Multiple Fuel Releases Impacting a Community Water System's Well Field in Rural Town of Julian, California

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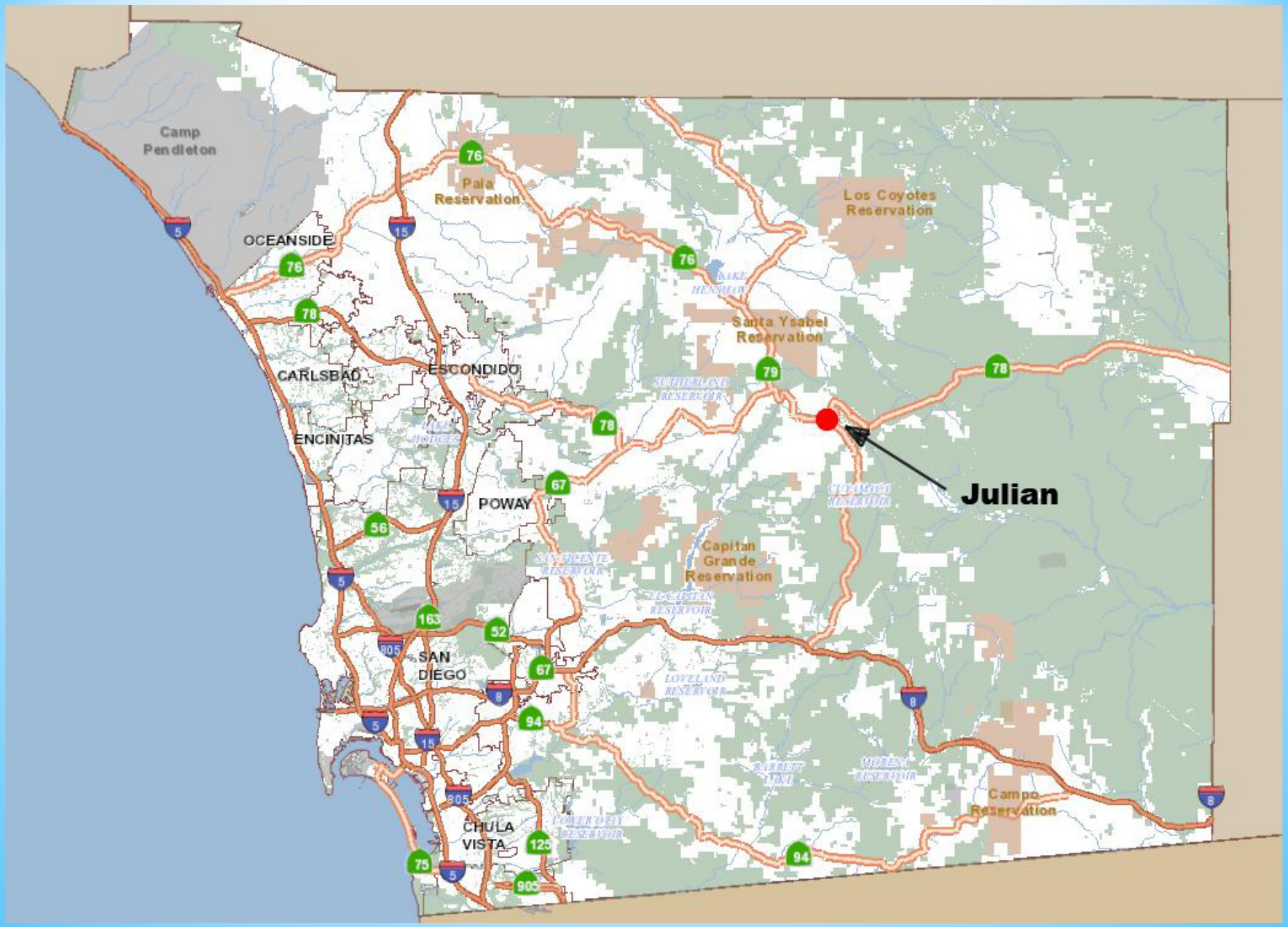
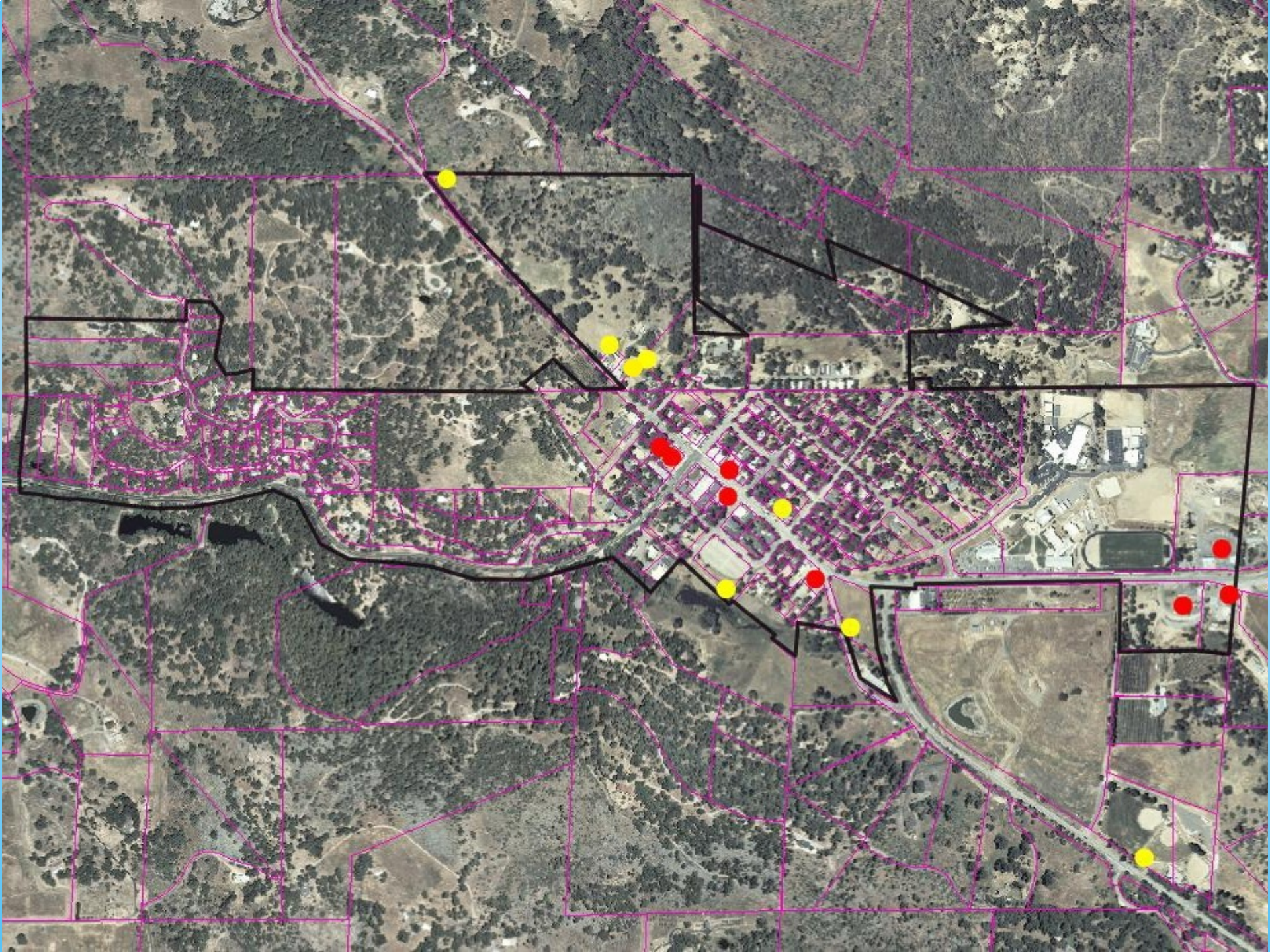

Camp Pendleton
Pala Reservation
Los Coyotes Reservation
OCEANSIDE
LAKE HENSHAW
Santa Ysabel Reservation
CARLSBAD
ESCONDIDO
SUTHERLAND RESERVOIR
ENCINITAS
Julian
POWAY
CUYAMACA RESERVOIR
Capitan Grande Reservation
SAN VICENTE RESERVOIR
EL CAPITAN RESERVOIR
SAN DIEGO
LOVELAND RESERVOIR
BARRETT LAKE
MODESKA RESERVOIR
Campo Reservation
CHULA VISTA
LOWER OTAY RESERVOIR



History of Julian

* In January 1870, gold was discovered by A.H. Coleman.
* In March 1870, approximately 1,000 miners moved into the area.
* This influx of minors resulted in approximately 100 claims and 60 working mines.
* By 1872, the town had over 50 homes, 3 hotels , 2 restaurants, one school and a large number of saloons.
* Most mining was completed by the 1880s with some mining activities from the 1930s to the 1950s.
* Production from the Julian and Banner area has been estimated to be around 4 to 5 million dollars of gold.

Town of Julian

Main Street looking Northwest

Main Street looking Southeast

Julian News – 6/30/1989

Town Drips Dry As Water Crunch Worsens

by Hank Garfield

Paper plates and portajohns will be the rule in downtown Julian for a while in the wake of a water scarcity scare last week that left several residents without running water for two days.

At an emergency meeting last Thursday night called by the Julian Community Services District (JCSD), the proprietors of town businesses were told to make every effort toward conserving water during what promised to be the driest summer in recent memory. The JCSD board of directors had told business owners the day before that water service to the townsite would be shut off during business hours on Thursday, but board chairman Dick Dickmann said they changed their minds late Wednesday night, and called the emergency meeting instead.

"Our biggest problem is that there's no water down there," Dickmann told the approximately 75 people at the meeting. "We don't have the water in the ground to bring it up and give it to you people."

Dickmann, members of the board, and water plant operator Harry Seifert explained to the group what had happened: the level of water in the tanks had dropped to a level insufficient to produce enough pressure to pump water to homes in higher elevations of the Julian townsite. Seifert said that the JCSD's wells were producing 61 gallons per minute, and that customers in the district were using that water at a rate of 60 gallons per minute. "The water in the tanks is virtually depleted," Dickmann said.

Several of those in attendance expressed dismay that the board had not informed them earlier of the existence of a potential crisis. Jim Huie, manager of the Julian Lodge, said he spent several hours on the phone warning people with reservations of the potential for a waterless weekend. Many of those people cancelled, he said, but the Lodge made up for the lost business due to walk-in customers.

"Business-wise, it didn't hurt us, but it could have been disastrous," he said.

Huie said he was notified Wednesday afternoon by a member of the board that water would be shut off that night, and then was further notified that those hours would be extended. He was never told, he said, that the board had changed its decision.

"It was the way it was handled that upset us," he said.

Mike Ciuffreda, owner of the Julian Cafe, likewise said he was not told that the water would not, in fact, be shut off. The Julian Cafe was closed

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New Moratorium Contemplated

The Julian Community Services District's board of directors, alarmed at California's prolonged drought and its effect on local water supplies, will consider the imposition of a new moratorium on water hookups at its next meeting Wednesday, July 12.

Board president Dick Dickmann, though not predicting whether or not the proposed moratorium would be enacted, said that the board is considering an "indefinite" ban on new hookups, which the board could lift whenever the water situation improves.

Dickmann said that three applicants currently have applications pending for new water hookups. Those applicants will have sixty days, should the proposed moratorium be enacted, to pay the required fee to the JCSD in order to obtain water service, Dickmann said.

A previous moratorium, which lasted for 18 months, was lifted in August of 1988. That moratirium was brought about by a study funded by the JCSD which seemed to indicate that water reserves for fire protection in the Julian townsite were inadequate. But water plant operator Hary Seifert said that although the townsite was possibly endangered during the recent water crisis, fire reserves are now up to 90 percent of where they should be according to County regulations.

Dickmann and Seifert each said that while the JCSD might not have adequate fire reserves on hand at the moment, other sources of water are available in the event of a fire emergency. "We have other resources at our disposal," Seifert said.

Water System Capacity & Drought Conditions

Julian Community Services District (JCSD) in 1989:

* Had three operating supply wells in downtown Julian (JCSD-1, JCSD-2 and JCSD-8) in the well field.
* JCSD was experiencing system capacity issues with the water table dropping significantly as summer approached.
* The County began receiving complaints about periodic chemical odors in the water from residents.

Julian News – 7/28/1989

Water Woes Return With Moratorium

by Hank Garfield

The Julian Community Services District, acting on the advice of the San Diego County Health Department, has imposed a new moratorium on water hookups within its boundaries.

The action was taken at a special meeting of the JCSD board of directors on July 17. Board chairman Dick Dickmann said that the moratorium would go into effect thirty days from that date, August 16.

"The moratorium is indefinite — until we either drill more wells or have more rainfall," Dickmann said.

Dickmann added that the well at Z & C Stonewall Stores is now on line and providing water to the district. A new well is currently being tested and should be in service by the end of August, Dickmann said.

The JCSD has several applications on file for new water hookups. Dickmann said that those applicants will have 60 days from July 17 to pay their fees to the district, Those who pay on time will be hooked up, he said.

The JCSD encompasses an

continued on page 6

Water System Capacity

JCSD took several actions to address the system's capacity issues:

* Added a private well (Z&C Well [JCSD-10]) as a supplemental source in the late summer of 1989.
* Added a new source well (JCSD-8) near existing well JCSD-2 in the area northwest of the fuel release.
* Began long range plans to develop a new well field outside of town.

AB1803 Water Quality Testing

* The County regulated the JCSD water system as a Small Drinking Water System at the time of the release.
* The County was implementing the AB1803 Water Quality Testing program.
* The primary supply well, JCSD-1, was included as part of that program.
* The well was sampled on June 19, 1989.
* Lab report identified the following:

  196.4 µg/l - Benzene

  12.2 µg/l - Toluene

  31.9 µg/l - Ethyl-Benzene
* In follow-up sampling at the High School, benzene was measured at 30 µg/l in the distribution system.

County Environmental Health Public Notification of Fuel Impacted Water Supply

COUNTY OF SAN DIEGO

news release

PUBLIC AFFAIRS OFFICE • DEPARTMENT OF HEALTH SERVICES
P.O. BOX 85524 • SAN DIEGO, CALIFORNIA 92138-5524

FOR IMMEDIATE RELEASE
August 31, 1989

Contact: Dan Avera
(619) 338-2395

JULIAN WATER DISTRICT CUSTOMERS ASKED TO USE BOTTLED WATER

As a precautionary measure, customers of the Julian Community Services District are being asked to use bottled water until further notice, according to word from County Health Services. The advisory came after one of the seven wells serving the district was found to be contaminated with benzene, a component of gasoline. The chemical is not known to pose an acute or immediate health hazard at the levels detected. However, benzene may cause cancer if exposure is long-term and, therefore, it is on the state Safe Drinking Water and Toxic Enforcement Act's list of known carcinogens.

Emergency Treatment System

* JCSD-1 was shut down on August 24, 1989.
* Chevron provided bottled water and trucked in water to businesses and residences.
* Chevron installed a VOC treatment system on September 8, 1989.
* System went into operation on September 8, 1989.
* Distribution testing indicated the system was free of VOCs on September 12, 1989.
* Bottled water order was lifted on September 13, 1989.

Julian News – 9/8/1989

Julian News
9-8-89

Trucks Roll; Water Supply Holds Out Through Labor Day

9-8-89

by Hank Garfield

The Julian Community Services District, already struggling with the prolonged drought and reeling from a financial scandal, received the third blow of a triple whammy last week when it learned that one of its wells was contaminated with the hydrocarbon benzene, a component of gasoline known to produce hazardous health effects.

The well, which JCSD officials said was producing one third of the district's water, was immediately shut down, and it is likely that the town would have run out of water over the busy Labor Day Weekend had not Chevron U.S.A., Inc. stepped in with a massive effort to truck in water from Palomar Mountain.

According to Susan Meusel, an engineer with Chevron's regional Marketing Operations, the company had supplied 174,000 gallons of water by the end of the Labor Day weekend. "We've been running the trucks around the clock," she said.

Chevron was also providing bottled water to all businesses and residents within the district, as the County Health Department has advised against drinking the town's water. The local Volunteer Fire Department and Lion's Club assisted in the deliveries. The fire department used its trucks to transfer water from the tanker truck which

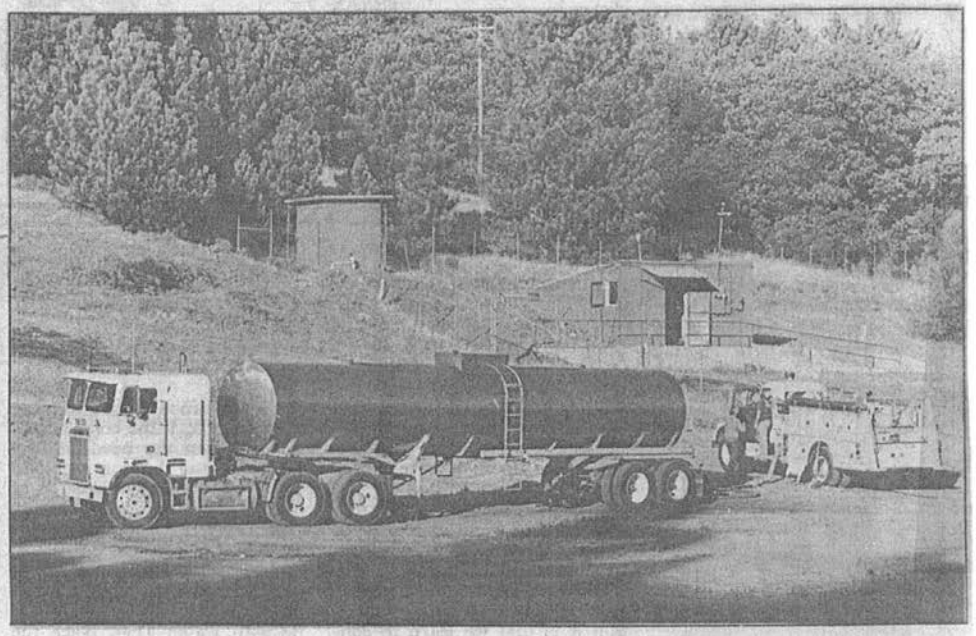
In a letter mailed to its water customers on August 24, the JCSD said in part: "The County Environmental Health Services has determined that the contamination does not pose an acute or immediate health hazard but may pose some possible long term health effects if

January of this year. The bill, he said, "provided funding from the state to help the Julian Community Services District and other small water districts." Two wells were tested; one was found to be contaminated.

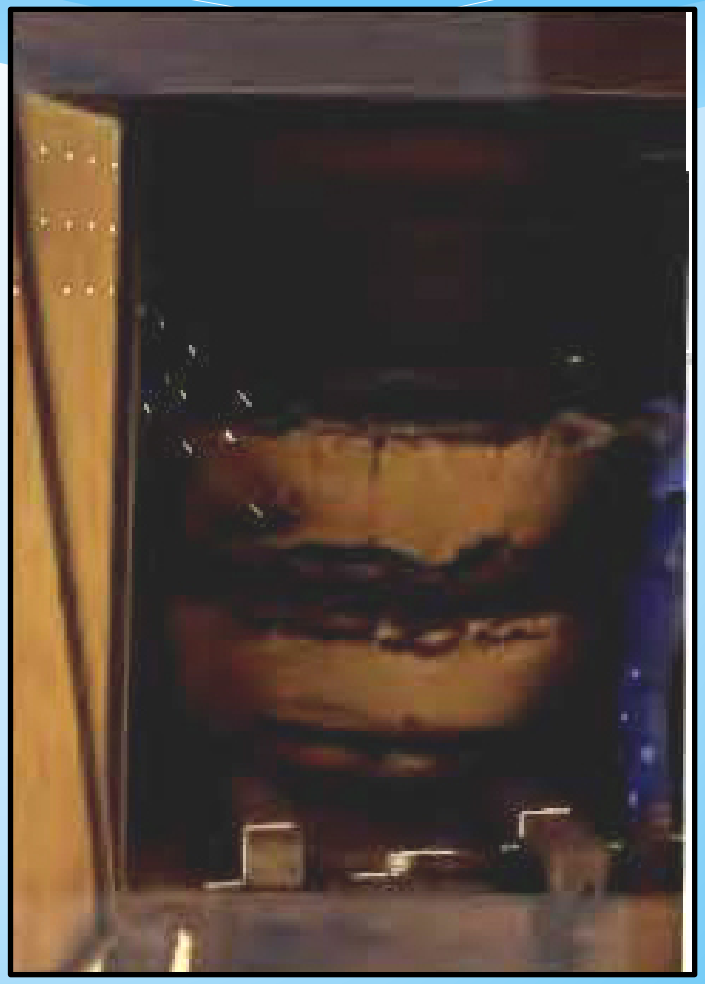
"We are investigating the possible sources" of the contamina-

the Chevron station.

According to Meusel, the goodwill gesture has cost Chevron in excess of $125,000. In addition to the hauled water, Chevron will also provide a filtration system, which was due to be installed earlier this week. Meusel said the well should be



Iron and Manganese Treatment



Sand Filter and Chlorination Treatment

Emergency VOC Treatment

JCSD Well Field
Former Chevron Station
Julian Auto Parts
Julian Cider Mill
Former Norms Service

Chevron Service Station Site Initial Evaluation

* Chevron was notified on July 26, 1989 of the contamination of the supply well since their station was likely the source.
* The County requested Chevron to test their UST system for any leaks.
* Testing was completed on August 7, 1989 and passed.
* Chevron provided copies of their inventory reconciliation data for review. There were no obvious discrepancies.

Historical Research

* In September 1989, the Baileys BBQ well had 620 µg/l benzene.
* Historical research indicated that there were USTs at:
  * Chevron site (six operating USTs in 1989),
  * Pacific Bell site (one operating UST in 1989),
  * Julian Auto Parts site (two tanks removed by Caltrans in 1986 from their right-of-way and two unused USTs remained on-site),
  * Julian Cider Mill site (six unused USTs remained on-site) and
  * Norm's Service Station (five operating USTs & four operating ASTs in 1989).

Installation of Groundwater Monitoring Well on Chevron Site

Chevron Service Station Site Initial Assessment

* The initial investigation included the installation of wells and borings completed between September 12, 1989 and September 13, 1991.
* Five USTs were removed on July 19, 1990.
* Testing from the UST removal identified a release.
* Two abandoned USTs were removed on June 10, 1991 (installed in 1920).
* Included drilling and installing:
  * 9 - Groundwater monitoring wells
  * 10 - Vapor extraction wells

Julian Auto Parts Site

Julian Auto Parts Site Initial Assessment

* Caltrans removed two USTs in 1986 that were in the Caltrans right-of-way. No release was identified at the time.
* Two additional USTs were removed on April 24, 1990.
* Testing from the UST removal identified a release.
* Site investigation began in January 1991.
* RWQCB Issued a Cleanup and Abatement Order to all parties on March 12, 1993.
* Chevron's consultant took over site investigation and remediation activities in June 1996.

Julian Cider Mill Site

Julian Cider Mill Site
Initial Assessment

* Six USTs were removed on May 10, 1990.
* Testing from the UST removal identified a release.
* Site investigation began in September 1994 with no formal report submitted due to consultant not being paid by the RP.
* RWQCB Issued a Cleanup and Abatement Order to all parties on March 12, 1993.
* Chevron's consultant took over site investigation and remediation activities for the RP in June 1996.

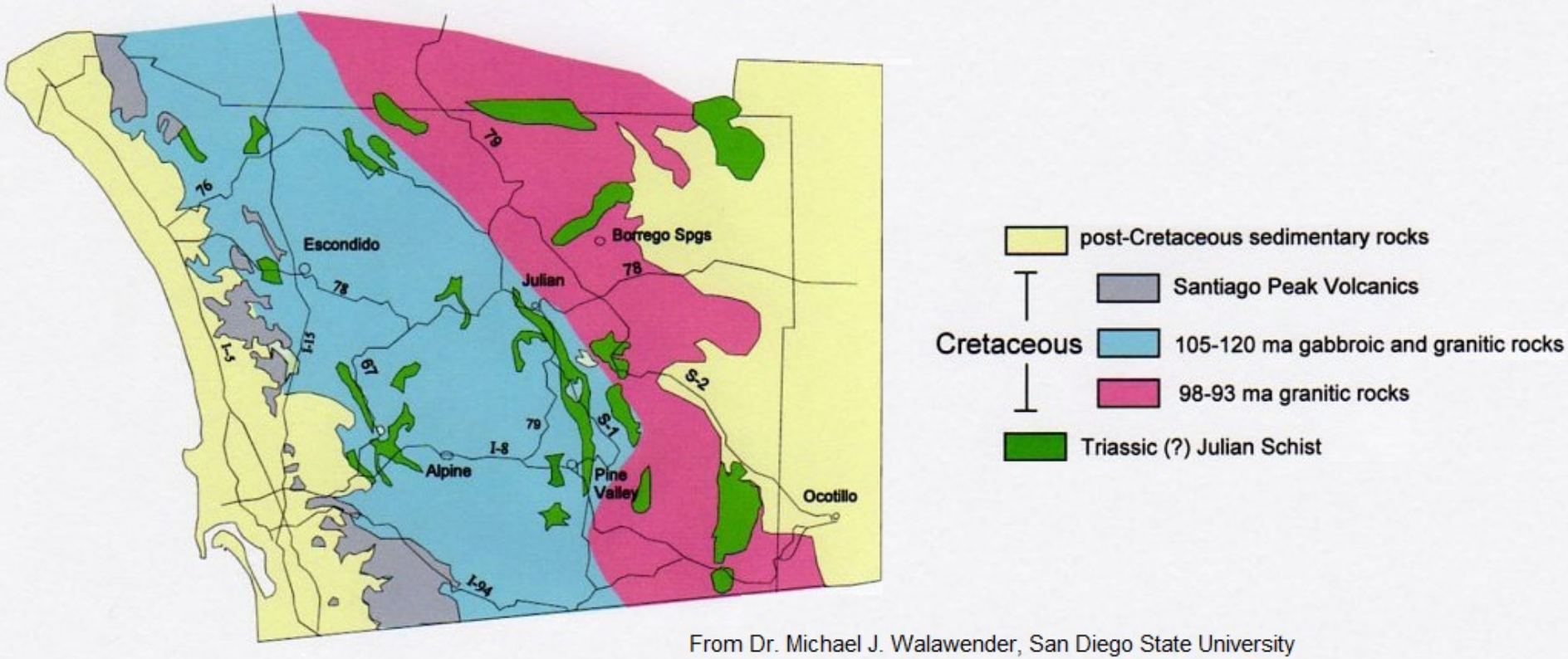
Norm's Service Station Site

Norm's Service Station Site Initial Assessment

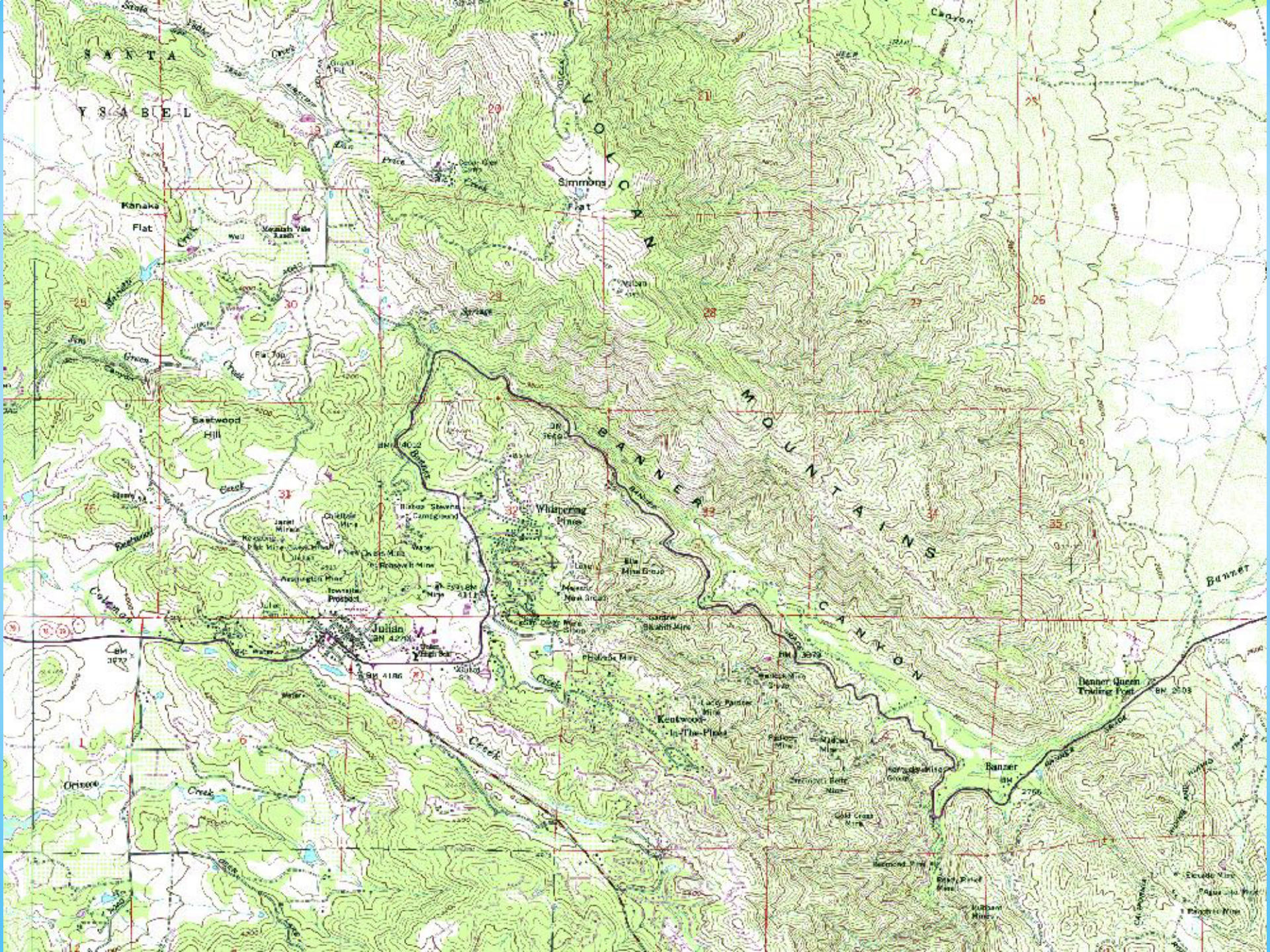
* Five USTs were removed on December 10, 1998.
* Installed four new double walled USTs in January 1999.
* Testing from the UST removal identified a release.
* Site investigation began in January 1994.
* RWQCB Issued a Cleanup and Abatement Order to all parties on March 12, 1993.
* Chevron's consultant took over site investigation and remediation activities for the RP in June 1996.

Geology

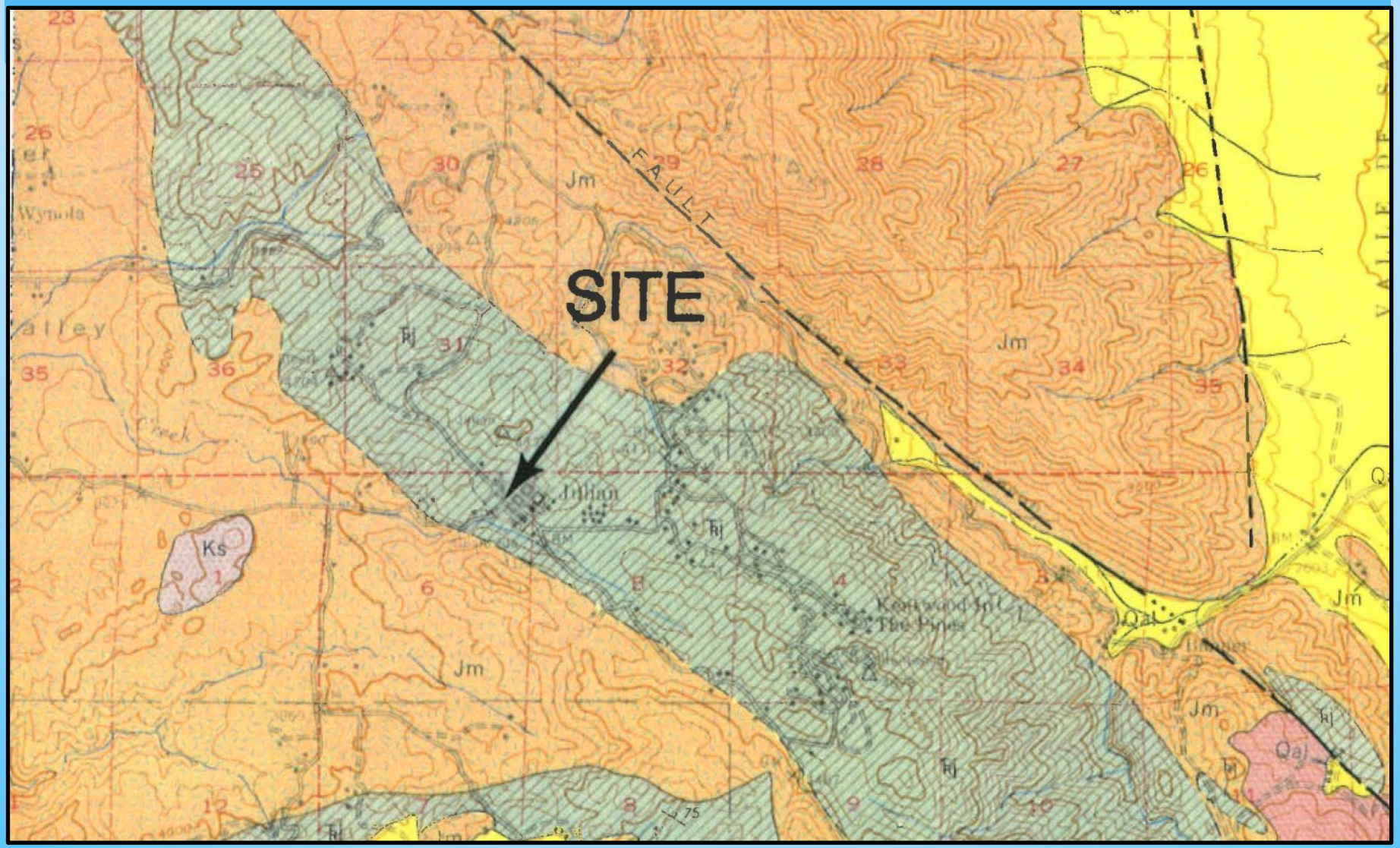
Generalized Geologic Map of San Diego County



From Dr. Michael J. Walawender, San Diego State University


SANTA
YSABEL
LOLON
MOUNTAINS
BANNER
CANYON
Simmons
Flat
Kanaka
Flat
Eastwood
Hill
Whispering
Pines
Julian
Banner
Banner Queen
Trading Post
Keystone
In-The-Pines
Orizaba
Creek
Canyon
Banner

Geology of the Julian Area

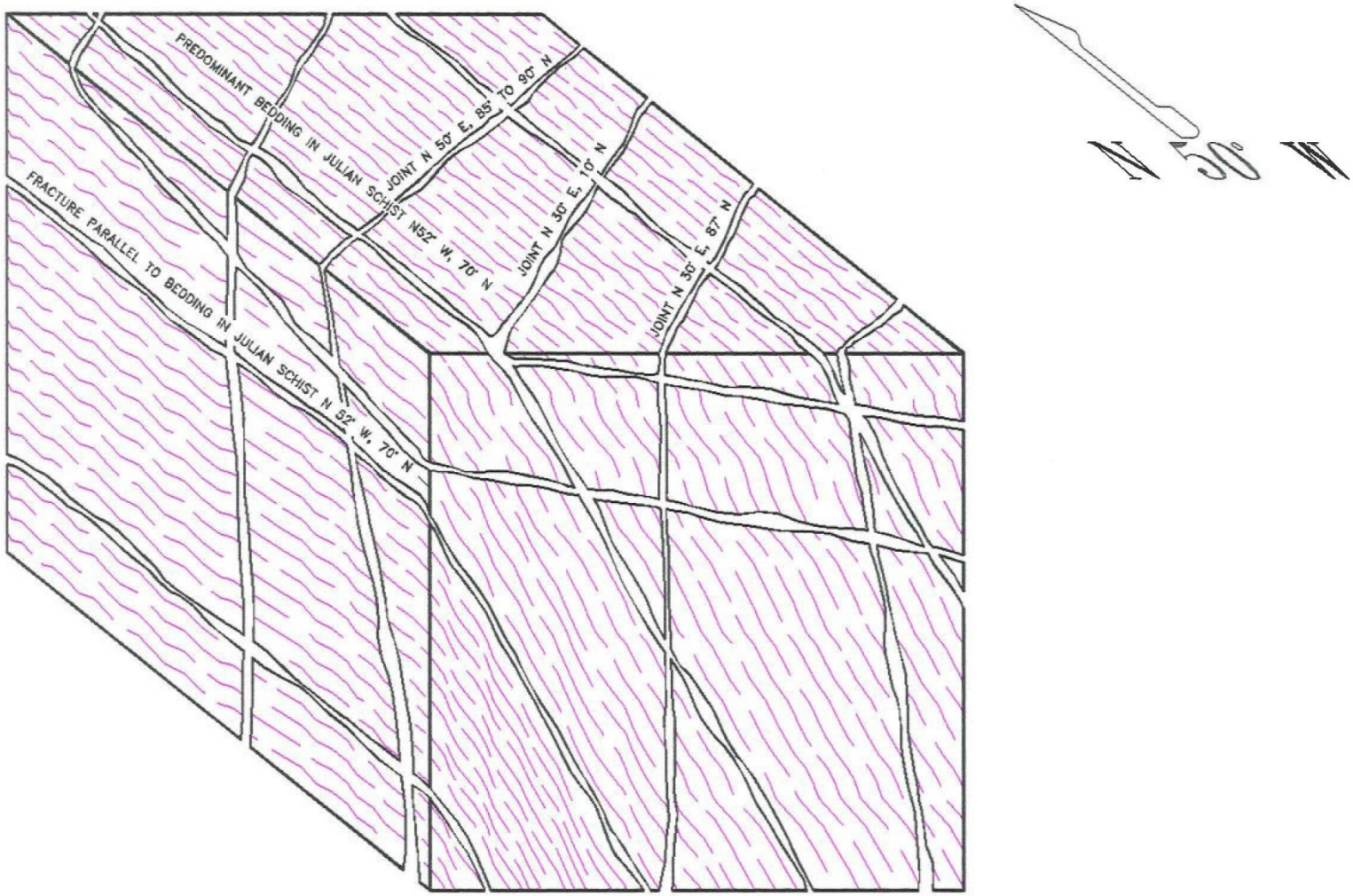


Julian Schist

Mixed Rocks

The mixed rocks consists primarily of:

* Quartz diorite
* Schist

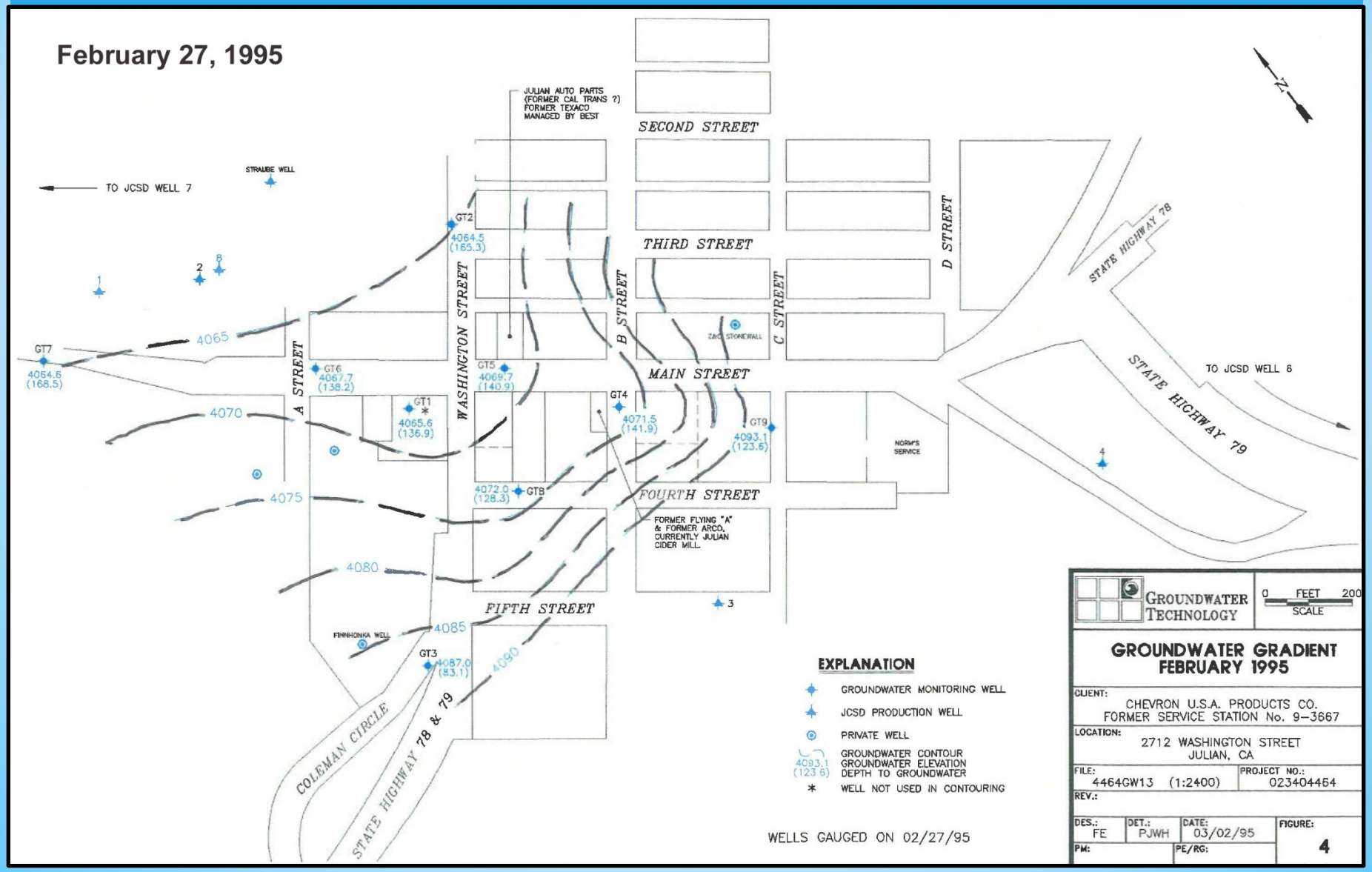


SCHEMATIC BLOCK DIAGRAM SHOWING ORIENTATION OF BEDDING WITHIN THE JULIAN SCHIST AND PREDOMINANT FRACTURES MAPPED IN OUTCROPS

Hydrogeology

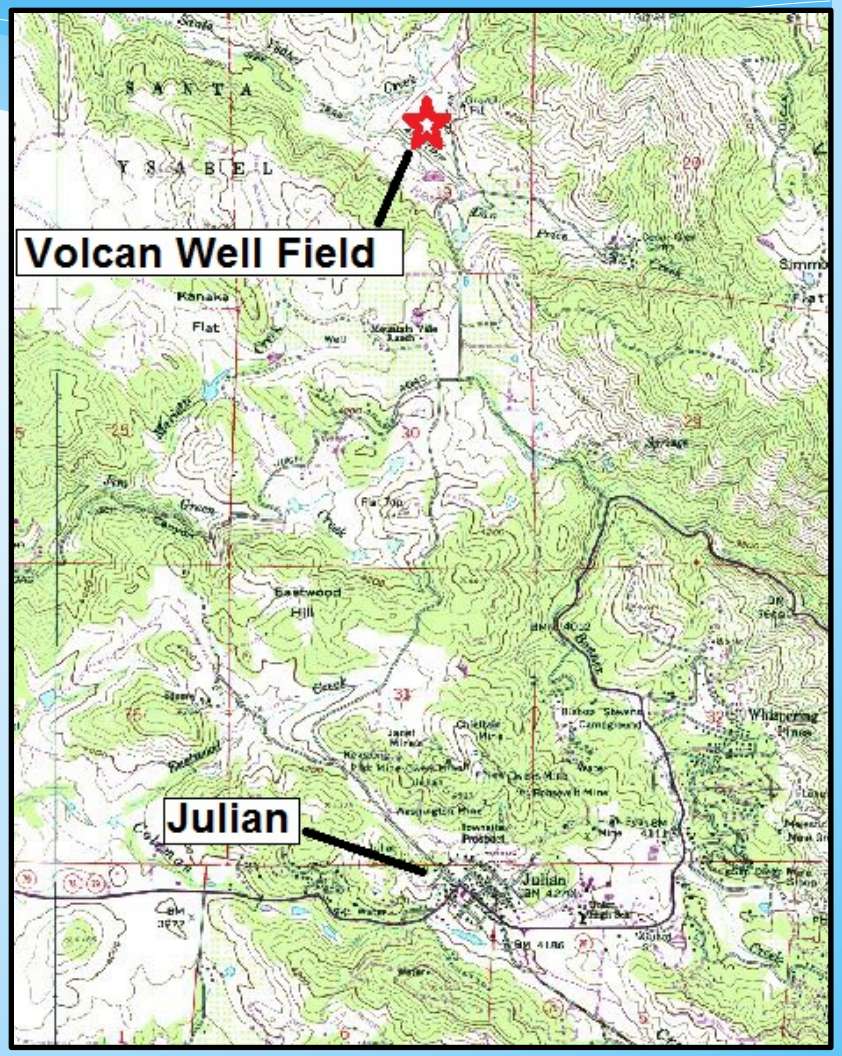
* The depth to groundwater is highly variable due to:
  * Seasonal recharge,
  * The amount of pumping from the aquifer and
  * The connectivity of the fractures.
* Groundwater levels in monitoring wells and production wells varies from depths of 28 feet to 290 feet.
* Observed seasonal variation of groundwater levels in individual wells varies from 50 to 100 feet.
* Weathering of the granitic/metamorphic rock extends to depths of 20 to 50 feet below the ground surface.
* Below 50 feet, groundwater flow is primarily limited to fracture flow.

February 27, 1995

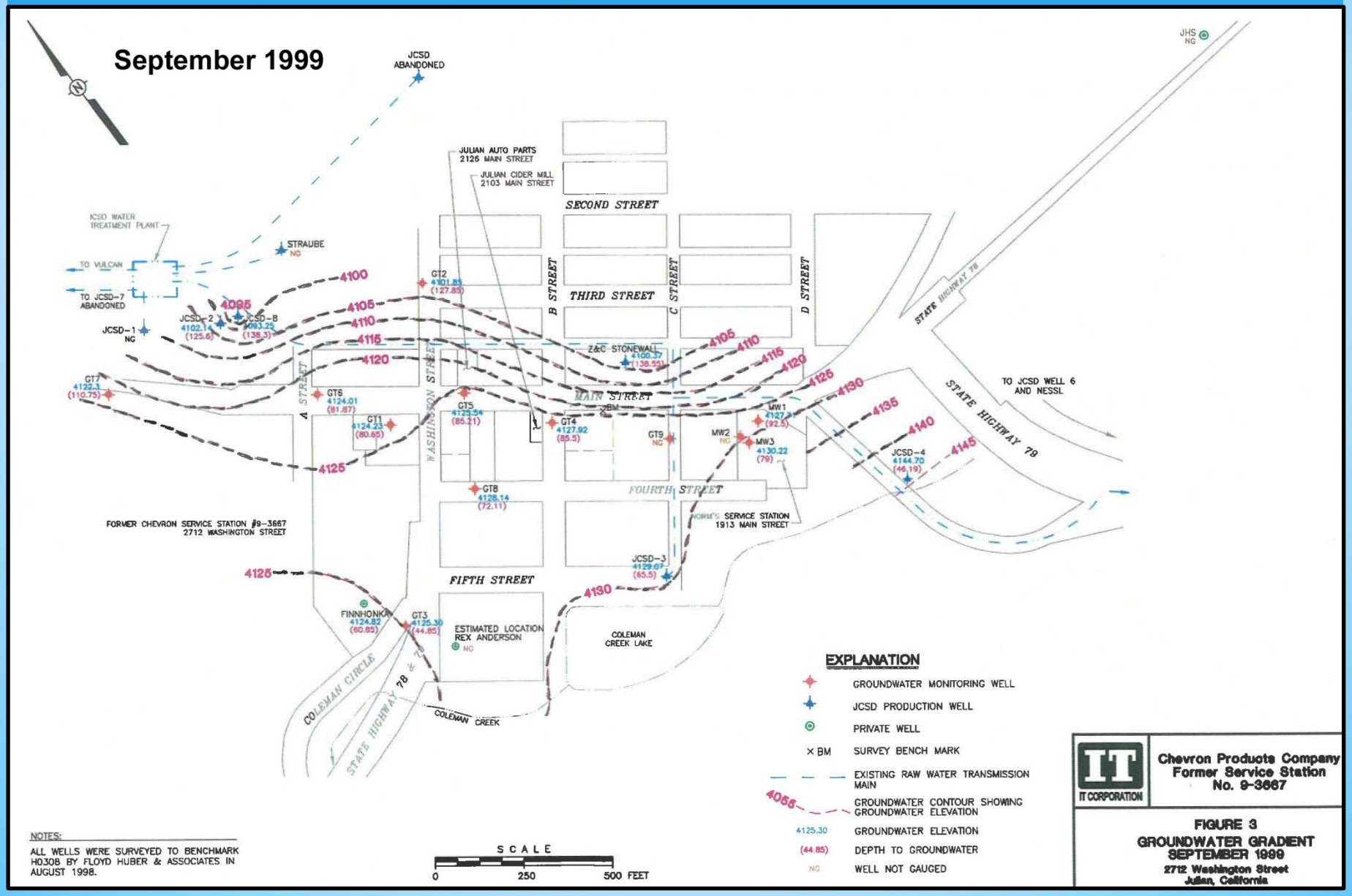


JCSDs Volcan Well Field

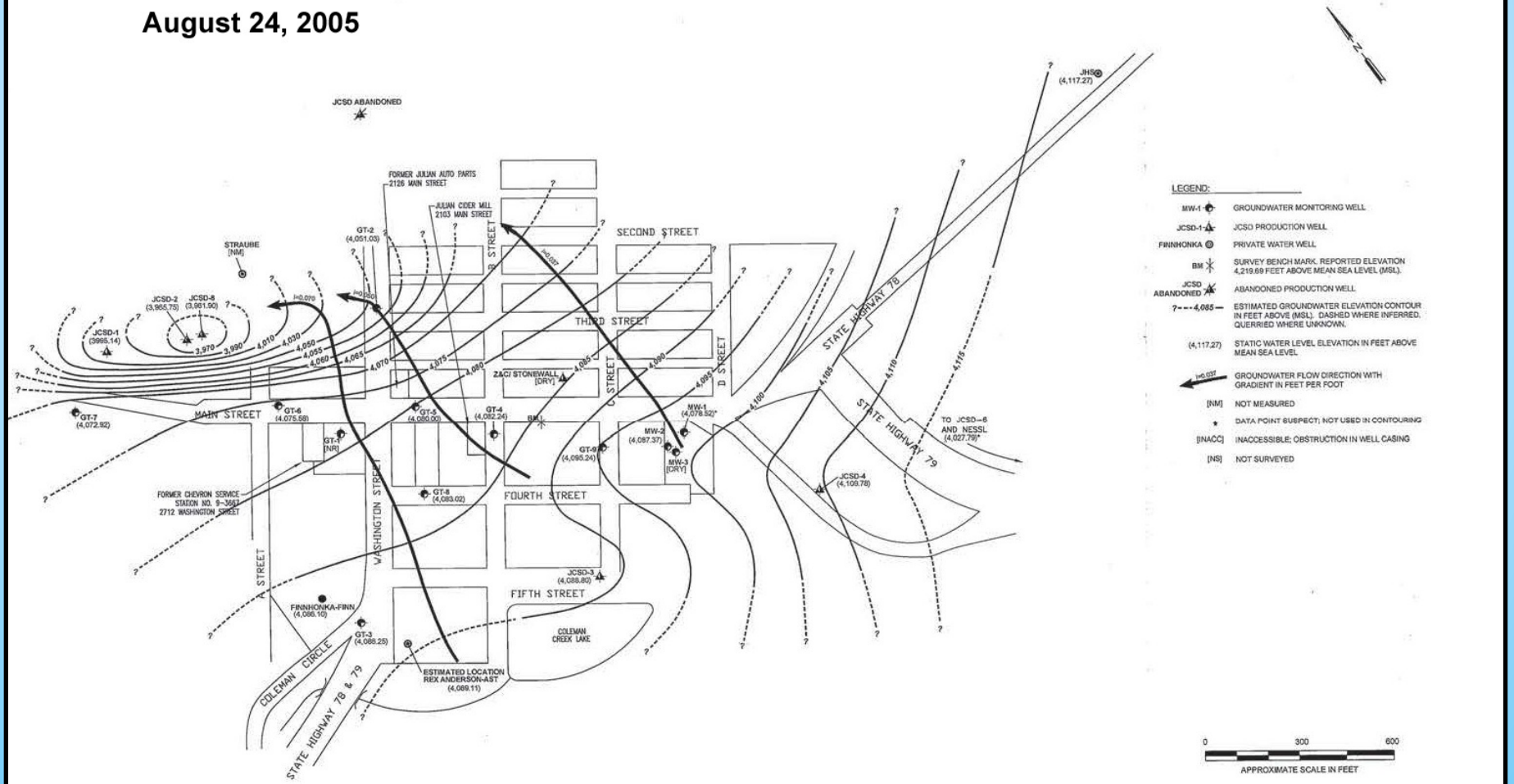
* The well field is about 2 miles north of Julian Town Center.
* The well field went on line in August 1985.
* By 1998, over 70% of the water supply for JCSD was being provided by the Volcan Well Field.



September 1999

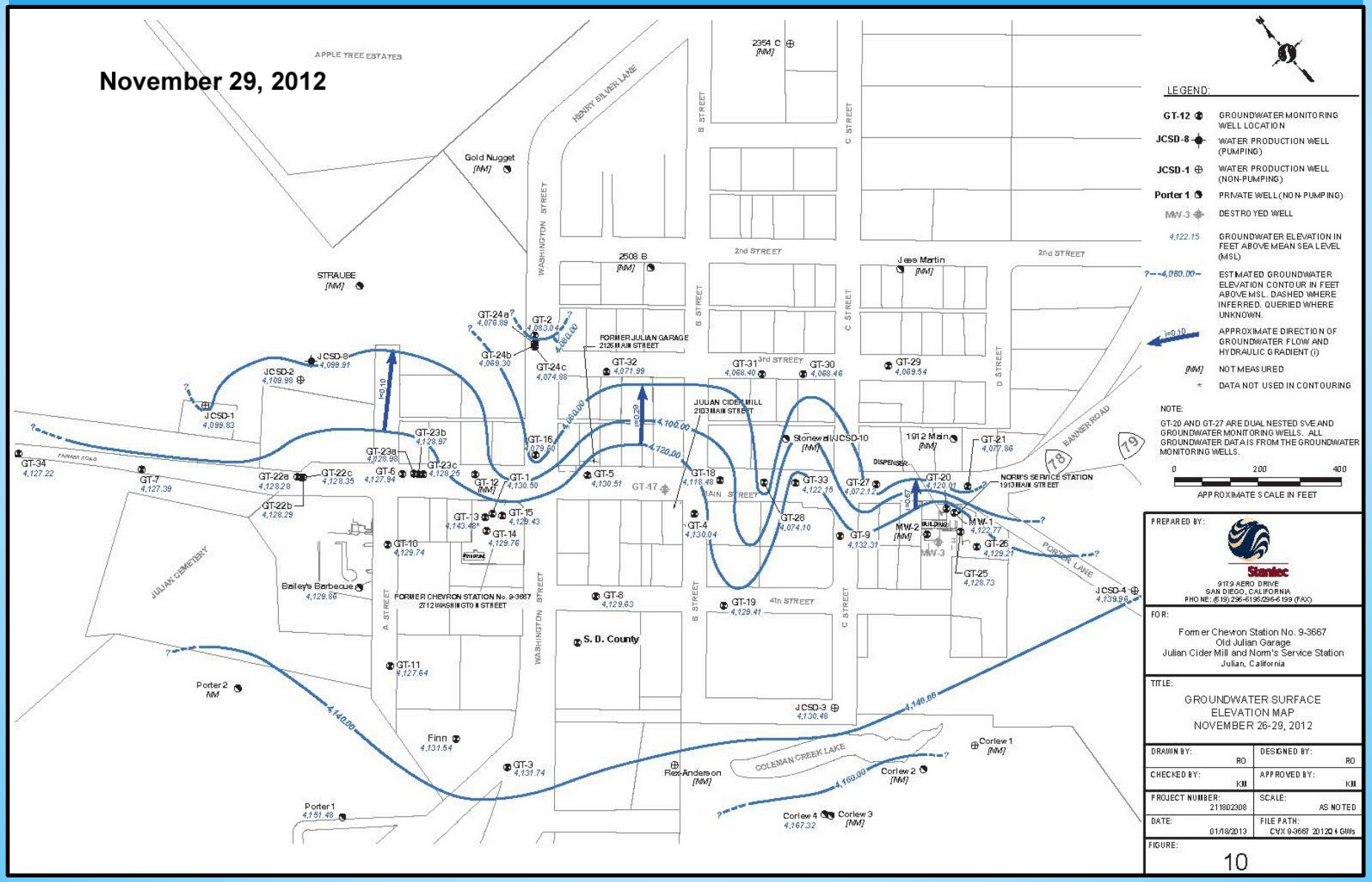


August 24, 2005



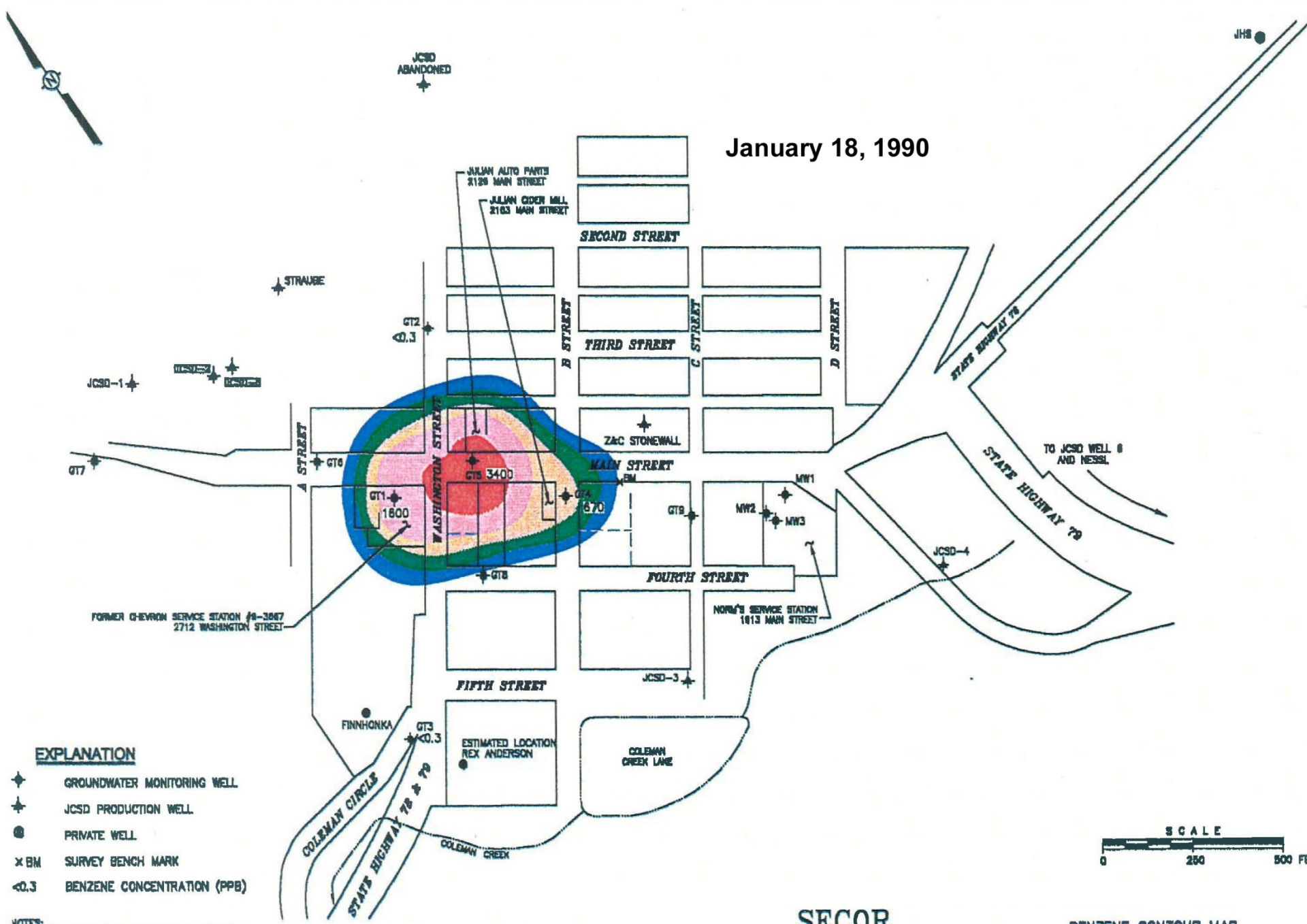
SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: CHEVRON ENVIRONMENTAL MANAGEMENT COMPANY BREA, CALIFORNIA	GROUNDWATER SURFACE ELEVATION MAP AUGUST 24, 2005 JULIAN, CALIFORNIA		FIGURE: 15
	JOB NUMBER: 08CH.53667.05	DRAWN BY: PD	CHECKED BY:	APPROVED BY:	DATE: 9/20/05

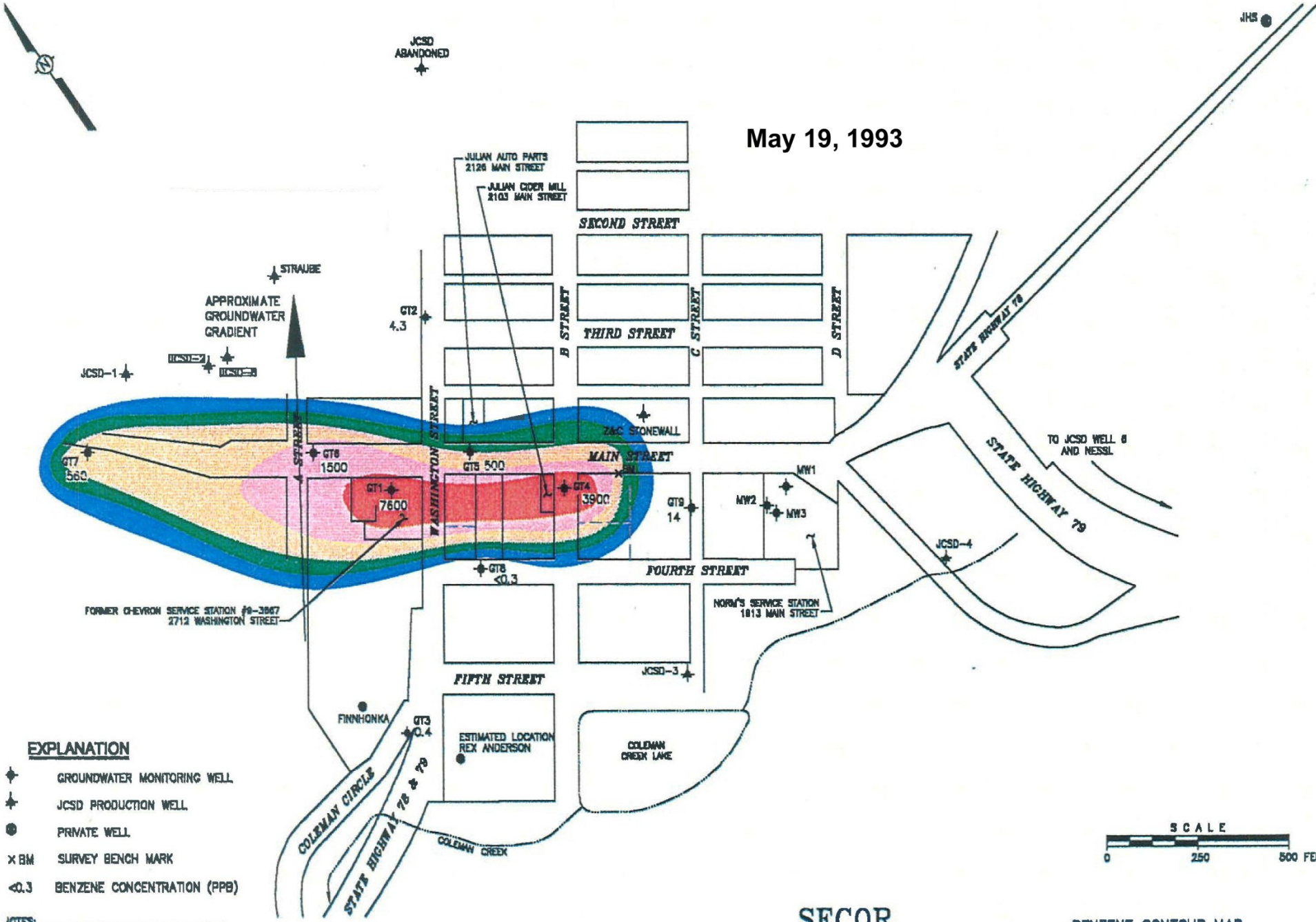
November 29, 2012

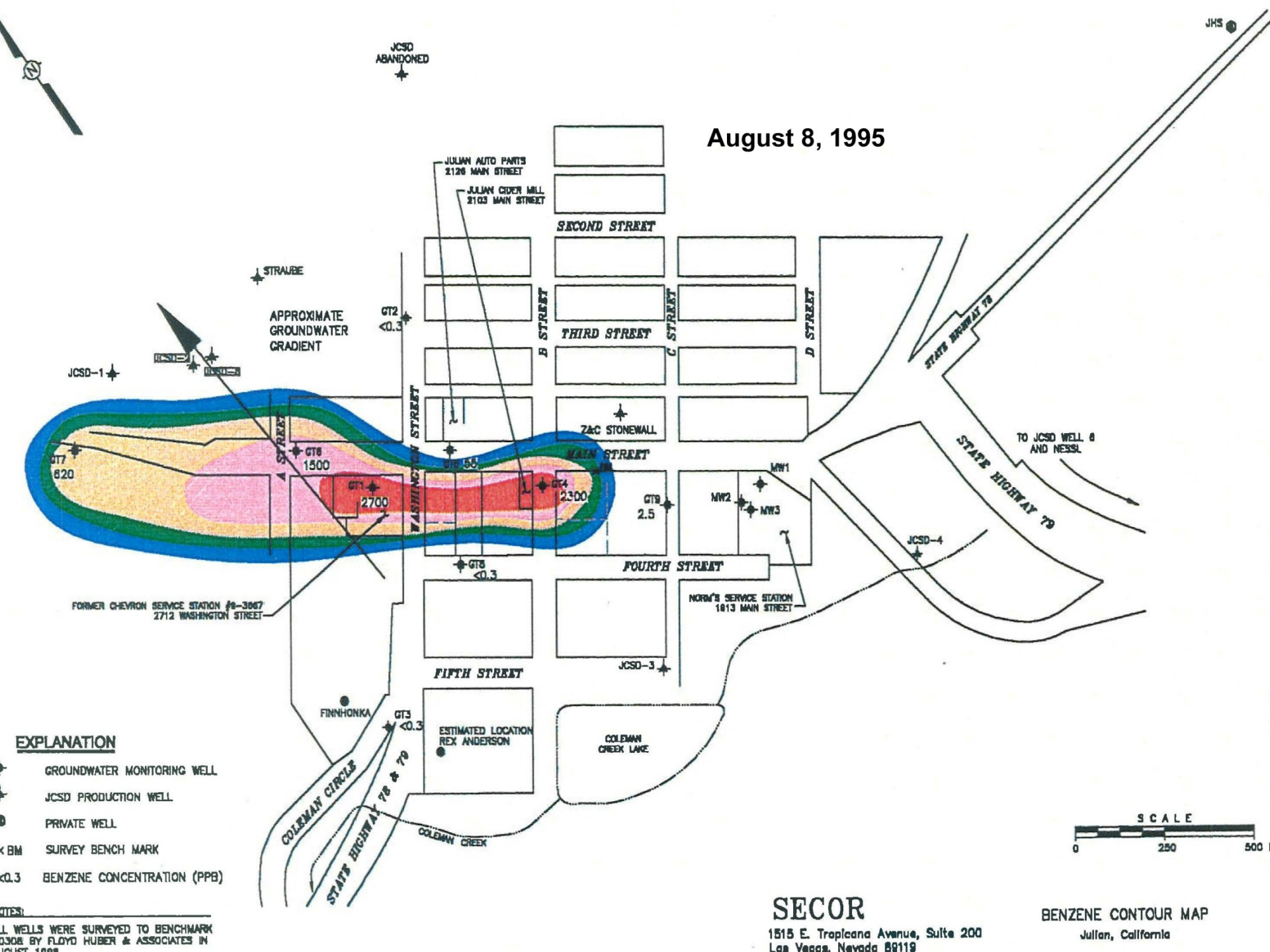


Benzene Plume
1990 Through 1995

* The groundwater investigation from 1990 to 1995 was limited to work completed by Chevron.
* Groundwater impacts were identified beneath the Chevron, Julian Auto Parts and Julian Cider Mill sites.
* Investigation at the Former Norm's Service Station had not been completed.
* The plume extends east–west along Main Street to the JCSD well field.


January 18, 1990
JCSD ABANDONED
JHS
JULIAN AUTO PARTS 2129 MAIN STREET
JULIAN CIDER MILL 2163 MAIN STREET
SECOND STREET
STRAUBE
GT2 <0.3
B STREET
THIRD STREET
C STREET
D STREET
STATE HIGHWAY 78
JCSD-1
A STREET
WASHINGTON STREET
Z&C STONEWALL
MAIN STREET
BM
GT7
GT6
GT5 3400
GT1 1800
GT4 870
GT9
MW1
MW2
MW3
TO JCSD WELL 6 AND NESSL
STATE HIGHWAY 79
JCSD-4
GT8
FOURTH STREET
FORMER CHEVRON SERVICE STATION #9-3867 2712 WASHINGTON STREET
NORM'S SERVICE STATION 1613 MAIN STREET
FIFTH STREET
JCSD-3
FINNHONKA
GT3 <0.3
ESTIMATED LOCATION REX ANDERSON
COLEMAN CREEK LANE
COLEMAN CIRCLE
STATE HIGHWAY 78 & 79
COLEMAN CREEK
EXPLANATION
GROUNDWATER MONITORING WELL
JCSD PRODUCTION WELL
PRIVATE WELL
× BM SURVEY BENCH MARK
<0.3 BENZENE CONCENTRATION (PPB)
NOTES:
ALL WELLS WERE SURVEYED TO BENCHMARK H0308 BY FLOYD HUBER & ASSOCIATES IN AUGUST 1998.
SCALE
0
250
500 FT
SECOR
1515 E. Tropicana Avenue, Suite 200
Las Vegas, Nevada 89119
BENZENE CONTOUR MAP
Julian, California


May 19, 1993
JCSD ABANDONED
JH5
JULIAN AUTO PARTS 2126 MAIN STREET
JULIAN CIDER MILL 2103 MAIN STREET
SECOND STREET
STRAUBE
APPROXIMATE GROUNDWATER GRADIENT
GT2 4.3
B STREET
THIRD STREET
C STREET
D STREET
STATE HIGHWAY 78
JCSD-1
JCSD-2
JCSD-5
A STREET
WASHINGTON STREET
Z&C STONEWALL
MAIN STREET
GT7 560
GT6 1500
GT5 500
GT1 7600
GT4 3900
GT9 14
MW1
MW2
MW3
TO JCSD WELL 6 AND NESSL
STATE HIGHWAY 79
JCSD-4
GT8 <0.3
FOURTH STREET
FORMER CHEVRON SERVICE STATION #9-3867 2712 WASHINGTON STREET
NORM'S SERVICE STATION 1813 MAIN STREET
JCSD-3
FIFTH STREET
FINNHONKA
GT3 0.4
ESTIMATED LOCATION REX ANDERSON
COLEMAN CREEK LAKE
COLEMAN CIRCLE
STATE HIGHWAY 78 & 79
COLEMAN CREEK
EXPLANATION
GROUNDWATER MONITORING WELL
JCSD PRODUCTION WELL
PRIVATE WELL
× BM SURVEY BENCH MARK
<0.3 BENZENE CONCENTRATION (PPB)
NOTES:
ALL WELLS WERE SURVEYED TO BENCHMARK 10306 BY FLOYD HUBER & ASSOCIATES IN AUGUST 1993
SCALE
0
250
500 FE
SECOR
1515 E. Tropicana Avenue, Suite 200
Las Vegas, Nevada 89119
BENZENE CONTOUR MAP
Julian, California


August 8, 1995
JCSD ABANDONED
JHS
JULIAN AUTO PARTS 2126 MAIN STREET
JULIAN CIDER MILL 2103 MAIN STREET
SECOND STREET
STRAUBE
APPROXIMATE GROUNDWATER GRADIENT
GT2 <0.3
B STREET
THIRD STREET
C STREET
D STREET
STATE HIGHWAY 79
JCSD-1
JCSD-2
JCSD-5
A STREET
WASHINGTON STREET
Z&C STONEWALL
MAIN STREET
GT7 820
GT6 1500
GT1 2700
GT4 2300
GT9 2.5
MW1
MW2
MW3
TO JCSD WELL 6 AND NESSL
STATE HIGHWAY 79
JCSD-4
GT8 <0.3
FOURTH STREET
FORMER CHEVRON SERVICE STATION #9-3067 2712 WASHINGTON STREET
NORM'S SERVICE STATION 1013 MAIN STREET
FIFTH STREET
JCSD-3
FINNHONKA
GT3 <0.3
ESTIMATED LOCATION REX ANDERSON
COLEMAN CREEK LAKE
COLEMAN CIRCLE
STATE HIGHWAY 78 & 79
COLEMAN CREEK
SCALE
0
250
500
EXPLANATION
GROUNDWATER MONITORING WELL
JCSD PRODUCTION WELL
PRIVATE WELL
BM SURVEY BENCH MARK
<0.3 BENZENE CONCENTRATION (PPB)
NOTES:
L WELLS WERE SURVEYED TO BENCHMARK 0308 BY FLOYD HUBER & ASSOCIATES IN
SECOR
1515 E. Tropicana Avenue, Suite 200
Las Vegas, Nevada 89119
BENZENE CONTOUR MAP
Julian, California

Initial Chevron Remediation

* RWQCB Issued a Cleanup and Abatement Order to all parties on March 12, 1993.
* Chevron installed and operated a vapor extraction system between 1994 to 1999.
* Extraction was limited to depths of 30 to 50 feet below grade (contact between decomposed schist and partially weathered schist).
* The systems removed 94,774 pounds of hydrocarbons.

Comingled Plume Investigation & Remediation

* Chevron took the lead on the Comingled Plume investigation and remediation in June 1996 for all four sites.
* After additional investigation was completed, a Corrective Action Plan (CAP) dated December 2000 was submitted to address the impacts to the unsaturated zone at all four sites.
* The CAP proposed using VES technology in phases for both shallow and deep hydrocarbon impacts.
* The CAP was approved in July 2001.

Chevron Service Station Site

* New VES System operated from June 2002 through December 2009.
* 6 Shallow Vapor Extraction Wells.
* 4 Deep Vapor Extraction Wells.
* VES System recovered 19,119 pounds of hydrocarbons.
* The system operated for a total of 42,183 hours (for 64% of the time).

Julian Auto Parts Site

* VES System operated from June 2002 through December 2009.
* 12 Shallow Vapor Extraction Wells.
* 10 Deep Vapor Extraction Wells.
* VES System recovered 2,968 pounds of hydrocarbons.
* The system operated for a total of 24,885 hours (for 38% of the time).

Julian Cider Mill Site

* VES System operated from June 2002 through December 2009.
* 10 Shallow Vapor Extraction Wells.
* 7 Deep Vapor Extraction Wells.
* VES System recovered 11,762 pounds of hydrocarbons.
* The system operated for a total of 37,355 hours (for 57% of the time).

Norm's Service Station Site

* VES System operated from July 2002 through July 2012.
* 21 Shallow Vapor Extraction Wells.
* 5 Deep Vapor Extraction Wells.
* VES System recovered 7,622 pounds of hydrocarbons.
* The system operated for a total of 51,624 hours (for 59% of the time).

Summary of VES Operations

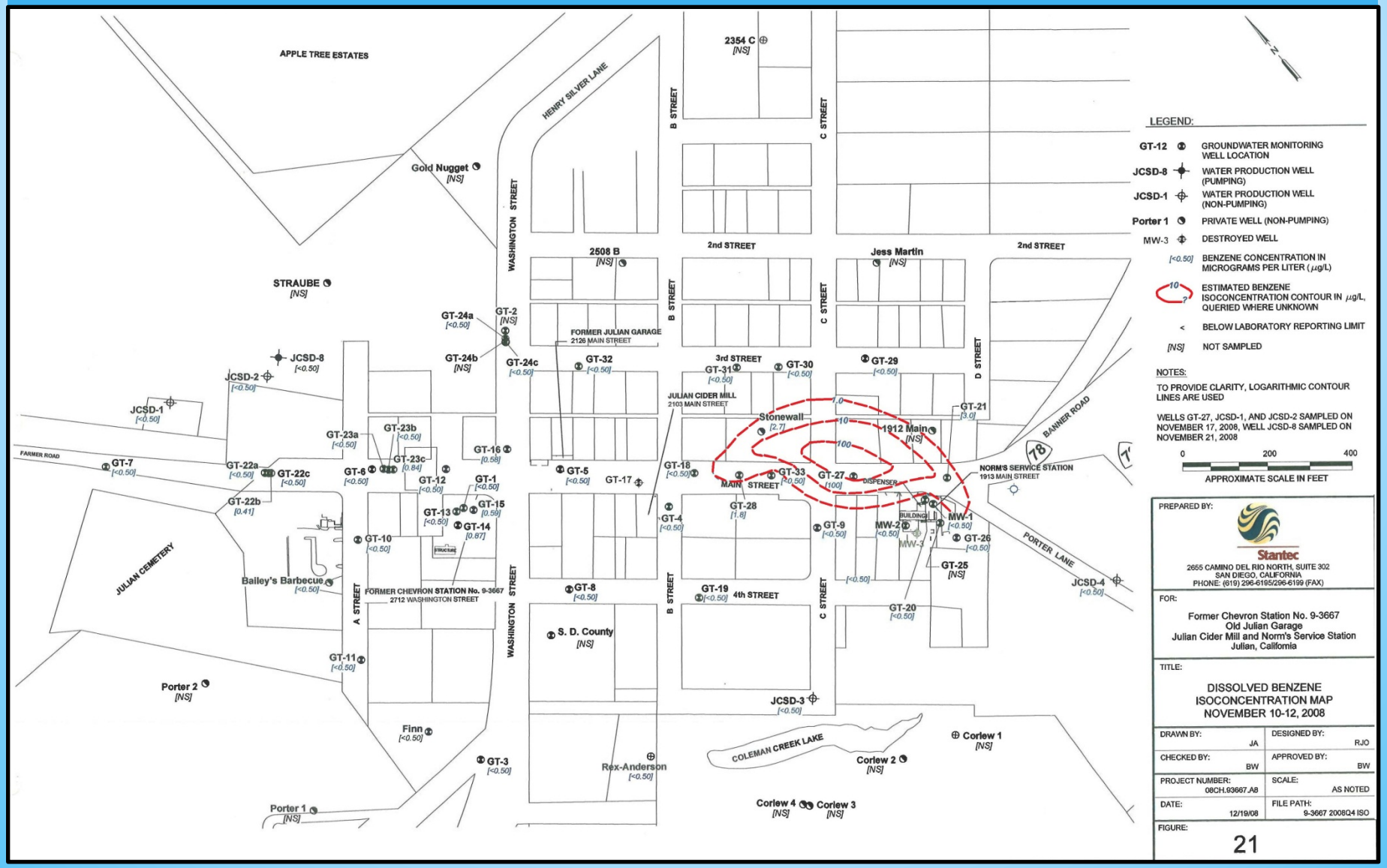
Chevron site [1994 to 1999]	94,774 pounds
Chevron site [2002 to 2009]	19,119 pounds
Julian Auto Parts Site	2,968 pounds
Julian Cider Mill Site	11,762 pounds
Norm's Service Station Site	7,622 pounds
TOTAL	136,245 pounds

Comingled Plume Groundwater Assessment

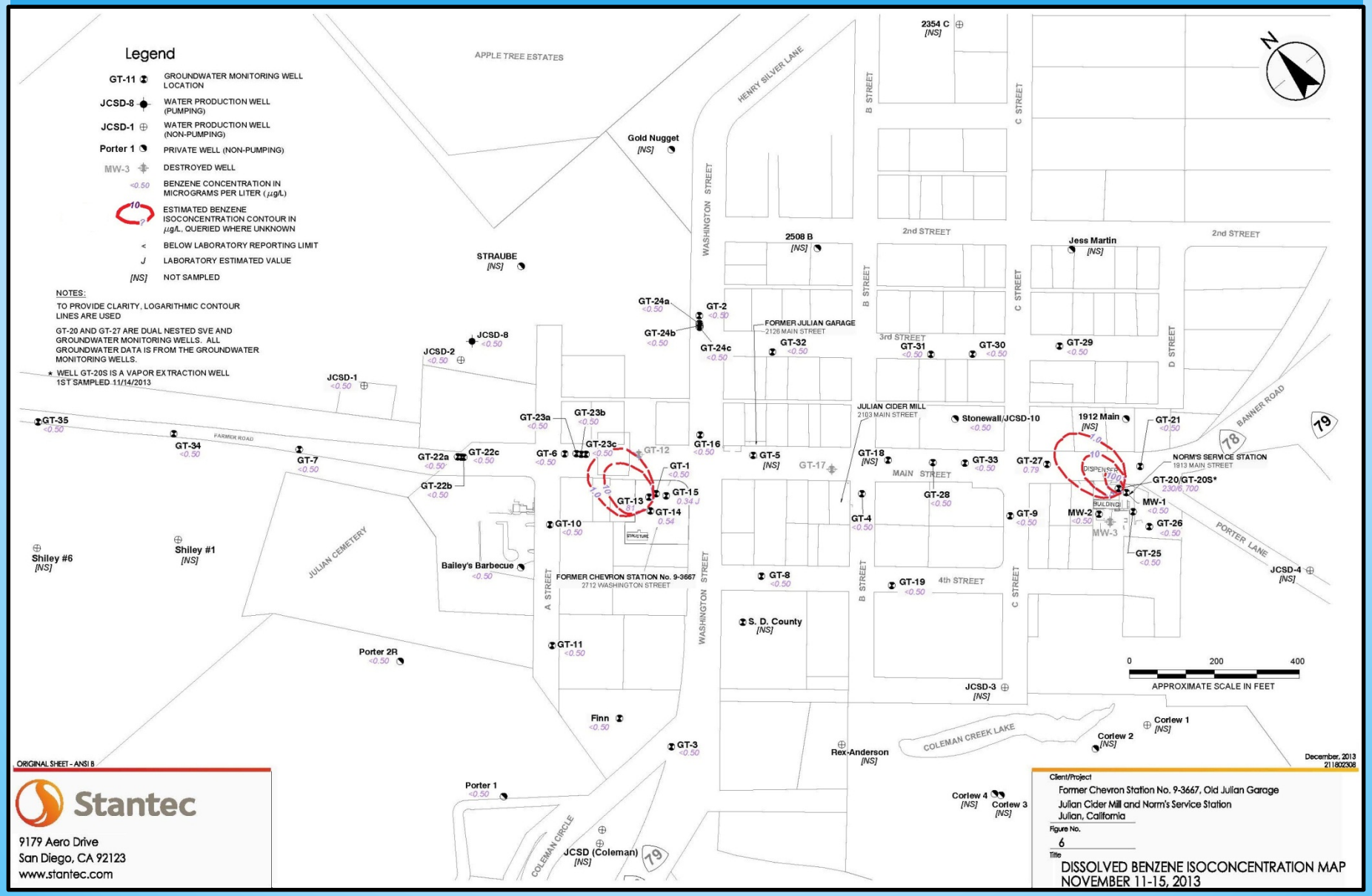
Groundwater assessment activities before and after establishment of the Comingled Plume designation includes:

* The installation of 45 groundwater monitoring wells
  * At three locations there were three nested well installed to define:
    * Vertical groundwater gradients and
    * Vertical concentration gradients.
* Semi-annual groundwater monitoring has included:
  * 45 monitoring wells,
  * 5 public supply wells and
  * 3 private supply wells.

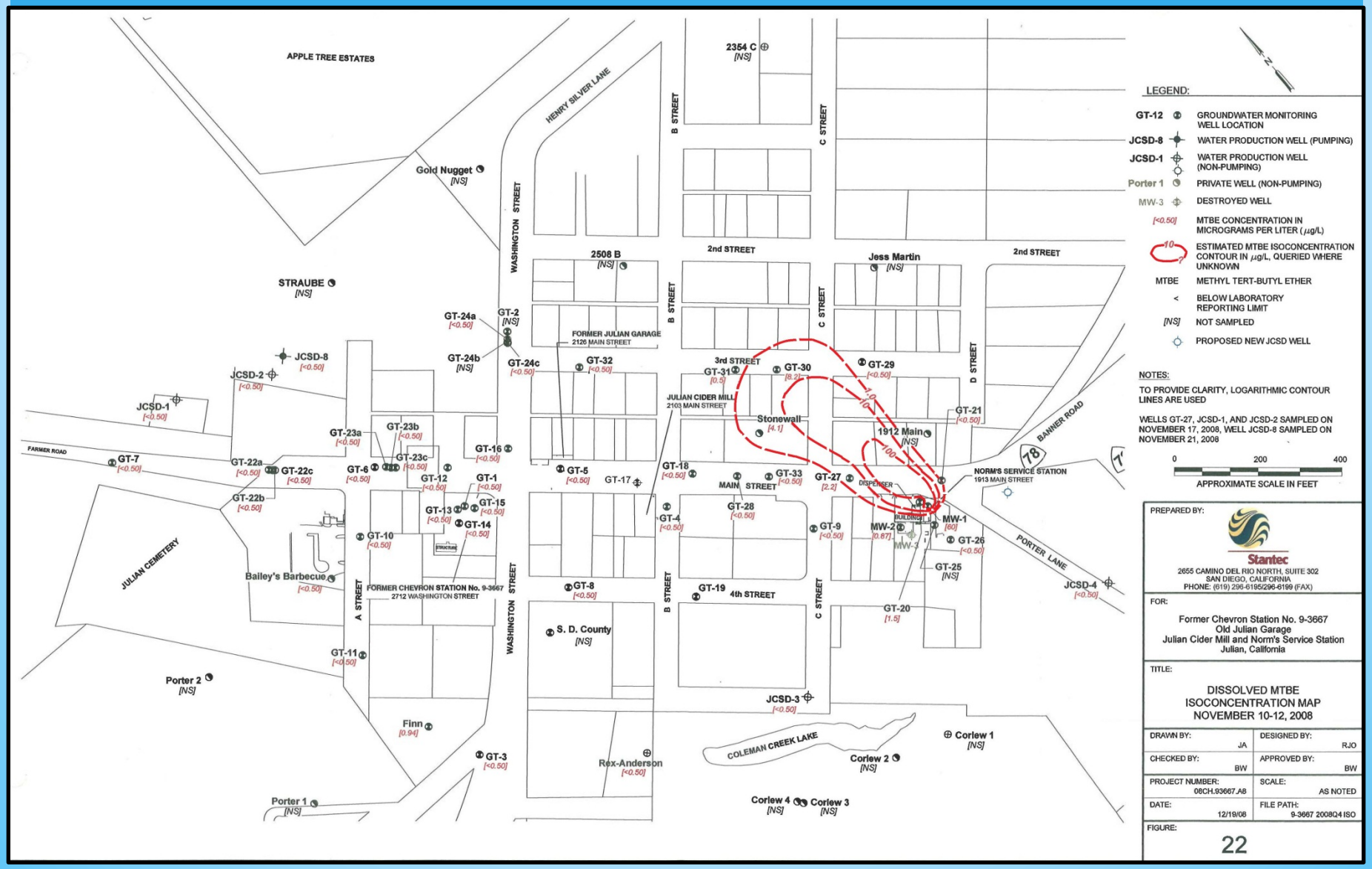
Benzene – 10/2008



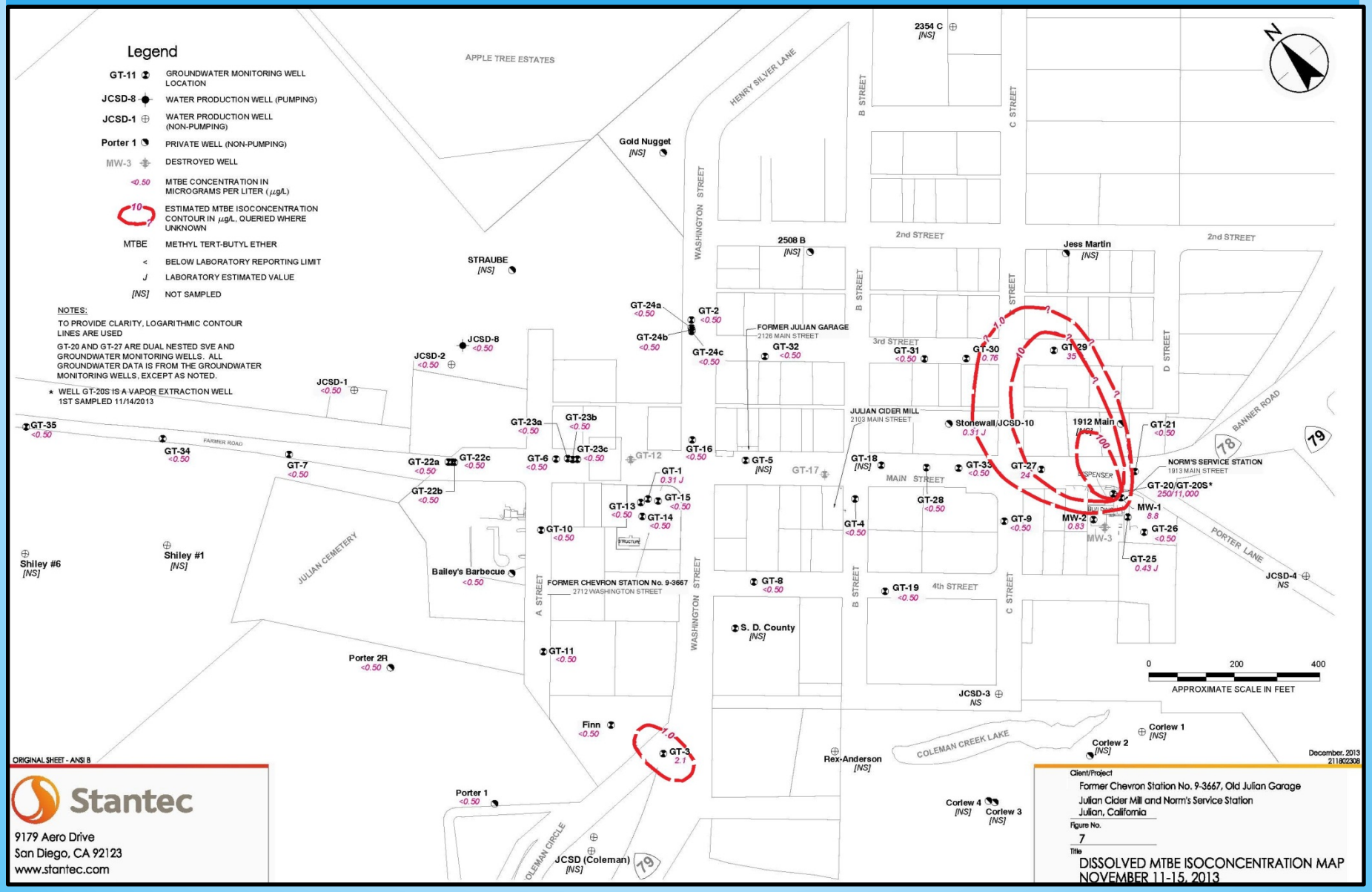
Benzene – 11/2013



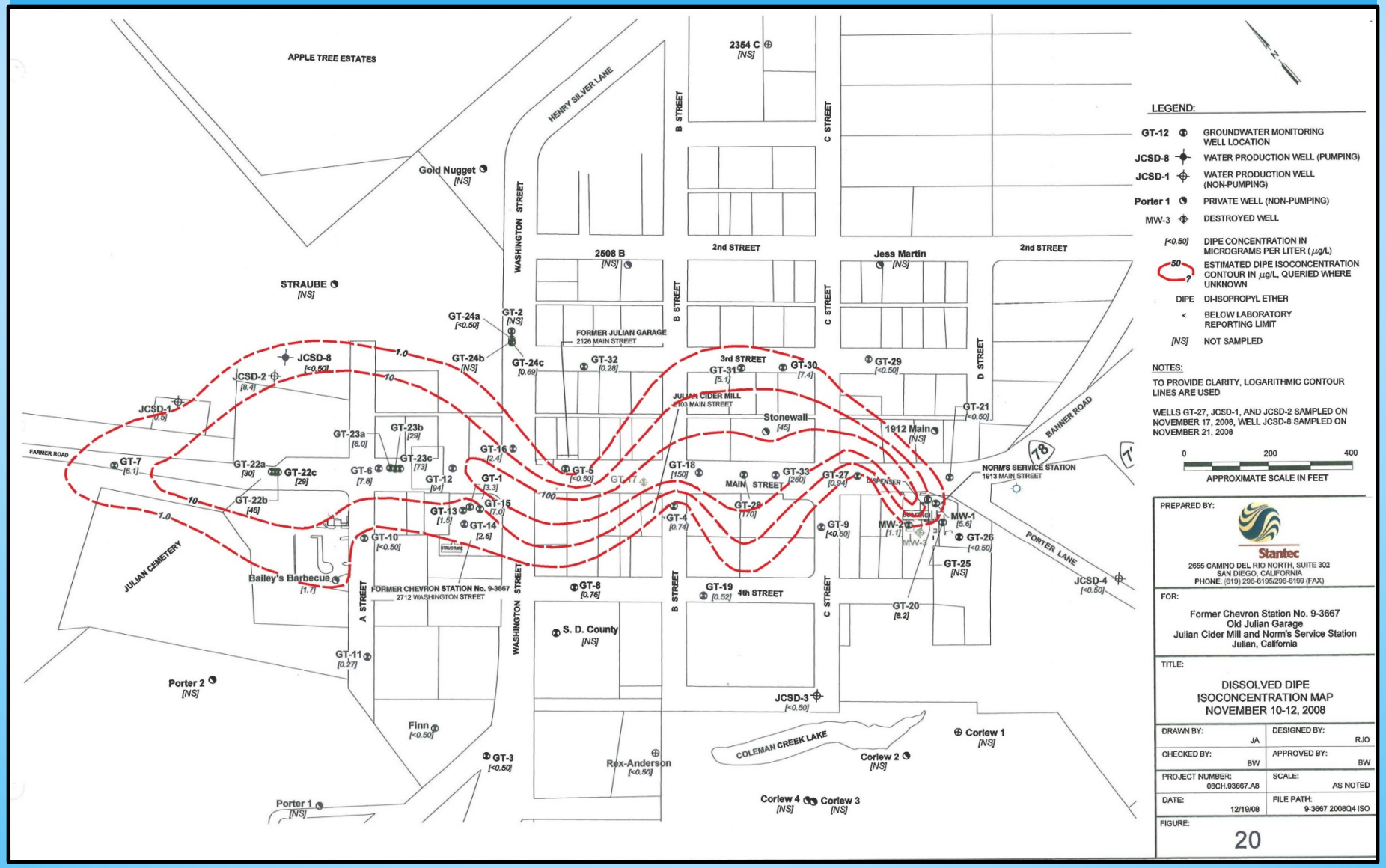
MTBE – 10/2008


APPLE TREE ESTATES
HENRY SILVER LANE
Gold Nugget [NS]
STRAUBE [NS]
WASHINGTON STREET
2354 C [NS]
B STREET
C STREET
2508 B [NS]
2nd STREET
Jess Martin [NS]
D STREET
FORMER JULIAN GARAGE 2126 MAIN STREET
GT-24a [<0.50]
GT-2 [NS]
GT-24b [NS]
GT-24c [<0.50]
GT-32 [<0.50]
JCSD-8 [<0.50]
JCSD-2 [<0.50]
JCSD-1 [<0.50]
3rd STREET
GT-31 [0.5]
GT-30 [8.2]
GT-29 [<0.50]
JULIAN CIDER MILL 2103 MAIN STREET
Stonewall [4.1]
1912 Main [NS]
GT-21 [<0.50]
BANNER ROAD
FARMER ROAD
GT-7 [<0.50]
GT-23a [<0.50]
GT-23b [<0.50]
GT-23c [<0.50]
GT-16 [<0.50]
GT-22a [<0.50]
GT-22c [<0.50]
GT-6 [<0.50]
GT-12 [<0.50]
GT-1 [<0.50]
GT-22b [<0.50]
GT-13 [<0.50]
GT-15 [<0.50]
GT-14 [<0.50]
GT-5 [<0.50]
GT-17
GT-18 [<0.50]
MAIN STREET
GT-33 [<0.50]
GT-27 [2.2]
DISPENSER
NORM'S SERVICE STATION 1913 MAIN STREET
GT-28 [<0.50]
GT-4 [<0.50]
GT-9 [<0.50]
MW-2 [0.87]
MW-1 [60]
MW-3
GT-26 [<0.50]
GT-25 [NS]
PORTER LANE
JCSD-4 [<0.50]
GT-10 [<0.50]
JULIAN CEMETERY
Bailey's Barbecue [<0.50]
FORMER CHEVRON STATION No. 9-3667 2712 WASHINGTON STREET
A STREET
GT-8 [<0.50]
GT-19
4th STREET
GT-20 [1.5]
S. D. County [NS]
GT-11 [<0.50]
Porter 2 [NS]
JCSD-3 [<0.50]
Finn [0.94]
GT-3 [<0.50]
Rex-Anderson [<0.50]
COLEMAN CREEK LAKE
Corlew 1 [NS]
Corlew 2 [NS]
Corlew 4 [NS]
Corlew 3 [NS]
Porter 1 [NS]
LEGEND:
GT-12 GROUNDWATER MONITORING WELL LOCATION
JCSD-8 WATER PRODUCTION WELL (PUMPING)
JCSD-1 WATER PRODUCTION WELL (NON-PUMPING)
Porter 1 PRIVATE WELL (NON-PUMPING)
MW-3 DESTROYED WELL
[<0.50] MTBE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
10 ESTIMATED MTBE ISOCONCENTRATION CONTOUR IN µg/L, QUERIED WHERE UNKNOWN
MTBE METHYL TERT-BUTYL ETHER
< BELOW LABORATORY REPORTING LIMIT
[NS] NOT SAMPLED
PROPOSED NEW JCSD WELL
NOTES:
TO PROVIDE CLARITY, LOGARITHMIC CONTOUR LINES ARE USED
WELLS GT-27, JCSD-1, AND JCSD-2 SAMPLED ON NOVEMBER 17, 2008, WELL JCSD-8 SAMPLED ON NOVEMBER 21, 2008
0 200 400
APPROXIMATE SCALE IN FEET
PREPARED BY:
Stantec
2655 CAMINO DEL RIO NORTH, SUITE 302
SAN DIEGO, CALIFORNIA
PHONE: (619) 296-6195/296-6199 (FAX)
FOR:
Former Chevron Station No. 9-3667
Old Julian Garage
Julian Cider Mill and Norm's Service Station
Julian, California
TITLE:
DISSOLVED MTBE
ISOCONCENTRATION MAP
NOVEMBER 10-12, 2008
DRAWN BY: JA
DESIGNED BY: RJO
CHECKED BY: BW
APPROVED BY: BW
PROJECT NUMBER: 08CH.93667.A8
SCALE: AS NOTED
DATE: 12/19/08
FILE PATH: 9-3667 2008Q4 ISO
FIGURE:
22

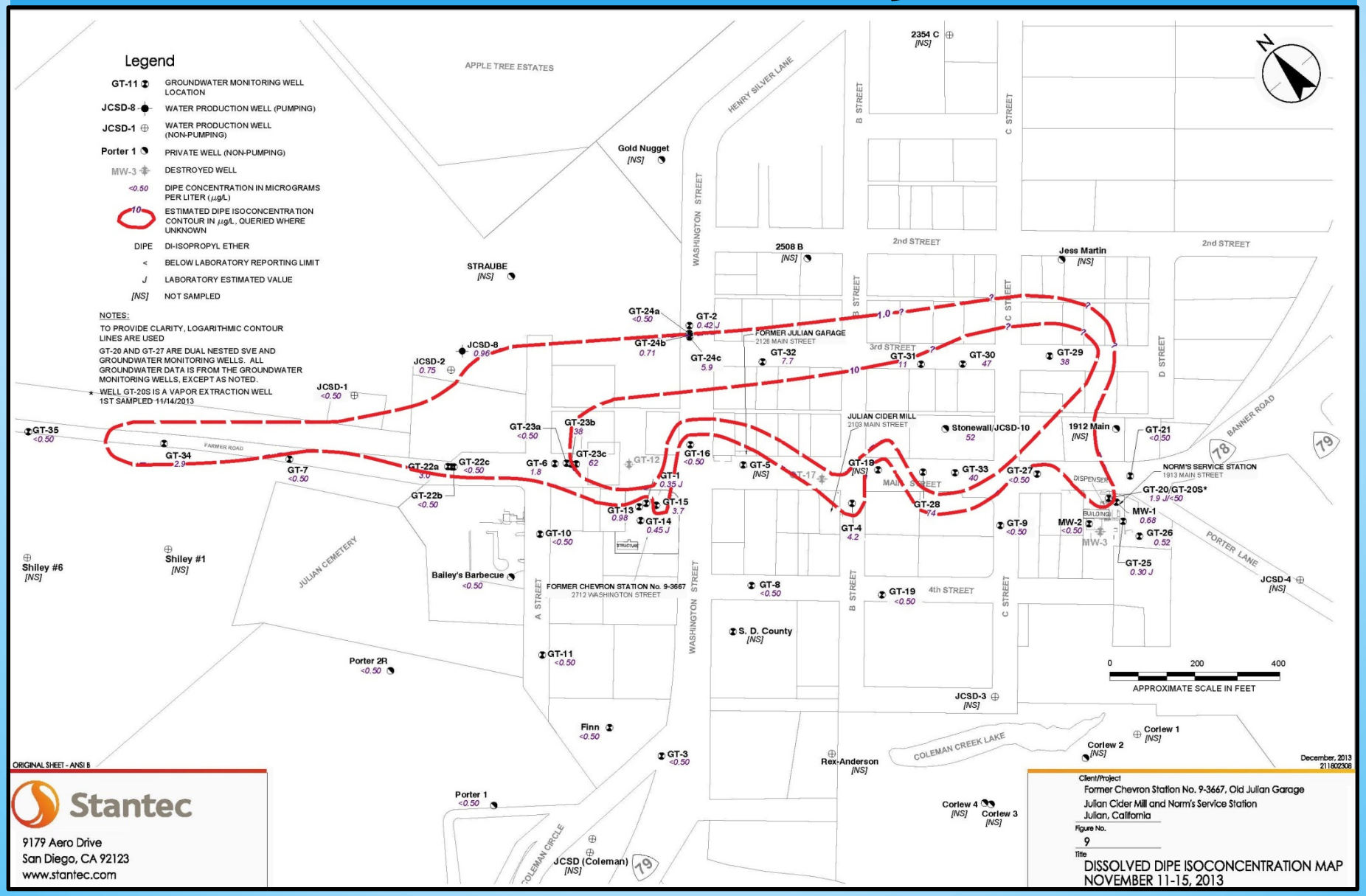
MTBE – 11/2013


Legend
GT-11 GROUNDWATER MONITORING WELL LOCATION
JCSD-8 WATER PRODUCTION WELL (PUMPING)
JCSD-1 WATER PRODUCTION WELL (NON-PUMPING)
Porter 1 PRIVATE WELL (NON-PUMPING)
MW-3 DESTROYED WELL
<0.50 MTBE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
10 1 ESTIMATED MTBE ISOCONCENTRATION CONTOUR IN µg/L, QUERIED WHERE UNKNOWN
MTBE METHYL TERT-BUTYL ETHER
< BELOW LABORATORY REPORTING LIMIT
J LABORATORY ESTIMATED VALUE
[NS] NOT SAMPLED
NOTES:
TO PROVIDE CLARITY, LOGARITHMIC CONTOUR LINES ARE USED
GT-20 AND GT-27 ARE DUAL NESTED SVE AND GROUNDWATER MONITORING WELLS. ALL GROUNDWATER DATA IS FROM THE GROUNDWATER MONITORING WELLS, EXCEPT AS NOTED.
★ WELL GT-20S IS A VAPOR EXTRACTION WELL 1ST SAMPLED 11/14/2013
APPLE TREE ESTATES
HENRY SILVER LANE
Gold Nugget [NS]
STRAUBE [NS]
WASHINGTON STREET
2354 C [NS]
B STREET
C STREET
2508 B [NS]
2nd STREET
Jess Martin [NS]
D STREET
GT-24a <0.50
GT-2 <0.50
GT-24b <0.50
GT-24c <0.50
FORMER JULIAN GARAGE 2126 MAIN STREET
GT-32 <0.50
3rd STREET
GT-31 <0.50
GT-30 0.76
GT-29 35
JCSD-8 <0.50
JCSD-2 <0.50
JCSD-1 <0.50
JULIAN CIDER MILL 2103 MAIN STREET
Stonewall/JCSD-10 0.31 J
1912 Main [NS]
GT-21 <0.50
BANNER ROAD
78
79
GT-35 <0.50
FARMER ROAD
GT-34 <0.50
GT-7 <0.50
GT-23a <0.50
GT-23b <0.50
GT-23c <0.50
GT-22a <0.50
GT-22c <0.50
GT-22b <0.50
GT-6 <0.50
GT-12
GT-16 <0.50
GT-5 [NS]
GT-17
GT-18 [NS]
GT-33 <0.50
GT-27 24
MAIN STREET
NORM'S SERVICE STATION 1913 MAIN STREET
GT-20/GT-20S* 250/11,000
GT-1 0.31 J
GT-13 <0.50
GT-15 <0.50
GT-14 <0.50
GT-28 <0.50
MW-1 8.8
MW-2 0.83
MW-3
GT-9 <0.50
GT-26 <0.50
PORTER LANE
GT-25 0.43 J
JCSD-4 NS
GT-10 <0.50
GT-4 <0.50
Shiley #6 [NS]
Shiley #1 [NS]
JULIAN CEMETERY
Bailey's Barbecue <0.50
FORMER CHEVRON STATION No. 9-3667 2712 WASHINGTON STREET
A STREET
GT-8 <0.50
GT-19 <0.50
4th STREET
S. D. County [NS]
GT-11 <0.50
Porter 2R <0.50
0 200 400
APPROXIMATE SCALE IN FEET
JCSD-3 NS
Finn <0.50
GT-3 2.1
Rex-Anderson [NS]
COLEMAN CREEK LAKE
Corlew 1 [NS]
Corlew 2 [NS]
ORIGINAL SHEET - ANSI B
December, 2013
211802308
Stantec
9179 Aero Drive
San Diego, CA 92123
www.stantec.com
Porter 1 <0.50
Corlew 4 [NS]
Corlew 3 [NS]
COLEMAN CIRCLE
JCSD (Coleman) [NS]
Client/Project
Former Chevron Station No. 9-3667, Old Julian Garage
Julian Cider Mill and Norm's Service Station
Julian, California
Figure No.
7
Title
DISSOLVED MTBE ISOCONCENTRATION MAP
NOVEMBER 11-15, 2013

DIPE – 10/2008


APPLE TREE ESTATES
HENRY SILVER LANE
Gold Nugget [NS]
STRAUBE [NS]
WASHINGTON STREET
B STREET
C STREET
D STREET
A STREET
2354 C [NS]
2508 B [NS]
2nd STREET
3rd STREET
4th STREET
Jess Martin [NS]
FORMER JULIAN GARAGE 2126 MAIN STREET
JULIAN CIDER MILL 2103 MAIN STREET
Stonewall [45]
1912 Main [NS]
NORM'S SERVICE STATION 1913 MAIN STREET
MAIN STREET
DISPENSER
FORMER CHEVRON STATION No. 9-3667 2712 WASHINGTON STREET
Bailey's Barbecue [1.7]
JULIAN CEMETERY
FARMER ROAD
BANNER ROAD
PORTER LANE
S. D. County [NS]
Rex-Anderson [<0.50]
COLEMAN CREEK LAKE
Corlew 1 [NS]
Corlew 2 [NS]
Corlew 4 [NS]
Corlew 3 [NS]
Porter 1 [NS]
Porter 2 [NS]
Finn [<0.50]
JCSD-1 [0.5]
JCSD-2 [8.4]
JCSD-8 [<0.50]
JCSD-3 [<0.50]
JCSD-4 [<0.50]
GT-2 [NS]
GT-3 [<0.50]
GT-4 [0.74]
GT-5 [<0.50]
GT-6 [7.8]
GT-7 [6.1]
GT-8 [0.76]
GT-9 [<0.50]
GT-10 [<0.50]
GT-11 [0.27]
GT-12 [94]
GT-13 [1.5]
GT-14 [2.6]
GT-15 [7.0]
GT-16 [2.4]
GT-18 [150]
GT-19 [0.52]
GT-20 [8.2]
GT-21 [<0.50]
GT-22a [30]
GT-22b [48]
GT-22c [29]
GT-23a [6.0]
GT-23b [29]
GT-23c [73]
GT-24a [<0.50]
GT-24b [NS]
GT-24c [0.69]
GT-25 [NS]
GT-26 [<0.50]
GT-27 [0.94]
GT-29 [<0.50]
GT-30 [7.4]
GT-31 [5.1]
GT-32 [0.28]
GT-33 [260]
GT-1 [3.3]
MW-1 [5.6]
MW-2 [1.1]
MW-3
1.0
10
100
LEGEND:
GT-12 GROUNDWATER MONITORING WELL LOCATION
JCSD-8 WATER PRODUCTION WELL (PUMPING)
JCSD-1 WATER PRODUCTION WELL (NON-PUMPING)
Porter 1 PRIVATE WELL (NON-PUMPING)
MW-3 DESTROYED WELL
[<0.50] DIPE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
50 ? ESTIMATED DIPE ISOCONCENTRATION CONTOUR IN µg/L, QUERIED WHERE UNKNOWN
DIPE DI-ISOPROPYL ETHER
< BELOW LABORATORY REPORTING LIMIT
[NS] NOT SAMPLED
NOTES:
TO PROVIDE CLARITY, LOGARITHMIC CONTOUR LINES ARE USED
WELLS GT-27, JCSD-1, AND JCSD-2 SAMPLED ON NOVEMBER 17, 2008, WELL JCSD-8 SAMPLED ON NOVEMBER 21, 2008
0 200 400
APPROXIMATE SCALE IN FEET
PREPARED BY:
Stantec
2655 CAMINO DEL RIO NORTH, SUITE 302
SAN DIEGO, CALIFORNIA
PHONE: (619) 296-6155/296-6159 (FAX)
FOR:
Former Chevron Station No. 9-3667
Old Julian Garage
Julian Cider Mill and Norm's Service Station
Julian, California
TITLE:
DISSOLVED DIPE
ISOCONCENTRATION MAP
NOVEMBER 10-12, 2008
DRAWN BY: JA
DESIGNED BY: RJO
CHECKED BY: BW
APPROVED BY: BW
PROJECT NUMBER: 08CH.93667.A8
SCALE: AS NOTED
DATE: 12/19/08
FILE PATH: 9-3667 2008Q4 ISO
FIGURE:
20

DIPE – 11/2013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GT-11 GROUNDWATER MONITORING WELL LOCATION
JCSD-8 WATER PRODUCTION WELL (PUMPING)
JCSD-1 WATER PRODUCTION WELL (NON-PUMPING)
Porter 1 PRIVATE WELL (NON-PUMPING)
MW-3 DESTROYED WELL
<0.50 DIPE CONCENTRATION IN MICROGRAMS PER LITER (µg/L)
10 ESTIMATED DIPE ISOCONCENTRATION CONTOUR IN µg/L, QUERIED WHERE UNKNOWN
DIPE DI-ISOPROPYL ETHER
< BELOW LABORATORY REPORTING LIMIT
J LABORATORY ESTIMATED VALUE
[NS] NOT SAMPLED
NOTES:
TO PROVIDE CLARITY, LOGARITHMIC CONTOUR LINES ARE USED
GT-20 AND GT-27 ARE DUAL NESTED SVE AND GROUNDWATER MONITORING WELLS. ALL GROUNDWATER DATA IS FROM THE GROUNDWATER MONITORING WELLS, EXCEPT AS NOTED.
★ WELL GT-20S IS A VAPOR EXTRACTION WELL 1ST SAMPLED 11/14/2013
APPLE TREE ESTATES
HENRY SILVER LANE
Gold Nugget [NS]
2354 C [NS]
B STREET
C STREET
2nd STREET
2508 B [NS]
Jess Martin [NS]
STRAUBE [NS]
WASHINGTON STREET
GT-24a <0.50
GT-2 0.42 J
FORMER JULIAN GARAGE 2126 MAIN STREET
GT-24b 0.71
GT-24c 5.9
GT-32 7.7
3rd STREET
GT-31 11
GT-30 47
GT-29 38
D STREET
JCSD-8 0.96
JCSD-2 0.75
JCSD-1 <0.50
GT-35 <0.50
FARMER ROAD
GT-34 2.9
GT-7 <0.50
GT-23a <0.50
GT-23b 38
GT-23c 62
GT-22a 3.0
GT-22c <0.50
GT-22b <0.50
GT-6 1.8
GT-12
GT-1 0.35 J
GT-16 <0.50
GT-5 [NS]
GT-17
GT-13 0.98
GT-15 3.7
GT-14 0.45 J
GT-10 <0.50
JULIAN CIDER MILL 2103 MAIN STREET
Stonewall/JCSD-10 52
1912 Main [NS]
GT-21 <0.50
BANNER ROAD
78
79
GT-18 [NS]
GT-33 40
GT-27 <0.50
MAIN STREET
GT-28 74
GT-4 4.2
GT-9 <0.50
MW-2 <0.50
MW-3
NORM'S SERVICE STATION 1913 MAIN STREET
DISPENSER
GT-20/GT-20S* 1.9 J/<50
MW-1 0.68
GT-26 0.52
GT-25 0.30 J
PORTER LANE
JCSD-4 [NS]
Shiley #6 [NS]
Shiley #1 [NS]
JULIAN CEMETERY
Bailey's Barbecue <0.50
FORMER CHEVRON STATION No. 9-3667 2712 WASHINGTON STREET
A STREET
GT-8 <0.50
GT-19 <0.50
4th STREET
S. D. County [NS]
GT-11 <0.50
Porter 2R <0.50
JCSD-3 [NS]
0 200 400
APPROXIMATE SCALE IN FEET
Finn <0.50
GT-3 <0.50
Rex-Anderson [NS]
COLEMAN CREEK LAKE
Corlew 1 [NS]
Corlew 2 [NS]
Porter 1 <0.50
COLEMAN CIRCLE
JCSD (Coleman) [NS]
Corlew 4 [NS]
Corlew 3 [NS]
ORIGINAL SHEET - ANSI B
Stantec
9179 Aero Drive
San Diego, CA 92123
www.stantec.com
December, 2013
211602306
Client/Project
Former Chevron Station No. 9-3667, Old Julian Garage
Julian Cider Mill and Norm's Service Station
Julian, California
Figure No.
9
Title
DISSOLVED DIPE ISOCONCENTRATION MAP
NOVEMBER 11-15, 2013

Outstanding Issues

* Due to Julian being in a groundwater dependent area, the groundwater clean-up goal for the plume is the MCLs and the Public Health Goals.
* The RWQCB Cleanup and Abatement Order established a process of developing alternative cleanup levels which has not been finalized.
* The residual benzene concentrations have decreased significantly due to the VES remediation that removed approximately 136,000 pounds of hydrocarbons.

Outstanding Issues (Continued)

* The MTBE concentration are located primarily in the area near the former Norm's site and the data indicates the plume in this area is not stable.
* Since November 2013, a sheen to 0.01 feet of free-product has been observed on the former Norm's site.
* The residual DIPE is pervasive across the downtown area at low concentrations above the Public Health Goal.

Future Activity

* Chevron has been directed to provide an evaluation of the migration of MTBE and appearance of free-product.
* Currently they are in the process of installing a nested well on the site to be used:
  * To get a better handle understanding of vertical contamination and
  * To be used as part of a focused pilot test to determine the most effective remedial approach to mitigate the free-product and the migrating MTBE plume.

Questions?