino Real Landfill (Sunland Park, NM) December 2007 (30 day hearing)
Site Suitability Consultant:	Lea County, New Mexico Uranium Enrichment Facility Sites Hobbs, New Mexico August 2007 to the present
Principal Site Investigator:	Eddy-Lea Energy Alliance, Global Nuclear Energy Partnership Site Characterization for Spent Fuel Reprocessing Facility and ARR January 2007-present
Permitting Consultant:	Sundance Oilfield Services, Eunice, New Mexico December 2006-present
Regulatory Consultant:	Ben Barnes & Associates, Austin, Texas October 2006-present
Land Use/ Regulatory Consultant:	City of Clayton, New Mexico May 2006-present
Land Use Consultant:	Lea/Eddy County GNEP Proposal Hobbs/Carlsbad, New Mexico, April 2006-present

Land Use Consultant:	Southwest Landfill Albuquerque, New Mexico February, 2006-present
Regulatory Consultant:	Las Uvas Dairies Hatch, New Mexico January 2006-present
Land Use Consultant:	Carroll, Gross, Reeder & Drews, L.L.P. Austin, Texas, July 2004-July 2005
Systems and Environmental Consultant:	CH2M Hill, Inc., Albuquerque, New Mexico August 2004-present
Regulatory Consultant:	Advanced Technologies and Laboratories, International, Inc. Germantown, Maryland, April 2004-2007
Regulatory Consultant:	Washington TRU Solutions Carlsbad, New Mexico U. S. Dept of Energy WIPP Facility January 2004-present
Regulatory Consultant:	National Enrichment Facility Albuquerque, New Mexico January, 2004 - present
Policy Consultant:	Aquila/Canberra, Inc. Albuquerque, New Mexico July, 2003 - 2006
Land Use Consultant:	New Mexico State Land Office Santa Fe, New Mexico June 2003- July 2005
Regulatory Consultant:	Cogema, Inc. Bethesda, Maryland August, 2002 - 2003
Regulatory Impact Consultant:	Hicks & Co. Austin, Texas January, 2002-present

Regulatory Consultant:	American 3CI Dallas, Texas February 2002-March 2004
Regulatory Consultant:	CTAC Carlsbad, New Mexico U.S. DOE/WIPP Site January 2002-2003
Regulatory Consultant:	Moncrief Oil Company Fort Worth, Texas Wind River Basin Wyoming August 2001-2003
Regulatory Impact Consultant:	Edwards Aquifer Authority San Antonio, Texas June 2000-present
RCRA Permit Consultant: (Sub-title C)	Westinghouse / U.S. Dept. of Energy WIPP Facility Carlsbad, New Mexico September 2000-December 2001
Expert Witness (remediation):	Bramblett & Bramblett El Paso Texas 2000-2001
Environmental Consultant: (Regulatory Compliance)	CRI, Inc. Hobbs, New Mexico January 2000-2006
Environmental Consultant: (Site Assessment)	Raymond G. Sanchez and Bob Desiderio Attorneys at Law Albuquerque, New Mexico February, 2000-February 2001
Environmental Consultant: (Water Development Strategy)	Kemp- Smith Law Firm El Paso, Texas February, 2000-2006
Environmental Consultant: (DOE Policy)	Lea County, New Mexico 1999- April 2000
Environmental Consultant: (Oilfield Contamination)	Chandler and Associates, Lufkin, Tx Spivey & Ainsworth, Austin, Tx

Assessment-Expert Witness)

In Re: Martha Oilfield (Paintsville, Kentucky)
July, 1998-present

**Environmental Consultant:
(Oilfield Contamination
Assessment-
Expert Witness)**

Phillips Petroleum
Borger Refinery (Tx)
Bartlesville, Oklahoma
1997-1998

**Environmental Consultant:
(Surface Water Protection-
Expert Witness)**

Richey Oil Company
Tyler, Texas
(Project located in Hudspeth Co. Texas)
1997-1998.

**Environmental Consultant:
(Remediation Estimates-
Expert Witness)**

"Triangl" (sic) Equities
El Paso, Texas
1997-1998

**Environmental Consultant:
(RCRA/RAD Regulation)**

Waste Control Specialists, LLC.
Pasadena, Texas 1995-2000

**Environmental Consultant:
(Land Use Analysis)**

Santa Teresa Development, Inc.
February, 1986 to 1994

**Environmental Consultant:
(Landfill Evaluation)**

El Paso County Commissioner's Court
El Paso, Texas
1989 to 1991

Environmental Permit Consultant:

R.R.I. (Waste Disposal)
El Paso, Texas

(Landfill Site Selection, Permitting)

June 1990-present
(Purchased in 1999 by Waste Connections,
Inc.)

**Biomedical Waste Technology Development:
(Regulatory Consultant)**

Med-Compliance Services
El Paso, Texas
February, 1991-1999

**Environmental Consultant:
(Land Use)**

Horizon Environmental Services
Austin, Texas
1995-1996

Director, Environmental Projects:

Rio Grande Council of Governments
El Paso, Texas
March 1987-July, 1989

**Instructor:
(Adjunct)**

New Mexico State University
Land Use Analysis
Las Cruces, New Mexico
1988

Principal Planner

Sub-Land, Inc.
El Paso, Texas
1986-1987

**Senior Policy Analyst / Land
Use Analyst:**

Espey, Huston & Associates, Inc.
Austin, Texas
1984-1986

**Division Chairman:
(Interim)**

Social Sciences
Wayland University
Plainview, Texas
1983

**Lecturer - Budgeting and
Forecasting:**

MPA Program, Texas Tech University
Lubbock, Texas
1983

Research Associate:

Center for Energy Research
Texas Tech University
Lubbock, Texas 1979

Lecturer - Technology Assessment:

Department of Industrial and
Systems Engineering (Doctoral Program)
Texas Tech University
Lubbock, Texas
1979

Assistant Division Chairman:

Public Administration/Systems
Wayland University
Plainview, Texas
1978-1983

**Administrative Head/Interim
Director:**

Computer Services
Wayland College
Plainview, Texas
1976-1978

Instructor - Public Policy:

Department of Political Science
Texas Tech University
Lubbock, Texas
1976

Assistant to City Manager:

City of Plainview, Texas
1976

**Research Assistant, Stochastic
Models:**

Frederick Hartmann, Alfred
Thayer Mahan Professor of
Maritime Strategy
Naval War College
1975

**Instructor- Department of
Anthropology/Sociology:**

Department of Anthropology/Sociology
Wayland College
Plainview, Texas
1971-1974

Research Assistant:

Department of Anthropology/Sociology
Texas Tech University
Lubbock, Texas
1970-1971

Technical Writer:

Litton Industries
Lubbock, Texas
1969

Education: (Major Fields)

PhD: Systems Theory and Environmental Policy
Dissertation Topic – Typological Constructs
(Environmental Policy Issue—Environmental Resources Management)
Texas Tech University
Lubbock, Texas
August, 1985

MA: Anthropology/ Sociology/ Public Policy Analysis
Thesis Topic – Ideal Typology Development
Texas Tech University
Lubbock, Texas
1971

BA: Anthropology / Biology / Journalism
Texas Tech University
Lubbock, Texas
1969

Advisory Committees:

New Mexico Environment Department, Draft Dairy Regulation Advisory Committee, June 2009 to present.

New Mexico Environment Department, Environmental Justice Planning Committee, December, 2003 to 2006.

New Mexico Governor-Elect Bill Richardson Transition Team Chairman (Tri-Chair) for the New Mexico Environment Department, November 14, 2002 to January 31, 2003.

New Mexico Environment Department Radioactive Materials Fees Advisory Committee (Waste Management and Disposal Industry Representative), May 1, 2000 to December 31, 2003.

USEPA Environmental Justice Advisory Council/ SWANA-- Waste Transfer Station Working Group, 1999 to May, 2001

New Mexico Environment Department, Tire Recycling Advisory Committee, 1995-1996

New Mexico Environment Department, Solid Waste Regulations Revision Advisory Committee, August - December, 1993

Rio Grande Council of Governments, Regional Solid Waste Management Plan (Far West Texas Planning Region), 1993

El Paso City/County Consolidated Data Processing Advisory Board - Oversight of computer operations for consolidated system, 1989 - 1991

Awards:

Solid Waste Association of North America (SWANA) Landfill Excellence Award for Best Landfill Operation in North America, 1997 (Coordinated effort for facility operation and evaluation).

Outstanding Contribution Award - Environmental Design Contest, Waste Education Research Consortium, (Los Alamos National Laboratory, Sandia National Laboratory, University of New

Mexico, New Mexico Tech, New Mexico State University and U.S. Department of Energy) May, 1993.

Outstanding Graduate Student Teacher of the Year, Texas Tech University, 1976.

George Mahon Congressional Scholarship Award for Graduate Study of Public Policy, 1974-1975.

Joint Graduate Student/Graduate Faculty Research Grant, "Development of Disaggregative Analysis for Decomposition of Large Data Sets", Texas Tech University, 1974.

Technical Reports/Papers/ Pre-Filed Direct Testimony and Related Documents:

Note: All of the Espey-Huston (EH&A) reports and all of the regulatory assessments prepared for the Edwards Aquifer Authority were prepared in collaboration with multi-disciplinary teams of experts.

"Volume IV: Siting and Land Use" IN THE MATTER OF THE APPLICATION OF CAMINO REAL ENVIRONMENTAL, INC. FOR A SOLID WASTE FACILITY PERMIT FOR THE CAMINO REAL LANDFILL, prepared for WCI, Inc. Folsom, California, March 2006.

"Rhino Landfill Status: Comprehensive Report to Otero County Commissioners," presented on behalf of WCI, Inc., Folsom, California, November 2, 2005.

"Summary and Evaluation of New Mexico Oil Conservation Division Process and Procedure Under OCD Rule 711(B) In Re: Proposed Permits for Solid Waste Disposal for Artesia Aeration and Gandy Marley, Inc., prepared for CRI, Inc. Hobbs, New Mexico, June, 2005.

"Proposed Findings of Fact" In Re: THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING THE APPLICATION OF GANDY MARLEY, INC. TO MODIFY NMOCD PERMIT NO.NM- 01-019... Case No. 13,480, prepared for CRI, Inc. Hobbs, New Mexico, submitted to OCD June 24, 2005.

In Re: APPLICATION OF LCRA TRANSMISSION SERVICES CORPORATION TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 138KV TRANSMISSION LINE IN KENDALL AND BEXAR COUNTIES: SOAH DOCKET NO. 473-04-7609; P.U.C. DOCKET NO. 29684, Expert Testimony presented in HEARING ON THE PROPOSED ALTERNATIVE FOR THE HILL COUNTRY PROJECT, June 27- July 2, 2005.

In Re: APPLICATIONS OF SANDOVAL COUNTY TO EXTEND AND MODIFY SOLID WASTE PERMITS FOR THE SANDOVAL COUNTY REGIONAL LANDFILL BEFORE THE NEW MEXICO ENVIRONMENT DEPARTMENT, Expert Testimony presented on Land Use and Site Suitability Criteria presented on May 11, 2005. (Permits Granted by NMED on June 17, 2005).

In Re: APPLICATION OF LCRA TRANSMISSION SERVICES CORPORATION TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 138KV TRANSMISSION LINE IN KENDALL AND BEXAR COUNTIES: SOAH DOCKET NO. 473-04-7609; PUC DOCKET NO. 29684, Expert Testimony pre-filed on December 8, 2004, Austin, Texas.

In Re: APPLICATION OF LCRA TRANSMISSION SERVICES CORPORATION TO AMEND ITS CERTIFICATE OF CONVENIENCE AND NECESSITY FOR A 138KV TRANSMISSION LINE IN KENDALL AND BEXAR COUNTIES: SOAH DOCKET NO. 473-04-7609; PUC DOCKET NO. 29684, Expert Testimony presented in HEARING ON ADEQUACY OF ROUTES, November 10, 2004, Austin, Texas.

"Siting and Land Use; Volume IV, Sandoval County Landfill Application," prepared for Sandoval County, New Mexico under contract to Gordon Environmental, Albuquerque, New Mexico, July, 2004.

"Regulatory Impact Assessment for Proposed Amendments to Rule 711 (Groundwater Withdrawals), Subchapters E (Groundwater Withdrawal Permits), F (Standard Groundwater Withdrawal Conditions), G (Groundwater Available for Permitting; Proportional Adjustment; Equal Percentage Reduction), L (Transfers), and M (Meters; Alternative Measuring Methods; and Reporting): Rule 715 (Comprehensive Water Management Plan Implementation), Subchapters A (Definitions) and D (Demand Management and Critical Period Management Rules): Rule 702 (General Definitions): Rule 709 (Fees), Subchapter D (Aquifer Management Fees)" prepared for the Edwards Aquifer Authority under contract to Hicks and Co./ Kemp Smith, P.C., San Antonio, Texas, July 2004.

"New Mexico Environment Department: Transition Task Force—Follow-Up Analysis of NMED Issues Raised in December 2002 Transition Team Report" prepared for the New Mexico Governor's Office, Santa Fe, New Mexico, December 9, 2003.

"Regulatory Impact Assessment for Proposed Rules Chapter 711 (Groundwater Withdrawal Permits) Subchapters E (Groundwater Withdrawal Permits), G (Groundwater Available for Permitting; Proportional Adjustment; Equal Percentage Reduction) and K (Additional Groundwater Supplies)" prepared for the Edwards Aquifer Authority under contract to Hicks & Co./ Kemp Smith, P.C., San Antonio, Texas, November 2003.

"Draft Surface Resource Protection Guidelines for Oil and Gas Operations on New Mexico State Trust Lands" prepared for the New Mexico State Land Office, Santa Fe, New Mexico, October, 2003.

"Regulatory Impact Assessment for Proposed Rules Chapter 715 (Comprehensive Water Management Plan Implementation Rules) Subchapters A (Definitions), B (Variance Procedures) and C (Groundwater Conservation and Reuse Rules) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./ Kemp Smith, P.C., San Antonio, Texas, July, 2003.

“New Mexico Environment Department: Transition Task Force Report” prepared for the Hon. Bill Richardson, Governor-Elect, State of New Mexico, Santa Fe, New Mexico, December, 2002.

“Regulatory Impact Assessment for Proposed Rule Chapter 711 (Groundwater Withdrawal Permits) Subchapter J (Aquifer Recharge, Storage and Recovery Projects) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, September, 2002.

“Regulatory Impact Assessment of Alternative Proposed Rule 715 (Comprehensive Water Management Plan Implementation Rules) Subchapter A (Definitions) and D (Demand Management and Critical Period Management Rules) [15 Percent Reduction in Stage IV Critical Period Management Groundwater Withdrawals] prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, September, 2002.

“Regulatory Impact Assessment for Proposed Rule Chapter 713 (Water Quality) Subchapters A (Definitions), B (General Provisions), C (Well Construction, Operation and Maintenance) and D (Abandoned Wells; Well Closures) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, August, 2002.

“Regulatory Impact Assessment for Proposed Rule Chapter 715 (Comprehensive Water Management Plan Implementation Rules) Subchapters A (Definitions) and D (Demand Management and Critical Period Management Rules) prepared for the Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, July, 2002.

“Regulatory Impact Assessment for Proposed Rule Chapter 713 Water Quality; Subchapter A (Definitions) and Subchapter G (Recharge Zone Protection—Phase I Regulated Substance Tank Rules)” prepared for The Edwards Aquifer Authority under contract to Hicks & Co./Kemp Smith, P.C., San Antonio, Texas, June 2002.

“Disposal of Non-Weapons Materials: GTCC Privatization Efforts.” Prepared for Aquila, Inc., July 2001.

“Revised Cost Estimates for Remediation of Contaminated Sites on Cantrell et al. Properties in Johnson and Lawrence Counties, Kentucky (Martha Oilfield)” prepared for the Chandler Law Offices and Spivey-Ainsworth Law Firm, July 5, 2000.

“Final Site Assessment and [14 Day Report] for Maloof Holdings at 100 Industrial Avenue, Albuquerque, N.M.”, prepared for Raymond G. Sanchez and Robert Desiderio. Submitted to the New Mexico Environment Department, UST Bureau, May 19, 2000.

“Disposition of Pre-Subtitle D Landfills”, presented at the SWANA Arid Landfill Symposium, Albuquerque, New Mexico, April 12, 2000.

"Preliminary Cost Estimates for Remediation of Contaminated Sites on Cantrell et al. Properties in Johnson and Lawrence Counties, Kentucky (Martha Oilfield)", prepared for the Chandler Law Offices and Spivey-Ainsworth Law Firm, May 25, 1999.

In Re: APPLICATION FOR SOLID WASTE PERMIT FOR LEA COUNTY REGIONAL LANDFILL BEFORE THE NEW MEXICO ENVIRONMENT DEPARTMENT, Presented Expert Testimony on Land Use and Site Suitability Criteria, Eunice, New Mexico October 15, 2005.

"Permit Application for Lea County Solid Waste Authority Regional Landfill", prepared for Lea County Solid Waste Authority, Lea County, New Mexico, submitted to Solid Waste Bureau, New Mexico Environment Department (NMED), January, 1998 (Permit granted December, 1998).

"Evaluation of Proposed Longo Construction, Inc. Sludge Application Project (27,000 acres) in southern Hudspeth County, Texas", prepared for Harlan Richey, March 1, 1998.

In Re: APPLICATION FOR SOLID WASTE RECYCLING AND DISPOSAL PERMIT FOR CAMINO REAL ENVIRONMENTAL CENTER BEFORE THE NEW MEXICO ENVIRONMENT DEPARTMENT, Presented Expert Testimony on Land Use, Socioeconomics, Demographics, Epidemiological Statistics and Site Suitability Criteria, Sunland Park, New Mexico, June 15, 1997.

"Permit Application for Camino Real Environmental Center Regional Landfill and Recycling Center, (Sunland Park, New Mexico), prepared for RRI, Inc., El Paso, Texas, submitted to Solid Waste Bureau, New Mexico Environment Department (NMED), Nov. 1996. (Permit granted August 1997).

"Changing Patterns in Regulatory Frameworks for Incinerator Technology", presented to National Solid Waste Management Association - Colorado/New Mexico Annual Meeting, Telluride, Colorado, October 11 - 12, 1996.

"Regulation of Incinerator Technology in New Mexico" (joint presentation with New Mexico Environment Department) presented to Interim Committee on Radioactive and Hazardous Waste - New Mexico Legislature, Santa Fe, New Mexico, September 12, 1996.

"Environmental Justice and Landfill Siting in New Mexico", with Hicks & Co. co-author -contract research for C.R.E.C., August, 1996.

"Las Azaleas Constructed Wetlands - Environmental Assessment", prepared for El Paso County, Texas Lower Valley Water District Authority. Submitted to Texas Water Development Board, August, 1994.

"U. S. Bureau of Reclamation as Regional Water Manager - Rio Grande Project", written testimony presented to Senate Sub Committee on Natural Resources (Senator Bill Bradley, Chair) U.S. Senate, Washington, D.C., May, 1994.

"Plainview Independent School District (Hale County, Texas) Redistricting Submission", Prepared for Plainview ISD, Board of Trustees, Submitted to U.S. Department of Justice, Voting Rights Section, August 1993. Pre-clearance Granted.

"Permit Application for Carlsbad/Eddy County, New Mexico Regional Landfill", prepared for Carlsbad/Eddy County, submitted to Solid Waste Bureau, New Mexico Environment Department (NMED), July 9, 1993. (Permit granted 1994).

Nu-Mex Landfill Supplementary Data Report/Documentation of Compliance, Submitted to U.S. Environmental Protection Agency Region 6, Prepared for JOAB, Inc., Sunland Park, New Mexico, May 28, 1993.

"Final Permit Application for Regulated Medical Waste Processing Facility - Albuquerque, New Mexico", prepared for Med Compliance Services, Inc., Submitted to the Solid Waste Bureau, NMED, May 1, 1993. Permit granted January 1994.

"Brownfield Independent School District (Terry County, Texas) Redistricting Submission", Prepared for Brownfield ISD Board of Trustees, Submitted to U.S. Department of Justice, Voting Rights Section, January 1993. Pre-clearance Granted.

"Floydada Independent School District (Floyd County, Texas) Redistricting Submission", Prepared for Floydada ISD Board of Trustees, Submitted to U.S. Department of Justice, Voting Rights Section, December 1992. Pre-clearance Granted.

"Preliminary Site Selection/Site Characterization of Proposed Carlsbad/Eddy County, New Mexico Regional Landfill", Prepared for City of Carlsbad/Eddy County, New Mexico, Submitted to Solid Waste Bureau, NMED, August 10, 1992.

"Draft Permit Application for Bio-Medical Waste Processing Facility - Albuquerque, New Mexico", prepared for Med. Compliance Services, Inc., Submitted to the Solid Waste Bureau, NMED, July 15, 1992.

"Documentation in Support of a Bio-Medical Waste Transfer Facility, Las Cruces, New Mexico", Prepared for Med. Compliance Services, Inc., Submitted to NMED and City of Las Cruces, July 1, 1992.

"Transportation Contingency Plan for Bio-Medical Waste Services", Prepared for Med. Compliance Services, Inc., Submitted to the Solid Waste Bureau, NMED, June 15, 1992.

"Documentation in Support of a Proposal to Provide Bio-Medical Waste Services to the New Mexico Hospital Association", Prepared for Med. Compliance Services, Inc., Submitted to Hospital Services Corporation, May 15, 1992.

"Alternative Redistricting Plans for the City of Brownfield, Texas - City Council Precincts", Prepared for the City of Brownfield, Texas, May 15, 1992. Pre-clearance Granted.

"Alternative Redistricting Plans for the Post Independent School District - School Board Trustee Districts", Prepared for the Post Independent School District (Garza County, Texas), June 30, 1992.

Pre-clearance Granted.

"Land Use Analysis of Proposed Sunland Park Annexation of Santa Teresa Commercial District" - Expert Testimony Before the New Mexico Boundary Commission, January 25, 26, 1992 for Santa Teresa Community Development, Inc.

"Border Environmental Issues", Prepared Testimony Delivered to the New Mexico Secretaries of Environment and Economic Development on Potential Border Crossings at Santa Teresa and Sunland Park, New Mexico, Las Cruces, New Mexico, January 14, 1992.

"Terry County Commissioner's Precinct Redistricting Submission", Prepared for Terry County, Texas, Submitted to U.S. Department of Justice, Voting Rights Section, January, 1992. Pre-clearance Granted.

"Environmental Assessment of Proposed Leviton Site", (Airport Business Park at Santa Teresa, New Mexico), prepared for C. L. Crowder Investment Company, Santa Teresa, New Mexico, September 19, 1991.

"Proposal to Replace MCS Incinerator" (to NMED), Prepared for Med. Compliance, Inc., El Paso, Texas, December, 1991.

"Prepared Testimony on Impacts of Buffer Zones in NMED Proposed Solid Waste Rules", Delivered to New Mexico Environmental Improvement Board - Roswell Hearings, November, 1991.

"Special Use Permit Application for Bio-Medical Waste Processing Facility", submitted to Doña Ana County for Med. Compliance, Inc., El Paso, Texas, September 16, 1991.

Summary of Findings for Nu-Mex Landfill Application Hearing, ("New Mexico Environment Department"), Prepared for JOAB, Inc./Med. Compliance, Inc., El Paso, Texas, August, 1991.

"Compliance Schedule for Bio-Medical Incinerator Pursuant to New Mexico Environment Department Air Quality Control Regulation 2020", Prepared for Med. Compliance, Inc., El Paso, Texas, August 1, 1991.

"Air Quality Permit Application for Proposed Microwave Bio-Medical Waste Processing Facility", Submitted to NMED (Air Quality Control Bureau) for Med. Compliance, Inc. El Paso, Texas, August 1991.