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Attorneys for WDS California II, LLC

**SUPERIOR COURT OF THE STATE OF CALIFORNIA
 COUNTY OF LOS ANGELES**

Coordination Proceeding
 Special Title (Rule 1550(b))

**ANTELOPE VALLEY
 GROUNDWATER CASES**

Included Actions:

Los Angeles County Waterworks District
 No. 40 v. Diamond
 FARMING/IRRIGATION Co.
 Superior Court of California
 County of Los Angeles, Case No. BC
 325201

Los Angeles County Waterworks District
 No. 40 v. Diamond
 FARMING/IRRIGATION Co.
 Superior Court of California, County of
 Kern, Case No. S-1500-CV 254348

Wm. Bolthouse Farms, Inc. v. City of
 Lancaster Diamond
 FARMING/IRRIGATION Co. v. City of
 Lancaster Diamond
 FARMING/IRRIGATION Co. v. Palmdale
 Water Dist. Superior Court of California,
 County of Riverside, consolidated actions,
 Case Nos. RIC 353840, RIC 344436, RIC
 344668

Judicial Council Coordination Proceeding
 No. 4408

SC Case No. 105CV 049053
 Assigned to Hon. Jack Komar

**WDS CALIFORNIA II, LLC'S
 EXCHANGE OF EXPERT
 INFORMATION; DECLARATION OF
 SCOTT K. KUNEY**

CCP Section 2034.210

**Date of Exchange: January 4, 2013
 Trial Date: February 11, 2013**

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2 TO ALL PARTIES IN INTEREST:

3 NOTICE IS HEREBY GIVEN that WDS CALIFORNIA II, LLC (hereinafter "WDS")
4 designates the following expert witness it may call at trial in the above-entitled action:
5

6 **EXPERTS**
7

- 8 1. David Dorrance
9 Western Development & Storage
10 5700 Wilshire Blvd., Ste. 330
11 Los Angeles, CA 90036

12 In addition, WDS may call the following witness to offer expert opinions based on his
13 personal observations and experience related to WDS's current groundwater production for the
14 calendar year 2011 and January 1 through November 30, 2012, and proof of claimed reasonable
15 and beneficial use of water for each parcel to be adjudicated:

- 16 1. David Dorrance
17 Western Development & Storage
18 5700 Wilshire Blvd., Ste. 330
19 Los Angeles, CA 90036

20 WDS also designates any witness whose testimony may be regarded as expert whose
21 name has been revealed by discovery or further discovery in this action, and those experts who
22 may be designated by other parties to this action.

23 Pursuant to Code of Civil Procedure section 2034.280, WDS expressly reserves the right
24 to submit a supplemental expert witness list on January 11, 2013 pursuant to the Court's Case
25 Management Order For Phase 4 Trial dated, December 12, 2012.

26 WDS also reserves its rights, pursuant to Code of Civil Procedure section 2034.310, as
27 well as any and all other constitutional, statutory and/or common law rights it may have, to name
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other experts before trial or to call to testify at trial experts not named, whose testimony is needed to aid in the prosecution of this action and/or refute and rebut the contentions and testimony of any other expert.

Dated: January 4, 2013

THE LAW OFFICES OF YOUNG WOOLDRIDGE, LLP

By: 
SCOTT K. KUNEY, Esq., Attorneys for Cross-
Defendant WDS CALIFORNIA II, LLC

EXPERT WITNESS DECLARATION

I, SCOTT K. KUNEY, HEREBY DECLARE AS FOLLOWS:

1. I am a partner with The Law Offices of Young Woodridge, LLP, counsel for WDS CALIFORNIA II, LLC ("WDS").

2. The matters stated herein are true of my own knowledge, except as to those matters which are stated upon information and belief and, as to those matters, I believe them to be true.

3. The following information is provided pursuant to Code of Civil Procedure section 2034.260.

4. David Dorrance. With respect to Mr. Dorrance, I am informed and believe the following to be true:

(a) Qualifications: David Dorrance is the in-house technical project manager with WDS CALIFORNIA II, LLC. See also, attached Curriculum Vitae marked as Exhibit "A," incorporated herein and made a part hereof by this reference.

(b) General substance of testimony the expert is expected to give:

1. Mr. Dorrance will provide testimony regarding WDS's current groundwater production for the calendar year 2011 and January 1 through November 30, 2012, and proof of claimed reasonable and beneficial use of water for each parcel to be adjudicated.

(c) Mr. Dorrance is available for deposition during January 14-31, 2013, except for the following dates: January 15, 17, 29, 31, 2013.

(d) In accordance with the Case Management Order For Phase 4 Trial, Paragraph 3, there has been no report prepared by Mr. Dorrance concurrent with this designation.

(e) In accordance with the Case Management Order For Phase 4 Trial, Paragraph 7, Mr. Dorrance's file on this matter, and any other materials for inspection, will be produced at least three business days before the date set for his deposition at WDS's place of business or such location as the parties may agree. Such materials will be produced in electronic format.

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Executed this 4th day of January, 2013, at Bakersfield, California.


SCOTT K. KUNEY

PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF KERN

I, ERIN L. LINDSEY, declare: I am and was at the times of the service hereunder mentioned, over the age of eighteen (18) years, and not a party to the within cause. My business address is 1800 30th Street, Fourth Floor, Bakersfield, CA 93301.

On January 4, 2013, I caused the below listed document(s) entitled as: **WDS CALIFORNIA LLC'S EXCHANGE OF EXPERT INFORMATION; DECLARATION OF SCOTT K. KUNEY** to be served on the parties via the following service:

X (BY POSTING) I posted the document listed above to the Santa Clara Superior Court website regarding the Antelope Valley Groundwater matter pursuant to the Court's Clarification Order. Electronic service posting completed through www.scefiling.org.

X (STATE) I declare under penalty of perjury under the laws of the State of California that the above is true and correct.

Executed on January 4, 2013, at Bakersfield, California.


ERIN L. LINDSEY

EXHIBIT “A”

David Dorrance

Western Development and Storage (WDS)

Mr. Dorrance devotes the majority of his time to selecting, evaluating, pilot testing, designing, permitting, constructing and operating water banks, following programs and water transfers throughout the West.

Education

BS Geological Engineering, Colorado School of Mines, 1984

MS Hydrology and Water Resources, University of Arizona, 1989

Thesis: *Seepage Meter and Streaming Potential Studies of Recharge from Upper Lake Mary*

Licenses and Certifications

Registered professional engineer, Texas

Experience

27-years of experience

2001 - Present: WDS, Vice President

1998 - 2001: Azurix, Director Water Resources

1985 - 1998: ENSR Consulting and Engineering

1983 - 1985 Various geologist/hydrogeologist positions Intermountain Resources, Waste Management, Inc. and the Colorado School of Mines - while a student

ASTM Standards and Key Publications

D4696-92(2000) Standard Guide for Pore-Liquid Sampling from the Vadose Zone

D4700-91(1998)e1 Standard Guide for Soil Sampling from the Vadose Zone

L.G. Wilson, D.W. Dorrance, W.R. Bond, L.G. Everett, and S. J. Cullen, 1995, "*In Situ pore-liquid sampling in the vadose zone*", Handbook of Vadose Zone Characterization and Monitoring, Lewis

Compendium of in situ pore-liquid samplers for vadose zone. Dorrance, D.W.; Wilson, L.G.; Everett, L.G.; Cullen, S.J. Washington, D.C. : The Society; 1991. ACS Symposium series - American Chemical Society (465): p. 300-331; 1991

"*A Compendium of Soil Samplers for the Vadose Zone.*" in L.G. Wilson et al (eds.) Handbook of Vadose Zone Characterization and Monitoring, Lewis Publishers, Chelsea, MI (December 1994) (Dorrance, D.W with Wilson, L. G., Everett, Lorne G., and Cullen, Stephen J.) (ICS Contribution #0228-53HW)

Representative Projects

Antelope Valley Water Bank, Kern County, CA (2001 - 2012)

Technical lead for the screening, identification, investigations, pilot testing, permitting, design, construction and operation of a 500,000 AF (100,000 AF/year) water bank in the Antelope Valley northwest of Palmdale, CA.

Madera Irrigation District Water Supply Enhancement Project, Madera, CA (1999 - 2012)

Technical lead to investigate, pilot test and configure a 250,000 AF (55,000 AF/year) water bank.

Semitropic Water Storage District Poso Creek Water Bank, Kern County, CA (2006-2008)

Technical lead to screen, investigate, pilot test and specify the location of recharge basins and flow path wells to supplement the existing Semitropic Water Bank.

North Kern Water Storage District, Kern County, CA (2009-2010)

Technical lead to evaluate the current banking program and assorted planned capital projects and provide recommendations for expanding 3rd party water banking operations.

Palmer Divide Project, Douglas County, CO (2008-2010)

Technical lead for identification, evaluation, permitting, negotiation, configuration and design of a 15,000 AF/year aquifer storage and recovery project entailing injection wells, a 28 mile pipeline and recovery wells.

Irvine Ranch Water District - Kern Delta Water District Water Bank, Kern County CA (2007)

Technical lead to evaluate lands for a new water bank within the existing Kern Delta Water Bank. Work included detailed analysis of Kern Water Bank performance and impacts.

Irvine Ranch Water District Strand Ranch Water Bank, Kern County, CA (2004-2006)

Technical lead to identify, evaluate and select lands for a new water bank adjacent to the north side of the Kern Water bank. Work included detailed analysis of Kern Water Bank performance and impacts.

Irvine Ranch Water District Confidential Water Bank, Kern County CA (2003)

Technical lead to identify, evaluate and select lands for a new water bank adjacent to the existing Rosedale Rio Bravo Water Storage District water bank. Work included detailed analysis of Rosedale water bank performance and impacts.

Delta Wetlands Project (2007-Present)

Technical support to the team that is re-configuring and permitting a project to seasonally store 219,000 AF on islands in the Bay Delta.

Harper Lake Water Supply Project, San Bernardino County, CA (2006)

Technical lead on a project to evaluate water banking opportunities in a sub-area of the Mojave Groundwater Adjudication.

McAllister Ranch, Kern County, CA (2002)

Technical lead on a project to evaluate integration of the ranch into the Pioneer Water Bank.

Cadiz Water Bank (2001-2004)

Team member on a project to advise a group on their investment in the Cadiz Water Bank project.

The Burlington Northern and Santa Fe Railroad Company, Western US (2002 – Present)

Technical lead responsible for identification, quantification, management and regulatory compliance for several thousand water rights, wells and water transfers in every western state.

Butte Water District Fallowing Programs (2002 – 210)

Technical lead for three projects to transfer water generated through fallowing of rice fields. Work included designing, negotiating, permitting, contracting and implementing the programs.

Butte Water District Conserved Water Transfer Program (2002 – 2010)

Technical lead for a project to quantify the amounts and mechanisms for water conservation within the district over the last 25 years. Work included crop and irrigation practice surveys, detailed GIS based estimation of ET and applied water requirements (monthly over 25-years for 15 crop types), development of a monthly water balance over 25 years, evaluation of water use and crop type trends,

evaluation of impacts on groundwater levels, economic analysis of commodities and the value of potential water transfers.

Contra Costa Water District Water Supply Portfolio Project (2005)

Technical lead on a project to analyze, rank and advise the district on options to expand their water supply portfolio through water transfers and water banking.

La Paloma Water Supply-Banking, Kern County, CA (2004)

Technical lead on a project to analyze the ability of the Berrenda Mesa Water District and various water banking agreements to provide sufficient supplies to a power plant. Work included detailed analysis of the Buena Vista Water Storage District and Kern Water Bank operations and impacts.

Root Creek Water District Groundwater Replenishment, Madera County, CA (2004-2007)

Technical lead on a project to evaluate the operations, impacts and water supply reliability improvements caused by a planned groundwater replenishment project.

Pastoria Power Plant Water Banking Agreement (2000-2001)

Technical lead on a project to analyze and negotiate a water banking agreement to secure a reliable water supply for a 750MW-combined cycle power plant. The supply was obtained by arranging several back-to-back contracts for procurement of turn-back pool water and stored water from irrigation districts.

Back-up water supply Analysis (2001)

Technical lead on a project to evaluate the feasibility of using excess hydraulic capacity in the California Aqueduct to convey water banked near Bakersfield to Los Angeles. Work included determining hydraulic limitations in canals, aqueducts, tunnels and hydroelectric plants, evaluating 30-yr of operating data and using stochastic methods to forecast probabilities of being able to convey the water.

Onyx Ranch, Kern County, CA (2008-Present)

Technical lead for management of water resources on a 30,000 acre ranch with senior rights on the Kern River and a variety of irrigation systems. Work includes calculation of applied water requirements of crops and riparian areas.

Farms in Riverside County and Kern County, CA (2010 – Present): Technical lead for estimation of water supply needs and planning of new infrastructure to serve over 17,000 acres of farms growing hay crops, cotton, various row crops, citrus and almonds.

River Garden Farms, Yolo County, CA (2008-2010)

Technical lead for a groundwater substitution conjunctive use project.

Private Investor Group: Former US Filter Lands in Imperial Irrigation District (2003)

Technical lead for a project to evaluate 41,856-acres of agricultural land collectively known as Western Farms. Work was directed towards potential purchase and participation in various contemplated fallowing and water conservation programs, including detailed audits of crop histories and irrigation practices at 335 parcels, estimation of ET and applied water requirements, development of strategies for water conservation and shifting to lower water use crops, development of a detailed, 15-year property management and water transfer plan, taking into account the variety of political and regulatory conflicts, economic analysis of farm commodity and water transfer pricing.

Other Projects

Mr. Dorrance has performed detailed technical/economic analysis of almost every major water banking and water transfer project in California, including the San Geronio Pass Water Agency, Chino Basin, the Kern Water Bank, the Pioneer Projects (North, South, Central), Semitropic (original and stored water recovery unit), Strand Ranch, Rosedale-Rio Bravo, Wheeler Ridge Maricopa, Kern Delta, North Kern, Delta Wetlands, Fresno ID, Castaic Lake RFP, Tejon Ranch, LADWP, Antelope Valley East Kern Water Agency, Mojave Water District, Antelope Valley and others. Mr. Dorrance has been technical lead on a variety of projects which included:

- Development and implementation of a protocol to rehab and optimize 500+ wells;
- Prioritization of repairs to 100 miles of aqueducts
- Inspection/testing of 90-yr old aqueducts
- Cost/benefit analysis on options to increase aqueduct hydraulic capacities
- Increase the hydraulic capacity for surface water intakes
- Selection and installation of regional metering systems
- Set up the organizational responsibilities and priorities for a water resources group serving 65 towns and 1.3 million people.

Other Projects

Sector	Location	Services	Regulatory	Description
Environmental				
Manufacturing	Gastonia NC	Permitting O&M Remediation	RCRA CAA NPDES	<p>Textron/Homelite: RCRA Compliance and Remediation</p> <p>The facility has 3 closed RCRA landfills, a chlorinated solvent plume that has migrated under residential areas and obligations to remediate soil contamination. Mr. Dorrance won, managed and was hydrogeologist for a project which included:</p> <ul style="list-style-type: none"> • O&M of an 18 well pump-and-treat system covering several square miles; • O&M of 2 SVE systems; • Monitoring and reporting from 100+ wells; • CAA, RCRA and NPDES permitting; • UST remediation; • A large RFI; • Construction of new treatment systems which do not use electricity; • Installation of telemetry systems; • RCRA landfill maintenance; • Sewer investigations; • Numerous agency negotiations; • Construction of a database which automatically generates agency reports; • Capture zone, mass recovery and O&M analysis linked to financial models; and • Use of enhanced recovery methods such as hydrofracturing.
Manufacturing	Greer NC	Risk Assessment Fate & Transport Remediation Public Relations Cost benefit Permitting	State level RCRA CERCLA	<p>Homelite/Textron: DNAPL Remediation and Litigation</p> <p>The facility has released DNAPL, TCE and hexavalent chromium causing a plume which is >0.5 mile long and >500 feet deep with impact to off-site surface water. Mr. Dorrance was project manager and hydrogeologist on a project which included:</p> <ul style="list-style-type: none"> • Cost-benefit analysis of remediation versus containment; • Technical impracticability demonstrations; • Risk assessment; • 5 miles of seismic refraction work to optimize the locations and numbers of wells; • 3-dimensional groundwater modeling; • Numerous nested, stainless steel well installations up to 500 feet deep; • Packer testing; • Slug and aquifer tests; • Hydrofracturing; • Agency and impacted party negotiations; • Natural attenuation demonstrations; • Leachability analyses; • Horizontal and vertical SVE wells; • Evaluation of 15+ advanced remediation technologies; • Dig and haul; • Design and installation of large scale pump and treat; • Customized project database for all prior and future work at the site; • Petrex surveys; • CAA, RCRA, POTW and NPDES permitting; • Litigation support; • On-going monitoring and reporting; • Geochemical modeling of hexavalent chromium transport; • Public relations; and • Pilot testing.
Manufacturing	Townsend SC	Remediation O&M Database	CERCLA NPDES	<p>Textron Townsend Saw Chain Site: O&M of groundwater remediation system</p> <p>Mr. Dorrance was project/task manager on a project to operate a large pump and treat system for hexavalent chromium releases that had migrated over several square miles. Work included operations, monitoring, reporting and permitting, including construction of a database that automated reporting and system auditing.</p>
Industrial	Barnwell SC	Risk assessment Modeling	CERCLA	<p>Textron Shuron Site: CERCLA RI/FS</p> <p>Mr. Dorrance was hydrogeologist to perform aquifer tests, leachability studies and groundwater modeling of metals and organic chemicals discharging to wetlands.</p>

Sector	Location	Services	Regulatory	Description
Manufacturing	Sanford NC	Litigation Fate & transport	State level	Fabco/Textron: Soil and Groundwater Investigations Textron had retained liability associated with releases to soils and groundwater prior to sale of the facility several years ago. Significant releases of chlorinated organic compounds had been detected, but it was unclear if the detected releases had occurred prior to or after the sale. Mr. Dorrance was project manager for work which demonstrated that releases had occurred after the sale and resulted in release of Textron from future remedial obligations.
Microelectronics	Winston-Salem NC	Permitting Risk assessment Remediation O&M	RCRA CAA NPDES UST	AT&T/Lucent: RCRA Corrective Action The facility has released chlorinated solvents and fuel oil to soils and groundwater. Mr. Dorrance was task manager and hydrogeologist on a multi-million dollar project to choose, design, install and operate bioremediation, bio-slurping, SVE and pump-and-treat systems. The project included risk assessments, automated treatment systems, custom databases and RCRA, NPDES and CAA compliance.
Microelectronics	Mesquite TX	Natural Attenuation	RCRA	AT&T: Fate & Transport Evaluation Mr. Dorrance performed geostatistical analyses of PCE transport and biodegradation (reductive dehalogenation) in the vadose zone and in a shallow, fractured clay groundwater zone. He demonstrated that natural processes are effectively remediating PCE and its daughter products TCE, DCE, and VC.
Specialty chemicals	Mt. Holly NC	Remediation Compliance Permitting Risk assessment	RCRA CERCLA	Clariant: RCRA Compliance and Remediation Mr. Dorrance was project manager, hydrogeologist and RCRA specialist on a project to prioritize closure and remediation of 40-miles of 90-year old sewers which had leaked chlorinated solvents and aromatic compounds. Work included optimization of existing pump-and-treat systems, inspection/ranking of the entire sewer system, and detailed agency negotiations for phasing of work over several years.
Pulp and paper	Franklin VA	Permitting Closure remediation	RCRA	Union Camp: RCRA Closures Mr. Dorrance was RCRA specialist on a project to close over 40 SWMUs at one of the nations largest pulp and paper mills. Work included voluntary closure of 6 ponds and design of a site-wide, risk based decision tree for prioritizing work on the remaining SWMUs. Mr. Dorrance's strategy was implemented in full.
Chemical	Freeport TX	Containment	RCRA	Dow Chemical: Groundwater Containment Mr. Dorrance was project manager and hydrogeologist on a project to quantify groundwater leakage through sheet pile walls. The project included installation of a 50 foot square sheet pile enclosure, installation of 14 observation wells, 2 pump tests (before and after wall installation) and groundwater modeling. The project resulted in an inexpensive, simple procedure for estimating groundwater flux through existing sheet pile walls.
Chemical	Freeport TX	LNAPL Remediation	RCRA	Dow Chemical: LNAPL Remediation Mr. Dorrance was hydrogeologist on a project to investigate, model and design an LNAPL interception system. The project included evaluation of tidal influences, pilot testing and multi-phase modeling using the programs SPILLVOL and ARMOS.
Specialty chemical	Charlotte NC	Natural Attenuation Compliance Soil remediation Risk assessment	State Level	BASF: Soil and Groundwater Remediation Mr. Dorrance was project manager and hydrogeologist on a project to investigate and remediate chlorinated solvent releases. Work included field laboratories, seismic surveys, cone penetrometer surveys, 3-D modeling, leachability testing, risk assessment, negotiation of natural attenuation. The team prevented regulation under RCRA by demonstrating that soil was not contaminated with listed or characteristically hazardous wastes. Compiled the first non-RCRA alternate clean-up levels for solvents in soils in the Charlotte area. Demonstrated to adjacent landowners that the plume underlying their property would not advance further - thus preventing litigation.
Fabrics plant	Mebane NC	Remediation Permitting O&M Public relations	NPDES	BASF: Groundwater Remediation Mr. Dorrance was project manager and hydrogeologist on a project to design, install and operate expansions to a pump-and-treat system for chlorinated solvents. The project included: seismic refraction surveys, modeling, cost/benefit analyses, risk assessment, public relations, installation of recharge galleries, leachability evaluations, O&M and NPDES permitting.
Industrial	New Jersey	Well installation	RCRA	Union Carbide: Installation of complex wells Mr. Dorrance was project manager and hydrogeologist on a project to install large diameter, telescoping wells through several aquifers contaminated with potentially pure vinyl chloride. Work included continuous GC monitoring for VC, Level B operations and on-site negotiation of well design with agencies as work proceeded.
Manufacturing	Davidson NC	Natural attenuation Risk assessment Modeling	State level	Ingersoll-Rand: Natural Attenuation Demonstration Chlorinated organic compounds were released to soils and groundwater adjacent to a lake that is the water supply for Charlotte, NC. Mr. Dorrance was the project manager and hydrogeologist on a project that developed a Corrective Action Plan based entirely on natural attenuation. The plan, supported by detailed fate & transport modeling, demonstrated that the plume would be remediated by natural mechanisms at a similar rate to active remedial systems. The plan was approved by the agency with no comment or changes.

Sector	Location	Services	Regulatory	Description
Manufacturing	Angola IN	Remediation Cost/benefit Fate & transport	Voluntary	Ingersoll-Rand: Groundwater remediation Mr. Dorrance was hydrogeologist to audit performance of a large sparge/SVE system removing chlorinated solvents from soil and groundwater. Mr. Dorrance's work was used to optimize operations and determine when natural attenuation would be sufficient to complete remediation.
Fabrics	Raleigh NC	Remediation Cost/benefit Fate & transport Phyto- remediation	State program	Athol: Soils and groundwater corrective action plan Mr. Dorrance was manager and hydrogeologist on a project to evaluate, select and conceptually design remediation systems for an aromatic compound release that had migrated beneath residential areas and was discharging to a stream. The chosen system included phased excavation, capping, LNAPL recovery, a bio-sparge trench and phytoremediation at the leading edge.
Industrial Municipal	Neville Township PA	Water Supply Modeling Risk assessment	CERCLA	Ohio River Site: CERCLA RI/FS This site is an island in the Ohio River where chemicals and metals were disposed over several decades. Mr. Dorrance modeled contaminant releases to groundwater and surface water to determine the amount of contamination that could migrate to municipal water supply wells. Simulations indicated that the majority of contamination is discharged to the river and it is unlikely that municipal wells will be impacted.
Manufacturing	San Diego CA	Remediation Risk Assessment Modeling	CERCLA	Solar Turbines: CERCLA RI/FS Mr. Dorrance negotiated and performed groundwater modeling of chlorinated solvent spills at a facility on San Diego Bay. Work included 3-D flownets statistically generated from tidal influence monitoring. Work demonstrated that there was no significant impact to the Bay and that interception of releases prior to discharge was not required.
Municipal	Denver CO	Construction Remediation Compliance	State level	Waste Management: Landfill Expansion and Remedial Action Mr. Dorrance was a project engineer for removal and treatment of 3 million gallons of leachate from a refuse-filled alluvial valley. He also surveyed and directed construction on expansion pits and a 100-year flood detention pond with a synthetic liner.
Mining Municipal	Milltown MT	Risk Assessment Modeling	CERCLA	Milltown Superfund Site: CERCLA FS Mr. Dorrance designed field and interpretation programs for a portion of the nation's largest Superfund site. Sediments behind a reservoir have leached arsenic to a regional aquifer, causing a plume that covers several square miles. Work included 3-D flownets, geochemical modeling, and animation to evaluate contaminant management techniques.
Industrial	Crosby TX	Remediation Design Modeling	CERCLA	French Limited Task Group: CERCLA Remediation Mr. Dorrance designed the conceptual lay-out of a multi-aquifer remediation system including 102 withdrawal wells and 28 injection wells. Work included quantification of groundwater flow across a sheet pile wall, pressure pulse tests, pilot vacuum-enhanced pumpage, pressure injection of clean water, and tracking of a bromide tracer. Interpretation included cross-sectional particle tracking, three-dimensional flow modeling and two-dimensional transport modeling.
Minerals	Castle Hayne NC	Remediation O&M Optimization	RCRA	Occidental Chemical: - Groundwater Remediation Project manager for optimization, interpretation and agency reporting of a 100+ well pump-and-treat system for hexavalent chromium. Work included geochemical modeling and automation of interpretation and reporting.
Chlor-alkali	Rieglewood NC	Permitting Remediation	RCRA	LCP Chemicals/Holtrachem: RCRA ACL and Groundwater Remediation Mr. Dorrance was project manager and hydrogeologist to design groundwater remediation systems for mercury releases. An ACL demonstration was used to limit the time that the system will be required to operate.
Chemical	Houston TX	Permitting Fate & transport	RCRA	GATX Terminals Corporation: RCRA Groundwater Assessment Senior hydrogeological engineer to measure the movement of multiple LNAPL, DNAPL and aqueous contaminant plumes through two aquifers discharging to the Houston Ship Channel. Field activities included a tidal influence study and aquifer tests. Interpretation included multivariate statistical analyses of fluid levels, derivation of multiphase flow equations, and analytical contaminant transport modeling. The Texas Water Commission stated that the resulting report was the best organized and most comprehensive effort submitted to that agency.
Chemical	Houston TX	Remediation Cost/benefit DNAPL recovery	RCRA	GATX Terminals Corporation: RCRA Corrective Measures Study Senior hydrogeological engineer to design a groundwater compliance plan. Activities included operation and evaluation of a pilot DNAPL recovery system and cost comparison of 15 different technologies. The plan included contaminant source removal, risk assessment, and interception of contaminants discharging to the Houston Ship Channel.
Industrial	Rock Hill SC	Remediation Permitting Fate & transport LNAPL recovery	RCRA	ThermalKEM/Phillip: RCRA Corrective Action The facility has released chlorinated solvents, metals and fuel oil to soils and groundwater. Mr. Dorrance was project manager and hydrogeologist to negotiate, design and install a horizontal well system for triple phase (dissolved, free-phase and vapor) recovery. The project included an RFI, custom databases, risk assessment and cost/benefit analysis of environmental liabilities during sale of the facility.

Sector	Location	Services	Regulatory	Description
Industrial	Greensboro NC	Permitting	RCRA	Ecoflo: RCRA Part B Permit Mr. Dorrance wrote and negotiated the Part B RCRA Permit application for a treatment and storage facility that accepts a variety of listed and characteristic hazardous wastes. The permit was issued on time with no NODs and no substantial agency comments.
Hazardous waste incinerator	Woodland NC	Permitting Public relations Water supply Wastewater	RCRA NPDES	ThermalKEM: New hazardous waste incinerator permitting Mr. Dorrance was task manager for planning and permitting water supplies and a zero discharge NPDES permit for a new hazardous waste incinerator. His responsibilities included presentations during public meetings.
Manufacturing	MS	Compliance	RCRA	Confidential Client: RCRA Compliance and Sewer System Strategizing Mr. Dorrance developed RCRA strategies for an old manufacturing facility with brick and clay pipe sewers that leaked chlorinated solvents, toluene and hexavalent chromium.
Petroleum	Lockport IL	Closure Remediation Decommission	RCRA	Texaco Refining and Marketing: RCRA Closure Onsite QA/QC Manager for a multimillion-dollar closure of 5 hazardous waste landfills at an inactive oil refinery. Closure involved consolidating all wastes into a 1-mile circumference landfill and grout injection into fractured dolomite bedrock.
Petroleum	Port Arthur TX	Groundwater monitoring Permitting	RCRA	Texaco Refining and Marketing: RCRA Part B Permit Application Designed, implemented, and interpreted a groundwater investigation for a 5,000-acre refinery with hazardous waste landfills, landfills, unlined lagoons, and wastewater treatment facilities.
Environmental: Miscellaneous				
Agency	USA	Publication	Standards	American Society for Testing Materials: Standards for Vadose Zone Investigations Co-wrote (with L.G. Wilson) national standards for performing investigations in the vadose zone.
Agency	USA	Publication	Standards	Corps of Engineers: Engineer Design Manuals Co-author on 3 manuals for design, installation and operation of wells, SVE systems and landfill off-gas collection systems. These manuals are used nation-wide and can be downloaded from the Internet.
Industrial	USA Germany	Remediation Cost/benefit Compliance	RCRA CERCLA UST NPDES	Remediation System Audit Protocol Mr. Dorrance developed an integrated method of evaluating and optimizing O&M of remediation systems by linking OPEX/CAPEX decisions to transport, mass balance and NPV based financial models. Numerous clients and the Corp of Engineers adopted the protocol.
Industrial	USA	On-line database E-commerce	CERCLA	Cleanup Level Corporation: On-Line Database/GIS System Mr. Dorrance is the president of the only company that provides on-line access to approved cleanup levels for over 10,000 sites around the country. The site includes real-time queries, complete RODs and GIS.
Legal	USA	Peer review Strategizing Depositions	RCRA CERCLA State	Various Legal Clients: Litigation support Mr. Dorrance provided litigation support on 10-20 projects around the country. His work included critique of work by others, fate & transport modeling, expert testimony and developing points of negotiation between parties.
Commercial	USA	Property transfer Remediation	UST	Various Clients: Leaking Underground Storage Tank Investigations Project Manager for numerous environmental audits. Used geophysical techniques, records searches and interviews to assess potential liabilities for both sellers and buyers due to leaking underground storage tanks and past practices. Developed and implemented plans to remediate contaminated soils, remove underground storage tanks, treat contaminated groundwater and perform vapor recovery.
International Privatizations and Acquisitions				
Municipal	Valpariso Chile	Privatization Valuation Forecasting Risk management Due Diligence	Environ. Sanitary Water rights Air Solid waste	Water Utility: Privatization Bid for ESVAL Mr. Dorrance was development engineer for evaluating assets, risks and demand associated with a water/wastewater utility serving 1,300,000 people. Work included inspection of systems, personnel interviews, OPEX/CAPEX proformas, evaluation of technical/regulatory/market risks, contribution to a valuation model, development of a water rights strategy and forecasting 30-yr demands for water/wastewater services.
Municipal	Santiago Chile	Privatization Valuation Forecasting Risk management Due Diligence	Environ. Sanitary Water rights Air Solid waste	Water Utility: Privatization Bid for EMOS Mr. Dorrance was lead engineer for evaluating assets, risks and demand associated with a water/wastewater utility serving 5,500,000 people. Work included inspection of systems, personnel interviews, OPEX/CAPEX/labor proformas, evaluation of technical/regulatory/market risks, contribution to a valuation model, development of a water rights strategy and forecasting 30-yr demands for water/wastewater services.
Municipal	Santiago Chile	Privatization Valuation	Environ. Sanitary	Privately Owned Water Utility: Acquisition of Aguas de Manquehue Mr. Dorrance was lead engineer for evaluating assets, risks and demand associated with a

Sector	Location	Services	Regulatory	Description
		Forecasting Risk management Due Diligence	Water rights Air Solid waste	water/wastewater utility serving 10,000 people. Work included inspection of systems, personnel interviews, OPEX/CAPEX proformas, evaluation of technical/regulatory/market risks, contribution to a valuation model, development of a water rights strategy and forecasting 30-yr demands for water/wastewater services.
Municipal	Posadas Argentina	Privatization Valuation Forecasting Risk management Due Diligence	Environ. Sanitary Water rights Air Solid waste	Water Utility: Privatization Bid for APOS Mr. Dorrance was lead engineer for evaluating assets, risks and demand associated with a water/wastewater utility serving 175,000 people. Work included inspection of systems, personnel interviews, OPEX/CAPEX proformas, evaluation of technical/regulatory/market risks, contribution to a valuation model, development of a water rights strategy and forecasting 30-yr demands for water/wastewater services.
Municipal	Buenos Aires Argentina	Privatization Valuation Forecasting Risk management Due Diligence	Labor laws	Regional Water Utility: Privatization Bid for AGOSBA Mr. Dorrance estimated labor costs associated with a water/wastewater utility with 1,200 employees serving 1,300,000 people. Work included personnel interviews, evaluation of union, technical/regulatory/market risks, contribution to a valuation model, development of a work force reduction strategy and forecasting 30-yr staffing needs.
Municipal	Rio de Janeiro Brazil	Privatization Valuation Forecasting Risk management Due Diligence	Environ. Sanitary Water rights Air Solid waste	Regional Water Utility: Privatization Bid for CEDAE Mr. Dorrance estimated environmental compliance costs associated with a water/wastewater utility serving 10,000,000 people in 65 towns. Work included analysis of current and emerging regulations, forecasting required investments and impacts on OPEX.
Industrial Municipal	Brazil	Privatization Valuation Forecasting Risk management Due Diligence	Environ. Sanitary Water rights Air Solid waste	Privately Owned Water Utility: Acquisition of AMX/Geoplan Mr. Dorrance was lead engineer for evaluating assets, risks and demand associated with a water/wastewater utility serving over 40 industrial facilities and several towns. Work included inspection of systems, personnel interviews, OPEX/CAPEX proformas, evaluation of technical/regulatory/market risks, contribution to a valuation model, development of a water rights strategy and forecasting 10-yr demands for services.